CULTURE AND CONTROL

Regulation of Risk in the Norwegian Petroleum Industry

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Shine on rising oceans and evaporating seas
Shine on our Frankenstein technologies
Shine on science ...

Joni Mitchell

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Abbreviations and acronyms

AoC	Acknowledgement of Compliance
ALARP	As Low As Reasonably Practicable
BBS	Behaviour Based Safety
BOP	Blow Out Preventor
DFU	Defined situations of hazard and accident
FAR	Fatal Accident Rate
HC	Hydro Carbons
HRT/O	High Reliability Theory/Organization
HSE	Health, Safety and Environment
IRIS	International Research Institute of Stavanger
KPI	Key Performance Indicators
LO	Norwegian Confederation of Trade Unions
LTI	Lost Time Incident
MTO	Man, Technology, Organization
NAT	Normal Accident Theory
NCS	Norwegian Continental Shelf
NOPEF	The Norwegian Federation of Oil and Petro-Chemical Workers (LO)
NOK	Norwegian Kroner (= ca. EUR 7.8, USD 5.1, GBP 10.2, as of March 2008)
NORSOK	Norwegian Offshore Cost Effective Initiative
NOU	Norwegian Public Reports
NPD	Norwegian Petroleum Directorate
NSE	North Sea Environmental Unit (Stavanger Police Department)
NTNU	Norwegian University of Science and Technology
OLF	Norwegian Oil Industry Association
OFS	Federation of Offshore Worker Unions (to become: SAFE)
OIM	Offshore Installation Manager
PSA	Petroleum Safety Authority Norway
R&D	Research and Development
RNNS	Risk Levels - Norwegian Continental Shelf (RisikoNivå på NorskSokkel)
SAFE	Federation of Oil Worker Unions within the Energy Sector (formerly OFS)
SBP	Statoil Safe Behaviour Program
UiS	University of Stavanger
UPN	Statoil Exploration and Production Norway
WEA	Working Environment Act
WTfS	Working Together for Safety

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1. Introduction

> *Justice then consists in not transgressing the customs of the city in which one enjoys citizenship. So a man would employ justice best for his own interests if he were to regard the laws as important when witnesses were present, but, when no witnesses are present, he were to regard the demands of nature as important. For the demands of the laws are artificial, but the demands of nature are necessary. And the demands of the laws are the result not of natural disposition but of agreement, but the demands of nature are exactly the opposite. So if a man transgresses the demands of law and his transgression is unnoticed by the parties to the agreement, he escapes without either shame or penalty. But if the transgression is noticed he does not. If, on the other hand, a man does what is really an impossibility and violates one of the inherent demands of nature, if all mankind fails to notice it the harm is no less and if everyone aware of it the harm is no grater. For the injury he suffers is not in appearance but in truth.*
>
> Antiphon (480-411 BC)[1]

This thesis explores the mechanisms and dynamics of public intervention in managing the risks of petroleum activities on the Norwegian Continental Shelf. As Norway's decidedly most important industrial sector and the greatest single contributor to the Norwegian economy, the benefits and revenues extracted from this industry normally receive the bulk of public interest and awareness. Although the risks involved have been addressed, encountered, and coped with since the drilling of the first exploration wells in the mid 1960s, they compete with the benefits in terms of public attention only in passing moments when the dangers involved surface as accidents or serious near-misses, or when the opening of new petroleum fields triggers serious environmental concerns.

Public intervention for managing and reducing risks predominantly takes the form of regulation. And conversely, it can be argued, regulation as such is predominantly motivated by a perceived public need to respond to some type of risk. But not all risks are regulated, and those that are, are of very different kinds. And the magnitudes, means, and methods of regulation vary, not necessarily corresponding to the nature of the risks involved or to their societal and technological contexts in any patterned or predictable manner.

[1] Papyrus fragment (re)discovered in 1915, possibly from the larger text "On Truth", reprinted in Sprague (1972).

As a field of academic interest, the regulation of risk as such is not very old, and has developed in a rather piecemeal way (Hutter, 2001; Hood *et al*., 2001). Partly, this is probably due to the highly multidisciplinary nature of the subject, involving the legal and socio-legal disciplines, most branches of social science, as well as the disciplines relevant for understanding the particular composition of risks to be studied. The study of risk regulation not only cuts across disciplines, but is thus also potentially unbounded in terms of scholarly relevance. In the same vein, the actual *regimes* of risk regulation cut across societal contexts, ranging from the level of political attention and statutory legislation, the administrative channels of execution and law enforcement, and down to the particular social, institutional, and technological contexts in which the risks are situated. Studying risk regulation thus involves encounters with daunting bodies of knowledge and vast amounts of actors and institutions, linked together in loosely and tightly coupled systems of interference and complexity. Apart from understanding (as far as possible and necessary) the nature of the risks involved, the study of risk regulation addresses questions about of how public policies and priorities emerge, how they are transformed into rules and policy instruments, how these are enforced and practically implemented, how the regulated parties respond, how the regulatory authorities respond to the responses, and so on and so forth. Research topics may include normative justifications of public intervention, their actual public legitimacy, the 'external' explanation of policy behaviour, the incentives for dealing adequately with risks in the absence of regulation, and the conditions and mechanisms that influence regulatory compliance, including the impact and role of the public watch dog position.

The epitaph to this introduction, despite its ancient origin, evokes just these rather basic queries about how human conduct unfolds within the boundaries of 'natural' and man-made controls. It points to the 'arbitrary' nature of culture, the 'cultural' nature of man-made laws, the strategic aspects of law-abiding behaviour, and the accompanying necessity of 'witness accounts' when man-made rules are violated, as contrasted with nature's demands, which cannot be defied with impunity. Antiphon was at odds with some of his more famous contemporaries, in not seeing culture and society as analogous to nature. Culture and society were not seen as governed by godly forces, teleological

purpose or ‘natural’ propensities, as was the more common view of the ancient philosophers, like Plato and Aristotle. Seeing customs as established by human agreement only, makes the old sophist Antiphon a ‘modern thinker’ in our terms. That he may be interpreted here as arguing *normatively* that laws (or customs) should be followed *only* when transgressions involve the risk of public attention and sanction, is perhaps of secondary importance as against the *factual* claim that nature will ‘strike back’ regardless of societal controls, but is arguably less ‘modern’ (Audi, 2000). Regulations and their systems of ‘artificial’ controls are embedded within larger contexts and networks of checks and balances, both external and internal to the market economy of production, no more ‘natural’ than the ‘natural’ market of neo-classicist economy (Habermas, 1996; Hutter, 2001). Seeing the potential law abider as simply a reluctant and cynical calculator ignores the multiplicity of mechanisms and motives that govern compliance with societal norms. The dividing line between ‘nature’ and ‘culture’ is not clear cut, and the content and context of modern public regulation and risk management constitutes (and reflects) a ‘second nature’ of cultural and societal conditions and controls. The boundaries are also blurred by the way in which risks are ‘measured’ or ‘experienced’, the social and psychological mechanisms of amplifications or diminutions of risk, the mechanisms of their management and their embeddedness in social checks and balances. But the idea of ‘truth’ being fulfilled or encountered only when nature ‘strikes back’ as against the arbitrary and coincidental nature of (artificial) social controls would still have at least a metaphorical significance in the modern world of pervasive regulation and sophisticated control mechanisms. But we are not willing to wait for the natural forces or the forces of man-made technologies, to appear as the moment of truth. And questions about the sufficiency and adequacy of ‘natural’ social controls (such as those embedded in markets and economic life) in furthering or protecting public and democratic interests and values, are in themselves of a highly public and democratic nature.

Themes, context, and scope

Within this larger thematic context, the present case study appears as just that: a case study. But even when limited to the level of a case study, the potential magnitude of issues to be covered, theoretically as well as empirically, is overwhelming. The questions

that may be raised in the study of risk regulation cannot and shall not be explored with equal depth and force, although an understanding of the broader and overall aspects of both the 'case' and the 'topic' will be attempted. The point of departure in this case, provides direction for the research project, as it specifically addresses the introduction of the concept of *culture* as part of the regulatory policy and vocabulary. More precisely, the main background for this research project is a recent regulatory reform including a new provision requiring the petroleum industry to develop a "good and sound" culture in the area of health, safety and environment, referred to as *HSE culture*.[2]

The new regulations were launched in 2002 and HSE culture was given much attention as an inventive, potentially productive, and occasionally even decisive 'approach' for improving HSE conditions in the industry. The integration of HSE culture as part of a regulatory strategy was considered unique, and was highlighted in all the relevant public policy documents. The primary purpose of the thesis is to account for how and why this particular concept was introduced, and to study how it has been integrated and applied within the regulatory framework and as part of the regulatory strategy. But the provision was also part of a broader regulatory reform and it grew out of a regulatory philosophy that relied heavily on systems of self-regulation and risk management within the industry, notably by addressing the organizational conditions of regulatory compliance, such as resources, competencies, and control systems. The introduction of the HSE culture provision thus has to be studied within the context of the regulatory regime as a whole, including the types of risk involved, the structure of actors and interests, and the patterns and styles of interaction between regulatory bodies and the regulated industry. Also, there are broader contexts of administrative policies and industrial relations that influence how systems of regulation evolve. Finally, as will be elaborated below, HSE culture came to be associated with a range of wide-ranging and profound questions about the understanding and management risks. All these factors then justify and necessitate a more comprehensive approach. The overarching purpose of the study is thus to *understand the*

[2] The research took place within the framework of a larger research program funded by the Norwegian Research Council: *Health, Safety and Environment in the Petroleum Sector*. The program covers a series of issues that influence health, safety and environmental conditions within the sector, notably technological change and organizational features, including also *HSE culture*.

causes and consequences of the introduction of HSE culture as a regulatory requirement in the Norwegian petroleum sector, within the context of the regulatory regime as a whole. Technically, HSE culture then serves as both the 'dependent' and the 'independent' variable. Substantially, however, the study concentrates on the 'story' of how HSE culture has evolved as a conceptual device for framing and reframing socially embedded understandings of risk and its management within the regulatory and industrial context.

It has been of some importance to outline the complexities and trajectories of this story in a naturalistic fashion, but also to recount some academic contexts encountered along the way, despite the risks involved in having to deal with, at least marginally, too many research traditions. Given the purpose of the study, at least three such traditions, in themselves highly interdisciplinary and 'unbounded', must be considered. First, there is the study of regulation and regulatory regimes, with several academic roots, such as economics, law, socio-legal studies, and policy studies. Second, there is the study of risk management, with academic roots in engineering, risk analysis, and organization studies. As indicated above, these research traditions are combined in the study of risk regulation regimes, and cover in principle all areas of regulation intended to control risks in society, such as to protect the interests of the citizens, employees, consumers, or the environment. Third, there is the study of culture, with multiple roots in the social sciences, primarily in sociology and social anthropology. The latter, being my own disciplinary background, will serve as a vantage point for the approaches chosen, perhaps giving this study some distinctive quality. That position suits the case, as this particular piece of empirical reality curiously impose a cultural perspective upon itself, thus making the corresponding cultural modes of scholarly interpretation doubly appropriate. As the story unfolds, the ethnographic approach and the phenomenologically inspired analysis of organizational *sense-making*, to borrow a phrase from Weick (1995; 2001), should appear all the more relevant. A more comprehensive discussion of these traditions and perspectives will be provided in the next chapter. A few preliminary observations should still be noted, however.

The literature on risk regulation has been increasingly concerned with the un-clear boundaries between the regulatory regimes and the systems and practices of risk management at the corporate level, sometimes referred to as the 'co-option of regulation' or the 'decentring' of regulation, where public and private forms of regulation constitute a mix of regulatory forms (Black, 2002; 2006; Hutter, 2001). What can be seen as regulatory compliance from the regime perspective, can be seen as risk management from the corporate perspective. That particular framing may also depend on the use of terms; sometimes risk management is used as an overall term for all systematic or organized attempts to control risks, irrespective of the location of its 'agency' (Baldwin *et al*., 1998; Royal Society, 1992). These boundaries have been particularly blurred by the introduction of statutory systems of self-regulation or so-called 'enforced self-regulation' (Ayres and Braithwaite, 1992). Such legal approaches do not only address risk issues as such. Rather, they may introduce 'meta-rules', indicating and specifying *how* organizations should deal with risk, by requiring the establishment of risk management systems that may include methodologies and processes of risk assessments, thresholds of risk acceptability, administrative structures and resources, feed-back systems to correct deviation and failure, internal monitoring and audit arrangements. Another related feature contributing to blurring boundaries is the shift from traditional 'command and control' regulation to purpose-oriented regulation. Instead of describing in detail how a given purpose should be achieved (e.g. by specifying the height of a fence, or the size of a window), purpose-oriented legislation attempts to leave such details to the regulatee. It merely states in a functional manner what purpose should be accomplished. Together these characteristics are intended to put more responsibility in the hands of the regulatee, and at the same time create more leeway and flexibility as to how legal requirements should be satisfied (their purpose given).

The regulatory regime for occupational health and safety in the Norwegian petroleum industry has followed both these paths, and has served also as a national benchmark for similar regulatory reforms on an expanding scale. But organizational perspectives on regulation were also inherent in the important legislative reforms on occupational health and safety in the 1970s, notably The Work Environment Act of 1977 (WEA). The WEA

emphasized local responsibility, involvement and participation, and it set up requirements for decision-making and problem-solving arenas that would further communication, learning-processes, and task-oriented improvements within the local work-place context.[3] This legislative practice developed partly as a response to increasing difficulties in setting and controlling specified standards, particularly apparent in the area of occupational health. It was believed that a focus on organizational features and local workplace action would be more instrumental in improving working environment conditions.[4] The WEA was applied to the offshore industry after some political strife, and served partly as a corrective to the more managerially oriented philosophies of quality control and safety management that was emerging (Ryggvik, 2000).

Philosophies and systems of self-regulation have become increasingly sophisticated and complex, intended to penetrate deeply into the organizational make-up of the regulatees. Investigators of regulation (as well as regulators and regulatees) are thus confronted with variously composed amalgams of risk management and organizational designs (Hale and Hovden, 1998; Hutter and Power, 2005). The concept of 'culture' has been present in the organizational literature for some time, and has gradually found its way into the literature on organizational risk through such seminal works as *Man-Made Disasters* in the late 1970s (Turner, 1978). The concept of HSE culture has its origins in the term *safety* culture that appeared gradually in the 1980s, and was linked to the broader concept of organizational culture, indicating that failures in communication, ill-structured ways of thinking and information processing, lack of commitment to safety, etc., were important causal antecedents of accidents. 'Bad cultures' became a buzz-word for both practitioners and investigators in explaining accidents and sub-standard risk management practices,

[3] Although seldom mentioned in the national literature as a source of inspiration (Gustavsen, 1984; 1990), this reform largely followed the same line of regulatory philosophy as was advocated by the British Robbens report, later to be materialized in the Health and Safety at Work Act in 1974. This legal approach was goal-based, encouraging a participative model of self-regulation, and involving the workforce actively in the improvement of local working conditions (Baldwin, 1986; Hutter, 2001). The Norwegian reform was largely inspired by the so-called socio-technical school developed at the Tavistock Institute, emphasizing the necessity of participative models of work-design, and by more general developments in labour relations towards the democratization of working life (Gustavsen and Hunnius, 1981).

[4] 'Occupational health and safety' is used here interchangeably with 'working environment'. The latter term indicates a broad approach to all environmental factors affecting the mental and physical health and wellbeing of the workers, which is reflected in the WEA.

often as a response and an alternative to the sometimes unhappy reliance upon increasingly complex and bureaucratic management systems.

By introducing 'HSE culture' as part of the regulatory framework, a 'new dimension' has thus been added to the organizational line of regulatory philosophy, arguably as an attempt to penetrate further into the self-regulatory mechanisms and placing even greater responsibilities in the hands of the regulatee in the attempt to make them regulate themselves. The White paper preceding this regulatory reform specified that a good culture implied that HSE aspects should be integrated as part of the common values of the regulated organizations, to be reflected in established attitudes, competencies, and behaviours. The reform thus also reflected and reinforced values held dear in the established legislative practice and public policy of work life that were corroborated with the WEA reform. The provision was launched with some ostentation, declaring Norway to be the first country ever to require industrial companies to develop their 'HSE culture'. The White paper preceding the new regulations made several references to this new concept, emphasizing the idea of "continuous improvement and learning". Subsequent ministerial Letters of Award to the regulatory agency had HSE culture high on the agenda, as a priority issue to permeate all relations with the industry.[5] However, the provision also generated some demanding challenges for the petroleum authorities, both in terms of interpretation, enforcement, and overall strategy. Integrating HSE culture in supervisory practices proved difficult, and the status of the provision in terms of its regulatory enforcement was subject to much uncertainty. These processes evolved in the face of organizational experimentation and discontinuity, which exacerbated the difficulties involved in developing conceptual understandings of 'HSE culture' that could be sufficiently shared and appreciated within the agency. Also, a diversity of 'cultural programs' appeared within the industry, adding to the proliferation of (sometimes contested) risk management strategies associated with the 'cultural turn'. At the end of the research period, the status of HSE culture as part of the overall regulatory strategy

[5] The regulatory structure is to be described more elaborately later. At the time of the reform, the relevant agency was the Norwegian Petroleum Directorate (NPD). In 2004, health and safety issues were separated from the NPD and organized in a newly established agency, the Petroleum Safety Authority Norway (PSA). References are thus sometimes made to either, sometimes to both, depending on time and context.

was not altogether clear. The obviously attractive, and perhaps also trivial, insight that cultural properties and processes play a significant role in how organizations encounter and manage their risks, was an important driving force during the initial stages of the process. As the real task of making the concept 'operational' within the regulatory context, the original enthusiasm faded. In fact, at the end of the research period (2006), no such enthusiasm was any longer apparent, and key policy documents mentioned the concept only in passing, if at all. What had happened to the HSE culture?

The present study will try to trace this process by investigating how key actors have tried to interpret and make sense of HSE culture within the operational context of enforcing the law and pursuing the regulatory purposes. How was 'culture' to be distinguished in its parts and as a whole, how was it related to other regulatory requirements and approaches to organizational risk, and how did the concept of culture make sense in the regulatory practices of supervision and in other encounters with the industry? Although the focus of this study is mainly on the regulatory authorities, the questions posed involve the whole spectre of actors within the regulatory space, notably the industry, trade unions and worker representatives, and other actors, such as various experts, consultants and even the research communities within which the study itself was situated.[6]

As noted, the cultural experiments were not conducted in isolation, but took place within the larger contexts and discourses of risk and its corporate and regulatory management. Thematically, these can be related to some of the key dimensions of risk management identified in the important Royal Society publication on risk from 1992, and later referred to as representing "recurrent sets of opposing views in risk management", that partly reflected "competing world views" (Hood and Jones, 1996: 9; Royal Society, 1992). Indeed, the introduction of 'HSE culture 'appeared as a trigger in provoking such competing world views; or perhaps more modestly, the cultural turn was enacted within the context of already existing conceptualizations and controversies about the understanding of risk and its management. Seven such dimensions were identified in the

[6] The term 'regulatory space', originally coined by Hancher and Morgan (1989), will be used occasionally throughout as a shorthand phrase to denote the complex web of regulatory issues and processes, and the interrelated involvement of public and private actors in the different facets of regulation.

Royal Society publication, not assuming that all positions clustered around the extreme ends, but rather as a way of ordering the debates and some of their associated assumptions.[7] These dimensions can be briefly summarized as sets of opposed doctrines. (1) The doctrines of *anticipationism vs resilience*, divided in how they value the use of causal knowledge of system failure to *ex ante* actions for better risk management (anticipationism), *vs* a focus on inherent unpredictabilities related to complex system failure and the need for resilience in order to cope with whatever risks that may appear. (2) The doctrines of *absolutionism vs blamism*, divided in that the former value a no-fault approach in order to promote information flows and learning processes, whereas the latter argue that the targeting of blame gives strong incentives for decision makers (at all levels) to 'take care'. (3) The doctrines of *quantificationism vs qualitivism*, divided in how they rely on quantifiable factors in risk management. (4) The doctrines of *design vs design agnosticism*, divided in how they judge the availability of secure knowledge in terms of institutional design. (5) The doctrines of *complementarism vs trade-offism*, the former claiming that good management smoothly combines economic goals with safety goals, whereas the latter claims that trade-offs are inevitable and inherent. (6) The doctrines of *narrow vs broad participation* differ in how they value the specialized advice of experts, as against the broader involvement of lay people. (7) The doctrines of *outcome specification vs process specification*, divided in how they rely on specified and 'evidence-based' standards for physical products and structures, as against a more process-based and discursive negotiation of regulatory options.

The main point here is that the context, into which the 'cultural reform' was introduced, was inhabited with complex and comprehensive risk management discourses and controversies, providing a contested and dubious landscape for its implantation.
Now, these opposing doctrines were not always replicated in exactly these forms, and the dimensions were occasionally given their own specific twists, as will be evident below.

[7] It may be added to this that the dimensions also represented an attempt to allow for a more 'relativist' and less 'objectivist' discourse in the risk debates, not assuming that opposing views could be 'settled by science', or reduced to a question about scientific certainty. It should be noted also that this contribution appeared in one of six chapters, in conjunction with a chapter on risk perception, both of which were firmly placed within the psychological and social scientific research traditions. Subsequent debates occasionally referred to the publication as "four chapters good and two chapters bad", thus confirming the need for breaking up the scientistic hegemony in the risk debates (Hood and Jones, 1996).

They also blurred and blended into new composite forms and oppositions, the most important of which appeared to be the relationship between individual responsibility and external framework conditions in the understanding and politics of risk management. This latter dimension in fact had two important and intricately related aspects. One was the 'factual/instrumental' aspect; that of which risk management strategy would actually promote safety in the most efficient manner: strategies addressing individual behaviour, or ones that addressed organizational, technological and economic 'conditions'. The other aspect was moral: how should the borderlines be drawn between external 'shapers' and the variously located individual agents in the normative attribution of responsibility and blame?

Notes on methodology (and meta-theory)

The data in this study were for the most part collected in the years 2005-2006. The methods employed are primarily documentary studies, qualitative interviews, and participant observation. The latter was for the most part not participative in the ideal sense, and included attendance at a number of conferences, seminars, meetings, workshops, etc. The research process included several weeks of fieldwork at the Petroleum Safety Authority Norway (PSA), were I was provided with a fully equipped office and admitted access to internal databases, web sites, and other documentary sources. I could freely move around in the organization on my occasional visits, arrange and conduct interviews, have informal talks with employees, and participate in relevant meetings. I participated in two supervisions during the fieldwork period, and I also had a short but intensive week on an offshore production facility. A more detailed outline of methods and data collection is provided in Appendix I.

This strategy and methodological makeup of the research process are tentatively adapted to the research questions outlined, and are predominantly placed within an interpretive and phenomenological social science tradition. The exploratory research processes adopted within this tradition involves a continuous interaction and dialogue between theory, concepts, and evidence rather than a deductively oriented testing of pre-defined hypotheses (Ragin, 1994; Strauss and Corbin, 1994). In this tradition, theory must

communicate with data in a manner that allows for mutual transformational patterns, indicating both proximity and distance to empirical phenomena. Ideas and concepts must been clarified in the course of the research process and modified in the face of experiential evidence. The approach builds on realist and naturalist foundations, but is not 'positivist' in the sense that some fixed reality is taken be to 'out there', only to be discovered through proper research methods. Social realities are fluid, changing, and continually (re)produced; 'theorizing' about them is a highly contextual and complex process, historically and socially situated, and open to constant revision and self-reflection (Moore and Sanders, 2006). Meta-theoretical questions thus underlie any interpretation, explanation, and representation of the social world. They are occasionally invoked in discussions about culture and risk management, but perhaps less often in the study of regulatory regimes within the context of policy analysis (Shrader-Frechette, 1991). Assumptions are always made about conceptual and substantial understandings, both in terms of how actors use 'local' theories and linguistic representations to interpret and explain their environments, but also in terms of the explanatory and interpretive representations of these processes. At both levels, the interpretive and explanatory endeavours are highly theory-laden, particularly so, since the concepts and linguistic representation involved are often highly abstract and far removed from the observational periphery, to borrow a phrase from Quine (1953). Still, at the empirical level, such representations are employed within these very observational contexts, sometimes bluntly denotative, sometimes cautiously referential, and sometimes reflexively conditional.

Giddens uses the terms 'first-order concepts' and 'second-order concepts' in addressing what he calls the 'double hermeneutic' of social science "introducing frames of meaning associated with certain contexts of lives to those of others" (1984: 248-5). It may be argued that this hermeneutic is more plural than singular, and also more multifarious than just being 'double'. Acts of interpretation in complex expert-societies are multilayered, including also 'natives talking back', partly though languages and contextual codes similar to those of the external observer or researcher, thus involving complex interactions between frames and contexts being imposed from several directions. There is another paradoxical twist added to these 'multiple hermeneutics' following from the

research questions posed here; studying how 'culture', as a concept with locally understood empirical meanings, is transformed and made applicable in the socially enacted worlds of risk regulation involves several levels of analysis. Furthermore, regulatory world views are also cultural phenomena, and the 'regulation of culture' must be understood within the context of these 'cultures of regulation'.

Penetrating the local rationalities or irrationalities (however defined and distinguished) will be more important in the pages to come, than exploring their 'external causes'. Although external and positive theories of why regulatory regimes develop as they do shall be briefly considered, there is in fact no conclusive evidence on the relative explanatory power of either of these; rather, there is a variety of external and internal mechanisms that shape regulatory decision-making and policy choices in each case, justifying the relevance of in-depth case studies. The role of internal and institutional processes has been discussed by drawing attention to the significance of regulatory discourses, world views, cultures, and even local 'tribes' (e.g. Baldwin and Cave, 1999; Hood *et al*., 2001). However, instead of using this as an opportunity to explore local rationalities in a 'charitable' way, there seem to a recurring taste for rather patronizing interpretations of bureaucrats and policy agents. In public choice theory they are for the most part (to the extent that they bother to work) seen as following their own interests (Niskanen, 1971). In policy analysis, they appear as victims of legislative myopias, and more concerned with avoiding blame than following the public interest (Hood *et al*., 2001). Institutional analysis, perhaps as an overstated reaction against economistic and rational models, tend to portray bureaucrats as caught in organizational anarchies and cognitive mind-traps, often inverting the procedure of rational problem-solving by making solutions search for problems rather than the other way around; or they appear as conformist cultural dopes, following established routine, 'standard operating procedure', and 'administrative rituals' (March and Olsen, 1979; 1989). And if they're not rule-following traditionalists, they're victim to the latest managerial fashion, mostly in order to gain external legitimacy (Meyer and Rowan, 1983; Powell and DeMaggio, 1992). Even 'cultural theory' has made its way to political and institutional analysis, reducing the socio-cultural systems to instances of the two-dimensional grid/group typology first

devised by Mary Douglas (1978; Thompson *et al*., 1990). It might be noted in passing that anthropologists may have been more willing to grant rationality (or reasonableness) to 'primitive peoples' and 'tribal societies' than political scientists sometimes are willing to grant to the Weberian crusaders of rationality – the bureaucrats, depending of course, on just how 'rationality' is to be understood.

On the face of it, the present case could easily lend itself to these somewhat patronizing portrayals of regulatory myopia, organizational anarchy, corrupted goals, confused means, administrative ceremonies, and garbage can processes. Of course, no organizations are exempt from such phenomena. But overall, I shall argue, 'my' bureaucrats appeared as rationally committed to the thoughtful and considerate pursuit of the public interest, even when considering their cultural experiment.[8] And in the end, it will also be argued, the very question of rationality in risk regulation should be approached with a considerable amount of modesty and reflection, both as seen from the 'inside' of government and from the 'outside'. I concentrate, however, on the 'upstream' side of how regulatory goals are pursued from the point of view of the regulatory agents, leaving, for the most part, the 'downstream' side of regulatory outcomes and overall 'effectiveness' to those more able.

It shall be argued later that assumptions made in the analysis of risk management have similarities to rationality assumptions on a more general level; risk management involves strong commitments to rationality, as this concept has been explored in other contexts (Elster, 1989; Føllesdal, 1982; Lukes, 1982; Shrader-Frechette, 1991). Rationality assumptions may take the form of representing rational beliefs and practices as 'self-explanatory', whereas non-rational (or less rational) ones require 'external' or causal explanations. A number of such external explanations are produced within various disciplines to account for these inferior rationalities 'from the outside' (ranging from psychological mind-traps, cultural biases, moral self-deceptions, to the 'false

[8] These portrayals are of course caricatured; the departure from sterile economistic models in policy analysis, toward more socio-cultural analysis is quite justified. However, the latter often rely on assumptions of a "rationality deficit", placing the analyst in the role of a judge from the outside. The patronizing and essentially degrading portrayals often lack an appreciation of the intricacies and trade-offs of bureaucratic practice, even if more 'naturalism' was what the new institutionalism sought for.

consciousness' of the alienated working class). Alternatively, it is argued, practices must be understood as 'local epistemes', to be judged on their 'local causes of credibility' (Barnes and Bloor, 1982). Both views, and a number of intermediaries, have their specific justifications and implications. I argue here neither for 'complete symmetry' between researcher and researched, nor for 'complete asymmetry'. Although these concepts, related to debates about rationality assumptions and relativism, are often used in anthropological encounters with 'radically different others', they are equally applicable when working in 'familiar' cultures; they may even be more important to consider in such contexts, as difficulties of interpretation do not always impose themselves in the same way (due to the very same 'familiarity'). However, establishing the role of rationality assumptions within these complex worlds, encountered simultaneously by both actors and observers, involves a considerate engagement with the contexts in which tasks are to be solved, as cultures evolve in just these task-solving encounters with the environment (Barth, 1972; 1989; 1994).

Under any circumstance, just by addressing these issues, considerable evidential primacy must be given to the local experiences and knowledges of the actors studied, seeing social reality as fundamentally shaped by human consciousness and purpose within locally understood contexts (Barth, 1981). In the anthropological tradition this is normally not reduced to a simplistic or naïve embracement of the 'native's point of view', however. Rather, the local and subjective world views must be interpreted, understood, and related to the presumably less context-bound and comparative constructs, understandings and theories of the social scientist (Kaplan and Manners, 1972). This is in line with the tenets of grounded theory, keeping multiple perspectives, that "contributes to building theory inclusive of lay conceptions and helps to prevent getting captured by those" (Strauss and Corbin, 1994: 280). They provide the following advice to interpretive researchers:

> They accept responsibility for their interpretive roles. They do not believe it sufficient merely to report or give voice to the viewpoints of the people, groups, or organizations studied, Researchers assume the further responsibility of interpreting what is observed, heard or read" (p. 274).

Cultures are not to be studied by some magic art of introspection or by trying to see the world just as it is perceived by the informants. Rather, what is perceived is, in the words of Clifford Geertz, "what they perceive 'with' – or 'by means of' or 'through' … by searching out and analyzing the symbolic forms – words, images, institutions, behaviors – in terms of which, in each place, people actually represent themselves to themselves and to one another". The trick is, he proposes more bluntly, "to figure out what the devil they think they're up to" (1983: 58).

Transposed to the case at hand, this attempt to 'look over the shoulders of the natives' thus involves both 'indigenous' and 'exogenous' understandings of how 'culture' was culturally enacted in the regulatory encounters with risk. And as should be made clear from the outset: it was not hard to imagine the troubles involved in making sense of culture as a meaningful and even productive and instrumental approach to the management of risk. At some junctures during the fieldwork these troubles indeed appeared as 'ill-structured', and trying to join in with my interlocutors in their endeavours appeared at times as oscillating between witchcraft and magic. But like the accident investigator: only allowed the 'luxury of hindsight' was it possible to reconstruct a version of these endeavours. Following the insights of accident and investigation research, it would be all the more important to penetrate the perspectives of local actors as they appear in just those contexts were understanding and action in fact take place (Hale *et al*., 1997; Turner and Pidgeon, 1997).

Making sense of culture, given a long history of locally adopted social science concepts and managerial systems and quick fixes that had orbited the industry for quite some time, often turned out to be an intellectually confusing and straining task. This was a space densely populated with the modern sophists of the consulting business, and partly also the R&D business, both adding significantly to the proliferation of models, nomenclatures and accompanying boxes and arrows. Among the virtually indefinite range of modelling options, a number of actors made a living by making *their* specific merchandise stand out as slightly different from the lot, thus adding to the jumble of solutions available for how the conceptual and virtual landscape of organizational encounters with risk should be

understood and arranged. Lamenting this predicament, one informant expressed both his concern and his appreciation for being given the occasion to 'think out loud':

> I really believe in the work that's done now, and it's really high time that we have more people in with a deeper knowledge, who have a scientific approach to this, that's important for me…. and also, in the busy everyday life it's not always that easy to get a chance to reflect on these things .. so when you're having an interview or dialogue like this it's really an input to clarifying some of my own thoughts and opinions. It's important for me to have the historical perspective, to look back and reflect on what we've been doing. (HSE manager)

Studying risk regulation in the socially, organizationally and technologically complex world of offshore petroleum industry often triggers reflections about whose frames and contexts are imposed upon whom. The role of the fieldworker would more often than not be that of the apprentice, with the informant as the master. This applied not only to the technological complexities involved, but also to the fine art of conducting audits, enforcing the law, and choosing, as rationally as possible, between available strategies of intervention. Sometimes my interlocutors were able to penetrate some rather confusingly composite enquiries, provide straight responses and illuminating practical examples (sometimes reframing the queries). In other words, the questions didn't always deserve the answers they got, and the meaning and significance of the latter would generally be more fully appreciated only when reviewing them later. Furthermore, this is a space populated with social scientists of most flavours, and the accompanying bodies of knowledges and terminologies. Stepping outside, taking the perspective of a distant observer and timid analyst, 'framing' or 'bracketing' these worlds in 'objectifying' representation, at least warrants a reasonable portion of careful academic self-reflection. Indeed, the awareness of the disciplinary (over)crowdedness and multiple experiential contexts also had its local expressions. Sometimes the 'natives' would remind me of the dubious role and authority of external observers and researchers, as against the interpretive constraints that were imposed by the regulatory context; as was commented by one of my key contacts within the Petroleum Safety Authority:

> If a researcher has a brief talk with an offshore worker in the coffee-shop it's bluntly referred to as 'empirical data', while our own extensive experiences from supervisions, investigations, and innumerable encounters with the industry, is often ignored or degraded;

> we should really be more willing to appreciate the vast body of accumulated knowledge possessed by our own people.

The qualitative methodologies of fieldwork and ethnography are clearly challenged in the study of regulatory regimes in complex society. The 'field' potentially covers a number of actors and places, located in ever expanding spheres and contexts; from the offshore work-site to the world's largest corporations operating in global markets, from the audit-styles of agency officials to the arenas of national and international policy making. The term 'multi-sited ethnography' has emerged as a response to the gradual departure from what has been referred to as the 'quadruple S' (synchronous single-society study) of traditional ethnography (Hannerz, 2003; Hylland Eriksen, 2003; Marcus, 1995; Marcus and Fisher, 1986). Complex, and increasingly global, social worlds must be approached by accessing different locations, actors, processes, and bodies of knowledge, all of which are differently situated in disparate and sometimes untraceable contexts. It may take more than the lifetime of an ardent ethnographer to track down only selected samples of these, in particular within the highly expert-based and multidisciplinary worlds of risk regulation. Strategically choosing the 'best sites', relying on existing representations (including those of the informants) is a matter of simple necessity, and painful compromises must be made given the time and resources available.

Two final points should be noted here, both of which 'twists' the theoretical and methodological scope of the study. First, the case itself, as the facts on the ground gradually appeared, prompted a certain reorientation of focus. The introduction of HSE culture served as a reminder that organizations, and bureaucracies in particular, are linguistic communities where relations between concepts and phenomena oscillates between implicit meanings and continuous negotiation, and that the latter may absorb much organizational energy. The processes of making sense of internal and external environments simultaneously involve both epistemic and linguistic capabilities, sometimes seamlessly bound together in dynamic social interaction (Taylor, 1985; Searle, 1996). Second, this again serves as a reminder that case studies of social phenomena both require and allow for contextual readings of their emerging and dynamic properties. In terms of methodological design, this has the effect that arenas and methods of

investigation have to be adopted to the simple fact that empirical phenomena sometimes materialize in unexpected ways, as may become evident below.

A brief outline of chapters

Given the cross-disciplinary nature of this study, imposed on it by the reality it portrays, a rather comprehensive survey and discussion of the relevant concepts, theoretical approaches, and research traditions is provided in *Chapter 2*. The chapter briefly reviews some approaches to the study of risk regulation regimes, and tentatively adopts a model for how such regimes can be analyzed. The development of enforced self-regulation and the accompanying concern with risk management approaches is of particular importance, as the interest in corporate cultures may be interpreted as derived from and extending these regulatory philosophies. The theories and practices of risk management have gradually incorporated social and organizational perspectives, including also the role of 'culture'. The concept of *safety culture* has attracted much attention from the 1980s and onwards, but has been subject to both conceptual and substantial debates, including the question of whether the building of 'strong cultures' could be seen as a way of coping with complex high-risk industries.

Chapter 3 provides an overview of the industrial context, including a brief historical account of the Norwegian petroleum industry, the developments of the regulatory regime, and an overview of key risk factors and the indicators used for measuring them. This chapter also reviews the *politics* of risk and some of the important controversies and debates among key actors, notably the industrial actors, the unions, and the authorities. The present framework of regulations, authorities, and industrial actors are outlined in *Chapter 4*. This includes also a brief review of the broader national context of public administration and regulatory policies and discourses. The origins and rationales behind the culture-provision and the context in which it appears are also presented in this chapter. The regulatory practices and strategies are presented in *Chapter 5*, portraying comprehensive, frequent, and multifaceted patterns of interaction between the authorities and the industry. The enforcement strategies are largely accommodative with a considerable degree of complicity between regulator and regulated. This is reflected in

industrial responses to regulations and regulatory practices, but must be interpreted against the high level of interaction, the large amounts of resources and economic and administrative capacities of the actors, and the high stakes implicated for the oil companies in the face of possibly compromising their attractiveness as licence holders (or contractors). In this chapter we address the relationship between systems oriented and organizational approaches to the analysis and management of risk, and the *post hoc* attributions of causes and responsibilities when damage is done, or nearly done. Corporate rather than individual sanctions clearly appear as the preferred reaction, reflecting a systemic and organizational understanding of causation and preventive risk management.

Chapter 6 reviews the follow up of the culture provision. Being a core topic of the thesis, this may seem late, but understanding this process would be difficult without first mapping out the broader industrial and regulatory context. As noted, the concept of HSE culture set off a number of questions about risk management. Although the new provision was launched with the optimistic hope of having added a 'new dimension' to those focusing on technology and management systems, organizational discontinuities caused a loss of momentum in the follow up process, and the 'culture-project' did not appear as fully integrated within the agency.

Risk management and regulatory roles are perhaps best elucidated in concrete events - accidents or near misses. These events show the trajectories of how situations unfold within technological and social contexts. The regulatory responses materialize in almost every step of such events, and also in the final sanctions employed, including the last resort of the law. *Chapter 7* traces with some detail one of the most serious and bespoken incidents (a serious near miss) during the Norwegian petroleum history, thus providing a window into the (un)successful management of real-life industrial risks. Both serious accidents and the 'cultural mood' served as triggers for the launch of large safety programs within the industry. *Chapter 8* discusses these, and some of the underlying risk management ideas they implicitly or explicitly convey. Many of the programs address safety culture, or what has emerged as its associated meanings, largely focussing on the

'sharp end' of individual behaviour on the offshore facilities. The largest and most comprehensive of these, is reviewed in some detail, and also the debates and controversies it has aroused. *Chapter 9* draws together these partly disparate traces of the cultural experiments and the broader regulatory context in which they traversed. Based on extensive accounts from agency officials, primarily those in leading positions, the chapter discusses the enigmas of 'HSE culture', why it was never made operational as a standard against which compliance could be measured, and outlines the gradual and emergent understanding of the comprehensiveness of culture as a concept *per se* and the troubles this caused for the regulators.

The last two chapters are of a more theoretical nature. Although drawing on the regulatory experiences in general and the attempts to relate these to 'culture', *Chapter 10* discusses the position of culture as an anthropological concept and proposes a multidimensional model of culture that reflects the great diversity of usages, but still map the cultural terrain in a distinct manner. It is also argued, however, that conceptualizations of culture, belonging as it does to the 'commons' within the conceptual landscape of social science, would effectively resist 'colonializing' attempts linked to specific theoretical approaches. Against this background, the regulatory encounters with 'culture' appeared as fairly reasonable, enlightened, and even 'rational'. *Chapter 11* draws together these discourses of risk, rationality and culture and discusses the conditions for how regulatory world views emerge within the regulatory space and for how they can be understood. I argue against some conventional approaches to the understanding of risk regimes and political bureaucracies more generally, in an attempt to revitalize the idea of such bureaucracies as fairly rational systems, institutionally framed and indigenously conceived for the purpose pursuing the public interest.[9]

[9] The text could perhaps be seen as consisting of three main parts. Thus, chapters 3-5 provides an outline of the risk regime as such (the context); chapters 6-9 analyze the process of integrating HSE culture in this regulatory context; chapters 10-11 discuss some theoretical implications, partly based on the empirical record, partly as a general contribution to academic discourses on the understanding of culture, risk and regulatory regimes.

2. Risk, regulation, and culture

As noted, this text has committed itself to the difficult task of drawing together several academic traditions and conceptual frameworks, largely as a consequence of the problems posed by the manner in which these particular slices of empirical reality are composed. They appear as 'natural' phenomena disrespectful of disciplinary boundaries. Concepts perform different tasks in this landscape, to the insiders as well as to the outside observer, and their demarcations are neither given nor totally arbitrary. This chapter provides, first, a brief discussion of the rather basic concepts of risk, regulation and culture, and second, an outline of theoretical approaches that will provide the framework for understanding the *case* within these intersecting and interdisciplinary academic contexts.

Concepts

'Risk', 'regulation' and 'culture', share at least one attribute: they are all concepts on a very high level of generality and abstraction, and appear most of all as just designating loosely encircled thematic fields. They fit the definition of *hypernyms*, the linguistic term for super-ordinate concepts that cover a broad range of phenomena, themselves classifying a number of subordinate terms. But to analyze these concepts semantically as hierarchically ordered structures of meaning is of course to hide the complex ambiguities contained in each of them. Even much simpler words than these must still be understood as provisional labels operating in specific social contexts and variably acquiring their pragmatic meaning through dynamic and essentially communicative processes of linking words to objects and observables, and to ideas and other concepts (Searle, 1996; Taylor, 1985). A brief conceptual excursion is justified here, also because the understanding and application of these words turned out to be a crucial preoccupation of the actors studied, both as conceptual creations and as something obviously or possibly found in the real world. But whereas risk and regulation were well established terms within the local nomenclatures, supported by 'standards' and definitions provided by 'experts', culture had no such status. It was a matter of both 'practical' and 'empirical' interest whether it could be used without one, given its newly acquires status as a legal provision.

Risk and regulation

At the most general level, the concept of risk oscillates between scientistic perceptions of calculable probabilities and cautious perceptions of uncertainty and unpredictability; both perceptions and their intermediaries are embedded within cultural, social and political environments, including also the normative valuations of the gravity of the possible outcomes involved, as against the possible benefits (Royal Society, 1992; Shrader-Frechette, 1991). A common procedure for analyzing or assessing risks involves three constituent components or stages: (1) identification of the hazard, (2) estimation of the level or magnitude of potential harms, and (3) evaluation of its acceptability. The second of these stages include the assessment of probabilities of possible adverse outcomes, the risk level sometimes quantified as the product of the two. Treating the concepts of risk and regulation in conjunction evokes the associated concept of *risk management*, sometimes treated as synonymous, and denoting the efforts and measures taken to "shape who can take what risks and how" (Royal Society, 1992: 136). Broadly conceived, risk regulation then involves a number of actors, ranging from policymakers, regulators, industrial actors etc., each playing different roles in the total effort to manage risks, including the whole process of identification, estimation, and evaluation.

There is no clear separation between these elements in the process of risk management, which will involve continuous reassessments of how much risk reduction is achieved through the various human, technological, and organizational measures taken. A rationalistic approach to the question of when and how to intervene by risk management efforts, such as statutory regulations, involves both an assessment of the nature and magnitude of the risks, and a strategic and proportionate deployment of regulatory resources. Ultimately, rational risk management will allocate the proper amount of resources in a manner that would reduce risk *effectively* according to the overall valuations of both 'costs' and 'benefits'. As would be evident, the task of defining, identifying and measuring risks is far from simple and straightforward. The 'technical' perspective on risk is largely probabilistic, using more or less advanced methods for making predictive claims from historical and statistical data on past incidents. The magnitude of risk then follows as the product of these probabilities and the quantified

values assigned to the possible outcomes. The possibility of calculating such probabilities depends largely on the availability of historical data. For many hazards historical records will be absent or sparse, making quantifiable probability assessments difficult or impossible. Even with available data, prophesies about future events will be intrinsically difficult due to the number and nature of conditions that would go into the estimate, in particular when human behaviour in complex socio-technical systems is taken into account. Judgements about risk involve some basic uncertainties about just *how* history will 'repeat' itself, and ultimately encounter our limited knowledge about the future. Added to this are the problems associated with valuating the possible outcomes. To measure the value of one relatively specific outcome, such as the loss of a (statistical) human life provoke ethical considerations about the comparability of young and old, the careful and the careless, voluntary and involuntary risk takers, the rich and the poor, etc. And in the real life risk evaluations, such losses may have to be compared to the value of other potential losses that might deserve intervening action, covering a diversity of human, material, economic, and environmental hazards. The technical and expert-based approach to risk is thus profoundly challenged, and the importance of public and democratic involvement appears as fundamental in risk evaluation (Shrader-Frechette, 1991; Wynne, 1992).

There is also a tradition, however, of analyzing public, or 'lay', perceptions of risk as 'facts', and explaining these in terms of their psychological, sociological or cultural causes. A number of factors are thus seen to influence the way we perceive risks, such as catastrophic potential, familiarity, immediacy or delay of harm, voluntariness and personal control (in facing the risk), moral or economic considerations about who will suffer and benefit, and the possibility of blaming the (assumed) risk-creators.[10] Such studies may be used for different purposes. They may simply map out actually manifested risk perceptions and explore the mechanisms operating in the formation of beliefs and attitudes about risk as such. They may serve as input to risk evaluations in a genuine attempt to take account of what people (variably affected by the risks in question) actually *value* before intervening priorities and strategies are decided upon. But they may

[10] For overviews, see Baldwin and Cave 1999; Kasperson, 1992; Royal Society, 1992; Slovic, 1992.

also be used to demonstrate how lay perceptions 'deviate' from expert-based judgments (such as about probability), 'explaining' how these deviations result from faulty reasoning and judgment, thus justifying the need for 'insulating' public risk decisions, and also for educating and enlightening the public about the 'real' risks.[11] We shall return to some problems and questions associated with these three perspectives later, in particular the latter 'deficiency' hypothesis.

To summarize, risk management (and regulation) involves transformations of hindsight perceptions to foresight predictions or prospects and the attribution of value to the possible outcomes. To establish a certain level of protection against some identified hazard is often a highly complex undertaking, and involves the assessment of a number of interrelated technological, human, organizational, and socio-cultural factors, including also assumptions about expected external preconditions for maintaining levels of acceptable risks in the future (von Weiszacker, 1996; Wynne, 1992).

Comprehensively defined, the societal management of risk appears as a major purpose of statutory regulation. The rationale and justification of regulation is normally to avoid or reduce the likelihood of some unwanted consequence of harming people, the environment, or material and economic assets and systems.[12] Despite the undifferentiated and perhaps tautological impact of this comprehensive view, it's still a reminder that, on an overall level, regulation is always a symptom and an expression of what society at any time defines as values and valuables that will not be properly attended to without regulatory interventions. We shall bear these complexities of risk regulation in mind in the following discussion, noting that both risk evaluation and management takes place in the face of profound epistemological indeterminacy and morally challenging considerations. Nevertheless, decisions about regulatory interventions are recurrently taken, increasingly justified as 'risk-based' (Hutter, 2005; Black, 2006).

[11] See for instance Breyer (1993). Critical discussions are provided by Wynne (1992; 1996), Shrader-Frechette (1991), and Sunstein (2002).

[12] It might also be argued that, even if regulations positively define societal goals to be achieved, such as the adequate provision of services, the implicit rationale is to reduce the risk that they are not. And inversely, the 'genuine' or 'pure' risk regulations will often be phrased as goals to be achieved, not only as harms to be avoided. Of course, some linguistic trivialities are also involved here, as when 'safety' is defined as a goal.

Culture

Raymond Williams (1985) once judged culture to be "one of the two or three most complicated words in the English language" and Anthony Giddens (1989) has referred to culture as the most comprehensive and widely used social science concepts, next only to the concept of 'society' itself. The concept of culture has a long and rich history in the social sciences. But its impact and application has been most thoroughly felt in the field of anthropology where it thematically almost converges with the discipline by definition. In the American tradition 'cultural anthropology' frequently appears as the academic label per se (as in text-books and university departments). Being a concept so much linked to the very identity of the discipline, it has been difficult to restrict its meaning for analytical purposes. Rather, ideas about culture have reflected a variety views about human societies as such, and definitions have accordingly reflected favoured aspects of social life.

Etymologically, 'culture' is derived from the Latin word *colere* or *colera*, meaning literally to cultivate, and is used thus also in a biological sense. Humanistic notions, also reflected in the institutionalized applications of modern society, carries some more or less evaluative norms about what *ought* to deserve the name of culture, including sometimes prescriptions for how and when persons (or groups) should be regarded as 'cultured' or 'cultural'. In modern social science, these evaluative and 'compartmentalized' notions (literature, music, art, etc.) are largely absent. At the most general level, culture, as opposed to nature, refers to the 'nurture' of human making, as the "learned, accumulated experience … those socially transmitted patterns for behavior characteristic of a particular group of people" (Keesing and Strathern, 1998: 15). Turning from such comprehensive approaches to authorized definitions has been a precarious enterprise. Even seemingly innocent standard definitions contain references and terms that will soon open up like a Pandora's box, releasing much, or most, of what social science is all about: Customs, traditions, world views, values, norms, practices, beliefs, meaning, identity, and even: 'way of life'. As may be recalled from the myth, only hope remained when Pandora finally was able to shut the box. Although the myth is normally not related to its biblical counterparts in symbolizing human hubris and defiance of the celestial order, one

might certainly hold that eating from the tree of knowledge in this case has caused a Babylonian confusion of languages.

As far back as in 1952 some 160 definitions of culture were counted in the anthropological literature (Kroeber and Kluckhohn, 1952). The tremendous rise and growth of social science, and anthropology in particular, since that time would render a repetition of any such exercise virtually impossible, if not meaningless. Many accounts of culture now appear more as reflexive discussions rather than as constricting definitions, simultaneously addressing the virtues and vices of the 'concept' as such, and its place in the semantic landscape of social theory. The counter-reaction to the definitional attempts has centred both on the futility of conceptually imprisoning 'culture' by outlining some specified inventory of 'culture-components', and much less the mechanisms governing them. The reactions may sometimes even appear as iconoclastic sanctions against the act of imaging the 'sacred', the heart of the discipline. More commonly, however, they reflect a less zealotry attitude, pointing to the amount of wrecked ventures into the essentials of 'culture', dissociated from social processes (Barth 1989; 1992). If used at all, it should be kept as a wholesale label covering phenomena for which we have developed more precise conceptual instruments. Although some ignore or dismiss 'culture' altogether as being too comprehensive and general for analytical or scientific purposes, there are also attempts to revitalize the concept and to adapt it to the disorganized and complex socialities of an increasingly globalized world (Borofsky, 1994; Marcus and Fisher, 1986; Ortner, 1999; 2006).

Despite all differences and ambiguities in anthropological thinking about culture, warnings recurrently appear against treating culture as the kind of uniform, coherent and 'thing-like' construct typically found in older notions of "Trobriand culture", "Balinese culture", "French culture", or even "Western culture". It has even been argued that the critique of the culture concept primarily has been concerned with the problem of essentialism (Ortner, 2006). Keesing (1994) notes that despite this professional awareness, there is still an almost irresistible temptation in applying these reified and essentialist notions, partly due to a self-reinforcing linguistic and conceptual efficiency,

but also due to the historical interest (even a "vested" one) in encapsulating the radical 'otherness' of peoples subject to anthropological intrusion, observation, and 'textual' transformation. The idea of cultures as bounded, self-contained universes of ideas and customs developed in parallel with a functionalist understanding of social structures as neatly woven together in self-perpetuating patterns. These notions of culture and society were adopted by the wider society and applied to complex, contemporary ways of life, such as when 'national culture' has served as frames of reference in deliberate attempt to provide nationalist ideologies for nation states. The notion of culture thus served societal purposes in the post-war period, as defining or redefining what was to be reconstructed (Goody 1994). As a possible remedy to this danger of 'misplaced concreteness', it has been suggested that the noun culture be replaced with its adverbial form, 'cultural' (Keesing, 1994), or even to think of culture in a 'verbal' form (Hylland Eriksen, 2003). But as noted by Keesing, "our own diseases may strike us down from unexpected directions" (1994: 303). We may note how 'culture' appears in ordinary public usage, as a sweeping statement, as a mysterious 'core', as a deep-seated 'cause', etc., taken as a short-hand expression for bringing order to 'disordered appearances'. The dangers of essentialism and reductionism are inherent in such concepts.

Defying the urge to provide new definitions of culture, we will at this point settle for a more provisional understanding of the term as different configurations of elements that seem to recur in constituting the inventories of 'the cultural'. These elements may be seen to form a more or less patterned 'matrix' which include *explicit or implicit normative and emotive prescriptions and bodies of knowledge and beliefs that are shared by social actors and communicated and reinforced through mutually understood (notably linguistic) symbols, thus providing viable recipes for relatively continuous patterns of social behaviour*. A more elaborate presentation and discussion of this 'cultural matrix' and its applicability in the organizational management of risks will be provided in a later chapter, after first having explored how the 'natives' within the regulatory space themselves managed to 'use culture' in managing risk.

The concepts combined: culture and risk management

With culture entering into the domain of risk and its management in societal and organizational contexts, new rounds of conceptual explorations have taken place, drawing on both the organizational literature and more broadly on social science definitions. Thus, norms became norms about safety, beliefs became beliefs about risk, and so on. The concept of culture has a somewhat intractable history in this broad field, including studies of how public perceptions of risk can be seen as somehow culturally conditioned (ie. Douglas and Wildawsky, 1983). What is of most interest here, is how culture is employed, first as a contributing factor in the explanation of why organizations fail to manage their risks and then, consequently, how aspects of organizational culture have come to be seen as important in managing and reducing risks.

Although it can be argued that 'cultural phenomena' are intrinsic to the academic study of organizations, the actual labelling of 'organizational culture' as a thematic approach is more recent, and has now appeared as a loosely encircled sub-discipline within the field (Martin, 2002; Martin *et al*., 2004). It has served as a framework for addressing the inner lives of organizations in terms of informal structures, norms, world-views, and 'lived experiences', etc., often by using in-depth, qualitative, and interpretive methodologies. By addressing organizational culture one would be able to get inside of the dynamic real life of organizations as it was experienced by participants, inaccessible to the more superficial, mechanistic, and rationalistic perspectives (Smircick and Calás, 1987; Martin, 2002). This literature developed partly as a reaction and a remedy to the negligence of traditional organization science, partly through a rephrasing of established perspectives and vocabularies, but also by providing substantially new perspectives to organizational studies in general, and thus also to how organizations deal with risk.

A more comprehensive discussion of the emerging role of cultural dimensions in the study of organizational risk is provided later. However, some preliminary observations might be noted. First, the notion of safety-culture or HSE culture seems on the outset as a less complex field of exploration than culture as such. It's not like addressing a 'way of life', and is thematically even more bounded than 'organizational culture', socially and

conceptually. Second, it oscillates between the descriptive-analytic and the normative-evaluative. In a sense, the idea of HSE culture suggests a return to the evaluative notions of culture in setting 'normative standards', including prescriptions for the values, skills, knowledges, designs etc., which are required in order to become fully 'cultured' or 'cultivated'. Although it is also used simply to describe and analyze the 'cultural state of affairs', there is normally an underlying normative implication of 'its' potentially cultivating role in the management of risk.[13] Third, it follows that culture in this sense is legitimately made subject to intervening strategies, just as organizational culture was to be instrumental in creating competitive firms (all though the legitimacy of either may differ[14]). Addressing a relatively bounded set of issues within relatively bounded social contexts, it is potentially amenable to shaping forces hardly imaginable in the wider society.

Understanding risk regulation regimes

The purpose here is not to provide any comprehensive presentation or discussion of models and theories of risk regulation regimes, but rather to attune the reader to the multifaceted and sometimes blurred sets of dimensions and variables employed in analyzing them. We also discuss briefly the combined development of purpose based regulation and self-regulation, and on how these developments reflect increasing levels of complexity in the societal management of organizational risks.

Theories of regulation

There are several theoretical approaches to the comparative study of regulatory regimes at a macro-level. These may have two purposes. First, they can have a normative purpose of accounting for when regulations are justified, and for how they should be devised in order to succeed. These approaches have stronger roots the general risk management literature, or in the disciplinary traditions specific to the regulated sectors. Thus, economists are interested in which regulatory mechanisms are necessary for the smooth

[13] Note that Hale and Hovden (1998) argues for a descriptive definition, excluding implicit evaluative norms.

[14] It reached a peak in terms of market attention during the 1980ties, as a managerially oriented catch-word for that present or absent magic so crucial for the performance and commercial success of companies, often referring to the endeavours of the Japanese (e.g. Deal and Kennedy, 1982; Peters and Waterman, 1982).

and efficient operation of markets, and health- and safety professionals will be interested in how regulations can be furnished in order to promote the goals of health and safety. Second, regulation theory may provide a more disinterested and distanced explanatory account of why certain patterns of regulation develop, paying specific attention to causes of varieties between regimes. These approaches are largely developed within the framework of policy analysis with disciplinary roots in political science. The theories themselves may still not differ in terms of issues addressed, only in how they are framed. Thus, the pursuit of public interests in the face of 'market failure' appears in the literature as both a normative justification *and* a positive explanation of regulatory intervention (Baldwin and Cave, 1999; Hood *et al*., 2001). Normative theory is supposed to provide recipes for regulatory intervention; positive theory provides *post hoc* explanations of it, sometimes by using the 'norm' as the benchmark against which the explanations are justified. Thus, if regulatory behaviour deviates from the prescribed norm of correcting market failure, however defined and understood, some other mechanism is called upon to explain why (such as bounded rationalities or other 'interests'). The nature of these explanations may depend on whether these deviations are seen as intended, as unintended, as accidental, or as 'causal'. These distinctions are important for the argument developed later, and we present alternative theories below with that in mind.

Theories of regulation focus alternatively on contextual factors that shape the regulatory content, such as the public interest, private interests, pressure groups, the media, and also on internal processes within the regulatory institutions (Baldwin and Cave, 1999). Regulatory content, the 'results' of these external (contextual) or internal (institutional) 'shapers', cover a number of properties, ranging from the design and severity of rules and their enforcement, the structure of regulatory institutions, to the overall policies, purposes, and strategies of regulatory intervention. The compartmentalization of, and interrelations between, such dimensions of regulatory regimes are not very firmly established, and analytically, categories, concepts, and explanatory conditions both differ and overlap. Lamenting the immaturity of this academic field, it has recently been argued that "the analysis of regulatory regimes today is in the sort of position that organizational studies was in the 1950s" (Hood *et al*., 2001: 58). As a remedy to this dismal predicament

they suggest a framework for outlining an ‘anatomy’ of such regimes. We shall return to this anatomy below. First, we briefly consider the ‘contextual’ theories, in particular the ‘public interest’ theory.

Public interest theories start with the assumption that the regulatory process is (or should be) shaped by efforts to pursue the public good, focusing on the public-spiritedness of trustworthy and disinterested regulators, often informed by expert knowledge. The policy makers identify and evaluate the risks and regulate those that are not considered to be appropriately contained and managed within the context of market mechanisms or other social controls. Interest group and private interest theories focus on how different stakeholders (private business, expert groups, consumer groups, etc.) are able to influence regulations through lobbying, mobilizing resources, etc. Institutional theories focus largely on internal processes within policy making and regulatory institutions.

From a public interest perspective, the correction of market failure is conventionally taken as a point of departure. Market failure may include a number of factors, not always uniformly categorized. Recurring themes include first of all failure of competition due to market power such as monopolies (natural or ‘unnatural’), externalities that are inadequately reflected in prices and economic decision-making, informational problems and asymmetries between buyers and sellers, transaction costs, and organizational failures (such as principal-agent problems). Additional market failures may variably be related to distributional justice, bargaining powers in the labour market, planning and coordination needs, and so-called ‘windfall’ or excess profits (Baldwin and Cave, 1999). The justification for (and explanation of) health and safety regulations are predominantly related to externalities and information inadequacies. Externalities point to the failures of incorporating social and public costs in the price mechanism, as when the costs of damage to the environment or to the health of consumers or employees are not reflected in the price of products and thus not ‘paid for’ in the marketplace. Regulation may compensate for this by ‘internalizing’ the externalities through taxes/levies or more direct interventions. Information inadequacies refer broadly to the lack of full knowledge about the ranges, prices, and qualities of available products that might adequately satisfy a

given consumer need. Ultimately, the range of such 'deficiencies' is almost infinite, at least when the more fundamental questions about 'need', 'quality, 'satisfaction', etc., are introduced. But even the ordinarily evoked information problems cover a broad range of factors, such as missing price overviews, product specifications, lack of expertise, etc. Within the context of organizational risk in corporate firms, unequal bargaining powers must also be considered a critical 'market failure'. In fact, a considerable amount of regulatory effort is devoted to balancing these relative powers (e.g. through requirements about worker participation in decision-making, the establishment of arenas for joint problem-solving, and the appointment of safety representatives,). Such requirements also contribute importantly to countering information inadequacies and asymmetries.[15]

Modelling regulatory regimes (the regime anatomy)

As noted, the study of regulatory regimes has been marked by a lack of comprehensive and analytically digested models available for capturing their composite and multidimensional nature. This has made comparative analysis difficult, and may, partly at least, explain the unclear status of competing theories. We return therefore to the model developed by Hood *et al*. (2001), which suggests some basic dimensions and properties specifically designed for making such comparative analyses. Although a comprehensive explanatory account, or even description, is not within the scope of this thesis, it's still a service to the research on regulatory regimes that terms, variables, and analytical categories are shared and recognizable within the research communities. Some problems with the model will also be discussed, however, related both to the analytical categorizations and to the explanatory schemes and strategies adopted.

Two basic dimensions are distinguished in this model: the control system itself, and an instrumental-institutional dimension. The elements of the control system are information-gathering, standard-setting, and behaviour modification, taken to constitute basic and universal features of control systems in a general cybernetic sense. The instrumental-institutional dimension is divided into regime context and regime content, reflecting the commonly used distinction in policy analyses between 'states of the world' and 'policy

[15] Such mechanisms thus operate outside the 'marketplace' as such, indicating that the organizational context ('the firm') provides other mechanisms for correcting such 'failures'.

choices'; in this case between characteristics of the risks within the societal context (the 'world') and the content of the regulatory regime itself (the 'policy'). As will be evident, these contextual dimensions correspond roughly to the various explanatory models discussed above, subdivided into *type of risk*, *public preferences and attitudes*, and *organized interests*. Regime content is subdivided into regulatory *size* (e.g. severity of regulatory standards, surveillance intensity etc.), regulatory *structure* (like degrees of fragmentation and complexity), and regulatory *style* (like rule-orientation, dedication or 'zeal'). The analytical framework can be schematically illustrated as in table 2.1 below.

	Information-gathering	Standard-setting	Behaviour-modification
Regime context			
Type of risk			
Public preferences and attitudes			
Organized interests			
Regime content			
Size			
Structure			
Style			

Table 2.1. Anatomy of regulatory regimes (adapted form Hood *et al.*, 2001)

The various properties of the context and content variables can thus be expressed in all the three components of the control system. This facilitates an analytical model for understanding and assessing how regime content reflects or responds to the worldly context in which its impact is supposed to make a difference. *Information gathering* processes can be analyzed in relation to the availability of data on the particular risk, the public pressures for providing information, etc. *Standard setting* can be analyzed in relation to how the specific type of risk can be encapsulated by standards, how interest groups may influence the levels of protection chosen, etc. *Behaviour modification* can be analyzed in relation to expected public responses to control measures, the conditions for monitoring regulatory compliance, etc. These basic analytical categories can be further subdivided into more fine-grained differentiations, depending on the purpose, scope or depth of the research, but also on the 'degrees of freedom' contained in the regimes under study; that is, "how far variation in one element of a regime is linked to variation in

another" (Hood *et al*., 2001: 35). The empirical complexities of variation thus limit analytical parsimony, and disaggregations of the composite dimensions can be made almost *ad infinitum*. It is sufficient at this point to concentrate on the second and third levels of disaggregation in order to provide a more elaborate outline of the model.

Starting with the context dimension, *type of risk* corresponds roughly to the 'public interest' model, in the sense that an ardent and responsible public regulator would be expected to solely consider the nature of the risk at hand, as against a carefully considered need for regulating them. It thus addresses the level or magnitude of risk, and the degree of *residual* risk, referring to the idea that regulations are only supposed to cover risks that are not handled by other systems of societal control. The functioning or failure of markets is thus taken to be one crucial benchmark for identifying such residual risks. The second basic context dimension addresses the nature of *public attitudes and preferences* toward the risks in question. This can be measured in terms of media salience or other indications of public attention and pressure. Sometimes also referred to as the *opinion-responsive* model of regulation, it is based on the conventional view that regulation is shaped by public opinion, for example as responses to major accidents (sometimes referred to as regulatory 'tombstones'). The 'responsiveness' will in turn depend on the uniformity, consensus and coherence of the opinions voiced. The third context dimension corresponds to the hypothesis that regulation is *interest-driven*, and addresses the impact of *organized interests* that populate the regulatory space, such as private business, unions, activists, lobbies, professionals, and experts. The role of such interests may be measured in terms of strength, influence, degree of consolidation, etc. In the model, it should be noted, even the regulators and the regulatory bureaucracy are included in this dimension; they are then (sometimes at least) reduced to the status of 'interest group' on a par with others.

Turning to the content dimension, *size* refers to overall investments made in reducing risks. First of all this is to be measured in terms of 'policy aggression', that is how much risk is tolerated and the strength of the regulatory ambitions and levels of intervention in reducing risk levels. This includes also the total of regulatory resources (skill, attention,

costs, etc.) which is provided and required from the parties involved. This is arguably the most important dimension of regulatory content. It may also be the most difficult dimension to measure, depending of course, on the nature of the risks in question. *Structure* refers to two rather distinct aspects, the first partly overlapping with the size dimension as it is taken to cover the particular mix of public and private actors and resources within the regulatory space. A high degree of mix thus reflects a large amount of non-state bodies and resources involved in the control system, covering third-party assessors, compliance costs, systems of self-regulation, etc. The second aspect of structure refers more directly to the institutional complexity of the regime and is measured as the degree of organizational fragmentation, overlap, and density of actors (i.e. self-regulating bodies, local authorities, regulatory agencies, ministries or central government departments, courts, etc.). The division of labour between these bodies can be laid down along vertical and horizontal dimensions, allowing for a multitude of institutional arrangements. The vertical dimension accounts not only for the distribution of tasks but also for the distribution of authority within the institutional hierarchy. The horizontal dimension would indicate the degree of specialization on the various hierarchic levels, such as the scope of responsibilities, goals, functional roles, target groups, etc. Regulatory *style*, also overlapping with the other two, is primarily meant to cover the operating conventions and processes involved in the control system. Partly, this is indicated by the degree of rule-orientation, such as the density of rules and enforcement measures, and the extent of non-discretionary 'command and control' approaches. Partly this dimension also cover the more informal and 'cultural' aspects of the regime in terms of the 'commitment' and 'zeal' with which the regulators pursue the regulatory objectives.

In sum, this model of regime anatomy provides a rather inclusive and comprehensive framework, enabling the integration of nearly all salient dimensions and variables that have been discussed in the regulatory literature. One particularly important virtue of the model is the way it facilitates a discussion of how the 'external' and 'internal' regime properties are distributed across the spectre of control components, and also, how aspects

of regime content reflect the worldly contexts in which they are embedded. It thus provides an adequate 'scenery' for the multifarious inventory of regime properties.

As noted, no attempt will be made here to systematically assign 'values' to each of these dimensions based on the empirical record to be provided later. Rather, the model will serve as an initial 'sensitizer' to the comprehensive nature of such regimes. In fact, we will even add to this complexity by briefly discussing some of the problems involved in actually applying the model for analytical and explanatory purposes. Apart from the problems of determining and assigning 'values' to the selected set of variables, these problems are related to the subsequent possibility of providing explanatory accounts for why regimes develop as they do, at least on a very generalized level, by using predicted adherence to behavioural norms as the explanatory benchmark without also questioning the conditions and assumptions involved in setting up such norms in the first place. We discuss this briefly below with particular reference to the problems in assigning values to regulatory *size* (in terms of 'net risk toleration'). Obviously, regulatory size must be considered against the *type of risk* involved. Regulatory size will thus be relative to the expected outcome or acceptance level based on evaluations of 'residual risk'. Cost-benefit analysis (CBA) may be applied in deciding whether regulations appear necessary and justified by examining if the expected benefits will outweigh regulatory cost.[16] Such approaches reintroduce the difficulties involved in estimating and evaluating risk, however, but frame them even more 'explicitly' by attaching monetary estimates to the values involved (i.e. such as estimating the value of life, or a 'statistical life', as against the value of certain kinds of environmental damage). They appear even more ambitious than risk evaluations, since ultimately, one needs to estimate the probability that a given 'benefit' (risk reduction) will result from a given regulatory intervention. Providing such evaluations would involve extremely complex considerations related to regulatory

[16] CBA has been promoted by OECD initiatives on regulatory reform through so-called regulatory impact analysis, but are variably employed in member countries (OECD 1997; 2002; 2004). Salient examples are President Reagans Executive Order 12291 of 1981, which required regulatory agencies to produce Regulatory Impact Analysis (RIA) based on cost-benefit considerations, and British requirements on regulatory proposals to submit Regulatory Appraisals that include a Compliance Cost Assessment (CCA). Sometimes these analyses are referred to a Risk Cost-Benefit Analysis (RCBA), reflecting that both the costs and the benefits are based on the calculations and evaluations of the risks involved (see Shrader-Frechette, 1991; Sunstein, 2002).

compliance in very diverse organizational and economic environments. In addition to such ‘technical problems’, cost-benefit models may also contain some serious biases, related to distributional concerns, as they tend to take the market place valuations and present distributions of wealth as given, although such biases may be corrected in more sophisticated approaches (i.e. Shrader-Frechette, 1991; Sunstein, 2002). There are still intrinsic dangers involved in reducing questions of risk evaluation and regulation to matters of simple calculation; to let ‘hard’ figures take precedence over ‘soft’ factors may be tempting in the face of all the difficulties involved in appreciating the complexities of the latter. It has even been argued that, since regulation often occurs where markets fail, “there tends to be an absence of good market-based data in exactly those circumstances where there is a case for regulating. This suggests that CBAs will be at their least persuasive or reliable where the need for rational and effective regulation is greatest” (Baldwin and Cave, 1999: 92).

Normatively, it may of course be argued that these considerations somehow must be reflected upon under any circumstance; whether or not they are systematically conducted, the final decisions will nevertheless reflect implicit priorities. But in terms of assigning values to these variables as benchmarks for further analysis, assuming that they reflect explanatory mechanisms, is highly problematic. In particular, this has implications for the public interest theory. In assessing this theory we cannot assume that ‘correcting market failure’ provides clear recipes for regulation, and even more so, that regulation can be explained as reflecting only such concerns. Questions can be raised regarding the possibility of unitary conceptions of the ‘public interest’, the expertise and efficiency that actually shapes the regulatory processes and outcomes, and also the very notion of ’market failure’ as a ‘scientifically neutral’ and unambiguously measurable property, disregarding how (economic) transactions and systems are socially embedded in webs of culture, power, politics, and normative valuations. There will thus be important public justifications for (and explanations of) regulatory interventions, not solely reducible to market failure considerations, but also reflecting a broader social policy agenda (Baldwin

and Cave, 1999). This is, of course, evident in the extensive regulation of the public sector itself, where market considerations are largely irrelevant.[17]

The distinctions between these approaches to regulatory regimes are not clear-cut, and their relative explanatory weight is not clearly established. Institutional theory and regime-internal factors have received much attention and the public interest perspective much criticism (Baldwin and Cave, 1999; Hood *et al*., 2001). The present study attempts to combine both, although more through exploratory than through strictly explanatory analysis. It also point to the role of ideas (such as 'HSE culture') as an 'independent factor' in regulatory processes, all though ideas has been criticised for being inseparable from the interests that carry them (Hood, *et al*., 2001). The purpose in this study is to understand the regulatory processes primarily through the perspective of the regulators and to unpack regulatory world views from within. This may involve an 'institutional, public interest bias', but may also allow for insights into case-specific mechanisms. And as will also be evident later, the impact of other contextual factors than the 'nature of the risks', such as expert influence, business pressure, or other stakeholders, will often be mediated through the regulatory processes in a manner that does not always make it clear which 'theory' is actually being substantiated. If the regulator for instance chooses to follow expert advice, respond to business or union interests, this may still be interpreted as perfectly rational accommodations to the 'public interest'. Expert advice may be considered 'good' and even necessary for the pursuit of the regulatory purpose, competing interests sometimes need to be balanced, and attention to the concerns of the regulatee may improve regulatory compliance. Regulation involves many such balancing

[17] Certainly, the regulation of public services, like the ones related to quality standards or distributive justice in health and education, may be considered as 'proxy regulations' of 'proxy-markets', and the 'market-like' mechanisms operating between users and providers will justify interventions even in the absence of a 'profit motive' of the latter. Such regulations often encompass quite different contexts of actors and stakeholders, such as semi-autonomous non-profit service-providers and local governments. But a market failure approach would in most such cases appear inappropriate. State regulations of municipalities often follow the same kinds of rationales and forms as the regulation of private businesses, and they may often be identical, such as in the case of occupational health and safety, where most regulations apply equally to all organizations, private or public (including also the regulatory agencies themselves). It would seem rather awkward to account for these regimes in terms of very different rationales operating in the two cases. And even when specific regulatory interventions may be motivated by market failure considerations, they may also be applied to other areas, disconnected from what motivated the intervention in the first place.

acts and trade-offs that call for sensitivity to the specificities of each case, including considerations about what really constitutes a case (Ragin and Becker, 1992). A regulatory regime will cover a number of specific areas of risk, and the mechanisms governing these may in fact differ in each case.

We shall return to some of these issues later, questioning also the role of theoretical assumptions made in various explanatory models, in addition to the difficulties involved in how the various dimensions of risk context and content can be measured against the complexities of regulatory regimes. And further, as the main purpose of the model is to facilitate explanations of regime varieties by systematic comparisons, there are also some questions to be raised about how this configuration of variables capture the operating mechanisms within the regulatory space. This will point also to some important methodological implications inherent in explanatory models. From a conventional 'hypothesis-testing' approach, a common critique against the public interest perspective is that it is too open-ended for explanatory purposes. Broadly conceived, almost any regulatory intervention could be taken to match the scope and variety of hypothesized predictions. One solution has been to use a 'minimal intervention' assumption based on 'strong' and liberalist conceptions of market failure (Hood *et al*., 2001).[18] I shall argue later that what may thereby be gained in explanatory power, may be lost in exploratory scope, and in fact also unduly underestimating the value of the public interest perspective. The value of explanatory models for understanding regulatory behaviour must be considered against a benchmark of 'indigenous reasonability' rather than some restricted and incidentally chosen ideals of 'rational' choice.

Rule-making, rule-following, and trust

We turn now briefly to some particularly relevant aspects of regime content and context, some of which cut across the distinctions provided in the model. In face of the questions posed here, intervention strategies that are adapted to fit external conditions of

[18] Regulatory intervention according to a market-liberal model would accordingly be restricted to 'private' compensatory measures in the face of failures of markets to let risks be reflected in the price mechanism, in the availability of insurance systems or tort law processes. Hood *et al.* restrict the search for market failures to information problems and opt-out costs (that is, the individual costs for any exposed actor of avoiding, preventing or reducing the risks).

compliance are the most important, and point to a very basic attribute of regulatory regimes as a control systems. Although some point to the more or less unbounded continuities of regulatory systems, from statutory legislation, public agencies, down to the internal control systems and procedures of the regulatee (Black, 2002), regulators and the regulated are also to some extent insulated in terms of information flows and organizational boundaries (Reason, 1997). Regulators attempt to penetrate these boundaries, but are constrained by the resources available and the difficulties involved in, virtually, managing the risks of others. As noted by Reason, even complex technological operations are relatively simple in comparison to the task of maintaining safety: Safety is a 'dynamic non-event' that requires a clear understanding of complex interactions in socio-technical processes. It is against this background we must understand the attempts to harness the internal regulatory resources of the regulatee through self-regulatory approaches.

Several variables are relevant in characterizing the diversity of self-regulatory systems, the most important of which, in this context, is the degree of governmental involvement and statutory regulation. Statutory rules can specify a number of requirements for internal risk management which involve a variety of supervisory arrangements at various levels. As noted, mandatory self-regulation with oversight by governmental agencies has been referred to as systems of 'enforced self-regulation' (Ayers and Braithwaite, 1992). Several justifications are claimed in support for such systems. The expertise argument point to the privileged position of 'insiders', in terms of professional and in-depth knowledge of the relevant sectors and the regulated objects and processes. Added to this is the assumed increase in legitimacy and compliance that might follow from self-imposed and expert-based obligations. Low costs to government and more efficient enforcement are also taken to justify self-regulation, following from the premise that firms will establish well-informed rules subjected to their own internal systems of monitoring and control. The flip side of self-regulation is, of course, that both rules and internal enforcement practices may be self-serving, and distrust in the motivations, incentives, and practices in firms necessitate supervisory interventions from government

bodies, who face an even more difficult task of monitoring heterogeneous systems of internal rules and compliance measures (Reason, 1997).

Self-regulation is often contrasted with so-called ‘command and control’ regulation, which impose standards backed by legal sanctions. Such rules may provide conditions for market entry or they may prohibit certain activities altogether. Normally, they oblige regulatees to comply with fixed technological, organizational, and behavioural norms. The force of the law is made to bear directly upon non-compliant behaviour, providing a direct link between the regulatory requirement and its (potential) enforcement. A number of weaknesses have been identified with such regulations, however, particularly related to the informational demands and the specialized expertise needed in order to set and target the standards and to predict how a certain specified standard would face up to the contingencies and trajectories of the diverse environments in which it shall fulfil the given purpose (Ayers and Braithwaite, 1992). Specified design or input standards, applied to constructions, equipment, operational modes etc., may be attractive due to feasibility of enforcement and predictability for regulatees. This may be an economical way of processing and digesting the information and knowledge needed to link means to ends, and even resourceful regulatees may need that kind of accumulated and ‘instrumental’ knowledge acquired from the privileged pinnacle position of observant regulators. But inappropriate standards and fixed solutions imposed on the regulatee, reduce flexibility and hamper innovations in technology and the organization of work processes. Performance or output standards escapes some of these problems since regulatees may themselves design the processes in order to meet the standard, but are still not directly furnished to guarantee that regulatory goals are met. Target standards make this connection explicit, simply by stating the goals directly. Problems are encountered, however, in enforcing such standards, and their application may require resourceful and motivated regulatees, able and willing to figure out what means will lead to the desired ends, even when voluntary industrial standards are available as accepted recipes.

So-called risk based regulation require regulatees to engage even more deeply in the self-regulatory processes as they are required to document through risk analyses how more

loosely defined purposes can be met and are thus expected to identify and implement preventive measures at all stages of a process that may lead to hazardous outcomes. The concept of risk-based regulation contains the notion that some level of risk must be accepted, but risk regimes are increasingly ambitious to the extent that all risks within a given sector or area are seen as potentially reducible toward a minimum or even zero. Often, however, risk based regulation may define certain norms or principles of 'acceptable risk'. The most ambitious and sophisticated forms of self-regulation appear in these systems oriented requirements, obliging the regulatees to mobilize all their organizational resources in the management of risk, also referred to as 'regulated risk management'. Managerial interventions may be directed towards all stages of a process from the 'prime movers' to 'final outcomes', including the promotion of organizational resilience in order to face non-predictable or non-preventable errors and accidents.[19]

These systems of self-regulation require some level of trust. In an obvious but important sense, this trust is imposed on the regulators in the face of the informational asymmetries and the 'decentred' nature of the regulatory systems (Black, 2002). Ultimately, regulatees are expected to fully 'internalize' the regulatory purposes and act autonomously according to desired goals and standards. From a purely economistic perspective the regulatee could of course calculate the net costs of compliance against the risk of authority sanctions. Thus it has been suggested that many firms will comply only if the anticipated sanctions following from exposed non-compliance exceeds the compliance costs.[20] There are at least two problems associated with this 'amoral calculator' model. First, the actual compliance cost will often be inherently difficult to isolate, making the assumption that only cynical calculation guides action accordingly difficult to 'test'.

[19] We do not provide any elaborate discussion here on the different notions of risk-based regulation (see Hutter, 2005). We may only note at this point, that several requirements on principles and methods of risk analysis and risk reduction has been introduced in the Norwegian petroleum sector, such as ALARP (As low as reasonably practicable"). The 'zero-philosophy' has been introduced as an ultimate goal or vision, based on the idea that harms always have a cause, and that these causes can be found and 'contained' by being manipulated or removed. And even when the 'primary cause' cannot be directly contained, the effects can still be controlled and managed in order to minimize damage.

[20] It has even been suggested that the proportion of such calculative firm behaviour may amount to some 20 percent of the "average population of regulated enterprises in most regulatory programs" (Bardach and Kagan, 2002: 65); although given some support from qualitative studies, they make it clear that this is basically an assumed estimate of the amount of 'bad apples' The main point is rather that regulators could do better in assuming that the major proportion of apples is good.

Costs would have to be measured against possible benefits, and the 'risk' of sanctions would have to include both the chances of being detected in the first place and an assessment of the expected magnitude of the sanctions (ranging from the size of a fine to possible market expulsion). There may certainly be implicit calculations involved in shaping the impact of some of these factors, but the image of purely amoral profit-seekers would be hard to substantiate on a general basis. Second, even if some degree of calculative behaviour cannot be ignored, additional motivational mechanisms operate in various mixtures and with variable impact from case to case. It's thus been suggested that a sense of social and moral responsibility play a significant role in how firms respond to regulations, and that corporate actors often are "concerned to do what is right, to be faithful to their identity as a law abiding citizen, and to sustain a self-concept of social responsibility" (Ayres and Braithwaite, 1992: 22). Although this 'political citizen' image of the regulatee partly builds on accounts of self-proclaimed motives, the impact of social responsibility may play a significant role, at least when backed by concerns about maintaining a good public reputation (particularly in the eyes of any market-access regulators). There is evidence, however, that the force of such motivations depend on the degree to which regulations and the accompanying enforcement practices are perceived as necessary, reasonable, and consistently applied; and conversely, that non-compliance may result when these conditions are not met, leading to what has been termed 'principled disagreement' (Kagan and Scholtz, 1984).

Thus, there is no uniform explanatory scheme that can account for how firms respond to regulations. As noted by Ayres and Braithwaite (1992), the firm may have "multiple selves"; the search for 'basic' motivational forces does not produce any coherent picture provides no unequivocal templates for regulatory action. Compliance as well as non-compliance may be the result of divergent mechanisms, such as attention to and knowledge of requirements, the professional ability to act on them, and the organizational capacities that can be mobilized in dealing with risk. The impact of such mechanisms can change from case to case within a single firm, and responses to regulation may diverge in different parts of the organization (Braithwaite *et al*., 1994; Corneliussen, 2004; Hutter, 2001). This 'organizational failure' approach, assume neither wilful defiance nor

normative commitment, but recognize the simple fact that organizations often fail to manage their risks, even in the face of 'sufficient' managerial capacities (such as resources, knowledge, technical ability) and willingness to comply. Organizational perspectives on how organizations deal with risks have been increasingly reflected in new regulatory designs (Ayres and Braithwaite 1992).

The regulatory strategies and enforcement policies will reflect these perceived images of compliance rationalities in various ways. Not in the sense that one supposed image of the firm 'dictate' a certain regulatory strategy. On the contrary, a sparsely resourced and hesitant firm may provoke unyielding regulatory responses in order to 'teach them a lesson', or it may incite a soft and educational approach. Such choices may reflect particular strategies against single firms, whole business areas, or general regulatory strategies, but they may also reflect local practices and even personal preferences or 'styles' of single inspectors; not only regulatees but also regulators have multiple selves.[21] Encounters between them are correspondingly multifarious experiments, oscillating between trust and distrust in enacting the basic control structure (Power, 1997). Stereotyping images of 'the other' is still a part of the rhetoric in these local enactments.

Culture and organizational risk

Cultural approaches to risk management coincides more generally with the development of organizational and social perspectives, designated as characterizing the 'third age of safety', following the technological approaches and the 'human factors' approaches, and partly conceived as a process of "maturation" in the field. (Hale and Hovden, 1998).[22] The organizational, social and cultural approaches to risk management are thus often seen in consort, but their relation to technological and individual factors appears in different shapes and configurations. Their impact might be indicated by pointing to the key role that organizational and socio-cultural causes have played in recent major accident

[21] Indeed, for several of the Norwegian regulatory bodies, in particular those with geographically dispersed offices, it has been a major challenge to 'harmonize' individual and local enforcement practices.
[22] Analogous classifications distinguish between the person model, the engineering model, and the organizational model (Reason, 1997).

investigations. In the analysis of the *Columbia* spaceship accident, the *Columbia* Accident Investigation Board (2003) highlighted the organizational, social and cultural background conditions that lead up to the accident and their recommendations likewise pointed to how such conditions would be critical for the safety of future spaceflights. It even suggested that the "NASA culture allowed flying with flaws" (2003: 107). Two comprehensive investigation reports on the explosion in the BP refinery in Texas in 2005, causing 15 fatalities and nearly 200 injuries, both highlight their 'safety culture' as an important background condition for why the accident occurred, providing extensive analyses of organizational deficiencies indicative of this diagnosis (see CSB, 2007; Baker *et al*., 2007).

The development of organizational approaches to risk is often traced to two important books, *Man-Made Disasters* by Barry Turner (1978) and *Normal Accidents* by Charles Perrow (1984). In the foreword to the latest edition of *Man-Made Disasters*, it was claimed that Turner "hit dry ground in Europe", that there was no "disaster sociology" at that time, and that the book was "received with curiosity" (Turner and Pidgeon, 1997: xi). The reason, however, was largely accounted for by the more general lack of interest in accidents and disasters within main stream social science and organizational studies. A coupling of these areas was gradually to emerge, however, and the "failures of foresight" during the "incubation periods" of ignored warning signs, as analyzed by Turner, became key points of reference in the organizational and systemic understanding of accidents (Turner and Pidgeon, 1997).[23] Likewise, Perrow, in the afterword to the second edition of

[23] The foreword by Diane Vaughan also mentions the contribution of James Short (1984), whose ideas captured the interest of scholars, together with Perrow's theory, and urged sociologists to emphasize the social aspects of risk and not leave risk analysis to psychology. Note however also an analysis by Koht (2000), pointing to the historical development of more complex and systems oriented models in investigative commission reports in the US and in Norway. He argues that, in fact, such models appeared in US reports as early as the beginning of the twentieth century, concurring with and influenced by the Progressive movement in politics and with the emergence of the administrative sciences. A parallel development occurred in Norway, but much later (from the 1960s), and largely following the entry of new professions into the investigative commissions, and the waning of the judicial influences. The changes were particularly apparent in the decline of individual error as the prime target of causal attribution (and the associated attributions of blame and culpability). It may be noted that these were both large scale events with pervasive societal impacts, such as The Pearl Harbor attack, but also 'ordinary' organizational accident, such as some major accidents on the Norwegian Continental Shelf.

Normal Accidents, pointed to the gradual shift in how accidents and organizational risks are interpreted; even in the media, it has become

> almost routine …. to mention that there is no single cause of accidents, that while operator errors are frequently involved they are hardly a sufficient explanation of the accidents, and that we are dealing with complex systems in which a series of failures can come together in a way that no one can anticipate" (Perrow, 1999: 353).

As noted, the role of 'culture' has attracted much attention in the literature on organizational risk since the 1980s, and 'safety culture' has appeared as one of the most frequently used terms in the safety management literature. The origins of the term or at least of its *impact* in the understanding of organizational risk and failure are often traced to its use in the reviews of the Chernobyl accident in 1986. It has been noted, however, that the post-Chernobyl discussions reduced 'culture' to a rather simple combination of administrative procedure and individual attitudes, and that its impact on the emergence of cultural approaches to safety "…stemmed much more from a rhetorical attempt to reassure Western publics that Chernobyl could not happen here, than from any direct or systematic social science analysis of the deep and complex issues involved" (Pidgeon, 1998: 203). In the same vein, Union Carbide, after the Bhopal accident, reassured the public that their US plants were safe, implicitly assuming that better ('Western') safety cultures made them so. But only eight months after Bhopal, their chemical plant in Institute, West Virginia had a similar accident; only chance circumstances prevented a catastrophic outcome (Perrow 1999: 358-59).[24] The use of such wholesale diagnostic labels and catch-all explanatory accounts (good culture/bad culture) was later criticised as undifferentiating smoke-screens, unable to distinguish and appreciate the complex combination of conditions involved, for overlooking those conditions related structural properties of complex systems, and for ignoring how risk and its management is also caught up in webs of economic pressures and power (Perrow, 1999). These controversies seem to have haunted the cultural turn within risk management research up to the present, simultaneously addressing questions about what culture really is, and 'its' contribution to the understanding of accidents and risk management.

[24] In fact, both Union Carbide and the occupational safety authorities (OSHA) had made inspections in the plant and found only some minor faults that were remedied. According to Perrow, the implicit assumption in both cases was that their safety culture was good.

These ambiguities of 'cultural mechanisms' have thus been present almost from the start. Turner focussed on failures of organizational rationality, knowledge, and information processing; culture was in this context seen as much as an obstacle to safety as the opposite. This duality is related to the way in which culture frames and shapes patterns of interaction and communication within and between people and groups of people, thus either facilitating or encumbering flows of critical knowledge and information, and likewise either facilitate or encumber the proper awareness and interpretations of warning signals in the 'incubation period'. This duality is expressed as follows:

> Part of the effectiveness of organizations lies in the way in which they are able to bring together large numbers of people and imbue them for a sufficient time with a sufficient similarity of approach, outlook and priorities to enable them to achieve collective, sustained responses which would be impossible if a group of unorganized individuals were to face the same problem. However, this very property also brings with it the dangers of a collective blindness to important issues, the danger that some vital factors may be left outside the bounds of organizational perception (Turner and Pidgeon, 1997: 47).

On the positive side, the socio-cultural 'qualities' of organizations could thus be mobilized as social-cognitive *resources* to be utilized in intelligent, sensitive, and critical analysis of discernible 'signals' and available evidence. This required active learning processes, not only through mechanical registration and digestion of past events and 'lessons', but by engaging in broader analyses of types of events across organizational boundaries, using multiple hypotheses, questioning received assumptions, and cherishing the ability to imagine the unexpected.

Awareness of the complexity of information processing in decision-making contexts prompted a focus on the difficulties involved in interpreting the nature of signals in the information flows, and that the ability to distinguish 'true' warning signals from the lot would typically be the privilege of post-event investigators. The politics and power mechanisms involved in both foresight prospects and hindsight (re)constructions were also apparent; both in the sense that external pressures from stakeholders would often favour risk-taking, but also in the sense that hindsight interpretations and explanations of organizational failure would be embedded in contexts of conflicting interest. In the

optimistic version, ‘safe cultures’ would enhance the ability to take care of all this in a balanced manner, facilitating appropriate interpretation of signals, active learning, creative foresight, and at the same time resisting economic pressures and powerful stakeholders. In the second edition of *Man-Made Disasters*, the double edged nature of culture was reformulated in the face of the optimistic beliefs that safety cultures could be somehow ‘engineered’:

> We can ask if it is possible to have …. an institutional culture which supports resilience and reliability in ill structured contexts; or is this a fiction, a dangerous smoke screen behind which the reality and resistance of organizationally generated mistakes, and in particular blindness to certain forms of error, will always lurk (Pidgeon and Turner, 1997: 187).

This duality of cultural and social-cognitive aspects of organizational risk has recently been rephrased by Hutter and Power (2005), embedded in their concept of ’organizational encounters with risk’. The phrase indicates that the way organizations deal with risks may be perceptually restricted, cognitively framed, and culturally embedded, and thus not adhering to the rational risk management model of well calculated decisions founded on full knowledge of possible outcomes and their respective probabilities. Rather, organizational encounters with risk are “characterized by a lack of clearly agreed or coherent data sets of historical event frequency in which judgments of probability are problematic and where possibilities of rational calculation are limited, if they exist at all” (2005: 10). The concept also suggests that indicators of risk, when they are known or discovered, do not cause uniform or predictable responses, but are filtered through amplifying or attenuating mechanisms intrinsic to organizational life. They may be enlarged and augmented or suppressed and denied during the ‘incubation period’ where potential dangers evolve. The signs are there, but are not properly attended to, interpreted or acted upon.

Partly, these mechanisms are due to the cognitive and organizational limits to information processing. Every stone cannot be turned, not everything can be attended to, interpreted, or critically examined. Organizations develop hard-wired routines, fixed procedures, and cognitive scripts in order to deal with complex processes, turbulent series of events, and

flows of information. Even ‘learning and self-critical cultures’ must narrow things down and make hasty decisions based on limited knowledge and ill-structured processing of information. Potential insights to be gained from post-event investigations may be biased, as the hindsight discoveries is a ‘reflexive luxury’ not available within the context of rapid decision-making, where overloads of information must be processed, understood, and acted upon. Something must be forgotten or ignored in the process of directing institutional visibility and attention. Encounters with risk are thus couched in processes of organizational sense-making. These encounters may appear as sudden and unexpected, or as latent and gradually emerging, often escaping management systems based on calculated predictability, organizational stability, and fixed routines. Even in organizations that are professionally attuned to managing risks, such processes of sense-making may in fact cause a systematic re-interpretation of ‘error-signals’. This is what Vaughan found in her analysis of the *Challenger* accident, where constant risk awareness became almost a collective mental trap, and overloads of failure-signals resulted in a ‘normalization of deviance’ (Vaughan, 1996).

The analysis in *Normal Accidents* had a more systemically pessimistic view on the possibility of safety in high risk industries, beyond the dualities and paradoxes of culture. Perrow’s contribution grew out of the sociology of organizations, and identified innate structuring of linkages and sequences in complex systems as inherently dangerous, sooner or later causing irreversible ‘entrapments’. Complex interactions and tight couplings in systems made them inherently vulnerable to accidents. These structural properties also lead to fundamental contradictions in terms of organizational and managerial design, since decentralized decisions were needed for handling interactive complexity, while centralization was needed for handling tightly coupled systems. Interactive complexity could only be managed close to the operational level as it depended on a considerable amount of discretion and personal judgement. Tight coupling, however, where single but interdependent components of production processes could lead to chains of unexpected events, could only be organized through detailed procedures and centralized control. Furthermore, external pressures, economic interests

and power would jeopardize these inherently vulnerable systems even more, adding to the systemic risks.

The so-called High Reliability Theory (HRT) was partly phrased as a critique of Perrow's pessimism, and tried to demonstrate how 'High Reliability Organizations', even with tight coupling and complex interactions, could be still able to avoid accidents (Roberts, 1990; 1993). Such high reliability could be achieved through organizational design and management, by making safety a paramount priority, and by allowing for structural and organizational redundancy (overlap, duplication, communication, etc.) in order to contain the vulnerability of single system components. Whereas Normal Accident Theory (NAT) pointed to the impossibility of fully preparing for the unpredictable trajectories of possible accident scenarios, HRT argued that this could be achieved by continuous training, simulations of trial and error learning processes, and imaginative foresight in preparing for the unexpected. HRT argued for the possibility of coping with the structural contradictions between centralization and decentralization through a common 'culture of reliability' that could facilitate flexible and alternate decision-making processes on all levels adapted to the situation and the context. The concept of 'mindfulness' has been introduced as a cover-all concept for this organizational 'state of mind', indicated by a collective capability to "notice the unexpected in the making and halt its development" (Weick and Sutcliffe, 2001: 3). Mindful organizations have an underlying style of mental functioning with five crucial characteristics, reminiscent also of the virtue-side of Turner's culture: preoccupation with failure, reluctance to simplify interpretations, sensitivity to operations, commitment to resilience, and deference to expertise. Following these principles, organizations should develop complex expectations and models, give 'strong responses to weak signals', avoid arrogance and hubris, and breed vulnerability.

Normal Accident theorists have objected to the implicit 'harmony-model' of HRT, ignoring the possibility (and probability) of faulty reporting, denial of responsibility, blaming, and internal and external power mechanisms (Sagan, 1993). The unitary culture model was partly also seen as requiring a kind of discipline and socialization, not compatible with democratic expectations and values of modern society. Perrow admits

that cultural properties and administrative designs, related to organizational redundancies, safety commitment, the humanization of work, etc., may contribute to better safety, but is still critical of the unquestioned confidence in how these essentially rational management models are able to cope with situations of high complexity and tight coupling. The principles of redundancy (many layers of protection) and diversity (different varieties of protection) has also been criticised for making the systems too complex and opaque, and sometimes in fact increasing interactive complexity and creating a false sense of safety among operators and managers (Rasmussen, 1993; Reason, 1997). Perrow argues instead for a 'contingency theory' of system accidents, that take account of critical system characteristics that will determine the number of unexpectedly interactive failures and the degrees of coupling that will determine their impact. Such system characteristics may range from socio-technical designs and information processing capabilities, to organizational controls and the 'organizational density' of the relevant environments (such as industrial structure, interest groups, regulators etc.). Disregard of these system properties is an inherent weakness of cultural and managerial explanations and designs; in particular, it will divert attention from the role of power and economic interests. Vaughan's analysis of the *Challenger* accident, locating the underlying causes in social-cognitive processes of 'normalization', was later to be criticized by Perrow as being too 'culturalist', underestimating the importance of external economic pressures and power-relations in the decision-making processes, thus noting that "we miss a great deal when we substitute culture for power" (1999: 380).[25] Economic interests dominating the external conditions for organizational safety will mitigate necessary redundancies (even when structurally possible and 'available'). Similar arguments have been put forward by Rasmussen (1997).

[25] This, despite the accounts provided by Vaughan about just these external pressures. We may note that power and economic forces gained a more prominent position in her analysis of the *Columbia* accidents, including also a somewhat adjusted reanalysis of both accidents seen within a broader historical perspective, perhaps as a response to Perrows critique. The distinctions may be due to some subtleties regarding the analysis of causal processes and 'sequences', as when external forces are seen to shape social-cognitive (or cultural) processes. This double edged view on culture has its parallel in anthropological theory, in particular within the so-called power shift tradition (Ortner, 2006). Culture is thus seen as both "enabling (allowing people to see, feel, imagine, understand some things), and constraining (disabling people from seeing, feeling, imagining, and understanding other things)" (p. 13). There is thus a double parallel, depending on how one analyze the role of *power* in the processes of 'disabling' and 'enabling'.

Disregarding for the moment the question about different conceptual locations of 'the cultural', what distinguish these schools then is not that they disagree in seeing the structural conditions of interactive complexity and tight coupling as inherently vulnerable and potentially catastrophic, but rather the nature and degree of the risks involved and the ability to manage them. While these controversies ultimately were related to whether or not certain very high risk industries should be allowed altogether, such as nuclear power plants, the ideas of HRT could still offer risk management strategies that could be applied in less controversial areas, where outcomes were not catastrophic.

The proliferation of cultural perspectives in the literature on risk management has caused a disordered multitude of conceptual understanding of culture, and no general consensus exists on the impact of cultural factors in understanding and managing organizational risk. This lack of consensus is thus not only 'empirical'. Rather, the majority of the numerous articles that have appeared on safety culture address and lament the conceptual troubles of 'culture'. Some address those troubles specifically, and provide suggestions for conceptual clarifications.[26] The diversity of disciplinary and methodological approaches have not made this easier, and even within the same 'traditions', divergence may be more apparent than convergence. Within psychometric paradigms, a variety of competing and overlapping 'culture scales' have been developed (Cox and Cheyne, 2000; Lee and Harrison, 2000), cultural components, variously arranged, appear in different models of risk management and accident analysis (Hopkins, 2006*b*; Reason, 1997), and a number of definitions are used, drawing on several academic traditions (psychology, anthropology, sociology, etc.). Some of these divergences are rooted in different conceptions of how culture should be understood and studied. Notably, this is evident in the contrast between the (primarily psychological/psychometric) view that culture is to be located in 'the mind', somehow as the configuration of 'attitudes' and 'perceptions' to be extracted from validated questionnaires, as compared to but separable from observable behaviour, and on the other hand, the (predominantly anthropological) view that cultural

[26] The following titles may serve as indications of this predicament: "Safety culture: Philosophers stone or man of straw" (Cox and Flin, 1998), "Cultures confusions" (Hale, 2000), "Much Ado About Safety Culture" (Guldenmund, 2006).

properties are located and produced in ongoing processes of social interaction, to be understood primarily through qualitative fieldwork studies.

Rather than examining these overlapping and competing positions, at this point only a brief sketch of some recurring themes and contrasts will be presented. First, there is a recurring imaging of cultures as 'onion-like' phenomena, indicating that culture is a 'layered' property with some basic and deep rooted assumptions and epistemes at 'its inner core', surrounded by observable behaviours and more superficial manifestations, such as stated or 'espoused' values at 'its outer layers', sometimes elaborated through a distinction between 'culture' and 'climate' (Glendon and Stanton, 2000; Guldenmund, 2000; 2006). Second, there are various ideas of organizational distribution of cultural dimensions, displaying (safety) cultures alternatively as integrated and coherent, as differentiated and divergent, or as amorphous and fragmented (Martin, 2002; Martin *et al*., 2004; Richter and Koch, 2004). Third, there is a thematic or componential localization of the cultural as basically designating informal and relational aspects of organizational behaviour and interaction, as opposed to 'structural', 'rational', and ' formal' aspects (Hale, 2000). Associated with this latter thematic localization are the attempts to identify culturally conditioned patterns of interaction that influence organizational redundancies, such as safety alertness, work-mate interference, no-blame attitudes, reporting practices, and learning processes. We shall return to a more comprehensive discussion about culture in a later chapter, only noting at this point the diversity of approaches available on the academic menus.

Concluding remarks

The purpose of this chapter has been to give a brief outline of some important and intersecting academic contexts that provide a background for studying how risk can be regulated through culture. Some convergence appears by keeping the perspective more attuned to the problems involved when regulation engages ever more intensively with the organizational preconditions for safe and reliable operations. Regulatory ambitions thus ascend beyond the level of simple rule-following, and the accompanying risk

management philosophies will extend beyond the single loops of simple cybernetic systems.

An additional purpose has been to convey a sense of the complexities involved in the task of integrating culture as part of a regulatory strategy and repertoire. Risk regulation regimes constitute complex societal systems, covering a broad spectre of 'contextual shapers' and content dimensions, appearing in a multitude of possible configurations. They operate on a number of levels, and the regulatory agents within such regimes have the difficult task of promoting regulatory goals through various mechanisms of 'remote control', only marginally able to influence directly the processes within which the risk management systems are supposed to fulfil the regulatory purpose; requiring 'good safety cultures' would appear as a tempting step to influence such processes.

We may note that the introduction of culture in the risk management literature was largely related to *safety*. And as we shall see, the introduction of culture as part of the regulatory strategy was largely inspired by the HRT literature, notably through the popularized version of James Reason (1997), which was primarily occupied with the management of major accident risks. Although major accident risk looms large in the Norwegian petroleum industry, the regulatory system has since the 1970s integrated a comprehensive collection of risk factors within one single regime, including occupational health and working environment. This made the process of translation and adaptation even more difficult, as these divisions between safety and occupational health already from the beginning represented somewhat distinct traditions, each of which covering rather disparate kinds of risks, and requiring a diversity of management strategies.

In the next chapter, we will look at the historical developments preceding this cultural turn, and the industrial and institutional context within which it appeared. As will be evident, this development may in itself be interpreted as a process of *cultivation*.

3. The development of the industry and the regime[27]

The Norwegian petroleum industry – a brief introduction

The Norwegian continental shelf (NCS) is the largest in Europe, three times larger than the Norwegian land area. In 2006 Norway was ranked as the world's tenth largest producer of oil and the fifth largest producer of gas.[28] Since the first oil discoveries were made in 1969, the petroleum industry has generated enormous wealth for Norwegian society and is by far the most important source of income for the country.[29] The petroleum industry covers a complex of actors, technologies, and natural resources. A number of national and international companies are engaged in the industry, and some 80 000 people have their employment directly linked to the petroleum sector, of which some 22 000 work offshore. The petroleum resources on the shelf consist of a limited number of relatively large fields, some of which are among the largest in the world. Extracting these resources involves complex processes of interaction and cooperation between the actors involved. The industrial value chain ranges from seismic investigation and resource exploration, drilling, operations and production, and finally, to decommissioning. Technologies include a variety of fixed and floating offshore platforms, sub-sea facilities, pipeline systems, and several onshore terminals. Actors who participate in the industrial supply chain range from the oil companies responsible for developing and managing the petroleum fields, down through a complex hierarchy of

[27] As briefly noted in chapter 1, the data presented here primarily cover only the period up until and including the year 2006. Unless otherwise stated, updated facts about the NCS are based on Ministry of Petroleum and Energy / Norwegian Petroleum Directorate (2007). Main sources for the historical overview are: Hanisch and Nerheim (1993), Olsen and Sejersted (1997), Ryggvik and Solbakken (1997), and Kindingstad and Hagemann (2002). These sources cover many of the same topics, and specific references are basically only given when the source appears as unique.

