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# **Safety culture in the Norwegian Petroleum Industry:**

*Towards an understanding of interorganisational culture development as network learning*

by

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## *Safety Culture in the Norwegian Petroleum Industry*

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## **Abstract**

In such complex industries as the petroleum industry, the effect and quality of SHE management will to an increasing extent be dependant upon the interaction between many different actors from different cultures and organisations. Processes of cross-cultural learning will thus be of crucial importance for what one can achieve. It is argued in this article that an actor-network theoretical approach could contribute with revealing findings in this area, and bring a deeper understanding of the complexities and relations between culture and learning. Individuals and organisations should be seen as constituted within heterogeneous networks in which knowing and learning not are limited by artificial boundaries, such as ‘departments’, ‘organisations’ or even ‘communities of practice’.

The paper discusses and critiques some aspects of safety culture in the petroleum industry as it is described and theorized in the literature. It is further drawing upon central perspectives of actor-network theory and organizational learning theory to suggest an understanding of safety culture development as ‘network learning’. The article concludes with identifying some areas for future research.

Key words: safety culture, network learning, actor-network theory

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## **Introduction**

In this paper I am proposing a framework for developing new understanding of the development of safety cultures in the oil industry, through central perspectives from organisational learning and actor-network theory.

I will discuss a few aspects of the networking of a number of actors in the industry, involving operators, contractors, unions, and government, and how change towards a network structure in the industry impacts on the efforts to develop safety culture. Connected to safety culture development, 'national cultures' are of interest too, firstly for safety culture development with participants from different nationalities, and secondly as a comparative perspective – how is it that similar industries in different parts of the world perform differently regarding safety?

Further research in this direction could possibly result in new understanding both of the development of safety culture, and of organisational learning in interorganisational networks – or network learning – in general. Moreover, such new understanding should be used for theory development relevant to the emerging academic fields of culture development (Cook & Yanow 1993, Turnbull 1999 and Haukelid 2001, etc.), and network learning (Knight 2002, Hoholm 2002), and for methodological development in the continuing research on interorganisational culture development and learning.

To come to terms with this topic, I am using central perspectives which emerged from my own recent Master's thesis on Network Learning (2002) and I have further done a review of literature on safety culture.

## Learning and Safety Culture: situated practices

Rather than the traditional individual, or cognitive, view of learning, I am taking a view of interorganisational (network) learning as cultural, social and socio-technical processes, emphasising the relational, situated and political nature of learning (Gherardi et al 1998 and 2002).

It is not consensus among researchers on the definition of ‘safety culture’. Reason argues that organisational culture is shaped by shared practices (1997, p.192), while Hovden argues with Schein that organisational culture consists of assumptions and beliefs that are “learned responses to a group’s problem of survival in its external environment and its problem of internal integration” (Hovden 2000, p.31). In his discussion of the term, the anthropologist Haukelid (2001) put forward a critique of some of the popular management literature for being superficial, and having an instrumental and manipulative view of culture as an alternative tool for control, a naïve view of management’s influence on culture, and a strikingly low interest for the social space surrounding the organisation. Haukelid calls for a definition of organisational and safety culture as a “common set of ideas, values, attitudes and norms that a group of people identify with, and that is part... of traditions and formal socialisation, more or less changed over time” (2001, p.9), and further that culture should be seen as a ‘system of meaning’ (p.10). While largely agreeing with Haukelid, I think we need to develop an understanding that both can embrace this deeper, more fundamental, anthropological definition, and at the same time keeping close to the *practice* of working, knowing and learning in groups, organisations and networks.

## The Introduction of ‘Safety Culture’

There seems to be a broad common agenda among most of the actors in the oil industry, from government to unions and

employers, to improve what they call the 'safety culture' in and across the industry.

Safety culture is a relatively new concept compared to the general work for Safety, Health and Environment (SHE). Through the last years the understanding has developed that technical, structural and regulatory solutions not is enough, neither a focus on individual 'human error'. It is recognized that social processes of interaction, co-operation and ultimately of common values and culture are equally important for safety performance. These social factors are usually far less predictable and manageable than technology, structure, architecture, regulations, etc., but are nevertheless extremely important to succeed in creating safe work places in the oil industry.

It can be questioned if the introduction of the term 'safety culture' in the oil industry and other industries really has changed anything about how the actors think of safety, or what they do to strengthen SHE (Rosness 2001). And how and by whom was the current understandings of 'safety culture' made 'truth'? When the solutions emphasised among most of the actors mostly are to do with standardisation and measurement, this can seem to be nothing more than a way to recirculate and modernise the common old methods. A way to keep the old 'regime of truth' going (Foucault 1980, p.76). It is especially problematic because this creates a gap between the expressed problem – safety culture – and its preferred solution – standardisation and measurement. As Haukelid (2001, 2002) have pinpointed, culture is hardly something one can measure, and to what extent culture can be managed is also questioned in the literature (e.g. Turnbull 1999, Haukelid 2001, 2002). It becomes even harder when we include the need for working on safety issues across organizational boundaries in the industry.

## A network view of organizations

The massive use of outsourcing, contractors, etc. in the industry, and the complex relationships between the different actors – shifting between competition and collaboration – make a network view of both organisations and the industry useful. These are heterogeneous networks, as in the modern society no network is purely social. Various technologies and artefacts are integral parts constituting the networks, and thus the cultures, of the social. This is particularly relevant in the field of SHE because almost all hazardous work processes includes aspects of human – machine interaction.

And in times of globalisation, the terms ‘network’ and ‘culture’ is becoming increasingly useful together, as these networks are not only heterogeneous in terms of humans and non-humans but also in terms of a variety of cultures, nationalities, languages, and practices participating in the same networks.

