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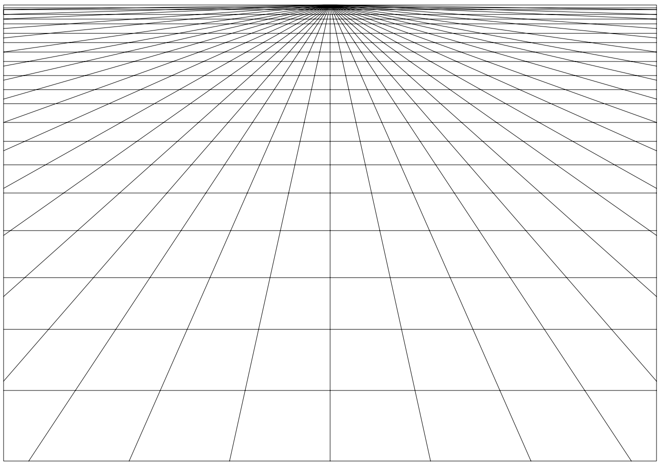

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Transboundary Risk Management:
The Role of Norway in International Cooperation on Nuclear Risk Reduction in Northwest Russia

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The Politics of Knowledge: Assessing and Communicating Risk
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Synopsis

Modern society is characterized by the growth of new, technologically manufactured risks which follow human progress and innovation. Nuclear technology is an example of such human-induced sources of risks. Nuclear risk or the risk of radioactive contamination is a transboundary risk in the sense that it crosses the boundaries of nation-states uninvited, being transported by air, wind and water. This thesis explores how nation-states cooperate to manage transboundary nuclear risks. The focus is on Norway and the efforts made by Norwegian authorities since the early 1990's to reduce transboundary nuclear risk stemming from nuclear technologies and activities in Northwest Russia. The thesis aims to explore what approach or combination of approaches a state can use during its cooperation with other states in order to successfully manage and reduce transboundary nuclear risk. The role of non-governmental and intergovernmental organizations in international cooperation on nuclear risk reduction is also analyzed.

My findings show that in order to reduce transboundary nuclear risk a state can apply three support approaches both in regional cooperation with the neighbouring states, but also on a more global level, involving international organizations and other states. First, by using the approach of collective learning, a state can gather information and knowledge on the risk at stake and thus define what needs to be done. Second, a state can provide technical and financial assistance to the state which is the risk manufacturer. However, to control that the assistance is used as it is supposed to, the risk of implementation failure must be addressed as well. Thus the compliance control approach is the third approach that needs to be applied.

When it comes to international organizations, the thesis shows that both NGOs and IGOs can serve as forums for collective learning and creation of consensual knowledge on the risk at stake. However, while IGOs, just as nation-states, can provide technical/financial assistance to the risk source country, NGOs are more suitable to serve as creative mediators during negotiations of intergovernmental agreements on nuclear risk reduction. Nevertheless, it is not sure that the combination of these support approaches is enough to address the risk of ineffective abatement: the possibility that all the measures undertaken still will not lead to successful risk reduction, even when there is no implementation failure.

Keywords: transboundary nuclear risk, intergovernmental cooperation, globalization from above.

Contents

Acknowledgements **3**
Synopsis **4**
Contents **6**
Illustrations **8**
Acronyms **8**
1. Introduction **10**
2. World Risk Society **13**
2.1. Risk 14
2.2. Nuclear Risk 15
2.3. Global, international and transboundary risks 16
2.4. Risk management in the world risk society 19
2.5. Three categories of negotiated risk 20
2.6. Four approaches to managing negotiated risks 21
3. Method **24**
3.1. Chapter outline 27
4. The Soviet Union and Nuclear Technologies **28**
4.1. The start of the Norwegian-Russian cooperation 31
4.2. Norwegian experience with nuclear power 32
5. Four Areas of Concern **34**
5.1. Safety at nuclear installations 34
5.2. Management, storage, and disposal of radioactive waste and spent nuclear fuel 37
5.3. Dumping of spent nuclear fuel and radioactive waste 38
5.4. Arms-related environmental hazards 39
6. Three Dimensions of Nuclear Risk **41**
6.1. The environmental and health dimension 41
6.2. The economic dimension 42
6.3. The military dimension 43
7. Norwegian Definitions of Nuclear Risks in Northwest Russia **45**
7.1. 1990-1996: radioactive pollution and nuclear proliferation 45
7.2. 1996-1998: radioactive pollution 46
7.3 1998-2004: nuclear proliferation 46
8. International Cooperation on Nuclear Risk Reduction **48**

8.1. 1990-1996: regional cooperation on knowledge gathering 49
8.1.1. The early cooperation forums 49
8.1.2. The Joint Norwegian-Russian Commission on Environmental Protection 50
8.1.3. International Arctic Seas Assessment Project (IASAP) 51
8.1.4. Arctic Environmental Protection Strategy (AEPS) 52
8.1.5. NATO Pilot Study 52
8.1.6. Collective learning approach and transboundary environmental risk 53
8.1.7. 1990-1996: Bellona Foundation and knowledge gathering 54
8.2. 1996-1998: international environmental cooperation 55
8.2.1. Contact Expert Group (CEG) 56
8.2.2. Arctic Military Environmental Cooperation (AMEC) 58
8.2.3. Norwegian-Russian Framework Agreement on Environmental Cooperation 59
8.2.4. Collective learning, technical/financial assistance and implementation control 60
8.3. 1998-2004: international environmental and non-proliferation cooperation 61
8.3.1. International Atomic Energy Agency's Nuclear Security Fund (NSF) 62
8.3.2. The G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction 63
8.3.3. Multilateral Nuclear Environmental Programme in the Russian Federation (MNEPR) 64
8.3.4. The Northern Dimension Environmental Partnership (NDEP) 66
8.3.5. Collective learning, technical/financial assistance and implementation control 67
8.3.5. 1998-2004: Bellona and the risk of implementation failure 68
9. International Cooperation on Nuclear Risk Reduction-Lessons Learned 70
10. Conclusion and Suggestions for Further Research 76
References 83

Illustrations

1). “Kola Peninsula” by University of Arkansas, 2002. p. 29.
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Acronyms

AEPS- Arctic Environmental Protection Strategy

AMAP- Arctic Monitoring and Assessment Programme

AMEC- Arctic Military Environmental Organization

CEG- Contact Expert Group under the auspices of IAEA

CTBT- Comprehensive Test Ban Treaty

CTR- Cooperative Threat Reduction Program

EBRD- European Bank for Reconstruction and Development

IAEA- International Atomic Energy Agency

IASAP- International Arctic Seas Assessment Project

IGO- intergovernmental organization

IPWG- Inter-parliamentary Working Group

MNEPR- Multilateral Nuclear Environmental Programme in the Russian Federation

MPC&A- Material Protection, Control and Accounting Programme

NDEP- Northern Dimension Environmental Partnership

NEA- OECD’s Nuclear Energy Agency

NEFCO- Nordic Environmental Finance Corporation

NGO- Non-governmental organization

NRPA- Norwegian Radiation Protection Authority

NSF- IAEA’s Nuclear Security Fund

RTG- Radioisotope Thermoelectric Generator

1. Introduction

Since the 1986 Chernobyl nuclear accident, European governments and institutions have become acutely aware that human-induced, technological risks cross political borders (Linnerooth-Bayer, 2001, p.1). Prior to the accident, only limited attention was paid to environmental risk management in Eastern Europe, mainly through exchanges of information. Transboundary health threats were largely ignored by the states and treated hypothetically by nuclear experts and policy makers (Barkenbus, 1987, p.476). However, even before the accident it was sometimes said: "A nuclear accident anywhere in the world is a nuclear accident everywhere in the world" (ibid, p. 483). Still, the Chernobyl disaster made it clear that a nuclear accident in Eastern Europe could seriously affect the West. It also became apparent that new ways of dealing with transboundary risks and associated responsibility issues and regulations were needed (Löfstedt & Jankauskas, 2001, pp. 37-38).

Norway, for example, became particularly worried about the nuclear power plant on the Kola Peninsula in Northwest Russia, which was considered unsafe by western experts while situated only 250 km from the Norwegian-Russian border. With time, as more information became available about conditions at this and other nuclear installations on the Kola Peninsula, the area became of a major concern to the Norwegian authorities and the public.

Until recently among all the nuclear challenges on the Kola Peninsula in Northwest Russia, mainly the old nuclear power plant and the decommissioned nuclear-powered submarines were perceived by western experts as threatening to Norway, while the large amounts of radioactive waste in the area were perceived as posing a local threat concerning mainly Russia (Mathismoen, 2007a, June 1). However, a new report published by Rosatom, the Russian atomic energy agency, concluded that the risk of uncontrolled chain reaction and explosion at the nuclear waste storage at the Andreyva Bay on the Kola Peninsula is significant. The situation now is perceived as dramatic by Norwegian experts. Thus, it is claimed that an explosion at the nuclear waste storage at Andreyeva Bay could have graver consequences for Norway than the 1986 Chernobyl nuclear accident. According to the Norwegian media, this critical situation has placed Norway on the top of a giant nuclear bomb. And it is sure that the bomb will go off, if nothing is done to stop it (ibid).

During the last years Norway has spent an average of NOK 100 million (USD 17, 3 million) annually on safe dismantlement of decommissioned nuclear submarines and securing radioactive waste storages in Northwest Russia. To clean up Andreyeva Bay would cost about USD 1, 5 billion, which is why international assistance is highly needed in the region (Mathismoen, 2007b, June 1).

Since the start of the Norwegian- Russian cooperation on nuclear risk reduction in the early 1990's, transboundary nuclear risk has been regarded in Norway as a threat to environmental, economic and military safety and security. Norway has cooperated with Russia and other states to reduce these threats. Several international agreements have been signed, leading both to regional and supranational collaboration forums. The cooperation on nuclear risk reduction in Northwest Russia has been both of environmental kind (concentrated around safety at the nuclear power plant and radioactive contamination of the environment by spent nuclear fuel and radioactive waste) and of military kind (focusing on nuclear non-proliferation, nuclear-powered submarines and highly radioactive strontium batteries from the Russian lighthouses). This thesis explores how nation-states cooperate to manage transboundary nuclear risks. First, it aims to define what transboundary nuclear risk is, by drawing on Ulrich Beck's concepts of global risk and world risk society. Second, it aims to illustrate how nation-states manage transboundary nuclear risks, drawing on the theory of transboundary risk management presented by Gunnar Sjöstedt.

I will try to achieve my first aim by exploring Norwegian authorities' definitions of nuclear risk posed by nuclear activities in Northwest Russia from 1990 to 2004. On order to achieve my second aim, Norwegian cooperation on transboundary nuclear risk reduction with Russia and other states will be analysed. There are of course many countries that have collaborated with Russia on management of transboundary risks posed by Russia's nuclear activities. This paper however is limited to the analysis of the Norwegian efforts in order to trace which approaches and strategies were applied by Norway as a state in order to facilitate and move forward international cooperation on nuclear risk reduction, and thus to make the world risk society safer.

2. World Risk Society

Along with several scholars, we can argue that contemporary world is characterized by new human-induced risks and threats which follow with technological progress and innovations of both developed and developing countries. These techno-scientifically produced risks represent the dark side of human progress, its negative side-effects or externalities (Chasek, 2001, p. 11). Management of these new risks is one of the most difficult and challenging tasks confronting contemporary societies (Jasanoff, 1986, p. V). According to Ulrich Beck, today we all live in a risk society which is replacing the old industrial class society. Late modernity is characterized by problems and conflicts that arise from the production, definition and distribution of techno-scientifically produced risks, not scarce resources or goods as in a class society (Beck, 1992, p.19).

Contemporary hazards are outcome of human action: they are events of modernization, urbanization, industrialization and globalization. These are manufactured risks as opposed to natural hazards stemming from external nature. In the modern society uncertainties arise from the very growth of human knowledge (Lupton, 1999, p.65). Such threats cannot be delimited spatially, temporally or socially, unlike the “personal” risks produced by early industrialization (ibid, p.62). In addition, what makes the risks of modernity different from the risks of the industrial society is the fact that they are no longer personal, but global (Giddens, 1999). Furthermore, they escape perception and are localized in the sphere of “physical and chemical formulas” (Beck, 1992, p.21). The magnitude and global nature of risks is such that risks are becoming more and more difficult to quantify, calculate, prevent and avoid (Lupton, 1999, p. 62).

According to Beck, there is a need for reflexive self-definition and redefinition of the Western modernity. The move towards reflexivity is an unintended side-effect of modernity. The threats generated through technological-industrial development force people to reflect on the bases of the democratic, national, and economic model of the first modernity, and to examine prevailing institutions (Beck, 1996, p.13). It is the process of modernity coming to critique itself and thus becoming reflexive (Lupton, 1999, p.66; Beck, 1992, p.19).

Risks of modernization are breaking down boundaries between classes and countries (Beck, 1992, p.23). In an ironic way, they are simultaneously democratizing and reinforcing positions of inequity: “Poverty is hierarchic, smog is democratic” (Beck, 1992, p. 36). At the same time class positions and risk positions overlap. Poverty seems to attract an unfortunate abundance of risks (ibid, p. 35). Moreover, techno-scientifically manufactured risks produce new international inequalities, both between the Third World and the industrial states and among the industrial states themselves. They undermine the order of national jurisdictions. To Beck, risk society is in this sense a world risk society (Beck, 1992, p.23). The new types of risks are simultaneously global and local, or “glocal” (Beck, 2000, p.218). Environmental dangers “know no boundaries”; they are universalized by air, wind and water. Thus, these new risks are transboundary.

2.1. Risk

What counts as a risk in the world risk society? There are many differing concepts of risk, from the realist technical approach, which defines risk as the product of probability and consequences to the social constructionist perspective, which address the value-embedded nature of all knowledge claims about risk, and emphasizes the nature of risk as a social attribute rather than physical entity that exists independently of humans. These two concepts of risk can be seen as ideal types often blurred in practice (Bradbury, 1989, p. 381).

Renn proposes a classification of risk perspectives which includes actuarial approach, toxicological and epidemiological approach, economic approach, psychological approach, engineering approach and social and cultural theories of risk (Renn, 1992, pp. 56-57).

According to the social and cultural theories, risks are socially constructed and the same risk is often addressed differently by regulators and scientific advisories in different countries (Jasanoff, 1986, p.4).

Beck defines risk as “a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself” (Beck, 1992, p. 21). For him it is cultural perceptions and definitions that constitute risks. “Risk” and the “(public) definition of risk” are one and the same (Beck, 2000, p. 213). As mathematical calculations risks are related directly and indirectly to cultural definitions and standards of a tolerable life (ibid, p. 215).