[28] Due to low national consumption (Norway has only 4.8 mill. inhabitants and a rich supply of hydroelectric energy sources), the overwhelming portion of produced petroleum is exported. Norway was in 2006 ranked as the world's fifth largest exporter of oil and the third largest exporter of gas, amounting to more than half of total exports from Norway. Production levels in 2006 amounted to 2,8 million barrels of oil pr day and 88 billion standard cubic metres of gas (Ministry of Petroleum and Energy / Norwegian Petroleum Directorate, 2007).

[29] Total revenues from the petroleum activities now exceed NOK 300 billion each year, representing approximately one third of the total revenues in the fiscal budget. The bulk of these revenues come from direct taxes and ownership in licences. Revenues are transferred to the so-called *Government Pension fund – Global*, the size of which passed NOK 2000 billion in 2007 (Ministry of Finance: http://www.regjeringen.no/en).

suppliers and contractors (such as drilling, constructions, equipment, engineering, marine systems and services, transportation, maintenance and modification, well services, etc.).

The petroleum industry is of course highly regulated in terms of both resource- and risk management, and regulatory policies cover sometimes highly politicized decisions regarding the overall pace of production, the opening up of new fields in environmentally vulnerable areas, general policies regarding the allocation of licenses, as well as standards for health, safety, and environmental protection. But regulation includes also the day to day monitoring and supervision of industrial behaviour.

The Norwegian 'oil-era' started in 1962. The European branch of the American oil company Phillips Petroleum made a formal proposal to Norwegian authorities, suggesting that the company were granted an oil and gas concession, practically covering the whole of the Norwegian continental shelf. In return, they would conduct a full geological survey of the shelf. Petroleum activities had already commenced outside the Dutch coast in the late 1950s, thus drawing attention to the possibilities of finding petroleum elsewhere in the North Sea. Phillips was at the time only a minor company in the petroleum industry, which was dominated by the 'seven sisters', Shell, Esso, British Petroleum, Mobil, Chevron, Texaco, and Gulf. No seismic surveys had been conducted in the North Sea, and the Norwegian authorities were certainly not prepared for such an initiative. Instead of receding ownership rights in return for seismic surveys, however, a process started of establishing jurisdiction in the North Sea. Sovereignty over the Norwegian continental shelf was proclaimed in 1963, and agreements about the principles of division of the shelf were signed with Great Britain and Denmark in 1965.[30] National ownership to the natural resources on the shelf was determined by statute, authorizing the government to award licenses for exploration and production. The NCS was divided into 37 quadrants, each comprising 12 blocks. In the first licensing round in

[30] Two ministries were involved in this process, the Ministry of Foreign Affairs, and the Ministry of Industry. The legal department in the former had the main responsibility for responding to the proposal. They had recently employed some very able young legal experts, primarily assigned for dealing with the preparation of Norway's future relationship with EEC. All of them were later to occupy leading positions in Norwegian society, within the political system, the legal system, the academia and in private business and industry. Their role forms part of the national mythology, sometimes perhaps overstating the heroic impact of single individuals.

1965, 78 blocks were awarded, granting rights to exploration, drilling, and production. It took four years, however, before the first significant discoveries were made in the Ekofisk field. Several large fields were discovered during the 1970s and 1980s (such as Frigg, Statfjord, and Sleipner). In 1980 the first licenses in the Norwegian Sea (north of 62°) were awarded, and during the 1990s the Norwegian petroleum era reached also the Barents Sea. Thus far, approximately one third of the total petroleum resources have been recovered.[31] The NCS is now considered 'ripe', with many maturing fields. No new discoveries of large fields are expected, and future production will consist of smaller reservoirs, tail-production, and the employment of new technologies for maximum extraction from existing fields.

A dominant theme during the first years was to attract the interest of the oil companies without compromising national interests in keeping control of the natural resources and the economic benefits. The first oil fields were developed by foreign companies, such as Phillips petroleum, Mobile, and Exxon. As the first oil-discoveries were made, the national interest gained force, and a process of Norwegianization developed from the early 1970s. In 1971, a broad political consensus was established regarding the main goals of Norwegian oil-policies, expressed in the so-called "ten oil-commandments". Most of these confirmed established policies regarding the overall national control of activities on the shelf, but more proactive and ambitious goals were added, including the active promotion of national expertise and industrial participation.[32] A Norwegian state-

[31] This amounts to more than 4 billion standard cubic meters of oil equivalents (scm). Of the remaining resources, 5,4 billion scm are proven resources, while some 3.4 billion scm is the estimated amount of undiscovered resources. The current yearly level of production (some 250 million scm.) is expected to increase somewhat for the next 5-6 years, followed by a steady but slow decline. Some of the older large fields, such as Ekofisk and Statfjord have an expected cessation around 2025-30.

[32] As part of the process of Norwegianization, a Royal Decree was issued in 1972, requiring that licensees should use Norwegian goods and services, when competitive. The national industrial capacity for participating in the oil industry developed gradually, with some crucial milestones in industrial achievement. These projects utilized several industrial elements familiar within the established industrial structure, such as design and welding of hull, navigational systems, the construction of concrete installations, etc. The construction of the Ekofisk tank in 1971-72, was a test case for the development of Norwegian engineering and use of domestic industry. Later, the so-called Condeep platforms were introduced, as a unique Norwegian design for platform construction (they were made of concrete, to be founded directly on the seabed). Semi-submersible drilling platforms were developed, most of which were built in Norwegian shipyards. Dynamic positioning systems, used for moving and keeping vessels and installations on correct locations, were developed at the technical university in Trondheim. Other achievement included a monitoring system for directing all functions on a production platform from a

owned oil company was to be established that would take active part in the petroleum activities and also manage the financial interests of the state. The company, Statoil, was established in 1972, and was given a substantial share in the awarded licenses. Gradually, it was to be developed as a major operating company, first though a process of knowledge transfer, and eventually through formal operating responsibilities.[33] In 2006, Statoil was the largest operating company on the NCS, with some 60 percent of the operatorships. The other major Norwegian company operating on the NCS, Norsk Hydro, was also given a crucial role in the process of Norwegianization. Hydro was Norway's largest industrial company, but with no experience from the petroleum sector. Gradually it acquired a major role as the second largest operator on the shelf.[34]

The NCS currently comprises some 50 production fields in operation, 8 exploration fields, 20 exploration wells, 8 land sites, and more than 13 000 km's of pipelines. 15 fields are located in the Southern North Sea, with Ekofisk and Sleipner (gas) as the largest.[35] ConocoPhillips is operator for the Ekofisk field, and Statoil for Sleipner Øst and Sleipner Vest. In the Northern North Sea, 28 fields are currently producing. The area covers some of the richest oil fields in the NCS, such as Statfjord, Gullfaks and Snorre, and a large gas field (Troll), all of which are operated by Statoil. The large Oseberg field (mainly oil) is operated by Hydro. The Norwegian Sea covers eight fields. The oil field Draugen was the first to come on stream in this area in 1993, and the large gas field Ormen Lange started production in 2007; both of these are operated by Shell. In the Barents Sea, no fields are yet in production, but the Snøhvit gas field is scheduled to start

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single location (offshore and onshore), supply ships specifically designed for offshore missions, and technologies for the survey and interpretation of seismic data.

[33] In 1985, state participation in the petroleum activities was reorganized through the establishment of *SDFI* (the State's Direct Financial Interest), giving the state a direct share in the licenses that was not linked to Statoil's commercial participation. The arrangement was still administered through Statoil until 2001, when it was transferred to Petoro, a new state-owned company established with the sole purpose of managing the SDFI. At the same time, Statoil was partially privatized, and made subject to the ordinary legislation for limited companies.

[34] After the collection of data was concluded (Dec 2006), a decision was made that the two companies be integrated into one large petroleum company, *StatoilHydro* (including only the petroleum related part of Hydro). These companies are for the purpose of this study still treated separately. Much discussion has ensued in the aftermath about the dominant role of this new company, and the HSE authorities have been granted additional resources in order to rebalance power relations.

[35] These also serve as hubs for the activities in the area, providing infrastructure for further transport through the Norpipe and Zeepipe systems. Oil is transported to Teeside, Great Britain, and gas to Emden Germany.

production in 2007. An extensive network of pipelines connects these petroleum fields with a number of onshore facilities in Norway, Great Britain, France, and Germany.[36] Offshore, there are more than 70 fixed installations and more than 20 mobile drilling rigs.

There are more than 300 production licenses and operatorships in these petroleum fields, divided among some 30-40 companies. Almost all the operating companies participate in several production licenses, typically comprising 3-5 cooperating licensees, but normally with the operating company as the largest owner/shareholder. Some ten companies only hold production licenses, the largest being Petoro (see note 33), with more than 100 licenses.

Company	Operatorship	Production license	Field
Statoil ASA	100	173	50
Norsk Hydro Produksjon AS	68	135	49
Talisman Energy Norge AS	15	48	8
BG Norge AS	14	23	
Lundin Norway AS	14	24	2
Total E&P Norge AS	13	72	40
ENI Norge AS	12	47	16
Marathon Petroleum Norge AS	11	19	5
BP Norge AS	10	15	5
AS Norske Shell	10	23	7
ConocoPhillips Scandinavia AS	10	12	9
ExxonMobil E&P Norway AS	9	24	16

Table 3.1: The largest operators and licencees on the NCS, 2006
Source: Ministry of Petroleum and Energy / Norwegian Petroleum Directorate (2007)

Measured in terms of work-hours, the bulk of offshore activities (more than 60 percent) are carried out by contractors and suppliers, Drilling and well operations account for most of these, followed by construction and maintenance, and catering services.[37]

[36] The largest pipeline network is Gassled, encompassing 9 pipelines for gas transport with a total length of some 6600 kilometers. Some oil is transported through pipelines, but the bulk of the produced oil is loaded offshore onto buoy loader shuttle tankers and transported to national and international destinations. Gassled is owned by several petroleum companies, with Statoil and Petoro as the largest shareholders. It is operated by Gassco AS, a 100 percent state owned company responsible for the transport of Norwegian gas to the markets. The Gassled system includes two gas processing plants on the Norwegian west coast; Kårstø and Kollsnes, both of which are operated by Statoil. Other onshore facilities include Tjeldbergodden (methanol plant), Sture terminal (storage/processing), Mongstad (crude oil terminal), Snøhvit (gas) and Slagentangen (oil refinery). All of these onshore facilities were incorporated into the petroleum legislation framework in 2004.

Institutional and regulatory developments

The motives for regulating the Norwegian petroleum industry are several, the arguably most important of which is related to the so-called 'windfall profit' or the economic rent made available from the rich supply of natural petroleum resources. Although huge investments and operational costs are required in order to extract these resources, the potential for profits instigate and justify correspondingly strong regulations. The trade-off defining this 'correspondence', the level or amount of regulation in relation to possible profits, has been subject to continuous assessment and rivalry. From the very start, the regulatory framework reflected the tradeoffs between providing incentives for the oil companies to engage in, invest, and produce, and at the same time to maximize the values extracted for the public through taxes, levies/royalties, and direct participation. The burdens and benefits of health and safety regulations have been part of these overall considerations.

The development of the health and safety regulations can be divided into several phases, depending on the criteria used for defining a 'phase'.[38] Some critical milestones may still be identified: the first safety regulations of the exploration and drilling period from the mid 1960s; the regulation of fixed installations in 1976, the introduction of the Working Environment Act in 1977; the introduction of internal control systems during the 1980s; the so-called NORSOK-process during the 1990s; and the new regulatory framework established in 2002. Various mixtures of contextual and institutional forces have contributed in shaping these developments.

The first rudimentary safety framework was issued by Royal Decree in 1965, preparing for the first rounds of petroleum explorations. In 1967, regulations were expanded and contained 130 sections, mainly covering safety issues. These regulations were largely based on the British system, including a heavy reliance on standards and 'best practices'

[37] Adding to these are a number of transport services, such as helicopter transportation of personnel and supply ships transporting the large amounts of goods needed in the petroleum activities (construction parts, water, diesel, oil, cement, steel-pipes, plates, equipment, operational supplies, etc.), including also the return of surplus and garbage.

[38] Hovden (2002) identifies four such phases, while Ryggvik (2000) portrays a more fine grained development.

developed in the industry. The role of existing regulatory systems of health and safety was marginal, except regarding some requirements specific to maritime activities (life-belts, lanterns, navigational rules, etc.). These latter influences were partly instigated by some serious accidents, such as the collapse of the Sea Gem rig in the British sector, causing 13 fatalities, and a collision between the Ocean Traveller rig and a supply ship in the Norwegian sector, causing a hole in the supporting legs of the rig. These accidents partly replaced trust in industrial 'self-regulation' with a more critical attitude. The regulations did not, however, appear to have jeopardized the 'cost balance' in such a manner that the companies were deterred from engaging in the exploration activity. In the case of occupational health and safety, such considerations were more prominent, and the existing legislation for occupational health and safety was not applied to the offshore activities except for some provisions about working hours. Thus, "a zone of regulatory exclusion" had been granted to the emergent industry (Ryggvik, 2000: 72).

Regulations in the early years were developed in close cooperation with the industry. The political administration was handled at the ministerial level, with limited resources and little knowledge about the emerging petroleum industry. Thus, the industry was from the beginning invited to participate in the development of policies and regulations. The administration had to rely on their knowledge, and benefit from a good cooperative climate. As the story goes, the head of the Norwegian government's Oil Advisory Board, Jens Evensen, invited all the relevant petroleum companies to the ministry, gave them three hours to agree on an educational program for the public officials; but adding: "If anyone tries to fool us, we will never forget it. That company will never be granted any licenses in Norway!" (Kindingstad and Hagemann, 2002: 29).

Balancing the risks of capture against the risks of regulatory and professional marginalization was thus ingrained in the encounters with the industry from the very start. Powerful and resourceful companies with first hand industrial and technological expertise would have the upper hand in negotiating with the state bureaucrats, creating a delicate but unavoidable balance between trust and suspicion. But the state had 'big sticks' and the informational asymmetries were gradually to be reduced (though not

removed) by promoting internal checks and balances and by building up regulatory capacities and professional expertise. With the large increase in oil-related tasks, The Norwegian Petroleum Directorate (NPD) was established as an administrative regulatory body in 1972. The NPD was given the dual task of resource- management and safety regulation. Their role in resource management was largely to develop knowledge and documentation about petroleum resources and reserves, and to provide advice to the ministries in awarding and following up licenses. In the case of safety regulations and supervision, the NPD would gradually acquire a more independent role, although all major legislative proposals and decisions rested with the governmental ministries and the parliament.

As the industry expanded steadily during the 1970ties, a new regulatory framework for fixed installations was proposed. This reflected a new regulatory policy relying more heavily on industrial self-management, thus also foreshadowing later internal control reforms (Ryggvik and Smith-Solbakken, 1997). The regulations of the first generation had frequent references to industrial standards and 'good practice' in the industry. This was absent in the new proposal, and stronger and more prescriptive provisions provided a clearer mandate for authority intervention. These provisions could interfere directly with the technological designs of platforms, such as a stated preference for the separation of living quarters from operational processes. To have living quarters placed on top of a petrochemical plant had gradually emerged as an unacceptable solution. The regulatory powers of the NPD were most conspicuously demonstrated in 1976, just after the regulations had been issued, when Mobil Oil was ordered to reconsider the construction of the Statfjord B platform and build a separate flotell. The letter postponed the upstart of production by one year and was later referred to as the "most expensive letter in Norwegian history".[39] The platform *was* reconstructed, but included living quarters, which were placed as far away from the production areas as possible. The case not only demonstrated the powers of the NPD; it was also indicative of the willingness on the part of the regulators to accept alternative solutions if these could be justified as sufficiently

[39] The statement originated from the first director of Statoil, Arve Johnsen; it was later framed and glazed and returned to the NPD as an unforgettable moment in the national petroleum history (Kindingstad, 2002: 164-67).

safe. This latter approach would also gradually appear as a key principle in the regulatory philosophy.

The safety regulations largely supported a managerially based control system and were thus in some opposition to the ideas of the new Work Environment Act that was underway, which emphasized participation, empowerment, and mobilization of lower echelons of the work force (Ryggvik, 2000; Ryggvik and Smith-Solbakken, 1997). The question of whether the proposed WEA should be applied to the sector was highly debated. The industrial actors, supported by the Ministry of Industry, argued against inclusion. The act was radical and new, and objections were in particular related to some critical provisions, such as giving elected safety representatives the authority to stop dangerous work. However, several driving forces worked for inclusion. The unions, but also the Ministry of Social Affairs and the Ministry of Municipal Government and Labour, responsible for the new act, argued for the full application of the act to the offshore sector. Public attitudes appeared to support full inclusion: there was no reason why levels of protection should not be as strong offshore as onshore.[40] The Alpha accident in 1975, causing 3 fatalities, prompted the same conclusion. Thus, from 1977, the same year that the act was implemented, it was also applied to the offshore activities. However, floating installations fell under the maritime jurisdiction, and was not included in the general petroleum safety regulations until 1992. The introduction of the WEA greatly improved conditions for offshore workers, regulating working hours, providing protection against unwarranted dismissals, and facilitating a more efficient involvement in decision making. For several years, a double regulatory track was thus followed, containing somewhat different regulatory philosophies, WEA and the safety regulations. The latter was more managerially oriented in emphasizing management systems and leadership responsibilities, while the former promoted and even presupposed active worker participation.

[40] The significance of public support in this process (also reflected in some of the large newspapers) may have been just as important as the pressures form unions within the corporatist system. The public appeared sceptical towards the great multinational companies, in contrast to the close ties that had developed between the industry and parts of the government apparatus (Bjørnson, 1993; Ryggvik, 2000).

Gradually, new regulatory needs appeared, in particular subsequent to several serious accidents, such as the Bravo blow-out in 1977. The report from the accident commission after Bravo focused largely on organizational and systemic causes, preparing the way for corresponding philosophies of regulation. The report identified a number of causal antecedents, such as bad equipment, violations of safety regulations, improvisation, long working hours, and lack of competence in critical operations. But other underlying causes were seen as major contributors, such as the prevailing 'can do' managerial ethos of the company. The operating company (Phillips) was criticized for not having an internal organization more dedicated to safety, and the commission argued that an internal safety system with clear distribution of responsibilities and more rational planning had to be developed. They also called for a *work culture* more dedicated to safety. [41] The accident also triggered a discussion about possible administrative and political goal conflicts in the regulatory system. As a result, health and safety issues were separated from the resource management. The NPD was left intact, but safety regulations were transferred to the ministry responsible for the WEA, and the agency was correspondingly split in two divisions, each reporting to 'their own' ministries.

The first guidelines for 'self control' for licensees was issued in 1979, and in 1981 these were elaborated and renamed as guidelines for 'internal control', requiring that management systems for safety be developed. New risk- and performance-based provisions were given, and in 1980 the first guidelines for risk analysis were introduced, including partially quantified risk acceptance criteria (such as for the availability of efficient escape ways). Also, the guidelines introduced a 'quantified cut-off threshold' related to the 'impairment frequency of types of accidents that could be disregarded' in risk evaluations, the so-called '10^{-4} criterion'. This caused considerable attention, and was

[41] Although the report identified both 'technical failure' and 'human error' as important causes, it also noted that the operator in question had not slept for 30 hours when the 'errors' were committed, and pointed most decisively to the "underlying cause" as related to the observation that "the organizational and administrative systems were on this occasion inadequate to assure safe operations" (NOU, 1977: 8). The report was part of the Report to the Storting (nr 65, 1977-78). The influence of Bravo and the subsequent investigation has thus been considered more important for the regulatory development than the disastrous Alexander Kielland accident (se p. 72 below). Whereas the investigation of the former emphasized system features and organizational failures, the investigation of the latter focused largely on technical aspect (see also Ryggvik, 2000).

an attempt to engage the industry more actively in risk evaluations and to indicate that offshore risk levels should be within a generally accepted range.

During the 1980s there was a considerable improvement in health and safety conditions. Oil prices were high and safety costs were not critical in the face of large company profits. The position of the NPD was considered strong, partly due to the attractiveness of new licenses (Hovden, 2002; Ryggvik, 2000; Ryggvik and Smith-Solbakken, 1997). The assignment of new fields was partly based on the safety performance of the companies, as judged by the NPD, a point that was repeatedly made clear to the industry. Pressures were also put on the operators to monitor the safety performance of their contractors and to include this as part of the contract. During the 1980s the internal control principles became firmly entrenched within the regulatory system. Goal oriented rules replaced prescriptive rules, and the new regime with *systems audits* and accompanying verifications was established (Dahle, 1994). Towards the end of the 1980s, this system spread to the land-based industries, and would gradually appear as an general regulatory philosophy in a number of regimes (Statskonsult, 2002). The risk management systems were developed with increasing degrees of sophistication, but also with much regulatory detail and documentary overload. Excessive bureaucratization thus appeared as a major concern in trying to make these management systems fulfil their intended purpose. Also, criticism was voiced against the managerial bias associated with the safety systems. Both unions and researchers claimed that worker participation suffered, and that health and safety issues largely became the province of professional company experts and consultants (Haukelid; 1998; 1999; Ryggvik, 2000).

But regulatory interventions also included more direct interferences in designs, technologies, and solutions, such as requirements regarding systems for remote drilling in order to reduce the high injury rates in these operations.[42] Towards the end of the 1980s, however, a significant drop in oil prices reduced profits and increased competition. This lead to the establishment of the so-called NORSOK program, the main purpose of which

[42] These interventions caused objections from the industry and much discussion about ambitions, technical solutions, progress, and deadlines.

was to make the Norwegian petroleum industry more competitive through joint efforts that involved both the industrial actors and the state.[43] More cost efficient and flexible technological and organizational solutions were deemed necessary, and a number of joint routines, procedures, and standards were developed and included as part of the regulatory strategy. The fixed 10^{-4} criterion was abandoned and replaced with more generally formulated requirements to define safety goals, risk acceptance criteria, and to document that their safety systems could reassure that the goals were met.[44] The new risk regulation was more specific in outlining the risk analysis *process* than risk thresholds and methodology (Dahle, 1994).

There was a gradual awareness during the 1990s that new regulatory reforms had to be initiated. Fluctuations in oil prices provided unstable attention to risk, and although maintenance of the established risk levels was a stated purpose of the NORSOK process, the pressure on efficiency, cost-cutting, downsizing, etc., caused increasing concern about the effects on health and safety (Hovden, 2002). Furthermore, there was a perceived need for restructuring, simplification, and harmonization with international standards. The regulatory process started in 1998 with the establishment of internal working groups, and involved extensive collaboration with the industry, unions, and various expert groups (see also next chapter).

Working conditions and unionization

The early years are sometimes referred to as the 'Wild West' or 'Texan' period (Haukelid, 1998). They were dominated by the multinational oil companies, such as Phillips, Exxon and Shell, and accompanied by large contractor companies, such as Brown & Root, Haliburton, and Schlumberger. Given the exemptions from the general working environment legislation, authoritarian management behaviour and anti-unionist policies moved the power balance clearly towards management and company interests.

[43] NORSOK: 'Norsk Sokkels Konkurranseposisjon' (Norwegian Offshore Cost Effective Initiative)
[44] The 10^{-4} criterion was considered to have had the "unfortunate effect", according to one of the 'NPD veterans' that it: "promoted the use of risk analysis to serve as evidence to the NPD that decisions taken were sound decisions, hence not complying with the intended purpose of ensuring sound internal decision-making processes within the companies. The result was a development towards 'number-crunching' exercises, through which, one might rather disrespectfully say that almost anything could be proved" (Dahle, 1994: 380).

Although no comprehensive registrations systems existed at the time, occupational accidents appeared to be almost routine and considered as a normal and integral part of the job (Ryggvik and Solbakken, 1997).

Apart from the many indigenous reports, an indication of the risk exposures is given by the fact that seven fatalities were registered in the period from 1967-71, a number to be measured against the fact that only two rigs and less than 350 workers were involved in the exploration activities (Ryggvik, 2000). Safety measures were mostly of the superficial and costless kind, such as putting up 'smoking prohibited' signs. The drilling culture was 'instrumental' and task oriented, with the experienced drilling experts as the local heroes of craftsmanship. This managerial and instrumental working culture included rough and sometimes humiliating and brutal treatment, and disregard of even serious injuries and fatalities. Sudden and unwarranted dismissals could follow from minor transgressions or protests. Apart from such apparent deterrence mechanisms, several reasons may account for this acquiescence and risk tolerance from the workers (Ryggvik and Smith-Solbakken: 1997: 95-96). Partly, they may have had some self-interest in 'filtering' the work force, as clumsiness, laziness, inefficiency etc., would be seen as a risk to everyone and also contrary to masculine codes of conduct gradually adopted and admired by the Norwegian workers themselves. A kind of 'duality' thus developed in the appreciation of the work situation, combining resentment of bad treatment and a certain fascination with the rough style, the latter probably reinforced by the experience of being part of the 'oil-adventure'. Also, low level managers and supervisors largely participated in operational work processes and could take the role as forerunners in problem solving and risk taking, thus contributing to a certain feeling of communion between leaders and workers. Harsh and authoritarian leadership styles were then associated with the accomplishment of tasks, not with a fixed order of domination and subordination, as rank orders were largely ignored in the free time. The period is rich on shop-floor narratives, including also episodes were workers would retaliate toward unpopular managers.

In the construction phase throughout the 1970s, shop floor relations seem to have changed somewhat, as Norwegian workers gradually became more familiar with tasks

and technologies, and thus more self-confident and intolerant towards harassment. They would exploit their practical knowledge against managerial inexperience, typically 'reversing' the formal hierarchy by exposing the incompetence of supervisors. Even outright negligence or defiance of orders would occur, often justified, as the stories go, by juxtaposing their own craftsmanship with 'stupid orders'. A stronger worker's collective thus developed during the 1970s (Ryggvik and Smith-Solbakken, 1997). But a high degree of risk acceptance at the shop floor level was also part of this rough culture, including a typical macho attitude towards personal injuries, which extended far into the 1980s, in particular on the drilling platforms (Haukelid, 1998).

The petroleum industry was only gradually incorporated into the Norwegian system of organized labour relations and general agreements. Union history in the early years is complex, combining national strategies, local initiatives, and shifting alliances. Several local interest groups appeared and disappeared, some of them organized as local 'company unions', partly in order prevent the impact of strong industry-wide unionization. The national labour confederation (LO) had problems with establishing themselves in the emerging industry, in part because of anti-unionism among oil companies. It seems that several large companies such as Phillips and Mobil worked hard to keep unions out, hoping that they could 'operate on their own'. But also, workers did not constitute a uniform collective, and it was hard to define and categorize groups with common denominators and interests. The LO wanted to use the general industrial model, ie. that all workers be organized together in one union for offshore employees with a corporative system based on centralized negotiations.

Some critical events contributed to consolidating and strengthening the unions (Ryggvik and Smith-Solbakken, 1997). In 1978 an open conflict developed, starting with what has been termed 'the oil-worker revolt'. On 20 May 1978 an unplanned strike among 600 Brownaker workers at Eldfisk (Alpha and Bravo) broke out. An American supervisor had physically attacked a Norwegian foreman for conducting a job based on outdated plans and drawings. The foreman was also fired. The same day another foreman was fired because he overslept (himself claiming that he wasn't woken up). The chief safety

representative asked for a meeting, but was also fired. A spontaneous strike then broke out, and the condition set for returning to work was that the supervisor be removed from his position. The strike was declared illegal, but the supervisor was finally transferred to the British sector. This incident introduced the most comprehensive wave of strikes in Norway since WWII. Unrest typically occurred among contractor employees. These were short-timers, the business was competitive, and strike-demands were often met, largely because of the enormous costs involved in delayed production. The right granted to the safety representatives to stop dangerous work also appeared in this period as a powerful weapon.

At the turn of the decade, two major unions dominated the petroleum industry: the LO union, NOPEF, which largely organized employees in the contractor and supply industry, and OFS, who organized the majority of the offshore operator employees. OFS had largely grown out of the local company unions, and was for many years operating independently of any national confederation.[45] Whereas the LO unions were bound by the national consensus of modesty and solidarity as part of the corporate agreements, OFS was from the beginning more independent, aggressive, and anti-authoritarian. Their more sector-oriented, activist, and self-assertive policies attracted accusations of irresponsibility and selfishness, and lack of solidarity with broader groups of workers. But they managed to create a unity among quite diverse groups in the industry. Their partial successes made them an attractive alternative for contractor workers in NOPEF and other unions, and there has naturally been a competition for members and attention between the two. The wave of industrial unrest was gradually brought under more control throughout the 1980s, moving toward fuller integration into the national corporative system. The balance of power and strategic alliances between the unions and workers, the industrial companies, and the state, have shifted throughout the petroleum era, depending on several factors; some of these may be related to structural and external factors, such as

[45] OFS (The Federation of Offshore Worker Unions) became member of the nationwide union YS in 1997. It was incorporated into a larger cluster of industrial federations in 2005, with the new acronym SAFE (The Federation of Oil Workers Trade Unions Within the Energy Sector). The same happened with NOPEF (The Norwegian Federation of Oil and Petro-Chemical Workers), which since 2006 is part of the Industry-Energy Federation. The number of organized workers is generally high (80-90 percent), and the two unions are about equal in strength. OFS/SAFE has a stronger foothold among the operating oil-companies, whereas Industry-Energy (NOPEF) are stronger in the supply/contractor industry and the rig companies.

labour market conditions; but also single events, such as the triggers and outcomes of strikes, have had an impact.[46] The role and strength of workers and their unions in the development of risk levels and management strategies have however been strongly emphasized by historians of this period (Ryggvik, 2000; Ryggvik and Smith-Solbakken, 1997). The relative contribution of pressures from below is still hard to evaluate very accurately, especially as these worked in consort with a strengthening of regulatory pressures. The implementation of the internal control reforms, new technologies, and a more committed leadership, had made HSE-concerns a legitimate and integrated part of the industrial management philosophies and practices. Staffs of safety personnel with fairly independent roles could also interfere in management decisions, and together with increased worker mobilization and self confidence, this contributed to making priority to HSE issues inescapable. Throughout the 1980s, there were substantial improvements in safety and a substantial drop in the number of accidents (see below). But, as noted above, the drop in oil prices throughout the 1990s instigated a process of downsizing, restructuring, increased use of contractors, etc., jeopardizing the achievements made and also instigating stronger external pressures on the fragmented unions.

Risks in the petroleum industry

Health and safety risks related to the offshore petroleum activities cover an extensive number of areas, both in terms of causes of hazards and in terms of possible outcomes.[47]

[46] A comparison with the British sector has been conducted for filling out this picture (Beck *et al*., 1998; Ryggvik, 2000). In Norway, strikes proved to be a powerful weapon, in contrast to the British sector. Economic framework conditions were more favourable in Norway. Unemployment was low, and the risks of activism were not perceived as too great. In Britain, however, unemployment was high. Also, from 1981, Thacher's aggressive anti-union policy worked against activist strategies. Norwegian oil workers were full of self-confidence, prompted by successful strikes, whereas British Workers suffered from resignation and demoralization. In the British system, the provisions regarding the role of workers representatives were thus excluded from the Health and Safety at Work Act, due to efficient resistance from the industry. The use of corporate channels may also explain the differences, since Britain had a more decentralized and less corporatist national union (TUC), compared to the Norwegian LO. As noted, workers in Norway also gained considerable public support, and a correspondingly critical attitude towards foreign oil companies. However, internal dynamics of the various conflicts must also be considered. The success of the first strike(s), motivated further action. Filling out this picture, it could be noted that after the successes of the 'revolts' starting in the late 1970s, a turning point occurred in 1990. An illegal strike was curbed by well prepared and strongly organized employers, which made a lasting impact, also on platform culture (Ryggvik and Solbakken, 1997).

[47] We concentrate here is on the risks regulated within the jurisdiction of the PSA. Main sources are to be found on the PSA websites (http://www.ptil.no/English/Helse+miljo+og+sikkerhet/Fakta_statistikk). Other

Risks include a large variety of factors, such as helicopter transport, fires and explosions (of hydrocarbons or other substances), blow-outs from wells, lifting and crane operations, and falling objects. Outcomes include fatalities as the worst case, in particular within the scenario of major accidents; they include occupational injuries, from cuts and bruises to serious and invalidating accidents, and also occupational illness, often as the result of long term exposures to various hazards (like noise, chemicals, bad ergonomics, etc.). Risk indicators are now broadly categorized in terms of major accidents, occupational accidents and occupational health, each of which will be briefly considered below. It should be noted, however, that the relationship between these broad categories have been increasingly focussed, drawing attention to the effects that the general working conditions have for operational safety. Physical and mental strain and stress may affect not only the health of individual workers, but also operational safety in the execution of tasks. And the regulatory requirements, addressing the underlying causes of risk (management, organization, operations, etc.), do not distinguish between the various outcomes that may result.[48]

Seen in a long term perspective, there has been a tremendous improvement on some salient risk indicators, such as fatal accident rates. The first fatal accident occurred in 1967. Since then there has been 260 fatalities, including fatalities related to major accidents.[49] The capsize of the Alexander Kielland flotel in 1980 account for almost half of these, and the majority of fatalities have thus occurred as a result of major accidents (53 percent); and if we include helicopter accidents (17,7 percent of the total), fatalities related to major accidents account for 73 percent of the total number. Occupational accidents account for 23,8 percent, and diving accidents for 5,4 percent. If we only considerer figures after 1981, however, occupational accidents account for 64 percent of all fatalities. During the 1980s, a considerable reduction in the number of fatalities was achieved. Until 1980 there were 88 fatal accidents on the shelf. From 1980 to 1990

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or more specific sources are provided throughout the presentation. An overview of risk indicators is provided in Appendix 2.

[48] This was particularly pointed out in the White papers from 2002 and 2006 (Ministry of Labour and Government Administration, 2002; Ministry of Labour and Social Inclusion, 2006).

[49] Major accident is defined by the PSA as an accident in which at least five persons may be involved, or an accident caused by failure of one or more of the system's integral safety and preparedness barriers. There is no universal definition of the concept but this one is often applied.

(disregarding the Alexander Kielland capsize) there were only 13 fatalities, in spite of the fact that the level of activity had quadrupled. Seven of these were diving accidents. From 1990 to 2000, there were 7 fatalities related to occupational accidents, and since 2000 there have been only 3. The last fatal accident offshore was in 2002. Fatal accidents have now reached a status of extraordinary concern and attention. Their measurement in terms of so-called FAR values (fatal accident rates) does no longer seem meaningful, as one single death would cause great fluctuations.[50] As noted, diving accidents account for a relatively large proportion of the fatalities, 17 in total numbers, although no such fatalities have occurred since 1987. Long term and serious health impairments have also been registered for divers, however, in particular among the so-called pioneer divers (in the period 1965-1990). The extent and magnitude of these delayed injuries (such as decompression sickness, changes in organic/neurological functions, etc.) have been subject to much scientific, professional, political, and also legal, controversy.

The tools and methods for registering and analyzing risk have improved dramatically over the years. A milestone in this respect was the initiation of an ambitious and large scale project towards the late 1990s, aiming to make a general and comprehensive risk evaluation for the whole NCS. Risk evaluations and reporting practices had thus far largely been conducted for individual risk indicators separately, such as occupational accidents, gas leaks, fires, well kicks[51], etc. The project was titled "Trends in Risk Levels – Norwegian Continental Shelf" (in Norwegian termed with the acronym RNNS), with the stated objective to obtain "a more unbiased and measurable basis on which to evaluate developments in the overall risk of major accidents taking place, as well as to

[50] Fatal accident rate is measured as the statistically expected number of fatalities per 100 million work hours. Comparisons with onshore industries are difficult on a general level, but in relation to comparable industries, such as refineries, the offshore industry scores considerably better. A study for the period 1988-1997 measured average FAR values for offshore and refining industries to a little less than 3 against a little more than 6, thus more than twice as high for refineries (Vinnem, 1998). Compared to international statistics in the petroleum industry, the Norwegian shelf is not extreme however, despite reluctance by some to fully trust those figures, especially for some third world countries (see http://www.ogp.org.uk/Publications).

[51] Well-kick means loss of control over a well, resulting in uncontrolled backflow of drilling liquid. It is an indication of a blow-out due to the well taking in gas, oil, or water.

identify which problem areas constitute the largest contributors" (NPD, 2001).[52] Important additional objectives were to identify potential areas for making regulatory changes and to use the knowledge acquired as a basis for identifying research and development needs.[53] The project has made extensive use of expert groups representing a variety of disciplines (risk analysis, statistics, social science, technological expertise, etc.). The project also involves extensive collaboration with the industry, both in terms of expert assistance and in terms of data collection. The NPD, and later the PSA, have had the main responsibility for the project and for the production of reports. In terms of scope it covers all production and mobile units on the NCS, the transport of personnel by helicopter, and the use of vessels inside the safety zone around the installations.[54] The first report (the pilot project) appeared in 2001 (NPD, 2001), covering historical trends and making an overall assessment of data gathered for the period 1996-2000.

The project has been followed up each year since then and results are presented in comprehensive annual reports, which continually evaluate short and long-term changes and trends in risk exposure. The project now covers the whole spectre of risks to personnel, divided into the three main categories of major accidents, occupational accidents, and work environment factors. Both qualitative and quantitative indicators are used, including quantitative risk analyses related to major accidents, comprehensive questionnaire surveys, interviews with selected key informants, fieldwork on selected installations, and conferences and workshops targeted against specific risk areas. A number of methodological limitations related to risk estimates has been addressed and partly compensated for since the project was initiated. Indicators exclusively based on

[52] RNNS: RisikoNivå på Norsk Sokkel. All reports are available, with summaries in English, at: http://www.ptil.no/English/Helse+miljo+og+sikkerhet/Risikonivaa+paa+sokkelen/. We refer henceforth primarily to the year that the reports cover.

[53] The current and 'updated' purpose of the project is to: "(1) measure the results of HSE work in the petroleum industry; (2) help to identify areas which are critical for HSE and in which priority must be given to identifying causes in order to prevent unplanned events and accidents; (3) improve understanding of the possible causes of accidents and their relative significance in the context of risk, in order to create a reliable decision-making platform for the industry and authorities in regard to preventive safety measures and emergency preparedness planning" (PSA, 2007).

[54] The project is limited to factors which fall under the PSA's area of jurisdiction. Helicopter transport is restricted to transport between the helicopter terminal and the installation (point of departure to point of landing on installation/arrival at heliport). The land installations (eight specified installations, of which two are in the construction phase) have been incorporated in the project from 2006

past/historical events would not directly uncover changes in underlying conditions influencing risk levels, such as deteriorating maintenance of technical systems. Also, the number of events related to individual hazards may be limited, in some cases amounting to very few or even none in the course of a year. Measuring the performance of different barrier functions against major accidents has been an important additional source for determining changes in risk levels. Furthermore, criteria precision, procedures, judgments, and attitudes, all of which may affect registration and reporting practices, have been discussed and addressed.[55]

An assessment of the overall distribution of risk factors was made just before the start of the RNNS project, identifying major accidents, occupational accidents, and helicopter accidents as representing respectively 30/30/40 percent of the risk to personnel (Vinnem, 1998). Thus, the helicopter flight represented by far the single most dangerous activity in the industry. A crucial contribution of the RNNS project was the development of uniform indicators for assessing risk. 21 categories of 'defined situations of hazard and accident' have been identified, providing a comprehensive set of indicators for evaluating risk levels, both individually and through the total assessments made. Important categories include hydrocarbon leaks, fires, well kicks, structural damage, injuries, illness, etc. (see Appendix 2 for an overview). A number of measurements are developed for each of these categories, including parameters for normalizing against the level of activity, such as the number of man-hours, the number of drilled wells, volumes of produced hydrocarbons, etc. Also, methods are developed for comparing the risk contribution of the various risk factors, both within and between the categories.

Major accident risk

The long term improvements in risk levels are reflected in the frequency of major accidents. In the period up to 1980 there were five such major offshore accidents, in the

[55] The measurement of changes in the efficiency of the barriers (e.g. fire-walls, fire-fighting, and detection systems) has improved, and other uncertainties and limitations have partly been compensated for, e.g. through relatively thorough quality control of the data and the establishment of more precise criteria, such as thresholds for reporting gas leaks. The impact of possible underreporting of such leaks is reduced by including only leaks greater than 0,1 kg/s in the statistics; this is a substantial leak that normally will result in alarm and munster on the installation, and thus be difficult to avoid reporting.

1980s there were two. There have not been any major accidents since 1992, and the last major accident with fatal outcomes (helicopter accidents excluded) occurred in 1986. Measuring the risk of major accidents now depends largely on analyses of incidents related to a selected sample of the 21 indicators. Important indicators include uncontrolled discharge of hydrocarbons, fires, well incidents, and construction-related incidents. Data related to barrier performance, work accidents, and working environment factors are also included.

The annual *number* of occurrences related to major accidents has varied between some 50 and nearly 120 in the period from 1996-2006. Non-ignited hydrocarbon leaks (gas leaks), well incidents, and ships on collision course account for the largest contributors in absolute numbers. In judging the risk, however, absolute numbers are of less value since the relative contribution of each occurrence varies widely. Still, these event types taken together contribute most to the total indicator (see below) for loss of life in connection with major accidents on production installations. For mobile installations, damage to supporting structures, is a major contributor. Gas leaks are considered an important contributor to major accident risk. From 1996 there has been an overall decrease from more than 30 such leaks to 15 in 2005. There are some large fluctuations, however, with 2000 and 2002 as peak years, both with more than 40 registered leaks. The risk potentials vary greatly with the size of the leaks, however, classified in three categories (0,1-1 kg/s, 1-10 kg/s, and >10 kg/s). Leaks larger than 10 kg/s are considered extremely dangerous, and there are six such occurrences in the last ten years. All leaks above 0.1 kg/s are classified as substantial, however, and even the smallest of these could have serious consequences if they ignite, particularly in enclosed spaces. The high level of leaks has caused much attention and concern over the last years. Comparisons with the British sector have shown a considerably higher frequency on the NCS, adding to the understanding that improvements were both necessary and possible. Following an initiative from the NPD/PSA, the Norwegian Oil Industry Association (OLF) implemented a project in 2003 in order to reduce the number of leaks larger than 0.1 kg/s by 50 percent (measured against the average for 2000-2002) by the end of 2005.

According to the figures from the 2005 report, the goal was met, and more ambitious targets were set; but the figures are still considerably higher than in the British sector.[56]

An aggregate risk indicator for major accidents has also been developed, based on the frequency and severity of incidents and on the weighted potential of each incident for causing fatalities (the statistically anticipated number of fatalities). The total risk estimate for major accidents is thus arrived at through a relatively complex model, but is presented only as a calculated indicator, not as explicitly showing the risk level (see Appendix 2). After a significant deterioration in safety from 1996 to 2000, no clear changes in the aggregate risk level estimate have been observed since 2000, however. Improvements in some indicators seem to be offset by deteriorations in others, and annual variations have been relatively large. Also, despite a reduction in the total number of incidents, the potential consequences of some of these have been so severe that the overall risk appears unchanged. It is generally emphasized in the RNNS reports that a long-term perspective is necessary and that single and perhaps unpredictable incidents could soon change the overall picture. Even if general trends are difficult to identify, the RNNS data still reveal the relative contribution of different risks, and are thus important sources for identifying areas in need of special attention.

Occupational accidents

The present reporting system for occupational accidents and injuries was introduced with the WEA in 1978. Currently, some 400 injuries are reported to the PSA annually. 'Injury' includes death, absence from the next shift, or medical treatment, but excludes first aid treatment. The risk indicator used is the frequency of injuries per 1 million man-hours. As for the major accident risks indicators, injury rates are best analyzed in a long term perspective, and minor changes from year to year would normally not be statistically significant. In this long term perspective, the rates have decreased steadily, fluctuating between 30 and 40 up until the mid 1980s, where it stabilized around 25, and is currently approximating some 10 injuries per million man-hours. There are large differences

[56] Se 2006 report. Partly this is also due to parallel reductions on the British sector. Based on a five year average (2000-2005), it has been estimated that Norwegian figures (normalized against platform years) are some 3 times higher than British figures. The frequency of ignited leaks has been higher on the British shelf however.

between groups, however, making it more enlightening to look at figures for different kinds of work (from drilling to catering services), and different categories of facilities, notably production installation and mobile rigs (see Appendix 2 for statistics from 1997-2006). The frequency of injuries on mobile rigs has generally been higher, but has also been subject to the greatest improvements. In particular, the frequency of injuries related to drilling and well operations has been high. During the first years of systematic registration, there were more than 70 injuries per 1 million man-hours related to these activities on production installations, accounting for the general view that these were the most dangerous parts of offshore operations. But the frequencies gradually approximated the general average, and were superseded in 1996 by construction and maintenance work. The registration of man-hours on mobile rigs was first established in 1990, and had then the highest frequency of injuries of all categories, mobile as well as fixed (more than 50). The average for all groups on mobile rigs during the 1990s was relatively stable, ranging somewhere between 31 and 35, and in fact increasing toward the end of the decennium. In particular, increased frequencies among operations and maintenance contributed to this, going from around 13 in 1990 to 40 in 2000. Since 2000, however, there has been a significant decrease in the relative amount of injuries for all categories. Figures for drilling and well operations on mobile rigs are particularly striking, going from around 50 in 2000 to some 11 in 2006. The total frequency on mobile units was reduced from 33,7 in 2000 to only 10,7 in 2006. For the first time the level of injuries in mobile rigs was then at the same level as for fixed installations. Frequencies have generally been higher for contractor employees, partly reflecting the fact that they generally perform more dangerous jobs (such as drilling and well operations), but these differences have also levelled out.

The reporting system singles out *serious* occupational injuries, which generally account for less than 10 percent of the total injuries.[57] Compared to onshore refineries in Norway, levels are about the same. Frequencies for serious injuries generally follow the trends for all injuries. They showed an increase in the second half of 1990, followed by a significant

[57] Serious injuries are defined according to several specific criteria, such as serious fractures, loss of consciousness, injuries that cause long term sick leaves, or permanent invalidation.

decline since then, except for a peak in the years 2000 and 2001, with more than 2 injuries per million man-hours. Since 2004, the frequency has oscillated around 1 serious injuries per million man-hours, which is significantly below the average for the last ten years. The total number of serious injuries in 2006 was 22 on production installations and 13 on mobile units. Mobile rigs still make the largest relative contribution to serious injuries. (with a rate of 1,7 in 2006 compared to 0,8 on production installations). Compared to the British sector, the frequency of serious injuries has been roughly the same, but with significantly higher fatality rates in the British sector.[58]

Occupational health

All though occupational accidents traditionally have received much attention in the petroleum industry, as in other industries, the magnitude of risks (and costs) related to occupational illness have in fact been estimated to be higher.[59] Risks related to occupational health and illness include a number of factors, such as exposure to chemicals and noise, muscular-skeletal strain, conditions for rest and restitution, working hours, and psychosocial work environment. Offshore workers are exposed to physically straining tasks, often in a harsh and noisy out-door environment; noise and bad whether accounted for the majority of exposures reported in the 2005 questionnaire (RNNS, 2005 report). Overall, muscular-skeletal ailments appear as the single most important contributor to work-related health problems. A majority of offshore workers report that they occasionally or often perform heavy lifting and repetitive movements, and that they often work in strained positions; a large proportion report that they suffer from muscular-skeletal pain. Some 30 and 40 percent report impaired hearing, headaches, and skin complaints, largely due to work-related factors. In the 2003 report, newly established indicators for noise exposure and management of chemical health risk showed that large groups of employees were subjected to exposures that exceeded permitted limits. Risks

[58] For the period from 2001 to the first half of 2006 there were on average 1,05 cases of serious injury per million man-hours on the NCS, against 1,14 in the British sector. The average fatal accident rate on the NCS was 1,13 per 100 million man-hours, against 3,9 on the British shelf (amounting to a total of 2 fatalities against 10 in absolute numbers). Joint reports are produced regularly (RNNS, 2006 report).
[59] This has been measured in terms of absence, disability, and work-related death. Costs of work-related illness has been estimated as the ranging somewhere between NOK 280-450 million. See Ministry of Labour and Social Inclusion (2006) for a summary, based on studies carried out by The National Institute of Occupational Health, and ECON, a consultancy firm specialized in economic analysis.

related to chemical work environment have received considerable attention for some years. About 70 cases of illness related to chemical exposure are reported every year. Considerable effort has been made to improve industry performance in this area, such as through registration systems, reporting, substitution of dangerous chemicals, and medical monitoring.[60]

Psycho-social working environment is largely monitored in terms of the degree of supervision, job demands, and support found in the job. The results pertaining to supervision are positive for most employees. Although many experience that they face great demands in their work concerning work tempo, concentration, knowledge, and skills, the majority reports that their work is often challenging in a positive way: they get good support, particularly from their closest colleagues, although there is a perceived potential for improvement in relation to feedback from line management. About ¼ report that they never or only rarely get any feedback. There are also 3 percent who report that they are bullied or harassed, amounting to more than 300 persons in absolute numbers (RNNS 2005 report).

Politics and perceptions of risk

The issue of risk levels in the offshore petroleum industry is certainly not only a matter of objective measurement and calculation. And even the more balanced and well-reasoned evaluations enter the public domains of risk politics, with contested perceptions concerning both the risks and the strategies chosen to regulate and manage them. At the time of writing, legal claims for compensation from a number of former divers from the pioneer-era are subject to court proceedings, where the government itself is on trial regarding their responsibility for regulatory negligence during this period. After years of controversy over facts and responsibilities, the government has taken "moral and political responsibility" for the acknowledged fate of the pioneer divers, and has established several compensatory schemes. Legal responsibility in accordance with statutory

[60] The robustness of indicators related to these risk factors is clearly variable, and there are differences between companies in the understanding of criteria for reporting risk exposures.

compensation law has not been acknowledged, however, due to the claim that the government as such had no direct role as an operator or employer in the activities.[61]

Although this case is extraordinary, it serves as a strong reminder that risk issues are often value laden and controversial, regularly mobilizing the affected stakeholders, and in this case also challenging the governmental role as regulatory authority. On the whole, however, the regulators appear to have had a relatively strong and legitimate position in the public, and have regularly positioned themselves in the role as authoritative and reliable in the politics and evaluation of risk. The introduction of the large scale RNNS project was an important contribution in this ongoing process, in particular as the relationship between 'measured' and 'perceived' risk levels was subject to continuous concern and debate among the involved parties and stakeholders. Although the industry would generally be seen as 'under-estimating' and the unions as 'overestimating' the 'real' risk level, the RNNS reports could alternate in 'supporting' either side, and could regularly also measure workers' risk perceptions' against changes in risk trends.[62]

Risk controversies and climate changes

Towards the end of the 1990s there was a mounting conflict between the parties about the development of risk levels. Some industry representatives stated that risk levels had shown a steady decline and that HSE conditions had "never been better" (Ryggvik, 2000). The largest unions, however, claimed that conditions had gradually deteriorated, largely due to extensive cost savings, downsizing, industrial negligence, and self-complacency. Industry representatives countered that the unions had hidden agendas and were basically serving their own interests, such as attracting membership interest. These conflicts were voiced in a number of contexts and arenas, and were most clearly

[61] The government has only very restricted legal responsibilities for inappropriate or absent regulations and control schemes, and the Supreme Court has been very restrictive in making the regulatory authorities liable for damages and compensation. The ongoing proceedings are therefore of great societal and legal importance, and attract a considerable amount of public attention.

[62] It may be noted that in the RNNS- questionnaire, respondents evaluated the risk potential in connection with the different accident scenarios as higher in 2005 than in 2003, despite the fact that no increase was registered. The impact of some conspicuous incidents in 2004 may partly account for that. The risks of gas leaks, fire, blow-out, spills, collision, and sabotage/terror were considered by all groups of respondents as higher in 2005 than in 2003. With the exception of collisions, no increase was registered in neither the number nor the scope of accidents in these categories. Only the perceived risk of helicopter accidents was lower in 2005 than in 2003 (RNNS 2005 report).

documented in the first RNNS pilot report, which included extensive interviews with some of the key actors (NPD, 2001).

Largely, the concerns of the unions were confirmed in the risk evaluations, and were also supported by research that pointed to the effects of the NORSOK-process, and that the strong focus on cost reductions in the face of falling oil-prices had endangered safety robustness (Ryggvik, 2000; Hovden, 2002; Vinnem, 1998). A study of serious accidents and near misses demonstrated failing safety systems, partly due to reductions in resources and the removal of positions and functions designated for health and safety issues, such as safety officers. Part of the new and 'lean' organizational designs was that HSE-issues should be a 'management-responsibility', and not delegated to staff functions. Not objecting to the idea of 'management responsibility', critics still pointed to the need for specialized expertise and designated watch dog positions (Ryggvik, 2000). The conflicting perspectives were sharpened also when key industry representatives questioned the research, largely based on the observation that there had been no clear increases in the total frequency of injuries. This in turn also caused discussions about the validity of these figures as adequate indicators of the overall risk level, in particular with respect to health and major accidents.

All in all, the NPD shared the concerns of the unions. Although the changes did not manifest themselves clearly in the NPD registration systems (such as injury frequencies), the agency still warned that falling oil prices should not lead to rash measures that would reduce safety levels. They also resisted pressure from the industry to soften regulatory standards. In 1999, the NPD director wrote in the annual report that: "Several independent observations and evaluations indicate that the total level of risk is increasing and that the negative trend will continue in the next decade". The first observations from the RNNS pilot project supported their conclusions, and in September 2000 the NPD Director General sent clear message in a letter to all licensees:

> The last couple of years a new critical focus has been directed towards the safety on the Norwegian shelf. The unions have been very active, both toward the media and the authorities, in communicating that the situation develops in the wrong direction. Studies conducted by risk analysis expertise at universities and in the industry provide well

> substantiated claims that the risk is increasing. By and large, the NPD shares this view…. In this situation we regret to say that the actors in the industry do not seem to fully realize these problems. The companies have the same access to data from the industry as we have, but in the media some company representatives have claimed that safety has never been better.

This was seen as a strong message, both in form and content. It was intended to 'settle things straight', to teach the industry a lesson, and to resume (or confirm) authority. The concern also reached the political level, and a decision was made to issue a separate White paper on health and safety in the petroleum industry at more regular intervals. Also, voices from the companies gradually appeared, confirming the NPD view, and calling for a more humble and self-critical approach from the industry.

On Christmas Eve 2000, there was a fatal accident on a platform at the Oseberg field, operated by Hydro. Both the timing and the seriousness caused much public attention. As noted, fatalities were rare occurrences, and Hydro had been particularly criticized for jeopardizing safety; only two weeks before the accident the NPD had issued a report about the negative safety effects caused by efficiency measures in the Oseberg field, and the subsequent accident investigation revealed serious flaws in how Hydro operated the field. Even closure of the field was considered in the aftermath. Extensive media coverage exposed the conflicts in public and included broad brush characterizations of increasing offshore risks, and deteriorating 'safety cultures', 'management cultures', and 'company cultures'. 'Culture' thus entered the public domain as a general label for both surface symptoms and underlying forces in how the industry was run.

A more cooperative climate emerged, however, and several joint projects were started. The mounting conflicts between the parties were largely approached by trying to rebuild trust. In 2001, the so-called *Safety Forum* was established as a joint tripartite arena for dealing with HSE issues. The Forum was to be led by the NPD, and included all key players, notably the industry associations and the unions. The ministry was given the status of observer. According to the mandate, the purpose of Safety Forum was "to contribute to increased knowledge and understanding of why and how the Norwegian oil and gas industry should be a pioneer industry as regards HSE, both on a national and

international level." The forum has since its establishment served as a reference group and consultation body for a number of key projects, such as RNNS, and has participated in the preparation of the governmental White papers on HSE. As part of this 'joint effort', a project was established by OLF in order to promote a more harmonized and sustained attention to HSE issues, called *Working Together for Safety* (WTfS). A number of working groups were established and several joint recommendations and practical safety tools have been developed, such as common systems for work permits and for so-called 'safe-job-analysis'. This was a response to complaints about disparate systems and practices between platforms and companies, which caused confusion and also a perceived threat to safety; in particular, contractor employees, were confronted with many such divergent systems.[63] WTfS has regularly reported to the Safety Forum. Also, an extensive educational program in 'regulatory competence' was developed for the industry in order to enhance knowledge about the new regulatory framework.

In the forth RNNS report (for the year 2003) interviews with key informants indicated increased confidence and a better climate of cooperation. The newly established arenas such as the Safety Forum and Working Together for Safety were reported as having contributed significantly to this. The RNNS project in itself also served as a major contribution in settling some of the disputes by providing a coherent and largely agreed upon overview of trends in risk levels and a systematic account of key risk indicators. The increase in several key risk indicators could not be disputed, such as hydrocarbon leaks, well-kicks, and collisions between platforms and supply vessels. Also, isolating serious injuries from the general injury frequencies, showed a considerable increase in the former. The later improvements in injury rates have largely been attributed to the 'new deal' efforts starting after the turn of the millennium.

Penetrating the risk indicators: human, social, and cultural factors

Changes were also evident in studies of HSE perceptions among offshore workers. As noted, the RNNS project included a battery of questions related to what gradually

[63] This issue has generally received low scores in the RNNS questionnaires (se Appendix 3). More than 70 percent of contractor employees have reported that different procedures and routines in different installations were perceived as a threat to safety (RNNS 2003 report).

appeared under the heading ‘safety climate’. The climate part of the questionnaire received considerable attention, since it directly addressed the offshore workers’ experiences of the human and organizational aspects of HSE and how these were handled at the work place. It covered a number of critical factors, notably perceptions about leadership and company behaviour, rules and regulations, competence and training, items related to work processes and behaviour, and some more general items about HSE issues such as reporting practices and safety meetings. The results of the pilot study in 2000 revealed a mixed picture. Several items in the questionnaire had low scores, specifically related to issues such as the quality of hierarchical communication, cooperation between operators and contractors, the influence of manning levels, and the general priority of HSE-concerns. Two years later, most scores had improved, some of them considerably so. For example, the percentage that agreed (wholly/partially) with the statement "I am occasionally pressured to work in a manner that threatens safety" was reduced from 39 percent to 18 percent. The 2005 study also showed significant improvements on several scores. For some questions, however, improvements have been less clear, such as the scores relating to industry's ‘paramount priorities’ and whether ‘production takes precedence over HSE’. Some concerns, appear as relatively constant, such as the extent of "doctoring" of incident reports, and the lack of cooperation between operators and contractors. Some items generally have had low scores, such as the quality and accessibility of regulations, procedures and safety systems, thus confirming the impression that ‘bureaucratization’ was perceived as a significant problem for the offshore workers (see Appendix 3).

The questionnaires were important additional sources for penetrating organizational and cultural conditions that would influence risk levels. The risk indicators would mostly provide intermediary figures between antecedent factors and ultimate outcomes. Immediate causes would be indicated from the categories used, but the complex webs of underlying causes are only revealed by more comprehensive analyses and in-depth investigations. It appeared as a major challenge in the RNNS project to be able to link the risk indicators to underlying organizational and human conditions in a more transparent manner. In the sixth phase of the RNNS project (2005 report), a series of seminars were

conducted in order to identify causes and remedies for some of the most critical risk indicators related to serious occupational accidents and major accident. Participants in the seminars were handpicked on the basis of their specific expertise and background in the relevant areas, and were invited to discuss the relative and combined impact of technological, human, and organizational factors. We present here a condensed summary of the results, partly because these seminars highlighted a series of critical and recurring themes related to organizational encounters with the industrial risks, and partly because they convey how these were experienced and articulated by people with first-hand experience. But also, it should be noted how the seminar design contributed to the categorization and conceptual organization of these observed conditions. Five dimensions were used for structuring the discussions and sorting out factors thought to be critical for safe operations: Organization, rules and regulations; values, attitudes and competence; work processes; relations and networks; technology and operations.[64]

Discussions on *organization rules and regulations,* centered on several topics; the transition from prescriptive to a function-oriented regulations was reported to have resulted in different sets of company-specific rules and procedures. Sometimes, these would be contradictory and cause uncertainty, particularly for contractor workers commissioned by different operators. Furthermore, procedures generally appeared as too complex, poorly-designed from the user's point of view and difficult to follow in practice. Also, organizational changes, rationalization and cost-cutting had resulted in lower core manning, causing greater dependence on contractors. Frequent changes of contractor would in turn cause discontinuity and loss of competence and thus affect task performance, planning and safety management.

Discussions on *values, attitudes and competence*, addressed factors related to training, the need for "facility-specific competence", risk and safety awareness, and the use of reporting systems. Declining competence and limited access to experienced personnel with "hands on" experience were observed (such as drilling/well operations and

[64] The model was referred to as the 'Pentagon model', and has been employed in various parts of the industry. A fuller discussion is provided in chapter 7.

shipping), and largely explained by low priority to recruitment and training programs. The gradual disappearance of facility-specific competence was explained as the result of maintenance work being increasingly performed by contractors, sometimes on short-terms, and involving many levels of subcontractors. Also, a general need was identified for improved understanding of risk and safety at all levels of the different organizations, and a greater awareness of the systemic consequences of individual decisions and actions. Several problems were identified in relation to reporting and reporting practices. Underreporting could occur as a result of possible penalties or accusations of "whistle-blowing". On the other hand, the practice of 'rewarding reporting' could result in reporting for reporting's sake. In both cases, reporting problems could be related to the fact that HSE results had become an important inter-company competitive factor, in particular for contractor companies afraid of losing contracts. This may also have affected experience transfer between companies and caused event-directed rather than preventive risk management strategies.

Discussions on *work processes* addressed issues related to "visible management", conflicting pressures of safety and efficiency, increased complexity and integration of activities, and "multi-disciplining" and fragmentation of tasks. Offshore managers, it was reported, had been charged with more administrative tasks and given less time to be out and about on the installation. This lack of visible management had negatively influenced their function as role-models and the perceived correspondence between "words and deeds" in management behaviour. Various examples were given of managers saying that personnel should "take the time to work safely" but that this no longer applied when it was a "rush job". In the context of widely varying offshore operations, work processes have critical phases in which speed of action is decisive for production results and the avoidance of potentially lengthy delays. Such situations gave both workers and managers a sense of pressure, subconscious or self-imposed, to prioritize efficiency at the cost of safety. The different activities performed during work operations have become more closely integrated and dependent on different people and work processes. This integration has entailed greater complexity in work processes, where individual activities have become more critical in terms of potential delays. This can bring extra pressure to get the

job done, with less concern for safety. Moreover, increased complexity in itself could represent a greater risk of unplanned events generated by systemic connectivity between tasks. Participants from various occupational categories and disciplines also reported that they were being charged with more roles and tasks, that specialist competence thus could be sacrificed due to “the insistence on multi-disciplining”, ultimately representing a danger to safety.

Discussions on *relational aspects and networks* centered on interfaces between different organizational units, between contractors and operators, and on the importance of informal relations for the execution of tasks. The key players in the logistics chain must deal with such interfaces, sometimes simultaneous and sometimes postponed, such as between drilling and day-to-day operations. Actions and decisions taken by one unit (e.g. a project organization) may have significant safety-related consequences for another unit (e.g. the operating organization). The different activities must be sufficiently coordinated with regard to safety, underlining the importance of such factors as flow of information, experience transfer, mutual trust, and clear lines of responsibility. The interface between operator and contractor is particularly important since contractors have increasingly been involved in operators’ own work processes (such as maintenance and logistics). Limited informal contact can lead to limited understanding of each other’s work and areas of responsibility. More generally, faulty communication between different units can contribute to varying perceptions of the risk potential in work operations and prevent the transfer of useful experience and critical information. The widespread use of contractual personnel on short-term contracts makes the formation of informal networks with permanent crew members more difficult. This may cause few opportunities to discuss work-related questions with other key players. It also makes it more difficult to know whether or not procedures are being followed and the job properly done.

Topics relating to *technology and operation* included more complex technologies and increased use of expert systems, modification of equipment and absence of standardization, replacement of computer systems, and choice of maintenance philosophy. In many areas, technological development has led to a combination of more

complex technology and increased automation. This imposes demands for more, and different, competence and skills. Lack of technological competence may be observed in a number of areas, among both managers and co-workers. The increasing use of expert systems mean that many activities are performed by personnel who do not necessarily have sufficient understanding of the consequences of their actions. Modification of installations has resulted in limited standardization, giving a high degree of installation-specific technology. At the same time, increasing portions of maintenance work is being performed by contractor firms which sometimes lack the requisite installation-specific competence. The constant upgrading of computer systems and problems with data conversion mean that important historical system documentation is not readily accessible. On some older installations, historical knowledge is largely linked to individual experience and competence. The choice of maintenance philosophy was also put forward as an important safety factor. It was pointed out that there are frequent discussions between different discipline areas about the lifetime of production equipment versus maintenance. The focus on cost-saving, low core manning levels, and limited local knowledge of the different installations may lead to reduced availability of appropriate parameters in maintenance planning.

The RNNS rapport summarized the results of these seminars in 4 critical themes: (1) communication and experience transfer between different organizational interfaces, (2) the formulation and use of procedures, (3) the establishment of reporting systems that contribute to learning, (4) adequate competence in relation to particular areas of discipline, specific installations, new technology, and work processes.

Risk management: issues and controversies

Addressing underlying causes and conditions affecting risk would be followed by questions about appropriate interventions and strategies, reflecting different and partly contradictory approaches to the understanding and management of organizational risk. In these matters, accommodating attempts appeared as less successful. Some of these controversies were clearly reflected in the seminars (and indicated in the ‘climate’-surveys), such as conflicts between safety and operational efficiency, use of local

knowledge *vs* expert knowledge, manning and continuity in the platform organizations, etc.

Bureaucratization of risk management systems was a recurring concern, and generations of such systems had replaced each other successively during the years. Issues related to 'rules and regulations' generally received low scores in the climate surveys, and only minor improvements could be observed. 'Culture' often appeared as the alternative; what could not be achieved through formal systems was to be achieved through culture. And the two could also be seen as contradictory, that safety was not reducible to 'systems', and in fact could be endangered by these. These were clearly not novel issues, as was clearly expressed by one of the old timers from the pioneer-era:

> Talking about culture – perhaps the best story is the safety meeting that I remember most …. it was lead by an American, at Albushell-Ekofisk in 1978. It was a start-up meeting in the afternoon just after dinner, with some Norwegians and Britons, half asleep. They were tired after work and a full dinner. On a table in front of him he had piled up stacks of paper, all the internal documentation from Phillips and all the Norwegian regulations. He gazed at his audience and said quite calmly: "Just continue sleeping. This, all these regulations and rules will take care of you. This meeting is just formality and routine." He then slammed the table, the piles of paper falling onto the floor. Everyone in the room woke up. Then he said: "That's just what this is good for. Every single one of you can kill all the people on this platform, by doing something stupid, by not asking questions, by challenging fate, by turning a valve without knowing what runs through the pipes, by cutting, by welding ….". He had the audience listening intensely for 45 minutes …. His message was: "You don't do anything out here without being absolutely certain that you've double- and triple-checked that you're doing the right thing and that you know what's going on" …. Today, in our culture, with outsourcing and all that, people are lumped together; some have never been on the platform and they hardly know each other. On the old platforms, the same gang worked together shift after shift, whether they were drilling contractors, catering contractors – we knew every single one of them …. You don't kill people you know. On the Norwegian platforms it's the "rule book". Look at all the paper we have! That's what takes care of us! Paper doesn't take care of anyone. It sinks, or burns….
> (former company director)

These 'conflicts' between formal systems and actual conduct (sometimes labelled 'culture') were however not accentuated as 'political' conflicts with camps and parties, although the practical and 'operational' (offshore) perspective would often be contrasted with the theoretical and 'academic' (onshore) perspective. 'In theory', however, all appeared to agree that formal systems should be minimized and optimally adapted to the practical context. The issue appeared more as a common grievance than as a conflict.

Several discourses and controversies of risk management can be related to the 'opposing doctrines' briefly summarized in Chapter 1, all though the intensity of the debates varied according to both topics and discussants. Some issues were more or less inherently politicized, such as that between blamism and no-blamism, and between trade-offism and complementarism. The latter issue was, however, 'politically resolved' on repeated occasions, as one minister after the other proclaimed that there was no contradiction between economic goals and HSE goals. In this, they appeared in the ambiguous twin role of risk management experts and politicians. There was certainly also another politicized twist to the issue, as the industrial opponents would variably agree about trade-offism, but invariably disagree about how the trade-offs in fact served either goal (safety or economy). Not only union representatives lamented how these goal conflicts permeated the industry, as was evident also from the RNNS questionnaires. The precedence of operational and economic goals was often seen as related to the use of so-called 'key performance indicators' (KPIs). A former deputy director of one pioneering oil-companies on the NCS, expressed this view most forcefully, and recalled their introduction thus:

> I remember when they introduced KPIs, with payment criteria, setting production targets and targets for up-time and down-time; then you can forget the whole talk of HSE. What happens? As soon as you come close to these limits, people start up without being sure it's safe, they've been down too long already. They start production when they shouldn't. …. Which are your KPIs? And how is the bonus-system? Operating time and production counts more. I remember the various consulting firms …. adopted these ideas from American business schools in the late 70ties. As soon as they were able to sell these concepts, KPI's and all that, HSE and that culture went right out of the window. There is a direct link. At the very same moment you get a total disconnection between policy statements about HSE, and the realities you are measured against, or let yourself be measured against. In fact, you promise your investors production-levels to the effect that you move along the edge at the risk of human lives. What kind of system is that? It's madness. You get the production you're supposed to, given the framework conditions.

Two other opposing doctrines had a mixed status in this politicized context, but were also subject to more than only 'professional' disagreements. In the case of quantificationism *vs* qualitivism, the issue was largely what numbers to trust, and their relative significance as inputs to risk management strategies. The introduction of risk indicators to the KPI systems had in fact contributed to transforming the priority problems to a risk

management controversy, as the risks related to the KPIs and other forms of industrial monitoring largely had relied on a rather simplistic use of such indicators. There had been a long tradition within the industry for statistical monitoring of risk, which relied heavily on registration of incidents, from larger accidents and near misses to minor injuries, like superficial cuts and bruises (Haukelid, 1998; 1999; Hovden, 2002). Apart from the need for reducing risk assessments to simple and easily measurable indicators, this approach has largely been justified by a widespread belief in the so-called 'Iceberg Theory' of industrial accidents. In a simplified version, it implies that there is a law-like proportional relationship between all kinds of incidents, i.e. that serious accidents occur at some more or less specified interval measured against the number of minor incidents and near misses, thus the 'iceberg'.[65] One implication of this idea was that of causal convergence between very different types of events (such as between a gas blow-out and a personal injury). In particular, the use of so-called *Lost Time Incident* figures (LTIs), often stood out as the most important risk indicator, and therefore as the knowledge-base from which risk management policies and priorities were designed.[66] An important assumption included within this dominant iceberg philosophy has been the attribution of causes to 'human error', the 'estimated' proportion varying from around 80 percent up to 95 percent. Influential safety evangelists, such as the DuPont safety experts, contributed to

[65] The intervals was originally set at 1:29:300. The theory is attributed to the American insurance official H.W. Heinrich, who in fact had a much more nuanced view on the relationship between different risk indicators (Heinrich, 1931; Heinrich *et al*., 1980).

[66] As it happened, in my first encounter with the petroleum industry, I was invited to participate in a 'morning-meeting', a telephone-conference between the operator's land organization and the offshore production facility (contracted from another business-unit of the same company). As usual (as if ritually underscoring the safety-first policy) the meeting started with a review of all 'unplanned incidents' that had been reported during the last 24-hour period,. The installation manager regretfully started his report with a fairly detailed outline of how one of the workers had woken up in the morning with "something in his eye". They could not figure out what had happened (perhaps something in his cabin?) since he certainly had used proper eye protection on the previous day shift. I first thought the whole story was some internal gag, only to be understood as essentially a message about the good safety record since the last morning-meeting. That was definitely not the correct interpretation. As the 'incident' was elaborated further, it turned out that he'd been sent to the nurse ('the medic') for treatment, which included the use of some anaesthetic ointment, further causing the event to be counted as an "incident involving medical treatment" (generally referred to as "H2-injuries"). This was such a high ranking event in their risk record system that only two such incidents were allowed for in their annual 'injury budget'. This was late January, and now they had already used half the budget (!). The episode stole some ten minutes of the meeting (which gradually turned to the amounts of oil that had been produced, etc.). However, at a dinner in the afternoon, the field director of the company (one of the old-timer engineers with some 30 years of experience from the petroleum industry), lamented the exaggerated concern with all the 'minor cuts and bruises', compared to the 'real dangers' associated with major accident risks.

the spread of these ideas and to accompanying safety programs that extensively addressed the importance of reducing the number of 'human errors' (Haukelid, 1999; Ryggvik, 2008). Much critique has been generated against this simplified view, and it has even been considered a dangerous smoke screen that attracts attention away from far more safety-critical conditions.[67] Critique was also voiced from within the ranks of the industry, and certainly from the agency officials in the NPD and the PSA. The point was forcefully made by one of the old-timers in the agency, referring specifically to the use of injury rates as the primary risk indicator, ignoring maintenance problems and safety consequences following from bad platform designs:

> Forget the statistics and look at the realities. What's the major accident potential, where is it, could you have designed it away? …. The statistics people, who'll never say anything unless some calculation can be done based on historical records. They don't recognize the potential for major accidents …. The industry is full of people obsessed with describing the leaf, the structure of the leaf or the sprig on the bough. They forget the trees and the forests.

Not surprisingly, the conflicts regarding risk levels towards the end of the 1990s were partly related to the industrial reliance on simplistically interpreted injury figures. From the NPD/PSA point of view, the RNNS project was seen as a major contribution towards a more comprehensive evaluation of risk factors and their relative impact. Risks related to major accidents and to work related illness was to occupy a far more prominent position in the annual reports than injury statistics. Still, the trust in numbers was ambiguous, since the professional risk evaluators in the agency clearly believed that the far more sophisticated approaches in the RNNS project were designed to avoid reductionist presumptions, such as those of the Iceberg Theory. The risk evaluations included a number of technical factors, such as the presence and performance of technological defences and barriers, and organizational factors, such as communication, stress, and the general working environment conditions. And although the reliance on historical data was important, much attention was also devoted to the impact of framework conditions and structural changes not yet apparent in the indicator records. Such factors included the aging of platforms, aging of the work force, old and 'rotten' wells, increasing reliance on

[67] The investigation reports after the BP Texas Refinery explosion (see chapter 2) both pointed to the preoccupation with operational error as a contributing factor to the negligence of the more dangerous and complex processual risks (Baker *et al*., 2007; CSB, 2007) See also Hale (2001) and Hopkins (2000). We return to this discussion in chapter 8.

computer based operations, rapid organizational changes, and increasingly amorphous work processes and organizational forms.

The analysis and evaluation of risks and their 'causes' had implications for management and strategies of prevention. According to the 'Iceberg view', focus would be on the attitudes and alertness of the 'morally committed worker' and a close monitoring of behaviour at the sharp end of production. Alternatively, priority should be given to investments in 'forgiving technologies' and redundant designs, making room for human failure, flexibility, autonomy, and absence of continuous control.

These divergent positions have often been framed in a politicized language reflecting oppositions between workers interests and industry interests. In their 'doctrinal' form, the positions were mutually rephrased as adversarial stereotypes. Worker's representatives would accuse companies of using behaviour-based safety approaches (referred to with the acronym BBS) as a way of putting responsibility and blame on workers, provokingly phrasing their techniques as 'concern for workers' while avoiding expensive investments. Company representatives would accuse workers (or their representatives) of escaping their share of responsibility, putting all blame on management and 'external' factors. This polemic thus involved mutual attributions of 'motive' and a search for 'hidden agendas' of adversary parties. The industry was seen as choosing a cheap way out, hiding economic interests behind a veil of expressed concern for everyone's safety and explicit statements about 'safety first', regularly contrasted with the (low) priority given to health issues. Behaviour based approaches were generally 'safety-oriented', focussing on salient and 'event-based' injuries and incidents, giving undue attention to long term health risks, typically not so high on the agenda from a company perspective. Union activists on the other hand were seen as being politically motivated, without due regard for the 'scientifically proven' significance of safe behaviour.

Like the opposed and competing 'risk management doctrines', these were stereotyped extremes, albeit also to be found in the real world. The practice of risk management would include various mixtures of assessment methods, redundant designs, models of

participation, investment policies, causal and moral attributions, degrees of resilience, etc. But the question of priorities and emphasis would still surface when different strategies and means were to be chosen; and the choices would reflect certain epistemic preferences as well as normative ones, variably affecting the interests of the parties involved.

These were the amorphous contexts, in which the regulatory philosophies and strategies were to make a difference,

Concluding summary

The development of the Norwegian petroleum industry has gone through several phases, and has almost reached its peak in terms of production levels. The risks associated with this industry cover a range of technologies, organizational structures, work processes, and human resources. Risk management strategies are employed on a societal level through government regulatory institutions, down to the management of the single offshore work operations. The basic regulatory strategy has been to mobilize regulatory resources on all levels, and to promote prophylactic, prudent, and self-corrective mechanisms within all managerial and operational facets of the industry. At the same time, strong unions have developed, able and willing to voice their interests and to exploit statutory warrants as they were produced.

We should note here also some more general societal features, regularly (but somewhat interchangeably) referred to as the Nordic, Scandinavian, and also the Norwegian model. We need not elaborate here on the nuances between these 'models', and in the following we will occasionally refer only to what can roughly be characterized as the 'Norwegian-Nordic context'. We find within this context a relatively high level of societal trust, egalitarian values, relatively low differences in income and economic resources, generous and universal welfare systems, a high level of state intervention, such as through relatively centralized systems of bargaining and extensive collaboration between the state and the actors in the labour market, and a correspondingly low level of industrial and societal conflict. Industrial democracy has been high on the agenda and democratic

leadership styles has been valued. Even industrial managers have been expected to represent democratic society and not only their commercial interests, and markets have been pragmatically viewed servants to the people, not the other way around.[68]

The petroleum regime is firmly placed within this context, in particular through the 'holy' tripartite system comprising the industry, the unions and the authorities, the latter burdened with the task of balancing opposing social and economic interests, but still benefiting from the active contribution of the industrial parties in making the regulatory system work. Regulatory ambitions have been high, and in the 2002 White paper, the Government proclaimed that the petroleum industry should have leading role in Norway with respect to health, safety and environment. In the 2006 White paper, ambitions were even bolder; Norway was to lead the world in this area.

Seen in a long term perspective, working conditions have improved considerably, and some key risk indicators are dramatically reduced. The driving forces in this change process are varied and complexly configured. Some authors hold that powerful external forces account for most of the safety improvements, and that the industrial actors primarily responded to pressures from the outside, such as empowered regulators, workers, and unions. Risk levels are seen to fluctuate according to the power balance between the industrial actors and these outside pressures, a power balance which in turn is influenced by the fluctuating markets for labour and petroleum (Ryggvik, 2000). Most industrial actors would point to intrinsic changes in attitudes, moral commitment, and 'corporate social responsibility'; they would also subscribe to complementarism as far as possible, but allow for trade-offism, and be firm that the trade-offs benefited safety (exempting occasional and unplanned irregularities in the system).

[68] The term 'model' refers here generally to the societal policies and institutional designs, whereas the use of the term 'context' indicates also the cultural context of trust and egalitarianism. There has been much discussion, however, about both the virtues, the empirical 'accuracy', recent 'pressures' and development trends, varieties between countries, etc., regarding both the model(s) and the general context. We need not elaborate on these issues here. For general references and discussions, see Barth *et al*. (2003), Bjornson (1993), Byrkjeflot (2001), Dølvik (2007), Svendsen and Svendsen (2006).

We should note again that the issues about risk levels and management strategies provided the contexts in which the cultural turn entered the industry. We will see, however, that the local enactments of the risk management doctrines had their specific configurations which often made it difficult to 'locate' the divergent positions and to 'organize' debates in a straightforward and constructive manner.

Another important context for the introduction of 'culture' was the number of competing, overlapping, and increasingly elaborate and comprehensive risk management systems. These have appeared and disappeared since they were first introduced, accompanied by continuous discussions about their appropriateness, both in terms of managerial prejudices and lack of worker participation, but also of their ability to cope with the risks in a transparent and efficient manner. Reliance on intricate systems (registration, documentation, rules and procedures, monitoring, internal audits, etc.) could in itself become a major obstacle to efficient risk management. The risks of risk management systems was ultimately that they appeared as smoke screens, detached from the operational tasks-solving contexts, increasingly academic, too complex to understand and impossible to follow. Accident investigations showed repeatedly that they were not complied with, and that procedures were inappropriate or unknown. The systems were often devised by external consultants and experts and not properly adapted to local knowledges and operational demands (Haukelid, 1998; 1999). The cultural turn was in part an attempt to 'connect' the risk management systems to the operational and socio-cultural realities of the petroleum industry (Haukelid, 2001; 2006).

This outline of the industrial, institutional, and socio-cultural developments provides a necessary background for understanding the present institutional and regulatory setting, to which we now turn.

4. Cultures of regulation – regulation of culture

This chapter provides an overview of the present regulatory framework and national regulatory context, including a brief outline of the more general administrative system and policies of regulation. The main focus, however, is on the content of the regulations and the regulatory context of the culture provision.

It's probably fair to say that risk regime in the petroleum sector have been in the forefront nationally, partly serving as a model and benchmark for regulatory reforms on a broader scale. In terms of regulatory philosophy, prescriptive regulations have gradually been replaced by goal-setting regulations, and inspections have been replaced by systems-oriented audits. The general discussions about the generality or specificity of regulations have been salient in recent Norwegian legislative history (Sand, 1996). The replacement of technically detailed with functionally open regulations, due to the inadequacy of detailed specifications in the face of highly dynamic and rapidly changing societal and technological developments, have been most forcefully accomplished within this sector. The old prescriptive regime was largely viewed as time-consuming and inappropriate. Regulatory development was seen as following a 'fire-fighting' method in a never ending attempt to keep up with new technologies and work processes, thus also making the regulatory system inconsistent and patchy. In addition to this, there was the problem of responsibility. Prescriptive regulations tended to put too much responsibility in the hands of the regulators if compliance didn't prevent accidents or harm. Through less prescriptive requirements, the responsibility for managing risks would more explicitly be in the hands of the regulatee. It has been generally acknowledged, however, that this would also imply a more co-operative and trust-based interaction with the industry. Thus, the regulatory processes have to an increasing extent involved the industrial actors, including the unions. In terms of political and democratic investment, the regulatory reforms have, within the overall legal mandate, been just as much participative and bottom up as top-down. The agency enjoys a considerable amount of professional autonomy and uses this to mobilize the professional involvement of the industrial actors and expert groups.

The national context

The Norwegian model of public administration is marked by firmly placing constitutional responsibility with the ministers of government, and ultimately with the "King in Council". In principle, all decisions and activities within the state administration are executed on delegated authority, and each minister is accountable toward the parliament for everything that goes on at the lower levels, including any failures committed. But in the practical everyday life of policy administration, a great deal of autonomy and discretion is certainly exercised, depending of course on a number of factors, such as the public salience of the policy areas, the amount of professional expertise involved in administering the policy area, the degree of professional overlap at the ministerial level, the degree of rule-bound triviality of decision-making, and sometimes also, on the personal authority of those occupying leading administrative or political positions. The establishment of separate public bodies outside the ministries of government has been a marked trend in the post-war period, reflecting the increasing complexity and specialization in society and public administration alike (Christensen and Lægreid, 2004; Egeberg, 1989; Sand, 1996). The general policy has been that ministries should concentrate upon its 'policy-making responsibilities' while 'technical decision making' could be decentralized to more independent non-departmental agencies. This was intended to prompt greater efficiency and clearer demarcations between political and administrative tasks. In this system, the courts also play only a minor role, when compared with other countries, as many legal roles and tasks are administered within the state bureaucracy (OECD, 2003*a*; 2003*b*). The Norwegian system, despite the formal hierarchy of offices, has thus been considered as highly decentralized compared with other countries, "reflecting the Nordic approach in trust-based decision-making" (OECD, 2003*b*: 7).

The agencies are lead by Director Generals, appointed by the government based on proposals from the administration. Terms of office have traditionally been indefinite, but arrangements with limited but renewable four or six year periods have gradually become more dominant. The agencies are governed according to principles and regulations based on 'management by objectives and results' (or 'performance management'). They

respond and report to their ministries according (often relatively flexible) targets and performance-based criteria, and are also occasionally subject to external evaluations commissioned by the ministries, and to audits from the Auditor General. In the area of risk regulation, parliamentary statute laws often provide ample opportunities for the ministries to issue secondary regulations under the authority of the statutory laws. This hierarchical structure provides extensive bodies of statutory regulations with equal legal force. Increasing societal complexity combined with increasingly ambitious welfare politics have caused a considerable degree of regulatory interventionism and a large number of such secondary regulations are warranted in statutory law (Sand 1996; Statskonsult, 1999).

Regulatory bodies and agencies have been established and expanded, and given multiple and variably composed roles in producing and enforcing rules, giving professional advise to the ministries and the regulated parties, and generally for overseeing the developments and policy challenges within their turf. These regulatory systems have historically been developed in a rather piecemeal manner, responding to sector-specific concerns as these have appeared in the wake of societal and technological developments, covering a large amount of laws, regulations, and administrative bodies with few internal or external pressures towards coordination or administrative reorganizations (Statskonsult, 1999). From the early 1990s, this changed gradually, partly as a result of pressure from corporate interest groups. Arguments where launched and lobbies activated in order to reduce the burdens of red tape, regulatory requirements, square-minded law enforcers, and uncoordinated inspectorates. In 1999, the Directorate of Public Management issued a report, counting some 20 agencies and inspectorates, 60 laws, and more than one thousand regulations within the area of health, safety and environment (Statskonsult, 1999). The report recommended that better organizational conditions be provided for coordinating regulatory tasks and for harmonizing policy instruments and legal measures in the area. Two years later, partly based on the same documentation and line of argument, a government commission reviewing ‘Societal safety and emergency preparedness’ suggested that all or most of these regulatory regimes be reorganized under one single ministry in order to make societal safety (broadly defined), more ‘visible’ in

the political landscape, to provide a more transparent allocation of responsibilities, and to coordinate the various regimes (NOU, 2000).

The NPD was an important exception to this fragmentation, and was used as a benchmark in the arguments provided for more integrated systems. The 'NPD-model' became a point of reference in the discussions that followed. Not only did the NPD cover an exceptionally broad range of health and safety issues (working environment and technical/operational safety), it was also authorized to coordinate all public supervisory activities directed towards the operators, including environmental issues and health services.[69] That is, the NPD-system was unitary and integrated in terms of regulatory *purpose* in one specific industrial *sector*, with a defined and delimited target group; following the traditional categories of organizational specialization (Egeberg, 2003) it appeared as relatively specialized in the former sense and very specialized in the latter (Statskonsult, 2002). At the same time this arrangement deviated from the more general model of having sector-independent regimes with more specified and narrowly defined regulatory purposes. It thus separated (below the ministerial level) occupational health and safety regulations in onshore and offshore industries.

A shift in government after the 2001 elections, won by the centre-right parties, brought renewed attention to regulatory policies. Headed by a high-profiled economy professor representing the conservative party, the Ministry of Labour and Administration drew comprehensive and ambitious scenarios for the importance and future role of regulation, supported by a peculiar mixture of theoretical, political, and ideological rationales. The reform proposals were presented to the Norwegian Parliament (the Storting) in a White paper in 2003, and covered virtually all areas of economic and social regulation, including some 40 regulatory agencies (Ministry of Labour and Government Administration, 2003). The report argued for the importance of regulation as a condition for efficient markets, fair competition, the provision of public goods, and the protection

[69] The arrangement includes the use of expert assistance from other administrative agencies with particular expertise within relevant areas, notably the Maritime Directorate, the Directorate for Civil Protection and Emergency Planning, the Coast Directorate, the Civil Aviation Administration, the Meteorological Institute, and the Radiation Protection Authority.

of public and private interests, including health and safety issues. It called for greater independence for the agencies, greater transparency, removal of conflicting goals (following the principle of 'single purpose'), and increased focus on their competence and professionalism. It proposed a comprehensive reform in the regulatory mandates of the agencies, with increased autonomy and discretionary powers. This was partly to be achieved by restricting the possibility of 'ministerial instruction' and by setting up independent appellate bodies for handling complaints. These arguments and recommendations corresponded neatly to the current OECD views about economic and social regulation, and coincided in time and substance with an OECD land report on Norwegian regulatory policies (OECD, 2003*a*; 2003*b*). As it happened, the White paper included a proposal to de-centralize a large number of the agencies, relocating them in various regional centres all over the country. Initially, the justifications given for this was primarily related to assumptions about a correspondence between geographical distance and discretionary autonomy. As the parliamentary decision-making process drew closer, however, general regional policies became more salient. As could be expected, this attracted almost the entire portion of public and political attention in the following process, and in sum the reform largely ended up as regional policy more than regulatory policy.[70]

The establishment of the PSA

However, the reform had two important consequences for the petroleum regime. First, it was decided to transfer the responsibility for a number of petroleum related land facilities to the NPD. Second, it was decided to split the NPD in two. Safety and working environment issues were to be transferred to a new regulatory body, the Petroleum Safety Authority Norway (PSA), with the resource management administration left in the old organization. It was admitted that the potential goal conflicts within the agency had not

[70] The reform left few other traces in terms of more general or comprehensive policies of regulation. As could be expected, the discussions in the Storting were almost exclusively related to questions about localization. The idea of setting up independent appellate bodies was rather bluntly dismissed, and other proposals implying a departure from the basic hierarchical principles of government were not accompanied by any reflections on the discretionary powers of the agencies following from the extensive use of open-ended functional regulations. Whether the re-localization of the agencies provided them with more discretionary autonomy is still an open question. The Competition Authority, which was moved to Bergen, has later been overruled by the ministry in several major cases.

yet “resulted in problems in relation to individual cases”, and the argument for a division was thus given a more principled twist, referring to the need for assuring “indisputable legitimacy and authority in issues relating to safety” (Ministry of Labour and Government Administration, 2003, Chapter 5.2.1). What this reform in fact effectuated, was simply to ‘de-centralize’ the already existing division of responsibility at the ministerial level, making it penetrate all hierarchical levels down to the front line bureaucracy. As noted in Chapter 2, working environment and safety issues had in the late 1970s been transferred from the ministry responsible for managing the petroleum resources (the former Ministry of Oil and Energy). Since that time, the regulations have been located in various (and/or renamed) ministries, normally in conjunction with general labour market policies. Currently it is the responsibility of the Ministry or Labour and Social Inclusion. The reorganization was still significant, as the responsibility for ‘balancing’ the trade-offs had now been formally removed from the agency level.

The NPD was divided from the first of January 2004, and the core activities within resource and safety administration were placed in two separate bodies, however still located in the same building. Goals that had been formerly integrated as ‘equal’ in importance were now reformulated by according ‘linguistic primacy’ to either. Thus the goal of the NPD was to

> contribute to creating the greatest possible values for society from the oil and gas activities by means of prudent resource management based on safety, emergency preparedness, and safeguarding of external environment.

The goal of the newly established PSA was to:

> stipulate premises and follow up to ensure that the players in the petroleum activities maintain high standards of health, environment, safety and emergency preparedness and thereby also contribute to creating the greatest possible values for society.

The division was not supported by the General Director of the NPD, and opinions diverged internally (Lindøe and Olsen, 2007). Goal conflicts had certainly surfaced from time to time, involving some strife between the safety division and the resource division; but the established checks and balances appeared as relatively well functioning. At the time of the reform however, roles were blurred in a manner that stirred some uneasiness.

In 2000, a process had started in the resource division in the NPD, reorganizing the whole division according to a 'team-model', comprising a large number of partly autonomous and loosely connected teams, with a 'management collective' on top. The years 2001-03 were quite turbulent, as the new model had been extended to cover also the safety division. The former separation between the resource division and the safety division was to some extent perforated, and part of the rationale was in fact to integrate the organizations in order to fully exploit resources and competence across borders and to facilitate a more 'holistic' approach toward the industry. This clearly caused some challenges in terms of handling potentially conflicting roles and goals. Administratively, the division of goals and responsibilities was explicit only at the ministerial level. The experiments also caused some organizational discontinuity, as several key officials in the ongoing regulatory reform project left the agency before the process was completed. Among them were the project leader of the reform and the originators of the culture provision.

The reform thus reversed the integrative attempts, and the separation was institutionalized more firmly than ever before (Lindøe and Olsen, 2007). When I first entered the PSA in 2005, the new organization was fairly well established, and the new regulations were the frame of reference. As noted, the increased agency autonomy announced in the White paper did not materialize instantaneously, as these would under any circumstance have to be endorsed through sector-specific legislation. The impact on the petroleum regime was primarily the setup of a separate regulatory body. But although the PSA is an 'ordinary' regulatory agency in legal and constitutional terms, it enjoys considerable professional autonomy, and as noted, this clearly contrasts with the much more politically and administratively governed resource management regime. Almost all discretionary authority is delegated from the ministry. Also, there are relatively few instances of formal complaints on agency decisions (see below), thus making this opportunity for ministerial interference minimal. Generally, the ministry expresses great trust in the professionalism and vocation of the agency. The role of the ministry is basically that of administrative control and overall governmental management according to administrative and budgetary

rules and processes.[71] Regulatory reform proposals and amendments are coordinated and discussed with the ministry, prior to the ordinary formal public hearings and reviews. Within the overall legislative framework and mandate, participation from below appears as equally important in shaping the content of the regulations. These participatory processes are largely organized through the so-called 'Regulatory Forum', which is lead by the agency and with representatives from the companies and the unions, thus allowing for extensive tripartite collaboration in amending and developing regulations.

The acts

The central acts regulating safety and working environment in the offshore petroleum industry are the Petroleum Act and the Working Environment Act. The Petroleum Act deals primarily with the management of the petroleum resources, outlining the system through which the petroleum activities are carried out in a long-term perspective "for the benefit of the Norwegian society as a whole". Section I states that "The Norwegian State has the proprietary right to subsea petroleum deposits and the exclusive right to resource management." The Act further specifies the license system for exploration and production, the administration of the financial interests of the state, responsibilities, liabilities of the duty holders, etc. All petroleum activities associated with subsea petroleum deposits (such as exploration, exploration drilling, production, transportation, utilisation, and decommissioning) requires permits or licenses (consent/approval) from the Ministry of Petroleum and Energy. Production licenses are typically announced through so-called licensing rounds, and the awarded licenses grant ownership to the

[71] This trust could be more bluntly expressed by a former Director General of the Department of Working Environment and Safety (1990-1997): "Generally, we had a deep-seated confidence in the safety department in the NPD; they were leading experts in this field and Magne Ognedal [General Director] was really an international capacity. The information asymmetry was obvious; if they said it's safe to drill a 5000 meter hole, we could not but trust them. We did not, and could not challenge them on their professional competence. We had lawyers, and economists and social scientists, whose basic expertise was that of manoeuvring within the administrative and political interface". In terms of regulatory process, the basic role of the ministry was largely described in terms of benevolent inquisition: ascertaining that due processes had been followed, relevant parties involved, expert judgements requested, etc. As to the substantive issues of establishing a 'prudent' level of safety, the agency appeared as relatively self-governed. Some critical issues could surface, however, but largely in a case-by-case manner, depending on activism from below or political attention from above (or both). The basic division of responsibilities has not changed significantly in the last decade; in a survey conducted by The Directorate of Public Management in 2002 the ministry even suggested that the delegation of powers to the agency had reached a level where additional delegations would remove their governing capacity altogether (Statskonsult, 2002).

petroleum resources. Licensees form groups, either through joint applications or through ministerial decisions, and an operating company is appointed on behalf of the group. A joint operating agreement regulating the relations (such as the allocation of revenues and voting rules) between the parties must be concluded in a 'licence document', and a management committee must be established as their decision-making body (normally referred to as the license committee). The state participates in these groups to varying degrees through the SDFI-arrangement (see Chapter 3).

The license document regulates the rights and duties of the licensees, with the prime purpose of optimally utilizing the available petroleum resources. Impact assessments shall be provided as input to the decision making process at several stages. Prior to the development of petroleum deposits, the licensees are required to submit a plan that contain an account of economic, commercial, technical, environmental, and resource related aspects. This plan shall also provide a general account of HSE-related aspects with regard to the chosen production strategy and development concept, including HSE-objectives, the acceptance criteria for risk, organization and management systems, operation and maintenance requirements, and the handling of the organizational interfaces and coordination between the participants. Special requirements to safety are laid down in Chapter 9 of the Act, the purpose of which is that the petroleum activities "shall be conducted in such manner as to enable a high level of safety to be maintained and further developed in accordance with the technological development" (section 9.1). The chapter only briefly covers target provisions relating to emergency preparedness, safety zones, etc., and general demands on documentation and qualifications of the licensee. The statutory framework for safety is thus primarily elaborated in the regulations.

From the HSE-perspective, the Working Environment Act (WEA) is naturally far more elaborate and comprehensive, being specifically dedicated to the protection of workers' health and safety. As briefly recounted earlier, the framework for the present legislation was laid down by an extensive regulatory reform in 1977. The reform grew out of extensive collaboration within what we in the previous chapter referred to as the

'Norwegian-Nordic context'. It was preceded by an increased attention toward working conditions during the 1960s and 1970s. The traditional model of regulation from above, through specified command and control rules, was challenged in several ways. This strategy had caused increased regulatory complexity, but it was still difficult to keep up with the corresponding complexity of hazards and their causes. Risks related to long term exposures, combined effects of several hazards, psycho-social strain, etc, were not sufficiently addressed in the traditional regulations. Consequently, and as noted in Chapter 1, the new regulatory philosophy reflected ideas about a dynamic 'bottom-up' approach, taking account of changing technologies and risk exposures, and relying heavily on local workplace mobilization and the establishment of mechanisms and arenas for participative problem-solving (Gustavsen, 1984; 1990; Gustavsen and Hunnius, 1981). The 1977 Act thus had a general form, with the purpose to secure a "working environment that provides a basis for a healthy and meaningful working situation", and requiring "full safety from harmful physical and mental influences and which has safety, occupational health and welfare standards at any time consistent with the level of technological and social development of society" (section 1).

Provisions are purpose oriented, specifying that the various aspects of the work environment should be "fully satisfactory" (with respect to the work place, technical equipment, substances, planning systems, work arrangements, emergency situations, etc.). Employers are obliged to continually monitor working conditions, provide risk information and proper training for employees, and to take appropriate action to ensure compliance with the act. An extensive system for worker participation and arenas for problem solving and decision making are outlined. Primarily, this involves the appointment of safety representatives and the formation of working environment committees (mandatory for enterprises with more than 50 employees). As noted in Chapter 3, safety representatives are given the right to stop dangerous work, and several provisions specifies their right to proper training and time to fulfil their tasks. Designated safety and health personnel (medical officer, company nurse, etc.) are required for certain specified categories of enterprises. The regulatory authorities are granted wide warrants to issue secondary regulations, and a large number of such regulations have been issued.

The implication of this is that even though the act has a general and purpose oriented form, the total body of statutory obligations are quite specific in a number of areas. As noted in Chapter 3, the WEA was applied to the offshore petroleum industry after some contestation, only with some exemptions, primarily regarding working hours. The act has been amended a number of times and a more comprehensive revision took place in 2005. The main principles, purposes and provisions have remained, however. The 2005 revision was largely a restructuring of the content and a linguistic simplification, but involves also a shifting of emphasis toward organizational and psycho-social working conditions, in accordance with changes in occupational and enterprise structure, and reflecting the diminishing role of traditional industrial hazards.[72]

The employer is the central obligated party according to the WEA, although employees also have specified duties to "cooperate" and to "take part" in the systematic HSE activities, including also preventive actions in situations of danger (interference, notification, etc). The hierarchical principle is contained in the act through the coordinating duties levied on the "principal undertaking" when several employers are involved in a specific work site (such as construction work). The principal undertaking shall cooperate with other employers and shall be responsible for coordinating the HSE work of each undertaking.

All sectors of society are covered by *General Civil Penal Code*, and since 1989, this act has included a section on the criminal liability of enterprises. Such provisions had until then been scattered around in several special laws, including the WEA. According to the new amendment, an enterprise may be liable to a penalty "when a penal provision is contravened by a person who has acted on behalf of an enterprise" (section 48a). The penalty will normally be issued as a fine, but the enterprise may also be deprived of the right to carry on business, wholly or partly. Several considerations are stated as grounds

[72] The revision also reflected an increasing attention to individual adaptations of working conditions in order to promote 'inclusiveness' for all categories of employees, regardless of personal capabilities and circumstances. The role of management systems is more explicitly regulated in the new Act, thus incorporating the internal control principles formulated as "systematic health, environment and safety work". These provisions, and the associated regulation are quite rudimentary, however, compared to the elaborate regulation of management systems in the petroleum regulations.

for imposing a penalty (and for determining its size and form), such as its preventive effect, the seriousness of the offence, whether it could have been prevented by guidelines, instructions, training, control, etc., or whether the offence was motivated by or resulted in the promotion of company interests or advantages. The size and severity of the penalty shall reflect the economic capacity of the offender. In the case of *individua*l liability, penal law distinguish between negligence and gross negligence (wilfulness or premeditation are hardly ever relevant in these cases). Negligence may be 'conscious' or 'unconscious', but the offender would under both circumstances be expected to have considered the possible outcomes, and thus be subject to penal action. The likelihood of harmful consequences in these cases is expected to approximate the 'general societal risk acceptance level in daily life' (Eskeland, 2000: 272). As will be evident, penal action in the petroleum sector is almost exclusively taken against companies, not individuals.[73]

The HSE regulations

The regulatory reform starting from the late 1980s had been pioneering as a collaborative process; a number of informal working groups had been established, allowing all parties to air viewpoints, make suggestions, and discuss feely. They were thus sheltered from the 'positioning' mechanisms that would normally follow from more formal processes. The same basic philosophy was evident up to the 2002 reform, which started in the second half of the 1990s. The initial purpose was partly to integrate the NPD-regulations with the regulations of the environmental authorities and the health authorities. Partly, the NPD also wanted the industry to take a greater responsibility for the operational guidelines and thus to continue the standardization process. Several parallel processes were started, including collaborative working groups which involved the key industrial associations, the major unions, experts, and NPD officials. An overarching purpose was also to strengthen the regulation of organizational designs and risk management.

There is no reason to believe that this process involved the NPD in a unitary collective endeavour, and hindsight reconstructions vary somewhat between the participants in the process. We have no interest here in ascertaining this historiography, the latter part of

[73] The role of tort law (and industrial insurance) is not considered in this thesis.

which coincided with the turbulent organizational period of team experiments (see above). Clearly, however, partnership in the regulatory process was unequally distributed and there seems to have been a loosely coupled network of around 10-15 people, with a handful of 3-4 key persons acting as initiators and coordinators, including the leader of the regulatory project. The network included professionals with a non-technical background (political science, economy), largely located in the supervisory department in the safety division. The professional departments were seen as somewhat traditional and 'technical' in the regulatory approach, and recent developments called for more comprehensive regulatory mandates. As noted in Chapter 3, the effects of decreasing oil-prices, the NORSOK-process, cost-cutting, and restructuring, revealed apparent shortcomings in the existing regulations. As was explained by one of the participants in the regulatory process:

> Companies were downsizing, getting really 'lean and mean'; they nearly got anorectic. Cheap, simple, and sub-standard technical solutions were chosen. This was a great challenge. The regulations weren't really appropriate for facing this situation. (former NPD official)

There were no requirements addressing critical safety issues such as maintenance, and no clear warrants for interfering directly with the amount of resources invested in safety. The only solution was to use high-level, purpose-oriented requirements in the Petroleum Act. The NPD officials had a watch dog position in the license-committees, but it wasn't easy to speak up without clear legal warrants. As part of the regulatory process, an analysis was made of a large number of internal company incident-investigations. According to this analysis, the investigations revealed a narrow, single-loop strategy of correction and repair; the potentials for learning and improvement were correspondingly restricted. Also, cross-disciplinary audits were conducted that covered several organizational layers, thus contributing to a better understanding of overall organizational processes. The results were not all encouraging and internal reports on incidents exposed sloppy attitudes and grave conditions.

New regulatory ideas were explored in the risk management literature and in the experiences from other sectors, such as the nuclear power and aircraft industries. The

idea of addressing 'culture' appears to have grown out of these processes; as was noted by one participant in the regulatory project. "We had to go to the core; indications were that something was missing in their organizational culture". There is no need to determine the relative impact of this informal network on the resulting regulatory reform; but as we shall discuss later, the idea of introducing 'safety culture' (the term 'HSE culture' appeared later) as part of the regulatory strategy clearly originated within this group.

First and foremost the new regulations were to include reinforced and more elaborate designs for risk management, including methods for risk analysis, management of change processes, designs for decision-making, traceability, outcome-evaluations, maintenance management, and a more comprehensive and organizationally oriented employment of barriers and 'defences'. The new regulatory structure contained overall *Framework Regulations*, issued by Royal Decree in 2001, and four more detailed regulations: the *Management Regulations*, the *Information Duty Regulations*, the *Facilities Regulations*, and the *Activities Regulations*.[74] These regulations replaced the internal control regulations and 14 more specific and disciplinary oriented regulations (including risk analysis, working conditions, emergency preparedness, drilling and well activities, load bearing structures, etc.). The prescriptive requirements within these areas were largely reformulated in industrial standards, and the regulatory provisions were replaced by goal-oriented (functional) rules. Most provisions are briefly formulated target statements, supplied with non-statutory guidelines that refer to the relevant standards. However, some important deterministic requirements were reinforced regarding safety barriers, redundancies, and 'defence-in-depth' principles. More loosely defined criteria for risk management were also reformulated, in particular by specifying that the ALARP principle ('As low as reasonably practicable', see below) required the duty holders to improve and implement safety measures beyond simple risk-cost-benefit considerations,

[74] The full title of these regulations are: *Regulations relating to Management in the Petroleum Activities (the Management Regulations); Regulations relating to Material and Information in the Petroleum Activities (the Information Duty Regulations); Regulations relating to the Design and Outfitting of Facilities etc. in the Petroleum Activities (the Facilities Regulations); Regulations relating to Conduct of Activities in the Petroleum Activities (the Activities Regulations).*

thus shifting the burden of proof in favour of safety.[75] Thus, both the number and the nature of statutory regulations changed. From 1985 to 1995 there were 22 technical regulations and four non-statutory guidelines. From 1995 to 2002 there were 14 technical regulations and 33 guidelines. From 2002 there have been only 5 general and purpose oriented regulations, with one guideline supplementing each, but with a large number of associated national and international standards.[76] On the whole, however, it was argued that the reform primarily restructured and elucidated the regulations, rather than substantially changing the material requirements.