But how can safety culture be developed in an interorganisational network? When Rasmussen (1997, p.185) argues that an effective safety culture is dependant upon a strong *hierarchical foundation* to be able to make consensus among the actors on values and practices, and Roberts (1990) found that ‘High Reliability organisations’ are characterised by *‘tight coupling’*, it seems pretty difficult in the large, loose (or at least shifting) and complex network structure of today’s oil industry. However, I don’t think we should abandon such a culture project, and if the industry are to come even close to success it is essential to study and understand the complexity and the dynamics in action in these networks.

Learning can be an important approach to how we can understand and develop SHE cultures in the industry, building on the last years of research on safety culture and on organisational learning as cultural and social processes, combined with the Actor-Network theorists radical understanding of networks and the social. My



argument is that development of safety culture needs to be understood as organisational and network learning, where both the individual actors, local networks, and the industry as a whole are seeking to improve their SHE performance.

## **Background and contemporary research trends**

### Researching safety culture

Although being a rather ‘thin’ representation of the oil industry as a whole, reading through one of the recent issues (Nov.2002) of the info-magazine of “Co-operation for Security” (SfS), a large scale project working across the Norwegian oil industry to improve safety and safety culture, still is an informing exercise to understand the common discourse on safety culture. Most of all, the different actors there talk about standardisation and measurement. Technologies, routines, procedures, terminology and practice all need clear common standardisations, and safety cultures need to be measured accordingly.

The SfS project manager, Erik Wiig (p.2) writes about the work to “develop common characteristics of a new SHE culture”, “common values and norms”, “common systems, routines and procedures”, and describes this as an “important standardisation work to reduce the risk”. He emphasises dialogue too, even though his goal for dialogue across the companies is more standardisation – to “identify best practices”.

Two competing producers (Kleven and Ruud, p.4) of technology are working for standardisation of their technologies, while representatives for a drilling company (p.6 and 8) are talking about “common hand signals, common language, common terminology” that should be used by all workers “independent of company membership and nationality”. Rune Botnevik in Statoil argues for

common standards of work permits and secure job analysis because so many offshore workers move around between different installations. And the managing directors of BP and Shell, both see the importance of standardized procedures and processes in “all critical operations” (p.2 and 10).

However, can standardisation be the solution in the work for safety culture? Isn't this to repeat the patterns from the nineties with huge and often failed organisation culture development programmes? – Programmes where the visible results often were a shining and superficial parade, but below the surface differences and resistance were still there, and after a few months little more than slogans and documents were left (see e.g. Turnbull, 2002). Furthermore, how can all the large companies' hard work on their own internal 'corporate cultures' be combined with common culture across the industry?

The more recent hunt for 'best practices' seems to be more modest and realistic. To study the practices of successful organisations, and make this knowledge and ultimately these practices, accessible for other organisations. But one needs to be a bit sceptical here too, because doesn't the search for a 'best practice' imply a rather static and simple view of the world? How can the situatedness and complexity of the identified 'best practice' be transferred? And won't the world (technology, organisations and networks, knowledge, etc.) possibly change again in between the identification and the implementation?

A few persons referred in this issue of the SfS magazine do additionally touch upon dialogue, learning, and of the political aspects of safety. The managing director in Shell appreciates the open and constructive *dialogue* resulting from the SfS project (p.10). Steinar Løvaas in Hydro argues for the importance of creating ownership, responsibility, and open dialogue across workgroups, professions, and corporations, furthermore that when

“several actors with different experiences participate in discussions about improvements, it triggers *new thoughts and new ways to solve challenges*” (p.9). This is coming close to common ideas of organisational learning, and seems to be constructive pathways to follow further. A couple of representatives for employee organisations (NOPEF, OFS and DSO) describes the work for safety in more political terms: “Something of most importance that the SfS project can do, is to give us *power* to speak up when something is wrong”, and that “many have expressed that to be engaged with SHE can be negative for the individual’s career opportunities” (p.3).

## Safety culture in the literature

Wilpert (2000) identifies three main views of safety in the research literature: Firstly the pessimistic view, that accidents are “natural, normal and unavoidable” (p.1260). Secondly the optimistic view, where the focus is on studying organisational features which render some organisations extremely reliable (p.1261). And thirdly the safety cultural view, where there is not yet a shared understanding (p.1262). Within the safety cultural view there are, as mentioned above, a number of different definitions – from common practices (Reason 1997) and ‘recurrent patterns of interaction’ (Rosness 2001) to common ideas, values, attitudes and norms (Haukelid 2001). In addition to his anthropological definition of culture, Haukelid (2002, p.18) operates with three levels of culture – a linguistic level, a tacit, embodied, and taken-for-granted level, and a fundamental philosophical level. This means that as researchers we need to dig below the surface, as “changes in manifest expressions do not guarantee that norms, values and fundamental assumptions have changed in the company”. (Haukelid 2001, p.15).

There seems to be good evidence of relations between safety culture and safety performance, although *which* factors that relate seems to vary (Hovden 2000, p.34).

When it comes to the extent to which culture can be managed, Haukelid takes a more modest view than Reason, who optimistically argues “that a safety culture can be socially engineered by identifying and fabricating its essential components and then assembling them into a working whole” (Reason 1997, p.192).

A cultural approach to safety seems especially relevant because, as Hovden writes, “SHE problems relate to basic values about life and death, risk issues engage opinions and feelings, and risks are unevenly distributed in industry and society” (Hovden 2000, p.25). Furthermore that “a SHE problem, though it has some roots in nature and technology, is bound to appear in a social context and is subject to social processes and cultural patterns, i.e. risks are social/political/cultural constructs” (p.29). Coping with uncertainty, and reducing ambiguity is integrated parts of risk handling, thus explaining the existence of an overwhelming material of symbolic representations and myths in the area.

Below I will try to mention and discuss a number of these issues of special interest in the literature.

## High Reliability Organizations and hazardous technologies

While most safety work and research are starting from analysing actual and potential failure, the researchers on ‘High Reliability Organisations’ (HRO’s) (e.g. Roberts 1990. Weick & Roberts 1993, Rosness 2001) start at the other end. They achieved fame during the nineties through studying “potentially hazardous organizations with histories of excellent operation” (Roberts 1990, p.160). Such organisations deal with hazardous technologies, and are

characterised in terms of complexity, tight coupling, interdependence, environmental uncertainty and disagreement about goals (p.170).