Moreover, the concept of risk reverses the relationship of past, present and future. The past loses its power to determine the present. Its place is taken by the future, by something not-existent and constructed; something that could happen (ibid, p. 214). The concept of risk thus characterizes an intermediate state between security and destruction, where the perception of risks determines human action (ibid, pp. 212-213). The notion of risk as applied in this thesis refers to a potentially dangerous situation.

2.2. Nuclear Risk

What is nuclear risk? Generally, nuclear risk can be defined either as a risk of an accident at a nuclear installation or as a risk of proliferation of nuclear weapons and radioactive materials into the wrong hands. What is feared in both cases is a release of radioactivity which can harm all living organisms and their surroundings. However, in the first case the release of activity happens by accident or hazard, while in the second it is done by purpose or intention. Thus, if we define risk as a result of probability and consequences, and a threat as an outcome of intention and capability (Heng, 2006, p. 71), we can speak of a nuclear risk in the first case and a nuclear threat in the second.

Beck, however, uses another definition. For him, contemporary nuclear and ecological *threats* differ from the *risks* of early industrial society by the fact that they are not limitable, accountable or insurable (Beck, 1995, p. 2). Thus, consequences of a potential nuclear accident are illimitable both socially and temporally, unaccountable according to prevailing rules of guilt and liability and neither compensable nor insurable.

The word proliferation has also two senses, one horizontal and one vertical. The “vertical” proliferation means increase of the superpower arsenals by development of new and improved weapons designs and numerical expansion of stockpiles, while the “horizontal” proliferation implies proliferation of nuclear weapons to other states. It is the latter use of the term which is usually presented as the proliferation problem (Gusterson, 1999, p.114).

2.3. Global, international and transboundary risks

As mentioned above, the risk society is characterized by global risks with potential disastrous consequences that cross national borders and thus can affect everyone on earth. However, it appears to be no agreement among scholars of risk whether these human-induced techno-scientific risks should be defined as global, international or transboundary risks. Beck, for example, identifies three types of dangers in the world risk society: ecological dangers, global economical crises, and – since September 11, 2001 - the risk of transnational terrorism (Beck, 2002, p. 4). These risks are caused either by affluence (e.g. greenhouse effect and genetic engineering), by poverty (e.g. toxic waste and obsolete large-scale technologies in the chemical and nuclear industry) or by the threat of deployment of (nuclear, biological, chemical) weapons of mass destruction, accompanied by fundamentalist or private terrorism (Beck, 1996, pp. 14-15).

Simai (1994, p. 258) speaks about international risk rather than global risk. By defining international risks as important, potentially disturbing and destabilizing factors or acts originating with, or generated by, various actors on different structural levels, and having spill-over consequences for other members of the international community, he distinguishes between five broad categories of international risks: the risks of armed conflict, risks resulting from the political destabilization of governments, economic risks, societal risks and ecological risks (ibid, p. 259).

Moreover, a typology of transboundary risks is proposed by Kasperson and Kasperson which appears particularly useful for the further development of this thesis. Transboundary risk is defined as a risk that arises when human activities in one or more nation-states threaten current or future environmental quality, human health or well-being in at least one other nation-state (Kasperson & Kasperson, 2001, p. 213). Four different transboundary risk types are further identified.

The first type, border-impact risks, involves activities, industrial plants or developments in a border region that affect populations or ecosystems in the border region on both sides of the boundary. They commonly occur in areas often viewed as marginal by the state or political elites at the centre, for example in peripheries of states. Even though these risks threaten inhabitants or ecology in the region, they usually do not involve long-distance transport of the risk. This type of transboundary risk typically is bi-national, although it may involve more than two countries if multiple boundaries happen to coincide. The development of the Gabcikovo-Nagymaros hydroelectric power stations on the Hungary-Slovakia border illustrates this type of transboundary risk well (ibid, pp. 234-236).

The second type, point-source transboundary risk, involves a few dominant point sources of risk that threaten adjoining countries or regions. The concentration of the risk source at one or several clearly identifiable locations, whether situated close to the border or far from it, provides a focus for perception of risk. The Chernobyl accident is the archetype of such a risk source. This is probably the easiest type of risk to manage, however this is not always the case (ibid, p. 236).

The third type, structural/policy transboundary risk, differs from the foregoing categories in that it involves less identifiable and more subtle and diffuse effects associated with state policy, the structure of the economy, transportation or energy systems. For example the structure of the Soviet economy based on heavy manufacturing, high energy inputs and little environmental concerns led to persistent long term effects for Russia and Eastern Europe. This is arguably the most difficult and important of transboundary risk types to manage. However, it may have a “forcing” potential for institutional change as questions of national security are being linked with environmental cooperation (ibid, pp. 236-237).

The fourth type, global environmental risks, involves human activities in any given region or country that affect many or all other countries or regions, often remote from the source country, through alterations of the global environment. As in climate change, the potential impacts are uncertain, the spatial resolution of precise effects is poor, and winners and losers are difficult to discern. This category of transboundary risk embraces many of those issues most difficult to accommodate, as it changes the global risk system as a whole (ibid, pp. 238-239).

It appears to me that the typologies of global risks identified by Beck and international risks defined by Simai are based on categories that are too broad and vague to grasp. If these risks were identified on the nation-state level (i.e. which country is the risk source and which is the risk bearer) they would probably fit in the typology of transboundary risks proposed by Kasperson and Kasperson and probably become easier to handle in practice. In the following only the term transboundary risk will be applied when talking about risks that cross political borders (i.e. both the terms of international and global risks).

2.4. Risk management in the world risk society

According to Beck, the global threats of the world risk society will cause people to act. Two perspectives for managing transboundary risks then are possible: globalization *from above* and globalization *from below* (Beck, 1999, p. 37).

On the one hand, globalization from below implies notions of "global citizenship" and "global subpolitics", which can be translated into grass-roots movements, where members of divergent classes, parties, religions and age groups organize into citizens' movements. In addition, NGOs are powerful actors of globalization from below. The concept of "subpolitics" refers to politics outside the representative institutions of the political system of nation-states. A special feature of this direct politics of the late modernity is that in practice its "globality" does not exclude anyone – not only socially, but also morally or ideologically. It is a politics without opposing force, a kind of "enemyless politics" (ibid, pp. 38-41).

On the other hand, global risks can be managed through "globalization from above", that is through border-spanning negotiations, international agreements, treaties and institutions (Beck, 1992, p. 48; Beck, 1999, p.37). Tierney points out that many, if not most, decisions about acceptable levels of risk are made by organizations and governments, not members of the general public. Governments are commonly seen as key actors in the reduction of risks and hazards (Tierney, 1999, pp. 230-234). With the spread of manufactured risks, governments will need to collaborate, since very few human-induced risks have anything to do with the borders of nation states, crossing those uninvited (Giddens, 1999).

Other scholars also underline the role of international negotiations, treaties and institutions, which can play a useful role in risk management as long as they do not threaten the priorities of member states (Chasek, 2001, pp. 9-15; Cutter, 1993, p. 68; Giddens, 1999; Jasanoff, 1986, p. 75; Kremenyuk & Lang, 1993, pp. 8-11; Sjöstedt, 2001, p. 280). Löfstedt and Sjöstedt present, for instance, three organizing forces that combine to manage transboundary risks. Market-based institutions and governance by treaties and regimes are the two institutional forces at the transnational level. The increasingly important role played by non-state and non-market actors constitutes the third organizing force that can either complement or compete with market and national or international authority (Löfstedt & Sjöstedt, 2001, p. 306). These forces are thus quite similar to the globalization from above and below perspectives proposed by Beck.

Transboundary environmental risks that cross borders of sovereign states pose new challenges for risk management theory and practice. In contrast to risk issues at local and national levels, there is little interdisciplinary research that focuses specifically on transnational level. Transboundary risk management can thus be considered a new and developing topic for risk researchers (Löfstedt & Sjöstedt, 2001, pp. 305-307).

2.5. Three categories of negotiated risk

In nuclear affairs risks are managed mainly through international collaborations and agreements, so the focus of this thesis is put on transboundary risk management through globalization *from above*. According to Sjöstedt, environmental transboundary risks as such are drivers of intergovernmental cooperation (Sjöstedt, 2001, p. 279). However, when negotiating on transboundary risk issues, governments must also address two other types of negotiated risk: the risk of implementation failure and the risk of ineffective abatement (ibid).

While the transboundary risk itself is a risk to what society values, such as environment and human health, the risk of implementation failure implies the possibility that not all the parties to an international agreement will fulfill their obligations all the time. The reason for this may be lack of trust between the negotiating parties or lack of feasibility in implementing negotiated solutions, for example shortage of technology, competence or resources. Additionally, there is the abatement risk, which means that the measures undertaken will not produce the expected results, even though there is no compliance or implementation failure. It is the risk of ineffectiveness (ibid, pp. 285-291).

The risks of ineffective abatement and of implementation failure may also appear on the negotiating table in addition to the transboundary environmental risk in order to insure the willingness of governments to commit their resources to the joint risk reduction efforts. Thus, these three types of risk represent three categories of the negotiated risk, which always confronts the parties involved in international negotiations on transboundary risk reduction (ibid, p.280, 292).

2.6. Four approaches to managing negotiated risks

Further, there are four approaches to managing negotiated risks on international level. These are compliance control, financial/technical assistance, negotiation facilitation, and collective learning (Sjöstedt, 2001, p. 292).

After a treaty on transboundary risk management has been signed, compliance control aims at improving the prospects of satisfactory treaty implementation. Two strategies can be applied to ensure compliance with a negotiated treaty or agreement. The first is the system of authorized international sanctions that can be used to penalize the parties that refuse to fully implement the treaty. The second is improved transparency, for example in form of reporting by national governments or NGOs, on-site inspections or monitoring (ibid). The main purpose of this approach is to address the risk of implementation failure. This approach is also likely to generate positive spill-over effects to the management of the risk of ineffective abatement, because the lack of compliance is likely to amplify abatement risks (ibid, p. 296).

The aim of financial/technical assistance is subsidization of those countries lacking the necessary competence or resources to negotiate or implement an international agreement. It can take form of economic, technical or scientific assistance (ibid, pp. 292-293). Aid and assistance may have a much broader impact on management of negotiated risks than compliance control. Thus, assistance may help to handle all three categories of negotiated risk (ibid, p. 296).

Creative mediation is a form of third party intervention aimed at facilitating the negotiation process. The goal of creative mediation is to reframe the issue at stake from a zero-game to a non-zero game situation. Other typical approaches apart from framing are use of compromise, issue linkages and trade-offs to break a deadlock in negotiations. Creative mediation does not represent risk management directly. However, it may help create favorable conditions for the other support approaches (ibid, p. 297).

The process of collective learning particularly pertains to the management of transboundary environmental risk, but it has positive spill-over effects for other types of negotiated risk as well. Collective learning incorporates all actors in a negotiation. Often relatively little is known about the issues at stake at the outset of international negotiations. Therefore, parties need scientific knowledge and information, provided for example by scientific communities, to clarify the issues, identify the stakes involved and understand their consequences, thus constructing consensual knowledge. The same risks can be constructed differently by different parties within and across borders. Thus, consensual knowledge has to be acknowledged by all the participations or at least by a dominant majority involved in negotiations. How transboundary risks are presented in consensual knowledge strongly determines how parties perceive the issues. It also settles the degree of determination with which parties pursue the resolution of the problem and commitment to the joint issue interpretation. Thus, an important means of facilitating negotiations is to begin by developing an appropriate organization and plan of action for the production of consensual knowledge (ibid, pp. 298-299).

Packages of two or more support approaches or strategies need to be constructed for successful management of transboundary risks. However, a management approach that is effective concerning one kind of negotiated risk is not always effective with regard to another. Thus, there is no guarantee that collective learning will enhance compliance control. Moreover, too strong emphasis on compliance control may impede collective learning. Hence, combinations of different strategies of risk management in negotiation must be considered in order to provide successful international cooperation on transboundary risk management (ibid, p. 300).

In the following chapters international negotiations on transboundary nuclear risk reduction will be analyzed with regard to these four support approaches for managing negotiated risks. What support approaches or combinations of them proved most successful in managing transboundary nuclear risk posed by nuclear activities in Northwest Russia? What type of negotiated risk did they answer? Is there a golden formula or a perfect combination of support approaches pertained to management of transboundary nuclear risks?

3. Method

This paper is based on qualitative analysis of a single case: Norwegian efforts in reducing transboundary nuclear risk in Northwest Russia through intergovernmental cooperation. To answer the study's first aim - how transboundary nuclear risk is defined - the focus is put on the Norwegian definition on nuclear risk stemming from the nuclear activities in Northwest Russia. To explore how Norway defined this risk, I found the master thesis in political science written by Magne Fjeld at the University of Oslo particularly helpful. In his thesis Fjeld analyzed how policymakers in Norway defined transboundary nuclear risk in the political debate during the time period from 1990 to 2004. A report entitled "Military Nuclear Waste and International Cooperation in Northwest Russia" written by Sawhill and Jørgensen, two researchers at the Fridtjof Nansen Institute in Norway, proved useful to describe what kinds of threat nuclear activities and installations pose to Norwegian interests. These two documents helped me to shape my understanding of what nuclear risk is to Norwegian authorities.

To answer the study's second aim - how states manage transboundary nuclear risk - I chose to concentrate on the Norwegian-Russian cooperation on nuclear risk management as my point of departure, and then to trace how this cooperation developed and expanded with time. The units of analysis are intergovernmental agreements, committees and other collaboration forums established during the period 1990 to 2004, aiming at reduction of transboundary nuclear risk in Nortwest Russia and having Norway as participant. Norwegian governmental reports and action plans on nuclear safety proved useful at this point.

In 1994 the Norwegian Government presented Report No. 34 (1993-94) "On nuclear activities and chemical weapons in areas adjacent to our northern borders" to the Storting (the Norwegian parliament) which provided an overview of risks posed by nuclear activities and installations in northern areas. The Norwegian parliament then recommended that the government drew an action plan containing specific follow-up measures. Thus, in 1995 the Ministry of Foreign Affairs initiated a Plan of Action for Nuclear Safety which was revised in 1997. The action plan has formed the basis for Norwegian collaboration on nuclear safety with Russia until 2005, when a new action plan was established in order to replace the one from 1997. Report No. 30 (2004-2005) to the Storting entitled "Possibilities and challenges in the North" provides an updated basis for the collaboration on nuclear risk management. I chose to focus on these documents because they are emphasized as the most important ones for Norwegian involvement in Northwest Russia in the new report entitled "Nuclear Safety in Northwest Russia", published by the Norwegian Ministry of Foreign Affairs in 2005. As I was studying in Strasbourg at the time of data collection, the Ministry of Foreign Affairs kindly sent me these documents on my request. These reports provided me with information on the agreements, declarations and cooperation forums that Norway established or became member of in the period from 1990 to 2004 in order to reduce transboundary nuclear risk in Northwest Russia.