The HSE regulations thus encompass all the risk areas related to safety and the working environment, and include also health services, the external environment, and financial assets (including production and transport regularity and operational availability).[77] As noted, the provisions are largely formulated as 'functional' requirements regarding the various aspects, characteristics, qualities, and outcomes of the product or process in question. The provisions thus combines purpose orientation with relatively open-ended target requirements, but still specifying a number of elements and conditions to be taken care of, using phrases such as 'necessary', 'sufficient', 'shall establish', 'follow-up', 'prudent' etc. Typically, the 'responsible party' is required to continually monitor, analyze, audit, revise, improve, etc., thus pin-pointing that the responsibility for safe operations is not limited to compliance with some prescriptive norm. The non-statutory guidelines recommend a number of standards as a means of complying with the requirements. If a recommended solution is opted for, it will constitute a key basis for documenting fulfilment of the statutory requirements. When other solutions are used, documentation must be provided that the chosen solution fulfils the regulatory requirements.

[75] According to Hovden (2002), these proposals met some opposition in the industry, as they no longer allowed for justifying cost-cutting purely based on (controversial) risk-cost-benefit analysis.
[76] The PSA participate extensively in the preparation of standards (primarily national) through working groups, reference committees, and review processes.
[77] The regulations are also warranted in the environmental legislation and the general health act, and are thus issued jointly by the PSA, the Norwegian Pollution Control Authority (SFT) and the Norwegian Board of Health (NBH).

The responsible party is primarily the operator, but the individual provisions also specify the obligations of other parties participating in the petroleum activities. Employees are required to participate in complying with the regulations. The hierarchy of responsibilities is specified in that the operator "shall see to it" that everyone carrying out work for him complies with statutory requirements (employees, contractors, sub-contractors). Likewise, the licensees are responsible "to see to it" that the operator complies with statutory requirements. These formulations are furnished according to the hierarchical principle, thus covering all actors down to commissioned contractors and suppliers.

Chapter 3 in the framework regulations establishes the "principles relating to health, safety and environment", which is also where the HSE culture provision is located. The introductory section clearly states that the principles shall be complied with and that they shall serve as basis for the enforcement by the authorities, and in particular that the "exercise of authority according to the regulations and according to the individual provisions as a whole is in accordance with this chapter." The principles are thus given a key role as a general point of reference for regulatory compliance. The term "Prudent petroleum activities" expresses the overall regulatory target, implying that the regulatee conducts "individual and an overall consideration of all the factors of importance to planning and implementation of petroleum activities" taking account of the "distinctive character of the individual enterprises together with local and operational conditions" (section 8). Section 9, "Principles for risk reduction" formulates the ALARP principle as moving beyond the more fixed and static use of acceptance criteria (the key principle in the former regulations), and in principle also moving beyond the minimum statutory requirements ("Over and above this level the risk shall be further reduced to the extent possible"). The guidelines also specify that this minimum level "must be complied with without regard to costs and that the party responsible cannot set aside specific requirements of the health, environment, and safety legislation with reference to calculation of risk." This section also introduces the associated principles of "substitution" and "best available technology" (the BAT principle), requiring the regulatee to "choose the technical, operational, or organizational solutions which

according to an individual as well as an overall evaluation of the potential harm and present and future use offer the best results, provided the associated costs are not significantly disproportionate to the risk reduction achieved." Section 10 specifies that "the operator shall have an organization in Norway which on an independent basis is capable of ensuring that petroleum activities are carried out according to rules and regulations. The party responsible shall ensure that everyone carrying out work for him in petroleum activities, have the competence required to carry out such work in a safe and prudent manner".

The culture provision appears as section 11 among these principles. Under the heading "Sound health, environment and safety culture" it specifies that:

> The party responsible shall encourage and promote a sound health, environment and safety culture comprising all activity areas and which contributes to achieving that everyone who takes part in petroleum activities takes on responsibility in relation to health, environment and safety, including also systematic development and improvement of health, environment and safety.

The subsequent chapters cover the establishment and follow-up of management systems, requirements on the provision of information and documentation, working hours, application of maritime legislation, and some administrative provisions regarding the rights of the authorities, such as access to facilities.

The four supplementary regulations provide elaborations of the Framework Regulations. *The Management Regulations* specify key elements of the management system, requiring regulatees to set objectives, norms, acceptance criteria, indicators, and to establish systems of internal monitoring, supervision, and "continuous improvement". All decisions shall be based on a comprehensive and adequate consideration of their implications for HSE. Sufficient resources shall be provided and planning and work processes shall be adequately specified and documented. Comprehensive requirements are given for the analysis of risk, specifically referring to major accidents, emergency preparedness, and working conditions, including the use of quantitative risk analysis. Risk reduction shall be achieved both through reduction of probability and by limiting the

extent of harmful consequences. The concept of barriers (defences in depth) reflects key principles of risk reduction, and refers to technical, operational, and organizational measures intended to prevent or interrupt the course of undesirable incidents. Sufficient independence between them is required when several are needed. Collective protective measures shall be preferred over protective measures aimed at individuals. The functions and performance of barriers shall be known and defined, referring to both technical, operational, and organizational elements which are necessary for the individual barrier to be effective.

The *Information Duty Regulations* specifies comprehensive requirements regarding material and information to be submitted or made available for the authorities. They contain requirements on applications for consent, alerts, notification, and reporting. Thus, the operator shall notify the PSA of situations of hazard and accident which have led to or could have led to severe and acute injury, acute life-threatening illness, severe impairment or loss of safety functions, or other barriers that endanger the integrity of the facility. The *Facilities Regulations* deals primarily with the physical and technical design and outfitting of facilities, including safety functions and loads, materials, work areas and accommodation areas, physical barriers and emergency preparedness. The *Activities Regulations* contains requirements on the conduct of various activities, including requirements regarding working conditions, maintenance, emergency preparedness, etc.

A large number of industrial standards are tied up to the regulations through the supplementary guidelines. This includes ISO standards for management, NORSOK standards for risk analysis and management, and a number of more technical industrial standards, most of which are tied up with the facilities and activities regulations. Also, several regulations pursuant to the WEA act are listed as reference documents to the regulations.

Emerging philosophies of regulation

The present regulatory system is a continuation of a long regulatory development, as briefly outlined in Chapter 3. As noted, some argued that the new regulations only

partially represented any substantial changes in the material requirements put on the industry, and that the regulatory process largely consisted in transforming the requirements into more purpose oriented and functional provisions, with the more prescriptive norms reappearing as industrial standards.[78] This was in large parts only a continuation of a long process, responding to some of the major difficulties associated with standard setting, as noted in Chapter 2 (such as those related to informational demands and technological change). These arguments and considerations have been present in the regulatory discourse since the 1970s, thus responding to the need for generalized rules applicable to the specific technologies, and environments in which they shall have their intended effect (Dahle, 1994).

Regulatory interventions can be directed at different stages in a process that may lead to harm, distinguishing between preventive intervention, act-based intervention, and harm-based intervention (Baldwin and Cave, 1999). Although it may be difficult to distinguish clearly between preventive and act based regulations, all these 'staged' intervention strategies are reflected in the regulatory standards. Preventive interventions are generally considered extremely important, for obvious reasons. The risks associated with sub-standard technologies and facilities are great, and post-construction amendments would generate high costs, as would other adaptive measures to compensate for awkward and unsafe technical solutions. Preventive interventions may also include approvals or consents that must be obtained before an activity can start (regarding technical installations, equipment, organizational resources, etc.). As was noted, however, the petroleum authorities have been reluctant to intervene in early stages in a manner that would give the impression that approvals were granted and that would somehow make them responsible for the chosen solutions. For instance, consents are only given as a 'clearance' that some activity (such as certain drilling operations) may commence according to a plan, not as any approval of the activity as it is later conducted. They have generally been careful not to intervene in any manner that would make them partly accountable if anything happened. Rather, all interventions address the self-regulatory

[78] Functional requirements are sometimes associated with both output demand (as contrasted with input demands) and a fairly open and purpose oriented standard.

systems wherein the regulatee must produce and document pre-activity risk assessments (preventive), compliance with internal procedures (act-based), and accident investigations (harm-based). The safety of installations (and other equipment) is to be the sole responsibility of the companies.

From the beginning, this strategy had caused discussion, and criticism, about the regulatory role in standard setting. Some considered functional rules to be a circumvention of responsibility by the authorities, that they didn't take a stand by providing explicit standards. But the process of involving the self-regulatory capacities of the industry was seen as critical, in terms of both necessity and rationality. The industry had to make judgments themselves, and instead of reversing the development, it was extended. As was noted by the regulatory director:

> We had to develop the methodology a step further, and consider all regulations in terms of their functionality. That is, if you start a process where you introduce risk management and a supervisory regime based on the principle of internal control or self-regulation, regulations must be adapted to the same philosophy. To enforce predominantly prescriptive regulations in such a regime would work against the objective we had. (director of regulatory development)

Defensiveness and blame-avoidance may have been elements in this strategy, but the justifications were obvious. Partly it was considered a simple matter of necessity. As one of the agency veterans explained, they received "piles of paper from the industry", and had no chances of making expert based reviews of all the technical documentation. But there were also more positive justifications. It would not only 'empower' the industry, but also engage them actively in the risk assessments and make them accountable for the solutions adopted. But the authorities were of course confronted with the need to know what were 'good enough', and the accompanying need for standard solutions in order to avoid unnecessary documentation processes. The first response was to provide guidelines. The idea was that the functional requirements could be optionally met by adhering to such guidelines, but that other options were possible if an equally satisfying effect could be documented. Much industrial discipline and knowledge were required in order to make this work. The increasingly functional rules clearly pinned the companies

in accounting for the solutions adopted. As was explained and exemplified by one agency official:

> Take the large renewal of lifting equipment on [one of the large offshore fields]. All the cranes had to be replaced. Eleven huge cranes at about [NOK] 45 million each. So we're talking about large amounts of money. Then, the new cranes were of substandard quality .... they were badly designed and produced, and …. it was really bad craftwork. This coincided with the introduction of new functional regulations, saying that the operator have to decide what function the cranes were supposed to fulfil, for example that they can lift 50 tons, with wave heights up to 4-5 meters, summer and winter. Then you get cranes with several deficiencies. With the old detailed regulations we could have pinpointed all these technical deficiencies. But with these new requirements, we have to ask: what does this entail for your operations? What kind of restrictions do you face? Then they started to list up: the heating up of the hydraulic system under strain restricting usage to 1 ½ hours each time, problems with the breaks so that personnel cannot be lifted, and so on. So all these things summed up one would expect the agency to proscribe the cranes altogether. But given the regulations, we didn't say that. Rather, we said: You now have a number of cranes out here with a functional capacity restricted to the lifting of empty 20" containers under perfect weather conditions. And if that's what you need, it's fair enough, just run those cranes. But if you need to lift a 32 ton coiled tubing unit, with 3 meter waves in winter, then you need another crane. This forced through a substitution of the cranes. I don't think they saw this so clearly themselves. (supervisory coordinator)

The next step in this process was the substitution of guidelines with industrial standards. The maintenance of guidelines, standards and manuals generally has high costs, and the technology advance ahead of them. As noted, with the new 2002 regulations, much of the content in the guidelines were replaced by references to industrial standards, and the role of the authorities was then largely to participate in standardization groups on a professional basis. But to the extent that these standards are referred to in the guidelines, compliance with the standard would normally equal compliance with the regulation it is linked to. And if an incident occurs despite compliance with a recommended standard, this could have a bearing on the subsequent legal assessment.[79] Still, it's of some importance that a distance is upheld between the authorities and the standards. References to standards are always made in guidelines, not in the regulations. If standards

[79] The Supreme Court has in fact recently acquitted a company in one case of pollution, where an incident occurred despite adherence to a standard. In this case a tank that was build according to EPA standards had a leakage (US Environmental Protection Agency). The Norwegian pollution authority claimed they had stricter requirements than the standard specified, but since the standard was considered to be widely accepted, the court sided with the company. This is still a grey zone, however, and just recently there has been a controversy between the PSA and the industry regarding life-boats. The guidelines originally had a reference to the general marine regulations for such boats, but the agency found these to be insufficient for the offshore facilities, removed the reference, and reinforced the requirements.

are referred to in supervisory reports, as exemplifying conformity or non-conformity, it must be formulated so that the standard does not appear as the only path to compliance. The responsibility for compliance must rest with the company. As was explained by the regulatory director:

> R: We must in a sense be clearer on roles, where the regulatory agency issues regulations containing mainly purpose-based requirements and the industry develop supplementary and detailed or prescriptive norms or standards. Much the same principles are now being used in part of EU-legislation. At the same time all involved parties have to be aware of the formal difference between the regulations and industry standards.
> I: Are you passing the buck then?
> R: No, definitely not …. We've stated that the regulations facilitate the use of alternative but in terms of safety, documented equivalent solutions on a detailed level. This principle should be both the right and the responsibility of the parties, and we shouldn't unduly intervene in their decision processes at this level.
> I: These are complicated regulations to enforce, then?
> R: That's true in a sense because we have to a larger extent have opened for discussions about alternatives. But just think how the situation would be if we returned to a regime with prescriptive regulations; regulations that specifies solutions in advance …. that would as we see it hamper, or stop, the technological development; unless we enforced regulations based on an extensive use of exemptions. This would in turn be time consuming and undermine the status of regulations. We must make the decision-makers accountable and make them understand their responsibility. We cannot always be ahead of the technological development. We're not the ones driving forward the technological development. We don't know all the answers for the questions of tomorrow. Rules that specify which of these future decisions were acceptable or not acceptable in advance would be impossible to develop. Gradually, everyone realizes this. Let me clarify however that we still have prescriptive requirements; when solutions shall be identical, where rights and obligations are defined, etc. (director of regulatory development)

This system where statutory regulations only provide a bedrock for industrial self-regulation, has thus been a long term process, But self-regulation does not relieve the authorities of establishing what in a given case should be considered 'good enough'. Deviation from a standard that may lead to increased risk must be compensated for by other measures, as will any change in circumstances that may make the 'standard' inappropriate. All operations must at any time be 'prudent' in terms of risk and safety as judged by the authorities, and enforcement practice cannot always rely on pre-specified norms, as will be discussed later.

But self-regulation is the key principle, and within the firmly established tripartite system, this presupposes close cooperation with the industry and a dialogue with the

involved parties largely based on consensus and mutual trust. These presuppositions were emphasized in both the 2002 and the 2006 White papers. If union and employee representatives grew more critical of the industrial practices, the system was vulnerable.[80] As was noted by the regulatory director:

> Obviously, when you operate a regime where the involved parties use the 'freedom' of the regulations to proactively improve HSE-standards, that's an ideal situation. But if that 'freedom' is used to look for minimum solutions it creates a different and more problematic situation. There is of course some flexibility. The employee side may observe, in their view, a reduction in standards, which we may still judge to be in accordance with justifiable interpretations of the regulations. This regulatory policy is clearly founded on participation from the industry and all the parties. One thing is participation in the regulatory process. But the regime also presupposes participation in the 'in-house' self-regulatory process. And this is a critical and sensitive issue. In the old prescriptive regime with detailed rules, if the industry wanted to adopt a different solution or approach, they would have to apply for exemptions from the regulations. This decision could then be subject to appeals from the employees. This provided a formal access to the decision process. In the case of self-regulation, the parties must participate. We transfer decisional powers to the industry on the condition that they have a dialogue with the employees when choosing specific solutions. If the employees or their representatives then say "we are not sufficiently included in the decision processes", we would be in conflict with an important premise for the development of the regulations. This is an important principle for us. But thus far, the parties have generally been satisfied with this regulatory policy and the access to the regulatory process, and we're really happy with that. (director of regulatory development)

But the exploration of interpretive 'freedoms' also gave the agency much power in terms of determining what was 'good enough'. Although the regulatory process was highly participative and consensus seeking, one requirement appeared to have unexpected consequences for the industry. Section 31 in the Activity Regulation regarding the "arrangement of work" stated that "the work shall be planned so that as much work as possible is done daytime, and so that the employees are assured necessary restitution and rest." The general and goal oriented wording was however further detailed in the guidelines, endorsed in the 2002 White paper, implying strong restrictions on night work and so-called 'joint sleeping' (sharing cabins). These restrictions had potentially far-

[80] Indeed, it was argued, in particular by the OFS, that the 'functionality' of loosely defined targets increasingly served as a smoke screen for reduced HSE standards, and that it made it difficult for safety representatives and union representatives to object to measures or to demand improvements, if no standard was available as threshold or norm. An evaluation of the regulations conducted in 2004 revealed highly disparate opinions among the parties, however, including also among different unions. The industry was moderately satisfied with the target orientation and the flexibility of the regulations, but more critical in terms of adequate cost-benefit assessments and predictable enforcement practices.

reaching implication with respect to night work during special operations, manning levels in critical phases, the availability of cabins, etc.[81] These interpretations and the following enforcement practices caused much discussion and controversy, and was seen by some industrial actors as unduly disproportionate. Costs were estimated at possibly several billion (NOK), and the Oil Industry Association (OLF) later published a report which addressed costs and benefits of the new requirements (OLF, 2006).[82] It was also considered a breach with the established 'goal orientation' in the regulations, and generally, this method was more difficult to apply in cases where the relationship between means and ends was dubious or contested, as it of course was, in the case of determining the impact of working hours and sleeping conditions in relation to health and operational safety. The NPD/PSA appeared firm in their responses, and produced their own counter-report, contesting what they saw as highly exaggerated cost estimates and defending the importance of the work arrangements, both in terms of health and of safety.[83] On the whole, this issue appeared to have caused some disturbance in terms of conficence and mutual trust; but it also revealed the powers of the authorities in establishing thresholds for acceptable levels of risk, not by simple and straightforward

[81] The wording of the guideline reads as follows: "The requirement to do as much work as possible daytime …. implies, inter alia, that night work should be limited to tasks and functions that are necessary in order to maintain prudent activities. The requirement to necessary restitution and rest …. implies, inter alia, that all personnel are allowed to sleep undisturbed and normally alone".

[82] This report was issued in March 2006, just prior to the finalization of the 2006 White paper, and was submitted to the agency and the ministry. It addressed a number of concerns related to the cost-benefit balance, and argued that authority interventions in several cases jeopardized the purpose orientation in the regulations by requiring specific solutions that was not sufficiently justified from a cost-benefit perspective. The interpretation and enforcement of the provision regarding working hours, rest and restitution appeared as prominent examples. Furthermore, a general argument was made for a stronger reliance on internal risk-cost-benefit analyses, based on 'realistic and operational demands', and considering also the need for a broader perspective on 'societal value creation'. Reference was also made to the internal regulations for the public administration about assessment of economic and administrative consequences and impacts of reforms and proposals ("Instructions for Official Studies and Reports"). These are laid down by Royal Decree and concern consequence assessment, submission and review procedures in connection with official studies, regulations, propositions and reports to the Storting. Although quite elaborate and ambitious in substance and intent, these regulations are not very strongly followed up and variably practiced. No control system exists for enforcing the regulations.

[83] The justifications related to safety were based on the risk for reduced alertness in the execution of safety critical tasks. Although research was referred to, documenting such effects (like the higher proportion accidents on night shifts), the results were contested in terms of scope, strength, and criticality. But in referring to the potential consequences of having 'tired workers', a strong argumentative rhetoric could still be mobilized.

enforcement of explicit rules, but by the execution of discretionary powers.[84] We return to the issue of law enforcement in the next chapter.

Regulating culture

Evidently, the regulatory context in which the HSE culture provision was introduced was complex and comprehensive, apparently pervading all aspects of industrial behaviour. The search into the history of the culture provision started with a few simple and partly contradictory hypothetical leads, ranging from the slightly patronizing suspicion that this was just another import of fashionable organizational design, to a more optimistic expectation of finding HSE culture to be thoroughly integrated in a comprehensive and cognizant regulatory strategy. No definite answer appeared, partly because the different traces that could be followed revealed no single narrative. There was no unitary exposition of the rationale behind or any clear conception of the course of events in the regulatory process. Still, the extremes could be ruled out; a lot of strategic thinking was evident at different stages in the process, despite the lack of any overall idea of how the concept of culture was to be integrated in regulatory frameworks and practices.

The origins

During the initial phases of the fieldwork, everyone seemed to point to someone else when asked about the origins of the culture provision. A lot of work had been done in order to explore the substance and practical implications of HSE culture, and to communicate this internally and externally; but the originating rationales and processes were not clearly elaborated. The rationales were admittedly responded to with some degree of coherence, but not quite in terms of its organizational origins or any exposition of the 'legislative intent' as it was developed in the regulatory process. How was this provision to be understood as part of the broader regulatory framework and was there an understanding of something 'missing' and a need to add a 'new dimension'? Responses were certainly given, but they didn't seem to relate directly to the course of the regulatory process, and appeared at times as hindsight reconstructions. It gradually became evident

[84] The interpretations were as noted endorsed by the ministry and possibly also originating from political interference. Rumours had it that the ministry (led by a Labour Party minister) had yielded to strong union pressure.

that crucial leads had to be traced outside the NPD/PSA, to the group of former employees who had left the organization during the turbulent period of organizational experimentation (see above).

It's certainly not possible to locate the introduction of the culture-concept to any specific moment of revelation or to any clearly identifiable process resulting in a 'cultural turn'. Most of the 'cultural' aspects of organizational reality that participate in shaping how they deal with risk had been present in the risk management discourses for many years, dating at least as far back as the Bravo blow out (see Chapter 3). During the 1990ties, however, there was an increasing awareness of how the more deep-seated organizational properties and processes did or did not contribute to the proper management of risks. The concept of culture emerged in this 'sensitizing' process, as part of a broader attempt at rethinking how regulatory efforts should be designed. However, this was not simply a 'mental' process of maturing insights into the deeper causes of organizational behaviour. As noted above, external influences were apparent, both through changing economic conditions within the industry and developments in the scholarly understanding of the organizational management of risk (such as from the nuclear industry). The main elements in this new regulatory approach were integrated into the reform process. The first person to bluntly take responsibility for introducing culture into this regulatory context, now employed as an HSE manager in the industry, was also the first project manager for the risk management regulation and later for the whole regulatory reform project. Finally, a fairly pronounced and elaborate statement of the 'regulatory intent' was provided:

> Yes, I was the one who introduced the concept. I adopted it largely from the Chernobyl investigation report. That's were it originates. What interested me was how it demonstrated the total breakdown of formal systems, despite the fact that you have such systems, that you have a relatively robust technology, that you have competent personnel, and so on. In spite of all this you do something so operationally outrageous …. This was not a technological failure; they tested the plant far beyond its limits, and didn't respect the technology. In short, they ran an experiment that they should never have run. And this they did in spite of all these factors, expertise, systems, and so on …. still it all collapsed, and the fact that it's possible in this situation to collapse quite comprehensive formal systems, that was a phenomenon they referred to as safety culture. And this phenomenon, that you can in fact bypass and surpass comprehensive formal systems, has also occurred in the

> Norwegian petroleum industry. So that was the first professional source of inspiration. The other source was the High Reliability approach from Stanford. The third source came from aviation. We got access to investigation reports from the FAA [The US Federal Aviation Administration] and others – that showed the same – that you have strong formal systems, but under certain conditions they can collapse. These were the three professional or scholarly roots …. So, I was the one to introduce the concept, based on what I saw in operation internationally. So that was the reason; and then I saw that this phenomenon …. that it addresses something that we also experience here .... The rest of the regulations are very much about formalities and formal systems, and a host of criss-crossing coordination requirements …. And still, formal systems may collapse. Written rules and procedures are like a specialty in the petroleum industry. We have loads of rules and procedures that no one comply with, and no one even believe that they should comply with them. If you look at aviation this would be totally outrageous. You won't find a captain who does not follow procedures. But that's because the captain knows he's not going to fly on his 20 years of experience, he shall fly on the total thousand years of experience of his company. But then, their procedures look a lot better; they're actually possible to comply with. The nuclear and aviation industries consider procedures as a means of experience transfer, that's where we gather our best experiences and our best practice. And that's where the experience of the company and the whole industry is to be collected. So it's not like some say in the petroleum industry, that "now I've been out her for 20 years and several stormy nights, so now I'll do as I please." A flight captain would never think of saying that. That's a kind of discipline in those industries that you'll never find here. But then we don't systematize experience like they do either, or collect data. Then I'm talking about the whole industry, including the authorities. (former NPD-official and 'originator')

The common theme in this initial account of inspirational sources appeared to be the fragility of formal risk management systems. Experiences from both the aviation and the nuclear industries were studied extensively, as was the safety literature inspired by the High Reliability tradition (see Chapter 2), thus reflecting the 'cultural turn' within the research on organizational risk. What was sought after, was a greater respect for risky technologies, a more sophisticated ability to learn from experience, and a more 'mindful' and dynamic application of formal systems and rules of conduct. These influences were further elaborated by pointing to the dangers of organizational *self-complacency* in the face of large scale risk potentials. Self-complacency in the face of 'good records' could lead to bad safety culture, indicated by deterioration of internal information processing and loss of sensitivity to risk.[85] The dangers of unchecked reliance on formal systems and

[85] A rather elaborate story about a Canadian nuclear power plant was reconstructed for making this point: Very briefly, the plant had been closed down by the authorities after having been ranked by the International Atomic Energy Agency (IAEA) as one of the world's ten best nuclear plants only three years earlier. Organizational self-complacency appeared as a major explanation. They started to ignore or distrust warning signals from unions, department managers, internal audits, safety officials, etc., and internal

organizational self-complacency, both ideas largely inspired by the High Reliability school, were thus initially the two prime components of the culture concept. But the culture provision was also seen as a clear continuation of the already established principles of enforced self-regulation: “It’s perfectly in line with the tradition that focuses on the ability in the industry to pull oneself up by one’s bootstraps, to work autonomously. In that sense it’s a typical PSA provision. It’s very representative for that kind of regulation.“ (former NPD official and originator). But there was also a clearly stated intention to catch up with recent developments in risk management and safety philosophy: to be ‘part of the trend’. The first drafts of the provision leaned heavily on ideas and formulations used in the nuclear industry (such as IAEA, 1999). In the regulatory process an external review group, including the cooperating research communities, commented on drafts and suggestions, and the response to the culture provision was perceived as positive; there was a “good professional dialogue about alternative approaches and formulations” (‘originator’). These were academic institutions heavily influenced by the same High Reliability tradition.

The culture provision was primarily supposed to reflect an intention. Several options were discussed. One was to have it formulated in the preface to the regulations. Another was to put it in the purpose section. Both options were considered as too weak. In order to emphasize its independent weight, it was thus placed in a single section, as part of the principles. The phrase ”encourage and promote” (see above) reflected several considerations: that it was supposed to generate processes, that it should involve everyone, and that it should promote participation and contribution from the employees. As was explained by another participant in the regulatory process:

> The culture provision was supposed to express the holistic perspective; it was the sum of all the elements, particularly in the management-regulation. But the authorities were not supposed to ‘diagnose’ the culture. Rather, they should challenge the companies. It was supposed to be a common project, a starting point for engaging in a dialogue with the companies. (former NPD official)

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communication deteriorated. Resources declined since they believed they performed so excellent that they would be able to manage with less. Bad news would appear as contrary to their self-image.

The network dissolved rapidly, however, during the brief period of organizational experimentation, and the new regulatory framework was barely completed before the great majority had left the NPD. The process of writing out the text of the provision, including the guidelines, was taken over by others, and was thus no longer in the hands of the group. The provision was quite consciously intended to be written in a speech-like, rhetorical manner, but the guidelines were supposed to be more specific. The group was not altogether happy with the result. Too few clues were given as to how it was to be followed up, and no references were given to the existing regulatory documents, such as those from the nuclear industry. The final wording of the guideline was rather short, abstract, and general, pointing to the purpose and scope of the provision, rather than to its content:

> This provision is new, but expresses principles embodied in the health, environment and safety legislation. To ensure the success of the systematic effort needed to prevent faults and dangerous situations or undesired conditions arising or developing, and to limit pollution and injury to persons and damage to equipment, a favourable health, environment and safety culture must pervade all levels of the individual activity/establishment. A favourable health, environment and safety culture is also needed to ensure continual development and improvement of health, environment and safety. In order to make it clear that this section applies across the entire scope of application of the regulations, the expression "health, environment and safety culture" is used instead of the more established term "safety culture".

Neither did the originators appear happy with how the regulations were followed up more generally. The new requirements were formulated in terms of functionality and purpose, some quite abstract, and the intention was initially to produce guidelines and develop common understandings for their enforcement.[86] This lack of clarity was all the more critical since the regulatory process was largely informal, undocumented, and thus sparse in terms of legal sources. At the same time this style of regulation involved a substantial amount of discretionary judgment in order to 'enforce compliance' in a productive manner, and required in fact very competent and demanding supervisions. The pitfalls

[86] This applied not only to the culture provision: "They require consequence rapports in the most unthinkable way. Some have fallen in love with that provision. The requirement that decisions shall "sufficiently informed", can be used and abused in all kinds of situations…" (former NPD official). A certain amount of disillusionment was apparent in the interviews with these former NPD-officials.

would include both misplaced concreteness and nebulous abstractness. As for the culture provision, this was particularly true:

> One must consider how requirements and orders are interpreted and put to use in the companies. "You must do something about your HSE culture" – how should such a message be followed up? It would be like saying, "you must focus more on attitudes and behaviour"… Some may feel that the word is like a lever providing a momentum, like "follow up" and "impact assessments", similar concepts attempting to drive forth change through some magic force. (former NDP official)

The organizational response

It would be a mistake to portray the introduction of HSE culture as the intellectual property of this network only, with no resonance or independent reflection from the rest of the organization. It seems, however, that the provision and the originating ideas lost some of its momentum in the process. No one in the 'new' organization was able to clearly account for the rationale as it was originally conceived. Even those who were quite deeply involved in the regulatory reform project had mostly vague ideas and memories about just how and why it was introduced, and referred recurringly to the former leader of the project. But the hindsight reconstructions of the cultural turn also displayed some commonalities, largely framed within the familiar language of systemic and enforced self-regulation. In fact, an outline of the whole regulatory history, from the introduction of the first internal control provisions, was the immediate response from the General Director on the 'how-and-why' question, providing also an eloquent version of the continuities embedded in the regulatory philosophies, with HSE culture almost as its final fulfilment:

> If we look back at developments in the industry, in the regulation of the industry, the NPD starts where it starts, that is in a situation with no trust between the industry and the authorities. It was largely a state of confrontation. This lack of trust had the implication that the authorities had to tell the industry exactly what to do. So in the beginning, rules were produced that specified almost everything. It was highly technical; much of the technology in use was age old, it was stone age technology, mud pumps from the war, etc. So there was a strong focus on technological improvements, and to have safety built into the installations. This continued over some years. Then we had to ask ourselves: what are we really up to here? We had specifications for rail heights, the number of toilet rolls, and so on. But what is this really about? It's about risk, that's what it is - management of risk. So we started a discussion: who is really responsible for what in this industry-authority picture? That was in fact quite unclear. We observed our colleagues in the Maritime Directorate saying that "we're responsible for safety at sea". But how could they be responsible sitting at the office

in Oslo? …. We realized that we could not be responsible for offshore safety. We didn't run any business. So the discussion started about *self-control*. They had to have systems in place to ensure that they complied with government regulations, and also with their own regulations. This had to be organized. So we wrote the first guidelines for self-control in 1978. And just as with the concept of HSE culture, we didn't quite know what it was. What does it 'look like' - and how are we as a public authority going to approach it? So something had to be sorted out, something about responsibility and how to handle that responsibility organizationally. That much was clear. But how should we inspect this? We realized that technically detailed regulations were an impediment both to us and to the industry. Regulations were constantly behind the industrial development, and there was a huge maintenance job – we tried to keep up with the development. But gradually we got a grasp of it, and the industry started to understand what we were after. One example: A manager in an oil company thought that the concept of self-control implied that we entrusted public authority to the company to the effect that they themselves could decide to deviate from regulations. Such problems came up. But we got it sorted out, and the development continued, and we saw that in addition to technological requirements we had to have management systems included in the regulations.

Then came the idea of internal control, and we revised our guidelines and introduced this new concept.[87] Internal control was used in some regulatory regimes, as some larger companies had mandatory safety officers for electricity systems. These officers were independent and were supposed to act on behalf of the authorities, but were at the same time employed and paid by the companies. Some inspiration was gained from this system. Also, there was a parallel development of quality systems and the standardization of such systems. This development was followed closely by the NPD. Definitions of management systems for HSE had much in common with definitions of management systems for quality, such as "systematic measures to ensure compliance with rules and regulations" …. So, the first improvement measure was technology, the next was on organizational management of HSE, without forgetting the technology. And we saw significant improvements. Then discussions started, in the industry, in research communities, about 'human factors' and all that… We were searching for new approaches. Improvements were levelling out; we didn't get further down, as with the number of injuries. So what should the next area of focus be, in addition to the two, in principle, already in place? Then we landed on …. that it's very much a matter of attitudes, of conditions and frameworks around people enabling them to do a proper job, and so on. These issues surfaced more and more as a result of cost reductions and somewhat tougher attitudes from the operating companies. So we said we had to announce this as an additional topic, and we called it HSE culture. And when we made the decision and wrote it into the regulation, it was more policy than anything else, formulated as a duty to *develop* a HSE culture ….

There was an understanding that this had to be digested in order to grasp what it was we were talking about. When we said "develop a HSE culture", then we start a process, we don't have a product requirement. This was very deliberate …. Certain considerations were already in place in the regulations. You could have explicated these considerations more clearly, but in that way you wouldn't bring them all together under one umbrella so to

[87] The concept of internal control seems to have emerged in the process that followed, without any obvious external influences. Inspiration from accounting was clearly rejected. One immediate reason for the change of terms was resistance from the unions to the concept of self-control.

> speak. For instance, you could have specified with more detail worker participation, worker responsibilities, management responsibilities, etc. But we wanted to pull it together within one 'umbrella concept' .... these things hang together, so it was natural for us construct this umbrella, and say that all the elements included shall be taken care of. Then the question comes up: what are all these elements? We didn't have the answer to that when the regulations were put in force, which meant that we had to start a development process to find out what the NPD intended to accomplish. And the industry had to do the same. And then we need to have good discussions together in order to promote that development. To some extent that's what we've had. We've prepared information products …. without claiming in any way to have the final formula. The intention is to try to clarify the content of this concept and to assist in the development process. And correctly, the process is not finished in any way. (PSA General Director)

We may note that the experimental nature of these regulatory developments were unwaveringly admitted, as were the necessity of creative engagements with the industry in fulfilling regulatory intentions and devising organizational designs and processes for that purpose. The ideas about a 'natural continuation' were perhaps the most widely shared outline and justification of the 'cultural turn'; it was clearly evident also in the account provided by the director for regulatory development:

> R: This paragraph on HSE culture can also be seen as the result of a long process, which may be traced back to the introduction of internal control when we started to focus on organization and decision processes, in the late 1970ties. That's when we introduced the first guidelines on risk evaluation as well as guidelines for what we then called "self-control", and later "internal control". The process started with the realization that the offshore structures, and the organizations needed to design and operate these, were so complicated that our traditional approach, using prescriptive regulation and detailed control, was no longer suitable. We had to find alternative ways of approaching this, and thus we came to the conclusion, in our supervision, to focus more on how projects and organizations were organized, how decisions were made and the considerations they were based on; rather than descriptive rules, specifying solutions. So this was how it started. …. Since then, we've been through a process of developing more goal based regulations and supplement these by references to acceptable industry standards in the guidelines, and focussing also on management systems, etc. Then, at one stage the health, safety, and environmental authorities – with regulatory responsibilities on the shelf – decided jointly to develop a holistic HSE-regime for the shelf, including safety, environmental, and health legislation. The concept of safety culture was not new. Using *HSE* was a consequence of this broader regulatory approach and perspective. It addressed how the operators complied with the regulations, not provision by provision, but as a whole. There were discussions on the issue of making HSE culture into a provision. Could you formally regulate this? Can companies be sanctioned for not adhering? And how could you define what was acceptable? There was a discussion whether it should be a purpose-like provision, similar to the intention of the WEA. The discussions ended up in a decision to regulate this area, in order to apply some 'pressure' on the industry. But in my view the difference in arguments weren't that significant, since it would be a difficult provision to enforce strictly anyway. There is so

> much discretion involved in the enforcement. But we thought that a dedicated provision would add strength to its implementation.
> I: Did you think it was needed, that it provided something new, something that was missing...?
> R: We believed so, we felt that. It was natural to develop the internal control concept and get a step further from procedure; to incorporate the internal control regime into an overall culture regime. That's how we saw it. Also internationally there was a process toward looking at more integrated approaches; not specifically dedicated to safety, quality etc., but to more holistic approaches. (director of regulatory development)

In addition to the 'natural process' argument, the idea of culture as the necessary 'next step' for further improvement, should also be noted. This was a widely shared notion, graphically displayed in a figure that recurrently appeared in presentations of regulatory developments, indicating the 'cultural level' to be the 'final stage' in a tripartite process, 'technology' and 'management systems' being the first two. Time appeared as the horizontal axis and HSE level appeared as the vertical axis and the 'arrow' ascended towards the age of culture. What was partly camouflaged in this visualization, and subject to some confusion, was how culture should be considered a 'novelty', only ambiguously contained in the preceding stages; or conversely, if technology or management systems had no role in the cultural phase.

It's difficult, but not necessarily critical, to determine the amount of hindsight rationalization in these expositions. Judging from the first responses, as perceived (and remembered) by the initiators, a long process of digestion must have taken place. In their view, the initial reception in the agency was not one of enthusiasm, and acceptance for the idea came only after much argument and persuasion. It was even argued that part of the justification for introducing culture was a perceived need for the agency to 'wake up' from their own 'self-complacency', and that the observed deterioration in the industry was reflected in the agency; but with the difference that the authorities didn't have equally strong incentives for change: "The difference is that authorities are normally less self-reflecting. Their self-complacence is more resistant. The industry *has* to change; they'll face sanctions, like loss of insurance, etc. But the authorities can defend themselves, point to the industry, point in all directions, except themselves" (former NPD

official). This ancient old *Qui custodient ipsos custodies?* question was to reappear occasionally, both outside and inside the agency.[88]

However, the process of digestion did not seem to leave any clear idea of how culture was to be addressed in future encounters with the industry. What was to be the outcome of the 'developmental process' in terms of confirming, fulfilling, or moving beyond established ideals of risk management, such as 'leadership engagement' and 'continuous learning'? With all the originators gone, 'HSE culture' somehow had to be reinvented, and the process of sorting out the regulatory implications and practical applications was taken over by others. We return to this follow-up process later.

Concluding remarks

The HSE regulations provide a comprehensive framework for the petroleum sector, virtually carpet bombing the industry with comprehensive statutory provisions and a large number of loosely associated industrial standards. They cover all aspects and actors in an intricate network, relying heavily on the active operation of self-regulating mechanisms to be installed within the hierarchies of industrial actors. The strategy is firmly based on the belief that regulatory capacities are more rationally employed by addressing the higher levels of risk management in the companies. Self-regulation is also a supplementary meta-regulation, not just a substitute for or a replacement of command and control systems. Thus it has also been termed self-administered command and control (Ayres and Braithwaite, 1992). But in the more elaborated forms of self-regulation, this labelling is not sufficiently precise. The self-administration must be enlightened, requiring extensive knowledge and self-reflection about how internal risk management processes in fact contribute to the fulfilment of the regulatory purposes. And these processes must attune the organization to continuous learning and improvement, not searching for the minimal standard of what's 'good enough". These were the ambitions of the new regulatory move, within which the cultural project was to play a significant part. Although there were some critical discontinuities in this reform process, the cultural turn can also be seen as a continuation, and was largely understood as such, of the long

[88] Taken to originate from Roman times, and translates normally as: "Who rules the rulers".

tradition of mobilizing self-regulatory resources in the industry. Although there were ambiguities as to what this new move would substantially add to the regulatory repertoire, there was still a strongly held belief that something was needed for penetrating beyond formal risk management systems.

5. Bureaucracy in action

> *The good inspector exemplifies the ideal of "flexible" regulation – neither uniformly legalistic nor overly accommodative, neither uniformly distrustful of regulated enterprises nor overly accommodative, neither uniformly distrustful of regulated enterprises nor overly trustful. The good inspector is willing and able to use the coercive tools of the law when necessary, but willing and intellectually able to make sensible compromises that avoid regulatory unreasonableness and elicit cooperation.*
>
> Bardach and Kagan (2002: xi)

The Petroleum Safety Authority Norway is located in the so-called 'knowledge park' in Ullandhaug, Stavanger, in walking distance from The University of Stavanger (UiS) and the International Research Institute of Stavanger (IRIS). Both these institutions have petroleum technology and risk management as two of their most prominent discipline areas, and contribute significantly to the development of knowledge relevant for both the PSA and the NPD. The Norwegian University of Science and Technology in Trondheim (NTNU), and some highly specialised consultancy firms also belong to this cluster of know-how related to the petroleum industry. There is extensive collaboration between these institutions and also some migration of people between them.

In this chapter, we look at how the agency uses their available resources in order to promote the regulatory goals.[89] Although 'behaviour modification' against the 'standards set' appears as critical criteria for the success of control systems, regulatory strategies involves a lot more than just 'compliance with rules', as should be evident from the foregoing. The ultimate goal appeared to be the promotion of enlightened risk management, entailing a number of difficult trade-offs, sensitivity to warning signals, responsiveness to internal and external regulations, adjustment to changes, and ability to continuously learn and improve. One of the newly employed PSA-officials, with some 25 years offshore experience as a safety manager, told me with some enthusiasm that the General Director had passed through the hallway one day, inviting anyone who'd

[89] This outline is written with the year 2006 as the 'ethnographic present tense', not implying any 'ahistorical bias', but rather as a convenient manner of representation. Policy statements and quotes referred in the text are found on the official PSA web-site that same year, and such references are not further specified.

encountered a “truly learning organization” to please come to his office and tell him immediately. Encounters with the industry largely took the form of confronting them with information gathered in order to make them act upon it in a purposeful and enlightened manner. Enlightenment was not the privilege of the regulator only. Although well resourced, they faced a well resourced industry, and expected them to know themselves better than occasional intruders form the outside. The cooperative context was essential, but not taken for granted. And if the trust was shaken, the enforcement measures were available and exploited.

Organization and resources

The PSA currently has some 165 employees and an annual budget of some 160 mill (NOK). The agency is headed by General Director Magne Ognedal. Originally trained as an engineer, he started his career in the NPD in 1974, and became director of the safety division in 1979. He has thus had a key role in building up the regulatory regime, and has been an active promoter of the ‘regulated risk management’ philosophies, both in Norway and abroad.[90] The senior management team furthermore comprises two directors of ‘supervisory activities’, a director for ‘professional competence’, a director for regulatory development, a director for ‘operational support’ (heading the administration and human resource unit) and a ‘strategic communication advisor’ (heading the information/public relations unit). Regulatory development covers all regulatory issues, including the follow up of international regulations, coordination of relations with other national and international authorities, and support to the ministry in the preparation of White papers, reform proposals, etc. A number of more and less permanent teams and project groups are formed that use personnel resources from all these four departmental areas.

[90] He was a key member of the so-called internal control commission in the late 1980s, preceding the internal control reforms on a wider national scale (NOU, 1987*a*; NOU, 1987*b*), and he was also an influential advisor to the Cullen commission after the Piper Alpha accident (1990), resulting in the development of the new risk management regime in the British sector. In fact, the Cullen report was occasionally referred to as the ‘Ognedal report’, although this influence was normally acknowledged only in informal contexts (see Beck, *et al*.; Ryggvik, 2000). His position within the offshore petroleum industry may be indicated by the occasionally employed nickname, ‘Mr. Safety’.

The organizational model was developed just after the establishment of the PSA in 2004. Although the team organization (see Chapter 4) by many was seen to have improved information-flows and perforated some disciplinary boundaries, the new management wanted more fixed structures, but still retaining some of the flexibility of the team model. The new organization should be task oriented; teams should be composed and work processes organized according to the nature of the tasks and problems faced. This organizational design is most clearly evident in how they solve the organizationally disparate concerns related to target group specialization on the one hand and disciplinary specialization on the other. In the present organization, 6 discipline areas constitute the basic structure, reflecting the complex variety of HSE-related issues. These are headed by discipline leaders, reporting to the 'professional competence' director, and with administrative responsibility for personnel resources. Six supervisory teams, headed by supervisory coordinators, reporting to the supervisory directors, constitute a secondary structure, dividing the regulated companies into designated target groups, notably oil companies, rig companies, and other contractor companies. This particular construction thus combines the disciplinary and the target group dimensions in a relatively ordered organizational matrix.[91]

The basic *disciplinary* units cover working environment, process integrity, drilling and well technology, structural integrity, logistics and emergency preparedness, and HSE-management and legal affairs. The number of employees in each unit range from 10 to 25. The *supervisory* units comprise a 'Statoil/Gassco team', which is the largest, a 'Hydro/Shell team', a team for the rest of the oil companies (ConocoPhillips British Petroleum, ExxonMobile, TotalElf etc), a team for all rig companies, one for the contractor companies, and one for the land facilities. Again, the number of employees in each team range from 10 to 25; administratively, however, they belong in the disciplinary units. The system thus implies that disciplinary and supervisory leaders act as leaders in one context and as ordinary group member in another; their latter role however limited by the burden of their leadership tasks. This structure facilitates both cross-disciplinary

[91] Resolving the inherent tensions between these basic organizational dimensions has been a major headache in several other regulatory regimes (Statskonsult, 1999; 2002).

approaches in encounters with the industry and transfer of experience across the landscape of industrial actors.

Although a number of professions are represented in the PSA, they are clearly dominated by engineers, roughly corresponding to the not uncommon '80/20 ratio' of technical/non-technical personnel in such regulatory agencies (Reason, 1997).[92] These cover a range of engineering disciplines, such as material science, construction, process-engineering, electro-engineering, etc., and include of course the more specialized disciplines within the industry, such as petroleum engineering, drilling and well technology. The working environment unit appears as the most multi-disciplinary, comprising chemists, biologists, physiologists, social scientists (anthropology, psychology), as well as engineers.[93]

Wage-levels are well above the average for public servants due to strong competition from the wealthy petroleum industry, ready to recruit attractive expertise from the labour market. Some also leave for consulting firms or R&D institutions. Generally the labour market is still able to offer considerably higher wages in particular areas. Depending on the level of activity and the economic fluctuations, certain disciplinary areas are particularly exposed to shortage problems, such as drilling and well technology, material science (corrosion, pipelines, etc.), and process-technology.

In national terms, at least within the traditional risk regimes related to health and safety, the PSA must be considered quite resourceful, measured against the 'size' of the regulatory space. Although they cover an extensive range of risk factors, the amount of regulated firms is limited. The number of operators has traditionally been low (10-20), and the principle of making the operating companies control actors further down the hierarchical levels has enabled the agency to concentrate their supervisory resources towards a rather limited number of actors. This broad picture is changing somewhat, however, both due to the increasing number of smaller operators and the fact that the

[92] Due to mixed educational backgrounds and organizational positions, exact figures can hardly be produced, But the 80/20 ratio appears as fairly accurate if internal/administrative staff is excluded, and would include also some 6-7 lawyers among the non-technical staff.
[93] Five of whom hold PhDs within their disciplines.

agency now approach the contractor industry to a greater extent. They also face a wealthy and resourceful industry with considerable administrative and professional capacities that can be mobilized in responding to the risk management requirements and assume responsibility for self-regulation. Such aspects of the 'controller-controlled ratio' are important for understanding the regulatory and supervisory options and strategies. The PSA is thus able to engage in quite diversified and comprehensive encounters with the actors, and the supervisory teams will be able to acquire substantial insights into the management systems, practices, and cultures of the companies.[94]

Priorities, plans and interventions

Although strategic priorities cover the whole spectre of agency activities, such as regulatory development, information, professional advice, and collaborative projects, we concentrate here on the supervisory tasks. Supervision is used as a comprehensive term for most encounters with the industry. These constitute the principal context for enacting the public role towards the companies and occupies roughly one third of the agency resources. We provide here only a rough outline of how overall philosophies, goals, resources, and informational sources are transformed into practical action.

'Risk based supervision'

Disposing available resources in a purposeful manner is in itself a priority, and much energy is devoted to developing and 'enacting' models and criteria for prioritization. The principal policy is that supervision shall be risk based and systems oriented. Risk based supervision has developed like a mantra in all Norwegian HSE agencies during the last two decades, and is generally formulated through the doctrine of giving priority to the 'greatest risks with the highest improvement potentials'. The principle of risk based supervision should not be interpreted as being restricted to any narrowly defined set of supervisory encounters with the industry. Rather, it is part of a more general public

[94] A contrast here with the onshore Labour Inspection is illustrative: It comprises some 500 employees regulating and supervising some 240 000 employers, spanning a highly diversified regulatory space of sectors and risk profiles, and generally facing much less resourceful and motivated regulatees. The Statoil/Gassco team , by comparison, alone include more than 20 agency officials for supervising two companies. And a meeting with the CEO of Statoil, holding 60 percent of all the operatorships on the shelf, must be considered a 'deep impact' encounter (compared to, say, a labour inspector supervising a grocery store).

management orientation toward efficiency, performance, and outcome-based result. Risk-based regulation and supervision are the logical extensions of this orientation in a risk regime, and implies neither more nor less than 'optimal risk reduction' as the ultimate outcome benchmark, to the effect of identifying the intervention strategies best suited for that purpose. The challenge is even greater in the PSA, as no other agency in Norway covers such a broad spectrum of risks, all of which would be subject to forces only variably within the sphere of agency influence. The allocation of internal resources is not only supposed to reflect the 'risk picture', but also the expected impact of any specific intervention. Self-reflective acknowledgement of the limits of organizational rationality in the face of these conundrums would occasionally surface. Indeed, after first lamenting the industrial failure to assess the effects of the measures and remedial actions required by the PSA, the General Director allowed himself to reflect a bit more modestly on the difficulties involved in making such assessments, comparing them to the difficulties involved in meeting similar requirements from their own principals:

> R: It's really what the Ministry asks us to do. What's your contribution? So we try. We're starting a project now to establish indicators in order to measure the effects of what we do. That's really a challenge …. A few years ago we initiated a project together with the industry in order to reduce the number of gas leaks with 50 percent within 2005.[95] So we instigated an industry project, and we followed it closely …. Now it looks like we'll reach that goal. That looks very good. But then there's the question: what's our contribution in this? What we've done is that we've put it on the agenda, demanded action, suggested means, suggested a goal, and we've got acceptance from the industry. So, that we as an authority focus on certain issues and put pressure on the industry - that will produce results and that is now confirmed. …. So through follow-up meetings, through supervisions that focus on HC-leaks [hydrocarbon-leaks], through such measures, we can keep up the pressure and produce results.
> I: But you could proceed like this, area by area, and try to measure the net effects of your contribution, to take account of all external factors, and so on…?
> R: Sure, it's really a challenge. (General Director)

The last remark was an understatement. It may come as no surprise that the 'indicator project' referred to, proved difficult to complete in a satisfactory manner. As noted, the RNNS project had in itself required lots of energy, resources, and computational skill; but justified agreement about the development of the various risk indicators and their relative contribution to the larger risk landscape, would constitute only a first step, a necessary

[95] See reference to the gas-leak project, chapter 3, pp. 76-77.

condition, for identifying the expected relative impact of any particular agency intervention. As was admitted with some resignation by one of the supervisory directors: "it proved very difficult". Ambitions had to be tempered considerably, in particular with respect to quantifiable indicators, and much self-reflective and discretionary judgment was required in order to link output measures to overall strategic choices and the more specific forms of intervention.[96] Relating developments in risk levels to regulatory and supervisory efforts also raised some 'auxiliary' questions of a rather different order; that is, about praise for 'successes' and blame for 'failures'. In the former case, it could run counter to the tripartite collaborative ethos to claim too much credit for improvements; and conversely, it could of course strike back on the authorities in the case of negative events or trends.[97]

Still, some critical, but not mutually exclusive, dimensions may be identified, along which the priorities had to be selected. They include such factors as the types of risk to be addressed (major accidents, injuries, or occupational illness), the stages or points of intervention (preventive, harm-based, or act based), the various causal antecedents of harm (technological, human, organizational, - or 'cultural'), the performance records of the companies (however measured and ranked), the organizational points of intervention within the industrial hierarchies (from licensees to sub-contractors), and the intervention methods to be employed in encounters with the industry (from collaborative projects to supervisory audits). Not surprisingly, very rough estimates and evaluative judgements provided the background for how priorities were made, and the outcomes would be produced in quite complex organizational processes, ranging from the ministerial level down to the single agency official.[98]

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[96] Quantified ministerial targets is thus typically related to input factors, such as hours spent on supervisory activity, currently amounting to some 60 000, which approximately represents 1/3 of their total resources. In 2005, this amounted to some 125 audits and supervisory activities. It may be noted that a recent evaluation report commissioned by the ministry omitted outcome effects altogether.

[97] Certainly, the opposite mechanism could also be observed: blaming the industry for failures and claiming credit for improvements.

[98] A certain reluctance could be observed in 'pushing' these overall risk-cost-benefit-analysis issues too far, reflecting a certain distaste for measuring the economic value of outcomes (such as the value of a lost life). But the issue was recurrently voiced and addressed, such as in both the 2002 and 2006 White papers (see chapter 3), and certainly also dating back to the pioneer era.

Some priorities are ‘fixed’ in the sense that they are more or less permanently embedded in the regulatory framework and in the composition of professional resources. Other priorities are more ‘variable’, partly because they are subject to longer term planning processes, and partly because they are adapted to dynamic and changing circumstances. In responding to a question about overall priorities, the disciplinary director in fact drew attention to the ‘fixed’ priorities in terms of the current distribution of professional resources:

> R: Traditionally, major accidents have had a lot of attention, because everyone understands the potential. But to damage your hearing after long term exposure, it’s not that easy to get the attention …. It takes such a long time. And then there are often so many other factors that have an impact, like from your private life.
> I: But you make priorities?
> R: Yes, but given that we’re also measured against result, it’s easier for us also to focus on issues where these results are visible within a range of say one or five years, rather than twenty. We must be firm in our long term perspective…
> I: You could think of a radically different distribution of resources .. like 50 percent on working environment?
> R: Well, that’s partly what we’ve done. Look at Statoil; they have like 600 drilling engineers, we have ten, but within working environment they don’t have more than we do. So we’ve done a prioritization, we’ve upgraded working environment considerably, compared to the normal distribution within the companies. … just to provide a rough picture. Half of the drilling engineers work with safety related issues, like well integrity and well control. Most of the disciplines have interfaces toward working environment. But there must be a balance; the technology must work, there must be stability on the floating installations, the structures must not yield, pipelines cannot crack or burst, and so on .... (disciplinary director)

The presence of high risk technologies and the prospect of large scale accidents, against the ‘softer’ area of working environment, thus appeared as a major priority issue. Traditionally, the former has been favoured, and in that respect, clearly reflecting also the priorities of the industry. It could be justified by drawing up worst case scenarios of the potentially devastating effects on the whole industry and its role in the Norwegian economy. But health and working environment had gradually gained a more prominent position and were increasingly also seen as critical for the safety levels on a broader scale. Indeed, an ‘integrated perspective’ on HSE and the interrelation between the constituent parts appeared as a major perspective in agency policy.

In short, the priorities were the result, not of precise indicators and calculations, but of much discretionary judgement about the relative 'size' of the broad spectre of 'residual risks', and of how interventions could contribute to reducing both the size of the risk and the size of the 'residual'. As noted, the concept of residual risk denotes the size of risks not handled by other regulatory systems. However, as intervention in the corporate regulatory systems was at the heart of the 'higher order' regulatory philosophy, 'reducing the residual' appeared as a primary purpose of intervention. Indeed, the assessment and evaluation of 'primary' risks were key elements in the corporate obligations.[99]

Addressing the industrial hierarchy

The policy of addressing, not only the intra-company but also the inter-company systems of control was justified as an optimalization of the regulatory resources. As evident from the regulatory system (see Chapter 4), a crucial idea has been to exploit the contractual hierarchies within the industry, by making the upper level actors control lower level actors. Operators have had an overall responsibility for all activities within their sphere, including all other firms directly or indirectly involved in the operations. Thus, they were responsible for the surveillance of contractors, sub-contractors, and the supply industry; contractors were also responsible for the surveillance of sub-contractors, and sub-contractors for sub-sub-contractors, etc. In this manner an intricate system of hierarchical controls has been devised, sometimes covering up to six or seven contractual levels. At its best this has been an ingenious way of incorporating checks and balances and establishing self-regulatory mechanisms at an overall systems level. The system strategically localizes the point of intervention but also relieves the agency of some supervisory burdens, as it has been possible to substantially delimit the number of companies in the target group, concentrating and directing most resources at the top level of the contractual hierarchy. All actors have had their specific responsibilities according to the regulations. As was noted by one of the supervisory directors: "One of the most important strategic choices made within supervision has been to approach the

[99] Such as the application of the ALARP principle. Indeed, the complexities involved in following up this requirement could be indicated by the fact that one of the leading risk experts in the R&D network (a professor at the UiS) had been commissioned to make a 'preliminary' evaluation of corporate 'compliance'. Not surprisingly, great variations were disclosed, including also variations in the interpretation of the 'principle' as such (Vinnem, 2006).

responsibilities of the various actors within the pyramid". Up to the late 1990s only the operators were subject to agency supervision.

However, this has also been a vulnerable and complicated system. Gradually, there was a growing need to approach lower level actors directly. First the ship-owners (rig-owners) and then other large contractors were included as target groups for supervision. Although transparency in accountability was one purpose of the system, the opposite effect could also emerge. As was explained by one of the supervisory directors:

> We saw a development where the operators didn't fully have hands-on control of all the suppliers. They were also submitted to severe rationalization processes. We also received information from contractors/suppliers that there was a very long distance from them to the authorities; that they'd always have to go through the operators. So you had the questions of cost-generating regulation, and of who were the real conveyors of requirements: the operators or the authorities. Do the operators hide behind the authorities when they specify their requirements? Which were really operator requirements of a commercial kind, and which were authority requirements related to safety? (supervisory director)

Also, in 2000, audits were for the first time targeted directly towards licensees. Departing from the hierarchical principle has not been only a smooth and uncontroversial path to follow. The exclusive focus on operators provided a possibility for supervisory concentration and uniformity. But the issue was not simply one of relieving supervisory burdens, but of optimally exploiting available resources and of being firm on the matter of hierarchical responsibilities. By subverting the system, operators could start feeling relieved from their own control tasks. One such critical issue arose with regard to the drilling rigs. In order to facilitate the transfer of mobile rigs from various jurisdictions, there was a need for a joint system of 'minimal certification'. This lead to the development of the so-called AoC system (Acknowledgement of Compliance), defined as "a decision made by the PSA to the effect that the technical condition of a mobile facility and the applicant's organization and management system are considered to be in compliance with relevant requirements in Norwegian shelf legislation.".[100] The AoC system is now being extended to comprise other mobile units as well, such as flotels and mobile production-ships.

[100] http://www.ptil.no/English/Helse+miljo+og+sikkerhet/Tilsyn+og+raadgivning/SUT_hovedsiden.htm

Supervisory plans and strategies

The supervisory policies encompass a broad range of interventions, from meetings with top company managers to spot checks on a facility. The bulk of supervisory activity is carried out through audits, with the purpose of providing an overall evaluation of compliance with regulatory and management system requirements.[101] A fairly detailed supervision plan is prepared each year, based on the general priorities and the more detailed knowledge provided by the supervisory teams.

The yearly priorities are formally based on the ministerial *letter of award*. In practice, of course, the agency has considerable influence on the final outcome.[102] The planning process starts in the spring, as priorities are fed into the government budgetary process. These inputs are primarily based on the observed trends in risk levels (such as reported incidents), and on societal, technological, and organizational conditions and changes thought to affect future risk levels. Such overall topics may include organizational interfaces, integrated work processes, management of change-processes, aging platforms, aging work force, etc.[103] There is a considerable amount of interaction between the agency and the ministry in this process, as inputs to the letter of award are produced during the fall and a draft is then sent to the ministry. It is formally sent to the agency in

[101] The Norwegian term, translated here as 'supervision', is "tilsyn". "Tilsyn" har gradually appeared as a common denominator for all agencies with supervisory tasks, but refers more specifically to those particular sets of activities with the purpose of actively assessing and sanctioning regulatory compliance. The actual inspection practices follow the standard guidelines for quality audit/assessment, adapted of course to the specific area of control.

[102] A practice of letting the agency draft the letter of award was in fact introduced in the early 1990s. As was explained by a former Director General (1990-1997) of the ministerial Department of Working Environment and Safety: "They produced drafts which were much better than what we could have accomplished on our own. And the priorities in terms of supervisory activities were to a large extent 'stable', with recurring issues related to the regulated activities. They could from their position make more enlightened judgements about the exact composition and priority of tasks". But clearly, this was an interactive process; as was explained by one senior official that had been heavily involved in these processes in the 1990s, the letter of award appeared as a way of 'seeing oneself in the mirror'. The phrase expressed both the impact the agency had on the outcome, but also the self-reflective process of having to account for and justify the strategic choices in the face of a critical and ardent principal.

[103] See also chapter 3. Examples of such overall priorities in 2007 are: aging installation, subsea facilities, onshore facilities, onshore-offshore integration, environmental vulnerability, *e*-operation, value creation, and internationalization. Integrated operations (e-operations) has become a major issue over the last years, as increasing portions of the actual offshore operations are carried out from quite advanced multi-media and computer-based onshore control-rooms. These may in fact be located anywhere in the world, and involve several cooperating companies responsible for different parts of the operations.

January, and the chances it's returned without major modifications are considered to be fairly good.[104]

The overall priorities are to be further elaborated and operationalized by the supervisory and disciplinary groups, however, and a so-called priority memo is produced for all groups of actors, including proposals for activities and measures related to every single actor. The teams also prepare a so-called 'actor-image' each year, based on meetings with the companies, audit experiences, consents and exemptions given, specific projects, reported incidents/accidents, willingness and ability to comply with regulations, etc. These summaries both serve as input to the upcoming plans and as more 'holistic diagnoses' that are communicated to the companies in so-called 'status-meeting' that are convened each spring. Considerations beyond 'past experiences' with the individual companies must also be made, such as upcoming change-processes, internal projects, or audit-plans. The more detailed activity plans must reflect the whole spectre of risk issues and perceived needs for intervention. The distribution of regulatory burdens must also be considered; as was noted by one supervisory coordinator: "We cannot keep up a constant heavy pressure on a company. We also have to give them time to follow up our requirements and orders, and then come back to assess the results when they've had time to implement measures". The concrete planning of supervisory activities is fed into a supervision database. Caution, logistic ability, and planning systems are needed in order to avoid colliding activities, and it is the responsibility of the coordinator to make decisions about how the various measures are composed and utilized. This includes how supervisory interventions are distributed across the companies, both in a short term and long term perspective, and how formal means are employed, with due consideration of varieties in company performance.

The supervisory plan does not distinguish clearly between audits focussing on management and control systems, and verifications more concerned with measurements, testing, inspection, etc. One single audit may contain elements of both, although the

[104] Political agendas are still evident in some cases, such as issues related to social inclusion and social dumping. The PSA also respond to input from the Pollution Control Authority, the Board of Health and the other agencies that they cooperate with.

theme of the audit will imply a bias towards either. Such themes cover the whole range of possible interventions, varying in resources invested, scope, generality, and the choice of HSE-elements to be covered. Supervisions can be directed towards ‘generic’ issues, such as ‘HSE-management’, ‘follow-up of incidents’, or ‘management of change and re-organization’. Some supervisions have an explicit focus on the internal hierarchy of self-regulatory mechanisms, and may trace the management of a defined area of risk from the overall systems perspective to the operational levels on some selected sites. They require a lot of resources however, but they also facilitate a more comprehensive evaluation of organizational performance on a broader scale. A large group of supervisory activities is specifically directed toward defined and delimited risk areas, such as lifting operations, well control, working hours, automation, electricity systems, etc. Some supervisory activities are also more ad hoc based, being conducted to follow up specific incidents or accidents (see below).

The audit process

The actual audit process involves, first, a notification to the involved parties some three weeks in advance about purpose, scope, time-schedule, agency participants, documents to be prepared (some of which are sent to the PSA in advance), notification of the safety representative, etc. Questions and clarifications are made in the interim period. In preparing for the audit, the team must assess the nature of the relevant statutory requirements, in particular their level of detail and specification, and to what extent the auditee is expected to have formulated internal requirements, which may include decisions about the amount and nature of company documentation to be studied before the actual audit, and what can be done on the spot. The audit itself starts with an opening meeting, with the agency explaining the purpose and scope of the audit, methods to be used, schedule, and practicalities. Normally, everyone from the company expected to take part in the audit is invited to the opening meeting. In particular, the safety representatives are expected to be present, and are also specifically informed about the right to a separate meeting with the team and the possibility to participate in physical inspections on the facility. Normally, a separate interview is conducted with the safety representative as part of the audit plan.

The audit is then conducted, with documentary analyses, interviews, and site observations; the latter may include improvised talks with employees encountered during the inspection. A closing meeting concludes the audit, where the team summarizes their main impressions, and the auditee is invited to give comments or supplementary information. No conclusions are presented at this stage regarding the specific observations or their legal status. The report shall be sent (with a copy to other involved parties) within three weeks, and list all findings and comments along with the 'supporting evidence'. Any formal measure (order) shall be notified in the accompanying letter. A summary of the report is posted on the PSA web-sites. The auditee is allowed a four week deadline for responding to the rapport, including how non-conformities have been or will be followed up. In the (rare) case of notified orders, the response shall comment on each specific item in a satisfactory way for the order to be dropped (i.e. by providing new information, specific measurements planned or taken, etc.). In the majority of cases some disagreements surface about the appropriateness or sufficiency of company performance, about the 'facts', or about the interpretation of observations as 'non-conformities'. Most of these disagreements are resolved through 'dialogue' or 'clarifying meetings'. If agreement is not reached, the PSA will normally order the company to implement the required measures. The audit is 'closed' when the companies have provided a satisfactory response, including a report about the measures taken or planned. Normally, the PSA will not physically seek to verify these implementations as part of a general follow up. Spot checks may however be taken in subsequent audits.

Points of interventions

Using the conventional distinction between preventive, act-based, and harm-based interventions (Baldwin and Cave, 1999), the former two clearly absorb the majority of resources. Given the heavy reliance on enforced risk management strategies, it is not easy to distinguish preventive from act-based interventions, however. Authority intervention, in terms of checking that the self-regulatory mechanisms are properly enacted (like conducting risk assessments), addresses both the preventive effects of the assessment and the act of conducting them. Likewise, adherence to internal procedures is (in 'theory')

preventive, but sanctioning non-compliance is act-based. Conventional preventive interventions, would be difficult due to information problems, and would sometimes run counter to the strong 'no-approval' ethos. The agency needs a *charte blanche* in pointing to and assigning responsibility for whatever non-conformity that might be discovered.

> This point can be illustrated by an example quite some time back, where an operator was going to develop an oilfield offshore. There were challenges related to the seabed, and they had to be confident about the foundations. They commissioned two consultancy firms to conduct studies and as could be expected, they come up with two different solutions. So the company sent these to us, asking which one to go for. Our response was to inform the company that this was a decision *they* should make and then present their decision to us. With this regime you put the responsibility in the hands of the company in the first instance; and if they have one or two sleepless nights, that's quite all right. At least, they'll check once and twice before they commence. (director of regulatory development)

Generally, the agency has been extremely cautious in not undermining the responsibilities of the regulatees. No approvals, decisions, or 'signals' that could be interpreted as approvals should be given. The agency would just point to the non-conformities discovered during supervisions. They would never give anything resembling a stamp of approval or a "clean bill of health".[105] The consent system, whereby the operators have been required to apply specifically for consent from the agency prior to the start up of activities (such as at certain pre-defined milestones or phases in a project), has been carefully designed in order to avoid such 'misunderstandings'. The consents are given on the basis of a self-declaration from the companies (including possible deviations from plans or regulations) where they must confirm that activities can commence in a 'satisfactory manner'.

Harm-based interventions were largely conducted as investigations of incidents and accidents, including the sanctions that would normally follow. The PSA investigate some 10-15 incidents/accidents each year, selected according to their seriousness, and a much larger number is investigated by the companies themselves. A limited number of the most serious cases are also investigated by the police. Compared to the onshore risk regimes, these investigations were given high priority, in terms of both resources spent and the

[105] The phrase is used by Perrow (1999: 359), referring to the practice of the US Occupational Safety and Health Administration, and indicates, implicitly at least, the regulatory risks involved in 'awarding' such approvals.

internal and public attention they received. It would be a mistake, however, to assess this priority against the ordinary arguments given for harm-based interventions, such as preventive deterrence. Partly, harm-based interventions were in all respects supplementary strategies, not substitutional ones; and partly they were indeed seen as preventive, not primarily with the purpose of deterrence, but rather with the purpose of 'learning-from-failure'.

Even though enforcement costs sometimes justify harm-based intervention (it's cheaper to sanction the relatively few instances of actual harm than the much larger number of potentially dangerous causes/acts), such considerations were not important. First, investigations were in fact quite costly and time consuming; second, the reports primarily identified, post hoc, the violations of regulations and procedures and were thus more like an 'after the (f)act' kind of act-based intervention, sometimes also conducted in the absence of actual harm (the gravity of harm-*potential* being an important criterion). Although the findings would always support subsequent action, including orders in grave cases, the justifications were not primarily based on deterrence arguments. Still, investigations could be seen as a kind of 'punishment'. Investigation reports were published on the web-sites, and there was a certain 'bad boy' stigma attached to having behaved in such a manner that the agency had to investigate the matter; and the production of subsequent sanctions could also be done with more evidential scrutiny and support. But an important justification was also that of information-gathering on a 'supra-case' level. Investigations were thought to provide unique insights into the causal antecedents of incidents and thus a contribution to the body of learning and knowledge necessary for preventing new ones. This applied to the company itself as well as to the agency. But also, they wanted the reports to be read by other companies in order to fully appreciate the 'lessons learned'.

Policy instruments and enforcement practice

The law enforcement philosophy of the PSA could perhaps audaciously be said to follow *The law of the Phantom*: "tough towards the evil and kind towards the good". But whereas the Phantom leaves his signatures (the Good Mark or the Evil Mark) as

permanent imprints, no such enduring and encapsulating signs of approval or disapproval would normally appear in the diagnostic practices of the PSA. To the contrary, they would take care to accommodate their policy instruments in order to avoid just that. As is evident from their basic regulatory philosophy, all signs of authorized approvals would be avoided. The agency would take care always to be free, after the fact/event, to make the company fully accountable. But neither would they treat their subjects as proven or potential villains. As will be apparent later, the early attempts to apply the culture provision in formal encounters with the industry stirred uneasy sensations of having used the Evil Mark ('bad HSE culture').

Working theories of regulatory compliance were more in line with the 'political citizen' model or the 'organizational failure' model, than with the 'amoral calculator' model (see Chapter 2). But, taking account of the possibility of the latter, the enforcement options and practices reflected rather what has been referred to as a 'tit-for-tat' strategy (Ayers and Braithwaite, 1992). That is, measures taken would be highly contingent, containing a diversity of informal and formal measures, and employed according to a broad range of circumstances, the gravity of the observed transgressions being seen as the most important. The availability of instruments within the enforcement pyramid allowed great flexibility and reliance on accommodative modes. Having ultimately the power to influence the chances of being granted access to the attractive markets, they were able to "speak softly with big sticks". As observed by Ayres and Braithwaite (1992: 19): "Paradoxically, the bigger and more various are the sticks, the greater the success regulators will achieve by speaking softly". Accommodating these instruments to the highly complex and versatile contexts of application required much discretion and professional judgement, confirming the claim that "There is … as much art as science in enforcement since trade-offs have to be made on a number of fronts" (Baldwin and Cave, 1999:117).

The doctrine and context of 'dialogue'

Dialogue and cooperation thus appear as key words in most accounts of relations with the industry. And as noted, agreement is normally reached between the PSA and the

companies before formal enforcement measures need to be used. Seen against the availability of variously sized ‘sticks’, there is some understatement contained in the more laconic formulation of official policy, where the PSA follow-up after a supervisory activity is described as “generally based on dialogue and cooperation with the players on the Norwegian shelf”, and that, as a rule, “agreement is reached between the PSA and the audited companies concerning our findings and impressions from the audit.”

On the whole, the industry is regarded as compliant, disciplined, and well-behaving. Although the reasons for this cannot be reduced to instrumental calculation only, industrial responses to regulation could variably be attributed to their affluence, to the reputational risks, and in the last instance to reduced chances of being granted future licenses. There was also a general observation that the readiness to comply would change if the companies were no longer interested in new licences; or at least that the interest in taking active part in the ‘beauty contest’ would diminish (Ryggvik, 2000). As long as the contest counted, even quite cost-generating measures were gradually accepted, like the remote drilling technologies which were introduced from the late 1980s. The Oil Industry Association and the Rig Owners Association could partly take the role of giving voice if regulatory interventions were seen as disproportionate or unreasonable. But generally, a certain amount of ‘self-restraint’ was apparent from industrial actors in terms of actively and openly voicing any critique of enforcement practices.

The industrial timidity would occasionally be subject to self-reflecting comments from agency officials, including also on the implicit powers of agency officials in their, sometimes unheeded, encounters with the industry. Enforcing compliance by ‘raising eyebrows’, would not bring any disagreements to the surface. In informal terms, the point was made more explicit. Although the risks related to market access are difficult to assess, the scenario of damage to reputation was seen as sufficiently efficient. As was noted by one of the disciplinary leaders, the companies made the connection themselves, whether it was justified or not:

I: How do you notice this mechanism?

R: I guess we notice in our use of measures … we don't need to use such severe measures in order to get things through; it's enough to hint at something to make the companies act.
I: So it's enough to just raise eyebrows…?
R: Sometimes, yes. (disciplinary leader)

Such mechanisms were seen to influence the company even if orders or complaints on orders in themselves had little impact on the company evaluations which where produced as background documentation for the awarding of licences. Rather it was the assessment of the HSE-standards as such, over time that mattered. But, generally, a certain self-restraint from the companies in objecting to enforcement practices or using their right to appeal or complain was observed from PSA officials as well as from the companies themselves. As was noted by a senior legal advisor: "The companies know that we make these evaluations and recommendations for the ministries. So they know HSE is part of the picture".

Enforcement measures

Law enforcement is no trivial pursuit in the petroleum sector. As noted in Chapter 3, an order to the industry may have huge economic impacts, and the petroleum authorities are arguably among the most powerful within the state administration. In one conspicuous case, an order was notified that the whole Ekofisk field be closed down unless extensive technological modifications and improvements were implemented. The total costs were estimated at some 20 billion (NOK).[106] This may only indicate the extreme end of the spectrum, and most cases were of less dramatic kinds; but regulatory intervention would potentially generate large costs, such as those requiring temporary production stops.

The enforcement measures are often displayed as steps on a staircase, the uses of which ascend according to the severity of the regulatory transgressions. It starts with 'dialogue', and is followed by orders, coercive fines, stopping activity, legal prosecution, and finally, expulsion. The enforcement strategy is displayed as a downward arrow to show that the accommodative alternatives are the preferred policy instruments. The term 'dialogue'

[106] This was in the early 1990s, and involved extensive negotiations and lobbying from the involved companies. The ministry was of course notified (a governmental memo was also produced), but voiced no clear position besides confirming the right of the NPD to notify the order; in the case of appeal, they could not commit themselves to any predetermined opinion. The case was finally resolved and the company (Phillips) conducted the upgrading of the field.

thus covers a broad spectrum of encounters with the industry. In terms of enforcement measures, dialogue subsumes a number of informal strategies, such as 'requests', informal warnings, identical letters to groups of actors about trends or general observations, copy of letters/reports to superiors within a company, safety messages, summoning meetings with company management, etc.; in short, all non-statutory initiatives taken to influence company behaviour. Even the posting of report summaries on the web-site may be considered as part of an enforcement strategy.[107]

A so-called 'Handbook of enforcement measures' provides rough guidelines for how the various instruments are to be applied in various circumstances. "Requests" are the most common response used in the follow up of audits. Requests are used as a first response even when non-conformities can be categorized as regulatory violations if these do not justify the use of orders. They might also be the response to observations that cannot be strictly categorized as non-conformities (referred to as "potentials for improvement"). Such responses may also be based on the more evaluative and discretionary judgments not specifically related to single observations but to overall 'impressions' that are not (or cannot be) easily substantiated by 'evidence'.

An order is a formal and legally binding enforcement measure. It is considered a "powerful preventive policy instrument" that clearly signals that the violation is of a serious kind with a considerable potential for causing harm. It may also be used when the actual violation (in isolation) is of a less serious kind but when the company in question has a bad record of responding adequately to the milder requests. Orders shall always be preceded by a notification, in itself seen as a strong signal to the company. Occasionally, the notified orders are not issued, or they may be modified or altered, due to faulty assumptions from the supervisors or corrective action taken by the company. But as a rule, notifications result in orders, indicating that there has been a preceding process of

[107] This risk of sanctions was indeed phrased in conjunction with the doctrine of dialogue, making dialogue conditional to the 'cooperativeness' of the firm, as evident from the following statement "there is a continuous dialogue between the Petroleum Safety Authority Norway and the players on the Norwegian shelf. For us, this dialogue is a means of influencing decisions/actions, and it is a central element in our supervision strategy. If the dialogue is unsuccessful, we can give notice of orders, and then orders. In serious cases where safety is endangered, we can demand that an activity be temporarily stopped. The authorities can also file charges with the police and impose fines" (http://www.ptil.no/English).

trying to come to an agreement. Normally, requests (and orders) do not specify changes or solutions to be implemented. This follows from the regulatory philosophy and the nature of the regulations, and the regulatee is rather prompted to 'do something', that is, to analyze causes, identify alternatives, and take 'appropriate action'. The message of self-diagnosis and self-treatment is as integral to the enforcement philosophy as self-regulation is to the regulatory philosophy. Responsibility must be firmly placed on the regulatee and auditee, not on the regulator and auditor.

The frequency of enforcement measures decrease with their strength. In fact, the strength of formal instruments may be indicated by their infrequent use. Only some 10-15 orders are issued each year; some of them are also related to the same incidents, but issued to several companies involved.[108] Orders are thus 'unusual events', as are the legal instruments further up the 'enforcement staircase'.[109] Legal prosecution will normally follow only very serious incidents or accidents, and will regularly result in a ticket fine (see below). All formal PSA decisions (like orders) can be appealed to the ministry. This occurs very seldom, perhaps once or twice each year, and if it does, the PSA decisions are confirmed in some 50 percent of the cases.[110]

The enforcement handbook, internal training programs, and the administrative quality systems, clearly provided clues as to how due processes were to be achieved; but to develop a uniform practice and culture of law enforcement were a constant and ongoing challenge, involving the comparison of quite diverse cases, dealing with complex socio-technical situations and contested risk contexts. As was explained by one senior legal advisor:

[108] Ten orders where given in 2003, three in 2004, fifteen in 2005, and 10 in 2006.
[109] Coercive fines are extremely rare, and are used when orders are not complied with within the deadline. Stopping activity is also rare, and shall only be done when there is an immediate danger. As explained by the agency: "Normally, the company will stop such activity themselves", referring also to the rights of the safety representative to stop dangerous work according to the WEA. Expulsion in terms of withdrawal of license or change of operator is the ultimate enforcement measure, but has never been used.
[110] It was suggested by the OLF, however, that many companies often saw the agency and the ministry as 'externally voicing the same views', possibly causing a reluctance to appeal. The relatively high proportion of appeals supported by the ministry (some 50 percent) was suggested as an indication that complaints were often justified, and the OLF argued more generally that the right to appeal should be used more actively by the industry (OLF, 2006).

> R: Like, we have this stair-case, indicating degrees of seriousness. The steps are meant to specify how measures should reflect this. But how do you define what is "very serious"? What criteria characterize a minor incident? And so on. It turned out to be very difficult. We tried to formulate criteria, but we simply had to give it up. It was too difficult. Like, you cannot link it to specific requirements, that transgressions of this or that provision were less serious or very serious. Even if some requirements are more critical.
> I: So is it more like intuition, then?
> R: What we would say is that …. as an administrative authority you're obliged to treat similar instances uniformly. But what is "similar"? So it's more like …. the various disciplines need to agree within their field, as a minimum. And then there must be a correspondence across disciplines. It takes a lot of coordination.
> I: But do they manage within disciplines?
> R: I really don't know …. It's not really law in that sense. It requires very good processes. You need to compare instances. Complications arise if you have a case, and you have some previous case, and then you must compare …. And no one knows what the future will bring. …. You need good processes to assure yourself that you find the right level. That people talk together ....
> I: Do you get rapports from the industry that you're not harmonized?
> R: Well, from time to time we're told that it's not uniform. (senior legal advisor)

I certainly had neither the competence nor the intention to press the questions further. There was some uneasiness related to these issues, however, and it was not altogether clear how the internal work processes contributed to transparent and harmonized enforcement practices. Certainly, there were rumours and some complaints from consultants and other external observers about 'hidden orders' and lack of accountability.[111] The important point, however, is the general lack of close legal scrutiny and pressure from the industry to test out the legal limits; one legal observer and specialist described the regime as an "almost empty legal space", referring to the fact that there was hardly any case law and that the legal standards were never tested in courts or challenged by the industry. Lack of transparency and unclear legal warrants for agency decisions were clearly of some concern to the industry, evident from the issues voiced in the 2006 report from the OLF on the use of cost-benefit evaluations (see Chapter 4, OLF, 2006).[112]

[111] Accountability in law enforcement was one of the apparently few critical issues in the evaluation report commissioned by the ministry in 2006.

[112] The report argued that comparable cases were not always treated equally, depending on both professional area and individual factors. The issues related to work hours, rest, and restitution were specifically mentioned as unduly warranted. As the regulations generally required much discretionary judgement in order to establish whether 'compliance' was achieved or not, the process and method of making such judgements were all the more critical. Some thus voiced the opinion that authority judgements

There is obviously a considerable amount of discretionary judgement involved in deciding upon the right use enforcement measures and thus also the interpretations that can be made from simply 'counting' them as indications of the 'enforcement policy' of the PSA. Several mechanisms were at work that contributed to keeping enforcement and compliance questions out of the legalistic flashlights; one was the 'problem-solving' approach of peers meeting peers. As was observed by one senior legal advisor in the PSA:

> I: Do you have many disagreements on facts and legal interpretations in your enforcement practice?
> R: Not often. Not necessarily because there is no reason to. There may be formal flaws and so on. But often they come to an agreement. They are received by engineers and written by engineers. And normally they come to an agreement. At least if no large costs are involved. But also when costs are involved, they may accept. I believe it's largely due to professional and practical agreements between engineers. There may have been, previously, a somewhat mistaken belief that if they protest it may influence the allocation of licenses or other things. Even if it didn't have any real impact, they created this conception of reality. That may have been one reason why they didn't protest, even if they had some justification for doing so.
> I: So the reason for compliance then?
> R: You have engineers on both sides. Lawyers and economists in the companies tend not to be involved. So they just consider the technical aspects, if it seems all right. So they don't pick on our foundation for requiring …. if they find our requirements reasonable. This may be combined with an exaggerated respect for what we require. They might have objected, but they may fear a negative effect if they do. But mistakenly so. It's quite legitimate to disagree with the agency …. It's not without reason that they talk about 'Supreme Court engineers' …. A lot of the engineers feel they can manage this themselves. Companies and other places, they say the engineers are a 'breed', in their training or whatever, they want to solve problems, and they want to do it themselves. Engineers tend to be problem-solvers, you know. They're world champions in most matters, so they handle the legal aspect too.
> I: How many 'Supreme Court engineers' do you have here?
> R: (Laughing). I really don't know. It varies over time. Some periods …. there is a constant improvement, though. I remember when I started here …. like administrative principles …. when you issue an order you must always give a notice in advance. But even a simple thing like that, it was almost impossible to make them do it. It was considered bureaucratic nonsense …. That's partly why we produced the handbook. To provide an overview of measures, with examples of how to write it out in order to get it correct according to proper administrative practice. The background was that to many things went out that wasn't good enough. (senior legal advisor)

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had to follow approximately the same methodology for risk evaluation as that which was established in the NORSOK standard for risk analysis (Z-013, see http://www.standard.no/imaker.exe?id=244).

Local problem-solving, based on highly contextual judgements about the case-specific conditions and about the probable results of legal instruments as compared to informal accommodations thus appear as important factors in the enforcement practices; facilitated, of course, by the contents of the regulatory tool-box.

Although there is a clear division of legal and non-legal measures, there is thus no direct or transparent relationship between a legal transgression (non-conformity) and the use of legal measures. The supervisory report is largely an account of the observations made. Based on that, the measures are decided upon. Normally, as noted, only a request is made to the companies for taking action in terms of analyzing causes and finding remedies. The idea is to differentiate, and to use legal measures only when these appear justified by the severity of the transgressions. But these overall considerations were also tempered by additional concerns and factors. As was noted by one of the supervisory coordinators:

> When we issue an order, we know they will concentrate on that and it will allocate their attention and resources. So we don't issue orders on less important issues. That would result in unbalanced focus, and they may forget what is most important …. you cannot use the sledgehammer always, it's a trade-off. …. Basically, I think an order is a poor measure. It's always a bit uncomfortable when we use an order. It may set off a period of suspicion about what kind of justification is provided, if there is some kind of retribution involved, and so on. But we have the handbook, saying what is the threshold for the various measures. So at least it's important that we bring into line the usage …. so the companies feel they're treated equally. That's what's most important. …. Then we know – that in some operators' organizations – an order in those companies really hurts bad. And at the other pole, you have, operators that hardly care. They have more of the 'latino attitude': "don't worry, this will turn out fine". So when our instruments and measures are received so differently, we have to take that into account when we consider using them. So there's not only one issue to consider. (supervisory coordinator)

The restrictive use of legal enforcement instruments can thus be explained in cultural as well as in instrumental terms. First, there is the highly technical professional dominance in the agency. While the regulatory processes and frameworks are strategically crucial and generally awarded high priority, the legalistic outlook is not dominant in the actual enforcement policy. The PSA is dominated by engineers with a practical problem-solving agenda. Even the director of regulatory development and the disciplinary leader for of unit for HSE management and legal affairs (comprising most of the lawyers) are both engineers. Lawyers are not the sideline, but are more quality controllers in the decision

making process in order to guarantee legal prudence. This confirms the impression that legal criteria and boundaries are not severely tested.

Legal measures appeared thus not primarily as instruments for getting things done, but rather as occasional 'signals' to the industry about the behavioural record. 'Dialogue', implicitly within the context of the basically asymmetrical relation, was the favoured approach. As noted by one of the supervisory directors:

> We've had a discussion over many years about the strategic use of means. You have, not a collision, but a balance between a legal approach or culture where you think of means strictly in relation to addressing regulatory requirements, deviations from these, and orders, and a more strategic approach to the use of means, especially when addressing safety-critical issues. These must be applied in a proper manner …. As an example: Strategic use of meetings with the top management in the companies …. one purpose of these meetings can be to address issues that we regard as safety-critical and which we think is important that the management must address in their management team and organization. Such meetings may be preceded by a letter addressing safety-critical issues as summarized from supervisions, investigations, etc. Simply to carry out an audit, or the decision to do so, will mobilize a lot of resources in the companies, and is of course also an instrument. (supervisory director)

The existence, and potential application, of formal enforcement instruments still serves as a basic framing condition against which these dialogical encounters took place. And some degree of 'existential uncertainty' on the part of the industry provided a convenient and perhaps also necessary condition for enacting the regulatory role with a corresponding degree of 'existential certainty'. After all, they faced the most powerful companies, in both international and national terms; to have some golden shares in their reputational assets was twofold 'safety-critical'. The 'empty legal space' may thus also have served some higher purpose, given that the regulatory powers were used with self-discipline and much enlightened 'dialogue'. The idea of 'filling it' with precise legal criteria, and quantified and comparable risk-cost-benefit estimates, could ultimately carry the dialogue to unforeseen voids.

The biggest sticks

The (second) biggest sticks utilized would be the activation of criminal charges through the police and the public prosecutor.[113] But, both instructions regarding their size and the user manuals seemed largely to have been provided by the risk management philosophies of the agency. Both parties generally described cooperation between the PSA and the police as 'close'. The collaborative culture was partly facilitated by the establishment of the so-called "Shelf Police", consisting of a network of Police Departments along the west cost, with the Rogaland Police Department in Stavanger in the leading role.[114] The NPD/PSA has worked closely with these departments since the 1990s, in particular with the 'local' department in Stavanger, which has a dedicated unit specialized in offshore issues (NSE).[115] On average, there has been +/-5 police-cases each year. The police are always involved and conduct investigations in the case serious incidents, such as fatal accidents. However, partly due to variable resources, there is no definite threshold for what shall become a 'police-case'. Resources may be wanting in critical situations, affecting priorities and uneven efforts over time.[116]

Police investigations are always initiated and conducted in cooperation with the PSA, and the police follows closely the information and professional advice they get from the PSA

[113] The prosecuting authority is organized in three levels: the Director of the Prosecuting Authority, the public prosecutors at the regional level and the prosecuting authority in the police districts. The latter two are organizationally separate bodies.

[114] As I was allowed to attend a two-day joint seminar with all the actors involved, these 'collaborative attitudes, were confirmed. The police officials clearly stated their acknowledgement of, and dependence on, the professional expertise of agency officials, and the PSA officials faced an attentive audience as they lectured on accidents, near, misses, investigations, trends, and future risk scenarios.

[115] "The North Sea and Environmental Unit" (NSE) was established in 1991. The unit is headed by a police superintendent, and includes 4 investigators and a legal specialist. The Rogaland district is by far the most experienced and largest in terms of resources and area of responsibility, and has advisory functions toward the other districts, including training and investigation assistance. It also draws on other resources in the district, but must assist other units if demand is high. The Public Prosecutor in Rogaland has responsibility for all prosecutions on the NCS. The system is regulated in a Royal Decree dating from 1990, and guidelines from the Ministry of Justice. Police responsibilities cover emergency preparedness related to major accidents, bomb threats, terror or sabotage, and investigations. The legal warrants are provided in the Penal Process Law §224-2, allowing for investigation of causes of accidents, even without any suspicion of illegal acts. Further regulations in fact oblige such investigations in cases of fire and accidents involving serious harm to people or considerable damage of property.

[116] Thus, after 2004, efforts devoted to shelf-issues were reduced due to extraordinary heavy work loads in the district after a major bank robbery in the city of Stavanger. Professional, armed robbers got away with more than NOK 70 mill in a spectacular and dramatic break-in, including the killing of a police officer. The investigation occupied vast resources in the police force. The threshold does thus not seem clear-cut, and is influenced by current capacities.

officials. Due to the close and frequent contacts, the PSA would normally not need to submit any formal report; as was noted by one PSA legal advisers: "The exchanges with the police are so regular that we need not use formal reports. They start the investigation when we want them to anyway".[117]

Normal procedure in the police-cases is that the police request an opinion from the PSA about liability. In assessing penal liabilities, negligent behaviour from the company or from individuals is the primary concern. Individual negligence is ordinarily referred to as 'human error' (slips, lapses, trips, fumbles, etc.) or more seriously as 'carelessness'. The strictly legal considerations about what can be regarded as 'negligence' (of not having taken 'proper care') may be highly variable, however. The organizational context will be given weight, although with differences in emphasis and thoroughness of analysis. Such factors as missing training, inadequate procedures, bad planning, etc., may to different degrees count, or not count (see Bjordal, 1997).[118]

In the petroleum sector, penal action towards individuals is seldom considered, however, and individual penalties are extremely rare. Penalties are almost exclusively levelled

[117] Formally, incidents are to be reported to the police through two channels. According to the Working Environment Act, companies are obliged to report all incidents involving fatalities and serious personal injuries to the police directly. Furthermore, administrative bodies report incidents and accidents according to instructions issued by the national Director of the Prosecuting Authority. Supplementing these instructions, the relations between the PSA and the police are regulated in a formal agreement. If the police have direct information, they start their own investigation, but they also open a dialogue with the PSA to have their judgement. All police investigations are thus undertaken in agreement with the PSA, and include the assistance of PSA-investigators. Police officers are always in charge, but the PSA personnel can supply questions after the interrogations. The PSA provides the closing summary/statement. All administrative decisions are left to the PSA, on the basis of their own parallel investigation. The police have in some cases prosecuting authority, but normally in these cases, they make a proposition to the public prosecutor who makes an independent decision about charges. The close relations between the administrative body and the police stands in some contrast to the Labour Inspectorate, who send formal reports to the Police, but often experience a lack of capacity and readiness to follow up the cases closely; this reflects the difference in contact frequency and professional dialogue.

[118] In legal terms negligence is regularly determined on the basis of terms like accidental accident, inattention, misplaced attention, faulty reaction or assessment of the situation, or slips of mind (Skjønhals and Jersin, 2004: 211). Although none of these forms of 'error' are in themselves sufficient for determining negligence (although accidental accident is generally out-ruled), there is clearly no definite threshold or criteria available. The experience and position of the offender, and other contextual factors would be considered in each individual case, although with some reference to case law in comparable cases. Partly, individual considerations are established as an institutional norm, but also, some less justifiable inconsistencies have been observed in relation to prosecutions and court decisions (Bjordal, 1997; Bjordal and Graver, 1996).

against the company. As noted in Chapter 4, an enterprise may be liable to penalty when a penal provision is contravened by a person who has acted on its behalf, even if no individual person may be punished for the contravention. The enactment of penal law in the petroleum sector must be considered an interesting departure from traditional legal theory and practice, where the main rule has been to look for individual culpability. Culpability of enterprises was primarily introduced as *supplementary*, to be applied when individual culpability was difficult to determine, but where the act or event should still be considered in terms of unlawful negligence. However, the preventive effect of making enterprises culpable was also given weight (NOU, 1989). The legal argumentation has been twofold. First, accidents and near misses may be the result of acts by several individuals, neither of which would, in isolation, be considered negligent; only the outcome, considered as the sum of these acts, constituted unlawful negligence. This is commonly referred to as *cumulative faults*. Second, when it is not possible to identify who has committed the negligent acts, this is legally referred to as *anonymous faults*. These categorizations are warranted by current interpretations of penal law, with parallels to the concept of 'objective responsibility', but were originally introduced only as "pedagogical" terms in the legal nomenclature (Andenæs, 1997). Within the context of received risk management philosophies established in the petroleum regime, they provided a welcome opportunity for making organizational failure a legally legitimate diagnosis and they appeared in almost all the NPD/PSA recommendations provided to the police.

The last instance of individual penalty was in fact the fatal accident on the Oseberg field on Christmas Eve 2000 (see Chapter 3). A brief review will provide some impression of the threshold for going to such 'extremes'. The accident occurred when a man was killed during a crane lifting operation. A pipe bundle was to be removed from a basket; there was no tag -line on the pipe bundle, men were working under a load, and the load was lowered into an area out of the sight of the crane operator. As it was lowered, the load hit an operator in the area. The lift was thus carried out in a so-called 'blind zone', but no flagman was present to control the lift, and warning signals were not used. The crane operator, who was also a supervisor, was finally sentenced with a fine of NOK 15 000.

In this case, the gravity of the transgressions was considered so serious that personal guilt was determined by the public prosecutor, and even gross negligence was later judged by the court.[119] Negligence on the part of the companies involved was also established, but not to the effect of acquitting the operator. Hydro, as the operating company, received a ticket fine of NOK 15 mill, and the employer and contractor company (Prosafe) responsible for the operation, received a ticket fine of NOK 75 000. The negligence of Hydro and the contractor company was related to the follow up of training and procedures, and for tacitly accepting non-compliant behaviour. Also, the deck was packed and orderliness and tidiness were seen as a contributory precursor to the accident. The contractor company was also criticized for not taking proper action towards the crane operator; he was known as a skilled operator, but also as a headstrong and influential personality. The fine was seen as severe, however, and Hydro, although they finally decided to accept it, expressed "surprise" by its size, compared to other cases.[120]

The conviction of the operator was unique, but whether or not this only reflected the severity of his acts, is not easy to determine, since there were no systematic analyses of 'comparative culpability' in these judgements. To some degree, one would expect that a certain amount of 'arbitrary circumstantiality' would influence both the process and the final outcome. What is most interesting from our point of view, however, is the observation that individual negligence is largely constricted through the strong professional influence of the petroleum authorities. The more blame seeking judiciary

[119] In fact, he was not taken to court in the first round, but was still charged guilty of negligence. According to the Criminal Procedure Act, even though guilt is legally proved, "a prosecution may be waived provided that such special circumstances exist that the prosecuting authority on an overall evaluation finds that there are weighty reasons for not prosecuting the act". However, guilt was still established, and this could in itself be considered an unusually severe sanction, given the general reluctance from the authorities to blame individuals. Even if no penalty was issued, he felt the establishment of guilt was unfair; also, he was fired from the company. Generally, if the person charged maintains that he is not guilty of the offence for which prosecution has been waived, he may require the prosecuting authority to bring the case before the court if the charge is not withdrawn. This he did, and the fine was sentenced. The court even reinforced the charge, from 'negligence' to 'gross negligence'. He later appeared publicly, together with the mother of the deceased, claiming, with her support, that he'd been unjustly treated.

[120] Fines were certainly also determined according to the wealth of the offender, which of course, was great. As noted above, the accident occurred in an atmosphere of growing conflicts about the development of safety conditions, and it provided an opportunity for the authorities to teach the industry a lesson, in particular in the face of what they saw as an unjustified self-complacency on their part. As noted, the accident also contributed to the gradual shift in the 'risk-discourse'; for Hydro, it triggered the launch of a large scale safety program (to be commented later).

system is kept on a distance and the 'systemic' and organizational approach attributes 'causation' and responsibility to the company as such rather than to the individual. The somewhat ritualistic uses of 'cumulative and anonymous fault', would possibly not have survived the discretionary judgements of more critical legal specialists not socialized into the prevailing risk management philosophies.[121] We return to this issue below.

Trust, calculation, and compliance

As noted in Chapter 2, a purely calculative regulatee would try to measure net costs of compliance against the risk of authority sanctions. Theoretically, this would involve rather complex assessments of expected costs (including, for instance, predictions about disclosure and subsequent authority behaviour). Ultimately, such calculative behaviour might appear more as a theoretical construct, as an 'ideal type', to be contrasted with the fully committed and socially responsible actor at the other end of the scale. The intermediaries were more interesting, and various mixtures of profit-seeking calculation and prudent risk management would appear in all companies in the course of time, sometimes reconcilable and sometimes not. Although the potential conflicts were recognized and accentuated, the 'prudence' of risk management practices was the main target of attention, organizational failure was a dominant explanatory scheme, and the industry could be approached within the context of 'dialogue'. However, as noted above, this dialogical context should also be understood against the industrial concern for reputational risks, and ultimately also their considerations about market access. To the extent that such 'framing conditions' kept potential conflicts off the agenda, the exceptional or 'threshold-testing' cases would appear all the more interesting.

As noted in the previous chapter, the new requirements regarding rest and restitution occupied much attention as a 'compliance issue'. In order to meet the requirement of 'normally sleeping alone', a number of measures had to be considered: rebuilding cabins, hiring flotels, accommodating schedules according to capacities, etc., all of which would potentially generate large compliance costs. And as indicated, the issue initiated a call

[121] This observation may be substantiated by a comparison with legal action in onshore accidents (industrial and transport sectors), where much lower thresholds for attributing individual blame have been evident (Bjordal, 1997).

from the industry for a more systematic use of cost-benefit analyses in the regulatory processes, including enforcement policies. Although some actors interpreted the industrial responses as acts of active 'non-compliance', the official arguments was rather that the interpretation provided in the guidelines and in the enforcement policy did not have the proper legal mandate, as these had not been explicitly presented in the formal regulatory process.[122] But the companies didn't respond uniformly to the requirement; some adopted a more pragmatic and timid stance. Partly, this variety would reflect very different compliance costs, but that would hardly be a sufficient explanation. Some even took some pride in making these investments, both as a (possible) contribution to risk reductions and as a 'gesture' to the welfare of the workers.[123] The PSA defended their position, and referred to the risk involved if people didn't sleep properly. Obviously there was a double pressure, however, as the unions also protested against what was seen as more lenient enforcement practices in terms of interpreting the legal force and significance of the clearly ambiguous phrase, 'normally alone'. The amount of discretion involved in these cases was considerable, and apparently, some practical compromises and accommodations were made in the process.

Most important from our point of view, however, is how this case challenged the 'conditionality' of the trust balance and exposed potential fragilities when critical issues about the socio-economic distribution of risk were at stake. The cost-benefit considerations that were thus introduced, involved rather complex questions: What was really the magnitude of the risks involved? How much risk reduction would be achieved by complying with the norm? What were the compliance costs, and did they justify the

[122] The OLF had commissioned a report from a law professor, supporting this view, 'technically' based on the argument that the regulatory process had not provided proper information about the consequences, which in this case, of course, were considerable in terms of economic costs. Since the parties had not been properly involved in the formal hearing process, the requirement was to be considered legally invalid. An explicit reference to this report was made in the "OLF guidelines for rest and restitution" (see: http://www.olf.no/hms/retningslinjer/?26481). Technically, the 'non-compliance' implied that the companies were expected only to consider the relevant solutions with reference to the general wording of the provision, and that no application for 'exemption' from the regulation would be considered necessary if this requirement was met.

[123] That was certainly the case for the small oil company I visited, including a six day stay at one of their production ships, were I, as it happened, slept in a cabin that had just recently been rebuilt into a single room. They proudly presented these investments as a sign of their general generosity and positive attitude in all welfare and HSE matters. In another company, it was also suggested that a too lenient compliance policy could be taken as a lack 'solidarity' with their industrial fellows.

(contested) risk reduction compared to alternative allocations of risk reducing efforts? And certainly: what was really the impact of 'welfare-concerns' for the workers in these requirements?[124] The strategy and response from the OLF could however be seen primarily as a case of 'principled disagreement', more than one of calculative non-compliance (Ayres and Braithwaite, 1992). These controversies were enacted in a fairly open landscape, with clear positions, and without seriously endangering the conditional trust that companies did not (openly) defy regulations once the authorities where out of sight. The nature of this conditional trust was explained by one of the supervisory directors as follows:

> I: What's the underlying incentive: Is there a shared interest as a common platform, implying that you only have to "remind them", or is it the underlying fear of sanctions, of loosing future licenses, of damage to reputation?
> R: There might be an underlying fear … the economic forces are strong and damage to reputation can be experienced as painful. And this again can have managerial implications. So the significance of addressing this at an earlier stage, and be very clear about the issues, is important. For example; we had this meeting recently with a company. We presented our experiences from one installation: "you've had a number of incidents, we've identified deviations in several of our audits that are not satisfactory. We observe that you as an operator do not take on the responsibility that you have according to the regulations, so what's your opinion about all this… ?" That's how we can approach it. (…) And the sanction then is that if they don't take on the responsibility as required, we will address this formally, in an order.
> I: But they could ignore other sanctions and be very cynical, tolerate a notice, pay fines, and so on?
> R: Yes, yes .... but the baseline …. we have this trust, this mutual trust as a foundation, and the mutual understanding of roles, that the companies assume responsibility. We must build on that. (supervisory director)

[124] The latter issue was even extended to the societal level, as the costs generated were juxtaposed with the amount of welfare that could be produced in other sectors (say elderly care) dependent on public funding, the availability of which ultimately depended on revenues and taxes from the petroleum industry. Industry representatives would occasionally suspect the welfare aspects of the, in practical terms, 'single room' requirement to be the 'real' motivation, and consequently to regard the risk arguments as a smoke screen. This was really a luxury demand, forced through the decision making process at the political level, disregarding due processes, formal hearings, and, if not disrupting, at least it had unduly bypassed the legitimate tri-partite collaboration processes that had preceded the regulatory reform. Incidentally, one of the leading union representatives occupied a position in the political staff in the ministry at the time. Besides those arguing substantially for the factual and risk based justifications, proponents within the unions, at the shop floor level, etc., would occasionally support the welfare argument, but would also refer to the great revenues generated in the industry and that this was something they really could afford with the current level of oil prices. And indeed, the company managers would themselves not hesitate to sleep in luxury hotels on their business trips. Such arguments were of course also applied more generally in relation to HSE- costs, welfare costs, wage-levels, working hours, etc.

'Conditionally' trust-based and high-level dialogue that address the learning and improvement capacities of the company, thus appears as the most concentrated 'high-impact' encounter with the industry.[125] Seen from the agency perspective, the regulatory strategies then reflect assumptions about company rationalities. From a purely calculative point of view, the enforcement level would be determined by the estimated deterrence effect on potential offenders, taking account of the assumed calculations of the latter. But, as noted above, the establishment of enforcement 'levels' was not so much determined by any assumed calculative rationality on the part of the companies as it was by the perceived severity of the transgressions in each case, although longer term company behaviour would also influence the choice of sanctions. But also, the longer term compliance record was also decisive in determining intervention strategies and priorities. Assumptions about mere cynicism were exceptions. Sub-standard performance was generally attributed to organizational abilities and capabilities rather than to bad motives; lack of 'engagement', priority, and expertise could be observed though, in particular in some rig companies. But trust, or conditional trust, appeared as the base-line in relations with the operators. And if required reports about rectified non-conformities after agency supervisions turned out to be mere lip-service, the agency reactions would be all the more rigorous; undermining the trust, appeared almost as adultery.[126] Within the context of 'dialogue', games of hide and seek were for the most part marginal phenomena.

Regulatory encounters involved adaptive flexibility, taking account of the multiple selves of the regulatee, but also of how these 'selves' would be influenced by internal and external circumstances, such as the internal rewarding systems or the current profitability in the industry. As was explained by one of the supervisory coordinators:

> I: So you're role is to come out with HSE-glasses and look them in the …?

[125] The meetings referred to are the yearly 'status-meetings' where the PSA managers meet with company managers in order to 'summarize experiences' over the past year. The supervisory teams prepare overall assessments of company performance as input to these meetings, and they are considered as being of great importance, as they allow for a discussion of company behaviour and future challenges in a face-to-face encounter with the top-management.