The answers to how these ‘histories of excellent operation’ are possible, are considered to be found in factors as culture of reliability, continuous training, ability to change between different modes of operation/hierarchy, direct information sources, and a multiplicity of overlapping and mutually supporting defences (Roberts 1990, LaPorte & Consolini 1991, Weick and Roberts 1993, Reason 1997). The fundamental problem that the priorities of reliability and safety compete with production and profit (Roberts 1990, Reason 1997), is emphasized being a daily choice for actors “whether or not to cut safety corners in order to meet deadlines or other operational demands.” (Reason 1997, p.5). Again, aspects relevant to both safety culture and to learning are mentioned as crucial.

## Standardisation

Unlike the HRO, standardization is not a distinct ‘school of thought’, but is found broadly in the literature and in practice, both regarding standardisation of technology, organization and culture. Several critical points about the work for standardisation of safety culture in the industry are made: the tension between companies wanting to develop their own culture (for competitive reasons) and the work towards a common and collaborative safety culture across the industry (Haukelid 2002, p.8), and that individual human action often can prevent accidents in spite of organisational and technological change to the worse (2001, p.25). Both Haukelid and Rasmussen (1997) emphasise the problem of trusting too much in standardised formal procedures and instructions, as the actual practices almost always will differ. This is because one can never foresee all local contingencies and complexities in the work practice context. This further implies that these formal texts are unreliable

standards “for judging behaviour in actual work” (Rasmussen 1997, p.187), as it will lead to scapegoating of the forefront operators, hiding the responsibility of the other actors in the system – like managers, colleagues, technologies, governments, and organizational structures.

## The politics of measurement, reporting and control

Standardisation means increased opportunities for measurement and control, and this argument is prevalent both in the industry and in much of the literature. But measurement is a problematic term when connected to safety culture. It can become more important to count, than to understand *what* one is counting (Haukelid 2001, p.19). To *measure* a culture is in any case a difficult, if not impossible, task in the first place. Although acknowledging the complexity of the task, Rasmussen (1997) still considers “risk management to be a control problem” (p.183), and argues for a strong hierarchical – top down – approach to safety management (p.185). He concludes that “no control system will perform better than its measuring channel” (p.196). The question remaining, related to culture, is if measurement of culture never can become very relevant, then perhaps control systems can neither be the only, nor the best solution?

Measurement, reporting and control systems are also recognised to have several implications making the picture more complex. Rosness states that the way we report and discuss accidents is influencing the safety culture, and Haukelid warns that incident and accident reporting is a precarious system, and that too much critique, or blaming, can lead to employees stop reporting, or even to manipulate or sabotage such activities (2001, p.23 and 2002, p.16). This is one of the main arguments of Collinson (1999) from his research on UK North Sea oil installations, examining ‘the politics of accident reporting’. His study reveals how the linking of

incident and accident reporting to performance assessment, leading to a 'blame culture', made offshore workers restrict, downplay and manipulate the reporting of accidents, which in turn undermined the company's safety culture (p.579). Collinson pulls threads from Goffmann's 'impression management' when he says that "performance assessment frequently creates employee performances" (p.579). A practice that is better capable of reducing incident and accident *statistics*, rather than the real incidents and accidents. He critiques Foucault and Willmott for their accounts of how individuals internalise surveillance and control through measurement and assessment. On the contrary, "culture management and its link with performance assessment may be a less effective disciplinary technique than Foucauldian accounts contend" (p.595). Because power and resistance are inextricably linked, this attempt to create disciplined selves "can unintentionally construct employees as calculating oppositional selves." (p.596). This failing to report accidents and near misses properly, is also explained due to the asymmetrical power relations and inequalities present especially between the privileged 'company men', and the unprivileged contract workers (p.592), concluding that "the offshore sub-contracting system is a major factor threatening safety" in the UK oil industry (p.595). It is certainly needed to inquire into these questions also in the Norwegian part of the industry.

To take this political perspective somewhat further: as mentioned above, cultures are heterogeneous phenomena, and according to Haukelid, there will always be a battle between individuals and between subcultures about values, power, and knowledge/truth, as "culture is historically situated and continuously produced through battle and/or hegemony" (2001, p.12).

## Multiple cultures and realities

Because safety cultures are not homogeneous, and the socio-technical system involved in safety management consists of actors from all levels, from system operators over managers and work planners, to legislators (Rasmussen 1997), there will be differences both in opinion and in practice between the parties about what 'safety culture' is, and how it is created (Haukelid 2002, p.6). The interesting part here is to note the possibility that the existence of several different realities or subcultures not necessarily will destroy the safety culture (2001, p.25), something which Gherardi et al (1998, 2002) have explored in the construction industry in Italy. In their research on safety culture and learning in the Italian construction industry, they have developed a framework for understanding organisational learning as social rather than individual phenomena. They further draw on theoretical perspectives from community of practice theory (Lave & Wenger), activity theory (Engeström) and actor-network theory (Law and Latour, etc.) in their exploration of social, cultural and cross-cultural learning processes related to safety in the construction industry. In particular they offer interesting insights into how actors from different companies, and thus cultures, and professions, often with different and conflicting definitions and understandings of SHE, are able to work and perform safety together.

Even if all organisations likely will have a multiplicity of subcultures, this is especially relevant in the oil industry, due to its combination of complex technology and wide use of outsourcing, alliances and partnerships. In this context, "how can the company make sure that there exists an integrated and homogeneous safety culture out on the rigs?" (Haukelid 2002, p.16). And if the Norwegian situation is similar to Collinson's account of the British part of the industry, we can possibly find an 'us and them' culture, treating contract workers as 'second class citizens', (Collinson 1999, p.588) undermining the contract workers ownership and responsibility regarding safety issues. But cultural diversity is not



only a problem to be solved, on the contrary it might be an important asset in the management of complex technologies, enabling more complex understanding of the problem. Bridging efforts would thus be more desirable than homogenisation of culture (Rosness 2001, p.3). However, the multiplicity does not only regard different organizational cultures. This is a global industry with frequent cooperation between actors from many different nationalities.