Two other reports which helped me to get a better overview of international cooperation on nuclear risk reduction were the report entitled "The Russian Nuclear Industry- the Need for Reform" published by the Bellona Foundation in 2004 and available on Bellona's website, and a report (already mentioned above) entitled "Military Nuclear Waste and International Coopeartion in Northwest Russia" published by the Fridtjof Nansen Institute in 2001.The Bellona Foundation is a multidisciplinary environmental non-governmental organization founded in 1986 and based in Oslo, Norway. It is working for sustainable solutions to the world's most serious environmental problems and is financed by industry, business, individuals as well as project oriented grants from philanthropic organizations and the Norwegian government.[1] The Fridtjof Nansen Institute (FNI) is an independent

[1] Bellona Foundation. (2006, June 1). Who we are. [On-line]. Available: http://www.bellona.org/articles/Who_we_are

foundation engaged in research on international environmental, energy and resource management politics. FNI is the research arm of *The Fridtjof Nansen Foundation*, established in 1958 in Norway. FNI's sources of funding include the Research Council of Norway, various Norwegian public bodies, business associations and private companies, the European Commission and international research foundations.[2]

By focusing on these documents I was able to discern the most important bilateral and multilateral agreements and organizations established to manage transboundary nuclear risk during Norway's cooperation with Russia and other countries. These documents also provided information about reasons for initiation of different cooperation forums and highlighted Norwegian priority areas concerning nuclear risk. The last two documents did not only concentrate on Norway's role in transboundary risk management, but also described cooperation forums in which Norway did not participate, such as for example bilateral American-Russian agreements. These documents helped me to get an overview of the international efforts in the area as a whole.

Websites of the organizations and partnerships mentioned in these documents proved useful when particular information was needed about their goals, worldviews, methods of work and approaches to risk management. The Norwegian Government's website was valuable when more information or a full version of a declaration or an agreement signed by Norway and its cooperating parties was needed.

I chose to base the thesis on Norwegian documents because it is focused on how Norway as a "victim" of an unauthorized and involuntarily transboundary risk is protecting itself from it through participation in intergovernmental risk management cooperation (i.e. through globalization from above). Thus, it is the Norwegian point of view that is presented in

[2] About the Fridtjof Nansen Institute. FNI, Fridtjof Nansen Institute. [On-line]. Available: http://www.fni.no/about.html

this paper. It proved difficult to find information on the Russian point of view on the matter which is not sited in western sources.

In addition, a focused interview has been conducted with Igor Kudrik and Alexander Nikitin who work with the area of nuclear safety in Russia for the Bellona Foundation. The main purpose of the interview was to find out how Bellona as an independent non-governmental organization has contributed to development of international cooperation on nuclear risk reduction in Northwest Russia. This method of focused interview allows more flexibility, by permitting the persons being interviewed to talk about the subject in their own “frames of reference”, thus providing greater understanding of their point of view, their perspectives and concerns than do other methods of interviewing (May, 1993, pp. 93-94).

3.1. Chapter outline

Chapter 4 describes the background for the current situation in Northwest Russia as an introduction to Norwegian and international concerns and cooperation incentives. It also describes Norwegian experience with nuclear power. Chapter 5 presents four areas of concern with regard to nuclear risk as outlined by the Norwegian government. Chapter 6 describes three dimensions of nuclear risk, or what kind of threat it poses to Norwegian interests. Chapter 7 presents Norwegian definitions of nuclear risk stemming from Northwest Russia during the time period from 1990 to 2004. Chapter 8 provides an overview of the intergovernmental cooperation on nuclear risk management from 1990 to 2004 and analyses what support approaches to transboundary risk reduction were applied during the cooperation. It also touches upon the role of NGOs and IGOs in international nuclear risk reduction efforts. Chapter 9 sumps up the findings from the previous chapter, and chapter 10 comes with concluding remarks and suggestions for further research.

4. The Soviet Union and Nuclear Technologies

Large-scale technologies such as energy technologies, along with steel, concrete, and other heavy industry, have occupied a major place in Russia ever since the days of the Soviet Union (Josephson, 1999, p. 7). When it comes to nuclear power, the Soviet leaders and Party officials believed that it was a panacea for the country's economic, social and geographic obstacles in achieving communism. In their visions of the future communist society atomic science played an eminent role. It could be applied in medicine, light and food industry, mining and metallurgy. In energy generation it was expected to provide cheap electricity anywhere and anytime. The future communism would be an atomic-powered communism (ibid, p. 5).

The symbolic and cultural value of nuclear power was as important as its use for economic and military purposes (ibid, p.111). At the end of World War II, the United States Navy was larger and more powerful than its Soviet counterpart. To catch up with the USA, the Soviet Union built a large naval force on its own, including a significant number of nuclear submarines, nuclear weapons and a series of naval bases and shipyards on the Kola Peninsula in Northwest Russia. During the Cold War, the Northern areas were considered to be of great strategic significance concerning the tension between East and West. Especially the Kola Peninsula was important in this regard, with its year-around ice-free harbour in Murmansk and direct proximity to the Atlantic Ocean, thus being of strategic importance to the Soviet Union (Nilsen, 1999, p. 40).

1) Kola Peninsula

During the Cold War, one of Norway's biggest fears was the possibility of atomic war with Russia and invasion of Norwegian territory. The large Soviet military build-up in the North was a source of concern, and although it was not primarily aimed at Norway, it dominated Norwegian security policy. Norway's geographical location made the country extra vulnerable during the Cold War. The country's strategic importance meant that its position and views were of large interest to its allies in the West. With the end of the Cold War and the dissolution of the Soviet Union the risk of invasion of Norwegian territory with subsequent deployment of Russian nuclear weapons became less realistic (Report No. 30 (2004-2005), p.12).

However, since the early 1990s Norway faced new nuclear challenges from the Russian side. First glasnost, then the collapse of the Soviet Union revealed previously hidden environmental damage on an enormous scale. The Yablokov report (also known as the White book) released by the Russian government in 1993 described over three decades of Soviet-era dumping of radioactive waste and nuclear reactors in the ocean (Nyman, 2002, p. 47). Moreover, poor conditions at Russian nuclear power plants, nuclear tests at Novaya Zemlya as well as unsafe storage of radioactive waste and spent nuclear fuel stemming from the nuclear submarine- and icebreaker fleets became new matters of concern in Norway and the West (Fjeld, 2005, pp. 32-33). Thus, with the end of the Cold war the focus moved from the fear of nuclear *threat* to the fear of nuclear *risk*, from the fear of deliberate deployment of nuclear weapons to the fear of an accidental release of radioactivity.

Another nuclear challenge emerged with the signing of a new treaty between the Russian Federation and the USA after the dissolution of the Soviet Union, aimed at reduction of these country's nuclear arsenals. In 1991, they withdrew their tactical nuclear weapons from forward deployment, “de-targeted” their strategic missiles, and signed the START I treaty (Strategic Arms Reduction Treaty) agreeing on a dramatic cutback of their nuclear weapons arsenals, including ballistic missiles and heavy bombers. In January 1993, Presidents Clinton and Yeltsin signed the START II treaty, agreeing to even deeper cuts in their strategic nuclear forces by the year 2007 (Sawhill& Jørgensen, 2001, pp.19-20). The Russian government also began laying up many of its warships, including nearly two-thirds of its nuclear-powered submarine fleet, as part of its radical decrease in military expenditures. As a result, Russia ended up with vast amounts of nuclear material and radioactive waste for disposal (ibid, pp. 1-2).

Between 1959 and 1991, the Soviet Union disposed of its radioactive waste in the Arctic Ocean and the seas adjacent to the Far East. Although Russia suspended ocean dumping in 1993, it did not substantially expand its capacity to manage nuclear waste, and the material stemming from its nuclear-based fleet reductions overwhelmed its existing capacity. The new situation gave rise to concerns over the potential risks this material poses to people, environment, property and economic activity (ibid).

During the existence of the Soviet Union there was no public scrutiny of what lay behind the technical achievements of the country. Environmental damages were not discussed publicly. However, with the restructuring of the Soviet society since the end of the 1980’s, there was more openness about the dimensions of environmental problems. Especially after the Chernobyl accident in 1986 and the release of the Yablokov report in 1993, the international society directed its attention to Russian nuclear industry and its safety routines. The accident led to greater openness about Russia’s nuclear activities, better access to information about conditions at the Russian nuclear power plants, as well as to broader international cooperation on safety at other nuclear installations (Report No. 34 (1993-94), p. 47).

4.1. The start of the Norwegian-Russian cooperation

Norway and Russia commenced regional cooperation in a number of areas in the North after the dissolution of the Soviet Union. Norway’s efforts are focused mainly on the Barents Cooperation; however, the Arctic Council is also an important forum for cooperation in the North (Report No. 30 (2004-2005), p. 32).

The Barents Cooperation was established in 1993 at Norwegian initiative. It is carried out both on a governmental level through the Barents Council and on a regional level through the Regional Council. The members of the Barents Council are Norway, Russia, Denmark, Finland, Island, Sweden and the European Commission. Its aim is to support and promote regional cooperation in the northernmost parts of Sweden, Norway, Finland and Northwest Russia. The Barents Cooperation has contributed considerably to the development of close ties between Russia and the Nordic countries. It is concentrated on cooperation in such areas as trade and industry, transport, energy, environmental protection, indigenous peoples, health, education and culture. It covers thirteen counties in the Euro-Arctic Barents region which are Nordland, Troms and Finnmark in Norway, Västerbotten and Norrbotten in Sweden, Lapland, Oulu and Kainuu in Finland and Murmansk, Karelia, Archangelsk, Komi and Nenets in Russia.[3]

The Arctic council is an intergovernmental forum in which all the Arctic Countries are full members. It was established in 1996 by Norway, Denmark, Sweden, Finland, Iceland, the USA, Canada and Russia, after the adaptation of an Arctic Environmental Protection Strategy (AEPS) in 1991 by these eight Arctic countries.[4] The Arctic Council is concerned with environmental issues, climate change and sustainable development. It is seeking to maintain biodiversity in the Arctic, and one of its most important achievements has been the documentation of the transboundary pollution through the Arctic Assessment and Monitoring Programme (AMAP) (Report No. 30 (2004-2005), p. 33).

Thus, Norwegian-Russian cooperation does not only concern nuclear safety and security, but also extends to other areas of mutual interest. In this paper only the work of intergovernmental cooperation forums established specifically to deal with nuclear risk issues will be analysed.

4.2. Norwegian experience with nuclear power

Despite of Norway's early acquisition of basic nuclear technology and know-how, its indigenous production of heavy water, and Norwegian exports in the nuclear field to a number of countries, such as France and Israel, Norway has never built its own nuclear power plant. Today, there are two research reactors in Norway situated in Halden and at Kjeller and managed by the Institute for Energy Technology.[5] Norwegian researchers had by 1955 already developed a technique for the separation of plutonium. However, Norway' resources

[3] Barentssamarbeidet. Utenriksdepartementet. [On-line]. Available: http://www.regjeringen.no/nb/dep/ud/tema/Nordomradene/Barentssamarbeid/Barentssamarbeidet.html?id=446944

[4] Arctic Council. [On-line]. Available: http://www.arctic-council.org/Default.htm

[5] IFE, Institute for Energy Technology. [On-line]. Available: http://www.ife.no/index_html-en?set_language=en&cl=en

in the form of hydroelectricity were perceived as more than satisfactory for Norwegian energy needs at the time. In addition, the environmental movement in the 1970s stopped all plans for construction of nuclear power plants in the country.

Norway has not developed a military nuclear program either, because it was perceived as too expensive and too technically demanding for a small and relatively poor country after World War II. As a member of NATO since 1949, Norway eventually came under the American Nuclear Umbrella (Forland, 1997, pp. 1-2).

Thus, in contrast to its neighbor in the East, Norwegian people have no experience with living next to a nuclear power plant, repossessing facility or radioactive waste storage on the Norwegian territory. This fact might be significant for the public construction and interpretation of risk as well as for Norwegian nuclear risk reduction initiatives. For example, it is possible that nuclear risk is seen as more acute by the Norwegian public than by the Russian, who had to learn to adapt to it and maybe even ignore it to same extent in their everyday lives. The next chapter presents Norwegian framing of nuclear risk stemming from Northwest Russia.

5. Four Areas of Concern

What kinds of nuclear science and technology in Northwest Russia and particularly on the Kola Peninsula were perceived as dangerous to Norway after the end of the Cold War and the dissolution of the Soviet Union? Four areas of concern (or priority areas) as outlined by the Norwegian government will be presented in the next four sections. These four areas of concern are mentioned both in the Report No. 34 (1993-94) to the Storting " On Nuclear Activities and Chemical Weapons in Areas Adjacent to Our Northern Borders", the Action Plan for Nuclear Safety from 1995 and, although slightly modified, in the revised action plan from 1997. The areas of concern presented show the Norwegian point of view on which technologies and activities are perceived as dangerous and why. These four areas of concern are: (1) safety at nuclear installations; (2) management, storage and disposal of spent nuclear fuel and radioactive waste; (3) dumping of radioactive waste into the Barents and Kara Seas, and (4) arms-related environmental hazards.

5.1. Safety at nuclear installations

The first area of concern focuses on such nuclear installations as the Kola nuclear power plant, nuclear-powered civilian icebreaker fleet, nuclear-powered submarines, reprocessing facilities and strontium batteries from lighthouses along the coast of north western Russia.

Russia currently operates 10 nuclear power plants with a total of 31 reactors that cover some 15 percent of the country's electricity needs. Half of the country's reactors are considered high-risk by international experts. Eight of Russia's ten nuclear power plants are in the European part of Russia, East of the Ural.[6] The nuclear power plant on the Kola Peninsula in Northwest Russia is located 250 kilometres from the Norwegian-Russian border.

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[6] Nuclear Russia. Bellona Foundation. [On-line]. Available : http://www.bellona.org/subjects/Nuclear_Russia

The IAEA, EU and Norway have conducted several inspections to investigate safety at the plant. During these inspections several defects were discovered. It is commonly agreed that it is impossible to bring the plant to up to Western safety standards (Bøhmer et al., 2001, p. 43). While geographically Norway has focused on securing the Kola nuclear power plant because of the short distance to the Norwegian border, Finland and Sweden have given priority to the Leningrad power plant near St Petersburg and the Ignalina nuclear power plant in Lithuania respectively. An accident at one of these nuclear power plants represents one of the greatest risks of radioactive contamination to Norwegian population and environment, with such consequences as cancer, genetic damages and mutations in humans, flora and fauna (Report No. 34 (1993-94), p. 50).