[126] In one referred case, it was discovered on a later audit that a company had erroneously reported 'closure' of non-conformities that had in fact not been effectuated. The agency reaction was described as close to 'astonished disbelief', and the response was accordingly severe.

> R: I think so. Even if they say that HSE is a management responsibility, we often ask the question, is HSE still priority number one? …. I believe there are other KPI's [Key Performance Indicators] that the managers are more explicitly measured against. There surely are conflicting targets and interests. And there's a great difference now, with oil prices over $ 50, from the time when it was $ 9. It wasn't very easy to get things done back then. They also ran the downsizing projects, cutting costs wherever possible. Maintenance, manning, store-parts, everything.
> I: So the deterioration towards the late 1990s was a consequence of this?
> R: It was a contribution …. And many of these fields were dimensioned in the 1970s, in an affluent period with high prices. There was no limit. You could pour in lots of people. They had huge organizations, crowded with managers and multilayered hierarchies. Now you normally have only two levels with top and middle managers. (supervisory coordinator)

The efficiency and adequacy of enforcement measures would thus depend on the stakes at hand. Assumptions made regarding the doctrines of complementarism, that safety and other (economic) goals go hand in hand, or the opposite doctrine of trade-offism, that safety had to be traded off against these other goals, were in practical terms themselves expressing trade-offs. The applicability of these doctrines was contextual and contingent. A report commissioned from the local R&D network about conditions for preventing major accidents, produced in collaboration with PSA officials in 2005, made a provisional list of safety interventions that could, respectively, be said to support either 'doctrine' (Aven *et al*., 2005). Savings regarding modifications, maintenance, and production processes, would clearly be in line with the doctrine of complementarism, as would increased regularity, longer facility lifecycles, and improved company reputation. Other interventions would support the doctrine of trade-offism, such as investments, down-time, revision-stops, etc. These were indeed hotly debated issues, and the intervention strategy and the force of legal instruments had to be adapted to the concrete context. The considerations involved were aptly illustrated by one of the supervisory coordinators, with specific reference to the introduction of remote drilling systems:

> Does it require actions that both safeguard HSE and at the same time contribute to increased income, then there's no problem. Or a dialogue could be required for them to realize that connection. But when we said, now, there have been too many accidents on the drilling floor. We want people removed from the drilling floor. So an order was given to establish systems for remote operation of pipes and work strings. They reacted with astonished disbelief and wonder. If you could have increased the drilling speed at the same time, it would have been easier to have this implemented. But drilling speed was reduced. A well trained crew could drill almost twice as fast with manual operations. But had it been the

> other way around, if you had increased drilling capacity using less people, it would have been easier to use arguments and persuasion, and we wouldn't have had to issue any order. (supervisory coordinator)

In sum, the conditions and conditionalities of regulatory trust and compliance reveals a complex picture, and although some operating mechanisms may be sketched, the outline provided here may perhaps reflect rather than inform the observation that compliance theory is still considered 'underdeveloped' (Hutter, 2001: 231).

Roles and accountability

Petty kings or captured auditors?

Part of the justification for the present organizational model in the PSA was that the broad and cross-disciplinary composition of the supervisory teams, with each member organizationally bound to their disciplinary units, would ensure appropriate distance and professional integrity. In fact, the organizational model prior to the brief period of team-experiments had been abandoned partly due to the capture risks. In this model, six supervisory managers had the responsibility for organizing all encounters with the companies. But capture was not the only risk. The 'company-man' model could also have the reverse effect, making them 'too powerful'. Due to this relative absence of organizational checks and balances, accountability could be compromised either way. The matrix model was seen as a fair trade-off between closeness and distance:

> R: …. some of what goes on is not so accountable …. this may get a bit out of control …. some may act as petty kings out there without substantiating or documenting what they do, or providing legal warrants. There's not much of that now, but I believe it has occurred from time to time in the past. And you had people here with very close relations with some companies, over longer periods of time. Parts of this culture is not so good…
> I: But close relations could also work the other way, that you'd develop a loyalty ….?
> R: Well, yes …. I've seen some out there, informing how things should be and be done, and who've had a somewhat limited understanding of administrative formalities and principles. But we also had a period with supervisory managers with long-term tenures …. and I sometimes had the impression that some did more to protect the company than to execute the necessary supervision. You have that side of it too. This regime was stable for a long time; for some 15 years you had this system with supervisory managers; none of them had the same position for that long, there was some rotation; but there's a problem when one person, without any corrective mechanisms, had that kind of relation toward these big and powerful companies.
> I: But you started out from the different perspective …. that they were powerful..?

> R: Both these aspects are present. The first aspect is mostly history. And the supervisory manager role ended with the team-model. (disciplinary leader)

Typically, the power and impact of the front line bureaucrats were, from the agency point of view, seen as somehow a legacy of the past. From the industry perspective, traces of this legacy were still apparent, however, as was evident also from the publicly voiced concerns from the OLF. An even more blunt report was provided by one HSE manager:

> R: I believe they should think more about the enormous power of single officials. Officials generally are very powerful and have a great impact throughout the industry. So it's important that, not only the agency management reflect on their supervisory activities and how strategies and are carried out; it's important for the PSA as such to have a strategy that everyone understands and the majority complies with. There will always be some who don't get it right but they will gradually be marginalized and isolated in the industry. But it would be a good thing if more officials realized and acted in accordance with a common strategy …. It's the officials who govern the industry, not the PSA-management.
> I: So you believe there's too little control of the output, against some standard?
> R: Yes. And it's a challenge for the PSA that the industry is governed by the officials, not the management. Sometimes that may be wise, but sometimes it's not all that wise. But .... we're very happy with our team …. (HSE manager)

Being more critical to the agency as such, than to 'one's team', was not untypical for the HSE managers and regulatory advisors. We return to company responses to regulation below, noting however, the conditional and often context-dependent nature of such responses.

United in knowledge, divided in roles?

Encounters with the industry were also encounters between professional peers. Some might have been school mates at the technical university, some would belong to the same professional associations, they would meet in seminars, etc. Well engineers would meet with well engineers, electro-engineers with electro-engineers, drilling engineers with drilling engineers, etc. (including even more 'specialized' encounters, such as between 'alarm-specialists' or 'emergency specialists'). The impact that these affiliations had in the encounters they had - as representing the position of regulator and regulated - is not easy to evaluate. Some encounters were also of a more 'hybrid' kind. Given the extensive level of interaction (partly allowed by the favourable 'controller-controlled-ratio'), these professionals would meet in a number of contexts (seminars, educational programs,

collaborative projects, standardization groups, etc.) where they would act partly in their professional role and partly in their 'positional' role.

To outsiders, these professional networks could be seen as compromising accountability and undermining the unbiased execution of the authority role. To insiders, they could appear as necessary for developing joint understandings, facilitating knowledge transfer, and also for making deeper impacts on the self-regulatory processes by 'greasing the wheels' and improving the total regulatory machinery, upon which the success of the regime ultimately depended. This is of course the rough picture; not all networks were frictionless and participants could be consciously aware of the roles they had. But the insider-outsider perspective was still evident. Thus, the lawyers, themselves sometimes alert to the non-transparent collaborations between 'problem-solving' engineers, had extensive professional interaction across actor/interest-group borders. Lawyers on both sides described this cooperative network as 'professionally grounded', oriented towards substantial legal issues regardless of the specific interests of the participants. These interchanges were reported to take place in a 'scholarly' atmosphere with participants sharing the same concern for informed and well-founded legal reasoning; in short: as arenas for dispassionate discussions of common disciplinary problems. Positional roles could allegedly still be retained in the ordinary encounters.[127]

In short, relations between the authorities and the industry would involve a mixed combination of both 'positional' and 'professional' encounters, and within the shared space of HSE-related matters, agency officials, company staff, safety-delegates, external specialists, etc., would often appear as united in terms of both professional interest and goal orientation. In these discourses, regulatory compliance and prudent risk management could be synonymous and undisputed concerns.

[127] All lawyers are gathered on a regular basis, referred to as the 'Petroleum-legal seminar', comprising lawyers from the relevant ministries, the agencies, the industry, the police, the public prosecutors, and also the courts (even the supreme court). However, HSE-issues amounts to only a minor (although increasing) portion of issues addressed (estimated to some 5-10 percent), the more time-consuming areas being resource-issues, contracts, taxation, and general administrative law.

Crossover experiences

One group of interviewees were particularly interesting in terms of roles; or rather, that one aspect of their professional career when tables had been turned. A number of agency officials came from the industry; generally a highly regarded experiential background in dealing with the companies from the agency perspective. And conversely, agency officials left for the industry, often as attractive candidates for positions as regulatory advisors or other HSE related jobs. How did this change of roles appear to the crossovers and to their environments?

Generally, these crossovers were seen as unproblematic and were even welcomed. As was noted by one supervisory coordinator (himself a 'crossover') referring to encounters with former agency colleagues, now occupying key HSE-positions in the industry:

> R: Basically they know the system here very well
> I: It would be in safe hands then?
> R: You could say that. But they'd also know very well our weak spots, both formally and practically. But I also feel more confident, like when we get an AoC, we don't have to go the whole round of explaining what is meant by this or that, what kind of information we require in order to carry out our assessment of HSE. But the role may be tricky ….
> I: Is it primarily a professional dialogue? What's the greatest difference in sitting on either side of the table?
> R: The difference is not all that great, I believe. We like to say in many contexts that we have common interests …. that operations shall be carried out without accidents or incidents, that no lives or assets are lost. In that sense we have the same starting point. But then we have different roles in this, and I'd think that may be the greatest difference …. If you take former PSA employees, they often end up as regulatory advisors or HSE-advisors, and I believe that, in addition to their knowledge of the regulations, they also know their intended purpose. Internally we talk about "our expectation". We never use that externally. Either it's a requirement or it's not. But a requirement is founded on an expectation as to some activity, what must be done in order to meet that requirement. Access to that kind of knowledge is precious for an operator …. I believe that's extremely useful; in fact, there should have been a system for circulating people in and out of the agency, both to get operational experience into the agency, and to get regulatory experience out to the industry. I guess many operators have realized this since we often meet former colleagues out there.
> I: So it's not motivated by a desire to delude or deceive the authorities in a more sophisticated manner, by knowing them 'from the inside'?
> R: I don't believe that. It's the knowledge they possess that's sought after, in particular the knowledge about agency expectations. I think that's important for many operators. (supervisory coordinator)

Seen from the other side, the 'converts' tended to point to the triviality of administrative procedure, the organizational complexities involved in making things work, getting things done, and mobilizing sufficient resources. As was noted by one regulatory advisor and former NPD-official:

> When I worked in the NDP I must admit I wondered why the companies didn't have systematic accounts of regulatory deficits; and if they have such accounts, why don't they take remedial action, what's the status, have they followed up, closed non-conformities, verified that the measures taken have caused improvements, do they have good systems for this? And so on. So when you come into the company you see that it's not exactly a lack of willingness, people want to do their best, it's more a question of time and capacity, and what kind of management focus is afforded. In our company there has been an increasing awareness that we've been good at making plans – this must be done and that must be done – so you get plans for all kinds of things, and you end up with so many plans that you've no chance of following it all up, or make an opinion about what is really worth doing …. you must be rather critical and selective when you decide on what shall be followed up, and when you do follow up, you must do it the whole way through. (regulatory advisor)

Several agency officials with long industrial experience as HSE-managers or officials confirmed these general observations, and argued strongly for the agency to pay more attention to the organizational conditions of compliance, partly by being more supportive towards the HSE-staffs and safety representatives, but partly also by being more sensitive to their own choice of intervention. Impractical demands or generally formulated requests to 'do something', to assess this or assess that and to take 'appropriate action', could leave the internal HSE-employees in bewilderment and frustration. The conventional but unqualified appeals to self-diagnosis and self-treatment, were convenient for the agency, and were 'politically correct' in terms of allocating full responsibility to the companies. But these requests could also be an easy way out, perhaps hiding incompetence and be unproductive in not providing any clues about the expected follow up. As was explained by another former agency official:

> R: The first thing that strikes you is how much effort is hidden behind a formulation in a letter. There's a lot more effort put into things than reach the eyes of the authorities, like all the implications of measures, studies, investigations which are expected from the authorities.
> I: If you look back - then you were the supervisor, now you're responsible - how did you experience the transfer?
> R: When you think back, the change wasn't all that great. The professional challenges are the same. Some things are easier, some things are more interesting and some things are less interesting. In some issues, I have revised my point of view. The agency tends to be very

> much occupied with overall judgements, assessing systems, etc., using very general formulations. But it's virtually impossible to have the faintest idea of when such a requirement is satisfied and when it's not. Such generic orders that they tend to enjoy, they're terribly difficult to comply with internally. And also, it's hard to understand what is referred to. Even if I'm a more qualified guesser than most others in the industry, sometimes these bureaucratic and general formulations that are perfectly meaningful for the official who writes it, they're virtually impossible for us to interpret …. We may agree on a general level, but what do they expect us to do? …. We cannot respond, like: "we've registered your request and now we've speculated for two weeks, and we're really stuck". There's something about the level of precision, about being concrete and straightforward, that I appreciate …. sometimes when you summarize and generalize too much, the message doesn't get through. (HSE-manager)

This latter comment, point clearly to the inherent double edged nature of systems oriented interventions, and partly also to the limits of the audit context in providing precise diagnoses at the organizational level, towards which the supervisory philosophy essentially directed its attention. Flaws and non-conformities could be discovered, but the question of how these were related to the 'underlying causes' to be found in the systems and practices of risk management (or even worse, as shall be evident: in their 'culture'), was not easily answered after two or thee days of audit. Unable to provide a 'solution' in a form that would commit the agency to the success or failure of 'its' outcome, they would rather provide timid diagnoses related to observed transgressions and generalized requests for remedial action. We thus turn to the issue of how self-regulation was promoted.

Enforcing self-regulation and promoting learning

The enforcement strategy is clearly not based on a philosophy of self-regulating firms as single loop feed-back systems, responding to pre-set standards and controls. The basic enforcement policy was to install the regulatory purpose as part of the self-regulatory cycles, seen to have been undermined by the traditional inspection-like controls:

> In the old days, long lists of violations were produced, and the company made action plans for corrections. The follow up consisted mostly in checking out that every single item on the list was taken care of. It was more like an inspectorate, and became almost a 'cushion', as an external controller department within the company. But that's a long time ago. (supervisory coordinator)

The traditional inspections were thus doubly flawed; they indirectly releived the company from their responsibility and they did not promote self-regulation as dynamic

mechanisms for learning and improvement. The expected response from the companies would be restricted to correcting the already identified failures. But even when adhering strictly to functional demands, there was a question of addressing failures in a manner that promoted a deeper kind of organizational response. As was exemplified by one of the supervisory coordinators:

> R: If you as an example of a physical problem find that a sprinkler head is packed you might address that specific issue, as it would imply that the functional requirement of having a working sprinkler system is not met. But we need to go beyond the observation that the sprinkler is plugged. If that's your only observation, the operator might change the sprinkler heads and make some corrections in the maintenance program. But the reasons behind a failing maintenance program may not be addressed. I believe we still have a way to go in order to challenge them on such questions.
> I: But there would be a danger in probing too deep into these causal mechanisms, that wouldn't be directly available for observations through the audit?
> R: Yes. But we might ask them to examine *causes* more closely. We don't do that so often. The furthest we would normally go would be to state that the sprinkler heads are packed and that we take that to be an indication of some weakness in their maintenance program. So what we get out of that is that they examine the program. We've gone a step further than just observing that the sprinkler heads are packed ….
> I: Do you discuss these issues, how to approach the organizations in order to get the desired response?
> R: Well …. we have discussions, but I believe it's mostly afterwards, in hindsight .... We need to improve our awareness before the tasks are prepared and carried out, before you go out there looking for those packed sprinkler heads. We need to think of these things in advance; when you're out there, and you've found those four sprinkler heads, your opportunities are more limited …
> I: But there's a danger in going too far?
> R: Yes. You get a lot more blurry. There might be other causes and it's risky to make indulgent interpretations. It's easier to dig in the wrong place. No one can argue against the sprinkler heads being packed. …. In the traditional engineering environments you're reluctant to say more than you can positively account for. You should be able to substantiate your observation properly, and two packed sprinkler heads there are …. I think we achieve the best results when we combine the supervision of management and steering, and the traditional disciplines, and in most audits, this is what we try to achieve. (supervisory coordinator)

Self restraint and diagnostic abilities were thus key virtues of the auditor, given also the limitations of the audit context in producing 'speculations' about organizational causes. This dilemma between being stuck in the fault-finding tradition and promoting proactive responses from the regulatee, was partly to be solved within the limits of the audit context, and the way out would be restricted by the reluctance to indulge in interpretive speculations about underlying causes. Although we will return later to the issue of how

‘culture’ could be evoked as part of this diagnostic repertoire, we may at this point note that culture appeared as a somewhat ambiguous way out of the dilemma:

> R: Some look for rust, without asking how it’s built and designed …. If the non-conformity is seen as how the valve is mounted, the solution is to turn it right, not to ask why it was erroneously installed in the first place. So I think there’s a potential for improvement in how [culture] is applied and used in our supervisions. I don’t think this is representative of our supervisions generally, but in some areas we’re still a bit in that vein. But it’s not done overnight. We work towards having a more conscious approach in all our supervisions …. to dig deeper in some areas and look at how activities are managed. And then we’ll have the cultural perspective in the back of the head.
> I: Meaning that you’re careful in using the word…?
> R: Basically, yes. I guess we look more for the effects …. I carry out audits within a technical discipline. Traditionally we also include management and steering issues, that also contains cultural elements, like if people report errors they encounter, if they get appropriate training, if they speak out when they don’t, if they’re heard when they do [speak out], if errors are corrected, and so on. (supervisory coordinator)

There is thus a very present and substantial dilemma involved in deciding how much the supervisory team should probe into all the possible organizational antecedents of error. The ‘symptoms’ can be evidentially substantiated, but the ‘diseases’ cannot, or, there may be too many ways of relating the former to the latter. The typical and functionally appropriate orthodoxy is to leave the diagnosis to the patient. The emergent convention in framing orders has thus become self-diagnosis: Conduct investigations, assess the risks, find the root causes, use external expertise, etc. The reflections related to the dilemma do not, it can be argued, express a strategy of avoidance or of passing the buck. Rather, they are deeply embedded within the context of the supervisory challenge, almost as respectful prudence:

> Out on the installations we see that the operators are not always able, fully, to learn from the incidents. We observe that some focus very much on each incident, in isolation. This screwdriver fell down. Watch out everyone that they don’t. What’s really required, according to our regulations, is that they look into the underlying causes of each incident, and also that they analyze a number of incidents and look for trends in such root causes. It varies how good they are in doing that, not only on a specific installation, but also at a company level, and across companies and abroad. (supervisory coordinator)

Agency interviewees were clearly aware of the limitations of the supervisory context. Great skills, preferably developed from industrial experience, were considered vital for

the sensitivity and diagnostic abilities of the auditors. Not only inexperienced newcomers could be fooled by detailed documentation and 'official' presentations. Some of the former NPD/PSA officials could afford an even more critical tone.

> I'm surprised how naïve and credulous the agency can be sometimes. Systems and formalities may be all in place. But when you know how things really work, how things may be twisted and manipulated …. There is too much reliance on formalities, written procedures, written reports. People in the agency without industry experience believe they can 'read' deficient HSE conditions from reports, from incidents, from internal audits, from statistics. That's a naïve belief. They go wrong from the start. (former NPD official)

In a sense, the higher order of self-regulation would make external controls redundant. What then was their distinctive role and contribution in relation to the industry, in particular in the course of an audit process? How did they think they would make a difference, seen within the context of resourceful, powerful, and self-managed firms?

> I: In principle this system is supposed to be self-correcting, almost making agency supervision superfluous…?
> R: That's true. We have two roles, to provide the regulatory framework and to enforce its realization. If they're outside of this framework they get a little 'stroke of the whip' …. In principle these 'strokes of the whip' should not be necessary; that would be a good indicator that the system works. We carry out our supervisions, but we don't find anything. They take care of this themselves, and there are no incidents. In the ideal world they take responsibility and have their own supervisions and self-correcting mechanisms. That's why we never give approvals. We only give consents. That's a main principle. Very often it's tempting to provide solutions. Most of us are professionals, and we may see solutions, but then you always run the risk of meeting yourself …. (supervisory coordinator)

Pointing to the responsibility of the firm, but taking the 'child raising' position, was in accordance with the regulatory philosophy. But the flip side was certainly also recognized. The role of the agency in circulating information and transferring knowledge could be sacrificed by the 'laid back' requests to always make the industry solve the problems. This could sometimes be hinted at by agency officials, referring to the necessity of expert contribution and the importance of using operational knowledge in 'solving problems'. Such reflections would of course challenge the timidity of requests and orders, leaving the solutions to the industry. But to a former official, now in a position of really having to do the job, the position of 'laid back child raiser' could be reflected upon more bluntly:

> I remember one episode, I was really ashamed. We'd summoned Statoil for a meeting; they'd had a lot of falling objects, and we were to scold them; and how we scolded! Statoil told how they'd done this and done that. But we didn't have any sensible response to what they'd done. They listed all the actions taken and all their precautionary attempts, but we had nothing to say, no professional response, other than "shame on you!". We could have saved the effort. That's not good enough! If you don't have any professional response, no fresh approach to suggest, no advice to offer, no idea of what else could be done – just summon an operator just to say: shame on you!. I thought it was incompetent and hopeless then, and I think it's even more so now. It doesn't help. And if the authorities cannot contribute anything but reprimands, they just follow along the road without doing anything important. The primary task of the authorities is to prevent accidents. And then they must find out how to proceed in order to fulfill that role. (former NPD official)

Company responses to regulation

We have occasionally referred to industrial responses to regulation, notably from the OLF and 'converts' from the agency. These industrial responses were more systematically addressed in a number of interviews with HSE-managers and regulatory advisors, however, in order to get a general impression of their relations with the authorities.[128] No attempt is made here to estimate a precise statistical distribution of these company responses, and much less so to systematically relate such distributions to other variables that might have any impact on them. Rather, the modest ambition is to portray the kinds and varieties of responses in more impressionistic terms, but sensitive to their inherently contextual and potentially biased nature. As may be evident, encounters between the authorities and the industry would thus be influenced by a number of factors related to various encounters with the authorities and also on their more overall views on the regulatory regime. 'Opinions' would thus appear, sometimes as digested reflections on years of experience in one company, sometimes flavoured by recent controversies, usually dependent on the relationship with members of the PSA supervisory team, possibly 'furnished' in the interview context in case the opinions voiced would reach the agency (despite reassurances to the contrary), and in some cases also formed by their experiences as agency employees sometime in the past.[129]

[128] After all, I only talked to some 15 company officials from 8 companies, most of whom represented the HSE-departments (including regulatory advisors). No comprehensive analysis was made of formal responses in relation to regulatory changes, agency policies, or supervisory interventions.
[129] Apparently, some international companies had, at least in the past, fairly restrictive rules for external communication with the authorities.

On the whole, the meetings with the companies largely confirmed the expectations generated from talks with the agency officials, in particular when supplied with interviews with the former officials. Perhaps the most striking impression from these talks was the diversity of responses. On the one hand, and in the majority of cases, professional trust and respect, sometimes even 'reverence', characterized their attitudes towards the agency and its officials. Agency officials were described as professional, knowledgeable, accommodative, helpful, pleasant, and understanding. Contacts were regular and frequent. One regulatory advisor had a picture of all the members of 'their' supervisory team on a board, including necessary contact information. There were weekly contacts, and the professional support of the team was considered "vital for the continuous improvement of HSE-conditions". Sometimes these approvals were somewhat conditional, and phrased in terms like: "at least the people we're dealing with", but adding: "but we know there are differences". In fact, the interviews could oscillate between such generalized views and concrete experiences. After first reproaching the agency in general terms, one HSE-manager then praised the supervisory team:

> To take the team I experience from my position, I believe they do an excellent job; the supervisory team we're exposed to is really first-rate. We've only had positive experiences with that group. So as a company we cannot say anything negative …. They're professional, they're flexible, and they're lucid. (HSE manager)

But there were also exceptions. Sometimes, the overall risk priorities would be questioned, if the agency was seen to approach minor risks rather than the major ones. Sometimes, in cases of published criticism, the 'bad boy' stigma was objected to, as if the overall safety commitment of the company was questioned. Rather than criticizing the company and its managers for not taking HSE seriously enough, more attention should be given to the rather ordinary organizational tasks and challenges of dealing with complex technologies, operational behaviour, and managerial processes; organizational failure, not poor management attitudes, was the issue. Some critical voices thus lamented that the agency officials didn't always fully understand the management systems, the

organizational make up, or the way things were supposed to work in practical terms.[130] Addressing such organizational issues based on relatively brief supervisory encounters could occasionally appear capricious and ill-founded to the 'insiders'.

In one particular instance, it was even questioned whether the agency supervisions really contributed to improving HSE conditions in the company, beyond the simple fact that external reviews more generally made them 'aware of' and 'alert to' the possibility of such reviews: "We know that we will be measured and evaluated, and that in itself is a motivation for improvement; but the supervisory reports are not always very useful in themselves. They scratch the surface, but the real diagnosis and the appropriate solutions come from within" (regulatory advisor). Also, a more profound understanding of the 'particular and local challenges' was called for, such as the trade-offs that often had to be made when dealing with risks in practical and day-to-day contexts. Although supervisions could have the effect of drawing attention to organizational failures and sub-standard performance, the actual framing of 'non-conformities' could also be experienced as unduly restricting the scope of possible remedies. Even if 'self-diagnosis' and 'self-treatment' was part of the overall philosophy of making the companies 'solve their own problems', any given non-conformity could implicitly entail expected 'conformity', and thus also restrict the scope of possible solutions; but, as noted, the relationship between 'problems' (non-conformities) and 'solutions' was not always clear cut. In line with the self-regulatory principles, an intermediary option would be to set minimal requirements to the use of qualified or competent personnel in the analysis of risk. In one case, a company had deliberately avoided to specify any competence requirements related to the analysis of incidents, as they wanted to use a broad spectrum of people with different backgrounds and perspectives in order to extend the interpretive scope of the evaluation; the subsequent controversies were finally resolved, but revealed the inherent problems related to just *how* the process of attaching solutions to problems was to be resolved. In another case, competence requirements related to the analysis of chemical risks was

[130] Occasionally, it was also reported that agency officials could admit these shortcomings themselves. In one case, an official, who had been temporarily engaged in the company as part of a 'knowledge transfer scheme', had apparently acknowledged, after two weeks, that he'd finally realized 'how the system was supposed to work'.

considered unduly restrictive and uniform, due to a perceived discrepancy between the 'size' of the risk and the capacity of the organization. But the accommodative and 'respectful' response was evident also in these cases; one HSE manager told proudly that they regularly hired a prominent expert of risk analysis to conduct evaluations (a professor at the university, who was regularly also used as an advisor by the agency).

The PSA clearly had to balance the collaborative and accommodative style against the regulatory role. This is of course difficult, and may explain why they (sometimes) had to 'assume' authority against a (sometimes) equally knowledgeable and self confident industry:

> R: And no one in the whole industry is more touchy or sensitive than the PSA; but it's a bit fun to tease them …. Sometimes you feel that it's them against the rest of the industry. You sometimes notice at conferences etc., if you criticize them – they don't like that.
> I: Why is that?
> R: I don't know, but I think maybe it's important for them to be, you know, a little unassailable, beyond criticism ....
> I: Like, it's part or the order of things, that they're the authorities and all that?
> R: Yes, right. Then I really think they're clever and I really appreciate Magne Ognedal and the way he's been running things, before and now. But I think sometimes they're too rash, like if you have some minor slip or deviation, they get at you just like that …. I should really have liked to run over the PSA with some of my buddies, you know, really probing into their own compliance with procedures and regulations, together with some experienced auditors. (HSE manager)

Just as the image of companies balance and oscillate between the 'distrustful money-machine' and the 'committed risk manager', themselves normally asserting the possibility of being trustful in both roles, the image of the authorities also balance between bureaucratic invincibility and prudent professionalism, although for the most part approximating the latter.

Attribution of causes (and responsibilities)

Providing explanations and attributing causes are part and parcel of risk management. Hazards may range from 'unexpected' accidents to slowly emerging health impairments, and the causal models applied would be correspondingly versatile. In the received risk management approach, preventive measures shall be applied somewhere along the intersecting causal chains and targeted against the antecedent triggers and conditions in a

manner that provides the greatest chances of avoiding harm. Beyond this, due to unpredictability or uncontrollability, risk management measures address the capacity for organizational resilience, the ability to cope and recover when barriers are absent or fail. Generally, the accidents and near misses have been the dominant preoccupation and concern. A number of models, tools and theories are applied in these endeavours by the authorities; influencing and influenced by parallel models in the industry and in the research and consulting networks. Typically, the use of technical causes has gradually been supplemented with human and organizational causes, largely promoted by the authorities. The application of causal models thus also reflects the development of the regulatory framework, locating both causes and related remedies to the overall risk management philosophies. That which may cause harm, is that which must be controlled; if the breaking of barriers cause accidents, prevention is restored by establishing and maintaining efficient barriers. Risk management is thus achieved by influencing the alleged causal antecedent, trailing them from immediate triggers to ever more distant 'root causes' of 'contributory factors'. As noted in Chapter 3, a plethora of methodological approaches are employed for understanding and explaining risks and their sometimes unhappy outcomes, with case narratives and statistical records as perhaps the extreme poles. Causal categories would accordingly be contextualized within the trajectories of the narrative, or they would be predefined and counted as frequencies in a sample. In between, there were digestions of accumulated experience, sensitive to individual varieties, but also generalized beyond these. As one of the experienced supervisory coordinators reflected on causal antecedents from the point of view of a 'generalized narrative':

> Often it's related to violation of procedures. That again may have three causes. First, the procedure may be inadequate. Second, it may not be known, people are unaware of its existence. Third, it's adequate, people know it, but they don't care. They take short cuts, they deliberately contravene, etc. Most people who violate procedures have a good reason why …. Often, these reasons are related to safety concerns. Perhaps most salient, is that procedures are inadequate and ambiguous …. One of the things we have observed several times is that, over time, a way of doing things develop. A serious breach is not a one-time incident; rather you stretch and bend the rules gradually, and then the front line work management is not always present where operations are carried out; this has been observed in several investigations. Managers responsible for work operations are often overloaded with administrative work, so they have to spend most of their time in an office. In the new regulations we address procedures specifically, saying that one shall ensure that procedures

> are understood and used as intended. This formulation is not unpremeditated. The usual way of checking out that the procedure is understood is to supply the operator with a list of procedures relevant for the job at hand, and then you're supposed to mark out when the procedure is read. Then you read 20 procedures in your leisure time, mark them out, hand the form to your supervisor who signs and puts it in the archives. The only thing you say, really, is that you've read the procedure. Eight out of ten don't understand what they've read; they read the procedure, but they don't appreciate the implications of what they've read. To read a procedure and to understand its content and the intention behind, that's two different things. Some companies have follow up questions to ensure that the procedure is fully understood. That's the proper way of doing it, and that's what's intended in the regulation. Very often the procedures are misunderstood …. they may be badly written. They're often written by academics, but it's not always academics who are the users. We have our own style of writing. This also applies to regulations. To me it's crystal clear. I don't see why people don't understand. But when you're out speaking to people, to outsiders …. even here in the PSA, we have our own manner of speaking; use concepts in the most obvious way. Like when we use "should" in a regulation, it's quite clear to us what that means. But it's not necessarily understood the same way by most people. We have to be aware of that. (supervisory coordinator)

The narratives of causal antecedents and 'sequences', contrasted starkly with the statistically processed records of counted numbers and fixed categories. The gathering and processing of statistical information occurred through a number of sources and methods; and as noted in the previous chapter, a number of requirements oblige the industry to submit information to the authorities regarding plans, consents, incidents, accidents, etc. On the average, some 500 incidents/accidents are reported to the agency each year, ranging from fairly minor injuries to serious accidents and near-misses. These data-bases serve as sources for prioritizing the supervisory activities. Linking the statistical records to underlying organizational causes had in fact been an important methodological challenge in the RNNS project, and no apparent solution was yet apparent. The seminars recounted in Chapter 3 represented in fact one such attempt near the qualitative end of the scale. Although statistical data was important in prioritizing and planning supervisions, it was mostly through the supervisory experience itself that the organizational dynamics could be uncovered. Exclusive reliance on statistics was not uncontested, and triggered also more profound critiques of the information gathering policies and of the kinds of analyses that were employed in the diagnostic process:

> Some in the agency are really obsessed with 'incidents'; 'learning from incidents' is like a mantra; we must learn and avoid the same thing from happening again". Sometimes I think that it would have been better if incidents and accidents had been forgotten altogether. One should rather focus on conditions on an organizational level, on knowledge, maintenance,

> stress, external pressure, etc. We need to learn about root causes, underlying conditions. Incidents are analyzed in isolated groups, like cranes, leaks, drilling etc., and don't provide that kind of organizational insight. It's no use to only employ the right terms, the new language, if we don't understand the mechanisms operating. You must realize that everyone speaks the "right" language; deviance, silent deviance, violations …. There's no guarantee that people mean the same. (former NPD official)

Also the industry uses similar registration systems, and causes are applied to incidents and registered in databases. There are several such tools in use, but the dominating system is "Synergy", which was developed jointly by Statoil, Hydro, Aker, and several other companies during the 1980s. The system has largely been quite standardised, with some instances of specific tailoring. Causal models are also used in investigation reports, and techniques vary across companies.[131] There were thus a number of available classification systems for 'causes', and several options for how these could be fitted together in more comprehensive models for understanding why risks developed and how they could be managed. There was also a high degree of overlap, with recurring and favoured 'causes', and ambiguous and diversified categorizations made it difficult to make any one of them commonly accepted. As was aptly noted by one HSE-manager:

> So when you want to draw conclusions on an organizational level and a management level, you need additional tools …. Then you have all these causal categories widely employed in the industry. That's a problem. I don't believe we benefit from having all this mess .... you know, Synergy, Tripod etc. And none of them are really good enough. I believe that, here, the PSA has a job to do, in order to arrive at some common causal categories that everyone in the industry can agree on and use, as a minimum …. And they must be logical, at a level that facilitates statistical analyses without ending up with 200 percent …. There's too much overlap, too much confusion, too much ambiguity. Then every single company may add their own categories. (HSE manager)

As noted, industry systems, the RNNS-reports or the PSA registration system do not penetrate deeply into background causes, only referring briefly to very generalized causes, as exemplified in the 2005 RNNS-report, where 'operational error' was said to represents the largest category of reasons for hydrocarbon leaks, involving a combination

[131] This includes the so-called MTO-analysis used by the PSA (man/technology/organization), TRIPOD, MORT, SMORT, etc., the latter often popularized through the so-called 'Loss-Cause Model'. Causal categories typically include operational error, working conditions, maintenance, procedures, etc, variously organized and including large numbers of subcategories, down to quite detailed precursors (like 'slippery surfaces', 'deficient/absent protection', etc.). The day-to-day registration systems are often criticized for being overly time consuming, bureaucratic, and costly. The average cost of processing an incident through the Synergy systems was said to amount to some NOK 3000.

of ‘human, organizational and technical factors’; and furthermore, that leaks from equipment, valves, connections or broken piping, often could be attributed to unfortunate design, inappropriate purchasing, and inadequate and faulty maintenance. Statistical monitoring of these predefined causal categories is conducted at all levels. The PSA employs causal categories both in the registration of incidents in the internal databases, and in their investigation reports.

The PSA-investigations and the MTO-model

Investigation reports detail and penetrate far more extensively the processes leading up to an event. The so-called MTO-analysis has been the prominent investigation method since the late 1990s, and was imported from the nuclear industry. The method is based on the idea that both human, organizational, and technical factors should be considered in the explanatory accounts (hence MTO: Man, Technology, Organization). The MTO-analysis involves the use of an ‘event- and cause-diagram’, a ‘change analysis’ and a ‘barrier analysis’. The event-cause diagram provides a linear account of the event sequence in a block diagram, and includes the attribution of ‘technical and human’ causes in the sequence. The change analysis describes how the series of events have deviated from earlier events, a normal situation, or from common practice. The barrier analysis identifies human, technological, or organizational barriers that have failed or are missing in the course of events. Figure 5.1 below illustrates the MTO-analysis worksheet. The main purpose of the analysis is to identify how the flow of events could have been broken, and what the organization have done in the past in order to prevent the accident. The MTO-analysis also includes technical, human, or organizational recommendations (which should be as “realistic and specific as possible”). Generally the terminology covers barriers, barrier functions, barrier elements, and influencing factors. In investigations, the term, ‘barrier’ is generally given a wide definition, as "all systematic, physical, and administrative forms of protection found in the organization and in the individual workplace intended to prevent, or limit the consequences of, faults and erroneous actions".[132] Examples of barriers within this interpretation are rules and safety

[132] See also the use of the barrier concept in the management regulation (p. 115). In the 2006 White paper, barriers are defined as “technical, operational and organizational measures which, either individually or together, shall prevent or interrupt the course of specific undesirable incidents. Barriers can reduce both

systems, procedures, guidelines, and traditional technical barriers like fire walls, blow out preventors, valves, etc.

During an investigation, the PSA-team (normally 3-5 participants) will interview relevant personnel both offshore and onshore, evaluate submitted documents and conduct an inspection on the facility. An MTO diagram mapping the immediate and underlying causes is then used to analyze the incident.

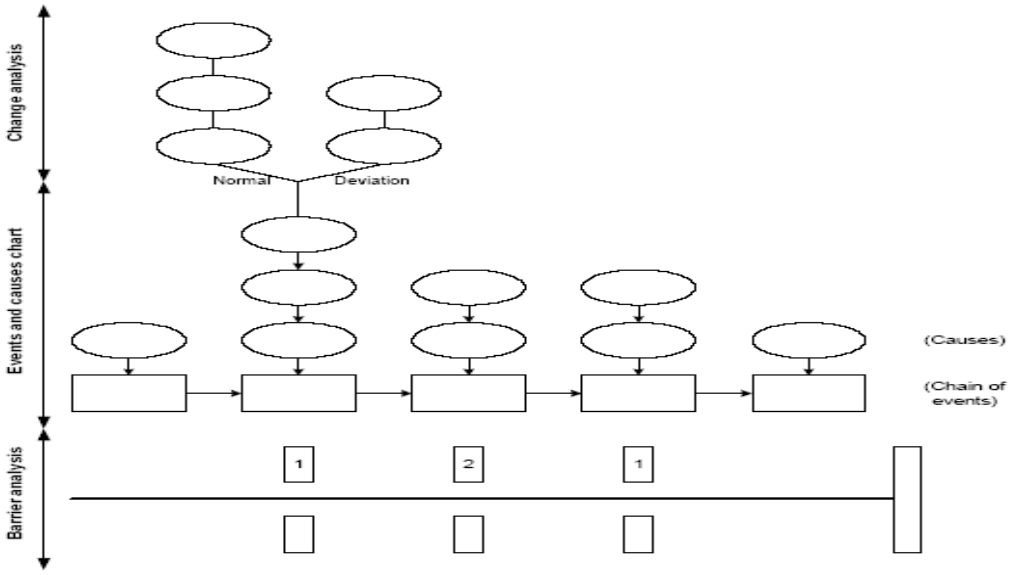

Figure 5.1. MTO-analysis worksheet

The attribution of causes follows a set of 11 predefined categories of 'underlying causes', including a number of sub-categories that indicate faults related to each category (some important sub-categories are listed in parenthesis):

A. Working environment (light, sight, cleanliness, temperature, wind, waves, noise, stress)
B. Work organization (time pressure, manning, competence, planning and preparation of tasks, division of labour and responsibilities).
C. Routines in change-processes (verifications, information, consequence analysis).

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likelihood and consequences". Nuances between definitions and specifications of 'components' and attributes of barriers were subject to some discussion, such as distinctions between functionality, independence, efficiency, testability, etc.

D. Management and platform-organization (policy and purpose, *safety culture*, quality programs, experience transfer, training programs, maintenance programs, division of responsibilities, risk analysis, emergency preparedness).
E. Ergonomics – poor technique (technical design, functionality and availability of information).
F. Working hours/time (overtime, stress, restitution and rest).
G. Communication (common understanding of risk, tasks and messages, tasks and risks, technicalities of media).
H. Written instructions/procedures (availability, content, format, readability, updating).
I. Supervision (delegation, follow-up, task overload/distribution, expectations, time pressure, work-mate contact, experience transfer)
J. Individual behaviour (use of procedures, preparation, self discipline, use of equipment, tiredness, motivation)
K. Training/competence (formal, practical, updating of competence, training material).

The actual use of these categories followed more elaborate definitions and criteria, and proficiency in the use of investigation techniques was generally followed up through special training programs and user manuals. At this point, disregarding the conceptual taxonomy employed, we may note how "safety culture" appears as a sub-category and an indication of "management and platform-organization" in consort with items such as quality programs and maintenance programs (but apparently dissociated from communication, supervision, work organization, etc.). The criteria for employing 'safety culture' in the causal analysis were specifically related to two conditions. First, whether the violations observed had a 'collective' nature, that is, if they appeared as commonly conducted and accepted within a work team. Second, whether the violations appeared to permeate hierarchical levels so that the operational failures could be taken as 'symptoms' of bad management (such as missing follow-up of plans, training requirements, risk analyses, corrective actions, etc.).

An internal analysis of 37 incidents/accidents in drilling and well operations in the period from 1998 to 2004, provides a picture of how these causal categories are distributed and attributed (see table 5.1. below). As each incident is investigated according to the MTO scheme, the method used was simply to count the frequency of causal categories in the material. Some categories appeared in almost all the events; category D (management/platform organization), in fact appeared in all of them. Other recurring

causes and categories were related to supervision, individual behaviour, and work organization; in fact, most categories appeared in the majority of the reports.

A. Working environment	56%
B. Work organization	86%
C. Routines in change-processes	45%
D. Management and platform-organization	100%
E. Ergonomics – poor technique	78%
F. Working hours/time	27%
G. Communication	75%
H. Instructions/procedures	67%
I. Supervision	97%
J. Individual behaviour	94%
K. Training/competence	45%

Table 5.1. Incident causes in drilling and well operations, 1998-2004

Within the most popular category (D), 'bad' safety culture appeared as the second most used sub-category, after failing quality assurance. It also appeared as the third most used sub category when counting all violations, and was used in almost 30 reports. However, operational error or lack of 'self-control' (the sub-category "individual behaviour") also appeared in almost all the incidents. This is not to be taken as expressing a bias towards identifying 'human error', in isolation, as an 'important' cause. The basic rationale in the investigation process was to uncover how the sum of MTO-factors had contributed in the course of the event. Operational error would normally be one piece in this puzzle.
We will return to these causal models later, noting for the moment how they, although pragmatically adopted, still served as important clues for framing the understanding of causal sequences and relations, and implicitly also contained (partly un-stated) theoretical approaches.

Causation and blame

'Operational error' was seldom highlighted by the agency. Given the long and strong tradition to address the systemic aspects of risk management, there was an accompanying reluctance to blame individuals; and 'operational error', although normally registered in the 'causal chain', came close to making that link. The related concept of "human factors" was not associated with 'individual error' as such, but rather with complex interactions between the individual and the environment. 'Human factors', as this concept

was employed within the agency, was primarily concerned with the understanding of socio-technical systems and interactions among humans in their work-related environments. Originally derived from the discipline of ergonomics, it had gradually become an important approach, in particular within the working environment group.[133] Through initiatives from this group, it was applied in audits and in other more collaborative encounters with the industry.

The associations between 'operational error' and individual blame was of course easy to make, and undue attention to both had the potential of constricting information flows and undermine the reporting cultures necessary for maintaining a viable risk management regime. Also, there were moral objections. The issue of causation, as translated to blame, made little sense in complex systems were the 'trigger cause' (like 'human error') would only be one element in the complex trajectories and configurations of facts and events. As noted, this no-blame philosophy was strong enough to resist the encounters with the more blame-seeking legal cultures and institutions. The in-house lawyers were socialized into the no-blame culture, but the NPD had also managed, with the aid of these lawyers, to 'cultivate' the police and the prosecuting authorities. As was explained by one senior legal advisor:

> R: Offshore, there hasn't been much focus on the work force. Focus has been on the company or firm-level. You'll have difficulty finding evidence for that [use of individual blame] in the petroleum sector.
> I: Does that mean that you've trained or influenced the police…?
> R: I believe it's related to the recognition that the offshore industry is so huge and complex, with huge and complex systems and organizational structures. So it's been largely realized that it would be difficult to find that *one* person has made a mistake …. You recognize that so many factors play a part, influencing the conduct of that person …. so you see that it would be fatal to single out one person as blameworthy for things that go wrong. Therefore, focus is put on the companies as such, that there is something wrong with how activities are run. But cooperation with the police has been close all along, as long as I can remember. There's also been unwillingness on our part to focus on persons. And our recommendations to the police have reflected that. And the police have followed our recommendation very closely all along …. there's been no counter-pressure from the police. Those working with these issues have understood that these issues are difficult and complex, and that it'd be

[133] In this tradition, data and methods and designs are employed to "optimize human well-being and overall system performance" Although the concept of 'human error' plays a part in these approaches, the main focus is to "contribute to the design and evaluation of tasks, jobs, products, environments, and systems in order to make them compatible with the needs, abilities, and limitations of people" (see the International Ergonomics Association; http://www.iea.cc/).

> hard to single out particular individuals. There has been very exceptional cases were you find someone who's been taking independent decisions, who hasn't been listening to others, and clearly behaved in a blameworthy manner, then you may have gone after the individual....
> I: Some say that the police in their investigations are content when they identify the immediate causes, that they don't trace the causal chains very far…?
> R: I really don't agree with that. As we have increasingly focused on a more holistic perspective on causal connections, the police have been keeping up, and they've been just as interested in searching for root causes. …. We always join them in their investigations precisely in order to convey a broader understanding of how the systems work, give them inputs in their examinations. …. We may have been in the forefront, but they've never been slow in catching up. (senior legal advisor)

Even the police investigations adopted a standard systemic accident investigation model. All members of the NSE-unit have been trained in the PSA investigation methods, although they used a slightly different technique themselves, more attuned to establishing 'facts' that could serve as evidence in identifying individual and organizational responsibilities. Terminology is also slightly different and more police-like, such as interrogation instead of interview, witness instead of informant, etc.; and of course, regulatory violations are identified as a basis for making decisions about legal prosecution. But the overall approach seemed well harmonized. The head of NSE unit was himself trained both as a police officer and as an engineer, and had some ten years of experience as an offshore petroleum engineer and HSE officer, and was thus familiar with the risk management philosophies and the accompanying methods and nomenclatures.[134]

But there were certainly debates about these issues. The director of regulatory development referred to this as an ideological debate, but seemed self-confident that the established regime would survive. Somehow, the systems based regime and the purpose oriented regulations had pinned the company as the prime mover in all matters of responsibility and causation:

> We've had a dialogue with the police authorities on these issues. They have underlined the fact that it's more complicated to start legal proceedings against companies, or individuals,

[134] He described the investigation process very much as a double effort: to uncover the course of events and at the same time to 'protect' those involved, emphasizing the establishment of trust when they were on the site; questions about 'external' conditions, such as sufficient training, if working conditions were well arranged, if work practices were normally accepted, etc.

> based on goal setting regulations, because there are fewer 'definites' to pin a case onto; thus you have to use more discretionary judgments about what's required. It is however our main focus to develop the best regulations as a tool for improving safety and thus preventing accidents or near misses from happening. So we have not, in our regulatory thinking changed our regulatory approach, but focus constantly on describing as best as possible the intention of the individual requirements. So we're not quite attuned, ideologically. We've often had discussions with the police on these issues. (director of regulatory development)

There has been some focus on this, as some consider judgments of individual responsibility to be too evasive. Even if clearly established procedures, such as conducting safe job analysis, were not carried out, no one was to be blamed. Companies have occasionally claimed that individual penalties are too rare, and unions have regularly claimed that responsible managers too easily escape public prosecution. Even some employees in the PSA were of the opinion that they had moved too far in order to protect the individual, although the legal approach was not necessarily seen as a desirable remedy. But the absolutionist ethos was strongly internalized. The preventive effect of targeting individuals would be rather small compared to that of targeting the company as such. And although the conflicts were apparent, the prophylactic no-blame attitude was also advocated within the industry:

> I: Is there a conflict between the legal outlook and system and the risk management perspective?
> R: Yes, for many reasons. To me the safety perspective is the principal issue. The prime task of the regulatory authority is to prevent accidents to recur, not to expose or punish. But then, sometimes it's really grave, and you'll have to take the sanctioning approach. So there's a question of when you use sanctions, which sanctions, and how you use them. Punishment is one ….You have the trade-off between sanction and information, and it's very difficult for any authority. In fact, I believe the NPD/PSA largely has administered that trade-off in a quite reasonable manner. But there have been strong tensions between ordinary officials and the lawyers …. It's been handled through internal discussions ….You'll always live with this …. The Rogaland Police Department has learned a lot and been constructive. I believe these issues have been reasonably handled. You have the unions who want more people hanged in the higher echelons, and the companies want more people hanged in the lower echelons, and the authorities stand in between and has to balance the concerns. You need good internal processes to handle this, case by case. (HSE manager)

The petroleum regime thus seems to have efficiently countered the more blame seeking approaches that is normally found in legal systems and cultures. This is not necessarily reflecting any national pattern. An analysis from the mid 1990s on the role of the

judiciary system (the prosecuting authorities and the courts) in relation to accidents (primarily in the industry, construction and transport sectors) concluded that this conflict was indeed a more pervasive phenomenon. It was argued that the legal system had not adapted sufficiently to the modern risk management philosophies that were reflected in the regulatory reforms and that investigations and legal proceedings often concentrated on the 'triggering causes' (typically at the operational level), thus missing the complex mix of antecedent causes and conditions preceding the accidents (Bjordal, 1997; Bjordal and Graver, 1996). The petroleum regime then appears as pioneering also in how the regulatory authorities have managed to 'educate and enlighten' the other legal actors, notably the police, and thus to avoid the blame-seeking, and often inconsistent, involvement of the public prosecutors and the courts. A 'double barrier' has thus been erected, favouring absolutionism rather than blamism. The justifications for this were both moral and instrumental; the former possibly also reflecting pressure from unions, and the latter reflecting the belief that information processing would be compromised in a blame seeking system and that event analyses had to reflect the causal complexities in order to promote learning and improvement. Still, the methods applied in investigations would be adequate for establishing individual negligence. The sequential ordering of events, in each step measured against relevant requirements, could, if served in the hands of a judiciary system untrained in 'modern risk management', easily have triggered verdicts based on individual negligence. As noted above, the justification for not doing so, even if faults were not 'anonymous', was that they were 'cumulative'. Although the threshold for applying that term was not clearly established, the 'causal impact' of the act in question was generally considered to be too insignificant for the outcome. Apparently, this legal pigeonhole was spacious enough for absorbing the overwhelming majority of 'errors' committed on the shelf. [135]

[135] It should be noted that no systematic analysis has been conducted here of the available investigation rapports in order to assess the uses of causal techniques. The general impression, however, is that various discretionary judgements about 'proximity' and 'adequacy' are summed up to outline the combined effect of several contributory conditions, and then linked directly to the abundantly available legal provisions in order to establish 'non-conformity'. These analyses did not (need to) approximate the kind of sophistication necessary for teasing out the more 'precise' causal impact of individual acts through various tests that may be employed through so-called causal minimalism for specifying 'causally relevant conditions' ('cause-in-fact'). Such tests of causation may be rather unrestrictive, such as the 'but-for' test implying only a requirement of necessity (the condition, without which, the outcome would not have occurred). Problems of over-determination or 'joint determination' have caused some to introduce stronger claims, such as

The mismatch between legalistic and organizational or systemic conceptions of risk and hazard is approached within the context of risk management politics, regulatory enforcement, and penal law. The potential conflicts between these systems are largely solved by keeping the legal system on arm-length distance. But issues about the attribution of cause (and blame), and the appropriate individual and organizational targets of such attributions, are still intensely debated and contested through the application of apparently competing models of risk management and organizational approaches to working environment and safety. Incidentally, the concept of culture served as a trigger in raising these issues and conflicts on a broader level, with the legal boundaries receding more into the background. And clearly, cultural values and ideas about reasonable and just ways of distributing the relevant risks will affect both legal and extra-legal judgments about causality, responsibility, and culpability. It has been argued that causation in law should to a greater extent reflect ordinary causal judgements outside the legal context (Hart and Honore, 1969; Honore, 2005). In the petroleum regime, the risk management philosophies served as templates for such 'ordinary' judgements. And in the end, it can be argued, there are no theory-free, context-free, or value-free criteria available for making judgments about these issues (Shaver, 1985).

Reviewing some salient regime properties

Before turning more specifically to the experiences of the cultural approach to risk management in the next chapter, we may at this point review some of the most salient aspects of the regulatory context within which these experiences took place. And, as we shall return to a more general discussion about the understanding of regulatory regimes in the final chapter, this review should also serve as a preparation for that discussion.

As would be evident, the practical task of managing risk from the position of the regulator, involves a complex mix of regulations, resources, priorities, organizational designs, supervisory techniques, analytical methods, conceptual schemes, causal models, enforcement measures, interaction patterns, and communicative styles. These

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conditions that are considered as necessary elements of a set of conditions jointly sufficient for the outcome, also referred to as the NESS test (see Hart and Honoré, 1969; Honoré, 1999; Honore, 2005).

components of regulation, in all their various modalities, reflect also some assumptions, ideas, and philosophies about the regulatory role, as well as structural conditions for fulfilling this. Encounters with the industry take a number of forms, and embody assumptions about motivational structures and conditions of compliance which inform the choice of appropriate enforcement instruments. Sources of power may variably depend on available sanctions, or on the professional knowledge and legitimacy as an authority (many would, humbly, refer to the importance of the latter). Anticipatory mechanisms are clearly present, as the regulatee knows that the authority has the means to strike hard if trust is broken. Although their role is formally founded on the legislative mandate provided by the law, the dominant rationale in enforcing regulation is based on dialogical and enlightened problem-solving in the promotion of regulatory goals, with arm-length distance to ministerial and political principals, as well as to the judiciary system. Partly we're dealing here with disparate systems of the societal order that converge in using the one, the legal system, to achieve the goals of the other; that is, the public policies of reducing risk and promoting the values of health and safety. The front line bureaucracy has the challenging task of navigating within these spheres.

Seen from a historical perspective, this regime has it own specific genealogy, developed within a national context largely characterized by predominantly egalitarian values, a relatively high level of trust, and a correspondingly low level of industrial and societal conflict. The regime is firmly integrated in a tripartite system of industrial relations, burdened with the task of balancing opposing social and economic interests, but still benefiting from the active contribution of the industrial parties in making the regulatory system work. We have previously referred to these broader societal features as the 'Norwegian-Nordic context' (see Chapter 3).

The philosophy of self-regulation, gradually emerging from the late 1970s, relies not only on the implantation of formal management systems, but also, on the proactive and dynamic involvement of regulatees, interest groups, experts, etc. Despite the genetic idiosyncrasies, some generic modalities of the regime may be highlighted by briefly considering some of its properties in relation to the 'anatomy' developed by Hood *et al*.

(2001), briefly outlined in Chapter 2. This also provides an occasion to critically examine some of the formative constraints contained in that model, in particular in terms of how specific configurations of dimensions and variables match requirements for conceptual clarity, the logic of categories, and how these capture the empirical varieties of actual regimes, to be understood both as 'cases' within larger regimes and between such composite regimes.

Starting with the tripartite control system (standard setting, information gathering and behaviour modification), this clearly cannot be conceived of as a static 'single loop thermostat'. Regulatory processes are dynamic and the regulatory purposes are pursued in a number of integrated approaches, each of which is not easily identifiable as isolated components of the control system. Regulatory activities, such as audits and investigations, contain elements of all three, as they simultaneously set standards, gather information and modify behaviour. Likewise, the RNNS project not only gather and process a comprehensive body of information and knowledge about risk, but serves also as a 'mirror' for the 'modification' of industrial behaviour. The three elements are still separable within these integrated practices, but we consider them jointly below, as they apply to each component along the 'instrumental-institutional' dimension. It should be noted at the outset, however, that the composite versatility of this regime makes it difficult to unequivocally attach *values* to these variables.

The first element, *type of risk*, makes that point particularly clear, for two reasons. First, as this component primarily addresses the magnitude of risk we may recall the comprehensive efforts devoted to evaluating risk levels in the petroleum industry. We recall also the great variety of risk factors, from health impairments to major accidents, and the problems, despite prolonged efforts, related to estimating the relative magnitude of each. As this component specifically address the *residual* risk, the impact of societal controls other than strict market controls must also be noted, such as the local systems of participation and voice (like safety representatives), although these controls of course belong to the 'content' of regulation. Again, the most striking feature of such controls is their embeddedness in socio-political context of the tri-partite system. Market failure

appears as a feeble benchmark for considering residual risk in this context. The second and third components, public attitudes and organized interests, are probably best viewed in consort. The former have certainly had an impact, and the tightening of regulations during the 1980s can be explained as largely a consequence of the Bravo blow-out in 1977 and the catastrophic capsize of the Alexander Kielland platform in 1980. The local media have extensive coverage of offshore incidents and accidents, but the impact on regulations is probably insignificant. The 'public' in this case is largely represented by the organized interests. Although the unions are dispersed in several separate organizations, they are all represented in critical arenas and mobilize much argumentative force and energy, as will be evident also in the pages to come. The industry also appear to further their interests primarily through argumentative mobilization. On the whole, interest groups are efficiently organized, with a number of available channels for voicing their interests. As it appears, the industry demonstrates a certain reluctance in openly objecting to requirements and enforcement practices, unless these appear severely unjustified; and the voices are predominantly channelled through the industry associations. The unions allow themselves a far more militant and outspoken role. On the whole, however, the organized interests are allowed to participate extensively in crucial phases of the regulatory processes.

Turning to regulatory content, the *size* component appears as intriguingly difficult to estimate, partly as regulations for the most part are risk-based and goal oriented. The severity of the regulations are also subject some (unsettled) controversy. No less than a Laplacian Demon would be required in order to measure the net risk reducing effect of interventions against some of these essentially un-predictable scenarios (such as the effect of, say, a sleepless night in a double cabin), as against the 'comparative' risk reducing effects of interventions against impairments of worker's health conditions (such as the effect of, say, a good nights sleep in a single cabin).[136] Still, it may be modestly

[136]As may be recalled, the Demon of Laplace (the French mathematician and astronomer, 1749-1827), was a theoretical construct based on the belief in causal determinism, typical of the strong belief in the progress of science during the Age of Enlightenment. It was launched in his essay on probabilities, regarding the present state of the universe as the effect of its past and the cause of its future: "Given for one instant an intelligence which could comprehend all forces by which nature is animated and the respective situation of the beings who compose it - an intelligence sufficiently vast to submit these data to analysis - it would

summarized, the overall investment in regulation appears relatively comprehensive in terms of resources, scope, and coverage. No province of risk easily escapes this regulatory framework. Regulatory *structure* is complex and composite, primarily in terms of the extensive role of industrial self-regulation. Standards, internal procedures, monitoring schemes, etc., vastly exceeds the amount of statutory regulation. The structure of the state bureaucracy, on the other hand, is tailor-made to fit the industrial sector, with extensive organizational integration of risk factors and elaborate coordination mechanisms towards other agencies. Regulatory *style* has been described here as typically accommodative; this must however be seen against the availability of the variously sized 'sticks'. The degree of 'rule-orientation' is somewhat dubious, since rules and procedures are abundantly present and strongly advocated but at the same time seen as intrinsically dependent on practical efficacy, knowledgable agents, and a 'good HSE culture'.

Given this very provisional summary, we should note however the overlaps and grey zones between variables. Thus, for instance, regulatory size and style would in many cases provide a combined indication of what is referred to as 'policy aggression', which in the model is referred to as only an aspect of size. As noted above, although 'style' appears as accommodative, it is clearly backed by the implicit possibility of severe sanctions, even if these seldom surface. Also the aggregate dimensions appear as overly composite; at other times they seem too restrictive in scope. In both cases this has explanatory implications. Categories like 'structure' and 'organized interests' are both very composite dimensions. The former combines two quite distinct institutional dimensions. The first, referring to the non-state share of regulatory resources, alone covers two separate sub-dimensions, that is the amount of third party contributions and the level of compliance cost. Both of these, in particular the latter, must also be seen as indications of 'size', in terms of the regulatory burdens and costs apportioned to the regulatees, including systems of self-regulation. The other aspect of structure opens the landscape of institutional arrangements within the state system, thus covering both the vertical and horizontal dimensions of organization. In itself, this complex constitutes a

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embrace in the same formula the movements of the greatest bodies of the universe and those of the lightest atom; for it, nothing would be uncertain and the future, as the past would be present to its eyes." (see Hacking, 1990: 11-12).

critical and dynamic dimension in the formation of regimes. Likewise, ‘organized interests’ joins very different groups of actors, with very different interests: business interests and union interests may be subdivided only on the third level of disaggregation. Within an industrial relations perspective, these are of course highly relevant. In sum, many levels of disaggregation are necessary in order to capture important mechanisms in the formation of regulatory content. More important in this context, is that the regulatory interest, or more specifically, the interests of the policy makers, the regulators, and the bureaucrats are not clearly separated, and in the aggregate analysis they are joined indiscriminately with the interests of all non-public interest groups. I shall argue below that ‘the public interest’ deserves a more unique and distinctive position in the explanatory and interpretive scheme. I shall further argue that this is also due to the more restricted delineation of ‘type of risk’. Although this dimension opens for a wide interpretation of ‘residual risk’, taking account of possible disagreements and uncertainties, it may also serve as a more narrowly defined benchmark in the explanatory analysis, restricting the scope of public interest explanations. We will return to this issue in Chapter 11.

This general account of regulatory world views and practices provides a necessary background for understanding the contexts in which ‘HSE culture’ was supposed to make a difference. Although only occasionally having touched upon the subject so far, we have still seen how ‘culture’ appeared in various configurations, sometimes ascending to comprehensive roles, sometimes descending to more modest roles; and as noted, the originators had all left the agency before these navigational processes commenced. We thus turn to how the heritage was ‘managed’.

6. Reinventing HSE culture

As noted, the originators of the HSE culture provision left the NPD during the initial phases of the 'team-period' around 2001. The follow up process was to be organized as a project (starting some time late in 2001), reporting directly to one of the supervisory directors. Some of the key members of the group, including the leader, were recently recruited, partly on the basis of training and competencies considered important for the follow up of the culture provision.[137] Neither the loss of the originators nor the composition of the project did contribute to any continuity or strong anchoring of the project within the agency. They clearly felt they had to start from scratch. No clues were given apart from the text in the provision, the very brief guideline, and some passages from the 2002 White paper that were being drafted. The lawyers and many of the engineers were somewhat bewildered; some were sceptically waiting for measuring criteria to be developed in case the provision was to be used as a yardstick for defining non-conformities, or worse still, as a warrant for issuing orders. The management provided in practice a more or less open mandate; as noted, the 'developmental' and 'experimental' nature of the provision had been formulated as a point of departure. In short, the regulatory implications of HSE culture had to be reinvented.

[137] The leader was a skilled HSE professional with some 25 years experience from the industry. He was also a petroleum engineer, and had practical experience as a well supervisor. He had participated as project manager for one of the most successful HSE-projects ever conducted in Statoil, contributing to the reduction of accidents in Statoil operated drilling operations with some 90 percent in the period from 1986 to 1991 (from a frequency of nearly 60 to 3,7 injuries per million work hours; in actual numbers from 72 to 3). The project enjoyed strong managerial support and utilized a number of organizational intervention strategies, such as training programs, continuous monitoring, and task analyses (see Haukelid, 1996). The other was an anthropologist specialized in organizational studies and with occupational experience from quality management in the hotel business. She admitted, as an anthropologist well familiar with the evident complexities and potential confusions related to "culture", that she was skeptical from the start: "I didn't really like the idea in the beginning; it was too complex and comprehensive …. Only gradually, it started to make sense, by discovering how cultural factors actually was very significant in all kinds of contexts". Partly, this development reflected increasing familiarization with the industry (with which she had no prior experience). Due to maternity leave, she was later to be replaced by another anthropologist (recruited from the local research institution, IRIS). Also, a newly appointed organizational psychologist participated heavily in the project.

Conceptualizing 'culture'

The work commenced largely as a venture into the literature on safety culture and risk management, in collaboration with the 'R&D network'. No contact was made with the originators. Not surprisingly, however, many of the original sources of inspiration were utilized in the reinvention process. Notably, these were largely to be found in the High Reliability-literature, in particular through the popularized exposition provided by James Reason in his book on organizational accidents (Reason, 1997). The first major achievement of the group was the production of a small booklet or brochure called "HSE and culture".[138] It outlined a broad perspective on culture that drew together these High Reliability perspectives, supplied with some anthropological perspectives and more general organizational perspectives on management and leadership. The holistic HSE-perspective was underlined, emphasizing in particular the importance of health and the working environment. This was quite deliberate, and in line with the priorities of the White paper; in both cases attempting to lift these issues out from the 'shadow of safety'.

Culture was defined as "the knowledge, values, norms, ideas and attitudes which characterize a group of people", subsequently complicated, however, by adding that culture "is also about technology, economics, law and regulations, and other conditions which influence daily life". In fact, it was of some importance to forward the message that culture was not to be understood as the sum of privately held attitudes mysteriously adding up to a strong collective commitment to HSE-values and "safe behaviour". Rather, HSE culture was seen as evolving from ongoing processes of interaction between people, groups, and framework conditions, not clearly delineated into unitary 'cultures'. Improving HSE culture would, in the short version, entail the application of appropriate

[138] For the latest and slightly updated version, see: http://www.ptil.no/English/Produkter+og+tjenester/Publikasjoner/4_temahefte_hms_kultur_relansert.htm. Several internal work-shops were also conducted within the agency in order to generate a reasonably comprehensive understanding and agreement (2001-2). In particular, it appeared vital to counter or at least supplement widespread ideas among some of the engineers, seen to be highly influenced by American-inspired philosophies associating safety culture primarily with 'attitudes and behaviour' at the low operational level (the 'sharp end' of production). These workshops were also largely exploratory in nature, conducted in parallel with the production of the booklet and the consolidation process of the culture group. External advisors, primarily form the R&D network contributed to and facilitated in the process. The process was completed when I entered the agency.

means to sensible goals and then to act on that, thus providing truthful agreement between words and deeds.

The dangers of self-complacency were particularly underscored, quoting from Reason's book: "If you are convinced that our organization has a sound safety culture, you are almost certainly mistaken". Self-satisfied organizations would endanger critical judgment and the ability to spot signals of danger. A sound culture, on the other hand, would "facilitate continuous, critical and thorough efforts to improve health, safety, and the environment". It was further pointed out that this required imagination, joint efforts, and a multi-disciplinary approach. The concept of HSE culture was then sketched out by adopting Reason's notion of safety culture as an *informed culture*, the composition of which would include *reporting, justice, flexibility,* and *learning* (see Reason, 1997: 191-222).

Reporting culture addresses the dilemmas inherent in the so-called 'zero-philosophy' between seeing harms as caused and therefore (in principle) preventable, and the possibility of counter-productive pressures toward keeping figures low. Dangers of underreporting are addressed, in particular by warning against sanctioning 'the messenger' or the 'wrongdoer', but rather promoting a climate of trust and a willingness to learn from experience. It is further pointed to the possible double edged effect of bonus systems: rewarding low figures in contracts (worker, management, or company level) can promote unreliable and manipulated rapports rather than improved HSE-conditions. *Just culture* addresses primarily the relationship between personal responsibility and the systemic conditioning of behaviour. Human error is 'human', and organizational responses must take account of that and apply proportionate and productive responses. Personal responsibility and vigilance must be exercised in all phases of operations, including planning and design, but is affected by organization and staffing. No threshold is indicated for when, or which, individual sanctions should apply in different circumstances. However, a distinction is made between "intentional and unintentional behaviour", but we are reminded on a very general level about the importance of perceived fairness, and the fact that both personal responsibility and framework

conditions matter.[139] A *flexible culture* is furthered by creativity, imagination, free-floating information, and the combination of multiple "mind-sets" in solving tasks. Redundancy is not mentioned specifically, although the industry is compared to High Reliability Organizations in having to balance between rule-following and swift adaptations to changing and unpredictable situations, not always able to afford the trial-and-error approach. The intrinsic nature of this trade-off is not altogether apparent, and the text also contains some underscored, but rather general, checkpoints addressing the need for making sensible priorities and the active use of procedures based on "risk" and "best practice". The last element, a *learning culture*, receives most attention.[140] Learning cultures are open and facilitates unbiased knowledge-sharing across internal and external organizational borders, including also the established institutions of employee contribution (participation) and tree-party cooperation, referring to and quoting from the Framework Regulations to that effect. We are warned against in-group biases, inadequate communication along organizational interfaces, and other mechanisms for suppressing or ignoring important information. Included, however, is also the handling of conflicting objectives, pointing to the dangers of compromising HSE by making shortcuts in the face of production demands, tight scheduling, and time pressure. Other conflicts between HSE and economy are not mentioned here specifically, such as investments, resources, manning etc., although they are to appear later.

The booklet also considers sources for understanding HSE culture, notably by discussing available methodologies. Methodological diversity is called for, pointing specifically to the need for supplementing the presently extensive and dominant quantitative measures with qualitative data. The industry is particularly advised to investigate how formal systems are actually complied with, and to identify causes of deviations as a starting point for revising systems, improving work processes, or both. HSE culture is treated in this section as a somewhat reified construct, as something out there that we can have 'access' to through various techniques. The use of a singular tense contributes to this,

[139] Reason (1997: 208-211) himself, it could be noted, in fact develops a fairly intricate model for managing this balancing act of determining the culpability of unsafe acts in his original presentation.
[140] This, contrary to the source text, where it is mostly seen as encompassing the former three, summarized as observation, reflection, and creation, only adding the most critical element of *acting* on these (Reason, 1997: 218-19).

notably by the use of such terms as “the HSE culture”, “an HSE culture” or “one’s own HSE culture”.

A more dynamic vision of culture is presented in considerations of “factors which can affect an HSE culture”, albeit the surviving singular tense. Culture is here described as continuously changing, through both external forces and internal dynamics. External factors cover national traditions, such as beliefs in the value of worker participation, multi-national influences due to the composition of the work force, differentiation of knowledge, professions, and tasks, etc. Also, structural framework conditions are seen as shapers of culture, ranging from state policies (regulations), economics (oil prices), technology, to natural resources. The forces shaping and changing culture may be clear, explicit, and apparent, or they may be implicit, hidden, and ‘unconscious’. No clear discussion is provided of how to see the difference, nor to distinguish external from internal forces, or ‘cultural’ from ‘non-cultural’ ones, leaving it to the intuitions of the reader to single out, at least, the extreme ends (like oil prices and reservoirs). Culture is thus permeating organizational realities in the guise of disagreements on priorities (culture conflicts), organizational differentiation (sub-cultures), decision-making powers (cultural powers), worker resistance (counter cultures), etc. Such cultural anomalies may be countered by unproductive problem-solving measures, such as: (1) tightening up bureaucratic systems and procedures leading to increased complexity, inappropriate work processes and alienated workers; (2) increasing worker discipline, leading to loss of trust and cooperation, again leading to muting and loss of information. Or they may be creatively approached by building a sound culture, in short, by avoiding the above. This leads to the final presentation of the role of management in the building of culture. Initially a distinction is made between ‘appreciated’ managers who are: open, honest, decisive, trusting, present, professionally able – and ‘unappreciated’ managers who are: closed, unfair, stressful, unpredictable, critical, absent and controlling. These management ideals are put to test, again, in the critical moments of choice between economy and HSE. And framework conditions, such as contractual arrangements specifying how performance is to be rewarded, strongly affect whether or not such tests are passed.

In short, the booklet summarizes an amalgam of researched and received wisdoms within risk management, and it both encapsulates and confirms some salient features of the regulatory philosophies, such as the no-blame approaches, promoting enlightened risk sensitivity and learning processes, warning against self-complacency, focussing on critical trade-offs, accentuating participation and tri-partite collaboration, and so on. Conceptually, however, culture appears almost as omnipresent, all pervasive, and unbounded within the various social, institutional, economic, and technical contexts. Culture is everywhere. It proposes a dynamic and open-ended perspective on culture, but does occasionally implicate 'holistic' ideas about singular and somewhat reified 'cultures'.

The booklet was generally thought to be well-received, triggered much interest, and was widely distributed in the industry.[141] It also constituted the most elaborated statement from the PSA about how HSE culture was to be understood; and as noted above, few such indications were given in the regulations or in the preliminary legal documents. Subsequent efforts to present and sell the HSE culture message were largely founded on the contents of the booklet, or at least, couched in the same terms and perspectives. The booklet was presented in a large two-day conference in November 2003, specifically dedicated to HSE culture. A similar conference had been arranged in 2002. Both conferences were well attended (some 200 participants) and received good responses. The programs largely reflected the more general and organizational issues of risk management, and included presentations from researchers, unions, and companies (thus predictably provoking discussions about the vices and virtues of behavioural approaches to safety). Members of the culture group also participated in the R&D network, and had several external presentations responding to invitations from companies.[142] Addressing HSE culture on public scenes thus took many forms, not always clearly distinguishable from other 'non-technical' meetings or seminars. Also, HSE culture would be addressed on occasions not specifically dedicated to the topic.

[141] It has been printed in some 8000 Norwegian and 3500 English copies, in addition of course to uncountable downloads from the Internet.
[142] The R&D network included of course also the HSE culture project in the HSE research program, being responsible for several joint seminars on the topic.

Supervision and enforcement

Greater challenges were to appear, however, in making HSE culture 'auditable' and 'enforceable'. It was, after all, a regulatory provision, in principle to be followed up like any other. In 2002, two pilot audits were conducted, furnished to address HSE culture in an exploratory manner, involving close and 'deliberative' cooperation with the 'test-companies'. These did not strongly involve the culture group, but were largely planned and arranged as an extension of the general supervisory training program. The experiences were mixed, however, clearly reflecting the difficulties involved in addressing, and even diagnosing, culture, within the bounded context of the audit.[143] Integrating HSE culture into the supervisory activities would gradually prove to be a challenging task. In the early phases of its conception as a statutory provision it was not quite clear how it was to be enforced. The ministry, dominated by lawyers, tended to prefer clear and enforceable provisions. In their dialogue with the PSA it was perceived to be regarded as an 'ordinary requirement' to be enforced as any other. The attitude of the ministry was that the legal codification had to imply a clear intention of its enforcement, thus enabling the possibility of assessing conformity against a more specified standard. They realized the difficulties involved, but indicated that it might apply to such instances as when regulations and procedures were "deliberately and continuously neglected"; if the managers clearly expressed or revealed "disregard for rules", that was to be seen as a violation of the HSE culture provision (interview with ministry officials).

In the NPD/PSA there were tendencies in both directions. But the main message that gradually came across was that this was to be considered as a more overarching provision, a goal to be reached for, and an opportunity for engaging with the industry in an open and creative dialogue about improving HSE conditions. Even the legal advisors, being socialized into the purpose oriented regulatory tradition in the NPD/PSA, saw it more as a provision of that same tradition. Enforceable rules had to be more specific: "you must know what counts as a violation, so there must be a standard to measure

[143] Using open questions, promoting self-reflection and learning, appeared as important entries. Asking about HSE culture 'directly' proved too 'comprehensive'.

against" (senior legal advisor). Evidently, no such standard was available in the case of HSE culture.

As noted in Chapter 4, there had been discussions during the regulatory process about the legal status of the requirement. Some clearly thought it better be formulated as an integral part the general principles and purposes (that activities should be 'safe and prudent'). When it finally ended in a separate section, this reflected most of all an intention of giving it force and attention. As was explained by the supervisory director responsible for the project:

> It's more like an overall objective, integrated in HSE-activities. As for instance section 1 in the WEA, it covers the underlying rationale for the other regulations …. There is no specific definition of HSE culture. HSE culture must be addressed in relation to other regulatory requirements and HSE-activities in a way that supports and enhances the development of a good HSE culture in the companies. There was much discussion about having a dedicated provision. I feared that, being good auditors, we'd take that regulation and look for 'the culture', address this single-mindedly and based on checklists. But fortunately, thanks essentially to the culture group, we've been able to develop and acquire a broader understanding of the complexity of this kind of concept, and brought the discussion up to a more overall level where it belongs. (supervisory director)

Although these were hindsight reflections, they also expressed initial concerns, uncertainties, and possibly also divergences regarding the enforcement issue. Even to the ministry, enforcement appeared 'natural' from a legal point of view; but the agency lawyers, more familiar with the substantial difficulties involved, were basically sceptical. The issue of enforcement was thus not clearly resolved. In fact, it was not possible to get a clear picture of how it was used in these initial phases. Clearly, no specified criteria were established for supervisors to measure conformities or non-conformities. But there were two conspicuous instances of at least 'partial' enforcement that received much attention. These were the two fatal accidents in 2002; HSE culture appeared in both investigation reports, and in one case even in the police report and finally also in a ticket fine issued by the Public Prosecutor. The fine included references to violations of a large number of provisions, the HSE culture provision being only one of these, and obviously not decisive for the penalty as such. We present these two cases below.

To my knowledge, culture didn't appear in supervisory reports, at least not in the form of "non-conformities" or orders. There were certainly rumours to the contrary, both inside and outside the agency, implying sometimes that this had become a new magic formula and that all sub-standard HSE-conditions from now on was to be seen as symptoms of the most underlying of all underlying causes: a bad culture. But the supervisory directors were quite conscious about not indulging in this kind of practice. One of them also admitted that in the early period they had to restrain the enthusiasm of some by removing references to HSE culture in several audit reports before they were formally issued.

As noted in Chapter 4, the expectations from the General Director were not so clearly stated, but pointed rather to the need for a 'developmental approach', and that HSE culture perhaps would be more approachable in overall meetings, based on a broader evaluation of company behaviour:

> R: To outline a picture of the culture as part of our supervisory activities …. I don't know. I expect a picture of the culture in the company to be summarized once a year based on what we know. We do make assessments once a year and an image of their culture should be a part of this. And there is much that can be used, within all of these areas that we keep an eye on within the companies. Then that picture must be communicated …. That shall be done .... or is supposed to be done, in yearly meetings we have with the top management in all companies. To try to keep to the overall picture …. we tend to go into details …. as does operators. This year we also want a meeting with the largest license owner, the state owned Petoro. Try to put pressure on the licensees. What do they do in the license committees, where is their focus? So we will present a request that they, in addition to what they already do, will put HSE on the agenda …. how do they contribute? It's apparent that a pressure is needed here, in budgets etc. It's the license that provides the money for the operators. The license partners are the owners, or the board, and the operator is the executive. That's our figure of speech. The operators run the fields on behalf of the license committee.
> I: So these meetings can be used to address HSE culture?
> R: I'd really like us to do that. We're not good enough today ….
> I: Did you address HSE culture in last year's round of meetings?
> R: I believe it was done, pointing to elements in what we have observed that illustrate the need for an improvement of the cultural element. Then this can be exemplified, such as absence of visible management, pointing to the question: "have you no concern for HSE?", as an attitude, as part of a culture. We do this, but we're not doing it well enough today. We must do it better.
> I: Have you considered how this shall be done in the upcoming meetings?
> R: I'd really like to do that
> I: Have the supervisory teams been instructed to 'diagnose' the HSE culture as part of the yearly evaluation?

> R: Yes, well it's not sufficiently explicit. …. In our expectations to the teams when HSE-conditions are summarized …. we're not sufficiently explicit that they shall try to portray the culture, and accordingly, what they should look for. So we need a process here.
> I: So you're not afraid of using 'HSE culture' [the term]?
> R: No, we must have the guts to say something about how we assess a company in terms of HSE culture.

This account summarizes some of the important dilemmas involved in terms of enforcing the provision. On the one side, a willingness and interest in exploring and utilizing the powers felt to be contained in the concept, and on the other hand, a qualified respect for what it implied in practical terms. But, known as a fearless crusader, unwavering in critical situations, and outspoken in encounters with the industry, this respect seemed to make him less reluctant. Still, as far as I know, the intentions to put HSE culture on the agenda in the meetings mentioned, were not followed up.

As noted, however, HSE culture appeared in the investigation reports subsequent to the two fatalities in 2002, the first one just a few months after the regulations had been in force. These cases thus stand out in terms of seriousness and attention, and a brief review will illuminate both how causal models are applied and related to the regulatory responses, and, in particular, how HSE culture appeared as part of these explanatory reconstructions.

The Byford Dolphin accident

This accident occurred on the mobile drilling unit Byford Dolphin on 17 April 2002 in connection with well completion operations on the Sigyn Field. Esso was operator of the field but Statoil was responsible for the operation on behalf of Esso. An engineer employed by the rig company Dolphin was struck on the back of the head by a so-called spool-piece (pipe) weighing 191 kg. The pipe-end had at that point fallen about 13 meters from the overlying drill deck through an opening in the deck (a so-called mouse-hole). The person was severely injured, and died later on the way to the hospital. The accident occurred during the installation of a so-called horizontal x-mas tree (HXT), a network of valves shaped as a X-mas tree to be placed above the well templates. During the operation, a piece of the drill string had temporarily been put in the so-called 'catwalk', a

carrier for transporting drilling equipment to the drill floor. The spool piece had been put in the catwalk a few days earlier. In the course of the HXT operation, the drill string had to be extended again, and the driller and the assistant driller decided to use the piece that had been put in the catwalk. A winch was used for that purpose, but in removing the string-piece, the spool-piece fell out of the catwalk, through the mouse hole and hit the engineer, who was working in the so-called moon-pool area on the cellar-deck below (an open area at the centre of the rig where equipment can be lowered down to sea level). They were working on improvements and adjustment of a landing skid in the area (that is, preparing an arrangement for temporary placement of equipment for the operation).

A number of factors were identified by the NPD investigation team as precursors to the accident, each of which involved violation of company rules, statutory regulations, or both. Planning and preparation of the operations had been deficient. The spool-piece was deficient and should have been removed, as temporary placing of devices and equipment shall be avoided (referred to as “deficient orderliness and tidiness”). Also, the catwalk was not properly secured in order to avoid things from falling out, and the opening in the floor (the mouse-hole) was not sufficiently covered due to time saving and convenience (referred to as “deficient covering of openings in the deck between work areas”) .The winch operator (assistant driller) didn’t have a proper sight of the area, and should have used a flagman (referred to as a ‘blind lift’). The driller observed that people were working in the area below, and gave a radio message that they should move out. The message was not confirmed, but the driller (erroneously) assumed that it had been received as he later observed a person move out of the monitor from his position in the drill room. Not having the radio message confirmed properly was a deviation from procedure, but was not considered unusual, and thus in effect seen as revealing a more widespread attitude on the rig. In fact, none of the people in the underlying area had heard the warning, since they were tuned to another frequency, yet another violation of company rules. Deficient planning and preparation for the operation also included missing work permits and safe-job analysis, both related to the lifting operations and to the work in the moonpool-area. This indicated both deficient knowledge and breach of applicable procedures, and it reduced the general awareness of potential dangers related

to the operations. In this case, deficient communication and practice for conducting simultaneous operations on different levels, was particularly critical. Uncovering the need for coordination of activities is an important purpose of these procedures and systems.

In sum, a number of causes and violations were listed in the NPD-report, where every relevant operation in the process were tied to the more generalized categories of analysis: insufficient planning and preparation of the task, including the use of safety assessments; insufficient knowledge and violation of procedures; deficient orderliness and tidiness; insufficient communication and coordination of simultaneous and parallel tasks; and, insufficient sheltering of openings between work areas (ie the mouse-hole). The overall evaluation in the report was that HSE considerations had not been properly addressed and implemented by the companies involved, evident both at the managerial and the operational level. Based on this, the NPD also notified a more extensive follow up of all the Dolphin rigs and all mobile rigs on Statoil contracts.[144]

Both Statoil and Dolphin received orders after the investigation was completed. Dolphin was required to evaluate knowledge of and compliance with company procedures on all their rigs on the NCS. It was further required that measures be suggested, implemented, and independently verified. The Statoil order primarily addressed their responsibility to "see to it" or "ensure" (cf the wording of operator responsibilities in the Framework Regulation) that their contractors had prudent HSE-systems, and that contracts allowed safety concerns to be properly taken care of in practice (referring specifically to time and resources).

Although safety culture was not addressed in the order, it appeared in the investigation report as a non-conformity following from an overall assessment of the large number of volitions of rules and procedures. More specifically, it was related to the failure of the

[144] Barely two months after the report on the fatal accident on Byford Dolphin was presented, allegations had been made via the press of so-called "new information" that could cast doubt on the NPD-investigation. One of these allegations, which had also been reported (anonymously) to the NPD was that the engineer had been working for 36 hours without sleep. This caused an extensive follow-up, including the involvement of the ministry, but the assertions were rejected by the NPD.

company to follow up and react to these volitions, and to the general priority of saving time at the cost of safety. It was thus noted that several persons were involved in the process, and that neither those responsible for the operation, nor other persons involved, interfered in spite of these violations. Insufficient knowledge and negligent attitudes were cited as possible background conditions, referring specifically to the fact that managers and supervisors had been aware of and tacitly accepted the infringements on several occasions. In particular, the decision to lift the HXT to the cellar-deck without the presence of responsible and competent personnel from the supplier company, and the decision to exempt the personnel on the cellar-deck from participation in the emergency exercise, was seen as clearly implying that priority was given to speed and timesaving rather than to rules, procedures, and safety. Also, based on reviews of recent incidents and reports from the rig, revealing similar patterns of contraventions, the NPD found additional support for the conclusion that Byford Dolphin had a "bad safety culture" at the time of the accident. The accident was followed up through an independent police investigation, and Dolphin and Statoil were both fined (NOK 1,2 and NOK 1,0 million, respectively).

In their report to the police, the NPD contended that neither the culture provision nor the guideline provided any criteria for how to judge whether or not a safety culture would be compliant with the regulation, and that no "standard" was established for making such judgments. But rather than letting this state of the matter 'weaken' their claim, they resumed and restated their position: "the NPD is of the opinion that, at least given the situation at Byford Dolphin at the time of the accident, and in the period prior to the accident, this would constitute a breach with good safety culture". The claim was further supported by referring to the internal Statoil report which stated that "managers and employees don't have a sufficiently good attitude towards HSE. The handling of HAZOP [Hazard and Operability Analysis], use of work permits, safe job analysis, insufficient hand-overs, orderliness and tidiness, exemplify this". The report further stated that "HSE-concerns often yield to economy and progress". Pervasive attitudes of negligence indicated by repeated violations, in particular as these had been accepted and even

supported by the higher echelons, thus constituted the basic evidential support for allowing judgments about a 'non-conforming' safety culture.

The diagnosis was thus primarily related to the situation at the time of the accident, more or less as a collective 'state of mind'. In referring specifically to the follow up of the Dolphin management, onshore and offshore, the same evidential support was largely applied, again concluding that the pervasive negligence in relation to rules and procedures contributed to a "bad safety culture". In this case, other provisions were referred to, such as the more general provisions about the duty to follow and to follow up all regulations, to persistently supervise, monitor, register, analyze, document, etc., and to continually improve HSE conditions. The same evidence was used in support of company negligence, but this time without the need for specific reference to the culture provision.

It thus seemed, as was later also confirmed, that the existence of the provision, as a regulatory requirement, didn't provide any 'added value' in legal terms; it was more like a 'supportive' claim in order to emphasize the gravity of the situation. Also, this was like a 'test case'; the new regulations had been in force for only a few months, it was the first fatality to occur since the Oseberg accident, there was still a need to teach the industry a lesson, and the occasion was there to apply the provision for the first time. Based on the justifications given by the NPD, the culture provision thus also made its way to the ticket fine that was eventually issued by the public prosecutor (however, only towards the rig company, not Statoil).

In line with the 'absolutionist' policy, no penal action towards individuals was taken, even though non-compliant behaviour was observed on a wide scale. The accident was seen as the result of acts by several individuals, to be considered as the sum of these acts, and thus as "cumulative faults". And it was not possible to identify anyone who had committed legally negligent acts, and faults were accordingly designated as "anonymous".[145]

[145] Penal action against individuals was therefore not considered to an option, although doubts were in fact expressed regarding the drilling manager.

The Gyda accident

This accident occurred on 1 November 2002 on the Gyda platform in the southern part of the North Sea in connection with a lifting operation. British Petroleum was the operator of the field and Smedvig was the drilling contractor. A deck-hand/welder employed by Smedvig died when he was crushed between two containers on the pipe deck. A chemical tank was stacked on top of another chemical tank. The upper tank was being lifted by the crane in an 'unplanned operation' when the crane hook or lug became wedged between the tank and the tank skid. The victim was working on top of the uppermost tank and was about to attach the crane hook when the tank was lifted and overturned and skidded into an adjacent container.

Four days after the accident, the NPD, as result of the their ongoing investigation, ordered BP to stop crane and lifting operations on Gyda. The order was issued orally on the installation, and BP had to stop all crane and lifting operations on the platform until it was verified that the relevant personnel who supervised and carried out such work had received the necessary training in BP's procedures for crane and lifting operations. BP was also ordered to confirm that similar training had been verified on the other BP installations. Within a week, BP replied that the required verifications were in place and that similar verifications had been carried out for supervisory and operative personnel on other BP operated facilities.[146] Based on this verification, BP could resume the crane and lifting operations on Gyda. The NPD continued to investigate BP's and Smedvig's land organizations in cooperation with the police.

18 transgressions were identified in the NPD-investigation related to both the stacking of containers, the performance of the lifting operation (sight, signalling, wires, etc.) and the work in heights. No one had interfered in the operation, and transgressions were partly due to lack of knowledge of procedures, but also that procedures were inadequate, unclear, and not sufficiently coordinated between the companies. The NPD concluded that many and collective violations of procedures caused the fatal accident, and that this would not have happened if the relevant procedural requirements had been observed.

[146] Notably the Valhall and Ula platforms, and rigs hired by BP.

Serious defects in BP's management system were uncovered in the report. The company itself had identified the dangers associated with insufficient knowledge of lifting procedures, and was aware that violations were a problem. Still, it had not been sufficiently addressed, and rectifying measures had not been implemented. The NPD had even conducted an audit on the same platform, aimed exactly at the same operations, just a few months before, pointing out several flaws that could be directly related to the accident, none of which had been rectified.

The report stated that this was a violation of the HSE culture provision, based on the transgression of the procedures, or more specifically, the pervasive nature of these transgressions, and the fact that they appeared as 'collective', that is, collectively accepted. Added to this was the lack of follow up on identified risks, both offshore and from the land organization. These observations indicated a "bad HSE culture". The comment about HSE culture was also highlighted in the subsequent press release: "The scope and gravity of observations made in connection with the investigation indicate a poor HSE culture in BP's land organization and in BP's and Smedvig's offshore organization."

Both the operating company, BP, and the drilling contractor, Smedvig, received (additional) orders after the publications of the investigation report. They were required to identify the causes of the violations, to implement measures to prevent such breaches, and to verify that the measures functioned as intended. This process was to be quality-assured by a third party. The order was aimed at the companies' activities related to lifting operations on all their installations, including also an evaluation of the need to address other activities on the installations they operated. BP was specifically ordered to review the management system in terms of how identified risks were followed up and corrective actions implemented. They were also ordered to review systems for ensuring their contractors' compliance with procedures.

The NPD may certainly have felt a need to expose their own efforts relating to this type of risk; in the press release, more than half the text was devoted to their general follow up

of lifting operations (and most of the remaining to the efforts of the NPD investigation team):

> The Norwegian Petroleum Directorate has been working on issues related to the safety of crane operations for quite some time. In August 2000, the NPD published a report regarding "Causal relations in lifting operations incidents". The background for this was that the NPD has in recent years noted a marked increase in incidents in connection with lifting appliances and falling objects - on both permanent and mobile installations. In the NPD's opinion, some of these incidents could have led to extremely serious accidents.

There were several disagreements in the subsequent correspondence between BP and the NPD. Some of these were related to the specific causal effect of single violations on the outcome of the accident, and more generally to the (implicit) allegations that the NPD conclusions could be applicable to the company operations on a wider scale. The BP investigation report largely confirmed the course of events, however, but was criticized by the NPD for not considering the background conditions related to the organizational aspects and failures of the management system. BP also objected to the conclusion that there was a 'bad HSE culture' on the platform. The NPD reply restated their observations about the collective nature of the transgressions, the insufficient follow up of training and monitoring of crane- and lifting procedures, and the fact that measures to be implemented after the NPD audits just a few months prior to the accident had not been followed up.

This time, the violation of the culture provision was not followed up in the police report, however, and the subsequent ticket fine (NOK 3 mill) primarily referred to the provisions relating to the specific violations and the general duty of the operator to follow up their contractors. The ticket fine was issued to the company, and individual negligence was not considered (again referring to 'collective and anonymous faults')

Aftermath and reconsiderations

These investigations served as critical landmarks, being the first 'test cases' for applying the provision directly. For some reason, however, the Gyda investigation appeared as a later point of reference, in spite of the fact that the formulations used in the Gyda report were more conditional, and that in the Byford Dolphin case, the provision was even directly applied by the prosecuting authority. Most probably, this was due to the reactions

from the company, objecting to having had their 'culture' stigmatized as 'bad'. Rumours had it that the reference made to their 'HSE culture' had been a fierce blow to their self-image as a 'prudent operator'. Despite the conditional and rather careful application of the diagnosis, fairly well substantiated by the serious and collective nature of the transgressions observed, the 'Evil Mark' was somehow attached to the company as such.

There were numerous references to the investigation report in seminars, interviews, and meetings, etc., presented as part of reconstructed 'narratives' of how the provision had been applied and the response it had caused. Of course, these reconstructions were not all consistent, and not always factually accurate, to the extent that accuracy could be determined. On the whole, however, they indicate the perceived 'dangers' associated with using the provision, and contributed the general feeling that it had to be enforced and applied with great caution. The PSA official responsible for the order and for the follow up of the company thus noted that: "It's a very powerful word to use, and it really upsets the industry when we do, since it addresses to such an extent their very integrity and inner lives; it's a bit dangerous to touch upon, I believe."

One critical consideration that would justify references to HSE culture was whether the 'indications' were really indicative, that is, if single acts and facts were exemplars of more comprehensive behavioural patterns (or 'attitudes'). In the Gyda case, the diagnosis appeared justified on just those grounds. Still, the officials involved in the investigation felt a need to justify its application and to clarify more explicitly the actual wording of the report and the order:

> R: The Gyda incident is a fair example of how we interpreted HSE culture at that time. It's not correct to say, as some do, that we issued an order warranted in that provision. In the rapport we said that our 'main impression was that the HSE culture had deficiencies.' The order wasn't related to that. But it's a good example of how we interpreted it …. Many of us are engineers, you know. So we need simple approaches. There was a focus on single elements in the HSE culture, like violations of procedures. And it wasn't only one violation. There were several people involved, violating the same procedures, there was a tradition for doing it, and we considered that to be an indicator of a deficient HSE culture. It was a group-phenomenon. But it was also related to individual behaviour. What we've seen later on …. it's fair enough to say that this is an indication that you have a deficient HSE culture, but what does it take to 'remove' such an observation, when do you have a good HSE culture? That's what's difficult. If you had related it to an order, when is it good enough?

> And that was the comment from BP: "From this delimited part of our operations, it's not enough to say that we have a poor HSE culture." But that wasn't what we said. We said it could be an indication …. so there were some discussions back and forth in the upshot.
> I: But you thought it was an accurate observation?
> R: Sure we did.
> I: And you still think so?
> R: Eh… well, that it's an indication? I believe so. It is an indication.
> I: So, did it become a communication problem? You were quite specific that it was not BP as such, that it was only an indication, it was not tied up to the order, etc. But you wanted to comment on the …
> R: Yes. And since it was not only the operator – you could observe similar attitudes extending to the entrepreneur – we got even more confident that this … there had to be a culture at Gyda that contributed to this. So then we concluded that this had to be an HSE culture issue. I also believe we considered it an order some time during the process, but we realized we didn't have enough objective evidence to use it as an order…. I guess we would have needed more evidence covering a broader area. That was the argument. So we landed on a more cautious and careful solution. But it stirred up much noise, more than the order itself I believe. I guess it hurt more for the operator, internally …. that they had a culture problem. So many people knew. And they didn't do anything.
> I: Wouldn't it be enough to say that they violated the procedures?
> R: We did that too. And the order to BP was for them to uncover *why* they violated these procedures. We got various indications of why, and in this specific instance I think we uncovered the reasons for the violations. What we said, was that they had to look into the rest of their organization. If conditions were equally sloppy elsewhere, they'd have a serious problem. Like in the case of pre-pressurized systems, you'd run the risk of serious accidents. So they ran a project, using external consultants, looking into the reasons why people violate procedures. What's the reason why you breach a procedure when you know it's there to protect you? …. And the results [of that investigation] were related to well known reasons. Some do it knowingly, because they're lazy or careless. Some do it because they don't know any better. Either, they don't know the procedure at all, or they have misunderstood, in which case it may be a poor procedure …. At Gyda they were not easily accessible. They were both in the BP system, there were some bridging documents between the BP system and the Smedvig system, so there were ambiguities as to which system to comply with, and there were some inconsistencies also. So the way the procedures appeared was not satisfactory. (NPD/PSA official)

The justifications were thus clearly in line with the kinds of arguments and criteria that still prevailed as indications for assessing HSE culture. But the lessons learned pointed towards a more restrictive policy in applying the provision, as was also argued by the NPD contact person for the company:

> There were so many collective violations of procedures, and so on and so forth, that we wanted to try the provision. .. When we issued the order we said that this could be indications of a bad HSE culture. And that caused an incredible amount of writing …. It was read as if the PSA said there was a bad HSE culture in Smedvig and BP. And the energy that was absorbed in this process that could have been used on something more positive, that was not a good use of resources and energy. So I guess we learned something from that. …. We must be very explicit about what we communicate; that we communicate

> that this could be indications; right? Even if it says so in printed letters, we were not explicit enough. And the newspapers use it for what it's worth, and so on. And again, it may cause a negative energy, but it can generate a positive energy if it's used in the right way. I am a bit unsure; but then, I haven't been working so intensively with this as the culture group, and they conclude otherwise, that we'd rather not use it. (NPD/PSA official)

The culture group had at this point, three years later, clearly communicated their reservations on this point, endorsed by the supervisory director, although it had not clearly reached the level of official policy. They thus also accommodated some of the concerns voiced about the communicative risks of making cultural diagnoses. The company responses may be part of this emerging policy of restraint. First, tensions could be triggered by making contested connections between 'indicators' and that which was supposed to be indicated. And paradoxically, as an unintended consequence, the diagnosis appeared to have triggered a 'cultural turn' within the company of a kind that the PSA and the culture group would gradually consider to have become a problematic side-track, and sometimes a perverted industrial off-shot of the regulatory intention. The relevance of both these concerns was evident from the following comm.ent by the regulatory advisor in BP (who was also a former NPD official):

> I: Some say that the critique of the HSE culture was perceived as unfair by BP?
> R: It's difficult to say; it's not up to us to dictate others perception of our safety culture, that's up to them to judge. There could be factual errors in the rapport that the management got hung up with, but …. What was special about the Gyda-incident was that Gyda was the perfect installation. There hadn't been accidents for the last 2-3 years. It was the state of the art facility in the company, a model-facility. Everything was …. it was a small platform, with a good design, high-quality materials with little need for maintenance, good relations with unions and so on. We would rather have expected something like this to have happened at Valhall …. That's what was special about the incident. But it's often like that, when you think you're good, that's when these things happen …. People here do their best, they are committed and conscientious, so it's not that easy to be told that the HSE culture isn't good enough. So there's been a process of self-examination, asking what we can change and improve …. and we've had campaigns focusing on safety-culture, that we must be accountable for our behaviour …. including campaigns for using the handrail …. People may have divided opinions about that, but what it means is that you should get used to follow the rules and take responsibility for what happens at your workplace. There's an increasing focus on using the opportunity to stop colleagues offshore, asking: is this safe? Have you conducted a risk-analysis or a 'Safe Job Analysis'? Previously, such interference would have been negatively perceived; such as commenting on wearing eye-protection or gloves, which sometimes appear as inconvenient and impractical to the workers. (regulatory advisor)

The ‘holding of rails’ had more than anything come to symbolize the behaviour based safety philosophy, and thus associated with all measures taken to make the workers adapt to the risks rather than the workplace to the worker. Certainly, no one appeared to object to the use of protective equipment; rather, the symbolism was related to the larger issues of proportionality and priority in the different risk management approaches.

Anyhow, the policy of restraint followed these early instances of hybris. It was not clearly formulated, however, and for the General Director, the Gyda case didn’t appear as particularly discouraging in terms of using the ‘word’:

> I: But isn’t it a bit dangerous, to characterize the culture?
> R: No, why should it be? It’s a challenge. But really not dangerous, I don’t think that.
> I: But I know there has been a certain reluctance to use the concept …. the question has been: should the word culture be used? It confers many associations, are we sure they understand what is meant, and so on. So it seems that an un-stated policy of reluctance has developed …. Partly because comments about culture might be over-interpreted. Like in the Gyda-rapport, were it was taken to apply to the whole organization as such, and not localized to the incident …?
> R: Yes, but this is where we need to develop this process further. In the case of BP and Gyda, HSE culture was used. I believe it was a lifting accident. So they came back to us, having interpreted this as a characterization of BP Norway as a whole, of their total culture. I can understand that they could, given the formulations used. But what it was all about was HSE culture in the lifting operations in that case, not all the rest. We had no evidence beyond that. But it was quite obvious that the HSE culture in lifting operations was ready for improvement …. But when this was sorted out, they were happy. And they agreed it wasn’t good enough. Attitudes towards compliance with procedures etc., it was totally unacceptable. (General Director)

The status and position of the culture provision within the larger regulatory system was still not sorted out clearly. The leader of the disciplinary unit responsible for HSE management and legal affairs (comprising most of the legal experts), largely formulated these ambiguities with elaborate reservations:

> You see the dilemmas that arise when we choose to regulate something like HSE culture, which in my view is more like a goal …. with the intention to initiate a necessary kind of dynamic drive among the various actors in order to achieve continuous improvement. For me, that’s what it’s about …. But …. I cannot come forward and say so since I’m not an HSE culture person. But that’s my understanding …. For me it’s an element that’s so huge, with a potential of being so overarching and just about all-inclusive, that it cannot be delimited to …. it will not approximate the kind of requirement or follow-up that would correspond to, say, the design of a gas-valve in a well. Such requirements could be specified

> by stating some design criteria and functional criteria, etc. …. You cannot relate this to culture unless you have a book of this size …. maybe, telling us that this element should be so and so …. I cannot visualize this you know …. And we have several such requirements in our regulations which are …. on a philosophical level that have more like an overarching function in relation to an activity in terms of creating a momentum in the system. But such requirements are difficult to design and difficult to promote. In these cases it's not possible to say that, "sorry, your culture isn't good enough", you know, "we'll give you an order on your culture". We had an analogous discussion regarding management systems …. I've never been a supporter of issuing orders, which on a general basis address the "management system", that's too comprehensive. You could certainly issue an order addressing some specific aspect of the management system, but to issue such an order on a general basis would amount to saying that you have a 'general problem' …. I could have understood, like if a report covered a number of conditions, grave conditions, revealing some basic problems in, say a department; they make some really bad decisions, they make serious mistakes, etc. …. there is something fundamentally wrong. And then, on this background you might conclude that there's a need to focus on competencies, tools, attitudes, and it might look as if the HSE culture here is not in line with what we expect the HSE culture of a company to be like. I wouldn't have any problem if such a line of reasoning was made visible. But to use the culture provision in an order or any other kind of formal measure, if it could be specified, pointing to something more concrete, then may be …. it's difficult. (disciplinary leader)

The reservations related to the culture provision were thus of a more general nature, pointing to how the relation between observed facts and overall diagnoses had to be specified within the regulatory context. In this context the appropriateness of HSE culture as an enforceable provision was fundamentally questioned. These concerns clearly had their parallels within the industry. As was noted by a HSE-manager from a contractor company:

> R: I'm a bit concerned now, that you have to be really prudent in these matters. HSE culture can be so many things, and so many ways to approach it. Just think, if you get an order: 'the culture isn't good enough'. I haven't seen such orders yet, but you get, like, you know, 'there's not enough leadership engagement', 'not enough campaigns', 'insufficient communication channels in relation to formal and informal meetings', these kinds of things; you know, all the desirable activities, what *shall* be in place. Like you say it's important that everyone who's going out on a platform knows what's going on there before they enter the helicopter. How far have you proceeded in the drilling process .. are you just commencing or are you about to finish .. or what the hell's going on? Often when you come out, you'll just have to enter the boiler suit and start working. So, if you don't have that onshore pre-job meeting, is that a violation of the regulations – about the culture? And these are the kinds of things I believe the culture is very much about. Like, can you really talk big about having a good HSE culture when you're seven months behind in your maintenance program? How concrete should this really be?
> I: So is it like almost anything that contributes to good HSE conditions is equated with promoting a good HSE culture?

> R: Yes, right. And then you need conceptual tools that make people understand. And not everyone doing supervisions have that kind of understanding. And it's really matured a lot since the provision appeared …. We have a large number of audits on any given facility during a year. They are from clients, authorities, and internal company audits …. If some say, we're going to check out the atmosphere on board; is that to check the culture? If you read the reports from the working committee meetings, what do you check then? We, who are HSE-professionals within the industry, we see a whole lot of things in these supervisions, and sometimes there's a bit too much capricious guesswork. It may be the auditors, that they're not altogether explicit or consistent about something being a regulatory or contractual requirement, defined in this or that way, and that the non-conformity is of this or that kind. And if you take the culture provision, what would qualify as an observation or a non-conformity? So you get back to the issue of how you measure these things …. And if you're an administrative body, is this run fully satisfactory in relation to culture? What are you going to look for? What's your action plan for culture activities? What do you do? And this is where we've experienced a lot of fanciful judgment …. from customers, from authorities, etc. (HSE manager)

Restarting the cultural process

This was the ambiguous and contested background against which the culture group was supposed to revitalize the cultural process. Producing the booklet was one thing. It had no legal status, it made no commitment to any particular diagnosis of industrial actors, and it could be written in 'splendid isolation', with fairly elaborate 'scripts' to rely on. Even cultural sceptics within the agency could endorse the content, as it confirmed received risk management approaches, and added some important but basically uncontroversial insights about learning processes being more comprehensive than just the single loop correction of operational failure. It did not, however, leave any clear idea of what was the value added by calling it all for 'culture', and of how this cultural approach 'communicated' with the existing vocabularies and risk management concepts, as these had been codified in the remaining regulatory framework. Furthermore, few examples were provided that could have facilitated a better understanding of how the agency expected the industry to proceed.