## National culture

Both Hovden and Haukelid show some interest in the study of internationalisation leading to an increasing number of people from different nationalities working together, and how this workplace diversity influences the safety culture. This is indeed relevant in times where the Norwegian companies also are exploring new business opportunities globally.

Unfortunately, I would say, Hovden uses Hofstede's famous theory of national cultures in organisations, which is under heavy critique at the moment for both its methodological and its conceptual basis. McSweeney is only the most recent contributor to this critique: "The limited characterisation of culture in Hofstede's work, its confinement within the territory of states, and its methodological flaws mean that it is a restrictor not an enhancer of understanding particularities" (McSweeney 2002, p.28). McSweeney concludes that there is a need for knowing "more about the richness and diversity of national practices and institutions – rather than merely assuming their 'uniformity'" (p.28) as in the case of Hofstede. One way to do this could be, following Schein, to "become cross-cultural learners, to expose ourselves to different cultures and begin to reflect on what it means to try to change cultural assumptions." (Schein 1996, p.46). This would be to move towards an understanding of culture development as *learning* processes, both

on individual, organisational and interorganisational levels (Lorbiecki 1997).

From this general review of some of the aspects in the safety literature, I go on to showing some of the links found in the same literature about knowing and learning.

## Knowledge and Learning in the safety literature

Learning can not be said to be a major theme in the literature on safety, and when it is mentioned, it is often treated quite briefly. Haukelid (2002) mentions the improved activities in the industry of training managers and SHE personnel, finding that involvement and collaboration on different levels is a common characteristic in successful projects. Going beyond individual learning, Reason (1997) and Wilpert (2000) recognise safety culture development as processes of collective/organisational learning, Rasmussen (1997) emphasises the need for organisational learning to cope with complexity, and Collinson (1999) quotes Turners argument that managers should create ‘an open learning atmosphere’ in which “mistakes, errors and near-misses could be discussed openly and without fear of blame or recrimination” in order to improve the safety culture (p.580).

Some writers express views relevant to situated learning theory/communities of practice theory: that we should be sceptical to explicit knowledge, because it is removed from its original practical context, and instead put more weight on bodily experience, or tacit knowledge (Haukelid 2001, p.13), that each person develop knowledge about and coping skills at the boundaries of their practices (LaPorte & Concolini 1991, Rasmussen 1997), and finally that e.g. service companies function as ‘information channels’ between the companies for best practices (Haukelid 2002, p..12) – or what Wenger (2000) amongst others would call a ‘broker’.

Other aspects relevant to organisational learning is that change of culture (learning) in too short time, often will be experienced as threatening, and thus be resisted by the members (Hovden 2000). Moreover, that active participation from the employees is one of the most effective tools in order to create an effective safety culture (Haukelid 1998 and 2002, Hovden 2000), and that commitment to safety issues is built local participation in developing goals and means of improvement (Rosness 2001). This is largely in accordance with the long standing participatory democracy tradition within organizational and management research (Pateman 1970, Reynolds 1980, Elden 1986), and which has been of major influence on the Norwegian work environment legislation.

## Culture and (inter-)organisational learning

Let's have a look at some literature in the organisational learning area and how it is relevant for development of safety culture. I have put a main focus on three different directions that together draw an interesting scenario for an understanding of culture development as (inter-)organisational learning.

Firstly, Cook and Yanow (1993) in outlining their view of organisations as 'cultural entities', define organisational learning as "the acquiring, sustaining, or changing of intersubjective meanings through the artefactual vehicles of their expression and transmission and the collective actions of the group" (p.449). And so organisational knowledge is not held by any individual by herself, but rather as something that is known and made operational by several individuals "acting in congregate" (p.448). They argue that OL only can be understood by close empirical observation of how mutual creation of shared meanings and identities develop through cultural artefacts. This is a view that matches Haukelid's 'deep' definition of culture, and it is at the same time a starting point on

which it is possible to develop an understanding of cultural practices.

Secondly, partly building on Cook & Yanow's cultural learning approach, and partly on Lave and Wengers' situated learning/communities of practice theory, Gherardi, Nicolini and Odella (1999, 2002) start with developing a 'social view' of organisational learning where learning is seen to be about becoming able to participate in specific social and cultural settings: "To know is to be capable of participating with the requisite competence in the complex web of relationships among people and activities. ...Learning, in short, takes place among and through other people." (Gherardi et al 1998, p.275). And then they develop it further into a view of learning based on construction of identity and on positioning in a discourse.

*"...when we join a community, when we are enabled to develop a new identity with reference to others engaged in the same activity, we also become accountable to them and to the other communities with which they interact. Learning is therefore both belonging and positioning oneself in a discourse." (Gherardi & Nicolini 2002, p.421)*

So, to participate in a community is to develop an identity, and this is done in relation to, and with reference to others, which makes identity development also an act of negotiating a position. This double-sided process of identity construction (based on *dissonance*) and positioning (based on *consonance*, or understanding) is crucial for a view of learning that can include inter-cultural and political processes as integrated parts, instead of as limiting factors. This can thus be seen as an inquiry into what also Haukelid (see above) mentioned – that different cultures working together not necessarily lead to bad safety performance.