Numerous nuclear lighthouses are situated along the northern coast of Russia: along the coast of the Kola Peninsula, around the White Sea and on Novaya Zemlya. They are powered by so-called radio thermoelectric generators, or RTGs. The possible radioactive leaks into the environment and the threat of theft of the radioactive strontium-90 in the unguarded and distantly situated lighthouses are matters of concern to Norway and other countries. An unknown number of lighthouses are located in the Baltic Sea, along the northern sea route in Siberia and around Kamchatka in the Russian Far East (Nilsen, 2003). In past, lighthouses have been tampered with and parts have been stolen. Thus they represent a real proliferation hazard. If RTG batteries were to fall into the hands of terrorists, they could be used to put together such devices as “dirty bombs”.

The Kola Peninsula has once had the largest concentration of nuclear-powered vessels in the world, the Russian Northern Fleet (Plan of Action, 1995, p. 7). The Northern Fleet is one of the biggest sources of possible radioactive contamination in Russia. It encompasses five bases near Arkhangelsk and Murmansk. Of the some 116 vessels that have been decommissioned from the Northern Fleet, 36 await dismantlement with their spent nuclear fuel still on board.[7] They pose an environmental threat in two ways. First, they present a risk of accident and release of radioactivity to the environment, because of insufficient maintenance. Second, there is no sufficient storage space for radioactive waste and spent nuclear fuel produced by these vessels (Report No. 34 (1993-94), p. 18). The Northern Fleet's storage facilities are filled up, while the spent nuclear fuel from nuclear icebreakers has been stored in floating technical bases (Kireeva, 2006). There is not enough capacity to dismantle decommissioned submarines either, so there is a risk that they will sink with nuclear fuel still remaining inside their reactors (Bøhmer et al., 2001, p. 8).

Moreover, there are three large reprocessing plants in Russia in Ozersk (Mayak), Seversk (Tomsk-7) and Zheleznogorsk (Krasnoyarsk-26). Operation of these plants has resulted in the discharges of large amounts of radioactivity into the Ob and Yenisey river systems, which transport the radioactive contamination into the Kara Sea (Bøhmer et al., 2001, p.54). Thus, even though these facilities are not situated in Northwest Russia, they threaten Norwegian fishing industry and marine environment. The reprocessing of spent nuclear fuel from nuclear based submarines and icebreakers generates large emissions of high active nuclear waste into the environment and increases amount of clean plutonium. Radioactive pollution from the reprocessing facilities harms mostly local population. Large areas are contaminated as a consequence of radioactivity releases caused by several accidents at these facilities. The Mayak authorities are now under investigation for environmental crime.[8]

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[7] The Russian Northern Fleet. Bellona Foundation. [On-line].Available: http://www.bellona.org/subjects/1140451462.29
[8] Bellona Foundation. (2006, May 22). Reprossesering i Sibir. [On-line]. Available: http://www.bellona.no/artikler/Reprosessering%20i%20Sibir

2) Reprocessing in Siberia.

5.2. Management, storage, and disposal of radioactive waste and spent nuclear fuel

The second area of concern focuses on radioactive waste and spent nuclear fuel. Radioactive waste is produced by all types of nuclear installations. It can be solid or liquid, and low, medium or high active. Spent nuclear fuel from the nuclear power plants, the civil icebreaker fleet, the Northern Fleet and waste from the reprocessing facilities are the major sources of high-level redioactive waste in Russia. As a consequence of Russia's turbulent political and economical development, reprocessing routines disturbances have led to storage of spent nuclear fuel at the nuclear installations where it previously had been used (Report No. 34 (1993-94), p. 53). Much of the fuel has been stored under unsatisfactory conditions at the Northern Fleet's technical support bases, on service vessels and on decommissioned submarines. The largest storage facility for spent nuclear fuel is at Andreyeva Bay, which is situated 55 kilometers from the Norwegian-Russian border. Substantial quantities of fuel from submarines are also stored at the Gremikha naval base at the Kola Peninsula (Bøhmer et al., 2001, pp.13-15). Many of the decommissioned nuclear submarines are still carrying fuel on board, and some of them are in very poor condition risking sinking with nuclear fuel on board. The icebreaker fleet stores its waste in its vessels, where a leakage at sea or an accident followed by release of radioactivity could have serious consequences for the local population (Report No. 34 (1993-94), p. 23). Existing storage facilities are virtually filled to capacity and they do not satisfy international standards. There is also a risk of “criticality accidents” caused by uncontrolled chain reactions as a consequence of irresponsible storage of spent nuclear fuel and radioactive waste at Northern Fleet service bases and storage facilities such as for instance Andreyeva Bay (Plan of Action, 1997, p. 9).

5.3. Dumping of spent nuclear fuel and radioactive waste

Spent nuclear fuel and radioactive waste dumped by the Soviet Union compose the third area of concern for the Norwegian authorities. The information about these activities became available in 1990 and confirmed by the Russian authorities in 1993 by the Yablokov Report. Radioactive waste has been dumped east of the Novaya Zemlya archipelago, as well as in the Barents, Kara and White Seas (Sawhill & Jørgensen, 2001, p. 9). It stems almost exclusively from the Northern Fleet’s nuclear submarines and the civil icebreaker fleet (Report No. 34 (1993-94), p. 54). The dumping resulted in local contamination around the dumping sites. However, the major risks of releases are in the longer term, after the containment material corrodes (AMAP, 2002, p. 64). The London convention of 1972 (ratified by the Soviet Union in 1975) bans dumping of spent nuclear fuel and high-level radioactive waste and limits dumping of low and medium level waste from ships.1993 amendments to the Convention prohibit all dumping into the sea, but Russia has not ratified this version (Bøhmer et al., 2001, p. 48). According to AMAP, the Yablokov Report overestimated the total activity of all the reactors dumped near Novaya Zemlya by more than a factor of three (AMAP, 2002, pp. 64-

65). However, resent dumping in the Arctic and Pacific Oceans by Russian ships has been reported.[9] Norway is worried about consequences this could have for people, marine environment and for Norwegian exports of fish.

5.4. Arms-related environmental hazards

The fourth area concerns arms-related environmental hazards. Novaya Zemlya has been one of the main areas for nuclear tests in the Soviet Union. After the dissolution of the Soviet Union it is the only area for such tests in Russia. The Soviet Union performed 715 nuclear weapons tests, 132 of which took place on the test ranges of Novaya Zemlya, 900 kilometres north-west of Norway's Finnmark County. Between 1955 and 1963 nuclear tests were conducted in the atmosphere and under the surface of the sea. Since 1963, nuclear tests were conducted underground. In the period from 1964 to 1975 about 60 percent of all nuclear tests at Novaya Zemlya resulted in release of radioactivity into the atmosphere (Report No. 34 (1993-94), p. 32). Testing on Novaya Zemlya ceased in 1990. Of all the tests performed there 86 were atmospheric, 43 were underground and three were underwater (Bøhmer et al., 2001, p. 51). Novaya Zemlya is situated in a vulnerable arctic area where radioactive releases could have grave health and environmental consequences. Even though Russia signed the Comprehensive Nuclear Test Ban Treaty in 1996, the consequences for the atmosphere and the ground water caused by nuclear fallout are still contested.

[9] Dumping of Radwaste at Sea. Bellona Foundation. [On-line]. Available: http://www.bellona.org/subjects/Dumping_of_radwaste_at_sea

3) Novaya Zemlya.

In northern areas there is also a large quantity of nuclear weapons which have to be destroyed. However, they may cause release of radioactivity if an accident happens during their deconstruction or transportation. Another and probably graver risk is the possibility of theft, sabotage and proliferation of nuclear materials, technology and competence, which can be used for weapons production and “dirty bombs” (Report No. 34 (1993-94), pp. 55-56). This risk is increased by the unstable economic situation in the country, forcing people to act illegally in order to survive, as well as by the rise of international terrorism.

6. Three Dimensions of Nuclear Risk

What kind of threat do nuclear technologies and activities in Northwest Russia pose to Norwegian interests? According to Sawhill and Jørgensen, nuclear risk stemming from Northwest Russia has three dimensions: it poses a threat to national security which includes environmental security, economic security and military security (Sawhill & Jørgensen, 2001, p. 11). Hence, it is a risk of environmental damage, economic damage or a risk of nuclear conflict or war.

6.1. The environmental and health dimension

From the environmental safety perspective, possible radioactive contamination from Northwest Russia can damage living cells in plants, animals and humans, leading to increased risk of cancer, genetic damage or even death. Because of its unique ecology, the Arctic ecosystem is more vulnerable to radioactive contamination than other regions of the world. On average, Arctic and sub-Arctic residents have a five-fold higher exposure to radio nuclides than populations in temperate regions. The European Arctic is unique because of the high concentration of radioactive sources located in the region, including nuclear powered vessels, nuclear power plants, nuclear weapons, spent nuclear fuel and radioactive storage sites on land, radioactive wastes disposed of at sea, and sunken nuclear submarines. This large concentration of nuclear sources presents a serious potential risk of contamination to the Arctic environment and its inhabitants (Sawhill & Jørgensen, 2001, p.11). The 1998 AMAP (Arctic Assessment and Monitoring Programme) assessment report concludes as following:

> ”… The greatest threats to human health and the environment posed by human and industrial activities in the Arctic are associated with the potential for accidents in the civilian and military nuclear sectors. Of most concern are the consequences of potential accidents in nuclear power plant reactors, during the handling and storage of

> nuclear weapons, in the decommissioning of nuclear submarines and in the disposal of spent nuclear fuel from vessels.”[10]

The 2002 AMAP assessment report adds:

> ” The major concern regarding potential environmental contamination relates to accidents involving nuclear material, especially accidents at nuclear power plants. Models show that a major accident at the Kola nuclear power plant in Russia resulting in substantial release of radioactive material to the atmosphere would require countermeasures to avoid high radiation doses to the population, which may then need to be applied for several years.”[11]

Thus, the risk of cross-border radioactive contamination of the Arctic environment associated with nuclear installations and activities in Russia is judged to be high.

6.2. The economic dimension

Nuclear activities and installations in the Northwest Russia present a threat to economic security in Norway both directly and indirectly. Directly – by damaging property in Norway. Indirectly – by damaging markets and consumer confidence (Ocean Futures 2005, pp. 2-3). This became particularly clear after the 1986 Chernobyl accident, when certain aspects of the agricultural sector were negatively affected, such as domestic reindeer and other grazing animals. Today the potential effects of nuclear contamination on the seafood industry are especially feared. Norway is the second biggest exporter of seafood in the world.[12] Seafood products are Norway’s third largest exports commodity, following only oil and gas. If consumers perceive that fish from the Barents Sea are contaminated by radioactivity, despite

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[10] AMAP, AMAP Assessment Report: Arctic Pollution Issues. (1998). Radioactivity. Ch.8. p.609. [On-line]. Available:
http://www.amap.no/documents/index.cfm?dirsub=/AMAP%20Assessment%20Report%20-%20Arctic%20Pollution%20Issues

[11] AMAP, AMAP Assessment 2002: Radioactivity in the Arctic. (2004). Summary. Ch.8 p.91. [On-line]. Available:
http://www.amap.no/documents/index.cfm?dirsub=/AMAP%20Assessment%202002%20-%20Radioactivity%20in%20the%20Arctic

[12] Norwegian Seafood Exports. Seafood from Norway. [On-line]. Available :
http://www.seafoodfromnorway.com/page?id=262&key=21607

scientific evidence to the contrary, it could have serious economic implications for the Norwegian economy. Maintaining consumer confidence in Norwegian seafood products is a principle national interest. Therefore, one of the major foreign policy objectives of Norway has been to assist Russia in improving its nuclear waste management practices so that it will not resume its former practice of disposing radioactive wastes into the Arctic (Sawhill & Jørgensen, 2001, p.13).

6.3. The military dimension

The risk of proliferation of nuclear weapons to irresponsible individuals, groups and regimes or “rogue” states has become a main challenge to Norwegian military security as well as to global security. Since the end of the Cold War the threat of nuclear proliferation has not decreased but increased: as the strength of Russia’s social, economic and political systems has declined, the motive and opportunity to steal, sell or sabotage nuclear material have increased. Under the Soviet regime, military guards and the state security forces maintained a constant surveillance over nuclear materials and personnel who worked with them. At the same time, the Soviet workers and scientist enjoyed high social status and had small incentives to steal or sell nuclear materials. The 1998 financial crisis has, however, severely undermined the foundations of the Russian nuclear safeguards system, thus increasing the vulnerability of nuclear materials to theft, sabotage and diversion. Whereas assembled weapons are heavily guarded and difficult to transport, weapons-usable materials in other forms (e.g. naval reactor fuel or strontium batteries) are stored under considerably less security, making it particularly vulnerable to diversion. Thus, the principle concern in the military security area is the possibility of theft, diversion or sale of weapons-usable fissile material. Related to nuclear non-proliferation is the issue of preventing nuclear terrorism. Both spent nuclear fuel (which can be used to manufacture a so-called “dirty bomb”) and poorly guarded, decommissioned nuclear submarines in Northwest Russia risk becoming terrorist targets (Sawhill & Jørgensen, 2001, pp. 14-16).

Thus the nuclear risk in Northwest Russia may be defined in environmental, economic and nuclear proliferation terms. Some refer to nuclear *safety* when pollution is emphasized and to nuclear *security* when proliferation is in focus (Mærli, 2002, p. 6). However, as mentioned before, to Beck and social constructivism scholars, the concept of risk is not given, but socially and culturally constructed. Thus, these three dimensions of nuclear risk must not be taken for granted, since they may be redefined and reconstructed with time. The three current dimensions might become obsolete, while new ones might be “discovered” or reborn. The following chapter will show how these three dimensions of nuclear risk in Northwest Russia have been presented in Norwegian political debate from 1990 to 2004.

7. Norwegian Definitions of Nuclear Risks in Northwest Russia

Magne Fjeld (2005) has analyzed in his master thesis how nuclear risks posed by nuclear technology in Northwest Russia have been defined in political discourse between Norwegian Government and Parliament in the period from 1990 to 2004. By examining which words, expressions and points of view were prevailing in the political debate in different time periods, he was able to divide this period in three subperiods. I will briefly present them here, since they are directly relevant for analyzing how these changing representations of nuclear risk in Russia affected Norway's efforts in reducing these risks. It is important to note however, that these definitions are highly connected to the international context of the nuclear affairs, and thus not very specific to Norway.