Internally, the HSE project (as a project-group) appeared as somewhat isolated in relation to the rest of the organization. It was primarily composed of members from the working environment unit; only the leader belonged to the drilling and well technology unit. The other important technical disciplines were not represented, such as structural integrity or process integrity. Despite the strong commitment to systemic (human, organizational and

technological) understandings of risk and risk management, the predominantly technical-legal composition of the agency, made the task of 'translation' between culture and the discipline-specific contexts of experiential knowledge a critical and fragile endeavour. Nevertheless, it was this translatory task that was imposed on the group. HSE culture had to be made operational as part of the primary context for engaging with the industry, the supervisory context.

There were explicitly stated plans for 2005 about furnishing the organization with more extensive knowledge and practical 'tools' to be employed in supervisory activities, in particular though the audits. First, this was to be achieved by a series of meetings where members of the group would make presentations and engage in discussions about how to integrate the cultural perspective in supervisory activities, starting with the extended management group and subsequently with all the disciplinary units and supervisory teams. The process was not fully completed, diffidently conducted, and ambiguously received. Most of all, it echoed a widespread sensation that HSE culture was still an airy concept. To be sure, the group leader was able to reflect quite concretely on how cultural properties and processes could be observed within and between miscellaneous compartments of industrial activity, such as in critical situations where human, technological, and organizational failures combined in the co-production of possibly fatal outcomes.[147] Still, the audience seemed bewildered; some raised critical voices, taking 'culture' to be just another buzz-word for the soft and intangible 'human relations stuff'. Questions were raised about how culture could be seen as a 'cause' of accidents and incidents. There seemed to be an expectation of something at least minimally operational and tangible, not something elusive and pervasive.

As one participant explained after one of the meetings: "You noticed the mood. People want answers. Time is ripe now for setting it right. Engineers and economists have their

[147] The presentations were largely based on the HSE culture booklet, frequently referring to the statement that good HSE culture was to be observed if 'continuous, critical, and thorough improvement' of HSE was facilitated. Critical goal conflicts, tradeoffs and balancing acts were addressed, such as between economy and production, and between individual and managerial responsibility. HSE culture was observed all over, as present in or caused by: work-teams, safety meetings, procedures, time schedules, manning levels and resources, operational priorities, contracts, bonus systems, etc.

own mode of thinking – controlling efficient work. We must learn to use the tribal codes and terms; operationalize, and say: *this* is culture". His own proposal, derived from the CEN 'Value Management Standard', suggested a safety culture to be defined through adequacy of *attitude*, *awareness,* and *knowledge*.[148] He had himself been involved in the early phases of the regulatory process and recalled specifically the importance attached to the notion of organizational *self-complacency*. As the search for optimally productive regulatory interventions involved the identification of basic 'root-causes', it was of vital importance to address those components in the causal chains that could be identified as both *essential* and *repetitious*. Based on the historical record, self-complacency appeared as a particularly good candidate. But to address such organizational phenomena through brief supervisory encounters was of course not an easy task. He had also been deeply involved in the development of the supervisory function and in internal training programs, dating back to times long before 'HSE culture' was on the agenda. He explained as one of the principal tasks of the good auditor to be able to subtly provoke the learning capacities of the auditee; not primarily by identifying 'non-conformities' but by making them see these themselves, see warning signals, sort them out, and act appropriately. This was of course a demanding endeavour in a predominantly technical and problem-solving culture of engineers, to be found on both sides of the table in the context of the audit. Nevertheless, to promote this capacity for enlightened self-regulation was still a basic attribute of the regulatory philosophy, penetrating resistance of assorted kinds, from operational priorities to organizational mind-traps. This supervisory role had to be cultivated within just these action-based and problem-solving environments, transforming abstract ideas into productive and meaningful action. As he emphasised later: "Not simply talk about it, but expose, confront and reinforce – through action and learning".[149] The reference to the standard was of course not unprecedented. This was a world of standards, and an international standard could serve as a legitimate template for

[148] The European Standard Committee (CEN) developed this standard in 1999 (CEN/TC 279: EN 12973). This reference was also mentioned in other interviews.

[149] In fact, we had engaged in several exploratory conversations about possible understandings and applications of HSE culture, both during and after the fieldwork period. As he was one of the real old-timers (employed since 1975), these were indeed rewarding and enlightening conversations. He had been a former director of supervision, and later of strategy, and had served as a deputy for the safety director from the late 1980s to the late 1990s; he had thus been an influential participant in the development of the regulatory philosophies at different stages, He had, however, no specific role in the culture project.

elaborating some essential features of desired organizational behaviour. The response was hardly typical, but was still symptomatic for the ambiguous relations between 'root causes' and 'manifested outcomes', with culture as somehow embodying the former, almost as a 'ghost' in the organizational machinery – a 'ghost' claimed to be conditionable.

No attempt was made to map out the full range of responses and associations to these presentations; most probably, as will be elaborated later, they were linked up with more general ideas about the management and mismanagement of risk, as these would be conceived and slightly adapted to personal or situational context (or to both). One supervisory coordinator had the following comment:

> R: We are quite a few simpleminded engineers …. it's kind of complex …. at least the presentation they give …. how comprehensive the concept of HSE culture really is. It's not readily accessible. You could see for yourself; confusion and blurred eyes spread in the room. People get a bit distant and 'hooked off'.
> I: You asked yourself if culture could be considered a 'cause'?
> R: Yes …. well, it's been a recurrent issue in several investigations. Like on the Valhall Flanke North. It was very close to a fatal accident. For a period we reflected on possible cultural causes. But then, we landed on the issue of project management and how you manage *changes* in projects, so we found it was more related to the management of change – how you comply with internal requirements in processes of unexpected change …. It's really quite typical for the investigation process. You see things very clear, the light goes up, then someone has a comment or an observation, tearing it all apart, and the argument dissolves. You test a lot of theories, and then they're abandoned. We use the MTO model to map out the causal relationships. (supervisory coordinator)

We shall further explore these ambiguous translation endeavours later, noting however, that the process of figuring out the trajectories of 'unplanned events' could follow unplanned patterns and that in the end, the more familiar models appeared to be the most rewarding. And we may recall, that in the MTO-model, 'safety culture' was reduced to a sub-category of 'management and platform organization', which in turn, was only one out of eleven major causal categories (see Chapter 5).

The group also commenced on the production of a 'culture guideline' for use in audits. Several drafts were in circulation, but the venture finally terminated. They were initially written as a catalogue of interview questions, sorted in various themes, such as follow-up

of incidents, reporting-practices, HSE-meetings, Safe Job Analysis, HSE-management, contracts, etc. There was an emphasis on certain issues such as “deviance from standards”, “words corresponding to deeds”, “conflicting goals”, etc. The thematic outline of these drafts did not deviate much from the more general conceptual order of audit techniques, questionnaires, or guides. And the questions also seemed quite similar to what was used in the supervisory training programs, and thus already in circulation in the various supervisory teams. The group finally concluded that the whole project appeared very much like a general supervisory guideline, and there was a certain sensation that people would perceive it as a somewhat patronizing intrusion into well established supervisory practices. The group clearly didn’t quite feel authorized to assume that kind of position.

One of the lessons learned, as a gradually developing belief, was that supervisions should not be specifically dedicated to HSE culture. The idea was even ridiculed as amounting to addressing questions like: ‘how is your culture today’. This reflected the belief that culture was “nothing in itself”, but was only “visible” in the ordinary HSE related activities (or non-activities). HSE culture should then be an integral part of ‘ordinary’ supervisions. The supervisory guideline was meant to serve this purpose. Discarding that idea, the question was how to proceed. The plan was initially to use the culture group as a ‘knowledge- and resource-base’, were the supervisory teams could ‘commission’, on their own initiative, assistance from the group. Later, this was seen as somewhat too weak as an incentive for the follow up process to succeed. The plan for 2006 was then to pick out some supervisions were members from the culture group could participate in order to ‘integrate the cultural perspective’, thus providing an additional dimension to the supervisions. No specific number appeared, but indications were given that at least some 5-10 supervisions should be explicitly dedicated to this project. Experiences were to be summarized as a basis for further strategies. As it turned out, no such supervisions were conducted.[150] Nevertheless, the most dedicated and able members of the group felt they could profit from the insights of the project in ‘ordinary’ supervisions were they

[150] Of course, I continued to ask, particularly as I was interested in joining the team; but the opportunity to make cultural audits an ethnographic experience was lost.

participated or had a leading role. But these were not explicitly singled out as 'culture-sensitive' supervisions, or made subject to any extensive learning processes on an organization-wide basis.

The supervisory director to whom the culture group reported clearly had reservations about too ardently diagnostic uses of the provision, pointing to both the limits of the audit context and the problems involved in legal enforcement. Although the following reflection was provided before the idea of 'auditing HSE culture' had been finally terminated, the outcome is foreshadowed.

> I: But people here would need to make it operational, know how to use it?
> R: Yes, and the purpose of the project is that they shall provide some guidelines for use in supervisions, so if HSE culture is an integrated theme in the supervision this could have a supportive function in helping our people to address those issues. But that would have to be related closely to the specific object of the audit. It's very difficult to address these matters at general company level. I'd rather use the summary rapports at company level, where you consider all your information about the company over a period .... using data from supervisions, incidents, AoC's, projects. This may reveal a number of systematic failures. I'd rather use HSE culture in that case, to summarize a broad range of findings .... and ask the company: "do *you* find this acceptable?" I'd say that that approach probably would have been more rewarding if you should address HSE culture in a company. Then you'd have one year or two years of experience, related to a series of areas, where you could challenge the companies and the top management: "is this good enough?", and relate it to HSE culture. But to use this isolated in an order, I don't think this is an appropriate measure. (supervisory director)

The idea thus appeared of using larger samples of indicators than could be extracted from single supervisions (including investigations) in order to facilitate a more extensive dialogue and to activate the self reflective capacities of the companies themselves, preferably at the higher echelons. It seems, however, that these more comprehensive company evaluations also avoided assessments of their 'HSE cultures'. These were devised by other people and the meetings in which they were presented, did not belong to the spectre of arenas in which the 'culture experts' were given any specific role.

Concluding remark

Reinventing HSE culture within the regulatory context was largely a piecemeal and incremental process; partly it involved the conceptualizing endeavours of the culture

project, partly some tentative diagnostic exercises, and partly it involved attempts to mobilize the agency through understandings and templates for practical application.

But reluctance and reservations appeared gradually, and was stimulated by both internal and environmental factors. These seemed to work in consort to bring the cultural turn to a standstill. We shall return to the internal conundrums related to the conceptual and substantial 'locations' of the 'culture-things' later. In the following two chapters we turn to the environment, partly to explore how the industry localized 'cultural factors', and partly to provide some more ethnographic details about the context of risk management. This venture is largely case oriented, based on examples from Statoil, the largest operating company on the shelf; first to see how they failed to manage their risks, and then to see how they tried to educate their workforce into doing it.

7. The Snorre incident

> *In theory, one could trace the various causal chains back to the Big Bang. What are the stop rules for the analysis of organizational accidents?*
>
> James Reason (1997: 15)

The Snorre incident may be considered as almost a watershed in the risk history of the Norwegian Shelf, and it had a potential for developing into one of the largest majors accidents ever in the North Sea. It occurred in the late fall of 2004, and was on everybody's lips and a recurring point of reference during the field work period. It is recounted and discussed in this chapter for these and for two other obvious reasons. First, it demonstrates how a series of decisions and acts may develop into a potentially catastrophic near miss, and serves thus as a reminder of the kinds of consequences that may surface in the complex and risky offshore operations. Second, it demonstrates how the actors involved reconstruct and react to the event; the PSA through their regulatory powers and the 'sinful' companies through self-reflection and remorse. In particular it provides a case for demonstrating the applicability of 'cultural causes', as they were presented and represented in post-event interpretations. We shall provide a brief account of the case-specific trajectories below; but primarily we discuss the ways in which it could later be reconstructed, and how various explanatory models are applied for understanding the complex configurations of antecedent 'causes' and 'conditions'. This discussion also offers a brief account of the post-accident reconstructions of the two most spectacular accidents in the NASA space-shuttle program. The comparison appears as particularly relevant, due to both similarities between the events themselves and the repertoire of hindsight understandings.

Snorre A

The Snorre A facility (SNA) is an integrated living quarters, drilling, and production facility in the Northern North Sea. It is permanently anchored to the seabed with tension legs and has a well template with 42 wells with risers and several export lines. Total production from SNA is around 200 000 barrels per day. The whole Snorre field is the third largest oil producing field on the NCS. Originally, it was operated by the Norwegian

oil company Saga Petroleum, who started production in 1992. Saga was bought by Hydro in 1999, who operated the field until 2003, when it was taken over by Statoil. Just a month before the incident, there was a change of drilling contractor from Prosafe to Odfjell. Although some 80 percent of the crew was taken over by Odfjell, several persons were replaced. This history of organizational discontinuities was later to appear as important background conditions in the explanation of the incident.

The incident started on 28 November 2004. In preparing for drilling the sidetrack P-31B from the existing well path P-31A, pipes were being pulled out of the well. During the operation, the situation developed into an uncontrolled gas blow-out on the seabed, resulting in gas under the facility. The majority of the over 260 people on the platform were evacuated by helicopters; Thirty-five remained in order to rescue the facility. The PSA characterized the incident as "one of the most serious to occur on the Norwegian shelf." In the press release after the publication of the PSA investigation-report, the Director General stated that:

> With only marginally different circumstances the gas blow-out at Snorre could have resulted in a major accident with the loss of many lives. Our conclusion is that the incident was not due to accidental circumstances, but a consequence of a general failure in Statoil's planning, procedures, and assessments.

The details of the process

It is difficult to provide a brief account of this incident without omitting important and critical details about facts and events. At the same time, only the professional insider would be able to fully appreciate the significance of all these details. The following outline is a painful compromise adapted to the need for a minimally comprehensive and comprehensible narrative. Some basic features of wellbores and well operations must be noted initially. A wellbore consists of several hole sections that are mechanically supported by layers of tubes with varying, and decreasing, diameters further down the borehole. Concrete is injected around the tubes in order to anchor the well to the seafloor and the surrounding rock masses. The lowermost parts of the well are perforated in order to open up to and extract oil and gas from a reservoir. Producing oil or gas from the well also involves a system of barriers and controls. To avoid uncontrolled releases of oil and

gas under high pressure, the well shall always have two tested barriers in place, such as remote controlled valves, plugs, casings, mud, and a topside blow-out preventor (BOP) on the platform (see figure 7.1. below).

The P-31A well was drilled in 1995 as a sidetrack to the observation well P-31. It was mainly used for injecting gas in order to improve the extraction of oil, until it was shut in in 2003. Various problems occurred during the completion of the well. At one point, the drill string got stuck, causing subsequent remedying operations that eventually resulted in the perforation of two to three holes in the 9 5/8" casing some 1500 metres below the platform.[151] A so-called scab-liner, a 'plaster' tube measuring more than 2500 metres of length and with an 'unconventional' (or "non-standard") diameter of 7 5/8", was thus installed inside this casing to cover the holes and reinforce the integrity of the well, which was then pressure tested, completed, and started up. The pressure integrity had however been reduced after the installation of the scab-liner (from 345 to 255 bar). The operation of the field was taken over by Hydro in 2000, who in 2001 measured extensive corrosion in and leakage from the innermost production tubing. A new liner-patch (a so-called "straddle") was thus installed in the lowermost section of the production tubing. In 2003, the operation of Snorre was taken over by Statoil, and its management was reorganized into a cross-disciplinary unit for the whole field (called SNA RESU).[152] In December 2003, a new leakage was observed and a casing-burst was diagnosed in the 9 5/8" casing after pressure testing, but neither the causes nor the location of the damage were critically analyzed. The well was then shut in, with two barriers: a mechanical plug was inserted in the tail pipe (the lowermost part of the production tubing) directly above the reservoir section, and the well was filled with brine (tolerating pressure only below 94 bar). The well was now diagnosed as "complex" due to the problems that had been observed and the unconventional remedies that had been inserted (scab liner, straddle, etc.).

[151] The holes were partly caused by flushing with powerful washing tools.
[152] The take-over made Statoil the sole operator in the whole Tampen area, and they could reorganize the running of the field; the so-called RESU unit integrated the formerly separate organization of production and drilling/well operations.

During the spring of 2004, however, a decision was made to conduct a "slot recovery"-operation on the well, requiring that the lowermost part of the production tubing with straddle be cut and the 7 5/8" scab-liner be pulled out.[153] A project team was established for this purpose. Apparently, all relevant historical data of the well were considered in the first plan for this operation, and according to the PSA investigation, the deficiencies related to the well had been considered, involving the participation of several contractors (except the drilling contractor). The primary barrier (the mechanical plug) was not to be removed, and an additional plug was to be installed above the planned cut of the production tubing that would serve as an additional barrier during the pulling of the scab-liner. This plan, predominantly composed by drilling- and well engineers, was presented in September 2004. During the course of October, the plan was changed, however. In order to avoid contact or 'communication' with the planned sidetrack, the reservoir engineers in SNA RESU wanted to cement the reservoir section in the well.[154] The drilling/well engineers opposed this as it would complicate the slot recovery, but a final decision to cement the reservoir section was taken by the end of October. The first of November, the drilling contract was transferred from Prosafe drilling to Odfjell drilling.

The next day, a planning meeting was held where various alternatives adapted to the new decision were considered. They finally decided to perforate the tail pipe above the plug in order to pump cement past the plug, and into the reservoir section as planned. The scab liner was then to be pulled through the BOP in a single piece. The potential problems associated with the known two to three holes in the 9 5/8" casing were discussed, but not identified as a risk. The perforation of the tail pipe would expose the well to pressure from the reservoir, but the heavy mud pumped into the well was supposed to keep the pressure from the reservoir under control. At this point in the process, the plan for the operation contained two critical elements (that were directly in conflict with regulations). The perforation of the tail pipe could potentially expose the well to pressure and hydrocarbon fluids from the reservoir, and the plan to remove the scab liner would leave

[153] A slot recovery is a preparatory operation to make ready for drilling a subsequent sidetrack for another well. The availability of well slots is limited, and the existing ones are used for these purposes. It requires however that the production tubing is cut and pulled below the kick-off point for the new sidetrack. This new sidetrack, P31-B, was to be the used for resuming production from the reservoir.
[154] Such 'communication' could potentially 'disturb' the functioning of the new sidetrack, P31-B.

only one known barrier function operative, that is, the drilling mud, as the primary barrier. In addition, cutting and pulling the scab liner had two potential risks involved: First, because of the unconventional size of this liner, there was only very little clearance left between the inner diameter of the 9 5/8" casing and the outer diameter of the 7 5/8" liner. Because of this small clearance, pulling the liner acted like pulling a piston through another piece of pipe. Similar as in a bicycle pump, this upwards pulling of the piston can cause a swab pressure underneath the piston, i.e. a pressure that, depending on the circumstances, can be lower than the reservoir pressure. Such a pressure reduction can cause a flow from the reservoir into the well. The second risk was related to the 'un-conventional' size of the scab-liner, which would block critical compensatory functions (such as holding and cutting functions) of the BOP.

Just 'how' these critical elements were all included in the plan is still not clearly understood. Apparently, the well engineer responsible for detailing and setting up the procedure for the operation was a hired consultant, and may not have had enough experience and sufficient 'authority' for objecting effectively to safety critical elements. There was clearly a pressure for arriving at a workable plan that would not 'unduly' postpone the operation. Such 'slot recovery' operations were not normally considered as 'important', but were more like routine jobs that would just prepare for the 'real' job of drilling the new hole. That this still was a 'complex well' appears somehow to have been 'suppressed' or 'forgotten' during this planning process. The decision to cement the reservoir necessitated an opening of the well somewhere down-hole, and all alternatives that included an explicit and thorough consideration of the damages in the 9 5/8" casing would entail a very time consuming and complex operation. Roughly, three 'interpretations' can be devised 'post hoc': (1) they fully understood the risks related to these old the damages, but took a chance; (2) they 'knew' about the risks, but did not fully understand the implications, and took a somewhat (in their view) lesser risk; (3) they misinterpreted the available documentation, did not consider the implications, and thought that the operation was safe.[155]

[155] This interpretation is reconstructed from the investigation reports, interviews with PSA-experts, and other drilling and well experts. Apparently, the 'content' of the critical meeting where the plan was devised

Notwithstanding the ‘vulnerable’ premises, a final and formal meeting was held on 11 November (including both supplier and SNA RESU personnel), going through both the history of the well and the details of the operation. A risk review, involving a critical and independent expert assessment from a ‘peer-review’ group, was planned the next day but was cancelled and postponed to 19 November due to collision of meeting times. The plan was still ‘verified’ by authorized personnel the next days, and finally recommended by the onshore drilling operations supervisor and approved by the onshore SNA RESU manager. The latter had the overall responsibility for the operations and was also responsible for summoning dedicated risk review meetings regarding “complex wells”.

In the intermediate week things started to speed up, as the drilling rig had completed an ongoing operation earlier than expected. The rig was thus skidded on 16 November. The same day a meeting was held onshore with the offshore drilling management, including personnel from the new drilling contractor (Odfjell). The slot recovery operation started already on 19 November, the same day the postponed risk review was supposed to take place, and which now was cancelled once again.

Several problems related to the presence of appropriate barriers during the operation had thus been discussed at various stages in the planning process, and were also to be discussed as the operation commenced; these appeared later to have been considered in a piece-mal and one-by-one manner, however. Although several ‘sub-operations’ were assessed during the course of events, the full significance of opening the well, given the original damages in the outer 9 5/8 casing, was never properly evaluated. Organizationally, a number of actors (decision-makers and professionals) had been involved in these processes; although fully responsible for the operation, the SNA RESU manager would have to rely on information and judgements from lower level managers and professionals, such as the drilling operations supervisor, and the (Statoil) offshore

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was to some extent ‘black-boxed’; although the premises for the plan must also have developed gradually, with the involvement of various expert groups. It also appears that some ‘auxiliary’ hypotheses were forwarded from participants in the post event investigations, such as the belief that the mud that originally had been inserted in between the chasings and liners would be sufficient for preserving the integrity of the barrier. In fact, it was reported by participants in the PSA investigation team that the interviewees had been somewhat ‘evasive’ in terms of ‘localizing’ the most critical decisions, such as to perforate the tail pipe.

drilling supervisor (who in turn 'relied' on expert-assessments of others). Judgements and decisions were apparently subject to rather stressing and chaotic flows of information, where the 'accountability' of each actor at any point in time could be rather ambiguous, in particular in terms of continually taking account of 'risk-relevant' implications of changes and accommodations made during the planning process.

Several problems occurred during the first days of operations, including some 'unexpected' and gradually more critical flows of liquids from the well. The tail pipe was perforated on 21 November, thus opening the well for a (potential) pressure and flow from the hydrocarbon bearing strata in the reservoir. This pressure was to be controlled by the hydrostatic weight of the drilling mud that filled the well and acted as the primary barrier. Although there were 'misunderstandings' about the barrier situation related to the secondary barrier (casing, tubes, etc.), these were apparently 'suppressed' in the ongoing operation, not believing that the pulling of the scab liner would in fact be carried out with an 'open hole'.[156]

There were also other problems that required attention and caused further disturbances during the process: When the production tubing was pulled, an incomplete cut had caused the tubing to be pulled with the straddle inside. As it was not allowed to let two pipes pass through the BOP, a decision was taken to drop the lowermost part of the tubing (some 50-100 metres) into the well with the straddle inside.[157]

The night shift drilling crew that arrived on 24 November comprised a drilling supervisor from Statoil who had not been on SNA since 1997, and one of the contractor's drilling foremen (toolpushers) was on his first trip to SNA ever.

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[156] In connection with the pulling of the (unconventional) scab liner, the drilling supervisor (day shift) did ask the program engineer (by e-mail) if the pulling of the scab liner through the BOP in the face of reduced functioning did not require a formal exemption. The reply, cited in the PSA investigation report, was that: "As I understand it, we do not have to do this as long as we pull a liner that is not out in an open hole." In reality, the status of the barriers was now insufficient. The damaged casing had earlier been specified for pressure only below 94 bar.

[157] One important consideration related to this decision was that this 'device' would complicate the planned cementing operation.

It was then decided to perforate the scab liner before cutting and pulling in order to equalize a potential pressure build-up behind the liner that may have developed over the years when the well had been in use. A risk assessment related to pulling the scab liner through the BOP was removed from the plan, since, as noted, at the time of the assessment the well was not considered to be 'open'. The pulling of the scab liner started on 27 November. Expected changes in pressure related to the pulling were not observed, but the operation continued.[158] The punching and pulling of the scab liner had now caused a potential pressure contact between the reservoir and the holes in the 9 5/8" casing. Gas, if mobilized, could then pass from the reservoir, up the clearing between the scab liner and the 9 5/8" casing and through the holes into the annulus.

At this point, the (potential) 'piston-effect' (see above) started to cause an inflow of gas into the well. The gas then slowly rised through the well under constantly changing pressure conditions. Due to the reduced hydrostatic pressure in the upper parts of the well, the gas also expanded; gas flow accelerated due to the expansion and at the end, came out of control. Later observations show that the breakthrough point in the outer casing (13 3/8") was observed some 500 meters below the platform, and several blow-out craters in the seabed were verified, the largest measuring 8x3 metres.[159]

Evidence for the piston effect, also called 'swabbing', was observed by the crew in the evening, and throughout the night of 28 November. Although this is a clear indication that gas is drawn into the well when there is communication to the reservoir, neither the causes nor the potential risks were considered as the phenomenon continued during the night. The response of the crew was to pull the scab-liner slowly and make regular observations.[160] Loss of mud was now observed but compensated by injecting more mud.

[158] It later turned out that these changes could not have been possible due to an absent or deficient seal in the casing spear that fastened the drill string to the scab liner.
[159] The outer casing was later referred to as having an unknown damage or weakness.
[160] Another reaction that most likely had an impact on how the situation developed was related to a heavy Calciumbromide brine that was placed behind the scab-liner in 1995 during the construction of the well. This brine mixed with the oil based mud in the well when the scab liner was pulled from its lower anchoring points. This probably caused the oil-based mud to thicken, that is, it created a viscous 'gel' that could have enhanced the piston effect.

It can only be speculated where this mud was lost, but there is a certain likelihood that fractures started to develop due to overburden.

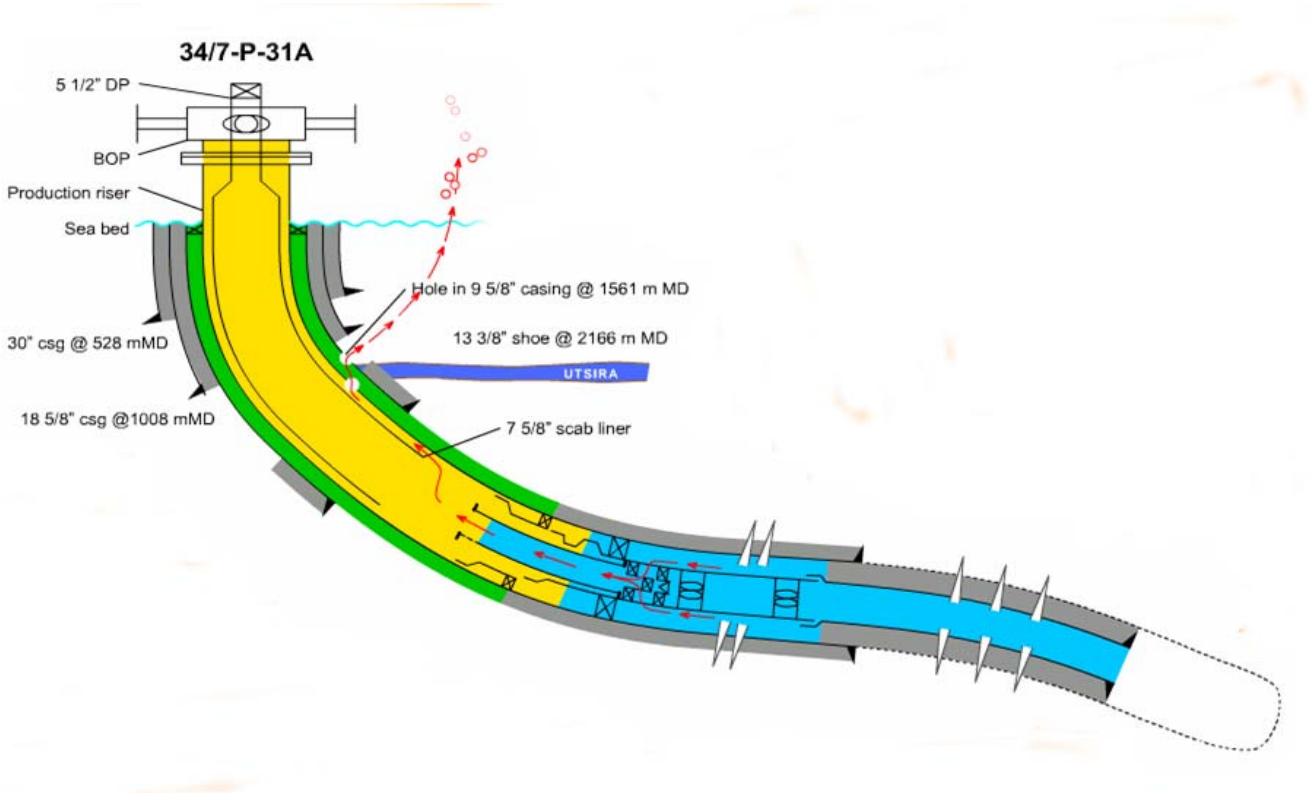

Figure 7.1 The P-31A well [161]

At 0500 hrs in the morning, the top of the scab-liner was pulled through the BOP, which was then blocked for several basic safety functions (e.g. cutting the work string that was inside the BOP and shutting in (closing) the hole efficiently). The operation continued, however, on the day shift, with regular flow-checks. Signs of instability were first observed throughout the afternoon and evening, with alternating losses of mud and increasing pressure. When loosing mud, additional mud volumes were inserted into the annulus, behind the scab-liner. Attempts were made to 'circulate' the well, but no mud was returned. Up until 1800 hours, the well was observed and additional losses were compensated for. At about 1800 hours, a critical backflow of well liquids was observed,

[161] Note that the indicated path of the gas is speculative, and not fully known.

which developed in an undesirable manner.[162] The annular preventor of the BOP stack had to be closed to stop this flow. This type of valve was the only one of three types of safety valves that could be utilized in the BOP. Also, another safety valve inside the work string (Kelly cock) was installed. Available mud reserves were now estimated and initiatives were taken to prepare new mud volumes.

This was the start of the *well control situation*.

The platform manager summoned an emergency meeting at 1900 in order to mobilize the emergency response management. Gas was now detected for the first time, in the cooling water on one of the compressors. This would normally cause automatic shut down of the main power, but the cause was supposed to be local and the gas detectors were thus blocked. Production from all the neighbouring facilities was stopped and the standby vessel, helicopters, Statoil's emergency centre, the public rescue coordination centre, and the PSA were all notified. The alarm was sounded and all personnel mustered to the lifeboats. Gas was detected in several locations, even on modules right below the flare, and from the annular preventor of the BOP. Due to the restrictions on the use of the BOP, the only solution left for killing the well was now to inject large amounts of mud at a high rate in order to force the hydrocarbons back into the reservoir (so-called bullheading). A decision to evacuate all unnecessary personnel by helicopter was made after an assessment of the movements of the gas. During and after evacuation, several gas alarms went off, and some reported that the sea was "boiling with gas". The main power was shut down automatically due to gas alarms and the risk of ignition, and full evacuation was considered. The emergency power was not sufficient for continuing the killing of the well, as the mud pumps and the drill string could not be run with enough power. As a gas blow out from the seabed was now evident, the danger of loss of stability and buoyancy was also considered. Damage to tension legs and gas under the platform could both pose a risk to the integrity of the whole platform.

[162] The details of these processes cannot be fully explicated here, but the 'behaviour' and measurement of liquid flows and pressures are critical in the course of these operations and have to be within certain critical thresholds in order to be continued in a safe manner.

At this critical juncture, the platform manager decided to continue the operation in order to save the platform. According to the emergency procedure, discretionary powers had now been transferred to him, although the decision to stay under the given circumstances was not in line with internal regulations. The scenarios were indeed dramatic, both in the case of leaving and in the case of staying.

The main power was manually re-started just before midnight. Some time had passed since the last gas detection on the platform, but the decision was still critical. The process of bullheading mud into the well could now continue, however. Pressure from the well would rise and fall as they were able to keep up the process. New mixtures of mud had to be produced continually, which is a time-consuming process, and supplies were gradually reduced. For two periods, the crew could only monitor the well, awaiting new supplies of mixed mud. External supplies of mud were not available since gas in the sea did not allow the use of supply vessels. As they ran out of oil based mud, a decision was made to make a final attempt using an improvised mixture of water based mud. Elevated evacuation preparedness was requested, and at around 0900 hours, 160m3 were ready for use. The pressure in the well was at this point greater than it had been when the process started around midnight. One long hour later, zero bar was recorded from both sides of the scab liner; the mud stores were then virtually empty. Thirty-five people were left on the platform after the last evacuation.

Post-event reconstructions

Even though the actual consequences of the incident were serious (including substantial costs related to delayed production), the potential consequences could have been catastrophic. The probability of ignition would have increased significantly with more unfavourable weather conditions, or in the case of a blow out on the drill-floor.[163] An extensive fire could have caused loss of human lives, and ultimately loss of the whole facility, including damage to the underlying well template, containing 42 well heads,

[163] A cloud of gas could have formed, and proximity to the flare boom could have caused ignition. The flare was extinguished only at 0300 (due to various problems).

risers, and various subsea structures. The environmental impacts of this scenario were dramatic. The total costs could have been some NOK 30 billion.

The PSA investigation

The PSA investigation report identified twenty-eight non-conformities, summarized as (1) lack of compliance with and control in the use of internal company procedures and governing documentation, (2) inadequate understanding and implementation of risk assessments, (3) inadequate involvement of management, and (4) breach of well barrier requirements. The non-conformities were related to failures of both Statoil and the drilling contractor, involving several levels in the Snorre organization both onshore and on the facility. The report highlighted the pervasive nature of these failures, and pin-pointed the fact that so many hazardous decisions had allowed the incident to develop. In summing up the investigation, they stated:

> Therefore, there is nothing to indicate that the incident was caused by chance circumstances. The non-conformities found in the investigation would all have been intercepted and corrected if the barriers had functioned. Individual barriers fail from time to time, but failure of so many barriers in different phases of an operation is extremely rare. The PSA is critical of the fact that such an extensive failure of the established systems was not uncovered. We question why this was not discovered and corrected at an earlier point in time (PSA, 2005: 4).

Three critical events where identified as ‘triggers’. First, the perforation of the tail pipe, thus exposing the well to pressure from the reservoir without considering the secondary barriers; second, the perforation, cutting and pulling of the scab-liner, equally violating the barrier requirements; third, failure to respond to the ‘swabbing’ as the scab liner was pulled (this should have been taken as a sign that the effect of the primary barrier, the mud, was significantly reduced). As noted above, gas had been sucked into the well (through a vacuum effect), mixed with the mud, and thus also reducing its effect as a barrier. The other non-conformities were categorized as ‘underlying causes’, such as planning with insufficient barrier control, lack of risk assessments, etc.

The report was careful in not making interpretations that went beyond any explicit evidential support. Thus, ‘insufficient leadership involvement’, which could otherwise be employed as a catch-all ‘root cause’, was specifically related to the failure of the

management to summit risk reviews, to approve deficient plans, etc. All 'underlying causes' were thus substantiated by reference to clearly verifiable observations only, reflecting the interpretive self-restraint appropriate for a regulatory agency. And each of the non-conformities were properly related to violations of internal company procedures and to the relevant standards and regulations. The violation of the requirements on well barriers (i.e. of having two independent barriers with known effects) recurred through the process from planning to the operation itself.[164]

The PSA report provided a rather laconic and fact-based historiography of the organizational changes and discontinuities prior to the incident. A discussion of their possible impact on the events, was given in a highly conditional mode, as an "assessment and discussion of uncertainties", and was introduced as issues where "contradictory information" was given, and where "the investigation has been unable to uncover an exact description of the incident, or where causal relations seem to be present, although this cannot be documented" (PSA 2005: 39). These 'conjectures' identified reorganizations, use of consultants, and change of drilling contractor as precursors that could have influenced the low priority and status given to the planning and preparation of the operation, in particular in the face of its criticality (i.e. the opening of a 'complex' well). Several indications were noted.

Discontinuities during the transfer of drilling contractor could have led to loss of information; despite the fact that 80 percent of the personnel were taken over by the new contractor, some key supervisors and managers were replaced. Although much of the old Snorre organization had remained intact (the Snorre organization consisted largely of former Saga and some Hydro personnel), the integration into the Statoil system was far from completed, including working methods, procedures, and use of expertise. Several organizational changes were underway, however, including plans for rotation of well and drilling engineers/supervisors, and including also the replacement of the senior manager

[164] The regulations specify that at least two tested barriers shall be present at all times between the reservoirs (or hydrocarbons in general, i.e. in processing systems) and the outside environment of people, things and ecosystems. The requirement is absolute and deterministic, and is further specified in the industry standard, NORSOK D-010 (http://www.standard.no/imaker.exe?id=1301).

for the whole Snorre field.[165] Also, the program engineer who prepared the well program was a hired consultant, and largely left alone, "without much management, guidance, involvement, and prioritization from senior management" (PSA 2005: 40). As noted, some key drilling/well supervisors/managers were just recently assigned to their positions, such as Statoil's drilling supervisor, who was on his first trip to the facility when the incident occurred. Finally, the accelerated start-up, due to the earlier availability of the drilling facilities, was noted as a possible contributor to stressing the situation. These were rather careful suggestions, in the face of what could easily be perceived as almost an argumentative overkill in terms of the organizational and operational stress that was created and imposed on the various steps of the process.

SNA: cultural causes?

As noted in the previous chapter, the policy of 'cultural self-restraint' had developed in the PSA before the SNA incident. This policy caused some discussion and concern, as it questioned the applicability of the provision as such. The discussion surfaced as the final preparations of the SNA report were being concluded. The investigation team had discovered twenty eight non-conformities, some grave and deeply systemic in nature, and the overall impression was that if this didn't qualify as a violation of the culture provision, then, what would? Still, the reservations prevailed, partly based on the previous experiences (such as from the Gyda case) and partly also based on more principled arguments about the formal use of the provision as such. The idea advanced by the culture group was that HSE culture should rather be used in positive terms, as something that should be promoted and developed, rather than in negative terms, as something 'missing' that could count as a 'deviation' from a norm. The reservations reflected also the perceived 'power' inherent in the term HSE culture. Still, 'culture' was a recurring point of reference in the subsequent discourses surrounding this dramatic incident. The leader of the culture group, himself a specialist in drilling and well technology, referred extensively to this case as an illustration of how a series of critical decisions, judgements, and acts reflected and revealed indications about a culture failing to deal properly with risks. The failures were evident on all levels in the organizational

[165] In fact, Snorre (RESU SNA) got a new manager on the very day of the incident.

hierarchy, and were all the more critical, as it was commonly known among well specialists that there were a number of such ‘old and rotten’ wells on the shelf. And the risks involved would not be properly approached if the risk monitoring policy only relied on the conventional use of historical data, such as the counting of ‘unplanned events’, like well kicks. These were risks that had to be managed through careful use of foresight analysis, imagining all the possible outcomes of well interventions based on in-depth knowledge that included also the *case specific* historical documentation, not just the ‘signs of danger’ as they could be read from event-based statistical records. Proper risk management had to take account of all the human and organizational preconditions for safe operations. These were risk management perspectives he hoped that the culture group would be able to draw attention to. HSE culture was to serve as a sensitizing concept for understanding emergent and ‘unregistered’ risks as well as for dealing with them in a sensible manner through all the critical junctures of judgement and decision making. But to ‘formally’ attach the label ‘bad HSE culture’ to any one event, group, unit, facility, or even company, appeared too hazardous.

Such self-restraint was not observed at the high-level encounters, however. The ministry prepared questions about the HSE culture of Statoil for meetings between the Minister of Labour and the CEO of Statoil. The CEO himself explained publicly that the safety culture of the Snorre organization had major flaws, but aptly adding to this observation that the main reason for the incident was that the organization hadn’t been ‘properly integrated into the larger Statoil system’, which of course, had a good and sound safety culture. The subsequent ticket fine, NOK 80 million, is the highest ever given in Norway. It was accepted by Statoil, apparently without protest, but in the subsequent public response, the claim was reiterated: the Snorre culture had not been properly integrated into the Statoil culture.

The Statoil report on the causes

This self-restraint on the part of PSA, stands in contrast to the more sweeping analysis in the Statoil report to appear later (Statoil/Schiefloe *et al*., 2005).[166] The order that was issued subsequent to the investigation report typically required Statoil to identify the causes of the incident and of the non-conformities, to implement appropriate remedies, and to measure and document their effect. An internal project was established in order to follow up the order, including also union representatives. The analysis of the causes appeared almost a year after the incident. The study was carried out by a research institute associated to the university in Trondheim (NTNU) and headed by a sociology professor. The final report was issued as an internal Statoil report, approved by the UPN director, and was in that sense also an expression of self-diagnosis and 'confession' on the part of the company. None of the observations in the PSA report were questioned; rather, they were penetrated and contextualized within the broader historical framework and a socio-cultural explanatory model.[167] It starts with the premise that individual behaviour is to be understood largely as an outcome of the organizational and operational context of tasks solving, including such factors as work loads, time-pressure, resources, competence, and incentive systems. Critical operations within high risk systems cannot rely on the absence of erroneous judgements, only that such judgements are monitored and corrected in time. The main conclusion in the report was, briefly put, that this was not the case in the SNA organization. Error was allowed to happen, they didn't really 'learn from experience', and, although the phrase is not used, the implication is that this was an incident that was 'waiting to happen'. The interplay between 'systems-critical' activities and weak organizational defences (barriers) caused 'high operational risk', with the implication that erroneous operations could lead to chain reactions with serious consequences, amplified by sub-standard technical conditions. Five dimensions organize the analysis, referred to as the "Pentagon model" (see also Chapter 3): (1) technology and operations; (2) organization and regulations; (3) values, attitudes and competence (also referred to as 'culture'); (4) relations and networks; (5) work processes, including

[166] A more technical investigation had been conducted just after the incident but did not penetrate very far into the organizational causes.

[167] It was based on extensive analysis of documentary evidence, a survey questionnaire and in-depth interviews with 152 informants, including virtually everyone involved in the incident.

cooperation, communication, and management.[168] In short, the report identified weaknesses along all these dimensions.

The *technological* condition of the platform had gradually deteriorated, mainly due to the priority given to short term production targets. In particular this was the case during the Saga and Hydro years. Statoil plans for improvements and modernization had not yet been implemented. Key informants stated that SNA largely had been managed on a day-to-day basis with an ad hoc problem solving approach, including improvised repairs rather than more robust replacements. High pressure on performance goals and speed made more systematic and long term maintenance and operational policies difficult to pursue. Two critical examples were given: First, instead of replacing the damaged 9 5/8" casing in 1995, the unconventional and 'awkward' solution of inserting the scab liner was chosen, which was cheaper and faster. Second, in the critical decision to change plans and perforate the tail pipe before pulling the scab liner, considerations about time and convenience were decisive, since it would ease the process of cementing the reservoir.

The *organizational* discontinuities and loose integration that was observed in the PSA report were confirmed and elaborated. Lack of integration into the Statoil system was partly explained as a response to expressed wishes from the Snorre organization, largely consisting of former Saga/Hydro employees, to be "left alone". Despite formal integration (organization, safety systems, and operational procedures), the organization appeared as independent, and not "socially and culturally integrated in Statoil". In addition to this, there were organizational changes still going on, as part of Statoil's plans for a more integrated management of the whole Tampen area, where they now operated all the fields, implying also expanded areas of responsibility for key managers. Combined with a high level of activity, these changes lead to an overload on management resources. Furthermore, the change of drilling contractor also occupied management resources and attention, and greater responsibilities were put on the Statoil drilling managers due to

[168] This analytical model is the same as was used in the workshops in RNNS project see chapter 3), which was organized by the same research institute (Studio Apertura), affiliated with the technical university in Trondheim, NTNU). The conceptual taxonomy suggested by this model has thus obviously contributed to shaping and framing analytical approaches and conceptual understanding on a wider scale, a topic for later discussion.

weaker follow up from Prosafe prior to the transfer. General adjustment and transfer problems were reported, and several informants experienced unrest and insecurity related to their jobs. These organizational disturbances in sum caused a "displacement of attention". The pervasive and repetitive violations of *rules and regulations* noted in the PSA report were interpreted as 'systems weaknesses' in the sense that they could not be attributed to conscious individual volition. Rather, there was a general lack of knowledge about internal safety systems and procedures. Several explanations were provided, such as insufficient training and time pressure. Generally, the safety procedures were described as unavailable, complex, comprehensive, badly organized, and subject to frequent changes.

Relations and networks were described partly in terms of internal cohesiveness in the Snorre organization, and partly in terms of its relative isolation in relation to the Statoil organization. These attributes, noted above, were evident also in the informal organization, pointing to the feeling of communion and good relations among Snorre employees, including also the contractor employees. SNA ranked high on mutual trust, general well being, and working environment. This confirmed also the observations of the PSA team, who, based on their experience from the investigation, characterized the working environment as "good". These factors were seen as critical in contributing to the successful rescue operation, where the virtues of the action-oriented culture were fully exploited. The flip side was the loose connections to the Statoil system. This included lack of professional cooperation and little use of Statoil expertise and experience.

The dimension most explicitly referred to as "culture", included *values, attitudes, and competence*. A strong and distinct local culture was identified, reinforced by several strong and dominant managers throughout the SNA history. Partly, this cultural diagnosis reinforced the preceding analysis, such as the value of "keeping up production", an *ad hoc* and short term perspective on operations, and an 'insulated' culture in relation to the organizational environment (the Statoil system). A high tolerance for risk and lack of systematic risk assessments could be related to these task oriented attitudes. To get things done without too much planning or thinking was important. Low tolerance for objections

and criticism was also observed, relating both to management decisions, expert judgement, and to external interference. Still, expertise in some areas seemed to have been weak, such as risk analysis and drilling- and well-operations. In sum, an image was drawn of a highly task oriented, self confident, and insulated organization, or 'culture'.

The last dimension, *work processes*, was then, partly, a repetition exercise. Planning of well operations had been an onshore issue, and communication with the platform had been insufficient. An argument was provided that hectic and shifting working conditions on the platform, together with low turnover and 'cultural stability', had developed a capacity for "micro-coordination", referring to the ability to mobilize people and resources for solving tasks and problems in a swift and flexible manner. Again, these qualities of the organization were credited for the handling of the emergency crises. Risk awareness and safety concerns were clearly present, but were not sufficiently mobilized by the management in practical planning and work processes. Also, management resources were largely absorbed in administrative tasks, at the cost of 'hands on' involvement in planning and operations.

The virtues of the analytical taxonomy of the 'Pentagon model' aside, the report deepens the historical and socio-cultural understanding of how the serious near-miss on Snorre developed, reminiscent of what Turner (1978) referred to as an incubation period; the disaster was halted only by the instant and extraordinary efforts of the platform manager and his crew. The 'signs' were evident also from other sources. Since 2003, four notifications had been reported to the PSA of serious incidents, two of which were well incidents (the other were a serious injury and a falling object). There was a general perception in the Snorre organization that SNA had among the worst HSE rankings in Statoil (Statoil/Schiefloe *et al*., 2005; PSA, 2005). The Statoil report also concluded that their informants themselves interpreted the causes of the repeated failures within a larger "historical and cultural context" related to work modes, communication, management, and strong leaders. The 'Snorre culture' appeared in a number of statements from the interviews. Mind-sets, behavioural modes, and norms had developed throughout the history of the field, where short term production targets overshadowed thorough planning

and assessment of risk. This was evident in the ambiguous interpretations of the status of the well. On the one hand, it was diagnosed as 'complex', and the operation was not considered 'standard'; at one point, however, or gradually, the operation becomes 'straightforward and simple'.[169] There were clearly factors that could support this mental twist, like the fact that this was 'only' an injection well or this was 'only' a slot recovery operation. As noted, such operations tended to be underestimated, and appeared as less 'prestigious', compared to drilling in 'virgin soil'. The underestimation of the well integration problems still appear as puzzling, in particular when considering the quite recent discoveries about the well problems and the decision to plug it.

Local optimizations and external pressures

The Statoil report analyzed the incident in terms of how organizational safety barriers were able to cope with complex and hazardous operations. Underlying causes were also identified in the history of the field and the well, implicitly blaming predecessors for leaving a muddled heritage, although the subsequent behaviour of the company was also critically analyzed. The relationship between historical and external contexts and the local processes of problem-solving shall be discussed below, partly by further exploring the Snorre-case, but also by briefly considering the post-accident investigations of the two NASA space shuttle accidents, *Challenger* and *Columbia*. We are interested here also in the more general questions of how causal complexities are analyzed and weighted, and in particular how 'cultural causes' may fit into these sequences and configurations. As will be recalled from Chapter 2, the explanatory and 'managerial' role of culture appears as one of the issues of controversy between the Normal Accident theorists and the High Reliability theorists, and a case-based discussion may facilitate an elucidation of the 'positions'.

[169] The possibility of gas entering through the outmost 13 3/8 casing was also part of this, as this possibility had not been seriously considered in the previous test that had indicated deviant pressures.

SNA: memory and adaptation

The deterioration of memory observed in the Statoil report, was later addressed by Coeckelbergh and Wackers (2006) in a recent analysis (henceforth, C&W).[170] Noting the problems related to retrieving formal documents of well history (travelling from office to office during the various takeovers), they still point to the fact that offshore personnel, that had been involved in the well operations as far back as 1995, didn't 'remember' the hole in the 9 5/8" casing before they suddenly observed gas bubbles in the water. C&W also point to the fact that the former investigation reports didn't fully account for what the onshore personnel involved in the planning 'knew' about well history, or explain why the operation of perforating the tail pipe and pulling the scab-liner was not considered critical. Which 'local' assumptions' were the made during the various stages of the operation? C&W question the remarks in the investigation reports about 'lack of competence' related to barriers and 'barrier thinking', and the hindsight reconstructions of what went on in the critical contexts of decision making. Taking the perspective of the actors, situated in these specific contexts, and in trying to avoid the 'implicit' attribution of cause to 'human error', it is argued that prior reorganizations put restrictions on the availability of expertise and that the allocation of resources to the project was not solely in the hands of the Snorre management.

Widening the context further, and not restrained by 'company perspectives' in exploring explanatory options, C&W spans the whole development of the Snorre field, representing a strategic asset to Statoil in the sense that the take-over of the field would make them the sole operator in the Tampen area (including large fields such as Statfjord and Gullfaks).[171] This gave opportunities for optimizing the use of resources and rationalizing the organization. The story is also traced back to the background for the end of Saga, the first operator of the field, the causes of its (hostile) takeover by Hydro, and later Statoil, and how the assets were shared and dealt with by the two companies in the

[170] The analysis is based on the available documents and reports, and including a number of interviews with key participants and observers of the incident: investigation groups, the platform manager, and others from the remaining group of thirty-five (see also Wackers, 2006).

[171] Examples of 'doctoring' interpretations in line with company self image and reputation may be found in the Statoil report, such as the 'blaming' of the 'Saga-culture' and the 'moneymaking' Hydro period ; but overall, the report is painstakingly 'self-critical'.

years to follow. Part of the deal was that Hydro would operate the Snorre field for some three and a half years, and that Statoil would then take over. Considerable cost reductions were implemented in the Hydro years, particularly in the onshore organization. Oil prizes in the period averaged around $10 /barrel, cost reductions were implemented in every conceivable way, and Snorre was operated as a money machine. The analysis then points to the very different contexts in which these strategic commercial decisions are taken, far removed from safety concerns. This context is

> … populated with different kinds of knowledge, skills, and sensitivities. It is a world of politicians, policymakers, bankers, lawyers. It is about the protection of national and private vested financial and industrial interests; requiring …. experience in business strategies and tactics that maximize share holder value. This is not a world in which reliability and safety consequences of deals are being explored. These concerns and consequences are relegated to the company that will take upon itself the responsibility of being operator for an offshore installation. The way in which Snorre A – the installation, the field – is *framed* as a business asset contributing to the value per share of the company on international stock markets – *deletes* from this world the sensitivity, vocabulary, and tools to assess the vulnerability inducing consequences of the deals being forged (p. 9).

Market stress, partly caused by sliding oil prizes thus created corporate unrest and commercial pressure. Considerations of safety implications would not be a high priority in these business transactions. Rather, operational consequences related to organizational changes, shifts of personnel, discontinuity of operational knowledge, all the way down to the effect of interpersonal relationships in day to day planning and operation, would have to be handled *post hoc*. They had to be adapted to at the operational level. The context of such decisions, on a lower level, is exemplified in the change of drilling contractor just prior to the incident.

The new drilling contractor was paid only for effective operational time (only for uptime, not for downtime), a type of contract not uncommon in the industry. In effect, time needed for maintenance, replacement of parts, etc., was not paid for, and accounting systems were devised to measure up- and downtime (to the quarter of an hour). The new contract effectuated a greater transfer of financial risks related to Odfjell personnel's

errors or mistakes from the operator to the contractor.[172] This squeeze and its consequences are summarized thus:

> The operator's onshore organization wants to keep moving in order to maintain a detailed time schedule. The contractor's onshore management also wants to avoid downtime, because this will a) interrupt cash flow and b) affect his operational effectiveness statistics that will come up in negotiations on contract renewals or effectuation of options. As a result there is a tendency for the contractor's offshore personnel to trust the operator's onshore expertise, rather than to rely on their own judgment. Relevant local and situated knowledges, experiences, and memories are suppressed; despite continuity of personnel, of bodies, knowledge and memories are in a sense *deleted* (p. 11).

Whereas the PSA report noted the possible effects of organizational discontinuities, and the Statoil report explored their actual impact, the C&W analysis consider their causes, thus expanding the causal linkages in the complex developmental sequences. Both the Statoil report and the C&W report point to the importance of coupling and complexity in understanding these sequences. Implicitly resounding normal accident theory, the Statoil report describe petroleum production in general terms as being characterized by complex interactions and strong dependencies between operations, functions, and activities. Rather than embracing Normal Accident Theory, however, it 'relies' on the more optimistic High Reliability perspective (although not explicitly referred to). It thus points to the importance of vigilant attention in all the parts in the chain, and the role of human, organizational, and technological defences that must be present in order to compensate for individual or isolated failures, understood as parts of the system and as steps in the sequential order. The C&W analysis draws on the same vocabulary in describing the development (on the long term) as a process of decoupling and increasing vulnerability.[173]

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[172] Previous contracts required severe or gross negligence to establish the contractor's liability for all costs resulting from such errors. The terms of the new contract required just (ordinary) negligence, and included also costs required to re-establish normal operations. In effect, this made it more difficult for their offshore personnel to voice safety and reliability concerns during operations if it could cause loss of income to the employer. Also, the contractors' influence on the planning and execution of operations was not correspondingly increased, but were managed by Statoil's onshore operational organization (SNA RESU).

[173] The latter understood as the systems ability to "anticipate, resist, cope with, respond to, or recover from undesired events that threaten the achievement or maintenance of performative closure". Performative closure refers here more specifically to the containment of hazards, that is, the system of barriers (pipes, valves, plugs, BOPs) that prevent the blow-out of high-pressured hydrocarbons.

At critical junctures, the human, organizational and technological barriers failed, and potential hazards were underestimated. The process of decoupling can be observed both in the high level decisions about business deals creating organizational ruptures, discontinuities and 'loss' of memory, and in the lower level decisions to change slot recovery plans without considering what new risks this could offset. These retrospective insights were not so clearly available in the context of "local optimization", where practical and efficient solutions appeared to be 'rational' within the bounded context of single and isolated instances of problem-solving; they may even be saluted and mutually approved. This isolation of decision contexts was apparent in several stages leading up to the incident, such as the critical decision to perforate the tail pipe before pulling the scab liner, which was technically considered to be more 'practical and convenient' (i.e. faster and cheaper). At this point, the failure of the pressure test less than a year before was 'forgotten', and no image of an 'open hole' was present. Later, when the pipe was pulled through the BOP, with basic stop functions unavailable, the uncoupling was (almost) irreversible. The challenge in this context, as noted by C&W, is to

> think not only how to get in and down and do the job, but also always to think how to retreat, pull out, while maintaining two barriers at all time. And the challenge is to think this in a flexible manner, that is, through the changes between types of partial operations, from running a tool on a wire to pumping down mud to pulling out a scab liner. Proper barrier thinking is a collective effort. It requires a diversity of input from all disciplines involved. And it takes time. Time should be a resource here (p. 16).

Time finally also caused a forced upstart, as the drilling rig was ready two days ahead of schedule. It is an open question, however, whether things would have turned out otherwise if the postponed but cancelled risk review had been conducted as planned on 19 November.

However, as the situation developed and the signs of immanent danger could no longer be ignored or 'reinterpreted', the ability of the organization to 're-couple' was evident. With gas intake from two parallel blow-outs (the seabed and the top side BOP), a number of critical decisions had to be taken. Although the first gas detection was interpreted as 'local', it was soon clear that a crisis was underway. As the emergency situation was established, the discretionary power shifted to the platform manager. Curiously, not only

was the incident a result of serious violations of barrier requirements. The rescue operation itself operated on a regulatory edge. Company regulations supported full evacuation, as did the Statoil crises management groups that were assembled onshore. The platform manager, however, opted for a rescue operation.[174] This included a number of precautionary decisions, such as turning vents, rearranging air intake, etc., but also high-risk (and non-compliant) decisions, such as rearranging electricity systems and re-starting the main power. The scenarios of loosing the platform, including the possible destruction of underlying structures and massive blow-outs that could cause major environmental damage, seemed decisive. The remaining crew was assembled, and participation in the recovery was presented as voluntary; all key personnel decided to stay, however. In this process of innovative problem solving under high pressure, some of the virtues of the crew and perhaps of the 'Snorre-culture', reappeared in a paradoxical way. Not in the manner of a 'reliability paradox' (that is the loss of experience and problem solving skills due to the an 'overburdened' system reliability: i.e 'full-proof' socio-technical systems that need no 'thinking' on the part of their human 'members'); rather, as was noted by C&W:

> In a paradoxical sense, operating Snorre A like a money machine maintained the improvisatory skills that saved the day in the recovery of the blow-out. Processes of improvisation and tuning do not only rely on existing knowledge but also themselves generate new knowledge, skills, and capacities. Furthermore, it is important to note that improvisation is not rule governed but coordinates actions in another way, that is, by using imagination. The reproduction of existing patterns goes hand in hand with innovative adaptations and exploration of new options (p. 23).

In fact, in this changed state of heightened risk awareness, they took great risks, but they also 'amplified' some of the dangers, such as the loss of buoyancy due to the gas

[174] The impact of this decision was critical, as explained by C&W: "If people would be killed in the attempt to regain control over the well, in the attempt to recover the developing crisis situation that was on a trajectory towards a major environmental, social and economic catastrophe, the platform manager would have to bear the brunt of criminal investigation and possibly criminal prosecution and punishment (….) The platform manager denies that any pressure was exerted on him by onshore management to stay on board and try to recover the situation. To the contrary, exerting pressure on him to stay would have been the most effective way of getting him to fully evacuate" (p. 17).

emissions; according to the PSA report, this scenario was less likely than the crew appeared to believe.[175]

Normalization of deviance as culture

The management of risk can thus be understood from different perspectives of variously situated actors, exposed to external pressures and constraints as well as shaping these, and also producing local strategies in complex processes of mental and social conditioning and optimization. The scope of such broad and highly contextual reconstructions of large accidents (and near misses), is evident in the post accident accounts of the two spectacular space-shuttle accidents, *Challenger* and *Columbia*. Both were analyzed by the *Columbia Accident Investigation Board* (and their advisers), which was carried out with the intent, not only to find out what happened to the shuttle, but also to "determine the conditions that allowed the accident to occur" (Columbia Accident Investigation Board, 2003: 6). This insight does not in itself indicate how deep into the history of possible causal antecedents the search will penetrate; in this case the reconstructed narrative went beyond *Challenger* and to features and weaknesses that the Board found to be deeply rooted in the history of NASA and its broader political and economic environments. The report highlighted the organizational, social, and cultural background conditions that lead up to the accident, and their recommendations likewise pointed to how such conditions would be critical for the safety of future spaceflights.[176] What makes the analysis particularly relevant from our point of view is the crucial explanatory role given to NASA culture. Culture is here understood as "basic values, norms, beliefs, and practices", defining assumptions made in way things are done, and which acts as a "powerful force that persists through reorganizations and the departure of key personnel" (p. 101). Culture is used both as interpretive biases, as models *of* the

[175] But that kind of knowledge was derived from scientific experiments, and could not be considered necessary for the operation of the facility; it was thus neither a result of hindsight privilege nor of foresight expectation.

[176] Diane Vaughan more than suggests that this was due to her analysis of the Challenger accident (Vaughan, 1996), which the Board had read; she was called to testify and later invited to work with them and eventually to write the important chapter that summarizes the historical lessons from both accidents. According to Vaughan, the Boards report "is the first US accident investigation report to give equal weight to social causes and technical causes...", thus departing from the "human factors model" or what she terms the "ritualistic post-accident investigation practice of placing blame on OE [operational error]" (2005:65). Consequently, the report is filled with references to the HRO-literature, and several prominent contributors to this tradition features on the list of "advisors and consultants", such as Karlene Roberts and Karl Weick.

world, and as collective ‘scripts’, as models *for* acting in it. In its application, it is contrasted with features of organizational structure, with flows of communication and with external environmental factors. But it is simultaneously both influencing and influenced by these, in an integral co-producing force in the flow of events. Culture was thus not ‘localized’ at certain steps in a stringent causal chain, but still made observable as sometimes quite explicitly described mechanisms in the course of events. The most salient of such mechanisms is the process of “normalizing deviance”, echoing Vaughan’s (1996) well- known analysis of the *Challenger* launch, and in fact reapplying this label on what turned out to be a recurring behavioural pattern in NASA.

The immediate cause in both accidents was technical failure. In the *Challenger* launch, the failure was caused by O-ring erosion; in *Columbia* it was caused by foam debris hits. Both weaknesses were well known, much discussed, and subjected to regular risk assessment processes. A number of flights had been successfully conducted, seemingly proving the weak spots to be well contained and within the limits of “acceptable risk”. However, additional strains to the system on the two occasions proved fatal. The cold night before the *Challenger* launch weakened the O-ring’s resistance to erosion; the foam debris hit a fragile tile and it was larger than the previous ones. On both occasions these facts were partly known and partly suppressed; in *Challenger* prior to the launch, and in *Columbia* just after the launch. The effects of the cold on the O-rings were voiced by engineers in the contractor company, but played down and suppressed by management, afraid of compromising business. The foam debris hits were a concern for a designated specialist task group, requesting additional scanning of the wing, but was incapacitated by the Project management. But the insufficient attention to warning signals was evident long before the actual events unfolded: “In both cases, engineers and managers who conducted risk assessments continually normalized the technical deviations they found” (p. 196). Both problems violated design specifications, but were transformed into a permanent maintenance issue following an initial engineering analysis, concluding that the design could tolerate the damage. According to the Board, these were turning points, as they “established a precedent for accepting, rather than eliminating, these technical

deviations". The process of normalization was to become further institutionalized (or 'culturalized'):

> As a result of this new classification, subsequent incidents of O-ring erosion and foam debris strikes were not defined as signals of danger, but as evidence that the design was now acting as predicted. Engineers and managers incorporated worsening anomalies into the engineering experience base, which functioned as an elastic waistband, expanding to hold larger deviations from the original design. Anomalies that did not lead to catastrophic failure were treated as a source of valid engineering data that justified further flights. These anomalies were translated into a safety margin that was extremely influential, allowing managers and engineers to add incrementally to the amount of seriousness of damage that was acceptable (p. 196).

Anomalies thus became "routine signals" rather than signals of danger, and 'strong' signals were reinterpreted as 'weak'. The behavioural patterns in the critical phase leading up to the accidents were thus not surprising, but rather a long term consequence of problems that had become what Turner (1978) called "ill-structured". The flight readiness process, intended to "transform known problems into acceptable flight risks", was in both cases disabled, largely because the known problems were already defined as acceptable; they could not overrule previous expert judgment. In Turners analysis this "ill-structuring" was revealed only with hindsight bias. The detailed account, in particular of the *Challenger* launch, facilitates a closer reading of how this process evolved, seen from the perspective of the actors involved.

The Board went further in their analysis, however. Common causes of both accidents led to identifying *history* as a cause, including a pervasive pressure on NASA to perform more like a business, with deadlines and efficiency demands, rather than as a research and development agency. The Shuttle was increasingly treated as an operational vehicle, with tight schedules and routine launches designated for operational tasks (servicing the ISS and Hubble). This was largely the result of compromises, as NASA was unwilling to reduce their ambitions in the face of budgetary cutbacks. What was originally designed to be an experimental project was increasingly treated as an operational one. In fact, the Board considered the schedule and shoestring budget to be as influential for the outcome as the actual risk decisions taken during the Flight Readiness process. Corners were cut and signals of danger were reinterpreted and dealt with in a manner that minimized the

likelihood of delays. Organizational accommodations following *Challenger* (as recommended by the accident commission), were reversed in the course of time; personnel cutbacks and outsourcing, simultaneously increased the reliance on contractors, and impeded oversight and communication flows. Reductions in safety personnel were justified on the (false) assumption that contractors would compensate with safety measures relative to their expanding commissions. Also, the independence of the safety organizations was compromised by role-conflicts and increasing reliance on the projects for budgeting; again contrary to recommendations of the *Challenger* accident commission. Structural changes were thus seen as "perpetuating dangerous aspects of pre-*Challenger* culture" (p. 199). Streamlining and downsizing conveyed a message of efficiency rather than safety. Furthermore, the Board pointed to the heritage from the Apollo era; the old vision of NASA as "the perfect place" where anything could be achieved, supported a strong "culture of invincibility"; this was visible also in the unwillingness to listen to outside experts.[177] This old entrepreneur-like culture of research and development "with its prized deference to the technical expertise" was gradually overrun during the Space shuttle era by an "allegiance to hierarchy, procedure, and following the chain of command" (p. 199). By implication, the assumptions of the 'can-do' culture were transposed within this belief in "bureaucratic accountability": the cultural belief that the seventeen years of successful launches could be attributed to the structures, rigorous procedures, and detailed system of rules. Continuing and deep-seated cultural properties (like easily produced confidence) were thus assigned a crucial role in explaining the missing impact of lessons from *Challenger*, however in close interaction with environmental and structural factors; the latter were however also occasionally referred to as 'cultural', at least in their consequence: "The NASA culture encouraged flying with flaws because the schedule could not be held up for routine problems that were not defined as a threat to mission safety" (p. 198). Production pressure and scarce resources influenced how risk issues were interpreted, and furthered rigid distinctions between serious and less serious problems, causing insufficient attention to the latter. Managerial behaviour was subject to conflicts between cost-efficiency and safety. The

[177] The Aerospace Safety and Advisory Panel told NASA in a 1985 report that they should stop treating the vehicle as if it was operational. The Board found that they continued to do so even after Challenger, despite repeated assessments reminding them that it was only experimental.

process of normalization allowed for selective and biased information processing, minimizing the risk of delay. Warnings were first rejected for want of "sufficient evidence", but a subsequent clearance was accepted without question. Cultural mechanisms of framing are thus involved in the process of determining which concern is to carry the heaviest burden of proof.

Cultural beliefs appear then as both 'victims' and 'agents' in the chain of events. The shaping of these beliefs includes a number of conditions, and their outcomes are visible throughout the critical junctures in the decision-making processes. There is, however, a delicate interaction between the process of shaping and of being shaped. The mental normalization processes appear as both models of and models for behaviour. The socio-cultural mechanism of normalizing deviance was later to be described as "a social psychological product of institutional and organizational forces" (Vaughan, 2005: 34). The report specifically relates this double nature of local mechanisms and external pressure to the HRT-NAT controversies, trying in effect explicitly to reconcile them. Vaughan's analysis of the *Challenger* accident, was addressed in the later edition of *Normal Accidents*, praised for its thoroughness, but also criticized for not accentuating the significance of external pressures and power mechanisms evident in some of the critical decision-making contexts, such as in the meeting the night before the launch (see Perrow, 1999: 380). Rather than seeing that context as a display of an engineering culture with twisted mind-sets and interpretive biases, Perrow point to the pervasive pressures that were put on the worried engineers, causing them to 'fumble the ball' and not able to mobilize the argumentative power that they in fact possessed. Cultural scripts existed, but the managerial ones prevailed, and the outcome was essentially an "exercise of organizational power" (Perrow 1999: 380). Perrow's analysis may thus point, not only to the role of power, but also to the way in which competing 'scripts' meet in asymmetric decisional battle-fields. Calling this the 'powers of culture' or just power and interests may be a matter of taste, but the basic line of reasoning is clearly resumed in the analysis of the *Columbia* accident and in the accompanying reinterpretation of the *Challenger* accident, with cultural mechanisms or 'scripts' appearing both as external cause

('production-pressure') and as lower level mechanisms of 'normalization', but this time with the latter as being more susceptible to the forces of the former.

Locating causes and remedies

Some interesting parallels and contrasts appear in these cases, both as the events unfold and as they are later reconstructed, however far back into the history they are traced. The process of 'normalizing deviance' was apparent in the SNA-case. 'Signs of danger' were interpreted as 'normal', as long as possible. But the attenuation of the possible risks did not appear as ritualistic repetitions with the reassuring effect of having 'followed the procedures'. Rather, the violations appeared as rather 'conspicuous', and even trivial; they were all the more outrageous from the point of view of the regulators. It could of course be reconstructed as an accident (incident) 'waiting to happen', but the more striking impression from the reconstructions was how it was 'made to happen'; it appeared as 'ill-structured' only because apparently 'obvious' and elementary judgements and procedures were not followed. In fact, the PSA report almost 'inverted' the question, in pointing to the 'ingenuity' with which the incident developed into a unique series of broken barriers and regulations. As they concluded their report summary:

> The non-conformities found in the investigation report would all have been intercepted and corrected if the barriers had functioned. Individual barriers fail from time to time, but failure of so many barriers in different phases of an operation is extremely rare. The PSA is critical of the fact that such an extensive failure of the systems was not uncovered. We question why this was not discovered and corrected at an earlier point in time (PSA, 2005: 4).

The argumentative overkill in the PSA report relied clearly on the most 'decisive' and fatal acts in the sequence. That is, they distinguished briefly three 'triggering causes': the perforation of the tail pipe, the perforation, cutting and pulling of the scab-liner, and the misinterpretation of the swabbing. Other causes were referred to as 'latent' or 'underlying'. In this scheme, rule violations (the non-conformities) and causes coincide. And the rules are embedded in theories of risk management that implicitly identify the 'stop-rules' of tracing causes, such as pointing to failures of required barriers. Identifying such violations is then analogous to the identification of causes.[178] The PSA would, at

[178] We may notice a contrast to the 'non-regulatory' reconstructions, however. Whereas the 'redemption' in the PSA report lies in the combined effect of systemic failures, the C&W analysis point to the 'local

least within the confines of their formal relations with the industry, hesitate to step beyond such identifiable and confirmable evidence.

We introduced this chapter with a reference to the issue of explanatory 'stop rules'. Reason responded to his own question by advocating the view that the search into antecedent conditions and causes should concentrate on that which is "changeable and controllable" (1997: 16 and 234-38). He thus links up the explanatory, predictive, and remedial value of different 'stages' or contexts within which to locate causes and accompanying remedies or 'effective points' of managerial intervention. These are displayed as a 'hierarchy', moving from individual failure via workplace conditions, organizational processes, organizational culture, regulation, and finally, society. He identifies the second, third, and fourth of these as the relatively most important ones, admittedly in a speculative manner, but asks thus if the 'pendulum has swung too far' in backtracking the origins of accidents. We may ask if these are questions that can be understood and 'answered' only in a 'positivistic' manner, ignoring some rather fundamental questions about human and systemic 'responsibility' within the range of explanatory candidates. We will touch upon these issues later, but note at this point that organizational culture and safety culture are given a relatively high ranking, both in terms of explanatory and remedial value. In fact, safety culture is explicitly treated as something that can be 'engineered' (Reason, 1997: 191-222; see also Chapter 6).

Returning to the cases at hand, we see how a plethora of explanatory factors, differently configured, enter in various post-event reconstructions. One may trace the lines of historical developments, assess the impact of economic forces, output pressures, organizational myopias, and down to the operational errors and technical failures. The general mood of wanting to get the job done 'quick and fast' appeared as a driving rationale that contributed to keeping the risks in the background and to listen to the signals in a manner that allowed the process to continue. Also, the longer organizational and economic histories, the external economic pressures, the gradual tightening of

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perspective' in drawing attention to the way the situation appeared to the practitioners as the event unfolded.

schedules, etc., all had their impacts on the decisions taken. But how do we locate and identify the distinct impacts of these numerous factors in the chain of events? And are the cultural explanations a way of locating these causes in the narrow context of social-psychological mechanisms operating in isolation from the environment? And what problems are solved by naming it all 'socio-cultural-historical causes', trying to bridge the 'cultural HRT' and the 'structural NAT'? Which are the substantial differences of interpretation and which differences are only due to linguistic arbitrariness? In order to go beyond the matter of naming, we would have to consider which 'parts' of the causal complex this term culture should serve as the sum of. The role of culture in the explanatory account of the *Columbia Accident Investigation Board* appeared to be mixed, both as cause and as consequence; or rather: both cultural mechanisms and environmental conditions were present in the 'co-production' of the event. The role of 'culture' within the conceptual taxonomy of the 'Pentagon model' employed in the Statoil report, appeared as more dubious and reductive. Arbitrariness, overlap, and analytical fuzziness were apparent; for instance, "communication and cooperation" appeared as sub-categories in all dimensions; 'mind-sets' or 'behavioural styles' likewise appeared under several headings; and 'culture' appeared under other headings than "culture", which in turn, was reduced to a combination of 'values, attitudes, and competence'. Cultural processes thus appeared both as disentangled from and embedded in the operational contexts within the MTO system.

To locate specific and differentiating causal effects of the various background conditions, that is, to 'isolate' their relative or decisive impact, is not easy from any of the analyses that have been provided. Which were the necessary or sufficient causes, tracing the scales of causal proximity to the events? None of the analyses referred here classify the various candidates in any rigorous manner, and the longer we trace the 'underlying conditions' the more ambiguous are their explanatory impacts. Rather than providing specified accounts of which of these steps that really would be 'a difference making a difference', engaging in contra-factual reasoning, etc., there is an argumentative overkill amounting to a large assemblage of critical factors that 'may' have changed the course of events.

In reconstructing such events, we might identify the explanatory status of 'deviance normalization', 'memory-loss', 'can-do cultures', task-orientation, or problem-solving and operational cultures, and even try to identify the impact of economic forces in the formation of such organizational mechanisms and cultures. We would perhaps find possible 'causal chains', but at all junctures, the outcome of any 'causal test' would be ambiguous. Following the advice of Reason, safe operations could not 'require' the absence of can-do problem-solvers working for economic gain. And, it should be noted, as the Snorre incident evolved, it was just this 'can-do' culture that finally saved the day. Rather, we would arguably look for conditions under which the basic economic forces are tempered in such a way as to provide due allowance for managing risks to the extent necessary for safe and prudent operations.

Culture as cause and as diagnosis

This was the dubious context in which the label 'HSE culture', good or bad, was to be tested for its explanatory and diagnostic virtues. As noted, the culture provision appeared as 'superfluous' in the PSA response. There were enough provisions available under which the non-conformities could be subsumed. It could, however, serve as a more 'supplementary' or 'summarizing' diagnosis, pointing to the pervasiveness of deviations, to the collective and tacit understandings evident in the operation, or to the underlying economic motivations that contributed to shaping these operational rationales. This is pretty much how the PSA General Director summarized the relevance of HSE culture in the SNA case, pointing also to its more general relevance:

> R: Then there is the question of how to follow up in terms of supervisory activity etc. You have several approaches. In particular, it's important to uncover what kind of culture they really have in a company, taking a serious incident as the starting point. Investigations that we carry out provide very good assessment, very good …. a lot more efficient in many contexts than the traditional audits and verifications. If you take the Snorre-investigation and ask what it says about the HSE culture in the Snorre-organization, you'll find that they didn't have any HSE culture. They had a money-production-culture: keep production up at any cost. That was quite obvious …. I often use this case as an example …. here's a thorough inquiry, it says a lot about a poor or missing HSE culture …. and it may provide much learning for others; study it, consider your own organization, look for things to improve.
> I: But HSE culture wasn't referred to in the rapport?
> R: No. No, that wasn't the question, you know. So therefore, the subsequent use of that rapport …. it's an additional question …. what you can investigate, you find all the

> deficiencies and rapport it to the company and demand that they correct and improve. That's the traditional approach. But the order they were given, grounded in what was discovered at Snorre, required that they must review the whole organization in Statoil, to look for similar conditions elsewhere …. and we demanded an action-plan, not only a list of measures, but they also had to describe how they were going to estimate the effects.

There was no apparent hesitation in this cultural diagnosis. This approach, challenging the company, calling for self-reflection, analysis, and improvement measures, and a somewhat open attitude as to what they would come up with, was as noted well founded in the supervisory strategy of the agency. The question about how the concept of culture would represent anything significantly novel in this context was not so clearly explicated. We recall, however, that culture later appeared in the self-evaluation required, but somewhat arbitrarily configured within the conceptual scheme of the 'Pentagon model'.

Although a reference to 'failures' related to HSE culture may have strengthened the conclusions in the investigation report, and served to attract more attention to organizational aspects beyond 'rule-following' or 'regulatory compliance', this option also triggered the 'dangers' involved in using the provision, as was noted above; and restraint was imposed in order to avoid 'misunderstanding'. Although the culture group extensively used the SNA case to exemplify the significance of culture, they advocated reluctance in terms of using the term 'negatively' (see chapters 5 and 6) and argued instead for a 'positive approach': the building of good cultures as part of the remedying and preventive efforts. These dangers of labelling were also shared by the supervisory director responsible for the culture project:

> R: You don't couple one incident in one area to the HSE culture of the company, since it's so all-encompassing. That's a sound development.
> I: Has it become a policy? Like in the SNA case?
> R: I agreed that they didn't address the culture concept in that rapport. I'm probably among those who're somewhat sceptical and careful in the use of that word, in investigations – or generally; it's so easy to say that it has something to do with the culture, which again can be handled single-mindedly as a question of attitude and individual responsibility.
> I: Has there been a clear management policy as to the uses of the provision?
> R: What has been said is that if you address that provision, you cannot build on that in isolation; you need a broader basis; you need a solid foundation in other regulations
> I: But that's been the case in these instances?
> R: Yes …. But the next step then would be to ask yourself: what does it take to say that the HSE culture is bad, since you didn't use it at Snorre? We really haven't had any clear

> viewpoint on that matter, no clear guidelines, other than the activities of the culture-project, and the maturing process this has been in the organization, a raising of consciousness about the complexity of the concept of HSE culture and the necessity to have a holistic approach. It will loose some of its force if it is used constantly.

The 'pervasiveness' of the culture concept was thus strongly felt among those who'd had the ambiguous privilege of probing into its potential meanings, as well as its potential force. These potentials also, as noted, involved a risk of culture being reduced to the sphere of individual attitudes and 'operational' behaviour. The question remained, however, of whether it would loose force if it was not used at all. Despite the willingness to talk about cultural aspects as significant in the promotion of desired HSE-performance, or the prevention of critical failure, and the understanding of both, the legal context also served as a restriction. What was the meaning of provisions that would not pass the 'enforcement test'? We will probe into these questions later, noting at this point how the culture provision gradually retreated from the regulatory context into which it had been incorporated.

Concluding remark

In sum, the Snorre incident can be described and interpreted from several perspectives, not mutually exclusive, but vastly different in terms of interpretive and explanatory scope. It ranges from the almost 'barren' but precise PSA investigation (that 'no one could object to'), to more indulgent searches for background conditions and causal antecedents, going on almost *ad infinitum*. The role of human agency in such systems is not easily analyzed. The blending of explanatory conditions, moral responsibility, and wider contexts of understanding, is also to serve as inputs for principled and pragmatic approaches to the reduction and management of risk, seen both from the regulatory and industrial point of view. To the degree that human agency is assigned any contributory part in the development of organizational failures, moral issues will also be evoked, the more so if events have damaging potentials or outcomes. As has been noted several times, the human contribution was given an ambiguous and contested role in the industrial risk management strategies, and variously linked to local interpretations of HSE culture. In the next chapter we explore some of these risk management approaches.

8. Risk, culture, and ‘safe behaviour’

As noted, the cultural turn in the industry and its initial embracement by the regulators, didn’t enter into an ‘empty space’. It entered a space populated with a diversity of ideas, regimes, systems, professions, bodies of knowledge, in a word, ‘cultures’, that conceptualized and epitomized how risks where to be understood and dealt with. These included systems of statistical monitoring, comprehensive bodies of industrial regulations and procedures, investigation techniques, causal schemes and charts, etc., providing different frames of reference for the social construction of risk management. In this chapter, some selected glimpses into this space will be provided, concentrating on those slices that first and foremost became associated with the cultural discourses and controversies. The process of integrating cultural perspectives as part of the risk management regime was thus a process of ‘connecting’ culture to existing and ongoing themes and schemes, but it was also a process of ‘disconnecting’ it from the heretical ones among these.

As noted, the cultural turn became entangled in basic controversies and opposing doctrines about risk management, about how risk was to be measured, about which risks should be given priority, and about the design of preventive measures. As was also noted, some dominant risk management strategies faced the critique of giving priority to injuries and fatalities related to ‘ordinary’ occupational accidents, rather than long term health impairments or major accidents; and furthermore, they did this in the wrong way, by trying to manage the workers rather than the hazards. Instead of respecting the autonomy of the individual, allowing for flexibility and ‘behavioural latitude’ at the operational level, personal attitudes and behavioural self-discipline appeared as targets for intervention. Was risk to be managed by pointing to the responsibility of the individual to safely manage oneself and nearby colleagues within the given framework of existing risks, or by addressing the managerial responsibility to minimize the risks embedded in these frameworks, with the aid and proper involvement of HSE specialists and employees (such as safety representatives and union representatives)? Such questions were epitomized in some of the large safety programs initiated within the industry.

The (cultural) safety programs

A number of such safety programs have been launched in the industry during its long history (Haukelid, 1998; 1999; Lindøe and Engen, 2007; Ryggvik, 2008). Some of the later generations of these are comprehensive 'behavioural' programs involving large portions of employees, down to the lowest echelons. As HSE culture and safety culture emerged as the new risk management catchwords, they were often referred to as 'culture programs'. Developing strong safety cultures, putting 'safety first', promoting good attitudes and safe behaviour, became common denominators, and appeared also as ingredients in the building of company reputation. The emergent industrial self-scrutiny around the turn of the millennium (see Chapter 3) was also part of the background for the programs, and some appeared to have been triggered by serious accidents in the companies (such as Hydro and Smedvig); the culture provision in itself was only occasionally referred to as decisive in this respect.[179]

Many of these programs focused largely on individual attitudes and behaviour of workers at the 'sharp end of production', based partly on the preoccupation with avoiding injuries and keeping LTI-figures low. The 'Iceberg Theory' (see Chapter 3), translated into the idea that there was a proportionate relationship between minor errors and major accidents and that the total number of errors therefore had to be reduced, appeared as an important metaphor for understanding risk. But it was a contested metaphor, both in terms of its possible interpretations and in terms of practical implications. Undue attention to 'human error' at the lower echelons of the hierarchy, could draw attention away from the more important behaviours and decisions at the managerial level, which affected the 'residual risks' to be faced at the operational level, such as technical conditions or work-pressure due to tight deadlines. The programs were correspondingly contested and criticized by some as 'symbol safety' schemes, preoccupied with encouraging the employees to holding rails in stairs and back their cars properly. As noted, 'the holding of rails' when walking in stairs had become a recurring point of reference, a metaphor, for this particular risk management philosophy. And indeed, when you entered the head office of

[179] It was, however, claimed by union representatives that some companies regarded BBS-programs as a way to comply with the culture provision.

some of the large companies, 'holding rails' would frequently appear on the list of 'expected' or 'required' behaviour that appeared on boards, in booklets, or small 'safety-cards' handed to you in the reception. Other 'expectations' could include not running in corridors or stairs, not reading while walking, being careful with hot coffee, etc. Such 'house-rules', of course reflected the essentially low risk environment of the 'office workplace'. But they also 'signalled' the importance devoted to safety.

From the point of view of the regulators, a diversity of perspectives could be found. The regulations clearly address 'framework conditions' and the managerial responsibilities; the *Management Regulation* specified in Section 1 that "Collective protective measures shall be preferred over protective measures aimed at individuals". The responsibilities of the employees were specified in the WEA, adding to their rights to safety and participation, also their duty to cooperate.[180] Beyond these requirements, no clear instructions existed for how 'behaviour modification' should be integrated in the risk management designs, and the agency had no mandate to interfere directly with behavioural programs in the industry. They could voice opinions, participate in discussions, attend parts of the programs, and so on. But the priorities in supervisory encounters were clearly on managerial and collective measures, and as noted in Chapter 5, in terms of individual blame and punishment their position and policy had been firm and resolute. Clearly, the industry had some benchmarks contained in regulatory expectations about how far they could go.

In the culture group, the paternalistic focus on the 'sharp-end' was a major concern. The role of the companies was to protect not to 'raise', or 'educate' the work force. But opinions also diverged in the PSA, as least as they were voiced and worded. Referring to

[180] The provision reads as follows: "Employees shall cooperate on the design, implementation and follow-up of the undertaking's systematic work on health, environment and safety .... actively cooperate on implementation of measures to create a satisfactory and safe working environment …. use the prescribed protective equipment, exercise caution and otherwise contribute to prevention of accidents and injury to health …. immediately notify the employer and the safety representative and to the extent necessary other employees when employees become aware of faults or defects that may involve danger to life or health and they themselves are unable to remedy the fault or defect …. interrupt work if the employees consider that it cannot continue without involving danger to life or health" (section 2-3). The section further specifies the duties to notify the employer or the safety representative in the case of danger (ranging from harassment to physical injuries).

the dangers in only relying on 'redundant systems and forgiving technologies', the director for 'professional competence' had the following reply:

> If we're going to devise systems covering up for all our errors, we end up drifting around in our own worlds, walking around in an empty space; I believe that would be fatal to all. I don't believe the world's like that, not at home, not in our kitchens, not anywhere. I believe it's fatal to think that way to the very end …. Sometimes there are no barriers. If you walk out on the street, if you fool around under some hanging goods, there are no barriers. There may be administrative barriers and sometimes physical barriers. But if you're allowed to recklessly fool around, empty headed, then we've done something wrong …. There's a long tradition for working with physical barriers, like preventing oil or gas from leaking out …. But it's very mistaken, as some of the unions do, to ridicule that we hold the rails, ridicule some simple things that contribute to our awareness. I believe that's just what's needed, to have some symbolic things that may seem simple and trivial, but still contribute to better safety. I remember we were ridiculed when we tried to promote the use of eye protection offshore. Eventually, it was required, and eye damages fell to 10 percent of the previous level. (disciplinary director)

Although agency opinions were not all harmonized, or at least not diligently scrutinized to the effect of arriving at a 'joint policy' on the behavioural programs, the issues involved could not be ignored. One of the programs even reached the parliamentary level (the Storting), and the minister had to answer to critical questions posed by a representative from Rogaland.[181] An American drilling company, Transocean, had devised a system, involving a 'diagnosis' of employees according to some pre-defined 'personality types', called 'beavers', 'lions', 'otters' and 'Golden retrievers'. The beavers were supposed to be introvert, careful, and prudent; the lions were born leaders, agile, and impatient; the otters were playful, social, and inspiring; the Golden retrievers were loyal, compassionate, and a bit conservative. These types were then coupled with colour-marks which all employees were supposed to wear on their helmets. The scheme was repeatedly exposed to ridicule, and ultimately seen as an intruding way of unduly stigmatizing employees, in particular by the leading OFS/SAFE representatives. As the issue was to be addressed in the Storting, the PSA was involved in order to investigate the scheme on behalf of the ministry, and for providing information in preparing the minister's answer to the Storting (in the so-called "Question Time"). According to the supervisory coordinator responsible for the investigation, the issue more or less dissolved

[181] The issue was obviously triggered by union representatives, some of whom were quick to detect such schemes and to voice their critique.

as they probed into it; basically, the scheme had not caused any local protests, appeared as rather innocent, and certainly not subject to any agency intervention.[182] Still, the case is indicative of how much ideological energy that was provoked in the discussions about these schemes and programs.

Clearly, there were the varieties of these programs (both between and within them). Some included a focus on management decision-making in terms of planning, scheduling, technological designs, resources, etc.; and the focus on behaviour at the lower echelons would involve the importance of care, trust, communication, etc., and in fact deliberately avoid any association between operational errors and 'blame and shame' (except in cases of gross negligence or wilful and repeated contraventions). The issue of 'stopping unsafe behaviour' had been a long term commitment in several companies, and campaigns had specifically addressed these and other aspects of organizational behaviour, with different levels of sophistication. And, certainly, such issues were far from trivial. The costs of error could be enormous, and membership in the so-called 'million-club' was a dubious honour (referring to the sometimes huge costs of operational errors). It seems clear, however, that these programs on the whole addressed issues of organizational redundancy at the operational levels, rather than at management levels and decision-making arenas affecting the overall organizational redundancies related to such issues as manning, resources, competence, structures, etc. Obviously, they neither addressed issues of 'structural' redundancy and reliability, unless such issues were actively voiced from below (such as outsourcing effects and staff reductions). Such threats to redundancy and reliability, may however also affect 'cultural' redundancies at the interpersonal and operational levels (Rossness, 2001; Rosness *et al*., 2000).

[182] First, the scheme hadn't been properly addressed at the local level arenas, like the Working Environment Committee. As it turned out, the OFS source was only one employee, who'd been pressing the issue internally. Later, when it was taken up in the committee, it was more or less reduced to hinge on just his personal opinion; the rest appeared to be quite happy with the arrangement. It wasn't perceived as stigmatizing, but more like a way of communicating to colleagues something about personal traits; this was seemingly done in a quite innocent manner, and in fact allowing for greater acceptance of differences in personal styles and behaviours, and facilitating better communication between employees. As when someone could appear reserved or uptight, others would be able to interpret this with some indulgence rather than suspicion. The PSA officials certainly had some professional reservations regarding the depth and validity of these personality tests, which were seen as "typically American".

We review here the "Safe Behaviour Program" of Statoil, which was by far the most expensive, comprehensive, and ambitious of the non-technical and workforce oriented 'culture' programs during the research period, and probably also in the Norwegian petroleum history as such. The program attracted much attention and was subject to vigorous debates, also within the research communities.[183]

The Statoil "Safe Behaviour Program" (SBP)

The program was originally planned to comprise all Statoil employees in Exploration and Production Norway (UPN), and employees in commissioned contractor and supplier companies. It was gradually expanded to include all business areas in the company, and an English version was developed and made available for international operations and for non-Norwegian personnel in Norway. Thus, it has been presented by Statoil as "the group's - and Norway's - most comprehensive commitment to safe behaviour and changing attitudes". Since the launch in 2003, more than 30 000 Statoil employees and contractor staff have attended the program. The program itself consists of a two-day "work-shop" in a Stavanger hotel, and a comprehensive and long-term follow-up to be carried out in the various parts of the organization.

Origins, ideas, and design

SBP largely originated from within the safety-staff of the UPN-organization, responding to a negative trend in the statistical records relating to injuries and fatalities. Apart from the established HSE-systems, large parts of which were considered to be unduly bureaucratic, many of the HSE- programs had the character of being short-lived campaigns, often dependent on a small number of committed individuals. The founding ideas reflected pervasive opinions among safety-officials in the industry: too much red tape, insufficiently entrenched procedures and systems, too many short term programs, and insufficient coordination of safety measures between operators and contractors. This program was going to initiate a long term commitment. It was to cover everyone,

[183] The Norwegian version is termed "kollega-programmet" (the 'colleague program').The account provided here (see also Appendix 4) is based on my own participation in the work-shop conference, Statoil website presentations of the program, reports from former conferences in Statoil Magazine 2004 no 1, data from interviews with key members of the SBP-staff, PSA-officials, researchers, and discussions and presentations in a diversity of seminars and conferences.

including key contractors, and it was to be followed up locally over a four year period. It was to be ingrained at all management levels, including dedicated work-shops for leaders in the initial phases. The UPN director was perceived as fully committed to the project, as was the company CEO. Two union representatives and two safety representatives were included in the steering group.

Two guiding principles were important in the preparations. One was that the workers should not feel they were being pointed fingers at and to preserve a context of mutual confidence. Still, a prime motivation was what they saw as insufficient attention to the significance of individual behaviour. As the originator explained it himself[184]: "Everyone who's been working with accidents knows that behaviour means everything", aptly adding: "and not only in the sharp end of operations". The focus on behaviour was supposed to include all organizational levels, including management decisions. It was still clear that DuPont Safety Resources inspired much of the program-content.[185] They had been hired in early in the process in order to "help the group achieve its zero harm target" and had produced a report that identified "the need for more focus on behaviour".[186] Although personal behaviour was key, they would not stress "bad attitudes", but rather the positive values of work-mate concern, and even the significance of systemic failures related to bad communication, stress-full working conditions, systemic vulnerability of complex processes, etc. However, the role of individual alertness and concern was stressed also in these contexts: "everyone has a responsibility …. you cannot put everything on the system" (SBP originator). To balance these agendas – behaviour modification but with a no-blame approach – appeared then as a prime concern. The second principle was pedagogical. They wanted an un-academic and straightforward style of communication, relying instead on storytelling and participant

[184] The founding ideas of the program are largely attributed to one person, often referred to as its 'master-mind'; here referred to as the 'originator'.
[185] The industrial company DuPont has for many years been an influential promoter of various risk management ideas, largely based on the Iceberg philosophy, the so-called 'zero-vision', and a behaviour based approach to 'error'. Their impact in the Norwegian petroleum industry has been considerable (Ryggvik, 2008).
[186] Citations from Statoil magazine (2004); it further explained that: "All the important conclusions from this study have been incorporated in the safe behaviour program. This drive builds on the recognition that everyone can make mistakes, and must reflect on their own choices and actions. The aim is to persuade people to change the way they behave.

involvement related to daily work activities. It was decided that the concept of barriers (defences) should serve as the recurrent image for conveying the key safety messages. They were critical of what they considered to be very academic and inaccessible accounts provided by various 'professionals', including the PSA. Rather, they wanted to relate it to some very simple and recognizable (precautionary) principles directly applicable to practical work-situations. "It may not have been right out of the book, but we had that discussion. We wanted a communications-platform; this had to work for 35 000 people out there" (SBP staff member). Also, the focus on 'behaviour', rather than 'attitudes' appeared as pedagogically justified; not because attitudes were not important, but it was clearly less tangible, unfit for the straightforward style of communication that was desired, and also more 'intrusive' on the part of the target groups. Five barriers were selected: correct prioritisation ('safety first'), compliance (with procedures), open dialogue (trust and rapport), continuous risk assessment (within the work-place context), and caring about each other (work-mate observation and interference). These 'soft' (human and organizational) barriers served as key points of reference throughout the program. It was carefully explained and the "Swiss cheese" model, derived from Reason (1997: 9-13), served as an illustration, indicting what would happen if barriers failed and 'event-chains' could 'travel' freely through all the holes in the defences.

The main concern here is how the program served as point of reference in subsequent discourses about divergent risk management approaches, particularly through the strong associations that were made between HSE culture and the behavioural programs. Some general observations about the ideational content and communicative styles adopted in the work-shops should be noted, as this was a peak event in the program, a 'kick-off' that not only conveyed explicit and implicit risk management philosophies, but which also served as a point of reference in the follow up.[187] First, it was a tightly directed seminar, with live and multi-media presentations, staged discussions, and pre-structured involvement from participants. Second, program messages were extremely well prepared, featuring leading company managers committing themselves to a 'safety-first' codex (apparently at all costs), testimonies and emotionally compelling stories about serious and

[187] A more detailed 'ethnographic' report from this work-shop seminar is provided in Appendix 4.

fatal accidents, and regular reminders of the need for work-mate concern and constant care for safety in all behaviour. Third, the 'Iceberg' was displayed on wide screens, symbolizing the relationship between minor errors and fatal outcomes, and the corresponding need for constant vigilance in all behaviour; but also, examples were provided of dangers inherent in complex organizational and socio-technical systems. Forth, the promises for the future were unequivocal. This was not to be any passing moment of self-celebration, but the start of a long term commitment to safety.

These ideological and professional foundations reflected an amalgam of established HSE philosophies that had developed in the practical, technical, and engineering communities throughout the industry. Terms and approaches were borrowed from a number of sources and moulded into a more or less coherent framework. The concept of barriers, as outlined above, served together with the Iceberg, as overall metaphors, with safe behaviours (and implicitly: attitudes) as constituent parts. The clearly stated idea was to influence people in order to modify their behaviour. Human agency was conceived as the prime cause of accidents, and the diligent manufacturing of 'human barriers' was intended to bring attention to the risk potential contained in individual behaviour. However, recognition of group level behaviour was evident in the focus on workmate observance, open dialogue, etc.

The criteria suggested for how safety concerns – and measures – should be voiced, reaffirmed a rather 'small-scale' perspective, as phrased in the "Six rules for good measures":

- The measures should be specific –they can never be specific enough.
- The measures must relate to what people do, not what people are.
- Focus on "the little things" at your workplace rather that the broad external framework which can be difficult to influence (such as finance).
- The measures must be practicable in relation to available resources.
- It must be possible to implement the measures at your workplace.
- Try to identify at least one measure which can be launched immediately. Small speedy successes help to maintain motivation.

The ‘stop-rules’ implied in these provisions reflected of course the ‘local’ perspective of the addressees, not necessarily the overall risk management policy. But they indicated that these larger concerns be a managerial privilege, and not a local concern.

Another underlying metaphor throughout the conference was one of all being in the same boat, having the same concerns and interests regarding safety, evident in the repeated insistence that the company was not going to compromise safety for economic gain. The need for ‘internalizing’ the context as one of raising common concerns on equal terms, was evident also in how the ambiguities of influencing ‘attitudes’ were approached, and a paternalistic framing was in a sense both present and absent: Indeed one might say it was present in the way it was absent, or rather, insistently absent. As the Statoil safety director subtly explained:

> In the gatherings, no pointed fingers are lifted in order to urge anyone to behave more safely. The arrangement is cast so that everyone should be able to draw their own conclusions and adjust their behaviour based on their experiences from the gathering (Statoil, 2004).

Or in the words of the program manager: “The aim is to get participants to think about their own choices and how they behave.” During the conference, there are several contextual framings to the same effect. “We’re not going to be obtrusive here; we just want to give you something to think about”. [188] Participants were praised for being honest and straightforward, and managers in particular were praised for being clear and explicit in their *own* priorities. Commitment and concern was cherished as autonomous sentiments to be extracted within the atmosphere and context of the gathering. This atmosphere and context occasionally resembled that of a religious gathering: a combination of personal testimonies and confessions, sometimes in a mood of penitent remorsefulness, and with an unquestioned identity of interest.

The follow-up plans have covered a four-year period, partly governed by a pre-structured agenda and partly adjusted to locally defined problems and activities. This process has primarily been the responsibility of the line management, with the support of the SBP

[188] We are reminded here of the classical motivation paradox, described by Watzlawick and others (Watzlawick *et al*., 1967).

staff and program material. A local SBP group has been established at all units, consisting of the line manager, the chief safety representative, and a safety officer. Everyone has participated in the follow-up, including most contract workers.[189] The local units shall systematically explore the five barriers, one by one, identifying specific challenges and obstacles to be overcome, devising action-plans, and conducting follow up assessments. The barrier related to 'work-mate' concern was the first on the list of follow-up items, and thus also the one with which they had acquired most experience. That choice was considered crucial for changing the traditional 'tough-guy' offshore culture, and thus also preparing for a more comprehensive motivational transformation. To re-establish the mood of the kick-off seminar, was considered vital in this follow-up process. As was observed by a member of the SBP staff:

> Those testosterone guys, drilling holes out there, they're really tough guys. They're not used to talking about human concerns and all that soft stuff. It's not been easy to talk about soft barriers, about concern for each other. But that's where we are now. The change has been tremendous. It's all right to care, and to interfere; and to take the time needed to do a job. There's a totally new way of working together. They can trust us, take the time needed. They stop, and talk about things. I'd never thought it'd possible, to make soft men out of those tough guys …. who *invented* the North Sea. (SBP staff member)

Program evaluations

Given the great costs and organizational energies invested in the SBP program, much internal prestige was tied up with its success. Although we are more interested here in the risk management philosophies of the program than in its actual impacts in terms of reduced risk or improved HSE conditions (to the extent that these could be 'measured'), some preliminary evaluations should be noted; all the more so, as these also entered the subsequent discourses and disputes about the virtues of the program. Statoil commissioned a large evaluation program from the local research institute (IRIS), which included extensive questionnaires and later supplied with qualitative studies and interviews at a number of selected sites (Olsen and Nævestad, 2006). It turned out that more than 80 percent had a positive perception of the program and believed it had contributed to a better safety culture in the company. In particular, the work-shop

[189] Normally, only the first 'levels' of suppliers/contractors join in the program, but may be extended to more levels if line directors decide so. .In most cases contracts are long-term. As one SBP staff member explained: "It's a stable crew and they really belong to us even if they have other employers."

conference received a positive response. Some 50 believed they paid more attention to risks at work, including unsafe acts of colleagues. More than 90 percent thought their leaders took the message from the program seriously. Managers reported improved openness about safety issues and that the threshold for interfering in risky situations had been lowered. But familiar challenges remained, like transforming the lessons into practice and keeping up the pressure and energy. Some employees reported a gradual deterioration in the face of day-to-day operational demands and that leaders that didn't follow up on the commitments made in the gathering. Work pressure, sick-leaves, and reassignments were cited as examples of circumstances interfering with the follow up. Later studies, however, confirmed the impression that communication-patterns related to safety had improved, and in particular that contract employees now felt more ready to interfere in situations of perceived danger. The informal hierarchy between operator-employees and contractor-employees has traditionally been strong, with high thresholds for contractor employees to voice their concerns. These signs of 'levelling hierarchies' were thus received with enthusiasm from the SBP-staff. Also, there was evidence that the high-profiled 'safety-first' statements so strongly conveyed in the work-shops had been used as internal 'boomerangs', where managers were confronted with earlier commitments and obligations (Nævestad *et al*., 2007). Of course, that there were varieties between teams and sites, came as no surprise to the SBP crew:

> But certainly, there are good teams and bad teams. Even on the same platforms you'll find great differences. We don't need any researchers to tell us that. …. and you still find remnants of that old attitude, that this is something we do to satisfy the system.
> (SBP staff member)

Responses, disputes, and adaptations

The responses to the program cover a range of viewpoints. To summarize, these can roughly be divided as *unconditional approval*, praising the conference, in particular the unequivocal management assertions about 'safety first', and adhering also to the importance of individual attitudes and behaviour; c*onditional approval*, praising the conference and the ideational approach but expressing doubts about the follow up; *conditional scepticism*, praising the effort and the message from the management, but

expressing doubts and reservations about the strong emotional and behavioural focus, the danger of seeing risk only in terms of individual failures, and its reduction as a matter of improving personal morals and collegial concern, implicitly also neglecting the importance of management decisions and not giving due priority to more important safety measures; *unconditional criticism*, considering the whole program as a false show off, diverting energy and attention away from the really critical and important issues, abusing personal tragedies, and representing a traditional 'blame-the-worker-not-the-hazard' approach.

This latter opinion was most fiercely voiced by the leading OFS/SAFE representatives, who saw whole program as a poorly camouflaged version of the (American and DuPont-style) 'behaviour-based-safety' philosophy (BBS). The focus on individual morale, attitudes, and behaviour distracted attention away from occupational health and working environment, technical conditions, and the broader context of (potentially adverse) industrial relations. Examples were given of long term health injuries being ignored by the company, tri-partite relations being neglected, and a more sanctions based approach to critical failures. These provided a quite different context for judging the 'human concern' and 'good fellow stuff' presented at the conference. The program management was seen as authoritarian and unresponsive, directing a tightly orchestrated show. This radical critique pointed to what they saw as an underlying management orientation and paternalistic philosophy, where union representatives and safety representatives were only considered as ordinary participants in the program, or assigned to secondary (marionette) roles. When they appeared in the gathering, their specific role was not emphasised. Any conflict of interest between workers and management was suppressed or silenced, not necessarily in any visible or active manner, but in the whole orchestration of the program. The collective of the workers was replaced by the collective of the firm. Trust in management was assumed rather than challenged, and important decisions would still be made over the head of workers or their representatives.