Learning of safety then, in a ‘constellation of communities of practices’ (community of practice might be seen to equal culture here) is “mediated by comparison among the perspectives of the world embraced by the co-participants in the production of this practice” (ibid p.419). One of the most significant intermediaries of knowledge and learning in their study of safety in the construction industry is the role of the ‘broker’, often embodied as a site foreman. The broker is a person with good relational competencies, able to “transfer and translate certain elements of one practice to another, to understand and appreciate the differences in perspective between one community and another”, “a living intermediary to synchronize the practices of a plurality of actors” (p.425). This role proved to be crucial to develop a common ‘discursive practice’ which according to Gherardi et al necessarily will be both a ‘dissonance and a cacophony’ (p.420). Every community or culture has a ‘distinctive safety culture’, and a building site requires the ‘interdependence of a plurality of communities’ (p.423). The ‘darker side’ of the effort to understand across boundaries – “what remains not understood, what is misrepresented or ignored” – is also brought to the foreground, and the network of interconnected practices is seen as situated, contingent and unstable. As a parallel, Elden’s (1986) account of the Scandinavian approach to workplace development, has many similar elements, such as an emphasis on participation and involvement in local practices, and an understanding of organisational learning involving “both conflict and cooperation, as stakeholders work out new meanings and new possibilities for action” (p.245). However, Gherardi et al’s account of cross-cultural learning of safety is still located in a single workplace, and there is a need to develop this further – to understand wider networks. More about that in the ‘Actor-Network Learning’ section below.

A third perspective on organisational culture and learning is found in Turnbull’s (1999) study of a culture development program in a

large British corporation. Turnbull in her research makes strong arguments against the myth that people in organisations ought to share common culture and vision. Her claim is that this 'unitarist' view of organisations does not have any relevance to the current organisational 'reality', where boundaries of cultures are increasingly blurred, and organisational membership not very clear. Even under the large scale attempt towards unitarism in the company she studied, resistance was never far from the surface (p.19), like Collinson also found on the rigs (mentioned above). As an alternative pluralist perspective, Turnbull mentions Burgoyne & Jackson's (1997) 'arena thesis' as a useful approach to practice. Acknowledging that conflicting purposes and values are inevitable, and even desirable, one should seek to create arenas where the differences can meet openly, to learn and develop knowledge and understanding across boundaries. A sociological approach that have done much work on researching plurality, process and relationality in the organizing of society is the so-called Actor-Network Theory. ANT provides us with a framework designed to research and describe the ongoing processes and strategies used by different actors to enrol other actors and achieve stabilization of an object (Callon 1988, Latour 1988, Law 1992), e.g. of organization, or safety culture.

## **Actor-Network learning**

In a study of organizational knowledge and network learning in a British community college, I started developing my understanding of learning as a network phenomenon, and especially what 'learning' means from an actor-network theory perspective (Hoholm 2002). There is not yet been done much work on network learning within the organisational learning literature. This is, I believe, a major research topic to come in the next few years. Knight (2002) is one of the researchers trying to establish 'network learning' as a field of research. She avoids the psychodynamic

pitfall of making this just a new way to research individual (or cognitive) learning, arguing in favour of a ‘relational view of actors’. A few examples is given of networks where performance of the network as a whole, rather than only the individual, is of crucial importance (community based social services, catastrophe operations, etc.). Her argument is that since it is widely recognised that individual (or cognitive) learning and organisational (social) learning are different phenomena, and should be explained through different frameworks, there is good reason to assume that this is the case also between organisational learning and network learning. What I think is less clear in her article is firstly what a ‘relational view of actors’ actually means, when she uses the more structural term ‘institutionalisation’ as a measure of learning. It can seem as if she not have decided between a structural and a relational view on organisations, a choice that will have significant implications for her further theorising on learning. I think also that her distinction between learning *within* networks and *by* networks are useful, but too rigid. If these can be separated, it will at least be as gradients, not as a dichotomy. Although agreeing on the necessity to research wider networks, I will suggest a view of network learning able to analyse learning both within and by networks. This becomes possible if we commit to a relational view of actors and networks, networking as process.

Latour (1988 and 1999) provides thought provoking explanations of networks in his ‘model of translation’. That networks should be understood as processes of translations, deformations, and transformations. This is because in this model, “the spread in time and space of anything – claims, orders, artefacts, goods – is in the hands of people; each of these people may act in many different ways, letting the token drop, or modifying it, or deflecting it, or betraying it, or adding to it, or appropriating it” (1988, p.267). This implies that networks are less predictable than one could believe, as everyone in the chain participates in shaping the object – and the

network. And the possibility of controlling networks becomes highly questionable, as power is treated not as a cause, but as “the consequence of an intense activity of enrolling, convincing and enlisting” (1988, p.273).

This kind of sociology tells us that we can never stop doing our ordering work. There is not a final state of order to achieve where we can rest. When the ordering work stops, so do the order. To create a ‘safety culture’ is to commit to a continuous process of defining, enrolling and keeping loyal all the involved actors. And so, to define a ‘safety culture’ is not possible in principle, but only in practice. It is continually up for negotiation, and will always risk to be contested. For research then, the interesting question is how this ordering of a ‘safety culture’ is done and maintained in practice, rather than what it *is* in principle.

Learning has not been a major theme in the actor-network literature. Fox (1999) have started working on combining ANT and situated learning theory, and Law’s work on organizing strategies (1994) touches learning briefly, and Gherardi et al are drawing upon some aspects on ANT in their writings. Hence, I have to ask: What *is* learning from this perspective? I am suggesting four perspectives that will help coming to terms with such a slippery concept as ‘learning’:

### De-centring of learning

De-centring of learning means that learning is different things. From an Actor-Network perspective it becomes a main issue not to privilege one view of learning in particular, but move between realities, and “treat [learning] as an ontologically complex entity” (Law and Urry 2002, p.12). When John Law in his organisational ethnography (1994) studied organising or ordering work, he touched the core of sociology – how is it that the social world is ordered?



Or, from his point of view, looks like – or performs – order. And I searched for a way to treat ‘learning’ in the same way, but could never really get to it. Because to learn is not neutral. Learning says that something is better than something else, that certain forms of change, or development, should be privileged. And therefore it is not totally parallel to ordering, a neutral definition of learning cannot be made, we already have a word for that: change. If learning is equivalent to change, then why don’t we talk about change instead of trying to ‘empty’ learning of its common sense meaning?