7.1. 1990-1996: radioactive pollution and nuclear proliferation

In the first period from 1990 to 1996, the new challenges facing Norway after the dissolution of the Soviet Union are represented as both an environmental risk threatening life, health, population and environment, and as an economic risk threatening Norwegian business interests (Fjeld, 2005, p. 36). Moreover, since 1993 a new aspect of nuclear risk posed by nuclear activities in Northwest Russia is realized. It is the risk of nuclear proliferation made salient by the possibility of selling or smuggling of nuclear weapons and nuclear competence, also to terrorists (ibid, pp. 41-42). This risk is presented as threat to Norway as a state, as a threat to national security (ibid, p. 46). Different concern areas are emphasized, starting with nuclear tests, moving on to nuclear power plant and radioactive waste, and culminating with proliferation of nuclear weapons (ibid, p. 43). There is no agreement between policymakers on what kind of risk poses the main challenge: the risk of environmental and economical damage, caused by potential releases of radioactivity from the nuclear power plant, decommissioned submarines, radioactive waste and spent nuclear fuel, or the risk of proliferation of nuclear weapons and fissile material (ibid, p. 50).

7.2. 1996-1998: radioactive pollution

In 1996 the minister of foreign affairs at the time, Bjørn Tore Godal, makes clear what risk represents the main nuclear challenge for Norway. It is the risk of radioactive pollution, which Godal defines as a threat to environmental, economic and military security (ibid, pp. 50-51). One of the reasons may be that since 1990 Norway has gained more knowledge about the challenges in Northwest Russia, and now had better overview of the gravity of nuclear contamination problems in the area (ibid, p. 52). Thus, contrary to the last period, when nuclear risk was presented as an environmental risk and a risk of nuclear proliferation, in the period from 1996 to 1998, one single nuclear challenge is defined in terms of radioactive pollution (ibid, p. 53). The risk of nuclear proliferation is not mentioned in this period as a challenge to Norway's security (ibid, p. 55).

7.3 1998-2004: nuclear proliferation

Nevertheless, the risk of nuclear proliferation gains again importance in the period 1998-2004. This probably has a connection with nuclear testing conducted by India and Pakistan in 1998, which awoke the fear of proliferation of nuclear weapons and fissile material in Norway (ibid, p. 56). The terrorist attacks in the USA on September 11, 2001 and the Iraqi war from 2003 have accentuated the risk of nuclear proliferation and international terrorism even more. The increased focus is put on Russia, because one of the world's largest concentrations of nuclear weapons is situated there with relatively easy access to them as a consequence of the unstable social and economic situation in the country (ibid, p. 62). The risk of nuclear proliferation is presented as both a threat to environment and a threat to military security in Norway (ibid, pp. 57-58). Even though radioactive pollution is no longer recognized as the main challenge, it has not totally disappeared from the political debate, still recognized as threatening Norwegian interests. However, now it is dominated by the threat of nuclear proliferation.

Thus, the period from 1990 to 2004 can be divided in three main subperiods. From 1990 to 1996, nuclear risk was framed both as a risk of radioactive contamination threatening environmental and economic security, and as a risk of nuclear proliferation threatening military security. From 1996 to 1998, the risk of nuclear pollution dominated, presented as threatening environmental, economic and military security. Risk of nuclear proliferation was not mentioned at all in the political debate in this period. However, from 1998 to 2004 it was the nuclear proliferation risk that gained importance, presented as both a threat to environmental and to military security.

8. International Cooperation on Nuclear Risk Reduction

According to Ulrich Beck's "globalization from above" thesis as well as the theory of transboundary risk management, states cooperate on risk reduction when they perceive a given risk as global or transboundary, threatening not only the risk source country, but also other states in the world risk society. Can nuclear risk stemming from Northwest Russia be defined as global? Beck defines three types of dangers characteristic for the world risk society: ecological, economic and terrorist risks (see 2.3.). These global risks are caused either by wealth, poverty or by the threat of deployment of (nuclear, biological, chemical) weapons of mass destruction.

Following Beck's characteristics of global risks, nuclear risk stemming from Northwest Russia is a global risk. To a high degree it is a consequence of poverty in Russia, caused by the dissolution of the Soviet Union, the turbulent transition to capitalist economic system and democracy, and by the financial crisis of 1998. In addition, it satisfies the criteria of global dangers: it threatens environment and business, and it poses the risk of nuclear weapons coming into the wrong hands. Thus, it satisfies the criteria of global risk required by Beck.

How was this global nuclear risk managed? What strategies were used during the intergovernmental collaboration to reduce this risk? What kind of international cooperation did the environmental, economic and military dimensions of global nuclear risk lead to? Was all the three categories of negotiated risk addressed (see 2.5)?

In the following sections international cooperation on nuclear risk reduction will be presented during each of the three subperiods identified by Fjeld. This chapter's aim is to illuminate how Norwegian definition of nuclear risk stemming from Northwest Russia affected what kind of international cooperation Norway initiated or engaged itself in from 1990 to 2004, and what support approaches were used in order to reduce the transboundary nuclear risk. Section 8.1 describes the cooperation on nuclear risk reduction during the first subperiod from 1990 to 1996. Section 8.2 presents the second subperiod from 1996 to 1998, while section 8.3 depicts international cooperation during the last subperiod from 1998 to 2004.

8.1. 1990-1996: regional cooperation on knowledge gathering

As mentioned in chapter 7, from 1990 to 1996 nuclear risk was identified both as a risk of environmental damage caused by an accident at nuclear installations in Northwest Russia and, from 1993, as a risk of nuclear proliferation. What actions were taken in this period by the Norwegian authorities to address these dimensions of nuclear risk? And what kind of international cooperation did this definition lead to?

8.1.1. The early cooperation forums

At the time, the Norwegian government was already involved in international cooperation on nuclear safety through such intergovernmental organizations as International Atomic Energy Agency (IAEA), OECD’s Nuclear Energy Agency (NEA) and European Bank for Reconstruction and Development (EBRD). In 1993 Norway and Russia signed a bilateral agreement on emergency preparedness and early warning in case of nuclear accidents at, and exchange of information on, nuclear installations including nuclear power plants, reprocessing facilities, nuclear-powered icebreakers and submarines. This agreement is anchored in the IAEA Convention on Early Notification of a Nuclear Accident from 1986 (Plan of Action, 1995, pp. 10-12). Norway has also been engaged in the Non-Proliferation Treaty since 1986.

In 1990 Norway and other Nordic countries established the Nordic Environmental Finance Corporation (NEFCO) which developed an environmental program for Northwest

Russia. Several investment projects in the sphere of radioactive contamination from this program have been included in the Norwegian Plan of Action on Nuclear Safety (Hønneland & Moe, 2000, p. 28).

To improve safety at the Kola nuclear power plant Norway established a wide-range programme.[13] In 1993 Norway started contributing funds to the EBRD's Nuclear Safety Account (NSA) which was set up at the EBRD to finance short-term improvements at first-generation Soviet-designed nuclear power plants in Central and Eastern Europe. In Russia, the NSA has financed technical improvements at Kola, Leningrad and Novovoronezh nuclear power plants.[14] Besides participating in intergovernmental organizations, Norway started cooperating with Russian authorities on its own as early as in 1988, with the establishment of the Joint Norwegian-Russian Commission on Environmental Protection in 1992 as a result.

8.1.2. The Joint Norwegian-Russian Commission on Environmental Protection

When it comes to dumping of radioactive waste, Norway and Russia have cooperated in this area since the days of the Soviet Union. The Norwegian Ministry of the Environment initiated Norwegian- Russian environmental cooperation which was established on January 15, 1988 (the same year the Soviet Union got their own ministry of environment) with signing of an intergovernmental agreement on environmental collaboration by Russian and Norwegian prime ministers. The Joint Norwegian-Russian Commission on Environmental Protection was also established this year and has since served as cooperation forum for Norwegian and Russian environmental protection authorities. The commission is headed by the Norwegian Ministry of the Environment and the State Committee of the Russian Federation on

[13] Norway's Cooperation with Russian Authorities. NRPA. [On-line]. Available: http://handlingsplan.nrpa.no/English/left/authority.htm
[14] Nuclear Safety Account. EBRD. [On-line]. Available: http://www.ebrd.com/country/sector/nuclear/overview/funds/nsa.htm

Environmental Protection. During its first years, the important issues for Norwegian- Russian cooperation were monitoring of air pollution, protection of marine environment and biological diversity, and investigation of health hazards.[15] The agreement on environmental collaboration was continued after the dissolution of the Soviet Union in 1991 and renegotiated on September 3, 1992, when a Norwegian-Russian Expert Group on the Investigation of Radioactive Contamination of the Northern Seas was established under the Joint Norwegian-Russian Commission on Environmental Protection. The aim of the Expert Group was to investigate allegations that radioactive waste was being dumped by Russia in the Barents and Kara Seas (Report No.34 (1993-94), p. 37).

8.1.3. International Arctic Seas Assessment Project (IASAP)

In 1992, 1993 and 19994 the Norwegian and Russian authorities organized three joint expeditions in order to measure the level of radioactive contamination in the Barents and Kara Seas. To assess the risks to human health and environment associated with the discovered dumped radioactive wastes and to gather more information about the consequences, Norway, Russia and the IAEA arranged a meeting in Oslo in 1993 where they agreed to carry out a research project called the International Arctic Seas Assessment Project (IASAP) from 1993 to 1996 (Report No.34 (1993-94), pp. 29-30, Plan of Action, 1995, pp. 16-17). Norway has also cooperated with Russian authorities to map the radioactive pollution from the Mayak reprocessing facility (Plan of Action, 1995, p. 17). In addition, a Memorandum of Understanding on Norwegian-Russian cooperation in the field of nuclear safety was signed in 1995, aimed at improving nuclear safety and preventing radioactive contamination in areas of mutual interest (Gundersen, 1997, p. 9).

[15] History: the Norwegian-Russian Environmental Co-operation. Svanhovd Miljøsenter. [On-line]. Available: http://www.svanhovd.no/jubile_bros/history.html

Thus, a bilateral Norwegian-Russian cooperation on nuclear safety, aimed at the environmental and economic dimensions of nuclear risk started already in the final days of the Soviet Union. The signing of the agreement on bilateral environmental cooperation in 1998, the establishment of the Joint Norwegian-Russian Commission on Environmental Protection in 1992, the joint expeditions to the Barents and Kara Seas in 1992,1993, 1994, and the initiation of the IASAP research project in 1993 set off bilateral Norwegian-Russian cooperation on nuclear safety and management of transboundary nuclear risk.

8.1.4. Arctic Environmental Protection Strategy (AEPS)

A regional multilateral cooperation for environmental protection was also initiated in this time period. In 1991 the Arctic Environmental Protection Strategy (AEPS) was initiated by eight Arctic countries: Canada, Denmark, Finland, Island, Norway, Sweden, Russia and the USA. Arctic Monitoring and Assessment Programme (AMAP) is a part of this cooperation, which is placed under the Arctic Council since 1996. Its main task is to provide the necessary database regarding pollution in the Arctic, to coordinate monitoring work and to asses the consequences of different types of pollution in Arctic areas. The Norwegian Radiation Protection Authority (NRPA) is leading in collaboration with Russia the subgroup in charge of work associated with radioactive contamination in the Arctic (Plan of Action, 1995, pp. 17-18).

8.1.5. NATO Pilot Study

Norway also initiated and chaired a pilot study under NATO’s Committee on Challenges of Modern Society on cross-border environmental problems stemming from defence and military related activities and installations. The idea was to take advantage of the new opportunities presented by the end of Cold War as well as to develop a basis for international cooperation in order to identify, map, assess and impede transboundary defence-related pollution. The pilot study lasted from 1992 to 1995 with publications of two reports - one on radioactive contamination and one on chemical contamination (Ellingsen Tunold, 1997, p. 17; Report No. 34 (1993-94), pp. 41-42).

Thus, a number of environmental regional multilateral collaborations have also found place after the dissolution of the Soviet Union, such as the AEPS and the NATO Pilot Study. They aimed at gaining more knowledge about the environmental challenges in Russia, just as the bilateral Norwegian-Russian collaboration did.

8.1.6. Collective learning approach and transboundary environmental risk

Thus, in the period from 1990 to 1996, when, according to Fjeld, nuclear risk stemming from Northwest Russia was presented as a threat to environmental, economic and military security, Norway engaged in a bilateral environmental cooperation with Russia, a regional environmental multilateral Arctic cooperation, and a pilot study under auspices of NATO. Concerning the risk of nuclear proliferation and military security, Norway has been engaged in the Comprehensive Test Ban Treaty (CTBT) since 1996. However, Norway did not engage in any international cooperation forums to specifically address this dimension of nuclear risk posed by the nuclear activities in Northwest Russia.

However, in this period only one kind of the negotiated risk was in focus- the transboundary environmental risk. The other two types of the negotiated risk – the risk of implementation failure and the risk of ineffective abatement - were not addressed by the emerging intergovernmental cooperation.

If we look at what support approaches were used in this period by Norway, the approach based on collective learning appears as the most salient when it comes to the risk of radioactive pollution. Through the joint Norwegian-Russian expeditions to the Barents and Kara sea, and such projects as IASAP, AMAP and the NATO pilot study, Norway engaged in information gathering and construction of consensual knowledge about the issue of nuclear risk as a threat to human health, environment and business. Norwegian government's goal in this period is "to protect health, the environment and business against radioactive contamination and pollution from chemical weapons in Russia and other East European states" as presented in the Report No. 34 (1993-94) (ibid, p. 5). The focus is on gathering more information and knowledge about environmental pollution caused by nuclear activities in Northwest Russia in order to provide a basis for consensual knowledge among the cooperating parties about the gravity of the problems in the northern areas. This is done by conducting expeditions to the areas of concern as well as by multilateral research projects and studies aimed at increasing collective knowledge about these problems.

8.1.7. 1990-1996: Bellona Foundation and knowledge gathering

According to Igor Kudrik and Alexander Nikitin, at the beginning of the 1990s also the Bellona Foundation directed its attention towards Russia, its nuclear challenges and environmental problems, associated with such activities as nuclear testing on Novaya Zemlia, dumping of radioactive waste in the Barents and Kara Seas, and reprocessing practices in the southern Urals. Bellona's goal was to create an authentic picture of what was going on in these areas. Thus, in 1994 Bellona published a report entitled "Sources of Radioactive Contamination in Murmansk and Archangelsk Counties" or the black report, which was the first publication that gathered all the information on nuclear challenges in Northwest Russia in one book. The goal of this report was to attract the attention of the international community to the issues that were described as “Chernobyl in slow motion”, and to put these issues on the agenda.