The program also entered into and involved the research communities: partly as hired evaluators, and partly as outside critics or timid observers. These 'scholarly' responses

largely reflected the same set of 'response profiles' outlined above. In the 'OFS/SAFE-camp', critique was levelled against the DuPont-inspired, 'American', and union hostile management systems of behaviour-control. The Iceberg Theory and its local interpretations were seen to distract attention from proper risk management measures devoted to risk-elimination, technological substitution, technical and administrative barriers, etc. These critiques were not limited to the SBP, which was seen more as one particular instance of the same risk-management-philosophy: blaming the worker not the hazard; relocating safety issues from arenas of regulated and collective bargaining to management controlled arenas; departing from the Norwegian tradition of tri-partite cooperation, strong unions, and vigilant authorities. The dual effect of the program was to 'capture' workers' representatives and to individualize safety issues. References were also made to how Statoil operated internationally, where they apparently accepted both non-regulated and non-unionized systems, and ignored broader and societal human rights concerns. The program was interpreted in terms of its ideological 'essence'. Behavioural focus was fair enough, but only organized through collective and institutionalized arrangements (Lindøe and Engen, 2007; Ryggvik, 2007).

The fiercest critics were faced with the challenge of accounting for the positive evaluation. One response was blunt dismissal: if you invited people to spent two days in one of the finest hotels in town and treat them with excellent food and service, they'd certainly come up with a positive evaluation. A 'false consciousness' argument also appeared in various shadings: that most people wouldn't be able to reveal the true ideological underpinnings, that the strong emotional appeal would lead to a containment of criticism, that the whole setting suppressed critical voices by treating worker representatives as 'ordinary participants', etc. Thus, the controversies surrounding SBP also reflected more deep-seated controversies about industrial relations, although critique was largely phrased by reference to the tripartite system, as the established Norwegian model for cooperation, thus not reflecting – or explicitly stating – more radical political positions.

There was much discussion about the justifications for this radical critique, of whether the program 'really' was of the stigmatized BBS-kind, that there was really no blaming strategies involved, that a more holistic socio-technical perspective was evident in the program design, that unions were represented in program arenas, that safety representatives were largely positive, that Statoil did a lot for improving technical safety through other programs, and so on. These debates absorbed much intellectual energy within the research communities involved in the HSE research program. Somehow, the fierce critique served as a 'discussion-benchmark', and no 'positive' evidence about participant responses or safety improvements appeared to make any impression on the critics. Ultimately, within a more overarching risk management perspective, any 'partial success' would appear as just a sidetracking smoke-screen. Being emotional about a broken leg was really not 'proportionate' in the face of long term health impairments or major accidents; and departing from the 'Norwegian-Nordic model' was ultimately the greatest risk of all since, in the past as well as in the future, this model represented the only guarantee for a safe industry, not benevolent industrialists.

However, more moderate critiques were also voiced, less 'principled' and 'ideological', and more 'rational' in the double sense that they reacted to both the moral-emotional evangelism and to the overall priorities apparently embedded in the SBP philosophy. This response was typical for the 'un-political' HSE-professionals (including several PSA-officials): praising the professional make-up of the show, uncomfortable with its strong emotional and behavioural tenor, and a bit sceptically awaiting the results. As noted, the PSA was also confronted with the program and its effects. Several officials had attended the work-shop conference, and the Statoil supervisory team faced the follow-up activities in their encounters with the company. On the whole, however, the program was considered by PSA officials and managers to be 'relatively balanced'. Their responses correspondingly oscillated between conditional scepticism and approval, partly depending on the specific experiences:

> I've been to the SBP-gathering, and it was really fascinating, with all the stories, and I remember them, so it works. But I reacted strongly to some of these testimonies, where they confess their violations. And the level was, like if they hadn't used gloves while cutting a tomato …. If you're going to cut five hundred tomatoes, that would be fair

> enough, but one... ! So, then I think, that was just before the Snorre-incident, you know …. And the onshore people, their violations were of the kind, like you might get a thrombosis if you work too much …. work stress, and we must be kind to each other, and all that. Then I think, the Snorre incident, there they didn't plan a well operation appropriately …. They didn't really assess the well sufficiently prior to its opening, and they seem to have started out on something where they didn't really know what could happen. And that's really 'silent deviation' onshore; no one talks about such issues …. If we have silent deviations here, it's not when we don't hold the rails; it's when we fail to do the right thing, or if we do something wrong in our supervisions. That would be our violations, if we focus on the wrong issues, and don't contribute to avoiding a major accident.
> (supervisory coordinator)

Thus juxtaposing the SBP with the near-miss on Snorre A was a recurring way of addressing the issue of proportionality. The stark contrast between the focus on human error at the 'sharp-end' and the series of managerial and organizational failures uncovered in the SNA case was apparent. But as noted, these were 'errors' that the program also wanted to 'include'.

In some way, SBP appeared unassailable. For the program management, the most radical critique was largely met with indulgent disbelief. Primarily voiced by leading OFS/SAFE-representatives, the critique was seen as a response from the margins, not really reflecting the attitudes of employees, not even the main thrust of the union members. It reflected the old 'us-and-them' attitude. As noted by one staff-member:

> Some criticize just for the sake of it. Or they believe there's something behind, some hidden agenda. That this is based on old American safety approaches where the employers just pass the buck, try to shift all the responsibility over to the employees …. SBA was established so that employees should not harm or kill themselves. Period.
> (SBP staff member)

In fact, the critique was largely treated as opinions 'in need of explanation', to be externally diagnosed so to speak.[190] The financial and professional investments by the company were seen as expressing a unique commitment to the common interest of all in improving HSE-conditions. They took great pride in the development of the conference program and its technical, organizational, and ideational make-up, but admitted that the real test of its success was the implementation process.

[190] On one occasion, a large conference on HSE culture, one of the leading SBP representatives challenged a panel of researchers to provide such an 'external' explanation. The 'base-rate' of course, being the undisputable qualities of the program and the positive response given by most participants.

But the staff also commented on the dilemmas inherent in the behavioural focus; in fact, there seemed to have been a development in focus as the program gradually involved onshore personnel, and eventually the whole organization. Obviously, this instigated some adjustments in terms of what risks to address. As noted by one staff-member:

> It was originally designed only for UPN-people, for the offshore workers. When it was decided that it should cover all of Statoil, we had to adjust. Some said: This program of yours is made for platform people, it doesn't fit here; it doesn't match our kind of work. And many onshore people don't know much about life offshore. And they don't know the philosophy. (SBP staff member)

Initially, these adjustments resulted in a focus on 'office risks' and even on so-called '24-hour safety' (including both working time and leisure time). Holding rails and safe gardening thus appeared as equally legitimate work-shop themes, providing new targets for the BBS critique: a totalitarian 'HSE fascism' that required full personal self-control to be implanted in everyone's minds and acts, at all times.[191] Gradually, however, these adjustments appear to have caused a larger focus on framework conditions: When the audience consisted of onshore managers, planners, and designers, new kinds of issues appeared about how offshore safety were influenced by their behaviour, the choices and decisions affecting technical design, logistics, timing, schedules, etc.

> We had to step back, look at the whole process, the underlying philosophy. From planning, design, the choice of materials, the use of materials, the composition of materials, the choice of equipment, pumps, valves, everything. You have to take account of the fact that these installations are supposed to endure extreme pressures and temperatures …. We're not distracting attention from technical safety. It's a precondition that technical safety is maintained and developed further. (SBP staff member)

So somehow, the 'framework conditions', the higher level decisions of planning, design, resources, time-schedules, etc., entered the program gradually, almost through the back door. Some sceptics from the PSA were even reported to have changed their opinion about the program after having attended these gatherings for the onshore units, comprising management, planners, technical staff, etc., and who had focused exactly on how *their* 'behaviour' laid foundations for the risk levels that had to be dealt with in the

[191] In some of the early conference reports, several examples are given of how employees take great pride in using safety protection in their garden work, etc.

offshore operations.[192] And as noted above, the original program ideas also contained socio-technical perspectives and ideas, dismissing the immediate causes as the most important, and most explicitly voicing a no-blame approach; as was explained by one staff-member:

> The iceberg is just an illustration. To remind ourselves that we do mistakes all the time. A pilot does 8 mistakes per hour. It's a human right to make mistakes. But we must realize that fact, and recognize the errors. When everything else fails, the concern of our fellow work-mates is our last barrier. We must be able to admit errors; to have a culture for reporting failure. That it's not to denounce anyone, to have something on them …. We needed a culture for acquiescence, not based on sanctions …. You cannot just focus on the guy who was present when the accident stroke, at the wrong place, at the wrong time. You must focus also on those who lay the foundations for safety. But originally, it was made for those at the sharp end. (SBP staff member)

These adaptations in the program didn't appear to have made much impression on fiercest critics. And the thresholds for distinguishing 'individual' and 'environmental' factors in the causal chains were infused with explanatory as well as moral claims. In the program vocabularies, 'neglect' and 'carelessness' were avoided, or subtly rephrased in a language of vigilance, care, and concern. But always to blame the 'system' was not seen as a viable solution. And a much bespoken 'management-of-consequence' policy in the company provoked controversy, and appeared to some to undermine the no-blame approach, or, worse, to disclose the true nature of the behavioural program. The thresholds for the application of behavioural sanctions within this policy was not altogether clear, however, and probably not uniformly applied.[193] Publicly, the 'repeated and voluntary' violation of company procedures was explained as a critical edge:

> Everyone must take responsibility. When someone has done something really stupid, we've taken a lot of so-called 'compensatory steps'; built ourselves out of the problem, with this or that device. And: if failures are repeated, it may have consequences. We need to follow a philosophy of consequence. The unions also agree to that. If it's a slip or lapse, that's all right; but if it's really your way of doing things, and you don't respond to corrections, then it must have some consequence. That's like raising children. We had a situation with some scaffold workers; during the erection and dismantling of scaffolds, they where throwing

[192] One of them had in fact himself written a critical PhD thesis on the application of 'Iceberg Theory', the use of LTI figures, and behavioural approaches to risk management.
[193] These policies appeared rather lenient, however, allowing for several loops of polite reminders and increasingly critical reprimands before any serious sanctions would be issued. Some examples of internal transfers were reported, however.

> these coupling devises around, to each other and into a basket. They weigh about half a kilo, and people pass below all the time. As it happened, they lost one of these devices. Fortunately it didn't hit anyone, but that was just luck. I believe they reported the incident themselves. A few days later they were observed, however, still throwing these coupling devices. So they were returned onshore on the first helicopter. When people don't respond to warnings, and carry on doing dangerous things, then that must have consequences. (SBP staff member)

This latter example appeared on several occasions, almost as a 'benchmark-narrative' for illustrating where the line should be drawn between acceptable human error and unacceptable negligence. The public debates (such as in seminars and conferences) seldom penetrated these issues down to concrete comparisons of examples, evaluated against more generalized norms about where to draw the line between 'personal responsibility' and 'external conditions'. They were rather polarized, confirming and cementing the positions between no-blamism and collective protection, *vs* blamism and individual risk adaptation. The extreme positions appeared largely as attributions, however, since few would wholeheartedly embrace any one of them.[194]

But although this mixture of moral and explanatory considerations was not only couched in these very polarized terms, the issue of explanatory primacy and strategic priority still pervaded risk management discourses, also seen from a more 'professionally neutral' point of view:

> I realize that it may be legitimate to focus on attitudes and behaviour, but then you must focus on all levels. If you look into Synergy [see Chapter 5] you'll find thousands, hundred thousands of errors at the sharp end level. Go and search for any registrations of erroneous management decisions. You won't find it here, you won't find it anywhere. We have a mental picture that errors occur at the sharp end, that's where it's important to take action. But that's not true. And it would take some self-scrutiny in many quarters to approach that. …. Then there's something about the way of thinking that's present here – that we shall stop people from doing mistakes. That's important; but on the other hand, we know that people make mistakes, they'll always do. We must rather construct resilient systems, which tolerate mistakes. That perspective tends to disappear. We think we can make people into angles, but we can't …. That was part of my reaction against the Statoil program .... Implicitly, when you make a mistake you'll feel guilty. But it is human to err. Why not

[194] The issue appeared in virtually all HSE conferences and seminars, the last time in the summer of 2006, where a former UPN director gave a talk in which he referred to the need to 'break the taboos relating to personal responsibility for safety'. This was soon commented on as a 'cold rush from the past', and also referred to on several later occasions as a 'warning sign' of the forces in motion and the need to resist.

> focus on all the risky situations where people have intervened in sensible ways and prevented accidents? There are a many stories of such heroism from the shelf. (HSE manager)

SPB as part of the Statoil risk management regimes

There is of course no true or final story to be told of the SBP-program. The strength, diversity, and divergence of the ones that were still provided, illustrate under any circumstance how the recurring risk management themes appeared in familiar oppositions: Behaviour *vs* 'systems and conditions', blame *vs* no-blame, profits *vs* safety, managerial *vs* participative models, etc. As may be evident, the versatility and 'ambiguity' of the program made it adaptable to a number of interpretations; nothing could prove any of them quite wrong – or quite right. It contains an amalgam of risk approaches and management ideas, making it possible also to find selective evidence for some 'essential' body of underlying principles. The 'holding of rails' and other 'symbols of safety', could be ridiculed and rejected for dislocating and sidetracking the risk discourses; but they were also justified, not essentially by the arguing for their importance in isolation, but just because of their assumed importance *as* symbols: they would signify a shared concern for safety and were as such seen as instrumental in spreading a general 'culture of safety'.

Beyond such discourses, the follow-up of the program takes place in a diversity of social contexts, thus mixing with local cultures and organizational settings that will shape interpretations and conversions into 'facts on the ground'. But these 'facts' are also influenced by a number of other risk management systems and tools that are more or less adapted to each other, conceptually as well as practically. As noted, the SBP originated within the safety staff of the UPN organization. By 2006 the program had gained an unprecedented status and impact, as a world-wide safety program in the whole Statoil system. There was certainly an element of 'internal imperialism' in this, even if the program had not 'replaced' other instruments and regimes. But there was considerable overlap between these, partly reflecting the simple fact that Statoil was a large

organization, with different hierarchical, vertical, and geographical divisions.[195] The UPN had implemented a specific tool for improving the manager-worker dialogue on safety issues, called "open safety dialogue" (although, by some, or in some cases, considered to be more disciplinary than dialogical). The Synergy system organized the handling of 'unplanned events' and several other diagnostic tools had been in operation, including an "organizational safety assessment", two work environment measurement systems, and also the data-sets available from the RNNS-project. Thematic overlaps were evident, in particular in relation to the overarching HSE culture concept, which appeared in the company HSE strategy for the years 2004-2008, with the prime purpose to "build a strong HSE culture". Two reports (partly internal) appeared in 2003-2004, identifying at least 7-8 systems and tools that in various ways addressed issues related to 'HSE culture' (Høivik *et al*., 2003; Høivik and Bye, 2004). These reports, however, also provided a conceptual demarcation of HSE culture, visualized as an umbrella with the following items: behaviour, attitudes and competence, interaction and collaboration, and procedures and physical conditions. In effect, the reports suggested that these items be normatively defined as the conceptual inventory of "HSE culture in Statoil".[196] We may recall at this point also how culture was pigeonholed in the Statoil SNA report, located primarily as something related to 'attitudes and competence' within the framework of the 'Pentagon model'. This proliferation of conceptual configurations at least appeared as one indisputable effect of the cultural turn, also at the company level.

We may note, however, that in the SBP, 'culture' was not specifically addressed as such, and was not included in the basic vocabulary of the program (although it appeared occasionally, as seen above). The 'pedagogical requirement' was part of the reason why. 'Culture' was considered by the staff to be a somewhat academic term, leaving more

[195] Occupational health issues were initially excluded from the program in order to preserve a dedicated attention to safety issues. Health issues were seen as 'complicated' and were organizationally and professionally dislocated from safety issues. As the program evolved, however, 'safety' was defined more broadly and working conditions more generally were frequently taken up in both the work-shops and follow up meetings.

[196] Each 'component' of the umbrella was to apply equally to both managers and ordinary employees. The inventory was based on work-shops and interviews with Statoil personnel with HSE-related tasks and responsibilities (safety representatives, HSE managers, etc). The report, typically, originated from the health and Human Factors units in Bergen (not the safety unit in the headquarters in Stavanger).

questions than answers, and more bewilderment than clear recipes to act upon; especially if unleashed in the diverse and primarily un-academic setting of offshore practitioners. But, as the originator explained: "deep inside, this is culture … everyone understands that this is all about culture". And the term certainly appeared in the various gatherings, outside the 'control' of the crew. In short, HSE culture in Statoil appeared in many configurations, and even when the term was avoided, it was still there, at least the range of phenomena to which the word so ambiguously referred.

Cultural imperialism, diffusion, and confusion

As noted, HSE culture and the safety-programs became 'associates', although the concept itself only appeared in some of the programs. The SBP, clearly being the most comprehensive of these, was sometimes accused of 'cultural imperialism', as it comprised so many companies and employees in the industry. Statoil had some 60 percent of the operatorships in the industry, and all important contractor companies had to attend and participate in the program. However, the other large operators, like Hydro, BP, Shell, ConocoPhillips, etc., all had their own, sometimes globally adopted, programs. This caused some frustration, especially in the contractor companies, who also had their own internal programs. Taken together, they required much time and resources, applied different approaches, and led also to some confusion. The 'program-inflation' (and overload) was finally addressed through the joint 'Working Together for Safety' group (WTfS) in the OLF (see Chapter 3), and an initiative was taken to establish a working group in order to 'coordinate the ideas' in a joint program for the industry. One of the participants in this process expressed his concerns in the following manner, adopting also a historical perspective:

> This cultural imperialism, you know…. Just think of Statoil and the SBP; they summon all their suppliers …. and think of the suppliers not so abundant in resources; what will shape their culture when everyone's been to the Statoil program? And two weeks later they attend the BP program. And it's required, you know. You really don't have much time to develop anything on your own. That was really the background for the establishment of that group …. Critique was levelled through the OLF board from several supplier companies – who got somewhat tired of all these operator programs …. When I use the term culture imperialism, it's seen from the supplier perspective. When I, as a responsible manager, shall build a good and sound culture in my company, I need time and money …. and you can become confused, you know, if you promote this or that … But this Statoil program, it's really quite general, you know, like caring for each other and all that … and you have this

> slogan, like “take two”, or like Transocean, with colour-dots on your helmet that says what kind of personality you are .... and it gets confusing, if you want to build an identity of you own. We also have our own slogans, and we spent much time to make people identify with this, like “this is us” or “this is ours”. And then we’ll have to send our people to all these arrangements that have this cultural imprint, that’s when I use the term cultural imperialism. It’s very important to have some humbleness in these initiatives …. But it’s really quite fruitless to be critical about the SBP; it really has so many good things in it …. and it’s really not worth while to use any effort in being critical. But the OLF board has addressed the fact that there is a worry among suppliers that there are so many initiatives among the customers, and that this has a cost in terms of their own culture building efforts. And we get questions when we submit a tender, what kind of culture initiatives we’ve taken .... and how do we respond to that? That we’ve had 50 people at the Statoil program? Or 20 people at the BP program? That’s just too stupid. (HSE manager)

However, these concerns extended beyond the culture programs that had proliferated since the late 1990s. Largely, the cultural turn more or less rephrased issues that had been on the agenda for many years, ranging from work-process training to team-building, and largely seen as belonging to the same cluster of ‘non-technical’ programs. Referring specifically to a Statoil program from the 1980s (´called “Stuck in drilling”), one HSE-manager recalled the following episode:

> R: I remember after the fist gathering, some of them came up to me: “Hey [N], this was really great!; and now we know something you don’t! And that was the meaning of the word ‘empathy’. So this was a lot about communication, about not misunderstanding each other, you know, all these ‘niceties’. So, in terms of content, this was really good …. For me this is much the same thing …. safety motivation, human factors, communication, hand over, that people know about the job, planning, treat each other respectfully; you know, all these things recur all the time; it hasn’t changed at all.
> I: So you believe that all these things that are now put under the label HSE culture, it’s really just exemplars of the same thing?
> R: Yes, that’s my view. We had a HSE culture then as well, right? And the good ones, they understood and did it instinctively, and the bad ones .... that’s the same today. So for me, these things are really about the same thing …. But what’s good about it is this awareness of the perspectives, like it’s easier to talk about, you know. Still there are things here that I believe we’ve not quite captured …. (HSE manager)

Against this broader background, the things not captured were perhaps beyond the referential capabilities of this one word ‘culture’. What the interviewee did capture, however, was the conundrums of sorting out exactly what this new concept would add to the understanding of risk management, how ‘it’ – the concept as well as the phenomenon – related to all the programs, schemes, systems, tools, and other conceptual devices that had orbited the industry the last decades.

Concluding discussion

The behavioural programs spawned competing narratives and served as triggers for accentuating some highly debated risk management controversies; and as they were repeatedly referred to as culture programs, HSE culture became closely associated with these same controversies. The contexts for interpretation include political perspectives relating to degrees of conflicting or convergent interests between employers and employees, moral perspectives related to the location of responsibility within the 'causal chains', as well as 'instrumental' perspectives relating to the efficacy of the programs in terms of reducing risk. These overall contexts and perspectives were not clearly distinguishable in relation to the ongoing discourses and controversies; instrumental arguments would blend in with moral and political ones, such as in discussions about overall priorities: if the investments devoted to avoiding injuries were justifiable and/or effective against the larger risk picture, if the addressees were properly selected in terms of justifiable and/or effective intervention strategies, etc. The HSE culture concept thus came to carry the burden of 'embodying' several critical issues and controversies about risk and its (mis)management. And these were introduced sometimes simultaneously, and indiscriminately signifying a body of ideas and practices amenable to disparate interpretations and 'disentanglements'.

Could some of these confusions be straightened out with the aid of experts and 'scientifically' produced knowledge? Starting with the 'instrumental' dimension, the assumption about there being a causal convergence between very different types of incidents, has been repeatedly criticised, as was briefly recounted in Chapter 3. Hopkins (2000) has pointed to the fact that major industrial accidents can occur in the face of exceptionally low LTI figures, and employs the term 'mono-causality' in a critique of the crude translation that often takes place from Iceberg Theory to ideas about causal convergence (Hopkins, 2006*a*). Hale (2001) refers to this idea as an 'urban myth' that has haunted several industries for years. This has resulted in working theories of risk management implying that accidents could be prevented only by reducing the total number of incidents and errors, large or small. Now, the attribution of 'causes' to human error is not intrinsically linked to this version of the Iceberg Theory. Psychological

research clearly demonstrates the role of human slips, lapses, mistakes, etc., as contributing factors in accident analysis (Reason, 1990; 1997). The analysis of 'robust' socio-technical systems has drawn attention to the role of 'human redundancy' in coping with 'error' (detecting, explaining, correcting, 'comprehending', etc.), which may support the legitimacy of focussing on work-mate concern or interference, internal 'stop-rules', communicative practices and qualities, etc. (Clarke, 2005; Rossness, 2001; Rossness *et al*., 2000). The understanding and promotion of such strategies has thus constituted an important interface between researchers and practitioners of organizational safety, and some key components of human redundancy have been integrated into the 'behavioural' safety programs. The important question of how this knowledge is fed into the essentially *normative* philosophies and strategies of risk management is still not exhausted, however, as this would involve also critical trade-offs between economy and safety, apparent in decisions related to such 'redundancy-relevant' factors as manning levels, contract conditions, and (costly) technical designs *vs* (cheaper) human adaptation. Risk management involves more than just a 'scientific identification' of instrumentally effective points of intervention within the complex causal chains and networks.

Neither is the 'scientific' status of how 'culture' contributes to the reduction of risk altogether clear, and these ambiguities are not restricted to the controversies between Normal Accident and High Reliability theorists (Hale, 2000). Although evidence can be found that organizations in offshore environments who do well on safety climate surveys also have lower accidents rates (Mearns *et al*., 2003), such research, although carried out with much methodological sophistication, may not be altogether informative for the implementation of a 'cultural' risk management approach.[197] As we shall see in the next chapter, the relationship between 'sound HSE culture' and prudent risk management occasionally appeared as synonymous, making the claim tautological rather than empirical. Apparently, the relationship between behavioural and cultural risk management strategies has also been victim to some conceptual confusion within the research communities, taking the former to be associated with 'bottom-up' strategies, and

[197] Salient climate indicators in this study include exactly such factors (distilled through psychometric factor analysis) as communication, job satisfaction, management commitment, reporting practices, etc.

the latter with 'top-down' strategies (see DeJoy, 2005). Analogous examples of conceptual disorder were evident also in the local research communities. Occasionally, the safety programs, such as the SBP, were taken to represent a modernized version of 'behaviourism' (in a 'light' Skinnerian sense). But clearly, the programs both presupposed and addressed 'mental states of mind' (like 'mind-sets', attitudes', 'moods', etc.), both directly and indirectly. As noted, the deliberate use of 'behavioural terms' adopted in the SBP, was simply a moral and communicative-strategic choice in order to avoid paternalism and 'intellectualism'. Behaviour modification was certainly the goal, but the instruments used were not of the stimulus-response kind, black-boxing the mind, even for introspection.[198] This pragmatic psychology of addressing 'behaviour' was rather based on the idea that 'attitudes' would change as consequence of the former. In practice of course, these components of behaviour modification would appear interchangeably and non-linearly.

As indicated above, such processes of attribution were evident also in the debates surrounding the programs; the critics were faced not only with counter-critique, but apparently also with 'diagnostic' labels. How could this, essentially irrational, opposition be explained? Whose interests were being served? This was the mirror image of the critique itself, which included not only instrumental and 'scholarly' arguments, but also references to concealed interests, and even to the suspicion that the amount of financial and institutional investment would make any substantial self-criticism cognitively difficult to handle.[199]

Summing up, the PSA has had to confront a number of difficult tasks, making sense of the complexities of culture, making it operational within the framework of their regulatory strategies, and simultaneously facing industrial initiatives, programs, and 'cultural interpretations', the latter covering an uncoordinated abundance of ideas and practices related to the significance of 'culture' in the management of risk. All the

[198] Recalling the story of the behaviourist, asking his partner after making love: "this was really good for you; how was it for me?"
[199] Cognitive dissonance, it may be recalled, appears in its strongest forms when much mental effort is invested, and evidence of its futility will generate dissonance-reducing mechanisms, like ignoring or refuting such evidence (Festinger, 1957).

dimensions of ‘culture’ outlined in the PSA booklet thus reappears in various configurations: safe behaviour *vs* external frameworks, economy *vs* HSE, formalistic risk bureaucracies *vs* ‘cultural’ risk organisms, the value of statistical monitoring *vs* operational and local knowledge, etc. Whose behaviour and whose culture were really addressed, and what relation had ‘culture’ to other ‘shapers’ if they were not also themselves really a part of ‘culture’? The contract conditions, the time-schedules, and the rewarding systems, were these arrangements only shaping culture, or were they also part of the cultural?

These discourses triggered practitioners and expert groups alike, and exposed divergences about industrial relations, causal relations, values, priorities, and disciplinary conceptualizations. In these controversies, conceptions of risk and its management lurk as benchmarks against which positions are interpreted and represented, and where researchers do not only *represent* the empirical realities they study. They participate in joint arenas, and introduce and impose frames of meaning onto each other in an ongoing ‘dialogue’ between facts, interpretations, theories, and actors. The theorizers and the theorized are blurred categories, involving even the vested interests of the former in the sense that research agendas and funding schemes to some extent reward those actors who at any moment are taken to represent the favoured conceptual schemes.

With these glimpses into the industrial codifications of culture and risk management, we now turn back to the agency, exploring how this cultural turn was perceived and conceptualized in the face of the experiences that had been made.

9. Lost in translation

Preliminaries

As should be evident from the foregoing accounts of the cultural experience, the challenges to be faced by the agency had many faces. And they were not faced by a uniform agency ready to provide clear guidelines for the cultural road to safety. The task was largely left to the culture group, with unclear mandates and fragile authority. The challenges appeared as an ambiguous mixture of conceptual and substantial quandaries, to be sorted out in a complex process of organizational sense-making, to borrow a phrase from Weick (1995; 2001). Although sense-making appears as both trivial and integral to organizational life, reflecting the inherent interpretive processes involved in transforming ambiguous 'environments' into minimally coherent and shared templates for organizational behaviour, the process of making sense of HSE culture appeared as more than ordinarily enigmatic. In this chapter we try to sort out the status and significance of HSE culture as it appeared after some three years of existence as a statutory provision, to explore the interpretive quests it caused within the institutional and socio-cultural context of regulation, and to tease out how the 'cultural experience of regulating culture' can be framed and understood within the multifaceted patterns of regulatory world views. We start, however, with a brief recapitulation.

By introducing the concept of 'HSE culture' the regulators followed a well established line of regulatory philosophy, arguably as an attempt to penetrate even further into the self-regulatory mechanisms of the regulatees. The new provision was launched with some ostentation as, as a 'new dimension' adding to those focusing on technology and management systems. The agency had arranged several well-attended conferences specifically dedicated to the topic, produced a widely read and distributed booklet on the subject, and integrated a number of 'cultural issues' in the RNNS project. Integrating HSE culture in supervisory practices proved difficult, however, partly because the context of ordinary audits appeared as inadequately fit for making 'cultural diagnoses', and partly because the status and nature of such diagnostic practices were not quite sorted

out. Also, the status of the provision in terms of its regulatory enforcement was subject to much uncertainty, and gradually, a ‘policy of restraint’ developed. The obviously attractive, and perhaps also trivial, insight that cultural properties and processes play a significant role in how organizations encounter and manage their risks, was an important driving force during the initial stages of the process. As the real task of making the concept ‘operational’ within the regulatory context, more demanding challenges were encountered. These were related partly to the development of conceptual understandings that could be sufficiently shared and appreciated within the agency. Partly they were also related to the diversity and ambiguity of risk management strategies and safety programs that proliferated within the industry. In short, the status of HSE culture as part of the overall regulatory strategy was not altogether clear, and a decline in interest and attention was clearly apparent.

Some critical factors for understanding this development have also been anticipated. First, there had been some critical organizational discontinuities in the process. The ‘originators’ had left the agency when the new regulatory framework was finally launched. Their scholarly inspirations were drawn from several sources, such as the role attributed to ‘safety culture’ within the High Reliability tradition. Only sparse traces of these original thoughts were left behind, and to some extent, the content and significance HSE culture had to be reinvented. Second, the follow up was organized as a project largely manned by newly employed officials and not deeply entrenched within the rest of the organization. Third, no systematic analysis was provided of how HSE culture was related to the large and comprehensive body of regulatory requirements already in operation. Forth, there were several ‘competing’ approaches and methodologies that had obvious but not explicated linkages to HSE culture. Fifth, the HSE culture provision can arguably be rendered as a ‘hyper-functional’ requirement, highly abstract in terms of its potential meanings and possible contexts of application, and at the same time penetrating deeply into the ‘inner lives’ of the regulated companies. The linkages between means and ends were correspondingly blurred. Adding to this was the force of the ‘fallacy of misplaced concreteness’, which occasionally tended to produce somewhat reified and essentializing notions of culture.

No ‘causal’ analysis will easily account for the relative impact of any of these factors in ‘explaining’ the observed outcomes of the culture project. Some conjectures may be explored, by tentatively posing counter-factual hypotheses about what would have happened if the originators had stayed, if the culture group had been differently organized and composed, if the enforcement policy had been more assertive, etc. But analyzing conditions of causal necessity or sufficiency in this process appears to render the outcome as almost ‘over-determined’, or at least as victim to highly vulnerable contingencies. In the following, we will explore the interaction between some of these factors, rather than specifying their relative impact. First of all, we trace the conceptual issues from the perspective of the regulators, as ‘reasoned explanations’ (Føllesdal, 1975; 1981; 1982), making sense of how the process was conceived and interpreted from the various positions within the agency. In this reconstruction, there was no point in conducting a ‘poll’ for discovering the exact distribution of ‘opinions’ on a predefined scale or set of ideas about HSE culture. More important was to discover the local rationales, associations, ideas, arguments, stories, and examples. In terms of ‘samples’ it covered the whole management group and the culture group, and thus more or less exhausted the universe of key policy carriers.

Culture: safe behaviour and/or ‘total risk management’

As argued above, the safety programs and systems that circulated in the industry reflected different and partly contradictory approaches to risk management, not always corresponding to agency notions about the proper understanding and management of organizational risk. Fending off the behavioural focus in the industry appeared as a recurring topic in the culture group. Some safety programs and schemes were clearly seen to distract attention from health related issues and from a realistic appreciation of the systemic and complex nature of organizational risk. They absorbed resources, framed perspectives, and inspired remedial measures. As they recurrently were labelled ‘culture programs’, or referred to as such, they also contaminated the cultural perspectives of the group, as presented in the booklet and in their external and internal presentations. The diversity and sometimes incoherent configurations of culture also added to the problems of matching the abstract word with references in the real worlds of local experience.

In the yearly safety conference of Safety Forum in 2004, just a few weeks before the Snorre incident, keynote speaker, professor Jan Hovden at the University of Science and Technology (NTNU) in Trondheim, addressed the question of why the Norwegian petroleum industry should be the leading industry within HSE (referring to the stated purpose of the 2002 White paper). He ended his presentation by questioning the usefulness of 'HSE culture' as this 'approach' seemed to have developed in the industry, and implicitly also in the PSA. He indicated that HSE culture could turn into a new 'cushion', in the sense that it distracted attention away from the real 'dangers': the 'technology' and the 'energy'. Alternatively, he called for greater attention to the development of management systems furnished to handle the dynamic of integrated operations and other complex technologies, work processes, and organizational forms. As the prominent head of several educational programs in safety management at the country's largest technical university, he was responsible for the education of numerous classes of engineers, and a particularly influential participant in both the professional and public discourses on risk management. Just a week later, the PSA (on the initiative of the group) made a public announcement on their website:

> **Good HSE culture - more than behaviour and attitudes.**
> HSE culture is not just about a focus on attitudes and behaviour. Companies with a good HSE culture keep up a continual, critical and extensive work with regard to technical safety and improvements in their management systems, while also carrying out measures that are directed towards the more interpersonal and behavioural issues.

An explicit reference was made to the conference, expressing concern about the circulation of heretic ideas about HSE culture:

> During the Safety Forum's annual conference we also discovered a scepticism to the authorities' and the industry's emphasis on a good HSE culture, because this might be to the disadvantage of HSE issues related to technical safety and management systems. If it were true that the statutory requirement on HSE culture entailed a one-sided focus on behaviour and attitudes, such a concern would be understandable. However, the PSA has other, and far more extensive, expectations regarding the requirement of a good HSE culture.

The unbecoming comment from professor Hovden clearly disturbed the group, and they felt a need to explicitly challenge his 'claim' by regularly quoting and commenting it in

public and in-house presentation, noting his possible misconceptions about HSE culture, and contrasting them with the 'correct' PSA approach.[200]

The 'episode' was thus an unpleasant reminder of how HSE culture had become associated with contested risk management philosophies, and disturbed the attempts to justify 'its' relevance and merit. Cultural risk management had also become a contested paradigm. We shall return to the role of the culture project below, noting, however, its fragility against both external and internal forces.

Managerial expectations and mandate

We may recall and review at this point the rather open-ended expectations from the top management. HSE culture was a somewhat ambiguous heritage from the regulatory reform process, and its regulatory implications had not been clearly considered. Some wanted HSE culture to be formulated as part of the overall purposes. The decision to have one dedicated culture provision was intended to add force and focus. But as noted, it also exacerbated the conceptual challenges, since the 'enforcement issue' came to be more explicitly addressed. The amount of discretion involved in actually 'diagnosing' industrial practices in terms of HSE culture was clearly acknowledged by the top management; recognizing these difficulties, the General Director, still expressed optimism, with the aid of time and good thinking:

> It's certainly not mathematics …. You cannot summarize components and figure the HSE culture to be …. like 90 percent satisfactory. That won't work. You need a wholly different approach. A great deal of discretion and judgment is involved. So, you know, it requires something more in terms of good judgment in order to arrive at a reasonable picture, it's not like saying that the steel construction is two millimetres short …. This is a real challenge. So I believe the process of developing this, both for the industry, but also for us as a public authority and the role we have …. this'll take time. It's not done overnight. But I have the belief that if we get a good hold of this, over time, that there is a challenge here in outlining a 'culture-picture, that will be very useful in terms of processes of regulation and improvement in the companies. That's my sincere belief. (General Director)

[200] He later explained that the comment most of all was meant to promote some critical reflection, and indirectly as warning against the inherent dangers associated with managerial fads and trends: that people would stop thinking and just follow fashion.

The reluctance to define, coupled with an optimistic sensation about the potentials of the cultural perspective, provided much leeway but not much direction. The solution was largely to see culture as a part of a 'developmental process', and engaging with the industry in a joint effort to improve.

But the 'developmental approach' applied not only to figuring out the content of culture. In fact, the cultural approach had in *itself* been presented as the 'highest form' of civilized risk management. As may be recalled, HSE culture was repeatedly displayed as representing a third wave or stage, superseding and succeeding the former 'technological' and 'system-oriented' stages, thus conveying the image of culture as being something substantially new. This clearly caused some concern and bewilderment, also in the culture group, who had inserted some 'reversing' arrows in their power point presentations in order to point out that technology and systems were still important, and that these factors also had to do with culture; culture was not to be seen as some entirely new or disconnected dimension.[201] But the impact of this way of configuring the cultural dimension was still clearly felt, as was evident also from the account provided by the disciplinary director, when commemorating on the birth process of the cultural turn:

> R: …. there was much talk about the management systems, and how to move beyond and see what was involved in the compliance with management systems. Then there was much talk about culture. We found that the industry was very clever in making these management systems, some were incredibly professional. But still, not much came out of it. So in trying to look beyond that, a lot of people talked about the culture. And I believe the concept was used in a rather loose and wide-ranging manner in the beginning. And I'm not quite sure how it is actually used today.
> I: Like in the figure?
> R: Yes, but I'm a bit afraid of that figure, that you conclude that now we're only going to work with the culture and forget the rest, like technology. We need to focus on the whole spectre in order to succeed. We cannot just say that "now, we've reached a new level of consciousness and we're going to work with culture". That'd soon turn out wrong.
> I: Have you found a balance - that communicates well with the environment?
> R: Well, the most conscious have, I surely believe that. Through the culture group, the booklet and so on, I believe we've been able to put this into words and express thoughts and descriptions that communicate quite well …. But after all, it's a difficult and comprehensive concept; so I'm a bit unsure …. I'd think that what you establish regarding patterns of

[201] The figure had obscure origins, but had appeared in the industry for some time, in various versions. Sometimes 'human error' appeared as the first stage, followed by management and steering systems Sometimes 'behaviours' appeared as the last stage, such as in the British petroleum industry *Step Change* program (http://stepchangeinsafety.net/ResourceFiles/Changing%20Minds%20Guide.PDF).

> behaviour and values in a company, that in the end that would constitute a kind of culture. I guess that giving orders regarding culture, I don't know if that would work. There are many approaches to this culture concept …. there are so many aspects to it.
> (disciplinary director)

Trying to get an idea of the difference between the existing regulatory framework and the nature of culture as either the sum of these elements already present, or some additional or extended dimension beyond this 'sum', appeared difficult. And, of course, it was as difficult to provide an answer as it was to interpret the ones that were in fact provided, tentatively responding to the somewhat complex question: 'what's new'?

We conclude this brief review of top management expectations by citing the supervisory director responsible for the culture project. We may note both the directional substance and the ambiguity contained in the response: the clear warning against behavioural reductionism, the sensation that much of culture was already present in the existing risk management approaches, but also the sensation that culture was something more, not yet fully explored:

> R: It's the sum of everything. But in addition, if we find deficiencies in many areas, there is a lack of management focus, lack of steering, missing priorities on HSE, and also an element of attitudes. But it's not only attitudes. We had a period with very much focus on attitudes and behaviour, making everyone responsible, like holding the handrail and so on; and that's fine, but it's much wider than that; it must be seen in a much more comprehensive context. And – that's my personal opinion – that we address that aspect, lift it up and challenge the company management based on the sum of our knowledge about the company, and ask them: What's your opinion about this? Do you share our assessment, and what are the implications in relation to the responsibility you have as managers? Do you take this seriously? It's more like having a dialogue about it; rather than just issue an order about 'bad HSE culture' or branding a company. I'm more confident that this provision, in conjunction with other elements, can be used in a dialogue with the company management. Otherwise you risk just getting newspaper headlines and a totally sidetracked discussion.
> I: If you had a company that complied with all regulations, like management systems, risk analyses, etc…. would you then say they had a good HSE culture?
> R: I don't know .... I wouldn't have said that, I wouldn't have used that word. It could easily been misunderstood as an endorsement or approval of an organization or company. Good HSE culture? No, that's difficult.
> I: But that's what it [the provision] says; that they should have a sound HSE culture …?
> R: Yes, yes …
> I: Is it something more then …?
> R: Well, it would be natural, if we can say the opposite, that here's a poor HSE culture, based on the sum and plus something more, then the natural thing would be that we also could say that, well, here's a really good HSE culture. It would be natural, yes …. But it would take a lot; to put it that way. But it doesn't follow that if there are some slips

somewhere, that still, that wouldn't mean that they didn't have a good HSE culture. In a sense it's the manner in which you deal with the failures that indicate how the culture is …. We've created some challenges for ourselves with that provision …. I belonged to those who thought that this shouldn't have been an ordinary provision, it should have been an introductory declaration of objective, more like a statement of intentions, or something like that. One of the reasons for why it became an article at the time was to get a focus on HSE culture. I see now that we've achieved that, definitely so, and that's positive.
I: Some say it's become a 'cushion'. Do you agree with that?
R: It depends a lot on how we present it and how the industry perceives the concept of HSE culture. If we present it as an attitude issue, it may turn into a cushion; 'cause then you don't make the necessary technical or organizational improvements. But if we present it from an organizational and holistic perspective, and mobilize the industry along such lines, then it shouldn't become a cushion; one element in this is for the management to claim responsibility, not only the single employee. Here we have a job to do.
(supervisory director)

The warning against motivational and behavioural reductionism had its corollary in the warning against cultural reductionism; that assessments about culture (if attempted) could only be based on very comprehensive evaluations of company performance, not on a series of isolated misconducts, but rather on their ability to deal with risk at a higher level of reflection and learning. Culture appeared then as a third wave, beyond technology, behaviour and systems, like an enlightened state of 'total risk management'. Two important 'themes' are thus foreshadowed: both the respect for the 'word' and a belief in its potential as a trigger for organizational learning and self-reflection. But in sum, the top management did not provide clearly digested expectations; rather, they modestly joined in on the search for the philosophers' stone of regulation.

Culture in operational management

First responses

Apart from the top management and the culture group, the middle managers constituted the most important organizational echelon for sorting out and defining appropriate conditions and arenas for 'applying culture'. The disciplinary leaders were faced with the task of making culture relevant to the risk management of the particular technologies and HSE issues within their fields, and the supervisory coordinators were faced with the task of making culture relevant in the supervisory strategies and auditing practices. Discussing HSE culture with the PSA disciplinary leaders and supervisory coordinators was an

exciting, enlightening, and bewildering experience. Everyone had developed associations and ideas about both the 'concept' and the 'phenomenon', and had more or less formed some opinions about how it fitted into the regulatory and supervisory strategies, also as judged against the responses and initiatives in the industry.

There are clearly many ways or sorting out or organizing these responses: Degree of interest or investment, evaluative considerations about its usefulness, judgments about its usage in the PSA - and in the industry, and certainly: ideas about what it 'really was', in particular in relation to other and partially competing systems of ordering the components of risk management.

To provide an initial summary, many responses could be placed somewhere around the middle on any one of these variables, oscillating somewhere between pending curiosity or interest and a somewhat resigned expectation. We shall not order the responses according to what 'values' they would be given according to these dimensions, but rather present positions within their argumentative context, and sort them according to some more general themes. To provide a preliminary outlook on this variation, and to illustrate some 'gut reactions', we present first a sample of immediate responses to 'HSE culture':

> What's been decided is that we don't run audits specifically dedicated to HSE culture. That would be mistaken. It's so comprehensive, it would be too difficult …. it should rather be a natural part, or an approach, to supervision in general …. But I believe we have a way to go in terms of awareness and being more conscious in the more technical supervisions. (supervisory coordinator)
>
> I don't relate very strongly to the culture concept. I have seen presentations from the culture group. For us it's more like something underneath …. We don't really ask many 'culture-questions' directly as such. It's more implicit when we review management systems and the 'steering wheel'. Also, messages and signals now are that we to a lesser degree will use HSE culture in investigations and so on, and say that the HSE culture is bad; that would be difficult to say. (supervisory coordinator)
>
> That's a concept we've strived to get a hold on …. Most people here use HSE culture in a rather simplified manner, compared to the culture group. They stretch the concept a lot, have a more comprehensive approach. The current view is that it's on an individual level, attitudes and things like that …. Still, we receive information that there's more to it .... (supervisory coordinator)

> We are perhaps a bit cautious in using the culture concept and in making conclusions in terms of culture. That may be a little cowardly but it may also be wise, since, in order to say anything about the culture you need very strong, say, evidence for claiming that something's wrong. Culture is so composite that you cannot claim that an incident …. indicate a bad culture. Such a foundation would be too narrow, you know. There may be a set of coincidences that gave such a result in just that case, and that in 99 percent of the cases it doesn't happen. But it's clear that if you find a whole lot of elements that point to or indicate a bad culture, then I think it's perhaps a little cowardly not to use the concept, and to say just that. (supervisory coordinator)

> This is a professional area where the concept of culture is not the first thing on your mind. These are the cold and hard mathematical disciplines. "Psycho-somatic conditions in pipelines" is a phrase that was used here when the work environment wave came in the late 1980ties …. working environment was going to be part of all supervisions. This is still a phrase that you'll hear in the corridors here, as something really far-fetched and beyond reason. It's a bit like that with HSE culture also, like in relation to estimating the carrying capacity of a load-bearing construction. There's not a direct match, you know. So I'd say that in the professional work within this discipline, this perspective is not very present, and neither, I believe, has there been any great appreciation for the attention and effort devoted to this in the last White paper. (disciplinary leader)

> As to the disciplinary questions in this area, I am not competent …. I imagine this to be like a somewhat odd animal …. and as I understood from the group that designed the HSE research project …. they were to investigate 'what it was'. There was no common understanding or definition of what this animal was really like, which elements were relevant; there was no unitary agreement on, say, one or two or three adequate models for what it was, how it was configured, how it could be managed; as far as I understood there was no agreement whether it *could* be managed - or not. So for me it's always been a somewhat distorted 'thing', and I've been waiting for the experts to agree among themselves. And it hasn't really triggered me .... So then you know where I stand. (disciplinary leader)

Admittedly, it did appear surprising at first to discover that 'HSE culture' didn't hit more fertile ground among these key actors within the agency. But the discovery certainly contributed to a certain change in the interpretive approach. The response from the disciplinary leader of the drilling and well unit, not included in the sample above, did however appear as a notable exception. It may be noted initially that he had the culture project leader in his disciplinary unit, most probably causing an impact on his response, and indeed his responsiveness, to HSE culture.[202] Early in the interview, in replying to the more 'instrumental' question of how to avoid accidents in drilling operations, he made an explicit, resolute and unsolicited reference to HSE culture:

[202] Indeed, the middle managers most closely involved with key members of the culture group and their activities, generally appeared as the most 'culture friendly'.

> Very much is done in the planning process. If you conduct a good planning process, including risk assessments and quality controls, and not the least, communicate this …. that is what we call a good HSE culture …. if this is communicated and that you make sure that what you have presented is understood, then you've really done a great deal. What we see is that they plan and do a great job; then they need to make a *small* adjustment, and then they forget to follow the good routines and procedures, meaning that they take the time needed to plan, check out, and assess risks related to these *new* circumstances. This happens often, not only at Snorre but also incidents with injuries …. "we were only going to …", and so on. (disciplinary leader)

We then engaged in a conversation about management errors in planning and design processes, as I took his choice of focus in the example to be an indication of the 'cultural mentoring' he'd been exposed to. He certainly dismissed the idea that everything was to be left to managerial decisions and 'framework conditions', adopting instead a balanced perspective: "You cannot eliminate everything. It's very important that the people out there are so alert and awake that they can say: 'stop, we cannot proceed now, this isn't right' …. If there's acceptance for people to do that, even if it costs this or that amount of money each minute, then you can avoid injuries or even major accidents." He insistently referred to the diverse responsibilities and tasks on all the organizational levels in a process, onshore as well as offshore. Specifically referring to drilling and well operations, he emphasized the gradual specification and detailing in such processes, how in each step one would need a sufficient understanding of conditions framed and assessments made in the former steps, down to the final performance of the operation. Responding to a somewhat simpleminded question about 'generalized failures' or 'common causes' when something still went wrong, he hesitated, referring to one of the older favourite 'root causes': "I'm sceptical to that. I believe we could go out on each and every supervision or investigation and say 'poor management and deficient leadership involvement'. But that's too simple. I can say that without even going out there. It'd really take a lot, to miss on that point." He proceeded by instead pointing to the complexity and comprehensiveness of procedures and routines, in particular to the fact that some of these are only relevant on very few occasions, and that people often do not know the relevant procedure, or they think they know but in fact do not. Also, in cases of organizational change, when drilling contracts, for economic or other reasons, are transferred to new contractors, involving new groups of personnel and others to be reassigned under a new

regime, quite intricate organizational interfaces must be reconfigured and harmonized, and people must learn and adopt to new systems and procedures. Involvement with and knowledge of procedures and risk assessments in complex organizational contexts were thus singled out as important antecedents for failure. These challenges must often be handled in stressful situations, where on-going work processes may leave little room for getting acquainted with written documentation, that may even be barely known about. In particular at critical junctures, such as shift handovers, the passing and processing of information may fail, with possibly fatal outcomes.

At this point in the conversation (or the lecture), the first explicit inquiry about HSE culture was made, to which he responded by relating it directly to what he'd been explaining:

> R: There's much culture in this …. I believe that by focusing on how those activities and routines, that is, how things are organized and run and make specific verifications, and then, to relate this to culture …. I'm more confident in such an approach, rather than running 'culture audits', like "how is the culture around here", you know. That's been our fear, what good would that bring us? I believe we observe lots of things that can be related to, say, a good or a bad culture, if you go in, like we did with [culture project leader], in an audit on well control. We looked at the interface between the operator and the contractor, how they worked together or didn't work together, how they arrange and follow up on systems and routines, and especially, if they're not followed, how these are either adjusted because they are inappropriate or address it by saying that there are so many violations and we cannot accept it. Or that we find that there are violations that they've known about, but not cared to apply to us for consents. I mean …. then you'll have a lot of things that I believe indicate something about their culture.
> I: But these issues were also addressed earlier. Is there any added value then, by bringing in the cultural perspective?
> R: Yes, for me there would be, or there *is*, that you'll have a larger context. It's true we've had procedures, but there's something about the connections, like the establishment, the usage, the follow up, and so on; that picture in that setting. Here I believe, at least how I interpret the culture concept, it has contributed to providing an overall concept or umbrella …. I'd think that this phenomenon …. that you fence in the drilling area, it wasn't like that when I was out there; anyone, even visitors or any idiot could walk right across the drill floor in the middle of operations …. Or that no random person should climb the drilling tower, or bring with him just any object. Or that you don't assign tasks to untrained persons without the company of a mentor.
> I: But this is very much about good HSE measures; is HSE culture synonymous with good HSE activities then?
> R: Well, it's a part of it. You have the physical work environment, but also you have the whole conceptual framework for safe job analysis and all that, and judgments and communication, that people have respect for, say, "here it's the drill floor operators who are responsible"; and not to mention the pipe deck, there the roughnecks are in charge. It

> doesn't matter if the drilling manager comes along, and is halted; if he does not respect that, then there's certainly not a good HSE culture …. Until last year or something, I thought that culture was something rather elusive and vague. HSE culture was like some foggy mist that I didn't really take hold of. It turned out to be a lot easier when we started to discuss it and [culture project leader] joined the drilling group, and we discussed what this meant from *our* perspective. Then we could apply it directly; that it wasn't only about holding the rail and all that nonsense. That's fair enough, but if that's the only focus …. If you don't have a culture where anyone at anytime can say "stop, this is not safe". If you're beaten up saying that, or sent on the next helicopter as it was in the so-called good old days, you don't say that the next time. It's not like that anymore, and I believe that's a good HSE culture. (disciplinary leader)

What made this interview different from the others was not primarily the associations made to the concept of culture. Rather, it was the unwavering firmness of the response and the unapologetic use of 'HSE culture'. The significance of this is not obvious, of course. But the fact that he'd been out in the field as a practicing auditor with the guidance of 'culturally inspired' ideas and mentoring must be seen as part of the picture. Since the 'mentor' himself was part of the disciplinary unit, digestions, interpretations, and discussions took place within a context of shared knowledge and practical experiences related to drilling and well operations. Obviously, the Snorre incident had been thoroughly discussed in the unit, also in 'cultural terms', as was apparent from the examples used; but the interpretations appeared as generalized, applicable to a range of comparable cases. Finally, the responsiveness to 'new ideas' reflected a good reputation and record of the disciplinary unit that had been apparent also in other cross-disciplinary projects.[203] These factors may, however, be seen as necessary, more than as sufficient conditions in terms of embracing the 'cultural dimension'.

This is not to indicate that the explanatory perspective here is biased towards finding the 'causes' of the reservations and scepticism to be observed from the majority of first reactions listed above. One might as well ask the converse question of why they *should*, uncritically, adopt HSE culture, given the rich variety of already existing regulatory 'tools', conceptual apparatuses, and analytical approaches. In fact, it was of some importance during the interviews to adopt an 'open' or unbiased stance, not making the

[203] The "Human Factors" expert testified to this, referring to some creative and innovative projects on work processes in drilling teams, and the group was generally regarded by the working environment people to be open for joint projects.

interviewees feel obliged to defend any positions; in particular as I supposedly would be regarded as belonging to the 'culture camp'. Rather, as may have been be noted, two related questions were normally forwarded in order to try to 'distil' what they saw as 'distinctive' about the HSE culture provision: first, the question of what they regarded as the 'value added' by the provision, and second, if they regarded an otherwise fully compliant regulatee as also being compliant with the culture provision. The latter question was occasionally also phrased in terms of there being a synonymy between 'good HSE conditions' and a 'sound HSE culture'.

The initial responses, I believe, more or less reflects the themes, associations, and perspectives that gradually had appeared; to some extent they also corresponded with the cultural sensations of the top management. A number of ideas about culture can thus be identified: the idea of culture as a 'third wave', an idea of culture as some ontologically existing 'property' or 'force', accessible perhaps only to 'the culture experts'; culture as integral aspects of HSE systems and practices and visible through 'indications'; culture as a normative superstructure of 'basic attitudes'; culture as a set of properties, only ambiguously corresponding to social and organizational structures; but also, culture as re-circulated wisdoms of the past couched in alienating newspeak. Some of these notions and ideas are clearly interrelated and not mutually exclusive; and, they are not always attributable to the individual interviewees *en bloc*, although some clearly could be squeezed into one or another category. In the following, we organize the presentation of responses under four headlines, starting with what may be called the 'non-expert complex'. This refers to the simple observation that interviewees often appeared somewhat apologetic regarding their own 'expertise' on 'culture'. Still, a number of observations and reflections appeared in trying to link the sometimes tentative and vague sensations and ideas about culture with the more established risk management approaches and topics. However, when applied to the relevant social and organizational structures and processes, it was difficult to make the culture label 'stick' to these in any simple or straightforward manner. Finally, the regulatory context provided some critical conditions and restrictions for how the label could in fact be used, most evident with respect to the 'enforcement-issue'. This four-fold approach thus structures the following outline.

"I'm not an expert, but…"

> We did have some supervisions on HSE management and maintenance management were the cultural perspective was integrated. So someone from the culture group joined in. But it hasn't been so easily accessible to us ordinary mechanics. They have knowledge in this far beyond the ordinary PSA official. But they've had good presentations in the management group and the various teams. (supervisory coordinator)

With the disciplinary leader of the drilling and well technology unit as one notable exception, a sense of intellectual or professional distance in relation to culture was apparent; that it was accessible only to 'insiders', but still something to take account of. From one of the other technical disciplines (structural integrity), there was also an awareness that culture mattered, but this time curiously attributed to a personal interest and thus presented as somewhat untypical for the general approach adopted in this department:

> So personally, I've had an appreciation for these perspectives related to culture, and for the effect it has on the physical behaviour …. I see the value of employing an abstract concept. I like abstract thinking myself, applying it in the real world. I wasn't part of that process, but I've seen it from a distance and I'm fascinated by the cultural element and how different cultures do different things …. like how different companies choose fundamentally different incentive structures in contracts. (disciplinary leader)

Starting with outlining the horrors of a recent and well known contract scandal, he explained how the oil company in question had been trying to induce the completion of the ordered installations, without success due to inadequate incentives and sanctions towards the suppliers. In the face of damage to local reputation in the case of large delays, they decided to finish the job in Norway, at their own expense. Annoyed at this, not without 'nationalistic' overtones in comparing with the straightforward cynicism of the larger multinationals, he then continued to describe the role of the local company representatives, the construction site managers:

> They all come from 'Body shops' …. except perhaps a company employee on the top. These are the 'jack of all trades' who's been long in the game. What are their interests? Clearly, they're interested in the next job …. I've seen these people in many contexts; they talk, and when you scratch the surface they're quickly stripped bare. It happens all too often that these are people who're clever talking and selling themselves in; they're flexible and move around …. not everyone is interested in that kind of job, so there may be a shortage. But in terms of getting a tough business-like follow up …. you know, these people are interested in being popular. They must be 'acceptable' to the various suppliers and customers. It's a quite small and transparent social milieu, and I believe there's a play being

> acted out, just to stay in that business. These are some personal reflections …. and much of the excitement I feel about the supervisory tasks has been related to these cultural matters. It's been a personal motivation. And I'm annoyed that [the company] behaves in such an amateurish manner out in the world, compared to, say, ExxonMobile or Shell. (disciplinary leader)

In terms of including cultural perspectives in the active engagement with the industry, however, he was also somewhat sceptical. They had a tradition for pointing to errors that could be subjected to the professional judgment of the engineer, and supported by uncontested evidential support. The 'deeper' social or cultural causes was partly reflected upon 'privately' and partly made subject to discussions with the industry in more informal meetings, challenging them to consider broader spectres of mechanisms than the purely 'technical'. Partly, this had to do with the kind of evidential support that could possibly be gathered through relatively brief encounters in supervisions.

There was thus a certain paradox in many of the responses to and accounts of HSE culture. Often it was talked about and used in a straightforward and seemingly uncomplicated manner, using examples and pointing to certain recurring characteristics of what was considered to be 'good' or 'bad' HSE culture. But still, they almost unanimously qualified their presentations by occasional apologetic comments about themselves as 'non-experts', and/or by making reservations about 'culture' as a rather elusive and difficult term.

This 'expert complex' could be approached in several ways; the majority did not provide themselves with membership in the expert club. Either one could talk about culture 'irresponsibly' and uncommitted, more or less in the accessible codes of everyday speech, were everyone could call things 'culture' without being put (semantically) on trial. Once caught in the regulatory role, however, culture was treated more evasively, or one would resort to the known and familiar concepts and models within the existing framework (such as MTO analysis). As will be recalled from Chapter 5, 'safety culture' appeared frequently in the MTO-based investigations, although that practice waned somewhat due to a more restrictive policy propagated by the culture group. Culture was to be seen in a more holistic manner and used in a more 'positive' manner, as something

to be achieved; ‘bad culture’ could and should not be simplistically indicated by ‘isolated’ cases. Perhaps this policy also contributed to a process of ‘professional alienation’. Ticking off ‘cultural failure’ in the MTO codification scheme, indicated, as the criteria prescribed, by pervasive and collective transgressions of procedures (see Chapter 5), was something that could be justified and substantiated through the relatively thorough investigation process. The ‘holistic’ approach made matters a lot more complicated. As was explained by one of the participants in the Gyda process:

> R: …. in that case it was about adherence to rules on the spot, and conscious violation of those rules …. and unacceptable behaviour that over time had become tacitly accepted. That kind of culture issues …. that was the reason why we used it. But I don’t have any knowledge about ‘culture’ as a discipline, I don’t.
> I: Do you think it’s something other than what you normally observe when you’re out, like decision making, management systems, maintenance systems, compliance with requirements and rules, assessments of consequences; all this that you observe, do you believe that this is part of culture, or...?
> R: Yes, this is part of culture.
> I: Is there something that’s not culture, then?
> R: Well, there are so many definitions of culture, what’s ‘in the walls’ and so on; but eventually I guess there is an element of culture in everything; but, you know, if a load-bearing construction is culture, that might be a matter of dispute, or a valve on a pipe line. But in the end it always comes down to some people who have made a decision on some foundation, and then you have an element of culture.
> I: What about the MTO perspective, is the meaning of culture unclear in relation to that approach?
> R: Yes, I believe so. And that’s part of the reason why it is a little difficult to use also. It’s easier to point to a deficiency in an MTO interaction than to a deficiency in the culture …. MTO can be done very technically, culture cannot be done technically, with a conclusive answer …. MTO can be done technically, like in relation to the handling of alarms, with combined technical and human aspects …. pointing to the interaction between people and systems. While culture goes as far back as upbringing, view of life, attitudes, what’s in the spine of every one of us …. MTO is a lot more tangible in relation to some specific activity or interface. But certainly there are things regarding humans as such, deep inside the souls that also influence this. But I feel that culture is even more ambiguous and in the air, as a concept, than MTO. (supervisory coordinator)

This ‘holistic’ concept of culture, partly inspired by anthropological usages and partly construed in order to counter the behavioural reductionism, thus opened a referential landscape within which almost anything of human origin could find its place. The justifications for this conceptualization aside, the somewhat bewildered retreat from the ‘group of experts’ was highly comprehensible. Within the regulatory context, the ‘holistic’ understanding of HSE culture thus entered a ‘game of competition’ with other

available models and configurations. We thus turn to the question of how culture could be related to the existing nomenclatures and understandings of risk management, particularly as these could be applied within the supervisory context.

Configurations of total risk management

> For me it's much the same thing, Human Factors, the MTO concept, HSE culture .... It's all much to do with understanding why things happen, why it goes wrong. Are the operations here so difficult that it's easier to make mistakes? (supervisory coordinator)

Given the long tradition of looking behind immediate causes, and the plethora of available models for tracing and configuring underlying and systemic ones, HSE culture clearly faced some difficulties in finding its proper place. The MTO concept and the 'Human Factors' perspective clearly constituted alternative configurations of risk management 'factors'. Culture was occasionally referred to as just the sum of MTO, for instance by the in-house expert on MTO investigation techniques. The presentations by the Human Factors experts could be hard to distinguish from the presentation by the culture experts.[204] These alternative models were thus referred as both 'similar to' and 'containing' culture, but being significantly easier to relate to and apply. The MTO-perspective somehow served as an all encompassing framework, not reducible to the MTO-*investigation* technique only. But the configuration of elements and connections within this overall perspective was an on-going endeavour.

A project was started during 2005, in order to develop a more comprehensive system for assessing the HSE performance of companies. A number of critical categories were selected for ordering these assessments: 'resources and competence', 'procedures and planning', 'communication and risk awareness', 'carrying out and following up activities', 'technical condition' and 'worker participation'. Scores were to be given to each company, admittedly with much caution and discretionary judgement. The system was to be a contribution to a more systematic kind of evaluation, partly to be used for

[204] Apart from certain differences in scope ('Human Factors' was more oriented towards work processes and micro-environments), the focus was recurrently on such elements as communication, cognitive skills, interaction and interfaces, management, trust, etc. There was also some overlap of personal interest, and both Human Factors and HSE culture had strong roots in the working environment unit.

benchmarking companies and possibly also to promote incentives for improvement.[205] One supervisory coordinator (apparently not among the most 'culture friendly') made a reference to these headlines as a way of relating culture to the more 'known and familiar' classes of phenomena, acknowledged as meaningful, significant, and substantial (although perhaps as an act of courtesy, given the context of the interview).

> This is a kind of thing that might be used to indicate HSE culture …. It would be like the sum of all these elements. May be not all but at least it could be related to the carrying out and following up activities, including compliance and management, communication and understanding of risk, maybe procedures and planning and also resources and competence …. There are really a lot of management aspects that go into the HSE culture. (supervisory coordinator)

We might refer to this tentative account of culture as the 'sum of everything' approach, as a kind of 'total risk management', recognizable also from the HSE culture booklet, presentations from the culture group, and the supervisory director to whom they reported. This, of course, made the process of teasing out the distinctiveness of the cultural perspective difficult. Still, some suggestions were provided, and largely these were related to some rather basic issues about overall priorities of HSE and the causes of these (like 'management engagement'), to the capacity for organizational learning, and to the general efficiency and proficiency displayed in the multifarious practices of risk management. But the act of relating these organizational qualities to 'culture' was not always made explicit.

> R: You see that, when you have incidents, with hindsight insight, you see that they should have understood; there have been indications, that it nearly happened before, or that it in fact has happened, on the very same installation. That they should have used that knowledge ….
> I: How are your observations and judgments responded to in terms organizational learning, that is, do they more or less 'passively comply', are they surprised, do they recognize or realize the organizational shortcomings, or…?
> R: It varies. We've had audits where they don't see any problem at all, that we just got it wrong, where there's been much back and forth, but eventually they've acknowledged our claims and said "great, thanks for giving us that push forward". They've then conducted their own supervisions and found that, "yes they're right; we have no control or steering." And that's our hope or our aspiration; to extract that kind of recognition and understanding. …. But there are other situations where they do what they believe they're expected to do, they just comply …. that's not such a good feeling..

[205] The project was followed up in 2006, and a rapport was produced that suggested a common model of performance measurement to be used in all the supervisory teams.

I: So you feel you could find something quite similar on your next visit…?
R: Yes. We have some supervisions where we look at, say the heli-deck, and we visit several platforms in the same company …. and we make the same observations all over. Then we challenge them, that this is really not necessary …. In that case we had a meeting where we challenged them on how they learned from supervisions, crosswise. And they said it themselves, quite resigned, that they'd had exactly the same experience from their own internal supervisions where they made the same observations. So in a sense, that's an acknowledgement.
I: Wouldn't that be the difference between a good and a bad HSE culture?
R: That's a good point! I'll write that down…
(supervisory coordinator)

So, in the somewhat exploratory (and collaborative) mood of finding a proper place for culture as something recognizable in relation to what could possibly be seen as candidates of application, there was a relieving moment of 'revelation'. Not that the revelation was 'substantial'; these were 'good' stories about how supervisions were supposed to work: to make the companies realize how they should manage their risks in a proactive and enlightened manner, not dependent on any specified list of non-conformities provided after authority audits.

But as noted above, the tentative accounts that were provided, would often evaporate or merge into the established models and philosophies when followed up by questions about the distinctiveness of culture: was this something new after all? And did it add anything to the already present ambitions of promoting self-regulated processes of learning and improvement?

R: In some cases we find the same non-conformities again and again. There is little learning from experience and positive management involvement and knowledge on NCS rules is missing. In sum, many signals indicate sub-standard performance on HSE. Clearly, much of this must be related to HSE culture. It seems as though they just correct specific flaws that we identify, without also improving the system leading to the flaws. When we find things like that, we ask, 'why haven't you reviewed your organization and analyzed the underlying causes…?' The good companies do that; if they find something somewhere, they will go through all their installations to search for similar flaws and issues.
I: So this was your association to the concept of HSE culture, repeated breaches and lack of learning from experience? Isn't this traceable to the beginnings of internal control in the early 1980ties?
R: That's true. But even in such cases we do not use HSE culture, or …. some may occasionally have used the word HSE culture, if many of these tings go wrong at the same time in their systems, in particular if the managers don't grasp it or support …. in such a

case we might have used the word, formerly, to summarize, said that it was a bad HSE culture in the company ….
I: Would the use of the word HSE culture add any meaning?
R: No I don't think so. It may be hard as it is to explain to some companies what they need to improve, even when we present a relatively concrete list of problems. If we used HSE culture, I don't think they would understand more …. 'Bad HSE culture'? Where would you begin? But I still think we have brought something with us from the project …. It was very fashionable for a while, big seminars and so on. Now it has waned a little. And then there is the question of what it is. Is it mainly behaviour, or is it something else? .... is it to hold on to the rail? .... in fact that's a real question. We have been to companies, who have attended the Statoil Safe Behaviour Program, and they're really into it, they back their cars, they have house rules that we're informed about when we're out on supervisions etc. Some go totally into this …. And hold the rails ….
I: Does that mean that the concept of HSE culture doesn't bring in anything new compared to what's already there, that it's just a somewhat vague common term for issues that is already addressed?
R: Yes, well ..for me it's a little like that, yes; after having this strong focus on behaviour for a while …. I've been to the first two PSA conferences on HSE culture; and the first one was very much 'behaviour and hallelujah' …. In the next conference, behaviour was 'out'. …. But generally, I feel HSE culture has been very much linked to behaviour, at least in the industry. I think most of the people here think about HSE culture as the sum of steering and management of HSE in all 'parts and joints', the 'the-way-we-do-things-here' approach ….
I: Could it be the glue that ties the organization to the regulatory requirements then?
R: Perhaps …. perhaps, because our regulations are very functional …. It's more detailed in the standards, and if some companies …. just correct non-conformities, one by one, in line with standards, they may claim to meet the requirements, but we wouldn't call that a good HSE culture – if you're just into the detailed requirements. HSE culture is more about 'the inside', attitudes if you like, that you understand *why* …. risk understanding, not only to do exactly as you're told without any understanding of the importance …. if you have the whole steering in place, including the execution in all its parts …. So I'm not sure if it adds anything, and we don't use the provision very much, it's more like a 'visionary provision'. (supervisory coordinator)

We may note also how the 'expert complex' would somehow fade to the extent that these associations to established risk management ideals were made. The following interviewee provides a somewhat analogous account of how this process of teasing out the evasive meaning of culture took place, but again, questioning the innovative potentials it would yield:

I: How do you think the culture requirement should be addressed, like in supervisions?
R: It must be presented as a natural part of the questions you pose, in relation to, say maintenance management. Some of the questions we pose in relation to maintenance, I believe that's been done in the past also, they clearly have to do with culture. But it hasn't been put into words. Like management engagement, which has always been a theme, that is also an ingredient in a HSE culture.
I: Does that mean you've really had a way of talking about the same?

R: I believe that. We haven't called it HSE culture. Some of the things we've focused on since the early 90ties, is how overall goals are transformed and made relevant, for instance in maintenance management …. Managers have a key role in this. What kind of engagement do leaders, like field managers, demonstrate? Are they really interested in maintenance, or is it only a cost in their accounts? If that's the attitude of an operational manager, at least you have a problem of conveying the message that maintenance must be seen in a long term perspective, as costs that pay off. If that's their philosophy, and you have an operational manager seeing this as only an expense, then you have a mismatch. These are questions we have focused on, at least since I came here, and that's in a sense also part of a culture.
I: Does the culture concept contribute anything new then, or does it only stir up mess and confusion?
R: It does create confusion, so it does. Does it contribute something new, compared to what we've had, only that we've used different concepts? I'm not sure. That things are interconnected, that's not a bomb either.
I: So it's been an important dimension all the time?
R: I think so. But it may have been more important for those of us who've been working with management systems, HSE-management, maintenance-management, and so forth. It may be more difficult to see if you're working with drilling operations and well-problems. But it's *presented* as something new.
I: It stirs up confusion, but still there seems to be a core of agreement, but not so clearly expressed?
R: I believe you're on to something. I believe there is a common core where we all agree. And that core is quite limited compared to the presentations given by the culture group. That's an impression I have when I talk to others. And again, I think much of this is something we've focused on for a long time. Now, it's been put into words, and put into a context. That may be the most significant improvement. And that it covers more aspects than just the individual. (supervisory coordinator)

Three observations may thus be noted. First, that the value added by applying the concept of HSE culture was unclear; second, that it had the potential of causing communicative confusion, both internally and externally; third, that it tended to trigger the association to behaviours and 'revealed attitudes', considered to be trivial, sidestepping, or unproductive responses in relation to the real issues and causes. Even the call for self-diagnosis could be double-edged, if only better attitudes and safe behaviour was called for. And simply applying the culture-label did not necessarily provide the proper insights for promoting desired organizational responses.

But the 'phenomena' associated with the concept clearly exist 'out there'; something that might deserve the label, which has to do with the organizational ability, or inability, to approach the desired level of purposeful, committed, and proactive risk management, incorporating reflective learning as a 'collective conscience'. This organizational 'ideal

type' somehow served as the benchmark for HSE culture, as being present if the ideal type is approximated and absent or deficient if not. But the vision of this cherished regulatee existed before 'HSE culture' entered the scene, and since that word was new and at the same time vaguely presented or perceived as not just a new word for known qualities but as something 'more', discernable perhaps to 'culture experts' only, a multiple mental operation was required in order to sort out the referential impacts of 'HSE culture'. The final 'test' of whether the introduction of the cultural perspective had contributed to something substantially new, was only partially passed and perhaps not even completed. Several options remained open, ranging from seeing HSE culture as being a new word for known phenomena, facilitating an increased awareness and sensitivity for these, to seeing it as a confusing concept instigating futile searches for its meaning. A number of intermediate options were visible, although there had possibly been a deteriorating process toward the latter. Clearly, the general interest in and 'affiliation' with the culture project would appear as a distinguishing factor in terms of how much energy was invested in these processes of translation.

The largely affirmative response to the question of whether a 'sound HSE culture' would be 'present' if all regulations were complied with, fully and in agreement with the regulatory purpose, confirmed the 'holistic' interpretation of the concept. The responses could however contain ambiguities. There was regularly a certain surprise at the question, although sometimes bluntly affirmative, sometimes also hesitant and reflective. The surprise indicated that the 'holistic perspective' was not explicitly recognised in relation to the normative foundations embodied in the regulations; the more cautious responses, however, indicated that there was 'more to it'. Again, this 'added value' appeared to be associated with the organizational ability to engage in sensitive and reflexive higher order learning strategies; regulatory compliance was not to be reduced to simplistic notions of 'going by the book'. On the contrary, such practices would be used as *examples* of bad management- or company cultures.[206]

[206] This could be the case if procedures evidently appeared as bad substitutes for more basic changes in organizational or technological design, such as requiring the employees to use awkward equipment or protection rather than removing the risks that made them necessary in the first place. Sometimes such procedures also appeared to be devised in order to 'cover up' for the company, and possibly push responsibility on the workers if something happened (that they didn't 'follow procedure').

Despite confessions about these confusions and the challenges and 'dangers' associated with using the label, most respondent were both able and willing to provide both reflexive conceptual accounts, numerous examples, and empirical associations. Some of these were certainly associated with perceptions about how culture had been adopted and applied within the industry. Most were critical of what they saw as a one-sided focus on 'behaviour and attitudes at the sharp end'. It was in fact seen as a major effort and contribution of the culture group, both to warn against the behavioural biases, and also to conceptually dissociate these from HSE culture. Clearly, there were different and perhaps conflicting views about the substantial issues of how to manage risks in terms of distributing causal weight and moral responsibility in the multifarious continuum between persons and their environments. In accordance with basic regulatory principles and strategies, a focus on 'behaviour' would at least have to cover *all* levels of actors and decision-makers, even up to the licence committees.

Opinions about HSE culture clearly diverged among the middle managers, about the virtues, vices, and ambiguities of the concept. But these differences did not necessarily reflect divergent opinions about the 'substantial' risk management issues. The most 'accommodative' responses may also have reflected loyalty to the project and its members (and vice versa). It was in fact hard to find any neatly ordered correspondence between opinions about 'HSE culture' as such, and the substantial issues to which the concept could be seen to refer.[207] The evaluative sensations influenced the dedication and interest in exploring the potentials of culture and not only discard it as substantially superfluous or semantically confused. But even the willing and accommodating responses reflected good intentions more than clearly defined strategies for how culture was going to enhance the supervisory practices:

> R: But all in all I believe it's hard to grasp this cultural element. I'm planning to challenge that culture group on that. They appeared in the supervisory group, advertising the use of the members in the group .... So I plan to get a discussion with them on these things related

[207] One supervisory coordinator, who deliberately refrained form using the concept since it just 'stirred up confusion', and with whom I participated in an audit, was on that occasion, as dedicated in teasing out the 'learning capacities' of the facility as the more 'culture friendly' respondents.

> to contractor issues, interface problems, and culture. Challenge them on that …. I think it's important, but it's very hard to take hold of. And I think that's a common sensation about that concept.
> I: But do you think it has any added value, that it has any contributions to make, that it can fill in any holes .... or?
> R: Yes, I think so. I don't know which yet, but I believe it can, and I feel that it's very much …. like a comprehensive or holistic approach when you think about culture. And that's a contribution. But I don't think I will get, like 5 or 6 smashing culture-questions …. I doubt that. But I might get some input to how other kinds of questions might say something about culture and that may trigger yet other questions. It's really not typical questions for engineers to probe into. And we have many engineers here, who might think that this is a bit too soft around the edges. And that's understandable. (supervisory coordinator)

The contrast, and possible contradiction, between 'cultural perspectives' and the 'technical mind-set' of engineers was not an uncommon association, and as noted, culturally sensitive supervisions were supposed to supplement or replace the traditional inspection-like styles, to the extent that these were still practiced.[208] But as noted above, such styles had for long been targets for reform, and the value added by introducing the 'cultural element' was not clear.

Culture, structure, and operational context

> I think it is a very demanding and challenging word to use. It opens a discussion about its meaning. They will say 'we have it', or it may be that parts of the company 'have it' and other parts does not. So it turns into a question about the use of words – if the 'whole company has a bad HSE culture' …. (supervisory coordinator)

The Gyda case foreshadowed several problems of diagnosing cultures; not only in terms of 'what it was' and how it would be perceived, but also of how it could be attached to levels of intersected and increasingly comprehensive, oblique, and blurred operational and organizational systems. Did it apply to crews, shifts, installations, projects, fields, companies, licenses? How did cultures 'correspond' to such organizational boundaries? Could cultures survive organizational transitions, fusions, company take-overs, etc? The issue was raised not only in the Gyda accident. It was significantly addressed also in the Snorre incident. Was it only the Snorre-organization that had a 'culture problem', was it Statoil, was it a heritage from the Saga-years? In short, the question of how cultures

[208] This was certainly not a universal rule, as some of the officials reported to have "fell in love with" the culture provision, clearly belonged to the technical disciplines.

could be attached to or matched with different social and organizational contexts was not clear.

> You have several perspectives. You have the license perspective, you have the project, you have the company; what is even more interesting is that you have the fields …. Seen in a broader perspective, that in terms of creating values for society, the fields as such are really the important unit. 'Managing culture', or whatever you might call it …. would then be a crucial element. Then it wouldn't just be silly logic, but it would be a value adding activity to work with culture, I would think …. Should we then require that there should be a 'field culture'? Fields are really very different, reflecting internal varieties in companies. This questions seriously any attempt to approach company cultures. I don't know. Should we concentrate on the license level? Then the projects would have to adapt their cultural approach to that of the license? (disciplinary leader)

The issue of targeting the significant organizational units, with transient and blurred social borders thus complicated the uses of the label, adding to the other conceptual problems discussed above. But these were clearly relevant questions to address. Were there systematic differences between companies or installations, and which were the most appropriate units identifying cultures? And what was the impact of long and short term changes in such cultures?

> I believe the companies contribute to some extent. But I believe these differences were greater in the past. Now, there's extensive cooperation across company borders through the OLF and working groups like Working Together for Safety. And we contribute significantly to greater cooperation through the regulation project. 20 years ago that would have been unthinkable, that you involve those you regulate in a project to develop new regulations that shall be applied to them. We included people who were deeply involved through the whole period. We've got a great deal of positive response on that approach …. And it has contributed to erasing differences between companies. Previously,10-15 years ago, we'd say that some operators, with their Americanized culture, were more like adhocracies. When something happened, and they decided to do something, they're number one. For instance, one of the operators jacked up a whole field. Few other operators in the world would even think of doing just that. Had it been an other operator they'd probably still been investigating what to do …. Historically, how to analyze incidents and utilize previous experience for continuous improvement, and that kind of thing, the systematic handling of such issues, that's been more of a challenge. Some operators have been excellent in their systematic approach, steering documents, streamlining processes, etc. But then they have a problem of getting things done …. map and terrain doesn't quite correspond. These may be two extremes, in my view. But this was like ten years ago. Differences have decreased considerably. Now they're hardly discernible. I believe, or I like to think, it's largely due to the processes mentioned. They may have realized that HSE is nothing to compete about; we should compete in other areas… (supervisory coordinator)

Despite these tendencies toward harmonization or development toward greater similarities on some dimensions, the differences between 'local cultures' were still observed, sometimes even down to the level of the crew; cultural difference was observed also in organizational interfaces and critical interactions:

> R: There's a lot of culture in the interactions between the actors, I'd think. May be also cultural problems, given the fact that you have a lot of companies, with different backgrounds, different points of view, beliefs, contracts, economic conditions, interests, etc. …. And what the culture provision prescribes is that all participating actors have a responsibility. And everyone taking part in this chain, it's about interaction, right, and how culture influences this interaction, or what is culture in this interaction, I believe that's a bit hard to grasp.
> I: Do you think there are specific cultures in companies or installations ..?
> R: I believe there are differences between one company´s installations, and between the crews in, say, a well-service company …. Sure, you will find in a company, elements of what the company on an overall level gives priority, like through the programs and all that; but I think it depends just as much on the local management; that's an element that I think influence culture – the management. But how, and all that, I feel that's hard to grasp.
> I: Does that mean that the large programs …. that you don't observe that they've had any impact when you're out?
> R: It's hard to tell and a bit early, really. There are different milieus on different platforms; that's true. It's more local. Every platform has its own framework conditions. On some platforms things are cumbersome, on other platforms things run smoothly. That's one kind of condition, some struggle with old equipment; others have a Rolls Royce, right. Some have a manager who believes this is important, or that. So you'll have small …. worlds.
> I: Is this apparent here …. that it's talked about?
> R: I believe there are several levels here. If you talk to those who travel around, you'll get that answer. That there are typical company cultures and typical installation-specific norms and rules, or what you would call it. In that sense I believe there are old histories, company histories, around …. (supervisory coordinator)

These various ideas about how cultural attributes corresponded to different social and organizational units, and how such attributes changed in the course of time, thus added to the ambiguities of culture.

But the problems related to increasingly ambient and dynamic organizational forms also triggered more existential regulatory questions, questions that could be seen as increasingly important and gradually making its impact on the very possibility of regulation. These had to do with organizational designs in very complex work processes, specifically apparent in the petroleum industry, with increasingly flexible and transient organizational patterns that could require rapid but non-predictable adaptations and much creativity in the execution of tasks. In particular, the introduction of new modes of

operation, based on the use of information and communication technology, has lead to the establishment of 'virtual factories' where the operating function (for drilling, production, maintenance, etc.), may be integrated between geographically separate teams, sometimes located in different parts of the world. The rule-bound and procedural style of management associated with HSE regulations and systems would meet serious obstacles facing these kinds of organizational dynamics; as was noted by one of the disciplinary leaders:

> I don't think you can design a perfect system …. you manage in the face of great uncertainty …. but that doesn't necessarily change the measures employed, only the perspective …. Or you will add something more …. you might want a 'culture', if that's the right word, implying that improvisation is quite all right. That's not acceptable in the present system; you design measures for controlling behaviour, etc., where improvisation is weird or unacceptable, where you have written and unwritten rules all around you …. I believe that what we are able to regulate will only decrease, not increase …. we're heading towards more entropy, more chaos, a lot more dependencies, unpredictable dependencies and so on; like in integrated operations. The regulatory philosophy we follow presupposes that we can, say, draw up an organizational chart. To do this, draw a chart, specify the available recourses, consider how you can 'manipulate' etc., that's really basic in our thinking about management. We're moving towards organizational forms where you cannot draw such charts for vital work processes; you cannot predict them the day before, or even hours before they are created …. Hydro says something quite apposite about this: know-how is invited into work processes through available electronic channels. They're invited; may be they don't respond, may be the invitation is sent to a lot more people than actually are going to meet to solve a task on an ad hoc basis. So you cannot plan ahead. That's the kind of organization we're heading towards. Ok: how are we going to manage that, how are we going to regulate its management? I don't know. The only thing I know, or think, is that our influential capacities, at least through regulation, will only diminish. The significance of, say, a procedure will not be the same …. That's important from a regulatory perspective, both regarding detailed and functional provisions …. In my view we must opt for a revolution; we are already late in the process. We're caught in the same line of reasoning that we've been used to since the 'cultural revolution', or even the industrial revolution. This more organic and transient understanding of reality does not seem to be reflected in how we relate to the industry today …. Today's solutions are poorly adjusted …. Then it's extremely important, for culture to play a positive role in this picture, that culture 'management, or whatever you might call it, must also be quite flexible, and far more comprehensive than these ideas about holding the rail …. or whatever… (disciplinary leader).

However, the acquiescent conclusion to draw from this somewhat exigent and perhaps defensive outline, was that 'culture', in its present shape, didn't approach the kind of sophistication required to meet up to such challenges. But then, neither did the remaining contents of the regulatory tool-box. Still, given these developments, where it becomes

increasingly difficult to formulate verifiable requirements applied to relatively fixed socio-technical structures, a revitalized and more dynamic conception of the cultural could perhaps be envisioned in order to capture and adopt to these new realities.

The regulatory context

> A requirement has no significance if you cannot verify the conditions for its fulfilment; this has been one of the discussions about the culture provision. It must be a tool for the authorities, actually relating so concretely to the realities out there that it's possible to see what's good enough and what's not good enough. (disciplinary leader)

Introducing culture in the regulatory vocabulary thus challenged not only the conceptual and diagnostic capabilities of the agency, but also the regulatory strategies and the possibility and even limits of regulation. Most respondents related these challenges to the already existing philosophies and approaches, trying to make 'culture' fit into these. For some, that process was relatively smooth; for others, it was more like a process of 'squeezing' than of 'fitting'. Although there were attempts at 'culturalizing' the audits, the results were far from clear. It's not coincidental that the two occasions where the provision was actually used was in larger investigations, where they were able, with considerable detail and in-depth enquiries, to trace the complexity of technological and organizational trajectories leading up to an incident. As noted in Chapter 5, the context of an ordinary audit often proved insufficient for providing very thorough assessments of organizational or underlying reasons for (or 'causes' of) the 'observed non-conformities'. Culturally attuned audits more than anything required a great leap beyond apparent and observable failures. The attempts of the culture group to develop supervisory guidelines reflected a desire to penetrate more deeply behind formal documents, and to use audit interviews more intensively in order to tease out what was really going on; emphasis was thus put on the context of communication, on establishing trust and confidence in order to get more truthful and realistic responses; they also had ideas about introducing group interviews in order to enhance the quality of the information, beyond what could be extracted from one lonely worker or safety representative. In a group, people might feel more confident, respond to each other, and provide more elaborate and realistic

information.[209] But, as noted in Chapter 6, these attempts were terminated; and since cultural diagnoses appeared to be beyond the capacity of ordinary audits, the idea developed that culture should rather be addressed on the basis of several sources of information over a period of time. But that venture also appeared to have evaporated.

Clearly, the 'cultural discomfort' was related to the experiences the agency had encountered in their relations with the industry. As one supervisory coordinator noted: "The industry asked: 'what do you mean?' And we were guilty of a meaningful response". So they'd rather not use the 'word' themselves, much less enforce the provision. There was certainly a discrepancy between engineering and legalistic 'cultures', oriented towards standards, criteria, right/wrong dichotomies, observable evidence, quantifiable indicators, etc, on the one hand, and the fuzziness of culture, and the interpretive and exploratory routes to its understanding. But the group resisted early attempts to 'operationalize' culture by using available 'measurement scales'.[210] We may recall also that the regulatory intentions, gradually adopted by the inheritors in the agency, were not that the provision should be enforced in the ordinary manner of measuring compliance. It foreshadowed a much more interactive and mutually engaging kind of follow up, requiring the agency to sensitize the industry to broader ranges of models and alternatives in attributing causes and designing safety regimes. Although the expressed experimental nature of the cultural quest also indicated their willingness to engage in more creative interactions with the industry, the regulatory context provided an unfavourable climate for 'culture'. And although the value of regulatory provisions could not be judged solely on the basis of their formal enforceability, they would still be put to this kind of 'test', searching for the 'evidence' sufficient to justify their application, in particular when appearing as single provisions.

[209] From the ethnographic point of view, the audit was mostly just a teaser in terms of access to the inner lives of the organization. As I joined one of my 'peers' (one of the in-house anthropologists) in a two day audit on a land facility, I could with some resignation sympathize with her expressed desire to be a 'fly on the wall in one of those safety meetings'.

[210] Apparently, several attempts had been made by consulting firms to sell in such instruments to the agency.

The effects of the rather tentative and cautious diagnosis offered in the Gyda investigation testifies to the perceived 'powers' contained in applying the provision (see Chapter 6). But also, the rumours and misconceptions that followed, both inside and outside the agency, indicate that the 'animal' was perceived to be more monstrous than it actually was (or than some cared to check out).

Under any circumstance, when challenged by the industry about the scope and content of the provision, the regulatory commitment had to be faced.[211] The 'enforcement issue', having to provide evidence for transgressions, was thus a recurring concern, as was evident in the Snorre case. This reflected also the notion that 'hyper-functional' provisions were 'void' if not clearly related to more specified criteria. The parallel discussions, or occasional reflections, whether it should have been phrased and placed as a purpose provision, or even abandoned altogether, gave indications to this. As noted above, the provision thus also challenged more deeply felt concerns about the scope and limits of the regulatory role, as was bluntly spelled out by the disciplinary leader for HSE-management and legal affairs:

> I try to imagine what it would be like from the other side of the table, if you were the company; what can you do with an order about your HSE culture? Where do I start? And even if they start with the more specific observations from the report …. and if they fix that, does it imply that they've really fixed their culture? I really think this is quite difficult. And I think the companies really work hard to do their best, and then they deserve a critique that's comprehensible, recognizable, manageable, as far as possible. I believe, if you create despondence, powerlessness …. nothing that adds value …. I really believe that we should contribute to value adding processes, we should make a contribution, it should have a positive effect. It can be really painful or uncomfortable, that's not a problem …. but it should be value adding …. But getting the message that my culture is in pain, that's a bit too much …. and then, how should I convince you that the pain is cured? And how many years should the treatment take in order to remove the pain, or to convince you that my culture no longer hurts? I really don't know. I'm really quite at odds on this point, and I feel I don't have the professional authority in this field to forward any qualified opinion …. As far as I understand, with respect to HSE culture, it's still an animal that's not very well defined, that there is no unequivocal model, or sets of models, or ideas about how you can 'fix' a culture, or improve a culture. You know, this is still somewhat ambiguous. This means that the requirement we have is not so easy for us as a regulatory authority to relate

[211] The importance of these environmental responses may be indicated also by the fact that the 'stronger' application of the provision in the Byford Dolphin case (see chapter 6), was apparently bypassed in relative silence; no one had challenged their diagnosis. And: the regulatory advisor in BP in fact also thought that the issue had been a bit dramatized, and that misunderstandings about the 'scope' of the formulations used had been sorted out and settled fairly soon; but even then, rumours persisted and were aggravated.

> to in our supervisory activity, as say, the requirements of a BOP; these are also functional .... and there are references to international standards defining acceptable functionalities in given circumstances. We cannot have that in relation to culture. So then it's perhaps a matter of questioning the whole image of which functions a regulatory framework should have, and the role of the authorities in relation to the industrial actors .... that must be revised.
> (disciplinary leader).

Organizational marginalization

HSE culture was clearly not high on the agenda in the strategically important arenas within the agency. Leaders on all levels evasively referred to the 'culture group' when questioned about HSE culture, including also policy issues about enforcement practice. By delegating culture to a relatively isolated group of newcomers, it did not enter the strategic level of consideration or reappraisal, and several important disciplines were not represented in the project. It was left to the project group to sort out and resolve the meanings and impacts of culture, and then to present their revelations to the rest of the organization, to the industry, and to all others. The group operated largely on the outskirts of the organization, trying to sell out what had been manufactured and alchemized in their internal and external meetings; not without managerial support, but still with only vague organizational appreciation.

The disintegration of the culture group culminated the summer of 2005 when the group leader left the PSA. He had been the most important ambassador for the culture project, both internally and externally. He could talk from experience, and street credibility was important, in particular when the topic was of the elusive 'human factors' kind; it had to be related to the recognizable and experiential contexts 'on the ground'. He also had good communicative abilities and an open 'un-fixed' vision of cultural processes, although he would at times appear as somewhat apologetic in terms of his professional authority on the subject of 'culture' (such as by referring to himself as being "only an engineer", thus also yielding to the 'expert complex').

Combined with the contributions from social scientists used as external consultants, the in-house anthropologists, the in-house psychologist (and a few other dedicated

professionals), one would expect the group to be well furnished for the task. Still, in terms of enabling the organization to make sense of and actively adopt a cultural perspective in order to realize or 'discharge' the announced 'cultural age', these factors were (at best) necessary conditions only, and far from sufficient ones. More important was how the culture project as such was embedded within the organization, in particular within its higher echelons, and probably also how prepared it was for engaging in a new and elusive exploration of risk management approaches (given the ones already in operation).

In a follow up interview after he'd left the PSA, the project leader admitted with some resignation:

> I soon realized that HSE culture wasn't so deeply rooted in the leadership-group. I felt they hadn't spent too much time in trying to get behind the wording of the culture provision, and therefore didn't always provide any strong support or commitment. They didn't clearly expect employees to read the culture-booklet and I believe some hadn't read it themselves. It couldn't be the responsibility of the group alone to be the bearers of the culture-message, explaining to everyone what was meant. The management had to be in the front line.

Apart from the fact that the members of the culture group also contributed, to varying degrees, in their roles as ordinary participants in the disciplinary and supervisory groups, the group as such was rather isolated within the organization. The very role of having to 'spread the cultural perspective' indicated that this was the mandate of the group in relation to the organization, not of the organization in relation to the environment. There was no 'cultural movement', only to be coordinated by the group; the venture was elusive and fragile. This was made particularly clear as the group, in early summer of 2005, was given the task of preparing a memo to be used as input to the new White paper, to appear in 2006. The memo was supposed to summarize experiences, make up a 'status' and provide some suggestions for challenges ahead. The task was organized as an afternoon workshop, outside the PSA premises to facilitate a dedicated and efficient work process, and I was fortunate to be able to participate. The occasion was thus unique, like a moment of truth, in terms of getting access to a concentrated review of the cultural experiment. Two key accomplishments were highlighted: The booklet and the conferences. Beyond that, discussions circulated around the strangely paradoxical issues

of (1) how HSE culture was to be understood and (2) how this 'still-in-progress gospel' was to be communicated in order to be appreciated by internal and external target groups. Clearly, a number of illuminating examples were provided of how cultural perspectives could enhance the understanding of underlying causes, could enrich supervisions, etc.; and the struggle against the disproportionate and ambiguous behavioural focus in large parts of the industry could be awarded some success. But the occasion made evident the difficulties involved in talking abstractly or generally about HSE culture, in involving the rest of the organization (particularly the management), and in evaluating the effects of the efforts made.[212]

At this point there were discussions about the organizational follow up of the culture project. Some clearly saw it as a 'project', something to be ended when the job was done: Now they'd had a culture project over some years, they'd made the booklet, some 'cultural' elements was included in the RNNS-project, and now they entered into a new phase. There were discussions about terminating the project and integrate the follow-up of HSE culture as part of the ordinary everyday business of the agency. This 'diagnosis', and its 'logical' consequences, reflected perhaps also a certain amount of organizational fatigue. Much work and energy had been invested, some achievements had been made, but the outcomes were dubious, and the prospects were somewhat intimidating.

There was a certain disillusionment, however, with a remembrance of enthusiasm, in how the former culture group leader commemorated his experiences:

> The culture project wasn't a fad. My industry experience made me interested. And I still don't believe the provision should be removed. Some say it could, that one should rather speak of 'management'. I believe that would reduce the quality of supervisory activities; it would be a poorer supervision, less able to creep under the skin of the companies. I've seen how one platform manager could break a code and really change a platform culture, almost overnight. He stood forth and declared his commitment; that everything was to be reported

[212] After four hours of intensive work, everyone was more or less exhausted, as were ordinary working hours. I ended up writing the memo in collaboration with a newly appointed member and secretary of the group. This is clearly not meant to indicate that I at that point was any more clear-sighted than the other participants in the work shop. Rather, I had no evening obligations, and I was also a bit (ethnographically) thrilled by the opportunity provided by the whole occasion, and to change roles: from observer, to observer/participant, to (almost) full scale participant. But I also believe that there was some ethnographic significance to the fact that the other group members didn't demonstrate a stronger dedication and concern for the end result.

> in an open and trustful way, that he wouldn't give a damn if he got anything on his record. This is much more important than fancy management systems. Then comes another manager along, and everything changes back to how it was before …. We must be able to understand the powerful dynamics of such processes if we are to improve HSE conditions out there. I really thought that the cultural approach would be a necessary asset in sensitizing the agency to such processes.

Throughout 2005, there were indications that engagement in HSE culture no longer appeared as particularly attractive; the anthropologist originally recruited for the task had been on maternity leave for some time, but did not rejoin the project. HSE culture was associated with vague and soft human intangibles, as compared to the real and measurable and tangible stuff of engineers. And the intangibles of the 'human factor' could be more readily approached by the more established models available. The task of the project was correspondingly daunting: combining and integrating theoretical and practical knowledge on 'culture' with the existing risk management conceptions and strategies, all to be made relevant to the industrial context, and finally constricted by the regulatory role. HSE culture had to appear as something significantly productive in terms of developing supervisory skills, interpretive repertoires, and explanatory models. The question of how to integrate or relate HSE culture to the existing concepts and conceptions would have required more committed contributions from the various disciplinary groups, and a willingness perhaps to make some accommodations and sacrifices in the design of 'classification systems'.

Accordingly, there was a gradual shift in the burden of proof towards justifying culture as a significant contribution to the regulatory repertory. In some contrast to the initial period of legitimate exploration, this could no longer be taken for granted. The 'unbecoming' comment by professor Hovden, and the reactions it caused, was indicative of this shift and how it was felt by those involved. It questioned the implicit but fragile convictions, and despite the fact that it could be countered by restoring the 'holistic approach' and blaming the industry for the reductionism, it was still somehow challenging the existential foundations of their mission. And the 'holistic approach' would strike back: in having to the face up to the task of conveying the practical applications of the ever expanding and increasingly abstract contents of the cultural 'black box'. The translation

process was all the more complex. First, by abstracting the cultural from complex and relevant experiential realities, then by making sense of the abstractions, and finally enabling a meaningful re-applications onto new and widely divergent experiential realities. The provision of 'examples' could in principle proceed infinitely, and the competence of the mentor would ideally comprise a rich combination of knowledge about the industrial risks, the successful design of their management, and knowledge about 'the cultural' as applied to these realities. It presupposed a lot of organizational patience, curiosity, and engagement across disciplinary boundaries, and probably a fair expectation that the effort would be rewarded. Faced with the organizational and communicative barriers, the task was overwhelming. As was somewhat more laconically commented by one project member, after it had been terminated in 2006: "very high interpretive costs were involved in the culture project". She still felt that the project had contributed to changes in the agency in terms of greater awareness and sensitivity to how socio-cultural preconditions were instrumental in achieving the regulatory goals. As was also commented by the project leader:

> The discussions we had with the industry about HSE culture did provide an opportunity for more 'enlightened' communication , in particular to 'undress' some of the existing naivety about a 'roboticized' world of people, organizations, and technologies, where you can push a button in one end and painstakingly predict a result in the other end .... and, furthermore, the idea that incidents and accidents can really be 'explained' if only the forms and schemes are sufficiently comprehensive. These discussions revitalized more 'holistic' appreciations of the fact that life, onshore as well as offshore, is not static and fixed, but to such an extent dynamic and influenced by so many factors and 'driving forces' .... We need to draw attention to all these 'relations' between framework conditions, such as the action or 'non-action' of the onshore organizations, the complexity of operational processes, the role of individuals and group-processes, being conscious about the importance of 'time' and timing, and so on and so forth. In short, we did have 'value-adding' and highly meaningful discussions that involved a number of people, also internally, that had not always been 'commonly accepted', and I believe this contributed to more reflective considerations about risk management in the industry.

As noted in the introductory chapter, the 2006 White paper had few references to HSE culture. Partly, it was referred to only as an aspect of the psycho-social working environment, partly as a topic requiring more research. The most extensive reference was made in relation to major accident risks, by pointing to the behavioural bias observed in the industry, and by providing a brief but quite comprehensive, 'total risk management',

account. The formulations used did not clarify much, but restored the idea that culture was sometimes just some aspect of some aspect and at other times it was all over the place.[213]

Concluding discussion

We conclude this chapter by recapitulating and exploring some implications following from the short version of the initial research question: 'What happened to HSE culture?' The title of the chapter draws attention to the interpretive and semiotic aspects, as did the introductory elaboration of this research question in foreshadowing a study of organizational sense-making. Evidently, the local practitioners of risk management could hardly have hit upon a more demanding and comprehensive term to cope with when choosing to introduce 'HSE culture' as part of the regulatory strategy.

The questions prompted by the cultural turn were multifarious: How could the 'culture label' (or its composite properties) be attached in any meaningful manner to the highly complex and transient operational processes and organizational structures within the industrial complex? Was culture predominantly to be found in the attitudes and behaviours of workers within the constraints of the workplace context? Were these local workplace contexts shaped by decision making processes at higher echelons, also deserving to be addressed in terms of culture? Was culture to be revealed in the overall priorities and trade-offs made in the licence committees? Was culture the residual factor that either 'escaped' of 'effectuated' the formal systems of risk management? Was compliance with procedures good culture only if procedures were good? How could 'indicators' of culture be interpreted and aggregated in order to justify cultural diagnoses? Was good HSE culture just another word for what any one authorized person considered to be good practices of risk management, *inter alia* as these could be extracted from the regulations?

[213] The formulations read as follows: "HSE culture must also address technical and operational factors. HSE culture must be addressed in a way that places more emphasis on technology, quality planning, competence, management involvement and other framework conditions for prudent operations". A list of suggestions of application is provided, including risk management, risk analysis, risk communication, and models for evaluating the human contribution to risk. The MTO concept was however used extensively, but never related to culture.

These were local enactments of the blurred semiotic and substantial engagements with culture, and they challenged the interpretive and diagnostic abilities of engineers and anthropologists alike (as well other professionals). The somewhat resigned sigh about being 'only an engineer' could only be responded to with considerable sympathy (and occasionally causing an analogous self-reflection on behalf of the anthropological discipline). At the same time, understanding the technologies, the man-machine interfaces, the decision making contexts, etc., was largely the privilege of just these experienced engineers, calling upon others to act as 'culture-experts'. A considerable amount of organizational energy and resources would be required in order to bridge these 'spheres of expertise'. But, as explored in this and the previous chapters, the bridging process proved difficult, and various 'islands' floated in the sea of risk management approaches. These approaches did, however, reflect a common and deeply rooted belief in the necessity of penetrating the layers of causes and antecedent conditions, beyond 'technical failures' and 'operational errors'. Social and organizational factors had for years been addressed with varying degrees of sophistication and energy. If there was a 'culture' to be found in the agency, in terms of 'basic assumptions' and 'patterns of behaviour', a place to start would be to analyze this relentless quest for 'underlying causes' and the classificatory systems devised for ordering them. It was probably just a matter of time and necessity that 'culture' at one point or another would appear among the candidates. And as noted in Chapter 3, this was foreshadowed as far back as after the Bravo blow out in 1977. And 'cultures' were probably talked about even before that. The trajectories of how and why it made its way to a prominent place among the "principles" in the Framework Regulation may in this context seem incidental. But, as will be further explored later, the venture can not be reduced to only a simplistic instance of 'imported fashion' from the global menu of managerial vogues, in order to claim sophistication or buy legitimacy from the environs. Rather, it was part of a never-ending quest for penetrating the secrets of enlightened risk management.

The interpretive conundrums of culture may tentatively be summarized as follows: *First*, what it 'was' in terms of empirical instances; *second*, the social or organizational scale

and boundaries of these; *third*, the semantic and pragmatic question of how they could be subsumed under the name of 'culture' according to 'expert judgment'; *forth*, how they were labelled and conceptualized within the established regulatory models and vocabularies; *fifth*, the relationship between the conceptual labels applied (new and old) and their possible empirical applications; and *sixth*, whether culture referred to something 'else', outside and beyond both established frameworks and perceptions. In *sum*, these uncertainties provided no clear strategies or templates for how 'culture' was to be applied in relations with the industry; some tended towards optimistic expectation, others towards reluctance or evasion. Many informants characteristically made it clear whether they were speaking for themselves, for others, or for the agency, indicating a lack of shared templates for conceptualizing culture. The act of labelling something by that name was typically accompanied with some reservation, and a sensation of relief could be observed when turning to the more familiar notions, such as 'MTO interfaces', which could be talked about with more straightforward confidence. Vague or implicit ontological assumptions could still be observed, about culture as being 'something', visible perhaps through certain indicators or that some competent observers possibly would be able to 'find it'. But occasionally, there was also a slightly ironic undertone indicating that there wasn't really much to find that would add any significantly novel insights to the understanding of risk management.

The culture group had moderately succeeded in deconstructing the most reified notions of culture and much energy was devoted to broadening its scope beyond the simplified ideas about culture as 'revealed attitudes' among offshore workers at the lower echelons. But these were only partial victories; and they were also double-edged in the sense that the scope of culture was broadened and lifted to the most comprehensive level of 'total risk management'. Dismissing the reified and reductive stereotypes also increased the interpretive costs. Even the more manageable interpretations employed during the initial phases, relating culture to collectively accepted practices within more localized operational contexts, were exceeded. The strategy of the culture group, as well as external 'culture experts', appeared at times as an attempt to 'attach' HSE culture to as many of

the known and favoured aspects of risk management as possible, making conceptually and substantially more relevant, familiar, and recognizable.

Culture was everywhere (as it arguably is). Almost by the same token it became elusive and obscure. The HSE culture booklet may not have eased this process of translation and application; it provided no clear exposition of how culture could be 'positioned' in relation to the established conceptual frameworks, or of how the cultural perspective would provide distinctively new approaches to understanding or managing risk. Curiously, hardly any references were made to the booklet in the interviews. But those who did, praised the content; among whom were some of the most unequivocally proclaimed sceptics. And as this scepticism was largely tied up with the behavioural biases associated with the 'culture programs', an almost self-defeating circle could be observed. But there is also another (perhaps paradoxical) side to this observation. The missing appeal of 'the cultural perspective' must partly be attributed to the simple fact that a number of the essential ideas it embodied were *already* deeply engrained in the regulatory ethos: no-blamism, openness and rapport, participatory designs, systems based and organizational approaches, tracing 'causes' beyond the immediate technical and operational antecedents, etc. Even if these regulatory philosophies provided a favourable climate for adopting received ideals of a 'sound HSE culture', the 'translation processes' were all the more challenging; in particular as this was perceived (and perhaps presented) as something significantly innovative. The fact that available vocabularies existed for much of what could be subsumed under the culture term abated the ability to identify the value added by employing a composite term with somewhat amorphous references.