## Phenomenology of learning

So my definition of learning is this: it is different things to different actors in different contexts. Sometimes to build networks, and sometimes to tear them apart. Sometimes to be loyal, sometimes to betray. To improve certain embodied skills, or to change patterns of interactions through common reflection. And so forth. And the same learning event can mean different kinds of learning to different actors. Learning is contingent and multiple, although always relational. This is a phenomenological definition, because it says that we always need to ask the actors, check it out empirically (Law 1994, Law and Urry 2002). But it is also beyond the single actor – it is relational (Latour 1988, Michael 1996).

## Relationality and heterogeneity of learning

I am saying that ‘network’ is an increasingly important metaphor to understand the form, the topology, of the social. To see actors in a set of links or relations, or perhaps *as* a set of links and relations. Not the naïve network picture being served in its most popular version, where you can almost ‘see’ the knowledge floating freely through cables, human bodies and data-bases, where transfer of knowledge is pure and undistorted ‘transport’ of knowledge. This is

where Latour (1999) expresses his disappointment about the term 'network': that it has lost its critical and controversial potential. Processes of knowing and learning in heterogeneous networks of the social is never just transport of knowledge, it includes transformation, deformation and interpretation.

Networks are heterogeneous, with both human and non-human participants. There is no reason *a priori* to believe that the involved technologies, cultural artefacts, architectures, etc. are of less importance for these processes than the humans. Can non-humans learn? I have realised that this is the wrong question, because learning has to be located *between* actors. But, yes, heterogeneous networks can learn, and also non-human actors can change, develop, or challenge its and others' positions, preferences and interactions in the network. Also non-humans can perform different roles, and take part in performing different ordering and learning strategies. Or hinder them.

Network learning is further about how interaction preferences, social architecture and time are strategic and political factors which are used to privilege certain groups in terms of access, participation and voice in the network.

Every need for, and practice of 'learning' is situated in a particular time and place between specific actors and networks, and so to decide what 'appropriate' learning in each case is, will always be the challenge both for each individual actor, and ultimately for all members of that network together. As in every complex process the outcome is not given, learning is not only something to negotiate and decide, it is also something to evaluate and to reflect upon after the learning event or process.

## The hideous purity of learning

This is another ambiguous aspect of learning. As if learning is always something attractive. But learning can be (and often is, I think) an effective way of enrolment into the dominant discourse, or culture, of the organisation or network (Coopey 1994, Contu 1999). Simplification and hiding of networks. I can easily imagine how learning might be used to hide or perhaps restore falling networks. Think of the many managerial projects of changing and building 'corporate culture' we have seen the last decades. And it can certainly be used to hide the strategies of ordering in operation in the network. I am not sure if the marketing of 'Continuous Professional Development' in every vocation always is about giving the individual 'rights' and empowering 'development', it could be that the desire for control and profit from 'calculation centres' like governments and market networks are as strong a motivation. Hence, if learning really is attractive, we need to ask attractive to whom? Learning to achieve what? What is learning here? Who are privileged in and through it, is it supporting a dominatory system? Who took part in its definition and negotiation? This is my critical take on learning. That we need to ask how we can make things better for all of us.

## **Research needs identified**

In the safety literature several needs are mentioned for future research, and I have chosen to include those most relevant to the topic discussed in this paper.

## The impacts of organisational change on safety culture

In spite of large organisational and technological change the last years, studies of complex processes of organisational change and their implications and unintended consequences for SHE management and culture is lacking (Haukelid 2001 and 2002,

Hovden 2000). Further Haukelid calls for mapping and studying of how safety cultures change and develop over time and in the context of societal and technological change (2001 and 2002).

### Safety culture in interorganisational networks

Roberts' (1990) questioning about "how interdependence and culture [are] related" and about cultural homogeneity in interdependent versus more loosely federated networks, points towards the need to develop network perspectives on safety culture. And both Rosness and Haukelid mentions the need to focus on the relationship *between* different parties more than just on intra-workplace activities (2002), Haukelid also points to the challenge of creating one common safety culture, when there are several different cultures in every company (2002), and questions if the large scale use of 'outsourcing' makes the development of safety culture harder.

### Safety culture and learning

Hovden (2000) has identified the lack of research concentrating on organisational learning and change, and suggests research on the question of how "the company learns to improve its SHE management system". And I would add to this – how *networks* learns to improve its safety culture/s, as the industry is characterised by a complex network structure. The study of safety culture and learning will, as Haukelid (2002) argues, need to take into account that cultures are *situated* in contexts of specific technologies, organisations, structures and systems.

### Cultural comparisons

Relations between safety culture and organisational culture, national culture, and globalisation will be interesting to study in the years to

come (Haukelid 2002). Particularly will comparative studies of cultural specificities contributing to safety culture, e.g. between the Norwegian continental shelf and the UK sector, the Mexico-gulf, or the Thailand-gulf have a great potential for providing new knowledge on safety culture (Haukelid 2002).

### Thorough empirical and theoretical research

On a more general basis, both Wilpert (2000) and Hovden (2000) critiques much of the existing research on safety culture to either lack empirically proven validity, or be too weak on theory. As one could expect that this research area is moving into a more 'mature' phase, it will be of great value to ensure rich and reliable empirical data material, and to establish solid theory, in order to take this important field of research into the future.

## **A research agenda for safety culture development as network learning**

In such complex industries as the petroleum industry, the effect and quality of SHE management will to an increasing extent be dependant upon the interaction between many different actors from different cultures and organisations. Processes of cross-cultural learning will thus be of crucial importance for what one can achieve.