At the time Bellona decided to focus on the Northern Fleet, its nuclear submarines and what was really going on there. Thus a new report was initiated, known as the blue report. It was published in 1996 and entitled “The Russian Northern Fleet: Sources of Radioactive Contamination”. Alexander Nikitin was co-author of this report, and his contribution to this report led to his arrest by the Russian Security Police in 1996. He was accused of espionage and disclosure of states secrets. Eventually Bellona won the case, but Nikitin was imprisoned for 10 months, and the entire process took five years from 1995 to 2000. The Nikitin case and the blue report drew a great deal of attention both in Norway and internationally to the Kola Peninsula and the problems there. This report was used in international negotiations on submarine dismantlement projects, and several countries became willing to finance such projects. Bellona’s reports were used by politicians, administrators, businessmen, decision makers and contributors during negotiations of new projects, because these reports provided factual knowledge about the amount and the nature of the nuclear challenges in Russia (Kudrik & Nikitin, 2007).

Thus, apart from the intergovernmental efforts on construction of consensual knowledge, Bellona as a non-governmental organization also contributed to the process of collective learning on both national and international levels. By its independent reports Bellona contributed to precise analysis and definitions of the issues at stake, increasing transparency of the nuclear risk matters and thus facilitating intergovernmental negotiations on nuclear risk management.

8.2. 1996-1998: international environmental cooperation

The Norwegian Action Plan for Nuclear Safety from 1995 was revised in 1997. In this plan the third area of concern, *Dumping of spent nuclear fuel and radioactive waste,* was redefined as *Radioactive pollution in Northern areas.* This redefinition might have been caused by the fact that, according to Fjeld's thesis, between 1996 and 1998 it was recognition of nuclear risk as a risk of nuclear pollution that dominated the political debate in Norway. Also a new nuclear-based facility was identified as threatening Norwegian interests in this period. Highly radioactive strontium batteries (Radioisotope Thermoelectric Generators or RTGs) from lighthouse lanterns along the cost of north western Russia were added to the first area of concern, safety at nuclear installations (Plan of Action, 1997, p. 8). What kind of international cooperation did the focus on radioactive pollution lead to? Two new international cooperation forums were established in this period by the Norwegian initiative: the Contact Expert Group (CEG) under auspices of IAEA and the Arctic Military Environmental Cooperation (AMEC). In addition a Framework Agreement on Environmental Cooperation was signed by Russia and Norway in this period.

8.2.1. Contact Expert Group (CEG)

In May 1995 the International Atomic Energy Agency (IAEA) organized a seminar in Vienna on "International Co-operation on Nuclear Waste Management in the Russian Federation", which was requested and sponsored by the Nordic countries. There participants from the Russian Federation, seventeen countries and international organizations cooperating with Russia in waste management projects, recognized the need for setting up a body to assist in coordination of their work.[16] At the initiative of Norway, the Contact Expert Group (CEG) for International Radwaste Projects in the Russian Federation was created under the auspices

[16] Contact Expert Group (CEG): History of the CEG. IAEA. [On-line]. Available: http://www.iaea.org/OurWork/ST/NE/NEFW/CEG/ceg_history.html

of IAEA in 1996. Currently CEG comprises twelve countries: Belgium, Canada, Finland, France, Germany, Italy, Netherlands, Norway, the Russian Federation, Sweden, United Kingdom and the United States of America, and four international organizations: European Commission, International Institute for Applied Systems Analysis, International Science and Technology Center, and the IAEA.[17] The CEG was the first international forum for coordination and cooperation on radwaste projects (Ellingsen Tunold, 1997, p. 19).

Main objectives of the CEG are: to promote cooperation between all countries and international organizations interested in contributing to projects aimed at enhancing the safety of spent nuclear fuel and radioactive waste management in the Russian Federation; to provide a forum for discussion and exchange of information with the view of identifying main priorities and presenting recommendations on specific projects for further cooperation; to avoid redundancy and duplication in project work in Russia and assure that priorities are properly addressed and made known to the international community; and to provide points of contact to facilitate cooperation.[18] All the donor countries meet yearly in the CEG to discuss current and future projects. Participants in the CEG are such diverse actors as technical experts, representatives of government authorities, commercial companies and operators (Ministry of Foreign Affairs, 2005, p. 8). Thus the Contact Expert Group appears to be a knowledge and information gathering body which, by serving as a forum for discussion, consultation and exchange of information, facilitates and enhances international nuclear risk management. Hence, it is also based on the collective learning approach, developing consensual knowledge on how new information should be interpreted and applied.

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[17] Contact Expert Group (CEG): Composition of the Contact Expert Group. IAEA. [On-line]. Available: http://www.iaea.org/OurWork/ST/NE/NEFW/CEG/ceg_composition.html

[18] Contact Expert Group. IAEA. [On-line]. Available: http://www.iaea.org/OurWork/ST/NE/NEFW/CEG/index.html

8.2.2. Arctic Military Environmental Cooperation (AMEC)

Arctic Military Environmental Cooperation (AMEC) was initiated by Norway in 1995 and signed by defence ministers from Norway, Russia and the USA on September 26, 1996 in Bergen, Norway. AMEC was a trilateral cooperation until 2003, when the United Kingdom joined AMEC. Norway initiated AMEC and requested that the United States participate in the program to address what Norway perceived as significant environmental problems located on its border with Russia. Norway is the second biggest exporter of seafood in the world and was thus concerned that these problems would adversely affect the Norwegian fishing industry (GAO-04-924, 2004, p. 4). AMEC appears to have broken new ground by opening up defence-related nuclear waste issues in Russia to international cooperation. It has served different national objectives for the three participating states, contributing to environmental and economic safety and security for Norway, strategic security for the USA, and financial and technological assistance for Russia (Sawhill 2000 in Hønneland & Moe, 2000, p. 28). Expanded participation in AMEC has been welcome since 2001 to reinforce the technical competence and the financing of the program. The United Kingdom thus joined the cooperation in 2003.[19]

AMEC is administered by the member countries' Ministries of Defence and it is directed towards dangers of nuclear contamination from military sources in the Russian Arctic, even though the declaration applies to all of the Arctic in principle (Mærli, 2002, p.17). It seeks to reduce the environmental impacts of Russia's military activities through technology development projects, such as transport and storage cask for naval spent fuel (Kudrik et al., 2004, p. 100). AMEC has primarily focused on the Russian aging fleet of nuclear submarines and their scrapping. From 1996, when the program was established to April 2004, AMEC member countries contributed about USD 56 million to the program

[19] Arctic Military Environmental Co-operation with Russia. Norway, the official site in the United States. [On-line]. Available: http://www.norway.org/News/archive/2002/200201military.htm

(GAO-04-924, 2004, p. 18). AMEC gives priority to such projects as storing and transporting radioactive waste from the submarines. The actual dismantlement of the Russian submarines is being funded by a number of countries (ibid., pp. 4-6).

Thus, AMEC is based on the financial/ technical assistance approach. It facilitates management of nuclear risk by developing and transferring the technology needed to prevent radioactive contamination from military sources and by funding development of new projects.

8.2.3. Norwegian-Russian Framework Agreement on Environmental Cooperation

AMEC led in turn to the Norwegian-Russian Framework Agreement on Environmental Cooperation which was signed in 1998 by the then Minatom (the former Russian Atomic Energy Ministry) and the Norwegian Ministry of Foreign Affairs after two years of bilateral negotiations (Nyman, 2002, p. 49). Until the signing of the framework agreement, lack of legal coverage for assistance programs, including exemptions from taxes, duties and fees, as well as liability protection for foreign personnel involved on the Russian territory limited Norwegian participation in AMEC projects (Mærli, 2002, p. 19). The agreement exempts Norwegian assistance from taxes, customs duties and other fees. It rules out legal measures against Norway and its personnel in case an accident were to occur on the Russian territory during the implementation of AMEC projects. It also regulates the right to verify that the technological assistance is utilized in accordance with the terms of the agreement. In addition, it allows for financial involvement by a third party.[20] In accordance with the agreement Norway will render free technical assistance and technology transfer to Russia for environmentally safe dismantling of nuclear submarines, including management of spent nuclear fuel and radioactive waste, as well as enhancing safety at nuclear power plants and

[20] Framework Agreement Opens Doors in Environmental Cooperation. Norway, the Official Site in the United States. [On-line]. Available: http://www.norway.org/News/archive/1998/199806russia.htm

other nuclear installations. A Norwegian-Russian Commission was established as well in 1998 to control and coordinate the implementation of the agreement.[21]

Thus, the agreement appears to be based on the compliance control approach and addresses the risk of implementation failure. If the Russian party does not comply with its obligations, the Norwegian party will stop the technology transfer and financial assistance it provides through the AMEC program. The agreement facilitates Norwegian participation in AMEC projects and hence contributes to transboundary nuclear risk reduction.

8.2.4. Collective learning, technical/financial assistance and implementation control

Hence, in the period when nuclear pollution was framed as the most important security/safety challenge for Norway both in environmental, economic and military terms, the country initiated establishment of the AMEC program and the CEG to reduce the transboundary nuclear risk. While both cooperation forums are focused on the environmental dimension of nuclear risk, the CEG appears to be more oriented towards the activities aimed at facilitating and enhancing international cooperation by serving as a forum for collective learning and creation of consensual knowledge, thus applying collective learning approach. AMEC, in its turn, is directly focused on the environmental dimension of nuclear risk and the economic dimension for Norway. It is based on the technical/ financial assistance approach. The bilateral Norwegian-Russian Framework Agreement is serving to address the risk of implementation failure, by making Norwegian assistance to Russia contingent on fulfilment of its obligations. Thus it is based on the compliance control approach.

[21] Agreement between the Government of the Kingdom of Norway and the Government of the Russian Federation on environmental cooperation in connection with the dismantling of Russian nuclear powered submarines withdrawn from the Navy's service in the northern region, and the enhancement of nuclear and radiation safety. [On-line]. Available: http://www.lovdata.no/traktater/texte/tre-19980526-003.html

In this period international cooperation is no longer of limited regional type, concerning only Norway, Russia and other Arctic countries. It is extended to include several European countries as well, thus becoming more global. When it comes to the risk of nuclear pollution, Norwegian efforts are no longer limited to collective learning approach concentrated on information and knowledge gathering, but also include the technical/financial assistance approach and the compliance control approach. However, the cooperation is still of environmental kind, not addressing the risk of nuclear proliferation stemming from nuclear activities in Northwest Russia. This is understandable to the extent that the risk of radioactive pollution dominated the political agenda in this time period in Norway, while the threat of nuclear proliferation was not mentioned at all.

8.3. 1998-2004: international environmental and non-proliferation cooperation

According to Fjeld, from 1998 to 2004 the risk of nuclear proliferation became prominent in Norway. It was defined both as an environmental and a military security threat. This change can also be seen in the redefinition of the governmental goal in the field of nuclear safety. While in the Report No. 34 (1993-94) to the Storting "On Nuclear Activities and Chemical Weapons in Areas Adjacent to our Northern Borders" the main goal of the Norwegian government is "to protect health, the environment and business against radioactive contamination and pollution from chemical weapons in Russia and other East European states" (ibid, p. 5), the Report No. 30 (2004-2005) to the Storting entitled "Opportunities and Challenges in the North" defines two main goals: "to safeguard health, the environment and economic activity from radioactive pollution, and to prevent radioactive and fissile material from falling into the wrong hands and being used for terrorist purposes" (ibid, p. 27).

During this period, the Norwegian efforts in Northwest Russia had four main priorities: dismantling of decommissioned nuclear submarines from the Northern Fleet, securing of strontium batteries from Russian lighthouses, infrastructure measures at the closed Northern Fleet service base at Andreyeva Bay on the Kola Peninsula, and intensified cooperation between Norwegian and Russian inspection and administrative authorities (Report No. 30 (2004-2005), p. 28). By that time Norwegian and other western assistance directed towards safety measures at Russian nuclear power plants has helped to resolve the most acute safety problems there (ibid, p. 30). In order to achieve its priorities Norway participated in three new cooperation forums in this period – the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction, the Multilateral Nuclear Environmental Programme in the Russian Federation (MNEPR), and Northern Dimension Environmental Partnership (NDEP) - as well as in an old one, the IAEA.

8.3.1. International Atomic Energy Agency's Nuclear Security Fund (NSF)

When it comes to nuclear security, the IAEA's activities in the area date back to the 1970s when the Agency began providing ad hoc training courses in physical protection. However, after 11 September 2001, it became clear that much more needed to be done to protect nuclear materials from potential acts of terror. In March 2002 the IAEA Board of Governors approved a three-year Plan of Activities to protect against nuclear terrorism, which enhanced and integrated the Agency's existing nuclear security activities. In the same year the Nuclear Security Fund (NSF) was established to which member states were called upon to contribute. The NSF is a voluntary funding mechanism. It was established to support the implementation of nuclear security activities as well as to prevent, detect and respond to nuclear terrorism. The Fund was extended when, in September 2005, the IAEA Board approved a new Nuclear Security Plan covering the period 2006-2009. The IAEA Office of Nuclear Security (NSNS) is responsible for coordinating the IAEA's Nuclear Security Plan. It is also responsible for the allocation of resources provided by the NSF.[22] As of 31 July 2003, 21 countries and one organization, the Nuclear Threat Initiative, have pledged more than USD13 million of support to the NSF to upgrade nuclear security worldwide. Norway has contributed USD 60,000 to the NSF. International support includes cash contributions as well as services, equipment, or use of facilities.

Apart from providing advisory services to states, the IAEA also organizes international conferences, training courses, seminars and workshops to disseminate knowledge about how to deal with nuclear and radiological threats.[23] The Nuclear Safety Fund plays, for example, an important role in the work carried out by the tripartite working group on “Securing and Managing Radioactive Sources”, established by the IAEA, the USA and Russia in order to locate and secure radioactive sources in the former Soviet Union.[24]

Thus, the IAEA is working for enhanced nuclear security worldwide by applying the technical/financial approach and the collective learning approach to transboundary nuclear risk reduction. Through the Nuclear Security Fund the IAEA is financing reduction of nuclear threats, therefore addressing the military dimension of nuclear risk. Through the activities under the Nuclear Security Plan, the Agency is aiming to increase collective knowledge internationally on how to manage and reduce nuclear threats and risks.