Still, there was a commonly shared sensation of value-adding dimensions that would contribute something significant, if not distinctively 'new', to the explanatory and managerial repertories. These 'known' and recognizable dimensions were closely related to ideas about organizational mindfulness and learning; the ability of the regulatees to move beyond simple and single-loop 'corrections' of error, to re-consider their work processes and to incorporate the regulatory intentions beyond the 'letter of the law' or the wording of a procedure. These dimensions could be recognized in the ideals of

continuous improvement, and constant alertness to how existing systems and rules yielded to their purpose in the real-life technological, organizational, and socio-cultural settings. A sound HSE culture would thus embody the ultimate 'high' state of self-corrective organizational learning beyond the mechanical following of rules or orders. The ability to learn and improve was not only not to repeat the mistakes of yesterday, but of being able to generalize across these mistakes, critically analyze underlying causes, and 'predict' or envision unapparent dangers. But to equate good HSE culture with 'organizational learning' would occasionally beg the question. What was there to learn, and how was the learning to be transformed into action? What 'messages' were hidden in the failures? The behaviour based and error-correcting approaches had partly contaminated the culture concept, and employing the term without extensive elaboration would not guarantee any desired response from the companies.

There would thus be different ideas about culture, just as there would be different ideas about risks, their relative importance, how to assess them, and how to manage them. But these latter ideas were not primarily related to different conceptions about 'culture'; or rather, they were only partially made explicable within the 'cultural frame of mind'. Certainly, reflections about how socio-cultural processes in organizations enabled or disabled them to take proper account of health and safety could be seen as a departure from both the confusions and the reifications surrounding the 'concept'. These reflections referred to the way conceptions, values, and norms related to risk management (or mismanagement) was integrated in and pervading the socio-cultural systems of the regulatee. The obviously productive collaborations between the culture project leader and his professional superior appeared thus as a promising case of successful translation.

These associations to culture were also in accordance with the original rationales, and the early enthusiasm and the traces of present optimism, could be interpreted as expressing a belief in culture as an almost self-evident understanding of the conditions of regulatory compliance as dependent on very real life socio-cultural processes in the industry. The originators' accounts also supported this view (like 'the breakdown of formal systems'), and so did many of the accounts rising above the apparent confusions associated with

understanding the ‘word’. Once the label was there, however, reified notions appeared of a compartmentalized condition ambiguously referring to particular spheres of reality within the landscape of organizational risk management. It was no longer seen as a genuine meta-regulation, but triggered instead a search for what was thought to be ‘elsewhere’, because it had been linguistically labelled as ‘something’, accessible perhaps only to the professionally trained. There was, perhaps, a queer insight in the joke about the “psycho-somatic condition of a pipeline” (see p 289). But everyone still understood that the safety of pipelines would be the result of how interests, perceptions, and beliefs entered into decision-making processes in complex organizational contexts, encompassing, also their socio-cultural situatedness.

The purpose of dedicating a section to the culture provision was to ‘lift it up’, attract attention, and provide regulatory force. The result may have been that HSE culture came to be seen as some particular kind of independent and measurable property, a reified state of organizational affairs. Although the culture group strived to adjust these images and associations, the relationship between ‘culture’ and the rest of the regulatory framework was not made clear; it was given a key position among the *principles* which were to serve as a general bedrock for both authority enforcement and regulatory compliance. ‘Culture’ indeed proved its position as a *hypernym*, comparable to the overarching purpose provisions about operations being ‘prudent’ and a working environment providing ‘full safety’. Such abstract and high level regulations were only made meaningful and applicable within the regulatory context if more specified, lower level rules or standards could fill in the criteria needed for claiming that compliance with the requirement could be assessed, and no comprehensive analysis or interpretation was made of how the remaining regulations could be seen as instances or even specifications of how good HSE cultures were to materialize in the industry. The fact that ‘HSE culture’ entered into an engineering and legalistic context of discourse, oriented towards measurements, indicators and ‘standards’, and even having to face the ‘enforcement test’, did restrict the scope applicability. Having ‘failed’ such tests and found unfit within these dominant discourses, the conditions for a viable existence were aggravated; some phenomena ‘existed’ only outside the formal frames of reference; at lunch tables or other in informal

encounters where ‘evidence’ for their existence could be addressed in uncommitted and colloquial terms.

But this alone cannot explain the translation problems. *First*, the organizational efforts devoted to the project should not be overrated; ongoing tasks absorbed the attention and the marginalized culture group was given the sole responsibility of providing translation manuals. *Second*, there were broader repertoires of supervisory strategies and arenas amenable to cultural sensitivities in agency-industry interactions that were only sparsely used. These did not necessarily require standardized codes of communication, and could be used for more explorative reflections about the complexities of risk management (as they probably also were, but, apart from the efforts of the culture group, evidently not in terms of ‘HSE culture’). Also, the supervisory context did allow for more subtle forms of communication and intervention, although the culture project as such provided no clear recipes for connecting to these. *Third*, the failure to juxtapose HSE culture more systematically to the existing and predominantly ‘rational’ plethora of regulatory expectations may have promoted a process where HSE culture receded into an ambiguous and mysterious *residual*. Normatively they might have cultivated a culture of rationality, but current understandings of culture also reduced it to ‘biases’, ‘rules’, and practices that operated according to less controllable mechanisms. Despite the elaborations made in the booklet, culture as intelligent design and problem-solving, faded, and culture lost some appeal by being dissociated from rationality at the organizational level and associated with ‘risk-adaptive’ behaviour at lower levels.

The relationship between culture and rationality was not only an indigenous (if implicit) concern; and an inclination to dissociate the two, treating culture as the residual that escapes rational models of social (and organizational) life, can be found in academic schemes, as will be discussed below. As rationality is key in risk management, understood as ‘effective’ ways of risk reduction, the disengagement may have been critical. But it was neither total nor unambiguous; traces of reconciliation could be found, implicitly through the way in which the idea of culture resonated with the images of regulatory compliance as something more than simpleminded adherence to rules or single

loop learning from the lessons of error. These ideas of culture were of course *normative*. A good HSE culture implied a commitment to the regulatory purposes and the already existing plethora of provisions provided for fulfilling these, and to the expectation that regulatory resources and organizational mindfulness were mobilized in creative and intelligent problem-solving, properly shielded from economic and operational forces. But this grander vision, or idea, appeared then as more or less synonymous with the mission of risk management and its regulation as such; the synonymy would turn into tautology, making it superfluous to 'test' whether a sound HSE culture contributed to reduced risk. But even that synonymy was not unquestioned and a number of reductive and compartmentalized visions appeared.

As noted in Chapter 2, the role of culture in the safety literature embodies some of the same enigmas, both conceptually and substantially. There is little agreement on the understanding of 'safety culture', and a number of variously structured configurations of cultural dimensions are available. The preceding accounts and interpretations of the cultural experiment should not be simplistically seen as an 'exposure of cultural incompetence'. Firmly placed among the principles in the Framework Regulation, and elaborately outlined in the HSE culture booklet, comprehensive recipes and indications for a 'sound HSE culture' were available. But it was still not clear whether culture was an 'additional element', or just encapsulating and expanding the existing norms and templates for prudent risk management. This resulted, not only in problems of operational and referential meaning, but created also some 'paradoxes of classification' since 'culture' would move within and between such conceptual systems.

Turner and Pidgeon (1997) pointed to another paradox of safety culture in drawing attention to how socially shared assumptions, beliefs, and practices can either facilitate or thwart the possibility for intelligent risk management, advocating of course, the 'cultivated' and normative ideal:

> In exploring safety cultures as a route to institutional design we need to go beyond exploring individual attitudes to safety; to the level of shared cognitions, and the administrative structures and resources which support, rather than constrict, the development of organizational intelligence and above all safety imagination regarding risk

> and danger. This can be seen as one part of the never complete process of active learning (1997: 188).

These normative ideals were clearly embedded in the cultural strategy of the PSA, sometimes referred to as culture, sometimes seen as a continuation of a long term process of regulatory development – and learning.

But such quests have their price, and make the task of regulation a lot more complicated. Identifying the contribution of the 'human factors' within the organizational, technological, and economic settings opens a landscape of opportunities and challenges diagnostic and intervening capacities, which are already severely constrained by the regulatory context primarily based on 'remote control'. The limitations of this context were apparent, but still ambiguous in terms of what properties of the regulated organisms that could be seen as 'auditable' (Power, 1997). Within this context, 'culture' appeared almost as a 'universal remote control'. The regulatory 'wet dream' appeared to rely on the capacity of culture to transform and incorporate regulatory goals, replacing proceduralism and bureaucratization, and tempering economic forces.

The cultural experiment was in every respect also a cultural process: of interpretation, of re-interpretation, of sense-making, of relating new ideas to existing bodies of knowledge, etc., situated within the organizational context of solving internal and external tasks. The regulatory world views in operation comprised a large body of conceptual and classificatory systems, derived from various organizational and disciplinary sources and applied to complex and transient realities, contributing to the unhappy fate of 'culture' as sometimes a meta-system, sometimes a subsystem, and sometimes elusively floating around and in between.

A rather simplistic conclusion would be that the regulators failed to follow up own regulations; a more benevolent interpretation would draw attention to organizational courage and regulatory inventiveness. Given the difficulty of the experiment, in the face of on-going tasks and absorbing challenges on all frontiers, one would not but expect extensive and protracted processes of digestion and maturation. In the next chapter, we

trace the ambiguities of culture within the academic setting, partly in order to prove just that point. The chapter may be regarded as a ‘parenthesis’ in the course of this text, as it basically explores academic struggles with ‘culture’, and may even be passed over for that reason. At the same time, it may serve as a ‘comparative analysis’ of such epistemic and semiotic quests, intended also to make the foregoing interpretive processes appear both comprehensible and reasonably ‘enlightened’. But first of all, it is an attempt to provide a ‘translation manual’ for accommodating culture to the diversity of academic and practical contexts of application, including the context of risk management.

10. What's in a name?

> *Whatever the infirmities of the concept of "culture" ("cultures", "cultural forms" …) there is nothing for it but to persist in spite of them*
>
> Clifford Geertz (1995: 45)

Introduction

As noted in the introductory chapter, the problems and research questions addressed here can be construed in several ways; they appear on different levels and can be approached from different angles. Multiple hermeneutics are required in order to address these configurations. The research project itself was part of the process of introducing HSE culture in the industry and in the regulatory strategy. Social scientists of most flavours contributed from all quarters (the industry, the unions, the authorities, the R&D networks, and other 'consultants'). The various academic notions of culture were supposed to blend in with the technical and managerial risk management models, which had also been increasingly adapted to include human, social, and organizational factors. The recruitment of two anthropologists to the agency was added to the list of measures taken to follow up the culture project. The cultural quest was in this sense a joint venture, although the parties involved had vague contractual obligations. The confusions and controversies attached to the cultural turn involved and reflected disparate academic perspectives and interests, as well as substantial conflicts about risk management strategies. I myself was given access to the agency as part of the venture, partly justified by the assumed prospect of some reward for the resources consumed (including hours of interviews with busy managers and officials). A two-fold personal motive emerged naturally during this process: how could the 'nature' of culture be excavated from layers of academic traditions dealing with the 'concept' and the 'phenomenon', and could the outcome of such exploratory endeavours be meaningfully digested in order to arrive at any viable templates for culturally inspired and informed strategies of regulation?

Personal motives aside, this chapter will resume the theoretical accounts of culture and its role within the conceptual, interpretive, and explanatory landscapes of social science,

notably in social anthropology and organizational studies. The purpose is partly to 'decompose' some dominant usages of the term and its relation to the phenomena to which it is supposed to refer. The hermeneutics of this quest involves thus a double focus: the options on the academic menu served as inputs to the practical (and intellectual) endeavours of finding a proper place for 'culture', but the academic ventures resembles this process through the queer combination of attractiveness, triviality, enigma and, even reverence, involved in claiming something to deserve that label.

And as noted in the preceding chapter, a comparison of these intellectual endeavours may provide some redemption for the former experiment, as yet another instance of the never-ending quest for exhaustive and non-redundant classification systems devised for making sense of complex and 'chaotic' environments. More or less in the same vein, this chapter will also try to substantiate some 'definitional' claims, suggested in Chapter 2, as a way to make sense of culture in a manner that minimizes the theoretical commitments that might follow from such claims. The concept of 'translation manual' may thus be more appropriate for denoting the suggested outcome.[214] Lastly, it may be added, the institutional contexts of risk regulation, within which the cultural experiments took place, are themselves embedded in and shaped by cultural processes, thus providing yet another reason for teasing out the modalities of culture.

The title of this chapter occasionally introduces discussions of 'essentially contested concepts', a label that may be appropriate in this case.[215] Juliet playfully and passionately discards 'linguistic essentialism' in denying the significance of Romeos family name. All though it may seem commonplace to remind oneself and others that concepts and their definitions are social constructions, the wisdom of Juliet is often forgotten in the turbulence of semiotic engagements with, and within, multifarious and ambiguous environments. But for such constructions to do their work properly, one cannot be all too

[214] The term is used here in a manner not unlike what is suggested by Davidson (1974/1984), and applied also by Tambiah (1990) in a more practical attempt to accommodate 'incommensurable' conceptual schemes.

[215] The term was introduced by Gallie (1956) to address "concepts the proper use of which inevitably involves endless disputes about their proper uses on the part of their users"; disputes about such concepts cannot be settled by appeal to empirical evidence, linguistic usage, or the canons of logic alone (see also Geertz, 1973: 29).

indulgent about them either. After all, Romeo was a Montague, and they both died – even if it was just a play.

Against these reminders, two initial conditions for the following exposition should thus be noted. First, the rather trivial insight that culture, the word, is as man-made as the phenomena it tentatively or assertively refers to, just as the understanding of risk management is as man-made as its real-world successes or failures. Second, providing prescriptive 'definitions' of culture is a capricious endeavour, and may put you in the unfortunate position of Lewis Carroll's Humpty Dumpty, occasionally ridiculed by philosophers of language when reproaching the idea that 'meaning' can somehow be determined by resort to some authorized 'origins' or to sophisticated semantic analysis.[216] Culture is arguably among the least 'professionally protected' social science concepts (compared to, say, 'reciprocity', 'ritual', or 'cognitive dissonance'). One might say it belongs to the 'linguistic commons', both within the scientific communities and in society at large; as such it may also be victim to the 'tragedy of the commons', thus left both uncultivated and recklessly exploited (c.f. Hardin, 1968). But then, no Humpty Dumpty could ever be granted 'property rights'. Culture notoriously defies any claims to definitional authority, due to both its 'comprehensiveness' and its 'commonality', Still, if used, it must satisfy some 'cultural requirements'; that is, an understanding of the concept must be minimally shared in order for communication to take place. However, given this point of departure, culture should be explicated in a manner that allows for a viable life in the 'commons', making it adaptable to various theoretical approaches, and as far as possible by using translatable and corresponding terms. In other words, we need a translation manual which is both conceptually robust and theoretically resilient.

This, in fact, appears as one of the lessons learned from the cultural experience outlined in the preceding chapters; that 'culture' repeatedly appeared as a separate order of reality, accessible only to 'cultural experts'. But even within these tribes of experts, such as the anthropological communities, the confusions and bewilderments appear no less daunting.

[216] As famously phrased, adding to the confusions of Alice in "Through the Looking Glass" (1871): *"When I use a word", Humpty Dumpty said, in rather a scornful tone, "it means just what I choose it to mean -- neither more nor less."*

Living with such abstractions as ‘culture’ may be endurable in an un-ending academic discourse, with no external pressures for arriving at a final ‘consensus’; for a regulatory agency with ongoing practical and operational demands, it discharged a significant amount of organizational uneasiness and discomfort. Incidentally, we may interpret this difference in ‘operational context’ against Perrow’s notions of interactive complexity and tight coupling: academic communities scores high on the former but low on the latter whereas proactive regulators scores relatively high on both. The following outline is therefore the result of much digestion, instigated by observing and joining in with the local endeavours, and only made possible with the benefit of time consuming hindsight. In order to justify and substantiate the outcome, we need first to consider with some detail the theoretical sources, primarily as these emerge from anthropological and organizational studies.

Theorizing culture

In Chapter 2, the concept of culture was largely introduced and discussed in terms of the troubles it has caused, ranging from simplified reifications to amorphous versatility. Also, its position within various academic traditions does not correspond (even within disciplines). In organizational studies and ‘safety science’, the somewhat incommensurable academic contexts of psychometric measurement and ethnographic interpretation, embody just some aspects of this ‘ill-structured’ state of affairs. The former approach, largely dissociating culture from behaviour, departs from the latter approach of seeing culture as behaviour embedded in real life contexts. The ‘pollster approach’, taking cultures to be discoverable through the statistical processing of ‘individualized’ responses to ‘validated’ questionnaires, reflecting ‘states of mind’ at the time of filling out the form, appears almost exotic from the ethnographers’ point of view. Indications may be provided through such studies, but cultures in the ethnographic sense, emerge as highly contextual modalities to be discovered in real life interactions. The analysis here starts naturally with the latter tradition, but tries eventually to accommodate the final suggestions to broader spectres of application (including, hopefully, the institutional context of risk management).

Culture in anthropology

Very briefly, the anthropological concept of culture was gradually developed from evolutionary and unitary ideas shaped in the 19th century, through emerging relativistic and pluralistic notions during the 20th century, to an increasingly complex understanding of 'the cultural' as something more or less deeply ingrained in highly dynamic and fluid social processes (Keesing and Strathern, 1998; Kuper, 1983; Peoples and Bailey, 1994). The most famous definition from the early period of evolutionary anthropology was provided by Edward Tylor:

> Culture or civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society (1871: 1).

Disregarding the implicitness of a 'singular' culture (not to speak of "civilization") to be understood as a "complex whole", we should note the familiarity of some basic components, such as knowledge, belief, custom, morals, etc. In fact, these inventories of culture appear to recur, despite diverse and changing ideas about 'their' constitutive nature, individually and taken together. In the evolutionary framework, the singular tense was crucial, since all societies were studied as instances of a continuous and unitary process toward the highest forms of culture and civilization. The plural notion of 'cultures' was developed later from the ethnographic achievements of Franz Boas and others, in an attempt to classify and explain varieties in human societies, not only as isolated 'experiments' of social communion, but largely shaped by cultural diffusion and interaction. Still, this plurality retained an idea of each culture as an integrated whole.

Culture came to be conceived of as everything specifically human, beyond nature and of human creation. The influence from psychology emerged gradually, and Ruth Benedict conceived of culture as "individual psychology thrown large upon the screen" (1932: 24). The interest in the concept of culture was largely American, and culminated in the famous article by Kroeber and Kluckhohn in the mid-century, identifying six categories of definitions of culture (descriptive, historical, normative, psychological, structural, and genetic), and providing themselves yet another definition:

> Patterns, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievement of human groups, including their embodiments and artefacts (Kroeber and Kluckhohn, 1952).

In Europe (notably Britain) 'Social Anthropology' has been the more common denomination; a difference in labelling that also reflected substantial divisions between the two academic traditions. At the height of the structural-functional school, culture was dismissed as a 'vague abstraction', and the American 'culturalism' was taken to be too intangible and ambiguous; this of course, in contrast to social structure. This view was gradually challenged and expanded through the works of Evans-Prichard and Leach, pointing to the indispensability of culture for the understanding of social structures and processes (Kuper, 1983). Later, Mary Douglas noted that "if anthropologists neglect culture, we could well dwindle to a sub-section of sociology or even of geography in European thought" (1978: 1), pointing to the unique calling of anthropology to deal with culture "systematically", given the neglect or incompetence of others (like philosophers, historians, economists, or psychologists).

Just as the notion of generically developed societies, to be studied as structured wholes, lost sway with the demise of the structural-functional school, the notion of singular 'cultures' gave way to far more fluid notions of loosely coupled cultural processes criss-crossing social boundaries. From within the British tradition, Douglas criticized American anthropologists for treating culture as too autonomous: "Culture itself was its own explanation and explained what else could happen" (1978: 1). Culture became mysterious, unexplained, and unchallengeable, only to be understood through its inner, notably linguistic and cognitive dynamic. "The human person was made into an automation whose choices are controlled, whose thoughts and values are passively received from the ambient culture" (1978: 3). Douglas' main ambition was to reconnect the cultural and the social, and at the same time provide a more dynamic model for understanding the relation between the individual and the socio-cultural environment. The outcome was the now widely known grid/group model, placing itself within the family of two-dimensional typologies devised to bring parsimonial order to the complexities of social life. But the dimensions were far from simplistic. The ('social')

group dimension was intended to indicate the degree of social incorporation of any individual, measured by the amount of social interaction, the interconnectedness of networks, and the strength of group boundaries. The ('cultural') grid dimension covered the amount and strength of rules and classifications that regulate individual options and social interaction, such as the availability of roles (ascribed or achieved), the degree of specialization, and the strength of 'insulating' social controls. Thus she challenged the traditionally held assumptions about group membership always being tied to up with intrinsic rules and rights. Mechanisms of grid and group operate in more dynamic ways and allows for several combinations, although still caught within the framework of the model: Briefly put, high grid / high group produce traditional hierarchies, high grid / low group produce fatalism or hermits, low grid / high group produce egalitarianism, and low grid / low group produce competitive individualists and markets (1978).

The model gradually made its impact beyond the disciplinary borders of anthropology. It even gave rise to a research tradition appearing under the label "Cultural theory" (c.f. Thompson *et al*., 1990), thus conveying the impression that this was what writers on culture (such as anthropologists) had come up with after some decenniums of investigation. This may perhaps disrespectfully be taken to reflect impoverished knowledge and academic neglect in the receiving end, be it political science, organization studies, or in the social theories of risk (Rayner, 1992). Despite the merits of 'cultural theory', derived mostly from the process and logic of its construction, it has also caused somewhat reductive applications of 'cultural' analysis, partly by diagnosing cultural 'types' rather than analyzing cultural processes, biased also by a Durkheimian tendency to see social phenomena as 'facts'.

One of the most influential contributions in the anthropological study of culture came with the interpretive or 'semiotic' turn of Clifford Geertz, credited as perhaps the foremost reviver of interpretive and symbolic anthropology in the second half of the twentieth century. The following famous and programmatic statement still ranges as one of the most widely cited accounts of culture today:

> Believing …. that man is an animal suspended in webs of significance he has himself spun, I take culture to be those webs, and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning (1973: 5).

Geertz' account of cultural analysis as interpretation of meaning must be seen against the mounting influence of what he saw as reductionist scientism within the social sciences generally, also making its impact in anthropology. To see culture as "webs of significance" was not to confine it to just the 'semantic' meaning of symbols, linguistic or otherwise. In fact, Geertz argued for a textual reading of social life in a broader sense:

> To see social institutions, social customs, social changes as in some sense "readable" is to alter our whole sense of what such interpretation is and shift it toward modes of thought more familiar to the translator, the exegete, or the iconographer than to the test giver, the factor analyst, or the polster (1983: 31).

Systems of meaning were to be approached through "thick description", a notion originally derived from the British philosopher Gilbert Ryle (1949/63). It was intended to provide an account of agency, beyond the level of simple (i.e. 'thin') description, by including the intentionalities, purposes, and circumstances that made human behaviour socially meaningful. This interpretive context is in an important sense local: human practice is intelligible first of all through the manner in which it is socially enacted. Acts are meaningful (such as the apparently exotic or opaque ones) only within the local context of beliefs, goals, and symbols. However, like language, culture is not imprisoned or hidden in people's heads, but displayed through publicly available symbols. Just as there is no 'private language' (as noted by Wittgenstein) there is no private culture. The interpretivism of Geertz has been received as particularly productive in the understanding of agency; the understanding of actors' intentions from within, as shaped by culturally mediated expressions of world views, desires, and emotions, forms a basic framework for un-reductive interpretations of social agency in all its variety. Comparison, then, is for Geertz a matter of attunement to difference, taking account of distinct forms of life but still engaging in mutual comprehension, rather than employing formal methods of concomitant variation, descending to the lowest common denominator or ascending to abstract universals (Ortner, 1999: 33). Explanations should be interpretive, seeing society less "as an elaborate machine or a quasi-organism and more as a serious game, a sidewalk

drama, or a behavioral text" (Geertz 1983: 23). Culture is seen as deeply entrenched, comparable to genetic programming, but located, not in our bodies, but as extrinsic sources of information in the inter-subjective world of common understandings. The genetic analogy points to the way culture provide 'instructions' or 'recipes' for the processes shaping public behaviour. Unlike lower animals however, such programming does not incite predetermined behaviours. In fact, the genetically programmed responses of humans are so generalized that they depend on the culturally manufactured sources of information available in the public sphere of significant symbols. Culture then, is intrinsic to our cognitive and emotional viability. Without it, a human "would be functionally incomplete … a kind of formless monster with neither sense of direction nor power of self-control, a chaos of spasmic impulses and vague emotions" (1973: 99).

The strong belief in the public nature of culture has been criticised, to borrow a phrase from Wrong (1964), as being 'over-socialized' (Barth, 1989; 1992; 1994). The idea of culture as 'public' seems in large parts to be derived from the semiotic perspective. But taking language and symbols as the basic metaphors for understanding culture, may have caused insensitivity to diversity and individuality. Language is only partly an adequate model for understanding culture, since few of our mental models and practical skills, it can be argued, are to such an extent subject to 'disciplinary controls' and continuous public scrutiny and negotiation, at least in the more 'denotative' and ostensive contexts of language use. There are misunderstandings and confusion, but mostly (or at least potentially) there is understanding (Davidson, 1974/1984; Lukes, 1982). Although there are individual variation in the use of language, such variation is of minor importance, against the role of language as a communicative vehicle, compared to the varieties of the worldviews, beliefs, values, etc., taken to constitute cultural systems. The more 'distributive' models of culture take these varieties into account by pointing to the partiality of cultural manifestations and the individuality and positioning of actors, without ignoring the transcendental capacity of commonalities (see Borofsky, 1994). Some have even argued that, if culture is primarily learned, "its ultimate locus must be in individuals rather than in groups" (Goodenough, 1981: 54). From the basic idea of culture as something learned, memorized and retrieved, there has thus been an increasing

interest among anthropologists in the cognitive sciences and has lead to re-examinations of the role of individual cognitive capacities in the analysis of culture (Bloch, 1994, Shore, 1996).

The idea of culture as primarily belonging in the 'ideational' spheres of social life, has had some prevalence, often contrasted with the more 'material' spheres of social organization and structure (Keesing and Strathern, 1998). In this sense, culture is seen to provide both models *of* and models *for* reality, pointing to the dynamic relation between the descriptive and prescriptive uses of symbolic representation, and to the 'double' quest of making sense of, and acting in, the world through systems of (more or less) publicly shared conceptions and behavioural templates (Holy and Stuchlik, 1983). The observable social processes and patterns of interactive behaviour, referred to as 'social systems', are still not clearly distinguishable from the 'cultural systems'. Culture and society have thus been seen as 'two faces of a sheet of paper', and Geertz, years before his more seminal essays, noted to the same effect that: "Culture and social structure are …. different abstractions from the same phenomena" (1957: 33-34). We return briefly to this 'dualism' below. Under any circumstance, the tendency to devise abstract typologies of either social structures or cultures, has met criticism. Cultural aspects, the software of rules, meanings, values, epistemes, etc., both interact with, and enact, patterns of social behaviour configured within larger material, political, and economic structures of opportunities and constraints. And no neatly delineated 'cultural system' can be found to correspond with any given social structure (or even community). The ethnographic task, it has been argued, is largely to trace these interactions and enactments at the level of events, acts, people, and processes, rather than as structured wholes. As argued by Barth:

> To enhance the power of our analyses …. we must turn from totalizing cultural models to generative models of processes …. from an exaggerated focus on the abstraction of culture to a more versatile attention to the multiple levels of events, acts, experience, ranges of variation, contexts, and larger systems – all of them permeated by characteristically cultural processes, but not simply constitutive of a unitary culture (1994: 360).

Simplified notions of culture have been particularly challenged in the face of increasingly complex worlds of floating and discontinuous social formations and hybrid identities

with no clear cut cultural boundaries corresponding to delineated social, political, or economic units (Barth, 1989; Keesing, 1994; Marcus and Fisher, 1986). Accordingly, the status of the ethnographic approach, relying on an intrinsically 'localized' methodology of linguistically competent in-depth investigation, is clearly challenged, as is the tendency to analyze social events as isolated texts to be understood as localized webs of meaning, disregarding the wider societal and historical processes. Rather than unfolding a relatively closed or bounded universe of exotic webs of meaning, it is argued, one should address "the clash of meaning in borderlands" (Ortner, 1999: 11). Instead of automatically reproduced patterns of culture we have multiple voices, ongoing negotiations and struggles, not only between broader categories of 'peoples' ("Balinese", "Javanese", "Jewish", "French", or even "Western") but also between and within social segments based on class, gender, ethnicity, etc., which unpredictably intersect with 'established' socio-cultural divisions. If cultural analyses are to be productive, it is argued, they must capture these broader historical, political, and social processes (Marcus and Fisher, 1986; Ortner, 2006).

Organizational culture

As noted in Chapter 2, organizations could perhaps be seen as more readily amenable to socio-cultural analyses, given their apparently more bounded socialities; but the enigmas of conceptualizing culture has still haunted this tradition of research (Alveson, 2002; Martin, 2002). A difference in perspective and scope should be noted, however, in that 'culture' in organizational studies appears as less engrained within the 'discipline' as such, compared to anthropology.[217] The ideational conception of culture as systems of 'symbols and meanings' is perhaps even more evident in this literature (Alveson, 2002; Frost *et al*., 1991; Schein, 2004; Smircick and Calás, 1987). It has drawn attention to rituals, myths, and stories that are seen to reveal underlying notions about what is believed, valued, and assumed, thus also providing recipes for thought styles and behavioural patterns. The organizational structures and decision-making processes have been taken care of in traditional (rational) organizational analysis, and the introduction of

[217] At the level of social science, it may be argued, anthropology stands in the same relation to the other social sciences, as cultural studies of organizations stands in relation to organizational studies generally, thus making the role of culture in these traditions different.

culture has been launched as ‘supplementary’; but gradually, cultural studies of organizations also expand their areas of application (Martin 2002). Social processes and systems provide the infrastructure for meanings to be expressed and do their work. The components of culture (values, beliefs, assumptions, rituals, etc.) are considered on the basis of how meaning is communicated, misunderstood, shared, dispersed, etc., in ongoing social processes. These underlying structures of meaning are visible as cultural manifestations, which may include almost any aspect of organizational life, such as formal procedures and structures, behavioural norms, stories and rituals, physical arrangements, etc. (Martin, 2002).

Again, such wide-ranging conceptions of culture also contain more deep-seated controversies about epistemologies, methodologies, ideologies, and theories, not only restricted to the ‘organizational culture’ literature. This has led some to conclude that there is “little sense of cumulative advances in knowledge in this topic area”, partly or largely due to struggles of intellectual dominance, resembling a “king of mountain” game (Martin *et al*., 2004). These struggles have been characterized by broadly defining three more or less conflicting perspectives, each containing a bias in seeing organizations respectively as dominated by *integration*, *differentiation*, or *fragmentation*. Although the perspectives are not defined as internally consistent schools of thought, their boundaries are seen as productive and sufficiently visible discriminations for fruitful categorization (Martin, 2002; Martin *et al*., 2004).

The *integration* perspective resembles, as the label indicates, the older visions of cultures as coherent and unitary. In the organizational setting this amounts to organization-wide consensus on basic goals and values, consistent behavioural norms, common understandings, and integrative controls. A large body of integrationist writers have had a normative and managerial agenda, providing recipes for ‘value engineering’ and the building of ‘strong’ cultures for improving performance (Peters and Waterman, 1982). Culture has been seen as the integrative ‘glue’ of organizations. And, if organizations do not empirically fit the integrationist perspective on the outset, they can be managed into it by design and effort. *Differentiation* studies, on the other hand, discover differentiation,

allegedly due to greater empirical sensitivity and lesser commitment to managerial norms and needs. They find inconsistencies, segmentation, conflict, and different understandings and interpretive schemes. Divergence may occur between the espoused or formal appearance and actual or 'informal' reality, and it can be found as floating sub-cultural islands (divided according to various professional, horizontal, hierarchical, or other demarcations). In the *fragmentation* perspective, consistency, consensus and clarity dissolve into seemingly anarchic chaos, at least in the extreme version. The patterns that occur are situational and transient; everything is ambiguous.

Interestingly, it has been noted by promoters of this tripartite division of perspectives that from the fragmentation point of view, "the essence of any culture is pervasive ambiguity" (Martin *et al*., 2004: 16). Unwittingly, this may appear as a contradiction in terms. Pervasive ambiguity may be seen simply as absence of culture, at least in its essentialist clothing. This latter observation points to a certain ambiguity in these meta-studies, whether the perspectives are epistemologically or methodologically biased in what they look for and find or whether they reflect the empirical diversity of the organizations studied. Martin (and colleagues) confesses to the former view, but in such sweeping categorizations there is an intrinsic danger of tacitly implying the latter, and indeed, of confusing the two. Clearly, there will always be ambiguity and, arguably, intrinsic epistemological uncertainties regarding the relation between theoretical outlook and empirical discovery. Attempts to reflexively explicate divergent positions appear as all the more important. In Martin's analysis, this is done by discussing how normative orientations associated with political interest' can cut across the three perspectives. Thus, one finds 'managerialists' as well as 'critical theorists' represented in all camps. The former will find integration healthy or achievable; the latter will find it oppressive. The former will interpret differentiation and ambiguity as a challenge or opportunity for managerial control, while the latter will see signs of justified opposition, be they explicit or confused. And so on and so forth. And the parties will accuse each other of political bias and bad science (see Alveson, 2002; Gagliardi, 2003). Thus, by taking 'political interest' as the border-crossing approach, normative and epistemological issues are simultaneously introduced, and partly fused, triggering ill-structured controversies about

the relationship between what 'is' and what 'ought' to be (and between 'positive' and 'normative' theory).[218]

Martin (2002; 2004 *et al*.) encourage a multi-vocal and reflexive "conversation", not subduing theoretical differences, but neither allowing them to overshadow the merits of either position. This involves constant alertness against conceptual and methodological biases that employ tautological and selective research strategies furnished to confirm one specific theoretical approach rather than to critically and continually examine its applicability. It further involves greater sensitivity to the complexities of cultural recipes and manifestations, not allowing some selected cultural property to speak for the broader picture. One will find, in most organizations, consensus, consistency and clarity, as well as conflict, divergence and ambiguity.

Still, the power of theoretical perspectives to 'frame' what is found can be strong; reality does not speak directly and unequivocally to neither participants nor observers, recordable as 'objective data'. Interpretation is not just a discovery; it involves also constitutive considerations about how 'data' are interpreted in order to justify the use of concepts like 'choice', 'consensus', 'consistency', 'power', 'ambiguity' and even 'culture'.

Over and above this ambiguous landscape stands one of the most influential proponents of cultural perspectives in organizational research, Edgar Schein; his approach is therefore worth a brief summary. It seems to reflect quite widely held ideas and assumptions about the concept of culture, not necessarily due to his influence, but he has provided an elaborate theoretical and conceptual framework for these commonly held notions. Culture, according to Schein, is:

> ..a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be

[218] Predictably, the meta-theorists will suggest meta-perspectives, transcending both normative and epistemological biases, thus attracting the attention of postmodernists and other academic suicide bombers de(con)structing everyone and everything in the surrounding areas, themselves included.

> considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems (Schein 2004: 17).

For Schein, culture is strongly associated with leadership, as two sides of the same coin. The association is even unique, since leadership embodies the potential for the creation and management of culture. But there is also the possibility of leaders to be just victims of culture, unless they "step outside", and themselves furnish cultural processes for meeting the organization's adaptive needs. In fact, this ability is what distinguishes leadership from "management" or "administration". Paradoxically then, the leader who is able to successfully discover and manage the 'culture' would, almost by definition, no longer himself be part of it. This vision of culture in fact combines several 'classical' notions of culture, such as the evolutionary, unitary, evaluative, adaptive, and holistic. Still, it would be a mistake to see it only as a retreat to the older notions of cultures as integrated wholes. Rather, it appears that Schein is interested in just those organizational societies that *in fact* match these older notions, either through empirical discovery or by managerial creation and design. The perspective is thus normative, not only in the 'integrationist' manner, but also in the sense that it 'normatively' (denotatively) reserves the word culture for this particular empirical phenomenon, and not making any claims about how we generally should assume organizations to be like.[219]

Schein thus takes culture to be the *defining* characteristic of groups having a shared history, its strength being dependent on "the length of its existence, the stability of the group's membership, and the emotional intensity of the actual historical experiences they have shared" (2004: 11). Schein most strongly advocate an essentialist, normative idea of culture, superseding all of its constituent and "superficial" components (such as the espoused values, norms, and beliefs) through structural stability (it survives despite

[219] This has caused some 'misunderstanding', since the 'discovery' of organizational differentiation or fragmentation would not really 'refute' the specific scheinian version integrationism. In this version, such ambient empirical phenomena (which he of course do not dispute the existence of) do not deserve to be called cultures at all. Schein even appeared with a brief commentary in *Safety Science*, (2004, 42/10: 979-83) advocating this particular version of the integrationist view. The comment was a response to inquiries following an article that analyzed safety culture in terms of 'integration', 'differentiation' and 'ambiguity', and exposed these entangled comprehensions of conceptual constructs and empirical phenomena (see Richter and Koch, 2004; Hale, 2004).

changing membership), depth (it's implicit and embedded), breadth (it's pervasive and inescapable), and through integration and patterning (it provides meaning and order). Contrasts between "deep layers of essence" and "surface appearances" recur in this analysis, relating culture to "basic assumptions", which operate below the level of espoused beliefs and values: "Culture is to a group what personality …. is to an individual" (2004: 8). Not surprisingly, Schein is often taken to be the proponent per se of managerially oriented integrationism. But, as argued above, this also points to some ambiguities involved in using such labels. The integrationism of Schein does not simply reflect a paradigmatic bias on the level of epistemology; rather, it reflects an interest in certain kinds of empirical phenomena, including a normative interest in promoting them.

Discriminations

Conceptions about 'culture' thus tend to blur substantial and semiotic issues, and actual usage may simultaneously reflect differences in both perspective and labelling. This may come as no surprise, given the range of phenomena that have been subsumed under the label, and we may appropriately ask what culture is not. The 'answer', as indicated, is partly dependent on the disciplinary tradition; not only in terms of empirical focus, but also in terms of the structure of academic nomenclatures. Culture may be taken as more or less the subject of a discipline as in anthropology, traditionally reflecting a holistic approach to community based studies, addressing modes of subsistence, political systems, ritual practices, cosmologies, etc., as components of more or less demarcated 'cultures'. Archaeologists and historians may also talk sweepingly about whole societies as 'cultures' of the past, or even civilizations of the present.[220] Culture may furthermore be taken as some subsystem of society (as sometimes in history or sociology), it may be taken as indications of regional of global variations in cognitive processes (as in social-psychology), and it may be taken as 'residual' properties of decision making processes, escaping the models of rational choice (as in political science or economics). Even within disciplines, the conceptual demarcations of cultural phenomena may be incoherent and ambiguous.

[220] Most conspicuously known through the assertions made by Samuel Huntington (1993), that the future conflicts of the world will be due to 'cultural' differences between 'civilizations' (Christian, Muslim, etc.) rather than to political, social, or economic factors.

One strategy, in eliciting the 'implied' or 'assumed' meaning of a concept, would be to look for conceptual juxtapositions, that is, what other terms are listed in conjunction with the concept, taking such juxtapositions to indicate a semantic differentiation of meaning. All though one cannot always assume that concepts thus are explicitly intended to be understood as distinctly separate and mutually exclusive, indications are still given about how they relate to one another, and usage indicates where confusion may arise. We briefly consider a selected sample of such 'competing' concepts below, notably social structure, power, and rationality.

Culture and social structure (organization/system)

As noted, the distinction between culture and social structure (or organization) is occasionally provided, and in anthropology it has even marked a division between major academic traditions. The two may, as noted, be distinguished as different abstractions of the same phenomena – as sheets of the same paper. Sometimes they are distinguished as patterns *for* and patterns *of* behaviour (Goodenough, 1994; Keesing and Strathern, 1998). These latter ('social') patterns range from residence, mobility, group-formations, hierarchies, statuses/roles, patterns of exchange, institutions, formal organizations, etc. The former patterns (culture) is thus conceptualized as an *ideational* property of social life, as the mental input factor, distinguished from its 'material' expressions in artefacts, observed behaviours, and institutional structures. The distinction is also drawn in organizational studies, sometimes taken to indicate a difference between formal structure and informal culture.

Such distinctions may be considered as only of analytical value. The 'ideational' templates, partly contained in the Geertzian models of/models for dichotomy, intersects with behavioural templates (patterns for) and their more or less patterned outcomes. However, the latter will seldom be unequivocally dictated by what the normative rules proscribe. The distinction between making rules and following (or not following) them is important, but would hardly serve as a viable operation for demarcating 'culture'. Indeed, an understanding of culture depend on the analysis of how the two interact (Holy and Stuchlik, 1983). Rather than seeing 'the cultural' as a distinct analytic entity, it can be

seen as the "social viewed from another perspective", the *socio-cultural* being more like "particular clusters of ways and products of thinking and acting" (Goody, 1994: 260). Clearly, (ideational) culture is conditioned by (social) structures, just as (social) structures are shaped by a number of culturally conditioned ideas about, say, hierarchies, rules, values, or even 'world views'. In the organizational setting such configurations of the 'socio-cultural' would be visible in the aggregate patterns of handling tasks, solving problems, and reaching organizational goals in the face of environmental demands and constraints. Structure and culture are indeed only fragile and blurred distinctions in such processes. But in terms of actual language use, the distinction is alive, and it is of course highly relevant to excavate differences between formal rules, normative templates, and actual behaviour, however labels are used for such purposes. Although the 'culture' (being the core 'topic') will be used though-out this chapter, the term 'socio-culture' would be the more appropriate term, given these difficulties of differentiation.[221]

Culture and rationality

The distinction often made between culture and rationality, has some ambiguous similarities to that between culture and structure. On the one hand, rationality may be seen as embodied in structures while actual behaviours are the socially conditioned 'deviations'. On the other hand, structures are seen only as external constraints within which actors strategically follow their own ends. In both cases rationality appears as self-explanatory and culture as conditional. Culture may impede rationality, while rationality may penetrate and supersede culture; when we consider 'agency', strategic or calculating ('rational') action somehow appears as less 'cultural'.[222] In institutional analysis, cultural and rational models are taken to represent ends of a continuum (Rothstein, 1996). 'Rational actors' enter institutions, pre-determined to maximize expected individual utility, and the aggregate social patterns result from strategic interactions governed by a 'logic of exchange'. 'Cultural actors', on the other hand, have restricted cognitive capacities in processing information and transforming their desires into strategic action,

[221] Note that the term *socio-cultural* is regularly used through-out the preceding chapters (unless 'culture' as the 'object' of research is referred to).

[222] The question of demarcation lines is apparent when we consider science as 'cultural knowledge', since often, when we talk of science as culture, we think of the socio-cultural contexts in which the scientific beliefs are produced, not the beliefs themselves, thus distinguishing between the context and the content of discovery (Hacking, 1999).

and are instead moulded into an organizational ('institutionalized') realm of rules, scripts, and templates characterized by a 'logic of appropriateness' (March and Olsen, 1989). Choices reflect values and identities which are largely ascribed, shaped and defined within institutionally created universes of meaning and common understandings. 'Institution' is the corollary of culture. We may note that this kind of two-partite distinction is evident also in the literature on organizational culture and safety culture. Alveson (2002: 6), explicitly reserves cultural phenomena for that which is "holistic, inter-subjective, and emotional rather than strictly rational and analytical". Rational decision-making is thus seen as "thwarted" by "cultural" mechanisms (2002: 6). This, as may be recalled, has some relevance in relation to what was described as the paradox of safety culture (Turner and Pidgeon, 1997; Pidgeon, 1998). The assumptions, beliefs, and patterns of behaviour, taken to constitute a culture, may be both part of the problem as well as of the solution. Only the normative promotion of organizational rationality, intelligence, and learning will generate a 'safety culture', thus also applying broader conceptions of rationality than the calculative behaviour of self-interested decision-makers.

These conceptualizations point to other paradoxes, involving both the relation between the 'rational' and the 'thwarted', and the relation between patterns *for* and patterns *of* behaviour (sometimes, as observed, taken to denote, respectively, culture and structure). Turner and Pidgeon, in referring to the distinctions between culture as observable behaviour ('the way we do things') as contrasted with culture as systems of symbols and meaning (shared cognitive models, stories, myths, rituals, etc.), adopt the second view. Culture is thus seen as an ('ideational') systems of meaning through which a given group understand the world. A safety culture is defined as "the set of assumptions and their associated practices, which permit beliefs about danger and safety to be constructed" and which is "created and recreated as members repeatedly behave and communicate in ways which seem to them to be natural, obvious, and unquestionable, and as such will serve to construct a particular version of risk, danger, and safety" (1997: 188). There is, it could be argued, a paradoxical absence of rationality implied in this mystifying use of 'basic assumptions', since it implies an understanding of safety culture, within the

organizational context, as something implicit, unquestioned, and biased, contrary to the stated ideals of prudent risk management. This, of course, may simply be a 'contamination' from the 'de-rationalized' conceptions of culture from the organizational literature, but does still contribute to some ambiguity in the understanding of the concept.[223] These ambiguities and paradoxes can be recognized more broadly in the safety literature, treating culture as inherent and encapsulating qualities beyond awareness, to be found in the deep layers of the organizational 'personalities'. These 'contaminated' notions of culture 'co-exist' with 'enlightened' notions, normatively promoting open learning processes, organizational resilience and redundancy, intelligent and ardent problem-solving, and all the other state-of-the-art approaches to risk management (Guldenmund, 2000; 2006; Turner and Pidgeon, 1997). Only by arguing for the significance of culture as a 'cultivating' factor, is rationality reintroduced.

From one perspective, conceptions of culture and rationality thus enter into 'zero-sum' games in the conceptual and explanatory battlefield; that which escapes models of rationality has cultural (institutional) causes, and vice versa; from another perspective, culture represents the enlightened state of organizational behaviour and problem-solving. This disconnection between culture and rationality, as indicated above and to be elaborated later, may in some respects 'thwart' the conceptions of 'culturally' sensitive risk management strategies, by 'hiding' the paradoxes in the referential claims.

Culture and power

Cultural modes of understanding and explanation are sometimes criticized for not taking power into account, a point made explicit in Perrow's critique (1999) that 'cultural interpretations' neglect the impact of structural and power-based mechanisms (see chapters 2 and 7). Such critique reflects also more widely held notions about power as basically located in the societal hardware of material, political, and economic forces and constraints. Partly, it is also related to the consensual visions of culture as coherent, unified and integrated, as is evident in the critique of 'integrationist' models of

[223] Even if they explicitly advocate the 'normatively rational' approach (the 'way out' of the paradox), we may still note the composite and ambiguous use of terms in the definition, in referring to 'assumptions permitting beliefs'; the 'rationality' contained in this phrase may be elusive and 'contained'; the phrase may even be reversed without any discernible change of meaning: beliefs permitting assumptions.

organizational culture. In Marxist analyses, culture appeared as epiphenomena of the superstructure, shaped by and reflecting fundamental material and economic conditions and cleavages of class and ownership. The Geertzian notion of culture as located in systems of symbols and meanings, although it points to differentiations and positioning of actors, social asymmetries and power relations are hardly visible. As has been aptly observed by Sherry Ortner: even in his famous discussion of "thick description", ethnographically located in colonial Algerie, and involving the forceful abuse of a Jewish sheep farmer who was unjustly jailed and had his livestock confiscated, the interpretive account is void of references to the social asymmetries embedded within the colonial context. The case is rather discussed in terms of a "confusion of tongues" and a "clash of cultures" (1999: 4). In a critique against such applications of interpretive anthropology, Keesing (1987) has pointed to how cultural meanings are created and defined in asymmetric contexts, seeing them as "webs of mystification as well as signification". But power and domination has also been comprehensively explored within the broadly defined realms of 'culture' by such seminal (although very different) writers such as Foucault (1980) and Said (1978). These explorations imbue cultural forces with intrinsic dynamics and impacts, not reducing them to epiphenomenal reflections. Locating culture in the sphere of 'ideas', has drawn attention to hegemonic discourses and ideological dominance, covering up basic social conflicts. And anthropologists have argued that 'localized' cultural expressions must be understood as embedded within larger narratives that reflect social asymmetries and power relations (Marcus and Fisher, 1986), the latter turn also being referred to as the 'power shift' in cultural theorizing (Ortner 1999; 2006). Power, however defined, appears to pervade the spheres of culture, however defined: in values legitimizing hierarchies, in the powers of knowledge, in emotional deprivations, in manipulative uses of language, in behavioural controls, in restricted availability of options, etc. Whether or not power is included in a 'definition' of culture, may be a matter of analytical taste. The strong evaluative aspects of power, related to value-laden conceptions of interests, social asymmetries, and control mechanisms, may be an argument for analyzing it separately, but still as intrinsic properties of social reality (Lukes, 1974/2005; 1978).

Dimensions of culture

We proceed in this exploration by keeping in mind that word processing, meaning construction, and linguistic agreements and disagreements are essential parts of social processes. Hermeneutic studies of language in use have superseded the older instrumental views, where meaning is understood in terms of simple *designation* (Taylor, 1985; Searle, 1995). However, these 'older' views still have a strong hold in living linguistic communities, often based on the idea of meaning as simple representation, that the meaning of a word can be explained by the way it can be used to *depict* the world (Taylor 1985: 9). Although words have referential capacities, these are enacted in social communities. Searching for the 'true' or 'original' meaning overlooks the way language also have expressive-constitutive meaning. In the case of 'culture', these insights are of particular importance, for reasons elaborated in the introduction to this chapter, and presumably reinforced by the following excursion into the diversity of theoretical traditions occupied with making sense of the concept. Not even the brief attempt to tease out some distinguishing features of 'culture' as against some conceptual competitors, provided clear recipes for delineation.

Instead of adopting a 'definitional' strategy then, the concept of culture will be approached here by identifying some of the key dimensions that commonly recur as culture is used. But even a more open ended perspective of the cultural, requires some agreement on the kinds of ingredients that go into it, and also on the nature of their composition The provisional understanding of culture provided in Chapter 2, assumed that culture, or the cultural, could be conceived as configurations of dimensional elements that appeared to form a more or less patterned 'matrix'. This 'inventory' of culture included *explicit or implicit normative and emotive prescriptions and bodies of knowledge and beliefs that are shared by social actors and communicated and reinforced through mutually understood (notably linguistic) symbols, thus providing viable recipes for relatively continuous patterns of social behaviour*. Now, this account of culture may appear rather conventional and mainstream, but just for that reason its comprehensiveness and scope should be noted, opening as it does, a Pandora's box of rather basic social science concepts: social agency, knowledge and beliefs, norms and values, meaning and

symbols, and including some ‘modalities’ of these components, such as patterning and continuity. We explore these components and modalities systematically below, by addressing them separately, as *dimensions*. The dimensional approach is critical in order to avoid essentialism and too many theoretical commitments, as was argued above. ‘Culture’, or ‘socio-culture’, must be adaptable both to the variety of ‘its’ empirical manifestations and to the plethora of theorizing options.

Arguably, the best starting point for approaching culture is the social agent. *Agency* is the necessary carrier and producer of culture; without living persons ‘it’ would find no expression, be it in the skilful manufacturing of technologies, the rule-bound behaviour in public places, or in the institutionalized behaviour in bureaucracies. The creative and productive role of agents in generating and transforming ‘culture’ is often downplayed, however, leaving them trapped as mindless robots in pre-produced structures of ‘meanings’ and other constraints. Agency, as sketched out within the context of defining culture, is often couched in phrases like ‘codes of conduct, ‘customs’, or even ‘ways of life’. As noted, there seems to be a bias toward the traditional, customary, and habitual, implicitly implying the kinds of behaviour which are governed by rules and norms, rather than interests and rationality, an observation to which we shall return later. First of all, agency is ‘positioned’ and context dependent, as actors are situated within intersecting spheres of *sociality*. Sociality is of course as basic to culture as agency. Despite all other differences, writers on culture, like Geertz and Douglas, agree on the social and public nature of cultural processes. Culture is shared, and not private, although culture would not exist without personal carriers. As famously noted by George H. Mead: “Every individual has a slice of society in his head”; the individual mind can exist only in relation to other minds with shared meanings (1934). Without going further into the depths of the relation between agency and sociality (or the individual and society), it is sufficient to note at this point what seems to be the commonly accepted idea that human conduct is both shaped by as well as itself shaping the environment. This points to the highly dynamic nature of how socio-cultural systems are continually produced, reproduced, and transformed through social interaction, taking note of both resilient and

recalcitrant properties of structural forms.[224] Such processes reflects as well as shapes the position of actors, but involves also an understanding of how both distant contemporaries (or even predecessors) and interactive social encounters, contribute to a sense of communal belonging and identity.

Taking social agents to be the producers and carriers of culture, we may proceed by looking at the 'content' dimensions, that which is carried and produced. These involve, of course, rather basic human faculties, such as values, beliefs, emotions, and language, arranged in just that order.[225]

Normative prescriptions may be seen here as broadly covering evaluative normative orientations, ranging from moral systems, deep-seated values and attitudes, to more mundane preferences and rules of conduct, without implying that the latter are simply applications or manifestations of the former, or that there is any overall consistency in these orientations as judged by inside or outside standards. Aesthetic norms might well deserve a category of its own, reserving this one for the basically moral norms. However, they might in some cases be hard to distinguish, and for the sake of simplicity we call them 'norms', thus also including the received humanistic conceptions of culture. Such norms of appearance, style, and form has been increasingly accentuated in studies of culture, from Balinese grace to communicative styles and among urban youths.

Knowledge involves the employment of cognitive capabilities which produce beliefs, worldviews, modes of thought and reasoning, and thus also provide recipes, mental maps and models for engaging with the environment. It ranges in principle from scientific

[224] This is of course one of the enduring and fundamental issues in social theorizing, famously encapsulated by Berger and Luckmann (1967: 79):" Society is a human product. Society is an objective reality. Man is a social product". A range of social theorists (like Giddens, 1984) have devised specific ways of dealing with this basic relationships between 'agency' and 'structure'. And we may note, the issue had its local expressions in the risk management controversies, evident from the attempts to locate causes, and responsibilities, within the range of available options.

[225] It may be noted that this inventory of content dimensions reflects some rather recurrent and fundamental categories in social theorizing. The basic distinction between the normative "ought" and the descriptive "is" parallels distinctions between "morals" and "epistemes". By adding agency, we cover the basic components of rational choice theory and some philosophical theories of action: preferences, beliefs, and actions/choices (Elster, 1986; 1989).

theory to religious cosmology, from everyday practical knowledge to magical belief. We have knowledge through elaborate theory as well as through singular observations of 'facts and events'. At this point, there is no need to discuss the occurrence of cognitive bias and error, or (contentious) differences between well-founded or ill-founded beliefs; these questions will be more explicitly addressed later, pointing also to the reflective nature of knowledge as continually and constitutively produced, reproduced, justified, explained, caused, and questioned – in principle in endless 'meta-games' oscillating between making and revising maps, and following or violating them.

Emotion, private and public, often furnish cultural modes with deep-felt commitment. Personal and public identities (national, ethnic, organizational, etc.) are invested with feeling. Behavioural norms are not only 'moral', but form part of the cultural order through internalized and exogenous mechanisms that are emotionally motivated, reinforced, and sanctioned. Beliefs (from religious to scientific) may also be entrenched with personal and socially conditioned feelings of vulnerability, strength, pride, joy, self-complacency, fear, etc.

Meaning and its symbolic expressions is often taken to be the very essence of culture; in particular in the wake of the Geertzian influence, "webs of significance" are the stuff of culture. Meaning in this sense extends, as noted, beyond the restricted semiotic symbol-reference relation, sometimes even associated with a 'way of life'. The world views as such are sustained in terms of the 'meaning' it conveys as representations (models of) to be acted upon (models for). Arguably, such a broad conception of meaning runs the risk of loosing analytical value, being more or less a corollary to culture. Meaning understood as 'everything meaningful' would (within the scheme suggested here) include most 'content elements' of culture: norms, knowledge, identity, emotion, etc. Meaning as 'meaningfulness' can in fact be expressed as certain combinations of these. By using the term "significance", this double meaning of 'meaning' tends to get blurred, and appears almost like a new "ghost in the machine", to borrow another concept from Ryle (1949/63). For the sake of clarity and analysis, it would be preferable to restrict the word meaning to its semiotic reference, including of course the meaning of gestures and non-

linguistic symbols. That seems to be enough for one word to cope with, ranging as it does from ‘big’ meanings (like the meaning of ‘culture’) to trivial semantics, traffic signs, or symbols of matrimony (as against the institutions of marriage as a socially ‘meaningful’ phenomenon).

Cultural processes can be seen then as social enactments of these rather basic building-blocks. Some crucial and dimensional features of these building blocks and their inter-relations in cultural configurations must be noted, both in order to avoid reifying encapsulations of ‘cultures’ as delineated wholes, and to maintain the announced ‘theoretical neutrality’. This can be approximated by considering cultural elements as ‘variables’, appearing in forms, degrees, magnitudes, levels, ‘depths’, etc: Values and norms can be arranged hierarchically, emotions vary in strength, forms of knowledge differ in a number of ways, etc. But the elements are ‘independent’ only in the sense that they should be conceptually or analytically distinguished. In cultural processes they appear in numerous configurations that mutually qualify and influence each other. The dimensionality of culture appear in combinations and processes of mutual reinforcement. Values may be manifest on different levels of consciousness, from explicit to implicit, sometimes only visible in behaviour, as ‘revealed preferences’; social communities need not share all norms; beliefs may be socially shared to varying degrees, more or less emotionally invested, historically changing; and so on and so forth. Still, these elements of culture are not to be understood strictly as necessary and/or sufficient conditions for a culture to ‘exist’, so as to constitute a carefully structured inventory. One might convincingly argue that none in themselves are sufficient, although most seem necessary. Two qualifying dimensions (‘modalities’) appear as particularly relevant: *continuity* (like ‘enduring patterns’), and ‘*depth*’ (like ‘implicitness’ and ‘basic assumptions’).

Continuity, in various disguises, recurs in most definitions of culture. It appears in the older literature as ‘tradition’ and ‘custom’ – that which is passed on from ‘one generation to the next’. Most modern writers seem to settle with some degree of ‘regularity’ in order for habits, thought styles, preferences, etc., to be counted as ‘cultural’. There is still a bias toward the more deeply entrenched aspects of the cultural. Cultural constrains are

resilient. The ‘generational requirement’ has faded, but sudden and passing displays of ‘life-forms’ cannot be taken as cultural either. *Depth,* for want of a better word, is meant here to signify one of the most common ingredients in definitions of culture: the implicit and tacit nature of much of the knowledge, values, rules, etc., that constitute the cultural domain. The prime model here would be linguistic abilities, like our (normally implicit and unconscious) use of grammatical rules. In the case of knowledge, the conscious attention that accompanies the process of acquiring knowledge often fades naturally as it is gradually transformed into effective action (Miller, 2002, Bloch, 1994; 1998). Indeed, much of what we do presuppose a more or less automatic embodiment, like when deliberate training is transformed into practical skill. Processes of thought do not follow the linear or logical-sentential model of linguistic learning and ability. Rather, learning is a highly complex and interactive engagement of simultaneous mental operations being performed and processed in active worldly pursuits of practical tasks and problem-solving. Knowledge is connected and ‘chunked’, often implicitly, and only embodied in the practical and tacit management of skills (Bloch 1994).

Un-stated and implicit rules of behaviour, and ‘tacit’ forms of knowledge, such as described by Polyani (1967), are thus often sources of reference when insisting on the implicit and deep layered and onion-like nature of culture. ‘Basic assumptions’, unquestioned and taken for granted, are seen as powerful shapers of cultural processes. There are also well known psychological mechanisms at work here, making its way to collective processes: What seems obvious needs no explication or explanation; the exceptional, rare, or queer catch our attention and provokes discourse (Plous, 1993; Fiske, 2004). Still, all this taken-for-grantedness may be overstated. At least, it cannot be taken as a defining characteristic of culture, leaving out everything consciously thought and talked about. Rather, there is an interesting dynamic between that which is stated and explicit and that which is not. Linguistic abilities, to take one paradigmatic example, are after all not located in mysterious and cognitively inaccessible quarters within our body of knowledge. Mastery of foreign languages improves by learning about syntactical and grammatical rules, by training the movements of the tongue, etc. But linguistic behaviour presuppose a considerable amount of automation, and ‘conscious’ linguistic knowledge

will recede or fade; however, such transitions do not imply any change of membership in the realms of culture, although the transitions are of importance for other reasons.[226] Also, these metaphors of 'depth' can sometimes lend themselves to reified notions of 'cultural cores' or 'essences of culture'. Cultural processes also involve active and conscious, and (arguably) strategic behaviour (Barth, 1966).

It may be disturbing at this point to ask, 'what's not in a name?' Clearly, these building blocs, as they are implicitly or explicitly contained in notions of culture, refer to familiar social science concepts regularly used and defined in more decomposed terms, such as 'normative structures', 'cognitive schemas', 'patterns of behaviour', etc. Why introduce this overarching and dauntingly composite concept of 'culture' to cover them all, as if they're not sufficiently complex on their own? The notion of the cultural appears to rely on an idea that the sum contains some qualities that turn it into something more than the constituent parts, some organic composition of mutually reinforcing processes. The building blocks are not separate 'components' but intertwined in complex ways that need to be studied and understood in their particularly composite patterns, but still without assumptions about there being strictly bounded and stable 'wholes' – or 'cultures'.

These emergent, composite, and dimensional properties of culture cannot then be discovered by identifying one dash of values, one dash of beliefs, one dash of behavioural patterns, etc., that together would make up the total of any neatly delineated 'culture'. But to preserve the label, if only in its adjectival form, one still needs to ask how deep-seated values or beliefs should be, how enduring or regular the patterns of behaviour, how emotionally invested the identities, etc., in order to deserve being termed 'cultural'. Clearly, some degree of stability, continuity and comprehensiveness, etc., seems to be required for the term to make sense. We might talk of 'national' cultures, but also 'airport-cultures', 'group-cultures' or even 'project-cultures' and certain sub-systemic phenomena like 'reporting cultures'. Such 'lower level' phenomena may contain the same qualities in terms of socially sanctioned norms and worldviews, if only referring to

[226] In psychological terms, much of these 'tacit' abilities fall under the category of 'over-learning' or 'automaticity', not necessarily deeply ingrained in the 'cultural' domains.

some limited social of thematic field, not grand cosmologies or societies. But there would still be an uneasily defined borderline excluding the more transient, bounded, and situational human encounters, even if they inevitably include culturally conditioned properties. It might be argued that in complex modern societies, cultural configurations and forces often appear in just these 'thematically' and socially restricted fields of 'micro-cultures', the total being all too diverse and complex ever to reach the level of anything more than traces of cultural components. Cultural processes are always in a state of flux, its components are continually made and re-made, and no specific composition can be defined as a critical 'threshold' for 'culture' to appear.

It would clearly be futile to try to set standards for what it takes to deserve the name of 'culture' (or even 'the cultural'), as if it could be defined by some minimum amount of values, norms, and beliefs, minimally shared and meaningfully communicated in some minimum sized community or group, with a minimum of deep-seated taken-for-grantedness, for a minimum period of time. Still, it's not all meaningless to think in terms of the cultural as tightly knit or loosely coupled, enduring or transient etc., but that would be more like thinking about a substance as thick or thin, rather than defining the exact state of thickness turning a soup into porridge; and conversely: even if we wisely abstain from defining that state, we realize that there's a difference between the two. Cultural components are 'variably present' in different degrees and forms, making it perhaps meaningful also to speak of 'cultures' as both weak or strong, deep or superficial, comprehensive or restricted, extensive or partial, distinct or ambiguous etc., depending on the actual composition and 'dimensionality' of elements.[227] Some 'national cultures' would then appear as rather thin soups, amounting perhaps only to some sense of shared territory, history, institutions, rituals, rules, and language. Some organizational cultures, on the other hand, might be considered 'thicker', such as can be observed in community-like grassroots organizations.

[227] What's fascinating about, say, Schein's perspective is how, within the organizational context, it takes culture to be just a combination of extremes on either of these variables. This is more a matter of definitional authority, which means that we must then label it "scheinian culture" (he may be in a position to claim such authority with some degree of success).

Importantly, however, cultural building blocs and 'borders' are also actively defined and promoted by participants, and may be actively attributed by relevant environments. Such processes are not just based on (informed by) 'existing' commonalities and differences between members and non-members (regarding their values, beliefs, semiotic systems, etc.). Signs of distinctiveness can be actively mobilized and 'constructed', both as internal markers of identity, and as externally imposed, often stereotyped, labels and images. Such regulative mechanisms thus also serve as delineations between 'us' and 'them', and may occasionally be quite fiercely evoked, such as in cases of ethnic conflict.[228]

The concept of culture oscillates in quite complex ways between the comprehensive and the particular, or even the residual. By using the comprehensive approach, it looses referential capacity by throwing too much into one basket. By trying to restrict its meaning, there is bound to be confusion and disagreement about what is or what should be in the basket. These are the paradoxes that seem to haunt the fate of 'culture', whether it's made to serve the understanding of societies and communities at large, near and distant, or the more bounded social worlds of organizations, even when applied to just some of their features (like risk and safety). The inventory and dynamics of cultural dimensions suggested here may not make the task of investigating culture an easy one, but they do reflect the comprehensiveness of culture and the great variety of notions it connotes in various communities. The intention here is to provide a framework for more consistent and structured communication about cultural phenomena, while retaining the possibility of divergent ideas about culture, but also by avoiding the less productive questions about what culture 'really is'. Aspects of culture are interwoven into human societies and must be studied by combining analytic and synthetic approaches, decomposing cultural elements, and at the same time taking culture to be more than just an added up sum of parts.

[228] Which is of course the reason why processes of ethnic and national mobilization to such an extent involves the 'activation' of such demarcating and identity-producing 'signifiers' (Anderson, 1991; Barth, 1969; Pappe, 2004).

The approach suggested here, notably not radically different from other 'dimensional approaches' (such as Barth, 1989), does not constitute any 'theory of culture', containing propositions about cultural forms or typologies, although it's presumably informed by and modelled from our knowledge about mechanisms that govern cultural processes. Theories specialized in some of the mechanisms operating within one or a selected group of cultural components (like rational choice, social cognition, or institutional 'rules-of-the-game') are still addressing the 'cultural' in a broad sense. Calculating behaviour is also 'cultured', even if processes of shaping preferences and beliefs are largely black-boxed in the explanatory models of rational choice. It follows from this approach that culture is not some residual category, evoked to explain that which escapes the conventional models of political, rational, or structural analysis. It may appear as such, because so many specialized models have been devised to account for its constituting components, talking about culture as if it was 'something else'. The dimensional approach outlined here is tentatively visualized in figure 10.1. below, adding also some general and 'local' terms along the main content dimensions in order to provide some provisional clues as to how modalities of '(socio)culture' and 'HSE culture' may serve as productive and understandable templates for expanding the more sterile vocabularies of regulated risk management. We may leave it at that, recognizing that only the 'insider' would be fully able to continue the translation process in a manner that could recapture some of the initial intuitions and self-evident insights: that regulations will not produce the desired results unless they are adopted within and adapted to the socio-cultural contexts in which their intentions are supposed to materialize.

As argued, no 'theory of culture' follows from the approach adopted here, quite the contrary. That it in effect can be accused of colonizing 'non-cultural' models and theories, subsuming them under its 'imperialist' domain, may largely be attributed to the nature (or socio-cultural history) of the concept itself. Evidently, concepts may serve different functions and purposes, analytic and explanatory, as well as exploratory, sensitizing, and non-reductive ones. Terms that are too composite may lose both the capacity for referential clarity and explanatory power. As has been remarked by Etzioni (1988: 27), with specific reference to 'unrestrained' conceptualizations of rationality:

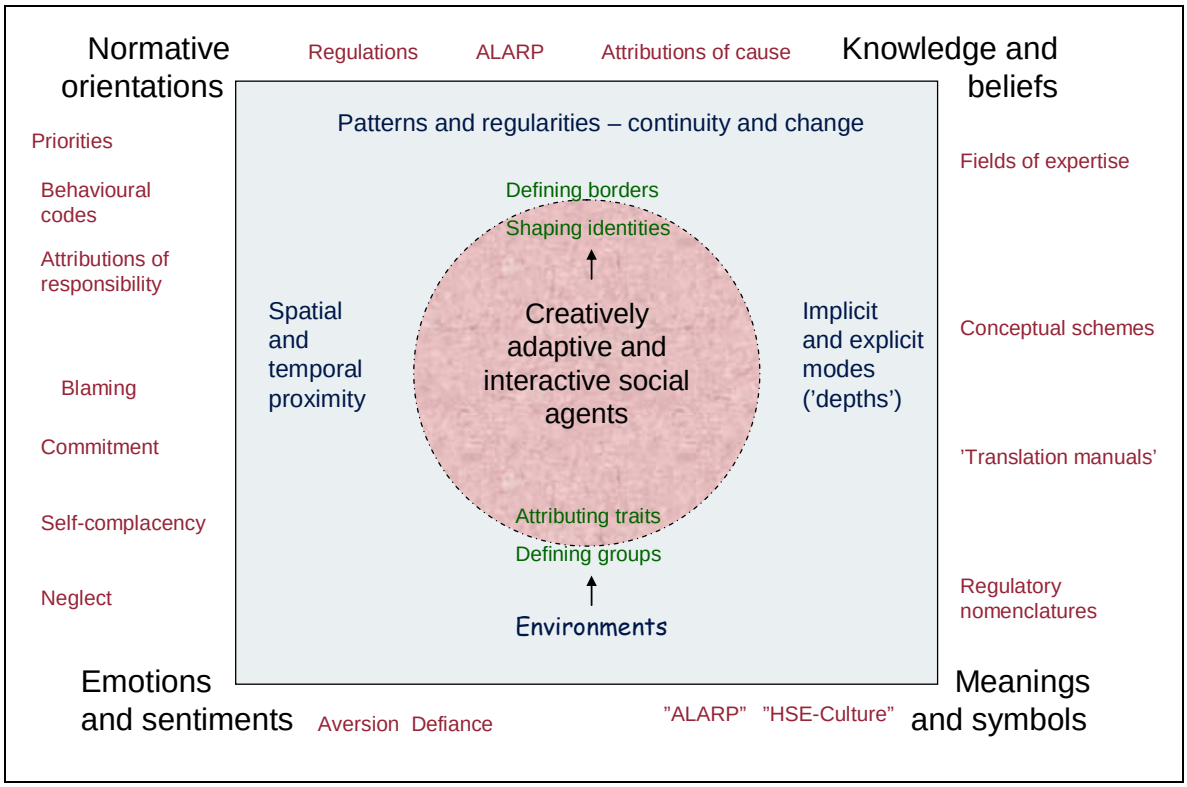

Figure 10.1. Dimensions of culture

"Once a concept is defined so that it encompasses *all* the ingredients that are members of a given category …. it ceases to enhance one's ability to explain". Evidently, 'culture', let alone 'socio-culture' does not satisfy such analytical requirements, unless 'captured' and fenced in from the 'commons'. The alternative may not be restricted to claims about culture as being just a very crude and catch-all outcome of ethnographic storytelling, compared to the scientific rigor of experimentally produced knowledge in social psychology, formalized comparisons of socio-political systems, or the psychometrics of organizational (safety) climate.

The strategy adopted here, does not 'exclude' the formation of such more specified and rigorous hypotheses and theories within an overall 'cultural' framework, but doubts the ability of such approaches provide productive ideas about what cultures 'really' are like. But, given a reasonable degree of consensus on relevant dimensions and constitutive parts, the more important questions may be posed about the role of socio-cultural factors in understanding and explanation by referring to variables sufficiently specific to serve

such functions. This approach is preferable to the more analytically bounded categorizations of 'cultural typologies', whether referring to 'societies', nations, communities, networks, groups, or organizations. When the alternatives are already filled with theoretical assumptions about sets of configurations, the analytical approach will be more restricted. It creates, predictably, unfruitful discussions of 'cultures' tending toward either 'type', containing features of two or three or four types, of being in transition, etc.[229] By starting with an anatomy of cultural dimensions, to be configured in a variety of ways, more analytical flexibility is allowed for by starting with the building blocks rather than with the buildings.

Concluding remark

Debates and disagreements about 'culture' tend to blur semiotic and substantial issues. On a very general level, there may be agreement about the kinds of phenomena that can be subsumed under that label (values, norms, beliefs, etc.), but as soon as the label is in fact applied to some slice of empirical reality and given denotative or explanatory functions, confusion or disagreement emerge. This appears to be the case in anthropology, in organizational studies, as well as in safety research. And as observed, it certainly was the case when applied within the practical context of risk management. But conceptual enigmas and competing systems of classification tend to produce ill-structured understandings and thwarted communication. In the case of the PSA, it was not easy to find any neatly structured correspondence between ideas about culture and ideas about risk management; and likewise in the industry. Moreover, proponents of 'HSE culture' would have rather different ideas about risk management, and proponents of any preferred risk management strategy could have different ideas about the merits of a 'cultural perspective'. Thus, the act of labelling also became part of the politics of risk management, not unlike how the naming of 'cultures' has become part of national and global politics, as well as of the politics and sociology of scientific knowledge.

[229] This, it can be argued, follows from so-called 'Cultural theory' (Thompson *et al*., 1990), and from paradigmatic categorizations of organizations studies, or of organizations. Ref to argument by Barth, arguing against the use cultural 'types', preferring the study of generative processes through analytical modelling (1966; 1972).

I have argued here that confusions in terminology and naming reflect the inherent and rather basic difficulties of semiotic engagements with the experienced world – engagements deeply embedded within social processes of understanding and communication. The local endeavours in many respects appeared as no less 'reasoned', nor more enlightened, than parallel discourses within academia. The difference of course, was that their task was not only one of intellectual comprehension within local communities of discourse, but also of practical deployment in gradually expanding and 'unmanageable' communities . Having to confront these enigmas myself, going hunting with the natives so to speak (if only in passing moments), didn't really prepare for any easy return to the ivory towers of academia. And to be sure, they were not easily separable from the subsequent task of actually writing out the 'final' story. No 'double' hermeneutics would easily account for the levels of engagement and comprehension involved, but they provoked a return to some rather basic issues in the anthropological explorations of self-reflexive interpretations of self-reflexive agents and the role of rationality assumptions in these interpretive quests.[230] We will further explore the role of such assumptions in the next and final chapter.

[230] Even the old 'positivist' Otto Neurath expressed this 'hermeneutic' predicament of science, as a series of inherently conditional and provisional judgements, in the following memorable statement: "Wie Shiffer sind wir, die ihr shiff auf offener See umbauen müssen, ohne es jemals in einem Dock zerlegen und aus besten Bestandteilen neu errichten zu können". The quote served as the epigraph to *Word and Object*, by W.v.O. Quine (1960). Incidentally, this seminal work contributed to re-configuring the philosophy of language by rejecting the notion of a language-transcendent "sentence meaning", and insisting on an understanding of language as socially instilled dispositions, to be analyzed through the simultaneous observation of linguistic usage in social processes of linking 'words' to 'objects'. For those familiar with Quine's argument, it should be no surprise that the referential capacities of 'culture' appear anomalous and contested, knowing how much intellectual effort he invested in analyzing the meaning of 'rabbit' (or 'gavagai').

11. Risk, regulation, and rationality

This final chapter will explore how regulatory regimes can be explained and interpreted from a more theoretical point of view, although occasional references to the empirical records will be offered throughout. The preceding discussion on the modalities of culture will also provide a frame of reference, both in terms of understanding regimes of societal risk management, and in terms of understanding processes and logics of organizational sense-making. Although this present piece of work is largely a study of the latter, incidentally dealing with anthropologically familiar words like culture, the worldly contexts in which these interpretive quests have taken place must also be addressed.

The choice of the term ‘understanding’ is used deliberately here, to indicate some modesty as to how much explanatory power can be extracted from a single case study predominantly based on qualitative methodology. Such studies are often seen to be interpretive explorations of diversities and similarities of social phenomena, not for explaining them or ‘testing’ theories (let alone, making predictions). Case-oriented studies are sensitive to the complexity and contextual nature of the single case; they treat the case as a whole, not as collections of parts (or collections of scores on variables), and comparisons between cases tend to focus on commonalities. Quantitative studies explore and explain the co-variation between variables measured across a large number of cases. The first approach provides familiarity with the case but generalization is difficult. The second approach may provide generalizations, but the context of the case is black-boxed. In case studies, the relations between parts are understood within the context of the whole, while the context of quantitative studies are the general patterns of co-variation between variables characterizing the members of a population of comparable units. Multivariate statistical analysis breaks cases into parts, while case studies may tend to stay with the case. But there are also alternative methodologies for systematic comparison of cases in order to identify patterns of so-called conjunctural causation (Ragin, 1987; 1994; 2000). Howard Becker has somewhat disrespectfully summarized these varieties of social research as follows: “Where the causal analysis leads to a probabilistic statement of what might happen, and the conjunctural analysis leads to a

description of all the things that must be present for a particular outcome to occur, the narrative analysis leads to what might well be called a tautology, the statement of a sequence in which is prefigured …. the end result" (1992: 210).

Most firmly placed in the latter tradition, the pitfalls of selecting the kind of evidence that will confirm the story you want to tell, must thus be closely observed. Within the confines of the case, however, this study may be of more value in terms of exploring dimensions of regulatory regimes, their 'informational' qualities, interrelations, and contexts for interpretation and understanding. Regulatory regimes also have their specific historical genealogies and path-dependent trajectories. The outcome could have been different with minor accommodations in some antecedent conditions. Thus, the 'systemic isomorphism' between industrial and administrative systems (and the 'risks' related to either), is evident. And similar models have indeed been used for explaining both. Sagan (1993) and Perrow (1999) both embrace models of organized anarchies, developed in studies of bureaucratic decision-making, in order to explain the emergence of organizational accidents.

Getting inside the black box of government has been one side-effect of the emerging focus on institutional analysis of bureaucracies. As indicated earlier, rationality may suffer in the shadow of over-socialized rule-followers or whimsical slaves of fashion within this tradition. Although the 'new institutionalism' also address how the logic of appropriateness and the logic of consequence co-exist and interact (March and Olsen, 2005), there is a bias towards the former. We return to this issue below, but note for the moment that the primary purpose in this study has been to uncover how knowledgeable actors solve problems and execute their tasks in a manner that hopefully has made them appear as more than rule-bound adaptors to local circumstance and normative scripts. Although the 'rationalities' adopted were not 'perfect', they still appeared, most of the time, as 'perfectly rational', which reminds us also that hindsight reconstructions of 'ill-structured' problems may only imperfectly provide any comprehensive understanding of how organizational processes of sense making actually appear in the turbulence of day-to-day problem-solving (Hutter and Power, 2005). The discussion here draws attention

not only to the indigenous rationalities, as understood from a ‘sociology of knowledge’ perspective, but addresses also how ‘theories of knowledge’ shape interpretations and thus blurs the delicate interface between the investigated and the investigators. But the latter must form some independent conception of the realities that local worldviews and conceptual maps refer to and cope with in order to provide ‘thick descriptions’. The dilemma then, is that we can neither assume privileged access to these realities, authoritative rules of language use, nor would we just report what people say and do; hence an interest in this chapter in exploring what kinds of assumptions that are made in the understanding of risk regulation and risk regulators. This ’realist interpretivism’, briefly foreshadowed in Chapter 1, has been densely phrased in the following manner: “interpretive social science requires that we master the agent’s self description in order to identify our *explananda*; but it by no means requires that we couch our *explanantia* in the same language” (Taylor, 1985: 118).

The presentation, in the necessarily linear form, evokes the plethora of organizational options available. The structure of the argument, however, is basically like this: In the interpretation of social phenomena, (more or less basic) assumptions are made about social agency. Such assumptions are of course part of ordinary social life as they are part of the social science investigations. The difference is not trivial, as the latter, by its nature and self-understanding, assume some interpretive privileges which is ingrained in the very act of linguistically and theoretically representing socio-cultural agency. Understanding regulatory world views challenges such interpretive quests in the most ‘ill-structured’ manner, as the management of risk ultimately involves rather profound epistemological and moral issues. Making assumptions about the world views of ‘local practitioners’, whose worlds must be ‘viewed’ with much enlightened rationality, requires great caution and self-reflective willingness to penetrate local rationalities before we turn to ‘external’ attributions and causal explanations. Explanatory models, eager to disclose the forces and biases that govern social agents, may themselves contain some inherent biases that flavour the manner in which the ‘factual’ interpretations are fed into the models and processed though the explanatory machineries.

As noted in chapters 1 and 2, the rational pursuit of the 'public interest' appears to suffer in the analysis of public administration and governance, thus contradicting what might be theoretically expected to constitute basic rationales for such institutions. The discussion questions some assumptions inherent in such analyses, substantiated by excursions into the complexities inherent in the regulation of risk, and addresses some critical problems involved in attaching rationality assumptions to the local magicians of risk regulation. A bridge-head is needed in interpreting these local rationalities, and by evoking a 'principle of charity', it is argued that the 'public interest' deserves a more prominent position among the available explanatory and interpretive options as a reasonably robust (but not uncritically assumed) assumption in the study of regulatory world views and strategies. That's about how far the argument goes.

Understanding risk regimes

As has been argued above, although risk regimes display patterns of continuity and consistency, they must also be decomposed, allowing for different combinations of antecedent conditions in each constituent part of the regime at different points in time. In Chapter 5 we tried to summarize some of these mechanisms as they could be exemplified in the Norwegian petroleum regime, tentatively referring to the analytical risk regime 'anatomy' outlined by Hood *et al.* (2001). We return briefly to this anatomy below, and the explanatory 'regime' contained within it, but primarily in order to provide some more general, and critical, comments and reservations. Furthermore, we address the applicability of institutional perspectives in the understanding of risk regimes, both in terms of the specifically 'risk-relevant' aspects, but also in terms of addressing some salient features of the regulatory role, in particular as this role has become increasingly reliant on 'decentred' systems of 'enforced self-regulation'.

Contextual shapers of regime content

The analytical scheme proposed by Hood *et al.* (2001; henceforth, TGR: *The Government of Risk*) provides a comprehensive attempt to facilitate comparative analyses of risk regimes by identifying and specifying common variables within a general control theory perspective. As will be recalled, it conceives of such regimes as combinations of control components (i.e. standard setting, information gathering, and behaviour modification),

distributed across the two instrumental-institutional dimensions of regime context and regime content. The various properties of the context and content variables can thus be expressed in conjunction with all the three components of the control system. The initial thesis is that the former explain the latter – that characteristics of the regime are shaped by the surrounding factors pertaining to properties of the risks as embedded within their societal contexts, notably the type of risk (evaluated in terms of market failure), public perceptions about risk, and the role of organized stakeholders. Taking regime context to be the independent variable, is seen to reflect some standard explanatory models used in policy analysis. Importantly, and as noted in Chapter 2, it is the first hypothesis or model which is associated with the 'public interest'; that is, if regulatory content duly reflects the predicted and proportionate correction of market failure (according to the given delineations of such failures), then (and only then) is the public interest theory 'confirmed' (see also Baldwin and Cave, 1999; Ogus, 1994).

TGR uses this framework in a comparative analysis of nine regulatory regimes, arguing that the "regime context triangle", taken together, gave "a fairly robust basis for understanding variety in the size and style elements of regime content across the control components" (p. 133). [231] Varieties of structure were least predictable from the contextual dimensions. The interest-group hypothesis fitted best with observed regime content, whereas predictions from the market failure hypothesis produced the largest number of anomalies. Also, there were significant varieties in just what kinds of mechanisms that operated between specific aspects of contextual shapers and their relative impact on the different content dimensions across the control components.

Not primarily for the purpose of contesting these findings, we shall rather discuss some conceptual, analytical, and theoretical problems encountered by the use of the model. Some of these problems are apparent and discussed in the preceding empirical analysis (and some are also pointed to by the inventors). In particular, we are interested here in how assumptions made in such models contribute to the framing of the analysis and of

[231] The regimes considered were related to such various risk issues as dangerous dogs, ambient benzene, paedophile release, pesticide residues in food, pesticide residues in drinking water, occupational radon, domestic radon, local roads, and occupational benzene. Note that these are largely 'civilian risks'.

the explanatory outcome. Such assumptions may be contained in how the analytical models are conceptually structured, and they may be related to the normative and analytical benchmarks or yardsticks employed with respect to the role of regulatory 'agency', and the rationality assumptions adopted in addressing this role. In particular, we consider the status of risk level (or magnitude) as a 'given' benchmark.

An explicit trigger for the interest in explaining risk regimes is that regulatory size reflects the 'residual' ('unregulated') risks in a seemingly anomalous and 'disproportionate' manner.[232] It may thus seem that unless risk level can be treated as a 'constant', the line of reasoning will be distorted in a manner that affects the explanatory powers of the model. Assumed magnitudes of risk are implicitly given a function as a benchmark, against which actors' perceptions or choices are interpreted or explained (regulators in this case), and appears as the point of reference when the explanatory options are judged upon. Uncertainties and disagreements involved in making risk evaluations appear in TGR as an alternative option only at the third level of dis-aggregation of the risk-type dimension, thus not clearly accounted for at the aggregate level of explanation. Furthermore, the 'risk-benchmark' is basically understood as 'residual risk'. This provides a double bias, as residual risk is largely understood as the kinds of risk that are not 'adequately' handled by market mechanisms, as normatively restricted to a narrow liberalist conception of such market failures. The argument then takes the form of discovering a 'deficit' or 'gap' between assumed risk and regulatory content (primarily regulatory size and style), which then serves as an indication that some other mechanism, like external pressure from the public or from interest groups, must have played a significant role in shaping regulatory content. Conversely, when there is a good match between assumed risk and regulatory content, this is taken to confirm the most 'risk-responsive' hypothesis, notably the market failure model (given, presumably, that perceived market failure triggers the response).

[232] Such mismatches are of course (even more) essential in *normative* approaches to risk regulation (see Breyer, 1982; 1993; Shrader-Frechette, 1991; Sunstein, 1997; 2002).

A certain construction of ‘residual risk’ is thus given status as an implicit background condition and explanatory benchmark. The gap between assumed risk and regulatory response does not by itself dictate other explanations, but taken together with the other explanatory conditions following from the model, it is still given a decisive role. To the degree that market failure can be observed, thus leaving a large ‘residual’ of risk, the hypothesis would predict that regulatory intervention should be proportionately severe. If that is the case, the hypothesis is confirmed, if not, it is disconfirmed. In the latter case, some other mechanism is called for. Analogously, in assessing the opinion-responsive hypothesis, the level of media attention and public pressure is measured as the primary antecedent of regulatory responses (content). If regulatory action reflects this ‘level’, the hypothesis is strengthened, and conversely if not. But again, assumed risk level serves as a background condition: the hypothesis is strengthened only if the size of the regulatory intervention deviates from that which is deemed to be a ‘necessary’ or ‘appropriate’ response to the ‘residual risk’ (otherwise they would respond to the risk, not to the ‘opinion’). So, contrary to the analysis of the market failure hypothesis, the opinion-responsive hypothesis is correct if public opinion diverges from ‘objective risk’, but not if it converges. Similarly, arguments for the interest-driven regulator would be based on empirical findings showing them to respond more to interest-group pressure than to risks; but again, measured against an assumption about what would be counted as a ‘rational’ or ‘appropriate’ response.

A second ‘bias’ (also affecting the public interest theory) is related to two factors. First, as noted in chapters 2 and 5, the public interest is partly ‘hidden’ among the contextual factors. It *could* be in the public interest to follow expert advice, to follow public opinion, or even to follow industrial interests (in order for these industries to provide maximum value for the public, as would be particularly relevant in industries with heavily taxed windfall profits). But as noted, TGR primarily relates any confirmation of the public interest hypothesis to the ‘proper’ correction of marked failure, more specifically by assuming these ‘residual risks’ to be restrictively framed within a minimal interventionist (market liberal) model; this, in order to strengthen the (potential) explanatory powers of the theory. The latter condition seems justified from an ‘hypothesis-testing’ perspective,

since, obviously, if an hypothesis is too indulgently defined, any intervention could be seen as confirmatory evidence. On the other hand, it leaves the public interest theory with little 'explanatory space'. The restriction is particularly evident in the reduction of market failure to 'information failure' and 'opt-out costs', to be 'estimated' as the possibility (or 'cost') of those exposed to the risks in question to 'know' and to 'avoid' them. This restriction, it can be argued, reflects rather extreme market-liberal assumptions, leaving 'other' market failures to unregulated market solutions or legal redress (notably private tort law).[233] 'Opting out' thus appears as a 'rationally' available possibility, and implicitly 'justified' (theoretically, that is) within the explanatory framework. In sum, the unhappy effect of this explanatory schema will be that, if risk-exposed and reasonably well informed individuals, seen from a market liberalist point of view, can 'choose' to 'opt out of the exposure', no 'rationale' exists for public intervention; and if intervention still can be found, the public interest does not appear among the explanatory candidates. The public interest hypothesis is thus severely marginalized within this explanatory model.

Summing up, explanatory yardsticks make assumptions about social behaviour, sometimes in a very general and theorizing manner, 'external' to how the regulatory 'world-views' and rationales actually manifest themselves in specific cases. Turning now to the 'present' case of risk regulation, located, as has been pointed out, within a Norwegian-Nordic context, several critical factors are salient: to give due protection to workers and promote industrial safety, to *avoid* exclusion from the labour market, to involve key actors in policy making based on the participative tri-partite model, and to encourage local work-place participation as an integral part of the politics of risk. An economic market-failure model, narrowly defined, would not duly capture these

[233] More precisely, it is argued (or 'asserted') that most externalities would be included in considerations of opt-out costs and information problems. External costs are normally considered to be major examples of market failure in the area of health and safety (and also, of course in the environmental area). Taking a broader view, however, the relevance of externalities could have a wider scope (compared to the restrictions imposed here), such as when the construction of rules create more extensive mechanisms for how regulatory costs are distributed, as in the case of mandatory health services paid by employers. Generally, considerations on externalities would predict high external costs to be matched by high regulatory costs put on risk producers, cf. Baldwin and Cave (1999), Stiglitz (2000). Typical interventions to 'correct' for externalities (apart from 'direct' regulation) would be levies and taxes.

'indigenous' rationales. 'Opt-out costs' would certainly not be considered a legitimate benchmark for regulation, specifically if reduced to a matter of economic calculation on the part of the 'risk takers'. Rather, the 'right to a safe job' would serve as the justification and operating norm for determining regulatory interventions. Occupational risks are not (or rarely) legitimately considered as 'willingly chosen', even by employers. Furthermore, judgements about information costs would not be reduced to a 'measurement problem', carrying the implicit presumption that once information is provided or 'symmetric', it can be freely acted upon by autonomous and instrumentally calculating agents. The thresholds and rationales for regulatory intervention advance far beyond such extreme market liberal ideas, and as may be observed from the empirical records provided here, the frontiers and controversies of risk management are arguably to be found at the other end of the scale in terms of worker protection. More important, perhaps, the thresholds for regulatory intervention appear above all as highly politicized and controversial, involving moral considerations about division of responsibilities, as well as controversies about power relations at work-places and in society at large.[234]

Broader societal contexts thus constitutes crucial frameworks for understanding the content and the context of risk regulation, involving overall considerations about the societal and economic distribution of risk and welfare. Any conception of 'residual risk' will thus be normatively embedded in the political economy of public risk policies. Mechanisms for compensating power asymmetries play a crucial role in the regulation of working environment and safety, not reducible to purely utilitarian considerations. Assumed ('predicted') and observed assessments of 'market failure' must in this case be seen within a Norwegian-Nordic context of welfare-state interventionist politics, in order to capture the kinds of considerations that actually shape the contexts of regulatory decision-making. This ' indigenous' frame of reference may make explanatory hypotheses less precise, or make them loose 'predictive determinacy'. However, such determinacy is hard to achieve under these highly complex and multidimensional circumstances.

[234] It should be noted here however that the analysis in TGR addresses a series of relatively 'isolated risk cases', and primarily 'civilian risks', not primarily embedded in the organizational and institutional context of industrial relations.

As noted, risks regimes are shaped though complex trajectories. Furthermore, 'regime-cases' are also often 'composite packages', containing 'singular' cases with their own path-dependent history. As has been argued by Ragin and Becker (1992), questioning, *What is a case?*, the 'units' chosen for comparative analyses cannot be arbitrarily delineated, and may have a great impact on the explanatory outcome. Thus, explaining regulatory regimes cannot be done *en bloc*, Evidently, the Norwegian petroleum regime covers a number more or less loosely connected elements of regime context and regime content. The shaping mechanisms are to some extent specific to each 'item' of regulation, combining several factors which operate in composite patterns. At the same time, within the context of the larger case, there are commonalities in regulatory content and design integrated within the same basic institutional structure. Clearly, the great variety of risk factors, cannot 'explain' this uniformity of structure and design; salient regime properties (such as structure) operate across this broad landscape of individual risk items.

As reviewed here (briefly summarized in Chapter 5), contextual shapers have played different roles throughout the history of the Norwegian petroleum regime. Sometimes the regulators appear to yield to strong industrial pressures, as arguably was the case during the first years of regulation and in the NORSOK process during the 1990s. But the national ('public') interest in attracting industrial engagement and keeping up production, was also evident in these cases. And authorities did not act uniformly in either of them, as was evident in the controversies about the introduction of the Working Environment Act in the 1970s (Chapter 3). Furthermore, the requirements on the separation of production and living quarters, the introduction of remote drilling systems, to mention some conspicuous and controversial cases, were arguably risk based, but the proportionality and risk-cost-benefit trade-offs were highly contested at the time, although gradually accepted and even 'unquestioned' by the industry. In the risk controversies during the late 1990s, the NPD sided with the unions. But the various risk evaluations, and ultimately the first RNNS pilot report, seemed to prove them right. Were they yielding to 'interest group pressure' (i.e. the unions) before these reports appeared, but responding to the risk afterwards? Or were they just yielding to 'expert advice'? What was the 'explanatory'

impact of their own independent assessments of incident reports, supervisory experiences, and observations of the developments in the industry? Alleged acquiescence to union pressures appeared in the controversies about whether the enforcement of the working arrangement regulations was a justified and proportionate interpretation of the 'rest and restitution' requirements (chapters 4 and 5). The PSA policy had to be defended against a 'double front', certainly legitimatized as being risk based by the agency, as much as it was rejected and de-legitimatized as welfare-based by industrial actors and accused of being too leniently enforced by the unions.

It is of course beyond the scope of this study to evaluate the relative impact of 'driving forces' in these 'within-case' cases. The point is rather to draw attention to the difficulties involved in judging whether the public interest is even-handedly considered in the regulation of the 'residual risks'. The notion of residual risk itself would irrevocably be caught up in broader societal, political, and normative contexts, making it difficult to establish any clear yardstick against which to 'estimate' the relative impact of each explanatory factor. We might thus proceed almost in a case by case manner to find items and packages of regulatory interventions variably shaped by external forces and internal considerations. Obviously, the specific combination of mechanisms operating in each of these cases is not the same, nor is the relative contribution of each. Characteristically, the explanatory contributors are highly entangled. As noted in Chapter 3, it has been argued that strong unions and the protection of contractual rights, were critical in developing a prudent safety regime in Norway, adding to the understanding that the internal control reforms alone could account for the great improvements during the 1980s (Beck *et al*., 1998; Ryggvik, 2000). At the same time, issues about the relative risk reduction of specific interventions have regularly been juxtaposed with issues about the relative social distribution of the enormous economic benefits from the petroleum sector. In the case of whether sleeping alone was a risk reducing or a welfare based benefit, workers clearly also saw this benefit in relation to *their* relative contribution to both industrial and societal value creation, as much as other observers drew attention to the relative 'luxury' of the benefit (compared to, say, their British colleagues or South-East Asian sailors). Clearly, any consideration of the 'risk residual' will depend on how we evaluate the

impact of such societal controls; but as the examples indicate, whether they cause an ‘increase’ or a ‘decrease’ in the risk residual is not easily judged upon.

Still, strategies of regulatory and supervisory intervention must ultimately, from a normative point of view, be evaluated on the basis of their expected (marginal) risk reducing effect. This involves a full account of available options across the whole spectre of control components, not only a static ‘reading’ of any given level of ‘uncontrolled’ risk. As argued in Chapter 5, not even a Laplacian Demon would be able to figure out the normative standard against which any level of regulatory intervention should thus be measured. And as noted, the grander issues about societal priorities would regularly appear in discussions about the ‘level’ of regulation and ‘comparative’ welfare in the industry; as one HSE manager at one point aptly commented in an interview: “You know, you can really get a head-ace when you start to think about all these things”.

The ‘reservations’ forwarded in this section do not, however, imply a rejection of the use of risk evaluations as explanatory benchmarks in the analysis of regime content, nor of the use of ‘restrictive’ hypotheses. Conspicuous discrepancies between risks and regulatory responses call for some explanation (and certainly for normatively justified adjustments of regulatory priorities). But the analytic function of ‘residual risk’ as a benchmark for comparison must be made explicit in the argumentative structure. The fact that risks so often are intrinsically contextual and contested in terms of ‘measurement’ and that strategies of risk management (as would be evident on the preceding pages) are equally contextual and contested, must be taken into account. There will be a recurring risk of re-introducing normative biases, no withstanding any stated purpose of using normative theories only as benchmarks for testing positive ones. To have moving yardsticks (or an invisible or indeterminate ones), will of course be problematic in any explanatory model; the possible explanatory biases should all the more be explicit and discussed. An attempt will be made to elaborate and substantiate this more general argument below.

Institutional rituals, anarchies, and garbage cans

But these are not the only biases inherent in explanatory models of regulation. First we need to consider the institutional perspectives that seem to account for the 'residual' aspects of public policies that cannot be captured by contextual factors. And again, the rational pursuit of the public interest seems to suffer. Returning to the analysis in TGR, a significant number of the observed regime content elements could not easily be attributed to contextual factors at all, pointing to the role of institutional processes that operate outside the "triangle of contextual shapers". The analysis thus turn to *internal* factors, and to "the way professional cultures or conventions evolve and the way policy domains are settled or captured by particular 'tribes' over time" (p. 143), referring specifically to the 'rediscovery' of institutional processes in the understanding of policy regimes.[235] Instead of using this as an opportunity to explore local rationalities in a 'charitable' way, the tribe-metaphor foreshadows instead rather patronizing portrayals of the regulators. In analysing the nine risk regimes in terms of responsiveness to change, in particular to pressure for more openness and transparency, the main conclusion is summarized in the rather discouraging neologism: "blame prevention re-engineering". This refers to institutional 'defences' against external claims and pressures by a creative mixture of blame-avoidance strategies, such as institutional distortion, complexification, delay, rebuttal, and even data fabrication. Again, such interpretations appear to rely on implicit notions about what *would* have been the rational policy choice, as a background against which the interpretations appear credible.

Although the 'new' institutional paradigms emerged as a remedy to some of the perceived anomalies of 'rational' and 'functional' models that were seen to rely on

[235] March and Olsen (1989) summarized this 'rediscovery' of the institutional perspectives against several trends that seemed to have made them fade into the background: *Contextuality*: politics is seen as integral within society, largely influenced by societal, historical environments, rather than itself making significant impacts on society. It's an epiphenomenon, reflecting and mirroring its context. *Reductionism:* politics is seen as aggregate consequences of action at individual or group level. There is no necessary presumption of conscious calculation at this point, only the assumption of "aggregation". Preferences are largely exogenous and context-dependent. *Utilitarianism:* politics is the result of calculated decisions. Preference, information, uncertainty, assessing consequences, choice etc, are keywords within this framework. Decision-making typically also involves predictions of the behaviour of others. *Instrumentalism:* focus on outcomes and purpose-oriented action. Symbols, ritual, ceremony are interpreted within an instrumental context, not as substantial components in their own right. *Functionalism:* Politics seem to progress and develop toward some functional or critical state.

assumptions that appeared inconsistent with real-world observations, the 'new' assumptions appeared to turn actors into over-socialized rule-followers or ritualistic goal seekers; they "champion programs that are established but not implemented … gather information assiduously, but fail to analyze it", and hire experts "not for advice but to signal legitimacy" (Powell and DeMaggio, 1991: 3). Although no observer of bureaucracy would doubt the occurrence of such phenomena, an aggravated counter-reaction may also have just inverted the biases of rational choice models.

In one of his award-winning novels, the Norwegian author Jan Kjærstad (1993) made his literary narrator provide an elated celebration of national heroes in recent Norwegian history. In this exclusive company he included Jens Evensen, the leading architect behind the resource management regime for the emergent oil industry in the 1960s, suggesting that every good citizen should keep bust of him on their mantelpiece. Another celebrated Norwegian, political scientist Johan P. Olsen, one of the leading architects of the new institutionalist paradigm, had some years earlier (with co-author James March) claimed that this regime was more or less a blueprint of earlier industrial policies (March and Olsen, 1989: 34-37). The policy makers had basically followed tradition, 'standard operating procedures' and 'rules of appropriateness', rather than rational strategies in the pursuit of the public and national interest.[236] Two conditions seemed to account for this. First, there was no careful or systematic calculation of alternatives, but rather some simple experience-based rules. Norms of rational calculation, assessing policy options, considering alternatives and systematically estimating possible consequences were not really adhered to. Second, the processes of handling foreign investments and companies in the process of 'Norwegianization' and the securing of national control, were more or less duplicates of formerly applied policies in the energy sector (such as the policies adopted in regulating the waterfalls earlier in the century).

[236] The theory of appropriateness (drawing on the philosopher Alasdair MacIntyre) typologizes action into anticipatory and obligatory. Anticipatory action follows the scheme of (1) considering alternatives, (2) identifying values, (3) assessing how consequences of alternatives satisfy values, and (4) choosing the best alternative. In contrast, obligatory action starts with (1) identifying the situation, (2) reflecting on ones identity, role and position, (3) considering the appropriateness of actions for oneself, and (4) do what is most appropriate.

We may ask if the prevalence of national 'customs, rules, and traditions' was no result of deliberate strategic choices. Theories of rational choice have been criticized for loss of explanatory power if 'rationality' is too broadly conceived (Douglas, 1986; Etzioni, 1988).[237] But we may also ask how 'smart' or rational a policy must be in order to disprove a nearly all-inclusive theory of appropriateness. The literary narrator reiterated pretty much the conventional national romantic narrative of heroism, often contrasted with the folly of the neighbouring Danes, who sold ownership rights to the (possibly existing) petroleum resources to a large ship-owner (they later bought it back). Although self-celebrating nationalism should be treated with some suspicion, there are also good reasons to (empirically) sympathize with the more romantic versions (Kindingstad and Hagemann, 2002). Noting of course that the outcomes of social choice cannot explain their causes (in order to avoid the functionalist fallacy, see Merton, 1957), the emergence of the Norwegian resource management regime, after all, generated vast incomes for the country, and developed its most important industrial cluster of technology and know-how. [238] The architects became later to occupy leading positions in academia, law, industry, and politics. If this case exemplifies a 'logic of appropriateness' more than a 'logic of consequence', the former 'logic' may appear as too all-encompassing for explanatory purposes, and the latter as a theoretical construct more than an empirical possibility.

The vision of rationality in organizational decision-making appears perhaps most vehemently undermined in the 'garbage can model', which in its pure form appears to decouple problems and solutions altogether (Cohen *et al*., 1972). Two organizational structures, the access structure consisting of problems and solutions, and the choice opportunities available to participants, are linked in arbitrary and anarchic ways. Problems can be ill-defined, ambiguous, or contested; solutions may appear from unexpected sources, participants come and go, and choice opportunities appear and

[237] As noted by Douglas (1986: 9): "Whittling down the meaning of self-serving behaviour until every disinterested motive is included merely makes the theory vacuous".
[238] The Norwegian resource management regime has later become a flagship in the foreign aid portfolio, attracting interest from oil producing third world countries wanting to learn how to extract maximum state revenues from their emerging industries, and to resist exploitative strategies from the powerful multinationals; the general altruism of present foreign aid policies are regularly questioned, however, let alone the international engagements of the state-owned oil company Statoil(Hydro).

disappear. Goals and preferences are not clearly ordered and their realization is apparently not attached to the means available in any instrumentally rational manner. These elements constitute partly independent streams and flows, and the energies and resources devoted to particular problem-solving situations vary. Densely summarized, these organized anarchies appear as "a collection of choices looking for problems, issues and feelings looking for decision situations in which they might be aired, solutions looking for issues to which they might be the answer, and decision makers looking for work." (1972: 2). A temporal order of chance and chaos substitutes a consequential order of rationality. Problems, solutions, information, preferences, decision makers, and choice opportunities flow in and out of decision arenas, and linkages appear as arbitrary and autonomous.

Cultural scripts, values, and rules of appropriateness help agents in manoeuvring within these anarchic and decoupled streams of ambiguous opportunities (March and Olsen, 1989). Although such manoeuvring practices may seem functional and even necessary in the face of the complexity of the problems and the environmental instabilities encountered, rationality, if allowed for at all, appear as basically incidental. Participants interpret the past, the present, and the future to the best of their abilities, victim to ambiguities and chaos, and for the most part resorting to (simple) rules of tomb.