An actor-network theoretical approach could contribute with revealing findings in this area, and bring a deeper understanding of the complexities and relations between culture and learning. Individuals and organisations should be seen as constituted within heterogeneous networks in which knowing and learning not are limited by artificial boundaries, such as 'departments', 'organisations' or even 'communities of practice'. Knowing and learning needs to be understood as complex and multiple processes

of translation and negotiation. Thus, learning needs to be seen as cultural, political, reflexive and strategic processes of “exploring and negotiating the space between networks” (Latour 1988).

My suggestions for further research into safety culture, are that the above identified research areas should be researched thoroughly, and with specific attention to some crucial aspects. These are aspects that both needs to be further researched in organizational culture studies in general and in safety culture studies in particular. In summary these are questions about how learning happens across cultures and organisations, and how knowledge and practices are distributed in the meeting and collaborative action of different actors from different cultures.

### Standardisation versus learning

‘Continuous improvement’ and ‘standardisation’ is both widely used terms within the safety literature. But in some sense they are contradictory, as standardisation probably will create resistance towards further learning. Perhaps larger proportions of the standardisation work should be put into creating open arenas for learning, communication and collaboration.

### The ‘knowledge regime’ in the safety field

There is a battle about the definitions of safety problems, safety culture, and its solutions between the parties in the industry. What implications does this have for the development of SHE culture? How did the ‘measurement culture’ in the industry arise and how is it maintained? These are questions of organizing strategies, network identities, and politics. To understand what knowledge is in the present context, and how its ‘regime of truth’ (Foucault 1980) is produced, could possibly help to “[ascertain] the possibility of constituting a *new* politics of truth” (ibid. p.77).

## Difference, ranking, voice and participation

In my masters' thesis (2002) I showed how different actors were able to participate in the same learning event with different expectations and views on learning. Furthermore, I raised questions about representation and silencing. These things could be further developed. Because if some actors are being silenced, then important experience and knowledge might be lost, and the silenced actors might risk being discriminated.

How does the interplay between the different actors and cultures enable participation in one and the same event? And how can we listen to the silent (non-) participants in the network? Should we try and give 'voice' to the silenced? Or should we try and describe how they were silenced? This is a potential for learning, for change, and perhaps for making our networks of the social more inclusive.

Differences can not be avoided. Ranking is the issue. To listen to other cultures, to find ways of characterising others that not make them lesser, just different (Law 1994).

In my study of a Community College in the UK, a group of people were performed into being the 'other', those who supposedly were not open to learning and change. I don't say that they were treated differently in the staff room (these were teachers), I don't know that. But I do say that they played an important role when we talked about learning and change in the learning group and in interviews, without actually being present They were translated into non-learners, represented by the 'learners'. To work with anti-ranking is the challenge. Perhaps one can explore other ways of representing these people and cultures, other stories to tell that would make them belong? And perhaps there is something to *learn* in listening to them, about the dominant 'open to change' ordering mode. Anti-ranking, and listening, and finding other stories to tell. Collinson

(1999) told similar stories from the petroleum industry, about a culture discriminating contract workers on oil installations.

In one way or another every actor and (sub-)culture in a network participates in producing and reproducing its reality and organization. What is interesting is *how* actors participate, and how they are able to participate. Perhaps the current situation in the petroleum industry shows a similar pattern as that of the three groups in Gherardi et al, where those with ‘relational rationality’ (the site foremen in their study) are in lack of a *voice* compared to the engineers (technical rationality) and the owners (economic rationality)? In this case the silenced group also proved to be significant for safety performance. These other two perspectives seems to dominate in the oil industry too, even in the work for ‘safety culture’.

## The politics of knowledge: space, architecture and privilege

In the above mentioned Community College study it was surprising to see how the staff, partly through the architecture of the school, had been able to create such big space – and hence autonomy – within their ‘layer’ in the strongly performed pattern of hierarchy in that particular organization. There is a need to inquire further into these aspects of how architecture participates in social and cultural patterns, in the privileging and restricting of access to knowing and learning. For example the staff room seemed to participate in the representation of knowledge in the organization, helping the performance of teachers as ‘the knowledgeable’, the powerful. Another take on this is to inquire the delicate dilemma between autonomy and control. Because if access to such processes of knowing and learning are given to other actors in the network, if the actors so to speak extend their boundaries, which they probably should, they would not only enrich their learning through new



perspectives and alternative information and viewpoints. They would also lose some of the space they had on their own. E.g. if the staff room at the college were opened to parents, students, management, and external actors, the teachers would gain access to lots of new ideas, experience and viewpoints. But their freedom to shape their own, and thus the student's, work practice would decrease. Opening the 'black box' for others is to gain access to new resources, but also to open up for participation and control from others.

## Multiple memberships and identities

There are internal tensions in actors too. If an actor is a 'person', a 'culture' or an 'organisation', they are notwithstanding members in multiple networks, performing different identities and roles in different contexts (Michael 1996). How do they cope with this? It is interesting to note that both Michael (1996) and Araujo (1998) mention the connection between multiple memberships and learning, but emphasise different aspects. While Michael asks in what way actors use their membership (identity) in one community to 'problematise' another, Araujo more optimistically sees multiple memberships as 'opportunities'. In times of technological development and globalisation, with discontinuities and flexibility in terms of time and space, this is more relevant than ever. When does it lead to synergies? And when does membership in one culture or network lead to resistance, conflict, problematization and challenging of another? I have already mentioned the dilemma between firms developing internal safety culture, and the work for an industry based safety culture. Another example is how the companies are able to implement their Norwegian SHE standards in other geographical settings. This meeting of different cultures, languages, identities, and definitions of safety requires considerable amounts of work, translating knowledge, interpreting cultural signs, and negotiating meanings.

## **Boundary roles and objects**

As another approach to the same task – to cross boundaries, learn from other actors, and make new connections, awareness of *boundary objects* and roles might be very useful. There is a lot of networking done from and through often quite invisible boundary actors of different kinds, sometimes a human, other times technologies, design solutions or simply stories, that travel between cultures and work communities. What I am suggesting is that awareness of these brokers can be of huge value when working with network learning on safety culture. An example is Haukelid's (2002) above mentioned reference to service companies as 'information channels' between the companies for best practices. However, I am a bit sceptical. Will a boundary actor more often generate privileges for the powerful, because of the asymmetry between the actors and cultures it connects, or can it be the key to more symmetrical relations? In other words, is the broker forced to play by the rules of the powerful to get legitimacy, and thus just be enrolling actors on behalf of the already powerful, or can a broker make its own rules by positioning in between the cultures?