8.3.2. The G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction

In 2002 at Kananaskis, Canada, the G8 countries established the Global Partnership against the Spread of Weapons and Materials of Mass Destruction in order to prevent terrorists from

[22] Nuclear Security. IAEA. [On-line]. Available: http://www-ns.iaea.org/security/
[23] Table- voluntary contributions to IAEA Nuclear Security Fund. IAEA. [On-line]. Available: http://www.iaea.org/NewsCenter/News/2002/actionplan_table.shtml
[24] Nuclear Security- Progress on Measures to Protect Against Nuclear Terrorism. IAEA. [On-line]. Available: http://www.iaea.org/NewsCenter/News/PDF/action_plan.pdf

acquiring or developing weapons of mass destruction. The Partnership is aimed at non-proliferation, disarmament, counter-terrorism and nuclear safety issues, particularly in Russia. The participating states have committed to raise up to USD 20 billion to help fund such projects over the next ten years. The destruction of chemical weapons, the dismantlement of decommissioned nuclear submarines, the disposition of fissile materials and the employment of former weapon scientists are among the priority areas.[25] In 2003 Norway became the first country outside the G8 to be invited to join the cooperation (Report No. 30 (2004-2005), p. 30). Thus, Norway joined the Global Partnership in June 2003, and has pledged contributions equivalent to EUR 100 million during a 10-year period (Plan of Action, 2005, p. 1). Through the G8 Global Partnership, Norway has cooperated with Canada and France on dismantlement and replacement of RTGs in Russian lighthouses, and facilitated the expenditure of a EUR 360,000 contribution from Canada in 2005 and EUR 607,500 from France in 2005-2007.[26]

Thus, this international partnership is also based on the financial/technical support approach just as AMEC. However, now the risk of nuclear proliferation threatening military security is emphasized instead of nuclear pollution and environmental safety.

8.3.3. Multilateral Nuclear Environmental Programme in the Russian Federation (MNEPR)

Just as in the case with the AMEC, where Norway was not able to provide technical and financial assistance to address the transboundary environmental risk without simultaneously addressing the risk of implementation failure, other contributors needed assurance that the Russian party will accept western assistance without "punishing" the contributors in some

[25] The G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction. [On-line]. Available: http://www.g8.fr/evian/english/navigation/g8_documents/archives_from_previous_summits/kananaskis_summit_-_2002/the_g8_global_partnership_against_the_spread_of_weapons_and_materials_of_mass_destruction.html#topofthepage

[26] GPWG Annual Report 2007: Consolidated Report Data Annex A. The G8. [On-line]. Available: http://www.g-8.de/Content/EN/Artikel/__g8-summit/anlagen/gp-report-annex,templateId=raw,property=publicationFile.pdf/gp-report-annex

way or misusing the donations. Thus, to facilitate international cooperation on nuclear threats and risks reduction, in 1999 Norway took initiative to negotiate an international legal framework for project assistance to Russia and chaired the negotiations until the Multilateral Nuclear Environmental Programme in the Russian Federation (MNEPR) was signed in Stockholm in May 2003 after four years of negotiations. The European Union, EURATOM, the USA, Russia, Belgium, Denmark, Finland, France, Germany, the Netherlands, Norway, Great Britain and Sweden signed the agreement. Its aim is to facilitate practical cooperation in order to enhance the safety of spent nuclear fuel and radioactive waste management in the Russian Federation, in particular through the implementation of projects that may be identified by the Contact Expert Group (CEG). It includes provisions on exemption from taxes, customs duties and similar charges for assistance provided under the agreement, and on exemption from liability in case of an accident during implementation of projects.[27] The right of donor countries to inspect project sites and to oversee implementation of projects and use of assistance is an important principle of the agreement (Plan of Action, 2005, p.1).

The signing of MNEPR made available several million dollars for nuclear clean-up projects in Russia's Northwest through the Northern Dimension Environmental Partnership (NDEP), a fund held by the European Bank of Reconstruction and Development (EBRD) (see below). With the endorsement of MNEPR by several European nations, numerous bilateral nuclear submarine dismantlement agreements between Russia and other nations have found place (Digges, 2004). Thus, MNEPR is based on compliance control approach, not only by improving transparency in the form of on-site inspections and monitoring, but also in a way by "sanctioning" the Russian party by termination or suspension of assistance projects in case of imposition of taxation on the contributors. Hence, MNEPR is based on compliance control

[27] Framework Agreement on a Multilateral Nuclear Environmental Programme in the Russian Federation. NEA. [On-line]. Available: http://www.nea.fr/html/law/MNEPR-en.pdf

approach and addresses the risk of implementation failure, by making western financial and technical assistance to Russia contingent on the fulfilment of the framework conditions.

8.3.4. The Northern Dimension Environmental Partnership (NDEP)

The Northern Dimension Environmental Partnership (NDEP) is another environmental cooperation which was established in 2001. It originates from the European Union's Northern Dimension initiative which promotes co-operation between the EU and its member states and the region's partner countries: Iceland, Norway and the Russian Federation. One of the Northern Dimension's key objectives is "working towards a safe, clean and accessible environment for all people in the north."[28] The NDEP Support Fund was established in 2002 by the EBRD to pool contributions for the improvement of the environment in Northwest Russia. The risk of nuclear contamination in the region is being addressed by a special programme of the NDEP Support Fund, called Nuclear Window. The Nuclear Window became operational in 2003, following the signing of the Multilateral Nuclear Environmental Programme in Russia (MNEPR). It is also supported by the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction. The NDEP and its Nuclear Window have rapidly become a major multilateral initiative in dealing with the issue of nuclear waste management in Northwest Russia. Its focus is on the Kola Peninsula, Archangelsk and Murmansk regions in Russia. The NDEP is based on the work carried out by the Contact Expert Group (CEG) of IAEA.[29]

When started in 2001, NDEP's state-actors were Russia, Norway, Iceland and the European Union. At the end of 2006 it had more than EUR 149 million at its disposal for nuclear safety projects in Russia and it received contributions from the EU, Denmark,

[28] NDEP Background. NDEP. [On-line]. Available: http://www.ndep.org/home.asp?type=nh&pageid=5
[29] NDEP Nuclear Window. EBRD. [On-line]. Available: http://www.ebrd.com/country/sector/nuclear/overview/funds/ndep.htm

Finland, France, Germany, Norway, Belgium, Canada, Russia, Sweden, the Netherlands, and the United Kingdom. As of the end of 2006 Norway has contributed EUR 10 million to the NDEP Support Fund.[30] Norway also participates in the Nuclear Operating Committee for the Nuclear Window. Its main task is to identify, propose and prioritise projects which fulfil the objective of the Support Fund. It also provides assistance during the implementation of projects.[31]

The first NDEP project was initiation of a Strategic Master Plan in 2004 to provide an overview of nuclear vessel decommissioning and related environmental rehabilitation in Northwest Russia. During the preparation of the plan, the Russian authorities produced extensive material on environmental problems and conditions at Russian nuclear facilities, including detailed analyses of specific problems. According to this plan, the largest and most urgent task is to deal with radioactive waste and to secure spent nuclear fuel at the Northern Fleet's technical support bases at Andreyeva Bay and Gremikha at the Kola Peninsula (Plan of Action, 2005, p. 1).

Thus, by producing a strategic master plan, NDEP has also contributed to production of consensual knowledge on nuclear risk by defining its most pressing aspects. Further, NDEP provides financial assistance to Russia made possible by the signing of MNEPR. Hence, it is based on collective learning and financial/technical assistance approaches.

8.3.5. Collective learning, technical/financial assistance and implementation control

Thus, in this last period when the threat of nuclear proliferation posed by nuclear activities in Russia gained importance both in Norway and globally, an increased international

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[30] Pledges and Contributions to the NDEP Support Fund at the end of 2006. NDEP. [On-line]. Available: http://www.ndep.org/partners.asp?type=nh&pageid=2

[31] Nuclear Operating Committee Mandate. NDEP. [On-line]. Available: http://ndep.org/files/uploaded/Nuclear%20OC%20Mandate.pdf

collaboration has found place with the creation of an international legal framework, MNEPR, which is based on the compliance control approach addressing the risk of implementation failure. MNEPR has facilitated transfer of international assistance to Russia provided by the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction, which is an international cooperation focused on the military dimension of nuclear risk, and by an international environmental cooperation, NDEP. These cooperation forums are not longer of a regional Arctic kind which characterized intergovernmental cooperation at the beginning of the decade, but are more global. Both of these cooperation forums are based on technical/financial assistance approach. They are financing the activities conducted in order to reduce two different dimensions of transboundary nuclear risk. In addition, NDEP's Strategic Master Plan is contributing to collective learning and creation of consensual knowledge.

In this period Norway also began donating to the IAEA's Nuclear Security Fund. When it comes to nuclear threat or the risk of nuclear proliferation, the IAEA's Plan of Nuclear Security contributes to collective learning worldwide on how to prevent and reduce nuclear threats, while the IAEA also applies the financial assistance approach drawing on its Nuclear Security Fund.

8.3.5. 1998-2004: Bellona and the risk of implementation failure

The Bellona Foundation published two new reports on nuclear challenges in Russia in the period from 1998 to 2004. The yellow report entitled "The Arctic Nuclear Challenges" was published in 2001. The red report "The Russian Nuclear Industry: the Need for Reform" was published in 2004. These reports did not only provide the updated information on the topic, but also contributed to sustain international interest in it.

However, Bellona was also aware of liability issues in case of a nuclear accident and impediments for international cooperation associated with them. Thus, Bellona initiated an

Inter-parliamentary Working Group (IPWG) which was established in Brussels in 1998. Its aim was to bring together delegations from the parliaments, administrations and industry in Russia, the USA, the European Union and Norway in order to discuss implementation of international projects. The Inter-parliamentary Working Group has been instrumental in advocating for MNEPR and by navigating some of the treaty's sticking points. Thus, according to Kudrik and Nikitin, another of Bellona's greatest achievements- besides providing impartial information on nuclear threats in Russia- was establishment of MNEPR (Kudrik & Nikitin, 2007).

Hence, in contrast to the previous periods, when Bellona's efforts were mainly concentrated on collective learning approach and improving transparency, during this period Bellona also played the role of creative mediator. By initiating a framework agreement that resolved the issues of transparency, taxes and liability and removed obstacles for international financial assistance to Russia, Bellona has contributed to negotiation of the risk of implementation failure, making it easier for the donor countries to initiate and implement nuclear remediation projects in Russia.

9. International Cooperation on Nuclear Risk Reduction-Lessons Learned

What approaches or combinations of approaches proved useful for Norway and its cooperating parties in order to reduce transboundary nuclear risk as well as the two other types of negotiated risk: the risk of ineffective abatement and the risk of implementation failure? This chapter sums up the findings from the previous chapters.

From 1990 to 2004 the Norwegian framing of nuclear risk stemming from Northwest Russia affected what kind of international collaboration on nuclear risk reduction Norway initiated or engaged in. Emphasize on environmental, economic or military security dimension of nuclear risk led consequently to either environmental or military cooperation on nuclear risk reduction. In the first period from 1990 to 1996, the nuclear risk stemming from Northwest Russia was identified both as a risk of nuclear accident, threatening environmental and economic security, and as a nuclear proliferation risk, threatening military security. Thus, both the nuclear risk and nuclear threat were emphasized. However, there was no agreement between policymakers about which of these risks represented the biggest challenge. Hence, Norwegian cooperation both with Russia and other Arctic countries had a knowledge- and information gathering character, aimed at collective learning and construction of collective knowledge. Through the Joint Norwegian-Russian Commission, the Norwegian-Russian expeditions to Barents and Kara Sea, AMAP and IASAP reports, the NATO pilot study, and the Bellona Foundation reports Norway and it cooperating parties attempted to gather the necessary information on radioactive pollution in the Arctic as well as other nuclear challenges in Northwest Russia. This information was needed to better access the gravity of the situation in the region and to find solutions to the discovered problems.

Norwegian framing of nuclear risk in this period and involvement in Northwest Russia can be contrasted with that of the United States, which already in 1991 established the

Cooperative Threat Reduction (CTR) Program. This programme assists Russia in dismantling of its ballistic missile nuclear submarines and securing its nuclear weapons by supplying equipment and awarding Russian shipyards direct contracts. Its aim is to help Russia to meet its commitments under the arms reduction treaties with the United States (Kudrik et al., 2004, pp. 96-98). In 1994 the Material Protection, Control and Accounting (MPC&A) Programme was established by the USA. Its chief focus is to control and safeguard nuclear weapons and weapons-usable nuclear materials. MPC&A programme has contributed with roughly USD 4.1 billion between 1992 and 2002 to control nuclear warheads and materials in and around the former Soviet Union (ibid, p. 102).Thus in this period the military rather than the environmental or economic dimension of nuclear risk was in focus in the USA, emphasising nuclear non-proliferation. Norway, however, needed more knowledge about the challenges in Northwest Russia to decide in which area it should direct its efforts. Thus, the collective learning approach prevailed in Norwegian cooperative efforts with Russia and other Arctic countries.

From 1996 to 1998 the risk of nuclear pollution gained importance in Norway undermining the risk of nuclear proliferation. Radioactive contamination was perceived as threatening the country's environmental, economic and military security. At the initiative of Norway, the Contact Expert Group (CEG) for International Radwaste Projects in the Russian Federation was created under the auspices of IAEA in 1996. Its main objective is to serve as a forum for discussion and exchange of information in order to coordinate and facilitate international cooperation on nuclear risk reduction in the Russian Federation. Thus, it is a forum for collective learning on challenges posed by nuclear activities in Northwest Russia on a higher level than those created in the previous period, which was dominated by research reports and studies. It does not only include Arctic countries, but also those with no direct borders with either Russia or the Arctic. It is a more global arena for collective learning and construction of consensual knowledge created under auspices of such authoritative intergovernmental organization as IAEA.

Another collaboration forum on nuclear risk reduction initiated by Norway in this period is the Arctic Military Environmental Cooperation (AMEC) established in 1996. The aim of this cooperation - to reduce the impact of radioactive pollution from military sources on the environment in the North - clearly coincides with the Norwegian definition of the nuclear risk in the area. It is an environmental cooperation based on financial/technical assistance approach addressing the transboundary environmental risk. However, this cooperation was regional, including only Arctic countries until 2003.

The 1998 Norwegian-Russian Framework Agreement contributed to facilitate Norwegian participation in AMEC projects, by addressing the risk of implementation failure on the Russian side and thus applying the compliance approach. However, the framework agreement covered only one AMEC-related project originally and three additional projects since May 2000. These additions were considered as a temporary solution to improving Norwegian participation in AMEC. It appeared to be to Norway’s advantage to strengthen examination and audit rights (Sawhill & Jørgensen, 2001, p. 40). For the USA, for example, the situation was different, as it operated under its CTR Umbrella Agreement, which covered liability and transparency issues.