If there was a rationality bias in the models of rational choice, the anarchical models contain an inverted bias. And certainly: if anarchy is looked for, it is not easily missed.[239]

[239] A good example of garbage can processes in the recent history of regulation in Norway is arguably the comprehensive reform on regulatory agencies emanating from the Report to the Storting in 2003 (see pp. 101-102). It was hardly based on any in-depth analysis of existing problems of apparent role conflicts; the inherent (but reasonably organized and no great cause of critique) role conflicts in the NPD had critically surfaced due to the team-experiments, as these involved the partial dismantling of established systems of accountability and the divisional separation of resource and safety tasks (teams were mixed and the divisional model dissolved). However, the separation of the NPD only incidentally 'solved' this very recently created (or exacerbated) problem. But the ministry could add another 'reform-item' to their merit-list. More generally, the decision to re-localize eight agencies appeared more or less as a solution from nowhere, to the great surprise of most observers and a shock to the 900 employees affected. The justifications provided traversed across an ambiguous argumentative landscape, with autonomy and capture arguments salient in early phases, but gradually replaced by 'regional policy' arguments as the parliamentary voting approached in the 'district-friendly' Storting. The autonomy arguments may have had some bearing in the case of liberalized network industries (where role conflicts of course would surface between new ownership-roles and regulatory roles) but the arguments were 'generalized' to all sectors,

But institutional theorists have also found 'tribal customs and rituals' in the ivory towers of academia, though presumably not within their own ranks, such as in the processes of constructing 'institutional theories'.[240] Incidentally, however, conjectures could be devised regarding the recurring identification of 'culture' with 'Cultural Theory' (as in TGR), where the role of 'culture' is drawn more or less exclusively from the grid/group typology of Mary Douglas, disregarding all the other alternatives available from the menu of cultural theories and conceptualization. 'Cultural Theory' then appears as just one option entering the scene of choice opportunities in a context were administrative scientists incidentally focused selective and limited attentive capacities on solutions to anomalies that escaped the conventional doctrines of rational choice. Once established, it endured as a convenient template, an appropriate convention for addressing the mysterious residuals of organizational and political life. But to see this only as ritualistic adaptations to organized anarchies of knowledge systems would possibly be opposed with much rational reasoning by the practicing academic agents.

However, the new institutionalist perspectives appear in several guises and do not converge on single sets of assumptions or outlooks (Peters, 1996; Powell and DeMaggio, 1991; March and Olsen, 2005). Although not the explanatory genus, self-interest and

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appearing as a solution to rather vaguely identified 'problems'. Problems that had in fact been identified, such as lack of coordination and cooperation between allied regimes, were 'solved' by localizing agencies in different parts of the country. Likewise, the lack of overall and regime-crossing risk-cost-benefit analyses was not addressed at all. This was all the more critical, as the proposal for adjusted interfaces between 'political' and 'administrative' decisions and increased autonomy basically resorted to some legal accommodations (although allowing for ministerial interference with respect to 'politically significant' issues). Problems related to the scope of discretionary administrative powers following from risk-based and functional regulations were hardly addressed. As might be expected, the public and parliamentary discussion concentrated almost exclusively on geography (adding only to the irony in that the proposition to set up independent appellate bodies was not accepted, despite the uncontrolled growth of such bodies in other areas). The only predictable (and predicted) outcome of the reform was a massive loss of professionals, virtually dismantling the existing agencies, seriously thwarting the stated reform purpose of 'strengthening their professional competence'. However, the decision processes regarding the comprehensive re-localizations appeared to have been conducted with much calculative ingenuity, a process that the former minister later have been reported to recount with some professional pride from his professor-position at the Norwegian School of Economics and Business Administration. Rationality not only appears in different degrees and forms, it appears also in subversively perverted combinations.

[240] That such claims can thus be self-defeating, almost as relativist philosophies of knowledge, may be apparent from the following passage: "Expertise is a collection of rules. Although they may be rationalized to some degree, rules are learned by experts as catechisms: Physicists learn what physicists do; lawyers learn what lawyers do. The rules are enforced by the standards of professions and the expectation of patrons. As a result, within political institutions, physicists do what physicists do and are expected to do; lawyers do what lawyers do." (March and Olsen, 1989: 30).

instrumental calculation are not out-ruled. Incidentally, the 'inner lives' of regulatory regimes as portrayed in TGR, appear as pervaded with strategies of self-serving calculation in the 'ingenious' attempts to avoid blame. And rationality, more broadly conceived, may be apparent on a systemic level, even if rules and routines seem rigid and bureaucratic. Rules facilitate coordinated behaviour and agreement by constraining and channelling the allocation of attention, standards of evaluation, priorities, perceptions, and resources. Organizational systems are seen as "arenas for contending social forces, but also collections of standard operating procedures and structures that define and defend values, norms, interests, identities, and beliefs" (March and Olsen, 1989: 17). Trust is ingrained (and partly required) through processes of institutionalization, and facilitates operational smoothness as it does not depend on the more immediate reciprocal mechanisms inherent in calculative behaviour.

However, rules are neither monolithic nor unambiguous, and the process of determining what is appropriate in the situation may be quite complex. As noted by March and Olsen (1989: 16-17): "The premise of organization is that not everything can be attended to at once, though in principle, such attention is required for comprehensive solution. Thus, a central anomaly of institutions is that they increase capability by reducing comprehensiveness". A logic of appropriateness, assisted by norms, identities, routines, and rules, enters as a matter of necessity in coping with ongoing demands and informational overloads. As recently summarized, the 'new institutionalism' "tries to avoid unfeasible assumptions that require too much … in terms of normative commitments (virtue), cognitive abilities (bounded rationality), and social control (capabilities)" (March and Olsen, 2005: 20). The ideals of risk management do indeed embody all these norms of rationality (including norms of instrumentality and morality) as prescriptive templates for local action. Rationality assumptions pose problems for socio-cultural analysis not only when understood too narrowly, but also when understood too comprehensively. But in either case, 'observed deviance' from given norms appears

to prompt ‘external’ explanations in a manner that reduces local practices simply to socially conditioned rules and ritualistic practices.[241]

This brief, if critical, review does not entail a return to simplistic models of rational choice, or that ‘rules of appropriateness’ are not of great importance for the understanding of institutional processes and decision-making. It should be noted, however, that the latter appear both as a consequence of complexity and as a way of dealing with it. But just these processes of dealing with complexity are common to agents and students of agency alike (be they risk managers, students of risk management or students of institutions and institutionalization). The choice of rationality assumptions is all the more critical; discarding the most restrictive assumptions about environmental dictates and rational choice or design, it still appears that far more comprehensive notions of rationality serve as yardsticks for identifying the ways in which institutions manage to get things done; the implications of such assumptions would clearly be most apparent in the case of risk management regimes, as will be further explored below.

Understanding self-regulation

One reason for reviewing these institutionalist perspectives and the garbage can model of organized anarchy is not only its general impact on policy analysis, but also the apparent applicability of these ideas to the case at hand. From a certain perspective it is obviously not difficult to find symptoms of anarchic and decoupled streams of problems and solutions if we trace the development of the cultural experiment: with a certain taste for caricature one could indulge in ironies about a culture-fad copied from recent risk management currents, suspended by a team-fad copied from the menu of organizational vogues, re-fashioned within the ‘single task’ agency modelled on New Public

[241] In anthropology, rituals are conventionally understood as ‘standardized’ behaviour where the relationship between means and ends is not ‘intrinsic’. This, however, does not make them intrinsically ‘irrational’. Rituals are separated from habit and routine by the symbolic meanings attached to them. Repetitive blue-printing of managerial designs and problem solving templates would match this understanding; but only pointing to the apparent isomorphism between the templates and their re-applications avoids the problem of demonstrating non-instrumentality as evidence for ‘symbolic reductionism’. Furthermore, as noted, the understanding of ritual in not exclusively related to their apparent ‘non-instrumentality’, but rather to the presence or absence of institutionalized symbolic elements; rituals may just be more ‘expressive’ ways of getting things done (Keesing and Strathern, 1998). As Barth (1961) observed with the migrations of Basseri nomads of Southern Persia, they were *both* adapting (rationally) to their environment *and* engaging in one of their important rituals.

Management inspired ideas, distorted in the industrial environment dominated by imported behavioural programs, and then finally lost in translation (or alternatively, put to rest in the garbage can, from where it was once picked up as a fashionable 'choice opportunity').[242]

That 'culture' partly remained as an 'idea', at least in the regulatory context, is still not very satisfactorily accounted for in terms of this scheme. Rather, it entered as a half-digested solution to real problems in the first place, and not as a solution looking for problems; only later did it appear as a 'solution' trying to 're-connect' to these. And as argued here, these 're-connecting' attempts show traces of quite enlightened processes of organizational sense-making, reflecting enduring and familiar problems related to the introduction of new terms and models in organizational life, and in particular in public administration. The temptation to test a magical cure for enacting the regulatory will through the central nervous system of the regulated organizations, may at worst be regarded as a case of institutional *hubris*. The intellectual and practical struggles to temper the magical forces released were nevertheless performed with much argumentative sophistication, not so different from analogous struggles within the academic communities (as argued in Chapter 10).

But the very idea of self-regulation and the introduction of enforced risk management may also be victim to the interpretive scheme of misanthropic institutionalism, appearing as convenient blueprints derived from the emerging standards of quality management, soon to become fashionable recipes for organizational, managerial, and regulatory design. The authorities could assume inventiveness and ingenuity, and at the same time escape

[242] As may have been be argued by institutionalist writers such as Meyer and Rowan (1991). A comprehensive discussion of trends, fashions, and institutional copying, is provided in Røvik (2007). Although it was admitted by one of the originators that they wanted to be 'part of the trend' (see chapter 4), this consideration appeared neither as a justification of any great importance, and much less as a 'cause', as should be evident from the account provided here. To explore and exploit the insights of organizational risk management studies was the primary justification. It may be noted, however, that 'safety culture' obviously did hit this field of study with fashion-like strength during the 1990s. Perhaps ironically, one of the main inspirational sources for importing the concept, James Reason recently referred to 'safety culture' as the 'fad of the 1990s', suggesting organizational 'resilience' to be its most promising successor. (The comment was given in a key note presentation at a conference on risk regulation at the *LSE* in March, 2007).

responsibility and let the industry do the job. Mechanisms of regulatory self-management, such as the use of industrial standards, has also been interpreted as a tactic for 'hiding' behind expert advice (Hood *et al*., 2001), rather than a legitimate (and necessary) strategy for adapting to developing technologies, and the insistence on allocating full responsibility to the industry could be interpreted as just another case of 'blame-avoidance'. We may however distinguish between 'blame-avoidance' as a motivating rationale and as an 'unintended' side effect. The evidence, as argued here (see particularly chapters 4 and 5) point to the latter option, following from a fairly rational and strategically explicit insistence on industry responsibility and self-management as a necessary condition for the overall promotion of regulatory goals. Although blame-avoidance is certainly an issue, these interpretations do not necessarily rule each other out. One important question would thus be to what extent reduced statutory responsibility would in fact imply reduced industry responsibility. Whatever answer is produced, 'blame-avoidance' (intended or not) may still be justified from a public interest perspective by pointing to the importance of sustaining the legitimacy of the public authority. Indeed, these were some of the many delicate balancing acts of the regulatory role. Exposing the authority to 'blame', such as by taking 'responsibility' for a given standard, would (as was argued) distract attention and absorb resources in unproductive ways.[243]

The development of self-regulatory systems may also be interpreted as more historically embedded responses to societal, public, and political concerns. As regulatory ambitions develop, in conjunction with governmental ambitions more generally, there will be a need for the introduction of self-regulatory mechanisms reminiscent of what Foucault (1979/1991) termed *governmentality*. This neologism, an amalgam of government and mentality, denotes penetrating mechanisms of societal 'hyper-controls', replacing the crude and direct controls with schemes that regulate 'the conduct of conduct' (later re-phrased by Rose (1999), as to 'act upon action'). In his historical analysis, Foucault

[243] It should be noted that issues about the standard setting role of the authorities was an ongoing concern; some unions clearly opposed what they saw as too lenient practices from the authorities, calling for more precise standards for worker protection, witch could also be locally used as benchmarks for demanding improvements.

points to the development of governmental rationalities and techniques, accompanied by the growth of specific forms of knowledge necessary for making populations governable (statistics, epidemiology, demography, etc.). This power/knowledge framework serves as the back-drop of regulated self conduct, and a system of self-governing subjects appear as intrinsically embedded in mechanisms and structures of societal power (Foucault, 1980). Detailed surveillance of conduct would be overwhelming given the growing complexity of large scale societies (although approximated within organized panopticons, like prisons). However, this Foucauldian outlook do arguably take the power/control perspective to the extremes, even if based on critical features of modern societies with ambitious and intrusive 'governmental' polities. If 'governmentality' is conceptualized as more or less as intrinsic and all-pervasive forms of dominance, neither feasible opposition nor legitimate authority is allowed for. If power is ingrained in the very fabric of sociality, almost as a zero-sum game, void of meaningful resistance and void enlightened democracy; no explanatory, imaginable, or legitimate alternative appears possible, allowing no freedom or resistance, just over-socialized objects, and unable to distinguish varieties of control and power, distinctions that are constitutive for the very idea of social interests, democracy, and legitimate governance (see Habermas, 1996; Lukes, 2005; Said, 2000). As argued by Taylor (1985: 152-184), the Fouchaldian power seems intrinsic to and even constitutive of social relations, independent of what interests or goals that are being promoted or curbed. The regulatory purposes of furthering social and democratic values are lost in this all-encompassing order of things. This is not indicated to under-estimate problems and controversies arising in the wake of new modes of social and corporate control, which may be related to broader societal concerns as well as to the 'instrumental' issues of control. The combinations of such instrumental and societal issues has attracted much academic (including anthropological) attention, such as in studies of modern audit practices and 'technologies' (Falk More, 2005; Power, 1997; Strathern, 2000). Importantly, however, such systems of control, notably within the area of occupational health and safety, are devised and justified just for their 'instrumental' capacity also to *counter-balance* existing ('residual') power asymmetries in society, such as between employers and employees, thus making it unduly one-sided to simply see them as stereotyped and abstract technologies of control.

Whatever the 'normative foundations' of these forms of control, we need to consider the more general characteristics of modern societies, related to information asymmetries, regulatory oversight, surveillance capacities, and the increasing levels of complexity involved in making regulations work. As observed by Hutter (2001), there are parallels between regulatory modes of control and the more general patterns of social control, manifested by the nature of the economic activities to be controlled and the constitutive ambitions of regulation. In this context, "The overriding regulatory goal is to constitute risk management systems as an integral and important part of corporate activity and beyond this to engender a deep understanding of these amongst all parts of, and all individuals within, the company" (2001: 319). These features are of a general nature, and would not in themselves explain national or sectorial differences. In a comparative analysis they might simply appear as 'necessary conditions', and the societal orders (or disorders) seem intrinsically related to these new forms of control. And indeed, the proliferation of principles of internal control to virtually all regulatory regimes in Norway the last few years proves their structural attractiveness. It is thus instructive to observe the varieties of such regimes, and of how reconstructions of societal risk reflect different societal trends, moods, and cultures, such as welfare policies, national cultures, and historical contexts (Jasanof, 2005; Koht; 2000).

The rise of self-regulatory systems appear as specific policy choices, growing out of identifiable historical conditions, the operating mechanisms of which may rest on both 'necessary' and somewhat 'accidental' causes. Turning to some salient features of the Norwegian regulatory and socio-political context, one should draw attention to a certain level of mutual trust, the relatively 'close' relationships between industry and authorities, and, as noted previously, the availability of 'big sticks'. Furthermore, the regulated industries consisted of large or medium-sized enterprises (with sufficient administrative and economic capacities), and with a gradually increasing impact of certain normative templates, such as quality management systems, preceding the reforms. An element of *necessity* was clearly apparent; there simply was no other option available than to mobilize systems of self control. The Norwegian petroleum sector still appears as a

pioneering example of such regulations. As was evident from the indigenous reconstruction of how this regime developed in the NCS-regulations, local inventiveness was emphasized (see Chapter 4). The manner in which inspirations were drawn from different sources, certainly in the face of the 'external' regulatory challenges, clearly point to how local initiatives were inspired by ideational currents and transformed into a gradually emergent regime of regulated risk management.[244] But the specific form that these meta-regulations of self-control should take does not follow mechanically from these initial conditions. The heavy reliance on comprehensive managements systems, formal company procedures, and documentary overloads appeared perhaps as side effects.[245] The regulation of 'culture' appeared in this context as an attractive 'meta-regulation', fulfilling the ideal of regulated risk management by virtually injecting a self-regulatory agent directly into the veins of the regulated bodies.

Risk and rationality assumptions

In this section we readdress the role of *assumptions* in the understanding and management of risk, using somewhat broader disciplinary and theoretical approaches, and specifically by analysing the status of rationality assumptions. The argument is basically of a more general nature, but still instigated by recurring reminders of the need for theoretical self-reflexivity encountered during the process of making sense of the indigenous patterns of risk regulation.

[244] That these ideas later travelled across the North Sea is not always recognized in some versions of how the British offshore regime later developed. However, the Cullen Report (1990) was clearly influenced by the advice offered by officials from the NPD, including Magne Ognedal, and it was even (as noted in chapter 5) informally referred to as the "Ognedal report" (Beck, *et al.*, 1998; Ryggvik, 2000). Neither was the debt to Norwegian regulatory ideas quite recognized when the report was launched; this was referred to with indulgent irony by veteran agency officials who had been present when Cullen presented his new regulatory 'visions'; as noted by one of them: "He was sitting in his wing chair, stating solemnly that he'd 'had a vision'. We knew where that vision came from." In fact, it was occasionally subject to some irritation that the Norwegian inspirations were not more explicitly acknowledged. Incidentally, however, most interviewees, when occasionally referring to the 'British regime', described this as (still) rather traditional and inspection-like, compared to the Norwegian supervisory policy.

[245] We should note, however, that these side effects appeared as equally dysfunctional when the reforms were applied on a wider nation-wide scale. Notably, small and medium sized enterprises experienced extensive bureaucratization as an unintended side-effect of the early attempts to regulate internal control systems on a general basis (Lindøe, 1992).

Summarizing the argument thus far, neither much rationality nor public spiritedness is granted to the regulators in some current models of explaining and interpreting public risk policies. To the extent that rationality is embodied within the regulatory ethos, it appears to be of the selectively instrumental and self-serving kind. In the preceding review, the rational pursuit of the public interest is basically 'discovered' only when market failures are 'correctly corrected', according to a narrow and liberalist interpretation of what constitutes such failures. These restrictions are theoretically justified in order to provide predictive determinacy, which seems reasonable, since too broadly defined hypotheses would lose explanatory power if any empirical finding would be consistent with its predictions. On the other hand, if the purpose is to explore local rationalities and regulatory world views, such restrictions might also 'exclude' alternative insights about regulatory processes by defining a too limited range of local rationalities (seen from 'within') and likewise restrict a 'reasonable' interpretation of aggregate results, in particular as these are contained or anticipated in the processes of local choice and decision making.

In the following, we address again the argumentative structures analyzed above, where the employment of normative benchmarks serve as standards against which behaviour are understood. If behaviours match the standard (as predicted by the theory), the theory is confirmed; if not, other theories are evoked. It follows that the specification of this norm is essential, as are the explanatory alternatives available. Seen from the 'outside', deviations from some norm (concentrating here on norms of rationality) often paves the way for a 'next' argumentative step: 'something else' must explain this phenomenon, either some causal mechanism, operating behind the back of the 'natives' (ranging from 'internal' factors like self-deception to 'external' factors like culture, and including combinations of these), or some hidden agenda, normally not directly exposed to the observer/investigator, but still 'deducible' from the behaviour observed.

The 'what else' argument

One attribute of such 'what else' arguments will be to 'bracket' (and often de-legitimize) practices and beliefs by attributing them to psychological, socio-cultural, or even political

origins or causes. This appears as a commonly employed strategy in many contexts, in daily life, in political and public discourses, and also in scientific discourses. It follows a rather simple, if implicit, procedure, reminiscent of the argumentative structure outlined above: first, by identifying some 'flaw' (often in the reasoning) of observed agents, and second, by identifying some other, underlying operative mechanisms, such as prejudice, egoism, tradition, rules of appropriateness, routine, or even 'culture'. Beliefs and practices are thus re-contextualized, virtually by the use of 'quotation marks', thereby objectifying them, drawing attention to their causes rather than to the evidence supporting them or to their local rationales.[246] A possible source of error in such attributions is however related to the confusion between origins of beliefs and their justifications. The confusion (or error) is apparent in the so-called *genetic fallacy*, where providing causes of beliefs is taken to discredit them, such as Freud's attempt to discredit ('irrational') religious beliefs by tracing them to their 'psychological causes' (see Shrader-Frechette, 1991: 18). But although causes of beliefs alone cannot be taken to bear upon their justification as such, we still tend to think that the two are not wholly unrelated. Rather, the more 'strange', incomprehensible, and seemingly 'irrational' we take others to be, the more we tend to ask: 'what else' can explain this behaviour or belief.[247] We pick up on that point below.

[246] A primary source of inspiration for addressing these argumentative practices, has been a (locally) famous and widely read article by the Norwegian philosopher, Hans Skjervheim (1976). Addressing the mounting influence of the positivist and objectifying social science tradition (in particular in psychology), he argued for a dialogical and hermeneutic understanding. Objectification implied a strategy of always 'contextualizing' the perspectives of one's interlocutors, treating them as just 'instances' or symptoms of causal processes operating beyond their comprehension. This, it was argued, distorted the communicative and participative engagements with 'the other', and lead ultimately to alienating understandings of sociality. Another source of influence is, of course, the already mentioned philosopher Charles Taylor. He insistently referred to his preoccupation with countering the natural science based ideals of positivist social science as the work of a 'mono-maniac'(Taylor, 1985). The corresponding term in this case might possibly be a 'meta-maniac', notoriously inclined to 'bracket' beliefs and practices within a larger explanatory scheme, within which they appear only as 'instances' of certain causally explicable phenomena.

[247] The term "what else" arguments is evoked by Shrader-Frechette (1991), referring to Quine and Ullian (1978). It may be noted that, despite reassurances from Shrader-Frechette, responding to an e-mail request about the correctness of the reference, I could not find any direct use of the "what else argument" in the Quine/Ullian book. What is discussed on the pages referred to (120-21), is in fact the phenomenon of "argument from want of evident alternatives". This argument, and its explanatory function, may be legitimate in cases where no other explanation seem available. Even if there is little or no evidence to support it, it still serves the function of accounting for something otherwise unintelligible. It is, however, pointed to as a frequently abused form of argument, as when we 'jump to conclusions' (indicating that alternative explanations are not explored after all). There is certainly a connection between this phenomenon and the "what else argument" as used by Shrader-Frechette, all though I cannot find that

Within the local arenas of risk politics, these mechanisms are visible in the way crucial actors mutually construct images of each other, as the when lay actors (the public, consumers, workers, etc.) are stigmatized as risk aversive or even strategically risk aversive, or when more powerful industrial actors are portrayed as calculating profit-seekers paying lip-service to HSE-values in order to please workers, unions, regulators, and the general public. Such mechanisms, it may be recalled, appeared clearly in the discussions and controversies about behaviour-based safety programs.[248] Risk, or rational risk management, is implicitly given a function in such argumentative strategies, as *perceptions* of risk and its management is benchmarked against some assumed, and notably more rational, alternative. The importance of stressing 'good intentions' is an evident reflection of this tendency to uncover the 'fundamental' operating mechanisms, and of the (often) accompanying, and (often) mutual process of attributing 'motives'.[249] Typically, these mechanisms were activated in conjunction with deteriorating *trust*, but perhaps more as a consequence of broken trust than as cause of it (although trust would certainly not suffer less as a result). The level of trust between key actors in risk

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Quine/Ullian use that specific phrase. The usage applied here, still derived from Shrader-Frechette (who then, perhaps mistakenly, derived it from Quine and Ullian) has more to it than the narrow interpretation of the 'jump to conclusion' mechanism, referring also to the mechanism of mixing causes of beliefs with the justification of beliefs, specifically apparent in the *genetic fallacy* and *ad hominem* arguments; this phenomenon, however, is also discussed elsewhere in the Quine/Ullian book (like in chapter 2) where they treat causes of beliefs *vs* beliefs acquired from evidence; and that is of course the phenomenon of interest here, not the reference details.

[248] As briefly noted in chapter 8, safety measures were re-interpreted as 'symbol-safety', acquitting the company and implicitly blaming the workers. Union resistance was re-interpreted as 'sectarian', and at one point even addressed as such an inexplicable positions so as to require 'explanation'. In one of the HSE culture conferences, one of the key architects in the Statoil program, referring first to the IRIS-evaluations, which had provided an "academically objective" confirmation of its virtues, 'challenged' the researchers in a plenary debate to provide a 'reasoned explanation' of the resistance to the program, calling upon a 'scientific judgement of why it was stigmatized from peripheral quarters'. Perhaps taken by surprise, the framing of the question was not questioned at all in the response, but rather presupposed (by referring to the difficulty in finding 'good reasons' for the resistance, but still pointing to the possible role of the media and of the need for some actors to 'position' themselves).

[249] This was particularly evident in the many public arenas where the politics and rhetoric of displaying good intentions ('HSE as first priority', 'safety first', etc.), and evidenced by the costly safety programs, appeared partly as an insisting request for trust, and partly as a 'disbelief of disbelief'. To the critics, the good intentions appeared, to rephrase the old quote, more as what the road to hell was paved with. Did they 'walk the talk' as was claimed, or did, in the end, 'money talk'? And conversely, the industry evoked the same strategy when confronted with 'unreasonable demands', not justified by critical and balanced risk evaluations. Most conspicuously, the 'single cabin' issue provoked attributions of hidden agendas and motives (such as 'welfare'), and the risk benchmark was accordingly brought to the surface by insisting on risk-cost-benefit evaluations.

management discourses thus appears as an important condition for 'explaining' the use such *genetic* fallacies, notably through their close relatives, the *ad hominem* arguments. The need to search beyond the face value of stated positions appears for the most part as instrumentally redundant, unless you have good reasons to distrust your fellow humans.[250]

These mechanisms of attributing causes in itself, has relevance for the discussion of risk, although not only for understanding 'lay' perceptions and beliefs, but also for understanding how more powerful actors, and even (social) scientists apply explanatory models in risk discourses. The exercise of juxtaposing accounts of risk and accounts of *perceptions* of risk, at least equals in difficulty the structurally similar exercise of juxtaposing rationality and its perception. As noted in Chapter 2, several mechanisms have been identified that appear to make people 'fear the wrong things', compared to the 'real and objective' (probability times consequence) risk potential. This rationality 'deficit' may be attributable to different psychological mechanisms, and various socio-cultural explanations may also be suggested. The former can include psychiatric research to show that nuclear opponents are mentally ill or that environmentalists have paranoid and primitive fantasies. Socio-cultural explanations may interpret 'risk-adverse' attitudes as expressions of 'anti-industrialism', 'sectarianism', and 'provinciality'. The *purpose* of such 'explanations' may occasionally be to demonstrate 'pathologic' fears and mechanisms as causes of risk aversion in order to stigmatize opponents of industrial and economic progress (see Shrader-Frechette, 1991, for a review).

The simple form of the argument is based on a perceived gap between 'rational' and 'actual' beliefs, the former self-explanatory and 'caused' simply by the way the world is, and the latter irrational or unjustified, and to be explained by some other external mechanisms of cognitive or socio-cultural origin. This is the simple structure of reasoning within so-called 'public deficit' models, the premise being some scientifically founded estimation of 'real' risk, against which public opinion is measured (Wynne,

[250] *Ad hominem* arguments, a subtype of the *genetic* fallacy, is listed as an *informal fallacy* in philosophy textbooks, and take the form of refuting an argument by attacking the arguer's character.

1992; 1996). Deviance is then seen as ignorance (deficit). People do not really know. The next step in this argumentative procedure is (often) to attribute their erroneous beliefs to some cause, psychological or socio-cultural. Apart from the more stigmatizing strategies of de-legitimation, the *politics* of risk may also involve educational strategies in order to 'inform' people about the real nature and magnitude of any given risk.

A more 'democratic' and participative procedure, however, is to let investigations of risk perceptions feed into the risk evaluation on the normative side: given that norms of acceptability and priority are not only questions of objective assessment, but also involve profound ethical questions where the moral preferences of ordinary people should be taken into account. Also, the more 'experience-near' position of the non-expert may generate factually quite appropriate perceptions of 'real risks'; risks are often embedded in highly contextual environments which make the 'lay-expert' divide inappropriate for assuming a corresponding asymmetry in terms of really 'knowing' the risks (Otway, 1992; Kasperson, 1992; Shrader-Frechette, 1991; Wynne, 1992; 1996).

Such controversies and issues have often been related to a division in the risk literature between on the one side, scientistic perspectives presupposing the possibility of discovering real and objective risk, and on the other side, a subjectivist perspective rejecting objectivism and arguing for various shades of constructivist and relativist positions. A dichotomy is thus created between 'cultural relativism' and 'naïve positivism', carrying the implicit assumption of a single dimension capable of ordering the variety of risk perspectives along a continuum according to the extent to which they display 'degrees' of either extremes (Renn, 1992; Shrader-Frechette, 1991).[251] Shrader-Frechette takes these oppositions as a starting point in arguing for a "midway position between cultural relativism and naïve positivism". However, trying to find a midway position between such 'extremes' may result, less in a midway, than in a landscape of

[251] The dichotomy is employed in Ortwin Renn's much sited classification of risk perspectives: "If risk is seen as an objective property of an event or activity and measured as the probability of well-defined adverse effects, the policy implications are obvious. Order risks according to "objective" measures of probability and magnitude of harm, and allocate resources to reduce the greatest risk first. If, on the other hand, risk is seen as a cultural or social construction, risk management activities would be set according to different criteria, and priorities should reflect social values and life style preferences. These two positions represent extremes in a spectrum of risk perspectives" (Renn 1992:54).

criss-crossing positions of methodological, disciplinary, and value laden doctrines of risk management.[252] Methodological value judgments are different from normative judgments about consequences, say, regarding the economic value of life as compared to other losses, and conversely, risk management controversies may be constitutive and value-laden apart from the moral valuation of the possible outcomes.[253] Some of these basic difficulties of ordering risk management discourses are evident in the conceptual organization of competing risk management doctrines referred to in Chapter 1, reflecting the complexity of possible combinations of judgments to be made in the management of risk. The deceivingly simple risk formulae, probability times consequence, for all its inherent complexity, does not provide more than a provisional point of departure.

Adopting the perspective outlined above, this framing of risk positions may cause too much indeterminacy in terms of interpretive potential. Analogous to the employment of rationality assumptions, there are too many dimensions implied in the risk concept to be able to order intermediate positions along an unambiguous scale. Even the extreme positions would carry too many combinations of 'sub-positions' to be unequivocally categorized. This way of framing risk positions conceals important distinctions, such as

[252] Although the initial framing is bounded by this one-dimensional view, her discussion takes into account the great variety of dimensions that go into the risk concept, arguing for more procedural, participative, and democratic processes of risk management. Admittedly, this presentation may thus be undeservedly caricatured for the sake of argument. As in Renn's article, the details of these positions are extensively elaborated; the point here is rather how such dichotomies still tend to 'order' and frame discourses, as was evident in the aftermath of the Royal Society report on risk from 1992, alternatively referred to as the "four chapters good and two chapters bad" and conversely as the "two chapters good and four chapters bad". The two chapters on risk perception and management adopted an open social constructionist and deliberative approach, whereas the other chapters adopted a scientistic/probabilistic account (see Royal Society (1992), and Hood and Jones (1996) on the succeeding disputes.

[253] The two can converge, like in the case of methodological preference for *type II* statistical error, that is, failing to reject a false null hypothesis, over *type I* error, that is, rejecting a true null hypothesis This preference would be the equivalent of maximizing utility and industrial risk taking. Carefulness in the scientific enterprise thus equals carelessness in the industrial enterprise. This is at odds with precautionary principles and maximin principles, from which *type I* error would be preferable. Scientific conservatism dictates that it's better to believe that no relationship exist (even if it does) than to believe it does (even if it doesn't), equalling industrial activism. This structural similarity has been taken descriptively, to explain the preference for public risks, and also normatively, for its justification. Shrader-Frechette holds this to be an illegitimate epistemological analogy that amounts to some kind of *prima facie* universal epistemological preference: "judgments about societal welfare involve "cultural rationality", and hence an assessment of the democratic justifiability of the risk imposition …. the fact that pure scientists minimize *type-I* errors provides no compelling reasons for arguing that societal decision-makers ought to minimize *type-I* errors" (1991: 135). She makes an analogous argument for not taking the inherent 'innocence-bias' of legal proceedings (of not convicting innocents) as a model for risk policies, involving an analogous innocence-bias unduly benefiting profit-seeking industries .

the ‘factual’ (probabilistic/predictive) and the normative aspects (values to be protected and promoted) of the risk concept. Even if two ‘factually’ oriented assessors agreed on the (probable) predictions about outcomes, they might strongly disagree about acceptability thresholds and priorities (such as between human and material/economic losses). The entanglement is apparent when ‘cultural relativists’ like Douglas and Wildavsky (1983), hide objectivist assumptions about risk, paradoxically even constitutive of their ‘relativist’ argument. Thus, the cultural (‘relativist’) theory of Douglas and Wildavsky, in fact make ‘actual risk’ into an implicit benchmark. The ‘cultural bias’ is identified (and can arguably only be so) on the basis of a discrepancy (gap) between the ‘real’ risk and the erroneously perceived risk. This discrepancy needs to be explained, in this case in terms of the cultural bias-mechanism. The structure of the argument is made explicit in an example from the Lele (1983: 6-7): Lele fear lightning more than leprosy, ulcers, and other tropical diseases Since these diseases clearly are more dangerous, some cultural bias must explain the ‘deficit’.

In such multi-step (essentially infinite) argumentative procedures of assessing facts, beliefs, reasons and/or causes of beliefs, etc., Shrader-Frechette (1991) claims that Douglas and Wildawsky overemphasize value judgments in hazard evaluation. But more important is that they first overemphasize uncertainty as a justification of relativism, only to continue applying cultural biases, implicitly based on a non-relativist premise; that is, a rationality assumption is used to justify the demonstration of a cultural bias. Given this position, we may note also the possible ‘contradiction’ contained in attempts to ‘refute’ cultural relativism by providing empirical counter-evidence. Returning for a moment to the critique based on fallacious applications of *genetic* or *ad hominem* arguments, such ‘evidence’ could be dismissed as irrelevant; judgements of beliefs (true or false), should not be made on the basis of their assumed causes. But benchmarks based in a ‘realist’ conception of risk enter into the critique of relativism and scientism alike. Shrader-Frechette uses such benchmarks several times, e.g. when referring to psychometric studies of risk perception, showing that risk aversion associated with externally imposed public risk, is greater than for privately chosen risks of the same probability. The point here is that such findings implicitly pre-suppose a separation of real risk and perceived

risk, which is in fact the kind of separation that Shrader-Frechette argues against. It would not be possible to isolate the effect of individual voluntarism if you didn't keep other factors constant; and the important constant in this case would be either the factual ('probability') side or the normative ('value') side of the risk evaluation.[254]

Risk and rationality

In order to elaborate this argument further, we need to consider the status of rationality assumptions in the interpretation of social phenomena from a theoretical perspective. As would be evident, there is an obvious convergence between the concept of risk management and that of rationality. Indeed, it can be argued that risk management embodies 'ultimate rationality', given that we apply a more comprehensive normative understanding of rationality than just the utilitarian calculation of expected satisfaction of given preferences. However, the concept of rationality has a broad and varied usage within social theorizing. Rational *choice* theory has been less concerned with the other forms of rationality, such as the rationality of the preferences themselves, or the beliefs that link actions to the expected outcomes (see Elster, 1986 and 1989 for discussions). Rationality has also been a major concern in the anthropological study of culturally diverse practices and belief-systems, and interpretations cover a range of positions, from early ideas about 'primitive' and 'pre-logical' styles of thought, yet to arrive at the civilized and rational Western stage of evolution, to more modern attempts to judge and compare 'irrational' practices of magic, witchcraft, and ritual against standards of scientific rationality. Sometimes the latter attempts have tried to demonstrate common

[254] The assumptions are contained in the following quote from Shrader-Frechette: "Cultural relativists need to establish that environmentalists are more risk averse than the facts about hazards dictate; they also need to show that this aversion is caused by environmentalists' group-induced pessimism, paranoia and anti-institutional sentiments" (1991: 38)." This two-step argument, implies both scientist assumption and social reductionism. There are thus hidden assumptions in the critique; first, claiming that hazards in themselves could "dictate" any risk perception, and second, implicitly claiming that causes of risk aversion has any relevance. The critique against cultural relativism can be taken to implicitly accept the same line of reasoning, if only in an inverted form. First, cultural relativists (and intellectual relatives) are attacked in a way that implicitly accepts some of the initial framework conditions. The psycho-social causes attributed to 'anti-industrialists', varies from mental disorder to sectarianism. By arguing against these as hypothesis (we have no evidence to prove they are either mad or sectarian), in some way one accepts the premises of argument in the first place. For example, the fact that many environmentalist critics are not located in the periphery but rather belongs to the 'centre' is taken to refute the hypothesis of cultural bias. What if independent evidence could be offered to show the existence of such alternative causes of people's beliefs, and what would the significance of such evidence be for the analysis of their risk perceptions in the first place?

structures of reasoning, and sometimes such comparisons has been discarded as misplaced, since different cultures, it is argued, must be judged against their own standards or 'ways of life' (for reviews and discussions, see Hollis and Lukes, 1982; Shore 1996; Tambiah, 1990; Wilson, 1970).

Normatively, the concept of rationality can be seen as essentially comprising the following four notions: rationality of belief, of rationality of reasoning, rationality of action, and also moral rationality (Føllesdal, 1982). Within any of these forms, beliefs might be more or less well founded, deductions more or less logical and consistent, and actions more less effective for the accomplishment of some defined purpose; and it can be argued, following Rawls, that standards of rationality also apply to moral reasoning.[255] These notions of rationality are apparently all implied in the idea of rational risk management and, the uses of rationality assumptions in social theory have thus transferable applicability within the field of risk. Starting from this broad four-fold conception, forms of rationality can be used as 'normative' assumptions, construed as a hypotheses to be conformed or disconfirmed, and thus applied for explanatory purposes as benchmarks against which behaviour can be predicted or beliefs be interpreted. Within the comprehensive four-fold conception of rationality suggested above, 'rational choice' appears as only one such form.

We may thus 'explain' human and social agency (beliefs, values, preferences, 'perceptions', practices) against some of the idealized norms of rationality, demonstrating logical deficiencies, unfounded beliefs, etc., a practice, as noted, demonstrated by early students of 'primitives', and implied in other normative theories (for instance of regulation). 'Deviation' from an established norm, and even suggestions for 'treatment', may then be the diagnostic conclusion (and cure), as indeed it was for many early scholars of 'the others' in the mood of the civilizing colonialism.[256]

[255] In particular, rationality norms are implied in the idea of reflective equilibrium (Rawls, 1973).
[256] One modern classic for deconstructing these traditions is notably *Orientalism*, by the late Edward Said (1978).

But the practice of attributing rationality norms to subjects as assumptions, against which explanatory or interpretive accounts of their practices are produced, is proportionally aggravated by the amount and nature of assumptions that are lumped together in any given conceptual-explanatory scheme. It would make little sense to employ rationality assumptions that in effect assume subjects to be fully informed, follow strict rules of logical reasoning, anticipate all outcomes of choices, etc. Even professional scientists and experts frequently make errors in statistical reasoning (Kahneman *et al*., 1982). And as argued by theorists of decision-making behaviour, different norms of rationality will not always be practically reconcilable, such as in the classical conflict between information processing and maximization of utility; it would simply be irrational to suspend decisions, awaiting full knowledge of alternatives and expected consequences. The rationality of action is necessarily bounded or only satisficing (Simon, 1976). For the more sophisticated rational choice theorists, the rationality standards against which decisions or choices are predicted, do not assume perfect information or exhaustive availability of alternative courses of action; rather, reasonable judgements are made with respect to available knowledge, efficient amounts of resources spent on gathering and processing information, often within social processes of decision making (Elster, 1986; 1989).

This leads to the question of how 'strong' or 'restrictive' the rationality norms should be, in particular with respect to their status as explanatory and interpretive assumptions. Furthermore, we may question the significance of motivational complexities behind practices and beliefs (sub-intentionality), and whether knowledge of the origins of beliefs have any relevance at all for the assessment of their validity. As noted in the introductory chapter, a simplistic version of the 'rationalist' approach is to see rational practices and beliefs as 'self-explanatory', whereas irrational practices or beliefs need some other, asymmetrical explanation. Rational beliefs are explained by the fact that they are rational, irrational beliefs requires causal, socio-psychological or 'external' explanations (Hollis, 1982). From the 'relativist' position, on the other hand, one must search for "contingent determinants of belief and reasoning without regard to whether beliefs are true or inferences rational" (Barnes and Bloor, 1982: 26-27). Investigators (historians,

anthropologists, sociologists, etc.) must search for the 'local causes' of their credibility. This symmetrical view, or 'equivalence postulate', is applied even to the investigation of scientific 'rationalities'.[257]

The attribution of 'external' explanations, is thus not necessarily reserved for the 'rationalist', but the status of rationality assumptions in the understanding of beliefs and practices are not the same. On a trivial level, of course, all beliefs have some causal antecedent of a mental kind, intelligence and rationality are as 'psychological' in their 'origin' as are stupidity and irrationality. But the search for 'external' explanatory mechanisms tend naturally to favour the latter, such as when cognitive processes are examined within social and cognitive psychology. Even if we approximate 'scientific ideals', much of the time behaving like 'naïve scientists', our cognitive resources are limited, we never possess full information, and processing the knowledge we have is subject to a number of biases and cognitive faults (Fiske, 2004; Plous, 1993). The social psychology of attribution demonstrates this most clearly by observing that, even if the attribution of causes reflects some basic features of rational reasoning, we still tend to deviate from these in some important ways. Most importantly, we tend to locate the causes of behaviour in some personal disposition of observed agents, rather than in the behavioural context, also known as the 'fundamental attribution error'. Situational factors, carefully integrated into the experimental designs, are overlooked or downplayed by experimental subjects. The operation of this 'erroneous' mechanism is reversed however when subjects are actors themselves, tending then to explain their own behaviour in terms of situational requirements. Mechanisms of causal attribution include several such dispositions, such as the tendency to link causality to the most available, conspicuous, or salient feature of the situation at hand, and reveals also a certain self-serving and egocentric bias in our attributions (like taking credit for success and blaming others for failure).

[257] Within this relativist framework, the postulate holds also for the hard sciences. As formulated by M. Hesse: "Rational norms and true beliefs in natural science are just as much explananda of the sociology of science as are non-rationality and error", cited in Hollis and Lukes (1982: 13). Scientific world views are essentially incommensurable, and there is no common ground from where to judge their rationality, a view normally associated with Kuhn (1962), arguing that scientists hold on to theories for all kinds of external reasons, like group pressure, scientific culture, historical conditions, etc.

Attribution theory thus demonstrates, first, a psychological bias in our interpretations, justifying 'asymmetrical' explanations of lay beliefs; that is, explanations that 'bracket' beliefs as biased by some mechanisms operating behind the back of subjects. Second, the premises on which this research is based, includes rationality assumptions about some 'correct' or rationally assumed procedure of reasoning against which lay beliefs are measured. Such assumptions are built into the experiments, like 'base rate' information (the relative frequency with which an event occurs), and consensus information (e.g. that people behave similarly when confronted with the same situation). 'Neglect' of such information is the implicit yardstick against which the asymmetrical diagnosis of cognitive fault is applied (Plous, 1993).

Against a 'relativist' theory (or sociology/psychology) of knowledge, one might then formulate a 'moderate rationalist' (or 'moderate relativist') view, allowing for treating irrational beliefs differently than rational beliefs. Indeed, both the mechanism of attribution *and* the theory of attribution involves a search for motivational causes of behaviour, and in the latter case, the implicit rationality assumption serve as the benchmark against which the attribution of causal 'second order' motivations (such as the biases of egocentrism or self-interest) gain its significance. It must be emphasised, however, that specified rationality assumptions carefully integrated into an experimental design make interpretation 'easy', which is of course the purpose of such designs. Such simplified conditions cannot be transferred to real life, where 'world views' appear as comprehensive and composite systems of thought and templates for action; not even in the case of scientific theorizing would it be possible to exactly 'locate' the processes and mechanisms of belief-formation (Quine, 1953). Is it possible then, to provide explanatory or interpretive accounts without any yardstick or benchmark, however uncertain, transient or tentative? As noted earlier, the ethnographic credo of taking the 'native's point of view' is not to be based on 'naïvist' assumptions, ruling out interpretations that surpass consciously recognized indigenous knowledges; interpretations and 'thick descriptions' may clearly be 'asymmetrical' within the context of socio-cultural theorizing. And to be sure, from a 'meta-perspective' all beliefs (including those experimentally and

scientifically produced) can in themselves be seen as involving 'acts of attribution' to the extent that all beliefs and perceptions can be located in personal dispositions or in the wider contextual environments of social agents.

Beyond 'what else'?

We have argued here that assertions about 'biases' (psychological and socio-cultural 'distortions') in beliefs and practices, presupposes some alternative, presumably a rational alternative, against which the bias-argument can be considered valid or even meaningful, thus justifying the 'what else' question. This does not imply that 'bias-claims' are illegitimate, only that they cannot be used as blanket explanations of socio-cultural practices and beliefs that for some reason triggers a search for 'alternative' accounts. To be sure, such explanations may appear attractive to the 'observer': explanation is found, closure is established, and agents are framed - and 'muted'. Again: how can we distinguish between legitimate argumentative strategies and the *genetic* or *ad hominem* fallacies, discrediting the justification of beliefs by referring to their origins? Do rationality assumptions and argumentative benchmarks enter into processes of reasoning, more or less implicitly and almost by epistemological necessity? How do we distinguish the interpretations and explanations found in the 'naïve science' of everyday life from those found in 'real science'? Within the context of scientific discourse, these structures of reasoning pose some intricate challenges, as they simultaneously appear in several layers of perspectives and meta-perspectives. The psychological theories of attribution are in fact only a scientifically 'institutionalized' example.

In the study of risk and risk management, matters are, if possible, even more complicated. It's difficult to identify any 'positions', since different perceptions and beliefs about risk contain a number of 'items', 'probability' being only one source of agreement or disagreement. If only risk perception, as a composite term, is taken as the 'thing' to agree or disagree about, components in the risk evaluation can really be internally adjusted so as to make almost any configuration of (conflicting) positions possible.[258] As noted

[258] To take one example: Research by Otway (cited in Shrader-Frechette, 1991: 91-92), show that negative public attitudes toward nuclear power, taken to prove lack of public understanding of probability, rather

above, only a provisional list of such ‘components’ will indicate this, such as the evaluation of (often fundamental) uncertainties in probability-estimates, valuation of possible harms and costs, valuation of benefits, valuations of principles of precaution, etc. There may be no procedure available to establish what kind of risk ‘decision’ or ‘perception’ is most rational in this amalgam, and it would be meaningless to explain or interpret individual beliefs or social action against such a composite benchmark. Almost any choice or course of action could be seen to follow from the ‘initial conditions’, and compatible with at least some assumptions about ‘reasonableness’.

‘Perfect rationality’, sometimes implicitly contained within the idea of ‘prudent risk management’, can not serve as the benchmark against which regulatory policies should be interpreted or explained. In the case of societal risk management, even the arrival of a Laplacian Demon would just be a necessary, not a sufficient condition for ‘perfect rationality’. In terms of ‘explaining’ regulatory worldviews and strategies, the ideals of proportionality and effectivenes would not only involve the prediction of risk reducing outcomes of any given intervention, but also some norms of morally enlightened risk-cost-benefit analyses. It can be argued, on *normative* grounds, that there is some deficiency in reasoning, knowledge claims, regulatory proportionality, etc.; but such ‘deficiencies’, even if convincingly argued for, would only provide arguments for deviations from the normative theories of regulation, and not in themselves justify ‘external’ explanations (implicitly converting normative theory to positive). Regulatory ‘content’ cannot be seen as the potential outcome of fully rational decision making processes, reflecting or optimally approaching the ‘common good’. ‘Mismatches’ between risk levels and regulatory content are thus vulnerable indications for evoking ‘external’ explanations; more effort is needed to explore the alternative rationalities of regulatory decision making. If narrowly defined rationality assumptions leave important aspects of regulatory behaviour out of view, extending the rationality assumptions to cover the ‘total, would be to assume too much rationality.

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reflect disagreements about values, specifically benefits associated with the energy source. In fact, pro-nuclear and anti-nuclear groups didn’t differ significantly on any items related to probability.

This leads to a final remark about the role of the *principle of charity* in explaining and interpreting social phenomena. Most explicitly stated by the philosopher Donald Davidson (1974/1984), it holds that some minimal assumptions of agreement on beliefs are necessary for understanding to be possible at all. Without it, disagreements would be impossible or meaningless, since we would have no position from where to interpret them; interpreting beliefs and actions only against standards 'intrinsic' to any 'conceptual scheme' (strong relativism), is basically beyond comprehension; we cannot but carve out some common space for understanding. There is some divergence, however, as to how much agreement is needed in order for understanding, translation, and interpretation to be possible.[259] But some consensus can be found in locating such areas of necessary agreement in "experience-near" contexts, like when people utter indicative sentences, confront practicalities of everyday life, etc. In the case of abstract theory, religious belief or other more elaborately construed systems of thought, it would be too difficult even to identify positions (Lukes, 1982; Taylor, 1985: 134-51).

Not only stated beliefs, but also sub-intentional accounts of belief-formation, must be allowed for in interpretation, including constraints of simplicity, effects of social conditioning, and also knowledge of explicable error (common sense or scientific). Building on these considerations, Føllesdal (1982) suggests four such rationality assumptions: First, some degree of rationality must be assumed in order to be able to understand behaviour (following the charity-principle), second, reasons for actions should always be included in explanations, even when causal explanations seem sufficient; third, complete rationality can not be expected, and explanations should not seek to maximize it; forth, people should be interpreted as having rationality as a norm, at least in the sense that beliefs, actions, etc., would be adjusted when exposed to more rational alternatives. A crucial notion in this application of rationality assumptions is thus that people, although not complying with (indeed not being able to comply with) ideal rationality standards, nevertheless should be charitably interpreted as having the potential

[259] Modified versions are suggested by several authors. Lukes (1982) suggests the *principle of humanity* as a somewhat weaker assumption, requiring only that we minimize unintelligibility by counting people right unless we arrive at better explanations by counting them wrong: it may be better to attribute to people an explicable error than a mysterious truth. This is also referred to as the "bridgehead argument" for necessary assumptions of interpretation.

of approximating them. Rationality comes in different forms, and it comes in degrees, but interpretation must always take into account the socially embedded context of linguistic usage, belief formation, and normative orientations.

In the theory of attribution, it might be argued that 'minimal and necessary agreement' is integrated into the experimental designs, thus enabling researchers to locate processes of reasoning and belief-formation in specified and de-contextualized settings (or rather, the contextual conditions are explicitly specified through the experimental design). The same might be said of certain psychometric studies or risk perception (Slovic, 1992). Transferred to real-life situations, however, we might confront the same kind of contextual metamorphosis as Latour (1983) has observed in extending discoveries made under conditions of laboratory experiments, to the external world. In the field of risk, such transportation of knowledge seems risky indeed, as has been noted by several authors, underscoring the significance of qualitative in-depth studies that are sensitive to the contextual and multidimensional nature of this field of research (Wynne, 1992; 1996). Mechanisms of attribution and their second order explanations must then reflect all the, partially dislocated, processes that go into the shaping of regulatory world views and their outcomes.

In the process of restricting and accentuating interpretive options we still need to consider the broader societal and institutional 'location' of the social agent. Following the calls for charity, such contextual dimensions are necessarily integrated in interpretive processes. The public regulatory role, dedicated to the prudent management of risk, may not be such a bad starting point for imposing some interpretive direction. Incidentally, it could be argued, this institutional role even provides an 'enlightened' and favourable context for escaping some 'errors of attribution' In the relatively firm stands taken by the Norwegian petroleum authorities in the case of individual blaming (even resisting the blame-seeking judiciary), it might be held that the 'fundamental attribution error' has been 'institutionally corrected for', creating rather an almost reversed culture of contextual attribution (or 'circumstantial causation'). We know that these psychological dispositions may be so strong that they can be preserved by subjects even when being exposed to 'de-

biasing' information prior to (or during) an experiment. But they may also be reversed by such information (Plous 1993: 187-188). And furthermore, the mechanisms of attribution appear in fact to be relative to the wider socio-cultural context, showing for instance that so-called 'collectivistic' cultures tend to attribute causes to the collective (Fiske, 2004: 115-116). Psychological mechanisms discovered in experimental settings with American college students as guinea pigs may provide no claim for having established universal 'psycho-facts'.[260] Analogously, as has been observed by anthropologists, dating back to its formative years as an academic discipline, the variety and frequency of witchcraft practices may be highly contingent on a number of identifiable socio-cultural conditions.

Just as we would be inclined to overcome errors of attribution, if properly exposed to the 'de-biasing' information or to the mechanisms in operation (we would presume researchers of attribution mechanisms to be particularly alert to the kinds of errors that they study), in the same vein we could expect institutional and cultural contexts to promote enlightened processes of belief formation and strategies of interventions in the societal governance of risk. Although not yielding unwittingly to naïve trust in government, the alternative may not be much better substantiated if judged against the plethora of interpretive options. Some charity may also be needed in order to 'localize' the 'errors' of regulation, although such charity should still not be uncritically substituted with any 'benevolent fallacy of genetics'.

We do not accept the mechanisms of witchcraft as legitimate procedures for attributing causation and blame. We study witchcraft as social phenomena to be explained as historically specific ways in which certain peoples make sense of (harmful) events, and in conventional ethnographic analysis they appear as mechanisms of social control, sometimes backed by cosmologies of fortune and fate (Evans-Pritchard, 1976). Even radical relativists, in understanding these practises as embedded within the idiosyncratic world views of language communities, would probably appeal to other theories of the 'causal' role of human agency within their own 'language community' (see Tambiah,

[260] A term in fact used in a popular psychology text-book to convey to the students the impression that they're now entering a science of man that will out-rule most errors of commonsensical 'wisdoms' (see Stanovich, 2004).

1990 for a comprehensive discussion). The employment of any 'technique' of social control will certainly be embedded within larger systems of culturally conditioned beliefs and values (and even accusations of witchcraft can be done with much strategic-rational calculation). Within these broader contexts we may have theories of risk management that find blaming-strategies to be counterproductive, as these reduce the information-processing and learning capacities of organizations, promote inflexible rule-following, transfer risks to other areas, or even discourage otherwise beneficial activities. Or we may (sic) have a deterrence theory of risk management, implying that the risk of blame and liability will provide incentives for decision makers to reduce risks (from whatever position within the hierarchy). Some would argue for sophisticated and differentiated targeting of these deterrence mechanisms, dependent on the 'estimated' effect in each case. Thus, even the support of deterrence mechanisms would yield quite different ideas about the targeting of deterrence instruments within the corporate and regulatory hierarchies, and thus of who should in the end be subject to moral blame and/or legal liability. It is not easy to reduce these issues to questions of effectiveness only. The calls for maximum 'manageability'(see Reason, 1997, and particularly Chapter 7 above) as an indicator for choosing just which conditions or triggers to 'contain', or which barriers or redundancies to promote in the virtually endless chains of 'causality', still leaves open a relatively large scope of normative and essentially *constitutive* questions.

Theories of minds, of people, of societies – and of risk management, are not only 'responding to facts'. They are also, to some extent, normatively constitutive of their subject matter (Taylor 1985, Hacking, 1999). The broader understanding of rationality adopted here, include moral norms as well, not only at the level of 'descriptive ethics' (that is, empirically observed adherence to moral norms or values), but also normative ethics. Theories and practices of risk management appears as inseparable from the moral and constitutive acts of attributing causal impacts to human agency in the object world with which they engage (Shaver, 1985). Even if causal mechanisms may be 'discovered' and inform the managerial approach (by addressing the most 'frequent' or the most 'underlying' of the causal options), the interfering strategies are inevitably also

impregnated with moral value. Any control strategy presupposes and constitutes certain thresholds or interfaces between agents and their socio-technical environments, implying underlying ideas about voluntarism and determinism, choice and opportunity context, decisions and framing conditions, autonomy and adaptation, action and reaction, cause and pretext, reason and excuse, etc., that cannot be determined solely by 'facts' or theoretical inferences from facts. Rather, the management of risk involves also the creation of 'facts on the ground' (in more than the trivial sense, of course), even if they are not practically applied in any consistent of uniformly manner (even, as was observed, within the consistency-seeking context of law). Risk management is about efficiency, to be sure, but neither the goals nor the means are chosen in a moral vacuum detached from normative commitments. As the culturally enlightened risk management approach moved beyond the 'modern' witchcrafting practices of blaming just that part of the organizational machinery where fault and error could most easily be located, this also implied a commitment to the re-location of the 'bewitched'.

Final note

This exploratory quest into the world of risk regulation started with a somewhat schizophrenic intent, both to understand from within, and to explain from without. By following the anthropological ethos of grasping the 'native's point of view', we also accommodate to recent calls to pay more attention to regulatory world views. There is however a delicate balance between interpretations from within and birds eye explanations from without; it implies addressing and representing world views *as* representations, against claims to objectively representing these within their worldly 'realities'. As long as anthropologists could claim authority to these double (or multiple) representations simply by 'having been there', the *Mise-en-Scène* of fieldwork experiences could be orderly arranged with scenes, actors, narratives, artefacts, and so on, that would make up the discovered 'cultures'. As the sites were revisited by others who returned with other stories, or worse still, countered by 'natives talking back' against the way their lives were being represented, the distinctive authority of the anthropological author evaporated (Clifford, 1988; Marcus and Fisher, 1986). The traditional 'rapport' of ethnography, based on having established confidence and understanding from the 'inside

of exotica' has caused much methodological and epistemological debate and self-reflection within the discipline. These concerns appear no less challenging in encounters with the complex worlds of professionalized, specialized, blurred, and de-territorialized cultures of modern society.

'Complicity' has been introduced as a new concept for making sense of ethnographic encounters with both familiar and alien cultures, not in the sense of a conspiracy, but rather as a term for seeing cultural sense-making as a joint process, with no clearly defined principal (Marcus, 1999). Geertz (1983: 57) argued against "an ethnography of witchcraft as written by a witch". No witches appeared to protest against this warning, but Evans-Prichard (1976), another great anthropologist, had earlier been scolded for not being faithful to the idiosyncratic logics or language games of the Azande witches (and magicians and sorcerers) (Winch, 1970); mistakenly so, it is assumed here, as some form of normative assumptions of rationality seem inevitable, regardless of where and how the natives are situated. Paradoxically perhaps, the challenge of identifying such assumptions and their interpretive impacts seem more compelling when confronted with ethnographies of risk as written by risk analysts or ethnographies of bureaucracy as written by bureaucrats. Apparently, no regulatory actor would claim – or admit – that, they were really hard pressed due to their inability to cope adequately with the risks in question, but devised some ingenious blame prevention strategies and thus restored their fragile reputation. Although naïve reliance on indigenous representations is not state-of-the-art methodology, attempts to 'look over their shoulders' or to 'explain from without', pose some serious challenges in such highly expert-based and knowledge-intensive cultures.

Starting with what would be counted as normative theory seen from the natives point of view, no one, evidently, would claim vulgar populism, business capture or institutional strategies of blame avoidance to have any role as normative templates for regulatory behaviour. But, as argued above, making a distinction between normative and positive theory is not easy within the complex and essentially normative field of risk regulation. The (implicit) 'what else' argument appears to make normative theory the standard against which to assess positive theory. The present argument calls for more patience

before evoking that step, and that complicity with native actors might open new interpretive options, even when only moderate rationality is assumed. And as argued, exploring world views requires that assumptions be made, also about the formation of beliefs and intentions. We do not only 'explain' these from the outside, at least not by discarding the former, simply on account of their causes. But there is no genetic fallacy involved in exploring the genesis of beliefs in their own terms. And the 'genetic drive' in the process of belief formation, as it appeared, was a strong and unequivocal commitment to the regulatory purpose. If the outcome did not always live up to the intention, no given scheme is readily available for reinterpreting the latter. Normative (even if 'indigenous') theories of regulation is what, on the whole, informs the process of regulation (however envisioned). But the choice of means and measures are rarely uncontested. Regulators also have (literally) multiple selves, and neither do these selves proceed unchanged through the regulatory processes. The response to complexity (and anarchy) may clearly be a lot of routine and rules of appropriateness (which may be perfectly rational, and not only 'ritually accommodating'), Between mindless rule-following and perfect rationality there are reasonable adaptations to variable circumstances, requiring interpretive, sense-making, discretionary, problem-solving, and strategic skills.

We have here critically addressed how the analysis of regulatory regimes seems to disfavour public interest models and to embrace institutional ones. The preceding argument favours both, or perhaps more correctly, tries to demonstrate that the former appears as 'justifiably charitable', and that the latter must be more genuinely attuned to local rationalities and rationales. Regulatory regimes are shaped by contextual factors, responding to a diversity of 'private' and 'public' expectations and pressures. But such shapers may also (even by 'definition') represent 'public interests', and be legitimately integrated in a governmental risk regime. Single instances of regulatory behaviour may thus substantiate more than one 'theory' of regulation. Indeed, it has been argued that explanatory models of regulatory regimes contain so many substantial differences in terms of generality, scope and possible applications that it "makes little sense to say whether one explanation carries more conviction than another without reference to a particular issue and context" (Baldwin and Cave, 1999: 32). This implies that theories

might as much serve as sensitizing perspectives drawing attention to the particular kinds of mechanisms operating in each case, thus providing assumptions and models for formulating 'situated' and exploratory hypotheses against which the available evidence can be evaluated (if not strictly tested). Regulatory regimes are extremely composite units of analysis, and they will often comprise a number of 'regime cases', each subject to their own trajectories, patterns of emergence, and worldly impacts. And their institutional emergence will not, on its own, explain their impacts, since the legislative intent may be thwarted in the encounters with the real world of risk; and the impact may explain the emergence only by discovering the mechanisms that lead the initiators to expect just that impact, if functionalist fallacies are to be avoided (Merton, 1957). Such features of regimes may even challenge the hypothesis testing approach to analysis, and strategies of inductive comparison based on case studies may offer a promising way of expanding the case-based approach. Traditional hypothesis testing may rely too much on the identification of variables that are exhaustive and relevant before the data sets are processed through the explanatory machinery, but risk regimes have some important composite and 'configurational' qualities that may support an argument for treating them as 'whole' cases (Ragin, 1987; 1994; 2000).[261] Within such cases we find a number of 'mechanisms' rather than causal relations, thus adding new items "to our repertoire of ways in which things happen" (Elster, 1989: 10).

Some of the arguments provided above, raise quite fundamental issues about epistemology, ethics, and social theorizing that cannot be treated here with the sophistication and proficiency of the specialists in these fields. But some arguments for their relevance have been provided, and hopefully also for the importance of a

[261] Comparative case methodology allows for sensitive interpretation of the specificities and uniqueness of cases, but also for identifying how causal mechanisms operate on a more general level through the analysis of how explanatory conditions are combined in variably configured cases, using quasi-experimental designs and set-theory. It is thus especially well suited for addressing questions about outcomes resulting from multiple and conjunctural causes, where different conditions combine in different and sometimes contradictory ways to produce similar outcomes. The potentials of this methodology have not been fully explored in the study of organizational risk or regulatory regimes, although some examples may be found, such as Levi-Faur (2003). Still, it is commonly agreed that the causes of accidents and harms should be sought within the complexity of technological, human, and organizational configurations and conjunctures. In fact, Ragin (1987) appeared in the reference list in the first RNNS report, where the basic methodological approaches were outlined; but it was not possible to find any discussion of the methodology in the text itself.

theoretically reflexive reading of regulatory world views and strategies. I found the issues encountered by the agents of regulation to provoke theoretically and morally rather profound questions, addressed by the 'natives' with much reflection and sensitivity to the scope and impact of their intervening strategies. Most of the time, their 'instrumental knowledge' of the application and effectiveness of these strategies would be superior to my own. They knew the jungle and the hunting techniques. Only when 'culture' was the issue, could I assume some professional authority. And then, was it possible to reconstruct the 'narrative' only with the help of privileged hindsight and much work. In this light, the troubles of culture appeared to resemble the conceptual and theoretical problems haunting the fate of culture in my own discipline, of never bringing culture down to the level of 'primary theory'. The discourses were certainly furnished with 'examples', but not in any systematic manner that could, for the future, provide for anyone in any given occasion, a template for what could be considered, say, an instance of 'good HSE culture'. The perfectly sound and engineer-like appeals to 'practical implications' in the 'harsh realities', replicated the academic discourses. Culture thus remained as 'secondary theory' of a highly abstract and theory-laden kind, the operational instances of which could not be consistently tested against primary theory on the ground, seeing things, interpreting, calling them names, and agree on the future usages. And of course, all the competing or alternative theories of a secondary order available did not make the project easier; not surprisingly, the most 'tangible' and operational of these had the greatest success in surviving.[262] The introduction of HSE culture, depicting as well as constitutive of the regulated space, was motivated by strongly internalized norms and regulatory goals, having the 'public interest' as the institutional bedrock. That the front line implementers of ambitious public policies searched for the philosopher's stone seem rather reasonable. But at least they preferred magic to witchcraft.

[262] The idea of regulating risk through the magic of culture thus resembles, it could be argued, the kinds of beliefs that could be seen as 'highly theoretical'. As argued by Taylor (1985) and Lukes (1982), asymmetrical explanations are difficult to apply with respect to such beliefs, since they are, in the imagery of Quine (1953), far removed from the observational periphery. The mechanisms of their adoption are not easily localized as 'explicable' responses to states of affairs, and may also include a number of extraneous reasons (political, 'religious' etc.). As summarized by Lukes: "In short, their being held may often be over-determined, so that it is scarcely possible to tell which reason was decisive" (1982: 295).

Understanding regulatory world views and strategies requires in-depth investigations of the regulatory rationalities from the ‘inside’; they are not simple ‘social facts’ to be explained only from the ‘outside’. In interpreting and explaining regulatory content, one must choose models that reflect the range of factors that can be expected to feed into the decision making processes at all levels, together with other factors that may ‘shape’ regulatory policies in more oblique ways. Regulatory intervention involves not only considerations of the nature or scale of the risks in question, but also of the opportunity structure of risk management at a corporate and societal level. Social and behavioural assumptions may feed into ‘probability' estimates (managerial behaviour, worker behaviour etc), including assessments of regulatory compliance, surveillance capacities and how broader societal factors influence levels of regulatory compliance (like economic conditions, labour markets, etc.) Regulators must assess also the benefits at stake, requiring a balanced appreciation of all the trade-offs involved in choosing regulatory policies. In short, the ultimate rationality requirement for the regulator would be based on dauntingly complex assessments of costs and benefits of risk management at a societal level, requiring not only an epistemologically and morally enlightened evaluation of risk, but also of the expected outcomes of the intervention options available.

Regulation involves a number of trade-offs and balancing acts, taking account of shifting environmental and internal concerns. Selectively finding some of these practices in accordance with other interests than the ‘public’ is not difficult; the latter still appear as a reasonably justifiable assumption to rely on, as the minimal rationality bridgehead necessary in order to interpret orientations and strategies. This obviously does not exclude other interests or ‘regulatory deficiencies’, but it pushes the burden of proof in the direction of those claiming them to be more influential. After all, the basic rationale for keeping these bodies public, is the uniquely democratic mandate of serving the public. The ‘institutionalized’ absence of commercial motives provides the conditions for and allows public policy makers and agencies to act on that mandate. They are shielded from the whims of populist politics, and unlike other commercial or semi-commercial expert groups, they may even bite the hand that feeds them, without much risk of starvation. The

regulatory purpose appears as the institutionalized motivational rationale against which the outputs of the governmental ‘black box’ must also be interpreted, however ambitious (and ambiguous) the goals and contested the means.

This institutional role presupposes professional self-management, politically attuned but not populist, professionally self-confident but not self complacent, sensitive to organized interests but not compromised by these. A culture committed to safety may only be a minimally necessary condition for tightly coupled and complexly structured high risk industries. Even in the more linear and loosely structured regimes of regulation, a culture of enlightened commitment to regulatory goals is but a necessary condition for treating them as sufficiently reliable.

Appendices

Appendix 1: Methods and data collection

General

I entered this research project with no previous experience from the petroleum industry. I did however have experience from several regulatory authorities, including 3 years in the Norwegian Labour Inspection Authority (the personnel and training department) and 3 years at a County Governor's office (as project coordinator for local and regional HSE authorities). I also served some 6 years as an advisor/consultant in the Directorate of Public Administration. The latter position involved working with several comprehensive studies and evaluation reports on regulatory regimes, including also the petroleum regime. In sum, I had extensive experience from working with a variety of regulatory regimes, in particular within the area of occupational health and safety, and I had worked closely with a number of various professionals and disciplinary groups (notably lawyers and engineers). This facilitated the data collection process in the sense that it provided some familiarity with current themes, regulatory challenges, supervisory methods and strategies, institutional structures, nomenclatures, etc. However, in terms of understanding the specific features of industrial structures, technologies, actors – and risks – I was a novice. The position of the novice is not necessarily unfortunate for the ethnographer, at least not in the initial phases; confronted with the rather daunting complexities of the case at hand, however, the position of the novice will haunt the ethnographer as ever-expanding fields of knowledge are encountered.

A brief account of the process and methods of data collection is provided below. Note that much data collection occurred through informal meetings and talks with key actors in the agency, the industry (company representatives, safety representatives, union representatives), and among various expert groups (including the research communities). These are of course not counted or accounted for in detail, but are still significant sources of information gathered during the fieldwork period. Note also that interviewees are not 'coded', since such coding in this context could compromise anonymity. A number of interviewees are of course not anonymous in the text due to their specific position.

Getting beyond the formalities and the often sterile language of regulations, public reports, and red tape accounts was normally a pleasant and rewarding experience. Informants were generally quite frank and outspoken, sometimes more so than was really needed for penetrating the historiography of events, and the regulatory 'world-views' and operating rationales. On the other hand, information gathered in the largely accommodative and sharing communicative climate of the interviews occasionally had to be 'dressed up' to some extent in the final expositions; as the issue of making data publicly available drew closer, considerations related to reputation and public appearance became more acute. However, this did not in any significant manner 'corrupt' or distort the final exposition to the effect of compromising the analysis. In particular, the PSA acted and responded very generously, not only during the research process, but also to a final draft of the thesis. In terms of 'ethnographic validity' they found the text to be 'recognizable and acceptable' from their position.

The process of discovery and exploration during the research was important, and no definite sets of questions with prefixed response-categories were used. A number of broadly defined themes and dimensions were outlined, however, with sub-categories and some 'test-questions' that could discriminate responses and elicit the kinds of distinctions that was looked for. Thus, a relatively open-ended interview guide was used (see below). But the questions were also developed along the way, and I was able to frame and reframe these issues as my own understanding developed. No prefabricated set of options for measurement were 'respondents' or 'responses' could be arranged or categorized could thus be used. In fact, mutual engagement with the topics occasionally made interviews resemble conversations, where they would supply superior knowledge on the substantial (regulatory and risk management) issues, and I could 'direct' the course, provide frames, sharpen perspectives and sometimes elicit contrasts and try to tease out nuances and distinctiveness in the responses. Importantly, the questions had to be adapted to the specific interviewee, depending on their background and positioning.
This strategy applied in particular to the questions concerning HSE culture. No pre-defined notions about what would be 'professionally' accepted conceptions about culture

or HSE culture were applied; rather, there was a collaborative search about possible interpretations.

Most interviews were taped and later transcribed. Taping interviews was preferable for several reasons, the most important being that it made it possible to benefit from the richness of verbal presentations, and that it relieved reliance on faulty memory. Also, it enabled better concentration on the topics and less time and energy was lost on taking notes.[263] All citations used in the text were later reviewed by the interviewees; some modifications have been adapted, but no significant change of substance has been necessary.

Interviews and participant observations did not follow any strict ideal of distance. Rather, in order to extract good and rich data, it is important to establish an atmosphere of openness and confidence. This sometimes involves actively using ones own knowledge and background in order to immerse oneself in a mutual exchange of information and experience. As noted, I had the advantage of being a former civil servant in various parts of the state administration, also enabling better access to local codes and languages. Not altogether dismissing the old positivist ideals of distance and objectivity, the challenge of productive fieldwork and 'informative' interviews often involves personality and sensitivity; this involves, not mechanical adherence scripts and procedures, but adaptation to the mood of the situation and the person.

Interviews and fieldwork in the PSA

The bulk of the fieldwork period (some ten weeks scattered through the period from February 2005 to February 2006 was spent in the PSA. I was able to attend several meetings and seminars during this period, most notably with the members of the culture project group. I also attended two audits. Some thirty-five in-depth interviews have been conducted with agency officials, 15 of which with members of the leadership group (including all management levels). Apart from the leadership group, the categories of

[263] Only one informant refused to use the recorder; a couple of times, I was asked to stop it as the conversation turned to sensitive issues, or they would plead me not to use the information indiscreetly.

agency officials particularly selected for interviews included those involved in the follow up of the HSE culture provision (the HSE culture project), a selected number of experienced 'old-timers', former managers, and people with industry experience. These latter informants were in a position to provide some historical reflections and sometimes a more distanced and multifaceted perspective on regime developments and practices.

Interviews with unions and industry representatives

Interviews and several informal talks were conducted with representatives from the two major workers unions, OFS/SAFE and NOPEF/Industri-Energi, and also from the major Norwegian Oil Industry Association. A selected portion of HSE personnel at the corporate level has also been interviewed, including HSE directors, HSE professionals, and regulatory advisors. This group includes some 20 persons from 8 oil companies and 5 contractor companies.

Other interviews

Other interviews included:

- A group (4) of ministry officials / directors from the Department of Working Environment and Safety, in the Ministry of Labour and Social Inclusion
- Two former directors of the same unit
- A number (ca 10) of former agency officials (some also included in other categories)
- Officials from cooperating regulatory agencies
- The head of the NSE-unit at the Rogaland Police Department
- The Public Prosecutor of the Rogaland District
- A selection of HSE experts / consultants working with the petroleum industry

Documentary studies

There is an abundance of documentary material of potential relevance for any student of public administration and regulatory regimes, including laws, regulations, preparatory legal documents, public government reports, and formal correspondence between key actors (Ministry, agency, industrial actors, trade unions, etc.). From the position as a fieldworker in the PSA, I had unique access to a variety of such documents, public as

well as internal (audit reports, investigation reports, orders, replies to reports, general letters about enforcement policies, etc.). The bulk of public and official reports, statistics, regulations, etc., are available at the PSA web-site: http://www.ptil.no/

These data sources obviously have unequal relevance to the questions posed. The wealth of documentary data often made the problem of selection greater than the problem of want. Much ready-made evidence can be gathered from these documents (such as regulations and accident figures). Some documents, like investigation reports, would provide detailed accounts of facts and events, largely related to observed non-conformities and their immediate causes, but also providing insights into the situational processes and the organizational contexts of the events. Still, these could often be written with a considerable amount of bureaucratic understatement and often retold more bluntly in later interviews with the authors/investigators.

Offshore fieldwork

As part of phase 5 in the RNNS project, a series of case studies / fieldworks were conducted at 3 different offshore installations. These were selected based on good or significantly improved HSE results, in order to identify reasons for their good performance, and subsequently for providing lessons for others in terms of 'best practice', specific HSE-programs, management involvement in HSE, local 'culture', etc. I was able to participate on one of these field studies together with a researcher from the International Research Institute in Stavanger (IRIS), in order to (albeit superficially) acquaint myself with the experience of 'being there', talking to people, participating in meetings, sightseeing the facility, and observing the technology, the organization, and the people in action. Some six days of intensive fieldwork was thus carried out on a production vessel in the Varg Field in the Southern North Sea. It included a number of loosely structured interviews (ca 15-20), attendance at several meetings (mandatory morning meetings, hand-over meetings, HSE meetings, etc.), surveys of the ship and the various work sites, and included also a number of informal talks (in the coffee shops, the cafeteria, the living room, etc.). The study also included a two day visit to the company

headquarters, with meetings, talks, and interviews with company management and HSE-personnel.

Courses, conferences, and seminars

- Offshore safety and emergency preparedness training. Mandatory one week course
- Regulatory competence for the petroleum industry. Two day general course
- PSA conferences on HSE culture 2003 and 2005
- Annual Safety Forum conferences 2004-2006
- Annual conference for the 'Shelf Police'
- Annual conference for chief company safety representatives
- PSA seminar on Human Factors
- PSA seminar on crane and lifting operations
- Statoil 'Safe Behaviour Program', 2 day work-shop/conference
- A number of seminars in the HSE culture research group (including also PSA officials)

Interview guide

General background information

- Education
- Work experience
- Present tasks and responsibilities
- Crossover experiences (between the industry and the NPD/PSA)

Overall perspectives on regulation

- Regulation and supervision as instruments in improving HSE conditions in the industry
- Perspectives on the development of the petroleum regime
- The regulatory role
- The basis of regulatory authority (trust, fear or professional respect?)
- Introduction, philosophy, and strategy related to risk management, self-regulation, internal control, etc., and specifically to HSE culture
- The legal context
- Human error and organizational failure
- Attribution of causes, responsibilities, and blame

The agency resources

- Competence, recruitment, and mobility
- Priorities and planning processes
- Cost-benefit considerations

Regulations

- Regulatory processes of production and amendments
- Involvement in the regulatory process (parties, expert groups)
- Purpose orientation, design of rules and systems
- The role of standards and internal company rules
- The relationship between the legal context and the risk management philosophies

The relations between the authorities and the industry

- Degree of oversight , frequency of encounters
- Roles: closeness, distance, loyalties, and 'capture-mechanisms'
- Regulatory style (trust, dialogue, spot-checks, etc.)
- Supervisory strategies (audits and investigations)
- Collaborative arenas (industry and unions)
- Professional cooperation (industry, unions, expert-groups, etc.)
- Cross-over experiences
- Informational asymmetries

HSE culture

- The role of HSE culture within the regulatory / risk management context
- The value added by introducing HSE culture
- The justifications, challenges, and experiences with the provision

Appendix 2: Risk and risk indicators

All sources: The Petroleum Safety Authority Norway
http://www.ptil.no/English/Helse+miljo+og+sikkerhet/

Defined situations of hazard and accident

Defined situations of hazard and accident is referred to as "DFUs", which is a Norwegian acronym ('Definerte Fare- og Ulykkessituasjoner'). The following items are included:

1. Non-ignited hydrocarbon leaks
2. Ignited hydrocarbon leaks
3. Well kicks/loss of well control
4. Fire/explosion in other areas, flammable liquids
5. Vessels/ships on collision course
6. Drifting objects
7. Collision with field-related vessel/installation/shuttle tanker
8. Structural damage to platform/stability/anchoring/positioning failure
9. Leaks from subsea production systems/pipelines/risers/flowlines/loading buoys/loading hoses
10. Damage to subsea production equipment/pipeline systems/diving equipment caused by fishing gear
11. Evacuation (precautionary/emergency evacuation)
12. Helicopter crash/emergency landing on/near installation
13. Man overboard
14. Injury to personnel
15. Occupational illness
16. Total power failure
17. Control room out of service
18. Diving accident
19. H2S emission (hydrogen sulphide leaks)
20. Lost control of radio-active source
21. Falling object

Taking note of the methodological issues involved in selecting and defining risk indicators, in particular in the face of sparse availability of historical data for major accidents, the DFUs were selected on the basis of the following criteria (the NPD, Pilot report 2000):

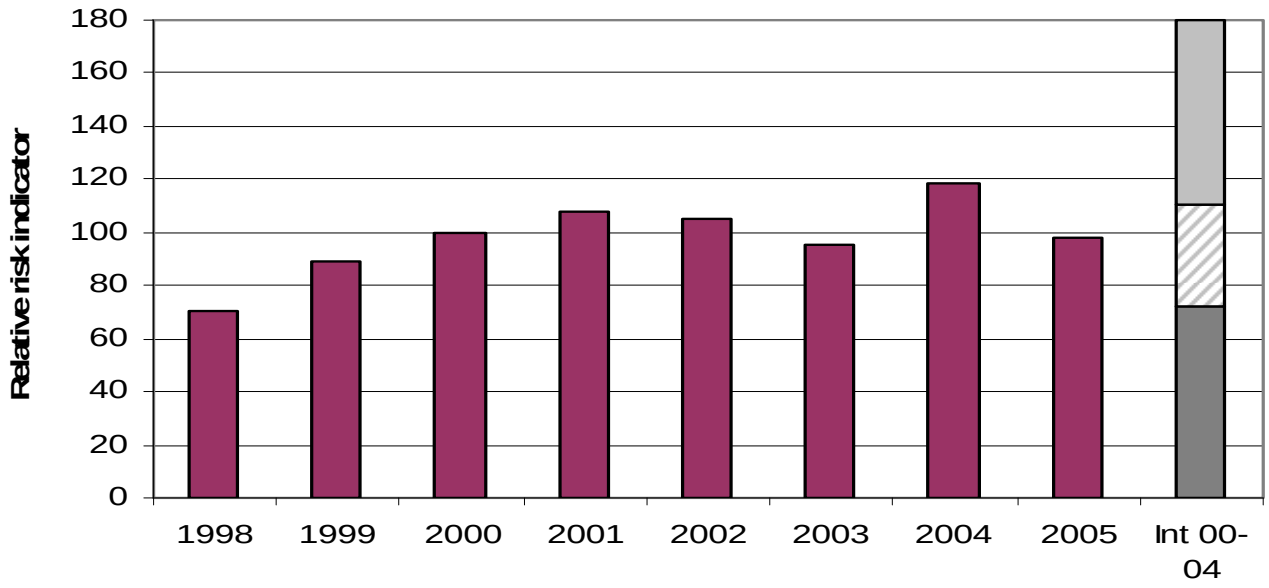
- The DFU is an unplanned event/situation which has led, or may lead, to loss (of life and other values), and hence represents a risk contribution.

- The DFU must be an observable event/situation, and one which it is feasible to record consistently and near-completely in relation to activities on the Norwegian Continental Shelf.
- The DFUs must (as far as possible) cover all situations that can lead to loss of life.
- The DFUs are important for motivation and awareness, since they are utilised in the planning and dimensioning of emergency preparedness.

Total risk indicator for major accidents

The figure below shows the development of an aggregated relative risk indicator from the years 1998 to 2005. It is based on a set of indicators from the DFU-list which are weighted according to their relative contribution to major accident risk (primarily items 1-12).

The figure shows a three year rolling average. The indicator is relative, and the level in 2000 is set at 100. The prediction interval (right column) indicates a 90 percent probability that the future values will be within the interval. Values above or below the interval are regarded as a significant increase/decrease. Man-hours are used as a common normalization parameter against activity level, put at a value of 100 in year 2000



Selected risk indicators related to injuries

Injuries and injury rates on permanently placed facilities

Activity		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Administration	Injuries	80	80	82	63	65	63	48	32	40	43
and production	**Injuries/mill. hour**	**15,8**	**14,7**	**14,4**	**10,7**	**10,4**	**9,3**	**6,6**	**4,0**	**5,1**	**4,8**
Drilling and	Injuries	141	133	117	124	111	103	90	54	59	51
well operations	**Injuries/mill. hour**	**28,7**	**26,8**	**26,5**	**26,4**	**21,5**	**18,7**	**15,4**	**8,6**	**9,4**	**8,0**
Catering	Injuries	46	45	54	54	53	32	28	19	24	27
	Injuries/mill. hour	**21,2**	**19,2**	**23,6**	**23,8**	**25,9**	**14,6**	**12,4**	**8,7**	**11,1**	**11,8**
Construction/	Injuries	295	348	330	382	320	248	238	196	180	176
maintenance	**Injuries/mill. hour**	**32,1**	**31,7**	**34,4**	**35,5**	**31,1**	**24,3**	**20,7**	**19,3**	**18,2**	**17,1**
Total	Injuries	562	606	583	623	549	446	404	301	303	297
	Injuries/mill. hour	**26,3**	**25,5**	**26,5**	**26,4**	**23,1**	**18,1**	**15,0**	**11,3**	**11,5**	**10,7**

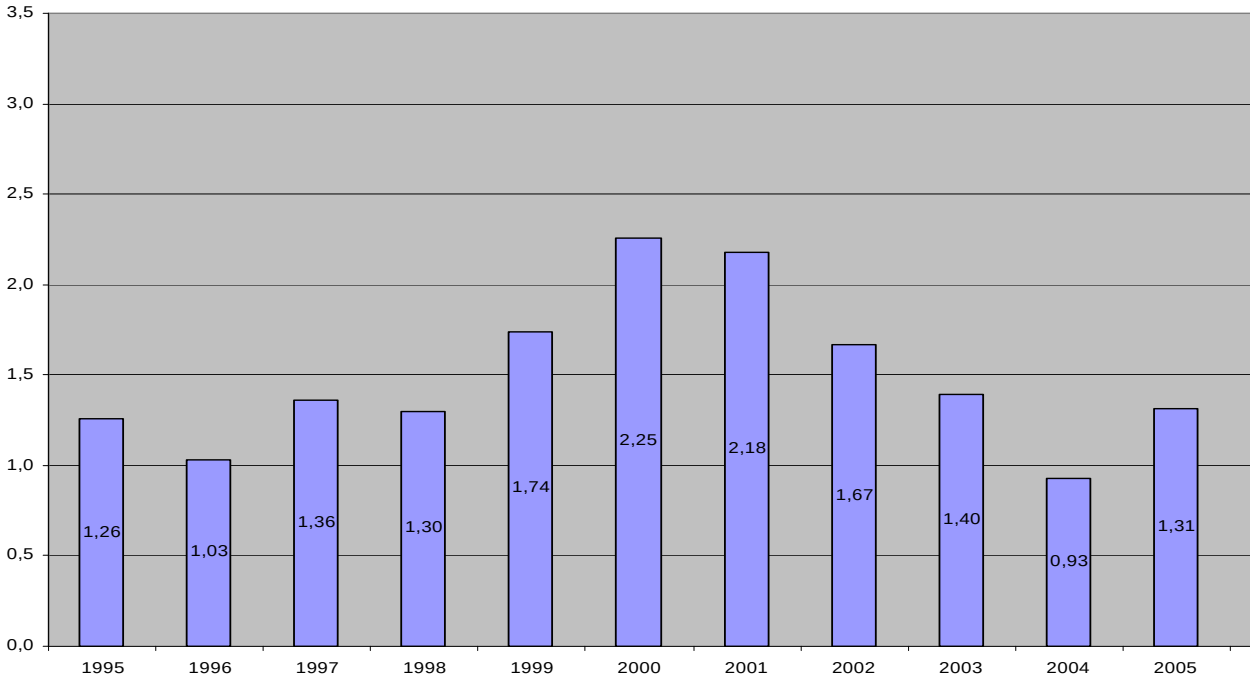
Injuries and injury rates on mobile facilities

Activity		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Administration	Injuries	8	10	10	0	2	0	2	4	1	1
	Injuries/mill. hours	**10,7**	**11,5**	**7,8**	**0,0**	**1,0**	**0,0**	**1,8**	**3,9**	**0,7**	**0,8**
Drilling and well operations	Injuries	158	157	152	146	92	68	40	39	47	37
	Injuries/mill. hours	**41,0**	**39,2**	**42,6**	**48,5**	**26,6**	**27,0**	**18,1**	**16,8**	**14,6**	**10,8**
Catering	Injuries	12	12	17	10	12	8	8	4	5	2
	Injuries/mill. hours	**21,0**	**19,8**	**24,0**	**15,6**	**16,7**	**11,2**	**16,9**	**7,9**	**7,5**	**2,7**
Operation and	Injuries	30	47	64	94	82	36	24	19	31	40
maintenance	**Injuries/mill. hours**	**22,0**	**30,4**	**34,7**	**43,1**	**37,4**	**17,4**	**15,5**	**10,6**	**14,7**	**18,7**
Total	Injuries	208	226	243	250	188	112	74	66	84	80
	Injuries/mill.hours	**31,8**	**32,2**	**32,8**	**33,7**	**22,5**	**15,8**	**13,8**	**11,7**	**11,4**	**10,7**

Injuries and injury rates by operators and contractors on permanently placed facilities

Activity	Company	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Injuries	Operators	130	140	151	158	155	135	96	67	90	82
	Contractors	432	466	432	465	394	311	308	234	213	215
Injury rate	Operators	15,4	16,1	16,8	17,2	16,3	13,7	9,4	6,8	9,4	8,0
	Contractors	33,5	31,0	33,2	32,2	27,7	21,0	18,4	13,9	12,7	12,2

Serious injuries to personnel per million man-hours



Appendix 3: HSE climate questionnaire

Note that:

- Scores are given from 'fully agree' (1) to 'fully disagree' (5)
- Positive and negative statements are arranged successively for each major theme.
- Minor changes from year to year are normally not statistically significant.
- Number of respondents were (approximately) 3000 in 2001, 8700 in 2003, and 9800 in 2005; average response rate has been some 50 percent.

Propositions (index)	**2001**	**2003**	**2005**
Leadership and company behaviour			
The company I work for take HSE seriously	1,65	1,51	1,50
My supervisor is committed to working with HSE on the installation	1,83	1,70	1,70
My supervisor appreciate that I call attention to conditions of significance to HSE	1,76	1,61	1,58
Manning is sufficient for taking good care of HSE	2,57	2,37	2,23
I always know which person within the organisation to report to	1,89	1,80	1,80
The emergency preparedness is good	2,05	1,95	1,91
I would rather not discuss HSE with my supervisor	3,30	4,41	4,41
Occasionally I'm required to work in a manner that jeopardizes safety	3,25	4,24	4,32
When it comes to one's career it is a disadvantage to be too concerned with HSE	3,22	3,94	3,99
Lack of cooperation between operator and contractors often lead to risky situations	3,09	3,55	3,69
Lack of maintenance has resulted in reduced safety	2,88	2,88	2,96
In practice the concern for production precede the concern for HSE	3,02	3,11	3,40
General HSE items			
The safety deputies' suggestions are taken seriously by the management	2,03	1,93	1,89
The safety deputies are doing a good job	2,02	1,92	1,90
It is easy to tell the nurse/company health service about worries and sickness related to the work situation	1,77	1,73	1,73
My colleagues are very preoccupied with HSE	2,04	1,89	1,85

I can influence the HSE-conditions at my workplace	1,77	1,68	1,67
Information about undesirable incidents are effectively used to prevent them recurring	2,09	1,93	1,91
I do not participate actively at safety meetings	3,20	3,89	3,84
Reports on accidents or dangerous situations are often “smartened up”	3,07	3,35	3,40
Regulations and procedures			
I think it’s easy to find the right steering document (requirements and procedures)	3,08	2,97	2,96
The HSE procedures are suitable for my work tasks	1,81	1,87	1,87
The regulatory requirements on HSE are not good enough	3,11	3,59	3,66
Different procedures and routines on different installation can be a threat to safety	2,83	2,17	2,28
Competence			
I have received sufficient safety training	1,68	-	1,47
I have received sufficient training in work environment issues	-	-	2,02
I have the necessary competence to perform my job in a safe manner	1,54	1,44	1,46
My lack of knowledge of new technology can sometimes lead to an increased risk of accidents	3,19	4,03	4,01
I doubt I would be able to carry out my preparedness duties in an emergency	3,27	4,19	4,22
I’m not sure of my role in the emergency organisation	3,31	4,35	4,35
Work situations and behaviour			
I report dangerous situations when I see them	1,37	1,32	1,34
Safety has top priority when I do my job	1,42	1,32	1,33
I stop working if I think it can be dangerous for me or others to continue	1,33	1,29	1,27
I ask my colleagues to stop work when I think the job is being done in a risky manner	1,58	1,48	1,47
My colleagues stop me if I work in an unsafe manner	1,93	1,79	1,72
Risky work operations are always carefully examined before they are commenced	1,62	1,42	1,41
The work permit system is always lived up to	2,03	1,92	1,86
I have easy access to personal protective equipment	1,30	1,26	1,26

I use personal protective equipment	1,17	1,16	1,15
The equipment I need to do my work is easily available	-	1,71	1.71
I feel sufficiently restitution	-	2,15	2,07
I sometimes violate safety rules to get the job done	3,17	4,00	4,08
The communication between me and my colleagues often fail in such a way that dangerous situations can occur	3,32	4,49	4,48
I find it uncomfortable to call attention to violations of safety rules	3,17	3,63	3,61
One can easily be perceived as an argumentative person when pointing out dangerous situations	3,11	3,31	-
There are often parallel work operations proceeding that leads to dangerous situations	3,09	3,44	3,62
My work site is often untidy	3,15	3,90	3,86

Appendix 4: The SBP work-shop conference

As indicated, the term 'workshop' is only partially appropriate for describing the conference. Rather, participants are witness to a tightly directed multi-media performance. The conference hall is provided with three large screens, massive sound effects, cameras, and a professional media crew. The conference crew (5-10 people) is uniformly dressed. A number of pre-recorded films and presentations are shown, conveying clear and emotionally compelling messages and stories. Participants (usually some 200) are seated in roundtable groups of 5-10. A conference-manager sits in a deep armchair up front, leading the audience through the program with serene authority, including well-orchestrated panel discussions. Occasionally, ordinary participants are invited to answer questions, comment on presentations or topics, or report from group-discussions. This is all filmed and displayed directly on the screens.

Right from the start participants are told that this is going to be something different from what they're used to: "Forget meetings which show safety statistics on overheads and give admonitory speeches about the importance of taking the time to work safely." Only a simple overview is briefly displayed on the screens, showing the number of serious accidents in previous years, reminding the audience of the "zero-mindset" adopted by Statoil, and that "every single one of them is one too many". One of the directors in the panel even states that "if this program can save one person's life it'll be worth it"[264] The audience is told that this conference will focus on attitudes and behaviour, and contribute to raising the consciousness of all. A director from one of the participating drilling contractor companies makes a short statement, praising SBP for fitting 100 percent in with the HSE-activities and philosophies of their own company. He describes two recent fatal accidents as an "awakening": "we couldn't live with that". In retrospect, they've realized that they've failed, and that they must plan their work better and take the time needed to complete jobs safely.

[264] Implicitly estimating the value of one ('statistical') human life to some 180 000 mill NOK (which is more than 10 times as much as the standard suggested in the guidelines for economic impact analysis from the Ministry of Finance), thus reflecting the general high-spirited and 'evangelical' mood of the conference.

The scene is then set by a popular and well-known Norwegian entertainer (writer, humorist, singer), appearing on the screens. He is impersonating a laid-back, disarming but concerned communicative style, talking directly to the audience from an old wooden sailboat (sailing is a well known passion of his and a recurring theme in his songs and writings). He is a recurring figure throughout the program, giving queer comments and 'safety messages', often seen through his seafarer perspective, thus providing a communicative framing quite different form the well-worn reiterations of safety postulates and glossy presentations of management policies. The context of the message is one of credibility, trust, and everyday commonsense knowledge and morale.

The whole first day is devoted to case stories exploring the causes and consequences of accidents, partly through documentary films. Some have a strong emotional tenor dwelling on losses and tragedies, such as a heart-breaking movie featuring the family of an off-shore worker who was killed in an anchor-handling accident, and a live personal testimony from a safety trainer who got seriously injured in a fire drill. Others present more 'informative' documentaries of causal antecedents of accidents, technical, organizational and human, with examples ranging from aircraft accidents to the falling off a ladder. The participants are regularly invited to provide examples of their own through brief discussions in the groups. In order to promote frank and open discussions they are given a general 'amnesty': No one, no matter how grave the violations they expose, shall suffer subsequent sanctions of any kind. Some are then interviewed by the conference manager, simultaneously displayed on the screens. Company reporters thus describe the mood of the session:[265]

> Drawing on their own experiences, members of the audience talk about such issues as the feeling of being pressured to complete a job on time. One after another admits that they often create their own expectations at work, and can thereby become trapped by their own willingness to take hasty decisions.
>
> In one case, a flare tip weighing almost 500 kilograms fell onto the platform and then into the sea – fortunately without injuring anyone. An analysis of the underlying causes indicated that the accident was due to a poor technical solution and a failure to pass on experience. On another occasion, a major crane lift was carried out on a platform without prior warning. Nobody was hurt then, either – but participants are asked about what corners they cut at work.

[265] From the Statoil Magazine 2004, no 1.

One principal issue recurs: The danger of sacrificing safety for economic considerations and the need to keep up production. And the message from the panel is crystal clear: Safety first! One field director states: “This is the message to everyone: safety must always be the first priority. And if you’re in doubt, you test us!” The conference manager responds approvingly: “isn’t that a great thing to hear?” At the same time he sides with the presumably sceptical fractions of the audience in repeating the call to ‘test’. The issue of ‘production vs safety’ is not only couched in terms of management pressure and economic considerations. Apart from the avowals from the panel about the overall company policy, much attention is later paid to lower level choices and practices compromising safety. Only once is there a reminder from one in the conference crew that management decision-making must also be subject to the same scrutiny.

The concept of ‘human error’ is introduced, as caused by loss of focus and concentration, absent-mindedness, forgetfulness, lack of risk-awareness, etc. Sometimes crews get too caught up in getting the job done; sometimes people behave less safe just for ‘convenience’; short cuts may become part of daily routine, a phenomenon recurringly referred to as “silent deviance”. One panel participant also makes a subtle distinction between short cuts and silent deviance, explaining the former as more like impulsive acts and the latter as more like established practices. Participants are invited to reflect on the phenomenon of silent deviance, and several explanations are offered: Professional pride, group cultures, a productive ‘mood’, but also a sensation of external pressure. The conference manager summarizes by referring to the near-miss at Snorre A as a dramatic consequence of “28 silent deviations”, apparently referring to the 28 non-conformities discovered in the PSA-investigation report. A new group of managers in the panel are invited to present their own personal plans for “eliminating the nuisance”. The recurring response is that they will all “put the issue on the agenda” in the upcoming department meetings and HSE-meetings.

The lessons to be learned throughout the seminar are summarized in the five barriers, also visualized in the program’s logo. The concept of barrier is explained in quite ordinary

terms, as “measures to prevent an accident when something unexpected happens.” Also, all accidents are explained as the consequence of weak or missing barriers.

Five barriers of the SBP program

Caring about each other:
Nearly all the behaviour which leads to accidents is unconscious - either because we haven't been paying attention or because we're not aware that what we're doing represents a risk. One of the five barriers is intended to help us compensate for this lack of awareness by taking a minute before starting a job to assess any risks we need to take into account. And we'll assess risk continuously while doing a job. People may always make mistakes, however, and not even the systematic use of risk assessments in advance of starting work can wholly compensate for that. We depend on each other, not least by having workmates who show concern for us and intervene when they see we're making a mistake and exposing ourselves to risk. This collegial concern often represents the final barrier in preventing an accident.

Correct prioritisation:
Correct priorities concern the way we deal with safety in relation to other important areas. Statoil has a principle which specifies that, in the event of a conflict between safety and other important considerations such as productivity or costs, safety will take first priority until the conflict has been resolved. This means that, if we are unsure that a job can be executed in a safe manner within the specified time or with the available resources, it must be postponed until we feel that we are in control of safety.

Compliance:
Compliance is about loyally observing decisions, requirements, guidelines and procedures. The challenge here lies in the scope and diversity of our formal requirements and procedures. We have a number of requirements for virtually every job, and must admit that knowing them all could be almost more than is humanly possible. So we cannot expect everyone to know everything. But everyone must be familiar with our system of governing documents, and must know and observe the rules and requirements which apply to the job they are doing.

Open dialogue:
A necessary requirement for good safety is that we maintain an open and trusting dialogue between managers and employees, between Statoil personnel and contractor staff, and naturally between Statoil employees themselves - in other words, at every level. The aim is that each of us must find it entirely natural, and preferably a bit enjoyable, to raise safety-related issues with our immediate superior and our colleagues. We must be able to pose critical questions about whether a job we have been asked to do can be executed in a safe manner under the prevailing conditions. And we must be sure that personal problems which could pose risks when executing jobs are openly discussed.

Continuous risk assessment:
Statoil has a number of formal systems for assessing and reducing work-related risks. Examples include risk analyses, safe job analyses (SJAs) and pre-job talks (PJTs). These represent excellent and necessary solutions for ensuring that we work safely. Even with such systems in place, however, we still suffer accidents. This is often because too many jobs do not call for the application of our formal risk assessment procedures. Nor can any available tools or systems replace the human brain and the senses it controls. Continuous risk assessment is about using our senses – and our common sense. It's not a question of making complex risk evaluations. The primary requirement is to pause for a minute ahead of a job and considering what the chances are for being injured if anything unexpected happens. You can then take the necessary steps to avoid such accidents. So the message is that it's better to take a minute or two before or during a job than to spend the rest of your life regretting something you failed to do.

Thus, barriers are seen as “the safety net underpinning all operations”. Even more inclusive definitions also appear, as “everything we do to prevent accidents”. Participants are urged to remind themselves of “why these barriers are established and the consequences of removing them”. The concept of *technical* barriers is referred to, as its original meaning, but now, it is stated, focus is on “soft barriers”. Focus is put on “one’s own behaviour”, the rationale for this being that: “Virtually all serious incidents and injuries at our workplaces are due to some form of human error. So everyday life can only be made safer by paying constant attention to our own behaviour in order to avoid mistakes.” Each of the barriers are carefully explained and referred to throughout the seminar, in line with how they are presented in writing in the program documentation (see text-box).

In addition to the concept of barriers, another well-known metaphor from the safety nomenclature recurs throughout the seminar, and visualized several times on the screens: The Iceberg. There is certainly no reference to the theoretical or historical roots of the Iceberg Theory, but the purpose is clear enough: everyone is to be reminded of the potential harm contained in even the slightest failures or mistakes. References are still made to the to the idea of an aggregating proportionate relationship between minor failures and major accidents: “Injuries in Statoil are likened to the tip of an iceberg. Errors lurk beneath the surface along the whole chain, and small margins determine whether these become visible in the form of accidents. Participants bear witness to risky behaviour and near-misses caused by taking shortcuts and by “silent deviance’” (Statoil Magazine 2004/1). This adds to the clear emphasis on the importance of individual behaviour; implicitly embodying the idea that other measures have more or less been fully exploited. As pointed out in one work-shop ‘report’:

> “A great commitment has been made to improving our technology and systems,” observed one manager. “We can’t get any better now without putting people in the centre. That’s got to be done through open dialogue and by talking to each other” …. It was personal, gripping and direct. We’ve heard the message before, but it somehow came across in a better way. It’s now up to us to change our behaviour. (Statoil Magazine 2004/1)..

Care, vigilance, thoughtfulness, and concern for others are repeatedly stressed by the conference crew and in questions posed for group discussion. Readiness to correct or stop the behaviour of others is underlined as a particularly important, but also sensitive issue. Reasons for not doing anything to prevent a colleague from dangerous behaviour are discussed, ranging from personal reluctance, group mechanisms, and even national culture:

> It must be permissible for colleagues to interfere in such circumstances – even though this runs counter to a Norwegian reluctance to criticize workmates. On the contrary, the speakers agree that the work culture must build on openness, trust, a sense of security and concern for others (Statoil Magazine, 2004/1).

The staged interviews and 'panel discussions' occasionally arranged from the podium, mostly feature directors, managers, safety officers and safety representatives. The messages range from the importance of personal diligence in safety matters, to the sincerity of company commitment. The latter is repeatedly underscored by management representatives (supervisors, platform managers, field directors etc.). Lower level managers typically express their willingness to spend more time near operations and be more 'hands on' in their leadership role, while higher level managers make bold statements about the priority of HSE goals, the ultimate test being situations of conflict with operational goals. The thrust of the message from the top was also evident from the fact that representatives from the top management of the UPN (and occasionally even the CEO) would always attend the work-shops and convey their safety commitment personally, as in the following statement from the executive vice president for UPN:

> "Good production won't be attainable unless we have safety under control," he affirms, and promises to put safety before output when asking questions of platform managers …. "If a conflict arises between production and safety, we must opt for the latter," thunders Mr Carlsen from the podium. "You must put us to the test if you're in doubt". Mr. Carlsen promises that management will get better at accepting criticism and at adjusting its course accordingly (Statoil Magazine, 2004/1).

The conference is concluded by stressing the importance of the follow up; that this is only the beginning of a long term process and commitment. Participants are challenged to state their own promises for the future. Testimonies from the round tables include:

- a well engineer wanting to contribute to a good working environment by being cheerful and good-humoured
- a manager wanting to motivate his subordinates to speak up if they observe departures from safe working practice and to remind everyone to accept greater responsibility for their own safety
- a production planner for new wells stating that she'll be more careful about subjecting offshore personnel to unnecessarily stringent deadlines when they're working on wells
- a well supervisor wanting to convey the message that they have time to work safely and to create room for dialogue within the team
- a chemicals manager wanting to sharpen up the compliance with procedures
- a supervisor for chartered drilling rigs, wanting to make sure that all reported incidents are passed quickly along the right channels.

The dedication to the follow up is aptly visualized by the role of the 'log'. All management statements are carefully recorded and put in a 'postbag', firmly placed in the hands of (notably) the platform managers. Back at work, management and employees are supposed to open the postbag together and "systematically incorporate the proposed changes in their working routines. The hope is that this will contribute to an injuryfree life at work for all the group's personnel." (Statoil Magazine, 2004/1). Both during the conference and in official presentations, a strong message is conveyed that this is not just another fashionable and short-lived safety campaign. Evidence for this – albeit conditionally – is provided in some selected post conference comments from participants:

> "I've been with Statoil for 25 years, and have experienced pretty well everything …. One improvement program has given way to another without being properly completed. This was different. It got you to think, and gave me a good gut feeling." Without wanting to promise too much, he believed that, once everyone had been through the program, it would be easier to discuss issues with colleagues without being regarded as critical. (Statoil Magazine, 2004/1).

Another basic 'motif' also recurs throughout; that the program is motivated by an altruistic concern for the well-being of all employees. Even the writer-entertainer makes a

disarming comment from his boat, reflecting on the fact that Statoil, after all, is a commercial company: They may have calculated that the whole program will provide return for investments and that the underlying motive is money. He thoughtfully rejects the idea, referring to his meetings with the company and the crew: “I’ve met these people and I believe in them, that they really care for the people here”.

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