## **Methodological issues**

This call for researching culture development as network learning requires some methodological reflections. As mentioned, a 'measurement culture' can be said to dominate the industry. But how is it possible to measure subtle and complex processes of cultural learning? At best it is possible to measure the effects of learning, while the process in itself needs more to be understood than measured. Hence, in-depth field studies seems absolutely necessary to increase our knowledge on safety culture beyond the present.

Both Haukelid (1998, 2001, 2002) and Collinson (1999) argues for more qualitative research in the effort to understand safety culture in the oil industry. While Collinson emphasises the need to ‘examine the view from below’, Haukelid emphasise the logic of *understanding* as more important than the logic of counting when it comes to culture, and different methods, triangulations, should be used – both open interviews and ethnographic fieldwork, in addition to surveys.

Actor-Network Theory approaches and the similar will tend to prioritise ethnographic methods. Any phenomenon of the social is local and practical empirical matters to be investigated by careful observation, reflection and representation. One of the first principles in ethnography, and in ANT, is to focus on *local* knowledge:

“The search for universal laws is rejected in favour of detailed descriptions of the concrete experience of life within a particular culture and of the social rules or patterns that constitute it.” (Hammersley and Atkinson 1983, p.8)

There is also the viewpoint in ANT, as in other post-structuralist approaches that “generalizable knowledge always privileges the more powerful over the less powerful actors” (Easterby-Smith et al 1998), and therefore a local focus provides a better starting point for understanding the social. Also VanMaanen (1988) emphasises ethnography as a written representation of a culture, which is not neutral, and thus implies a responsibility for the researcher on how the representation is being done.

In this way it becomes possible to inquire into how individuals and cultures are constituted, and also acts, in different networks, and to study how “people slip and slide between realities” (Law and Urry 2002, p.11). Law and Urry (2002) states that in social research (as in any other social practice) “no method is innocent” (p.11), they

are part of the social world. Method is performative, in the way that it not only reports or discovers reality, it participates in the making of those realities, it helps performing them into reality. This implies what they call a shift from “epistemology (where what is known depends on perspective) to ontology (what is known is also being made differently)” (Law and Urry 2002, p.6), with the implication that “there is no single ‘world’” (ibid p.6). Instead we can talk of a ‘pluriverse’, in which different methods and practices tend to produce different realities and “different ways of thinking and knowing” (ibid p.11). This aspect of method is called ‘enactment’ and suggests that, in difference from relativism, the ‘real’ is real, but also made, and relational. To take the consequence of this view, one have to admit that research and its methods have important political sides to it. Because if methods not only uncover realities out there, but also bring realities into being, then the researcher needs to ask herself:

*“Which realities? Which do we want to help to make more real, and which less real? How do we want to interfere (because interfere we will, one way or another)?” (Law and Urry 2002, p.14)*

## **Concluding remarks**

Understanding of processes of learning in intercultural and interorganisational networks is in its starting phase in the organisational research community, both related to safety and to other areas. The topic is catching growing interest at the moment, caused by a growing need for mutual learning across cultural and organisational boundaries in a number of contexts in the years to come (Knight 2002).

Likewise the literature on Actor-Network theory until now has given little attention to the phenomenon of organisational learning, although, as I have showed above, there are good reasons to do so.

Connection of learning with aspects from ANT has begun by Gherardi in the field of safety and organization, and by Araujo (1998) and a few others in the field of innovation, but there is a need to develop this further, making it relevant for wider networks beyond the single workplace.

Back to safety culture in the petroleum industry: I am not sure if the Norwegian 'oil adventure' would have existed at all if today's safety standards were imposed on the young emerging industry. When the American 'cowboys' came to help us establish a Norwegian petroleum industry in the late sixties and early seventies, the culture was probably better characterized as risk taking and rash. And considering the available knowledge and technology at the time, any truthful consideration of safety at all could have made the whole project fall in pieces, not to talk of today's 'zero-tolerance' regimes.

According to Latour (1996), this problem of defining safety was part of the reason why a large innovation project in France failed to realize a radically new public transport system during the eighties and nineties. This project was not able to define safety in *absolute* terms, and a *probabilistic* definition of safety was not good enough for anxious politicians and managers. Responsibility for potential accidents is not very politically attractive.

Unfortunately, I do not think it is possible to achieve absolute safety in this industry. It is too complex, involving too many heterogeneous actors, and the very premises on which the industry is built is not of the 'absolute safety' kind. Perhaps a 'zero-tolerance' target is, pragmatically, what has the best effects on safety, in spite of its lack of realism. Or perhaps more modest, realistic, and thus achievable goals will deliver greater collective awareness and learning effort to improve safety across boundaries. I don't know, but I think the question is worth asking. Related to the above discussion of the politics of e.g. accident reporting, should we seek to decrease or delete accidents? I am afraid that deletion will

too often mean hiding, or black-boxing, both by individual workers protecting their career and by managers protecting the companies' public image.

In the further work on safety in the oil industry, there is a need to incorporate reflection around these aspects of politics, identity, multiplicity and networking. And a need to understand this: organizational *change* is not necessarily the problem, *stabilization* is. Without change or learning resulting in new common, stable practices, in few years time such change programmes become little more than trophies hanging over the fireplace: dead memories of the past.

For these reasons there is a need for in-depth research of cultural practices in the industry, so that we can learn how different practices coexist and interact, and how common (and safe) ground, or new common safety practices, or at least coordinative practices making things safer, can be developed and established as *common* across the different cultures, communities and organizations in this complex industry.

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