In the third period from 1998 to 2004, the recognition of nuclear risk as a risk of nuclear proliferation rather than the risk of nuclear pollution gained importance in Norway. It was presented as a threat to both environmental safety and military security. In this period Norway, as a result of the work carried out by the Bellona Foundation and its Inter-parliamentary Working Group, initiated and negotiated an international framework agreement, MNEPR, to ensure legal protection for environmental waste-management assistance projects in Russia. Norway also participated in the Northern Dimension

Environmental Partnership (NDEP) and the G8 Global Partnership against the Spread of Weapons and Materials of Mass Destruction. MNEPR established the necessary framework for facilitating broad international participation in improving radioactive waste and spent nuclear fuel management in Northwest Russia, thus applying the compliance control approach and reducing the risk of implementation failure. NDEP is focused on the environmental dimension of nuclear risk and the G8 Global Partnership on the military dimension. Both are based on technical/ financial approach to managing transboundary nuclear risk. Norway's framing of nuclear risk as the risk of nuclear proliferation in addition to the risk of radioactive pollution explains Norwegian participation in the G8 Global Partnership and contributions to the NDEP Fund. The MNEPR has proved to be vital in facilitating the work of these two collaboration forums as well as of other bilateral projects.

Thus, the international cooperation on nuclear risk reduction has been based on three support approaches both on the regional level involving Arctic countries and on a more global level, concerning non-Arctic countries as well. To address the transboundary environmental risk the approaches of collective learning and financial/technical assistance were applied. To answer the negotiated risk of implementation failure, the compliance control approach and financial/technical approach were used.

On both regional and global levels international cooperation with Russia started with knowledge gathering and information exchange about the scope of nuclear challenges in Russia's north-west. International forums were created to construct consensual knowledge on the negotiated environmental risk. On the regional level this work was carried out through such projects as Norwegian-Russian expeditions and IASAP, AMAP and Bellona's reports. On the global level, CEG proved to be an important discussion forum on nuclear issues. For instance, the idea of MNEPR was brought up at a CEG meeting; CEG also facilitated development and negotiation of MNEPR.[32]

The technical/financial assistance approach was applied by Norway on the regional level with the creation of AMEC, and on a global level with the creation of the G8 Global Partnership, the NDEP Fund and the IAEA’s Nuclear Security Fund. However, similar to IAEA, AMEC defines cooperation in terms of workshops, seminars, conferences, and exchange of information (Sawhill & Jørgensen, 2001, p. 25), in addition to technology development and funding of the projects in the Russian Arctic. Thus, both AMEC and IAEA are contributing to the processes of collective learning on nuclear risk issues as well.

Norwegian participation in AMEC projects was limited, however, until the signing of the Norwegian-Russian Framework Agreement in 1998, which addressed the risk of implementation failure. Nevertheless, this agreement proved insufficient for Norway’s participation in AMEC. There was a need for a broader framework that covered contributions of other countries as well, for example through the G8 Partnership and the NDEP Fund. Thus international collaboration on a more global level became possible with establishment of MNEPR which is based on compliance control approach and addresses the negotiated risk of implementation failure for all the contributors. Both NDEP and G8 Global Partnership Programme are based on MNEPR.[33]

Thus, compliance control is the third approach applied by negotiating parties to address the risk of non-compliance. The importance of managing this risk for successful international collaboration on transboundary risk reduction is enormous as the development of G8 Global Partnership and MNEPR has shown. When the Global Partnership was created, it was seen by many nations as, if not the final solution to Russia’s nuclear problem, then at least as a big step in the right direction. However, no nation seemed willing to be the first to

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[32] Minutes of the 20th CEG Meeting. IAEA. [On-line]. Available: http://www.iaea.org/OurWork/ST/NE/NEFW/CEG/documents/Minutes20eng.pdf
[33] Ibid.

start funding nuclear clean-up in Russia. One of the reasons was the lack of economic and technical transparency. Donor nations were simply informed of the amount of money needed to complete certain projects in Russia and asked to transfer the money to Moscow without any auditing and accounting rights. This was, however, the only way for the contributors to assist Russia in managing its nuclear problems. However, in 2002 it became known that a large amount of donors' money has been misappropriated and unaccounted for. Liability was another major issue for the donor countries (except the USA which operated under a liability accord under the CTR Umbrella Agreement) (Kudrik et al., 2004, pp.114-115). Thus the risk of implementation failure kept the donor countries away and impeded international cooperation on transboundary nuclear risk management. This is why the signing of MNEPR is seen as a large breakthrough for bilateral and multilateral nuclear remediation projects in Russia, opening a new era for nuclear threat reduction and environmental clean-up projects (ibid, p.116).

10. Conclusion and Suggestions for Further Research

This thesis attempted to show that in what terms nuclear risk is defined and which of its dimensions are emphasized directly affect what kind of international cooperation is initiated and what countries feel threatened by the risk and vice versa. A successful cooperation on nuclear risk reduction may thus change a country's definition and perception of the transboundary nuclear risk. As a consequence, the country may feel less threatened by the risk or switch to managing one of its other dimensions which did not seem vital before.

Both the risk of nuclear accident and of nuclear proliferation can be framed as a threat to economic, environmental or military security of a country. Norwegian experience with reduction of transboundary nuclear risk, which threatens its environment, population, economy and national security, illustrates that it is first and foremost the countries in the neighbouring regions with the risk bearer that feel threatened by the risk and hence initiate cooperation with the risk bearer and each other. They frame the risk in a specific way and gather information on it in order to establish consensual knowledge on how the risk is to be defined and managed. The next step is to provide the necessary technical and financial assistance to the manufacturer of risk, if it is unable or unwilling to manage the risk on its own.

However, to ensure that the aid provided is applied as it is supposed to, larger degree of transparency and accountability is needed, such as access, audits and examination rights to the donor countries, immunity of the donor personnel, in addition to exemption from taxes and fees on the aid offered. Thus the risk of implementation failure or non-compliance needs to be negotiated as well. However, this risk appears to be particularly difficult to address during the negotiations in this case. One reason for this is the fact that highly sensitive, national security information often surrounds military applications of nuclear energy. The fear of espionage and nuclear accidents caused by involvement of a third party is another reason for these difficulties (Sawhill & Jørgensen 2001, pp. 37-38). International management of other transboundary risks probably would not face the same difficulties as management of transboundary nuclear risk does. The source of risk thus might play an important role in determining how hard or easy negotiations of the risk of implementation failure are.

The case studied in this thesis attempted to analyse what strategies or combinations of strategies prove most successful when states negotiate transboundary nuclear risk reduction. According to my findings, the approach of collective learning proves to be the most useful in the beginning of an intergovernmental cooperation in order to gather more information on the issues at stake and construct consensual knowledge that can serve as basis for further development of negotiations. The next step is to provide technical and/or financial assistance to the risk source country in order to resolve the identified problems. However, as Norwegian cooperation with Russia shows, this approach does not prove successful until the risk of implementation failure is addressed. To achieve this, use of compliance control approach is necessary. The combination of these three approaches has been observed both on the regional Arctic level and on a more global international level. Thus, it is not limited to bilateral, regional or multilateral international cooperation.

However, the support approaches of collective learning, financial/technical assistance and ensuring compliance are not guaranteeing that the risk of ineffective abatement is addressed. There is no assurance that the abatement measures will produce intended results even when there is no compliance failure. Current agreements and partnerships may be insufficient to insure that all three categories of negotiated risk will be successfully managed. However, it remains unclear what approach is needed to reduce this risk. As mentioned before (see 2.6), the compliance control approach is likely to generate positive spill-over effects to the management of the risk of ineffective abatement, because the lack of compliance is likely to amplify abatement risks. Thus, the signing of MNEPR by Russia might be the solution to the risk of ineffective abatement as well.

Another question is: what approaches can be used by NGOs and IGOs in intergovernmental cooperation on transboundary nuclear risk reduction? Bellona’s studies and expert reports show that a non-governmental organization can serve as a producer of factual knowledge on the issues at stake and thus contribute to production of consensual knowledge both nationally and in international negotiations. Bellona’s reporting on the nuclear challenges in Northwest Russia has contributed to improved transparency on what was going on there and thus helped address the risk of compliance failure. Bellona’s involvement in negotiations of the MNEPR agreement also shows that a NGO can serve as a mediator, facilitating intergovernmental negotiations of an agreement. In this case an agreement which also addressed the risk of implementation failure. However, even if Bellona works both for increase in collective learning and compliance control, these two approaches can work against each other as mentioned in 2.6. Too strong emphasis on compliance control may impede collective learning. This may explain the problems Bellona is facing in Russia at the moment (see below).

The IAEA as an intergovernmental organization under the United Nations has also contributed to the process of collective learning on the issues of nuclear risk since its creation in 1957. However, with the establishment of the CEG under the auspices of the IAEA, a special forum designed for development of consensual knowledge and collective learning on radwaste problems in Northwest Russia has been created. Thus, similar to Bellona, the IAEA utilizes the approach of collective learning to facilitate international negotiations on nuclear risk reduction. However, in contrast to Bellona, through its Nuclear Security Fund the IAEA also applies the technical/financial assistance approach to address the military dimension of nuclear risk. Hence, a country can increase its own and others knowledge of nuclear risk both through NGOs and IGOs. However, as this case shows, IGOs may be more suitable for technical/financial assistance approach, while NGO's can serve as mediators during intergovernmental negotiations of an agreement.

It also remains unclear if these four support approaches are enough to analyze transboundary risk management. The compliance control approach, for example, only tells us how to make a state implement an agreement, but not how to make it sign it. Thus, it assumes that an agreement concerning transboundry risk reduction is already signed, and only the risk of implementation failure needs to be addressed. None of the four approaches tells us what is needed to make a state sign an agreement or treaty and commit itself to some international norms and regulations. As mentioned above, it took four years to negotiate MNEPR and two years to negotiate the Norwegian-Russian Framework Agreement. International politics are indeed characterized by anarchy, where no superior power can force a state to sign an agreement, if it is not in that state's interest. Thus, it is hard to imagine what fifth approach could be useful to make negotiations of intergovernmental agreements easier and facilitate international cooperation on transboundary risk management.

It also remains vague what country played the role of creative mediator, and wherever this approach was applied by any country at all. Was it, for example, Norway, with its initiation of AMEC, CEG and MNEPR? And is the role of creative mediator only limited to facilitating negotiations between two disagreeing parties? Or can a country working for involvement of more states and organizations in management of transboundary risks and expansion of international cooperation also be referred to as creative mediator? If this is the case, Norway can be said to have the role of creative mediator. According to the Norwegian Ministry of Foreign Affairs, it has been an explicit Norwegian goal to play a catalytic role in raising international awareness of and financial support for nuclear safety and security in Russia and to create multilateral mechanisms for this purpose (Hønneland & Moe, 2000, p.

28). Along with the United States, Norway was the first of Russia's international partners to become involved in nuclear safety cooperation (Traavik, 2005). The close cooperation with Russia over the past decade has given Norway a central international position in the field of nuclear safety. This position has made it possible for Norway to encourage other countries to participate in international projects as well as to address important issues during international discussions (Ministry of Foreign Affairs, 2005, p.15). Thus, if it cannot be said that Norway played the role of creative mediator during the development of the international cooperation on nuclear safety in Northwest Russia, the role of catalyst is certainly a good description for the Norwegian efforts. Still, what qualities are necessary for an actor to become a creative mediator? Is it money, power, willingness to act, military strength, knowledge, independence, proximity to the source of risk or something else?

And what role do non-governmental organizations play in globalization from above perspective? Are their role limited to knowledge production and information gathering on the issues at stake? Bellona's example has shown that they can also be initiators of important break-through agreements. However, according to the Bellona Foundation itself, in Russia they are regarded as a "necessary evil", because they invite independent experts and get external risk assessments, thus presenting the facts as they are, and not as it is convenient for somebody else. Bellona is also being accused of transforming itself from an ecological organization to a political organization or some kind of financial supervisors (Kudrik & Nikitin, 2007). This is a worrying fact, because it is possible that without Bellona's achievements Russia would not get the same amount of financial and technical assistance as they do today. Thus, there is a need to place NGOs as well as IGOs in the globalization from above perspective. As described in 2.4., Beck places NGOs in the globalization from below perspective. However, this thesis shows that NGOs can play an important role in intergovernmental negotiations as well.

Another question concerns the fact that only Arctic and Nordic countries engaged in the international cooperation in the first place, with other countries joining them later. An example is AMEC, where USA, Russia and Norway were the only partners since its creation in 1996 and until 2003, when the UK joined. Another example is the creation of NEFCO as early as in 1990 by the Nordic countries. Can the reason for this be differing perceptions of risk in different countries? Could it be that Arctic countries perceived the nuclear risk as the border-impact risk which affects populations and ecosystems in the border region on both sides of the boundary (see 2.3)? And did the non-Arctic countries perceive the risk as the point-source transboundary risk which did not concern them directly until the 2001 terrorist attacks in the USA? According to Sjöstedt, the context of crisis plays often an important role in transboundary risk management. An element of crisis with immediate or near-term negative consequences is often necessary to launch international negotiations in the first place. The rapid response to the 1986 Chernobyl nuclear accident was The Convention on Early Notification of a Nuclear Accident and the Convention on Assistance in the Case of Nuclear Accident or Radiological Emergency which were negotiated in a few months in 1986 (Sjöstedt, 2001, p. 283). Did the terrorist attacks in the USA create such a context of crisis? Did they contribute to the creation of NDEP in 2001 and the G8 Global Partnership in 2002?

Furthermore, the tree dimensions of nuclear risk presented here - a threat to environmental, economic and military security - are also socially and historically constructed. One important characteristic of nuclear is its international construction. As mentioned before, transboundary risks are constructed and agreed upon only when consensual knowledge is achieved during international negotiations. What other dimensions of nuclear are there? And could the existing dimensions be constructed differently? Could the economic dimension, for instance, include a threat to agriculture or tourism instead of fishing industry as is the case of Norway? Is it also possible that there are more dimensions to nuclear risk besides these three?

Is nuclear energy, for example, becoming more “legal” as the challenges of global warming are being put on the political agenda in more and more countries? This year the Norwegian Research Council has appointed a committee to study the opportunities and risks related to the use of thorium, an element that can be used as fuel in nuclear power plants, but which is claimed to be a safer and cleaner source of energy than uranium (Bjørnæs, 2007). Will the growing need of energy lead to redefinition of what nuclear risk is to Norway and to other countries? These are some of the questions that need to be answered in further research on transboundary nuclear risk management.

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