The Nordic Model revisited:
Focusing Events and Regulator as Proactive Agent in the
Norwegian Petroleum industry

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1 Introduction

During its 50 years of existence the Norwegian Petroleum risk regulatory regime has been shaped by focusing events, changes in public risk perceptions and public action (see Chapter x, Chapter y in this book). Through close interactions between the Norwegian government, the oil companies, the supplier industry and the unions, the shaping of the regulatory frameworks has been characterized by shifting alliances, power relations, trust and distrust. Focusing events have thus created policy arenas for change, but also influenced the relationships between the involved actors and created institutional settings in order to regulate risk and safety.

To some extent we may say that the Norwegian risk regulating regime was created out of two major crises. In 1977 and 1980 two large accidents on the Ekofisk field in the southern part of the North Sea took place; the blow out at the Bravo oil rig and the capsize of the oil rig Alexander L. Kielland. The first was a public eye opener concerning potential environmental consequences of offshore oil production in the North Sea and the other was the largest industrial disaster in Norway since the Second World War with 123 human losses. Both focusing events mobilized public opinion and brought the debate about safety on the public and political agenda as well creating a process of self-reflection and renewed effort within the industry (Lindøe et al. 2011). From a regulatory point of view the accidents represented a big shift on the policy agenda and led to a regulatory paradigm shift from an old reactive regime based on prescriptive and technical requirements towards a risk based, proactive regime with functional legal requirements. The regulatory regime after Alexander Kielland in 1980 differed from the old regulatory regime in several respects, particularly with regard to partnership between public regulators and industry, supervising and fostering self-regulation by industry, the involvement of labor force and other stakeholders and the issue of mutual trust among the parties.

This chapter addresses the impact of focusing events on regulatory regimes such as the Norwegian, and will particularly show how such events may influence the organizing of the working life and safety of the petroleum sector. In order to understand substantive policy change in Norway which may stem from focusing events and crisis, we will introduce the prevailing organizing principle of industrial relations in Scandinavian countries; namely “the Nordic Model”. The principles of the Nordic model of risk regulations have thoroughly been analyzed in Lindøe et al (2014) where it also has been compared with familiar risk regulatory regimes in UK, US and Australia. The main objective of the analysis in Lindøe et al (2014) is to compare different traits of robustness of the four regimes respectively. Accordingly this article follows up the robustness perspective in relation to crises and further connects this to learning and change.

The chapter is organized as follows. First we will briefly introduce the Norwegian context and the basic principles on how the petroleum industry in Norway is organized. Thereafter we will go through principles of regulatory regimes and the basic characteristics of the Nordic model. This discussion is followed by a conceptual introduction of the regulatory regime analyzing
state/public and private/industrial partnership by combining safety management system (self-
regulation) with public/state regulation with legal binding laws and regulation. Third, the
impact of focusing events on the Norwegian petroleum regulatory risk regimes is discussed
respectively and the article is finalized with a discussion of the robustness of the regime
today.

2 The Norwegian Oil Industry
The regulatory foundations of Norway’s oil industry were created in the 1970’s with the
establishment of Statoil, the Norwegian Petroleum Directorate (NPD) and the Ministry of Oil
and Energy (MOE). From its establishment in 1972, Statoil became the main instrument of
the state in developing Norwegian petroleum competence and relying on the concession
system to strengthen its dominance. Agreements regarding training and transfers of
knowledge and technology from other companies were negotiated, and Statoil itself took the
role of intermediary in delegating tasks to Norwegian industry. Industrially, the company
contributed greatly to technical and organizational adaptation by utilizing traditional industrial
networks and functioning as an agent transferring and adapting international petroleum
techniques and competence.

The outlook for long-term production and positive investment returns also induced the
international oil companies to be flexible in meeting the demands of public officials regarding
their development strategies, choice of suppliers, and measures to transfer competence to
Norwegian companies and research institutes. This form of governmental organising for a
national petroleum industry is fully compatible with what Michael Porter denotes an “infant
industry policy”, and it contributed to the creation of a petroleum industry cluster in Norway.
Representatives of the Norwegian government considered these terms as absolutely necessary
for securing the greatest possible share of oil profits for the Norwegian society.

The UK developed a regulatory framework for exploitation of its North Sea oil and gas
deposits that resembled that of Norway in many respect. The UK government initially
implemented a petroleum tax system and a system of handing out licences, and established
institutional bodies to oversee offshore exploration and production. But developments in the
UK domestic oil industry followed a different path from that of Norway after the 1970’s.
Only the Norwegians pursued the “infant industry policy” during the eighties, while the UK
chose to deregulate and de-emphasise active governmental participation. In general, we may
say that UK oil policy in the eighties consisted of little more than a passive concession
practise that relied on a tax policy that was compatible with the objectives of the Thatcher
government (Engen 2009).

As the Norwegian oil companies and main suppliers gradually built up their competence in
the shelter of a protectionist policy, the public administrative apparatus for oversight of the oil
and gas industry matured. The formation of NPD in 1973 followed traditional administrative
practice (Olsen 1989), and the Directorate engaged personnel with little experience in the
petroleum industry, frequently resulting in an inflexible approach to regulation of the
industry. This rigidity began to change in the late 1970’s and 1980’s, however, as NPD built up independent competence to handle complicated technical problems and complex development projects.

With respect to economic policies, Norway has been different from other “Petrostates” in two important ways. First, the prevailing institutional framework in Norway helped to better integrate the international oil industry into the existing industrial structure, created channels for technological transfer and national competence upheaval, and laid the foundation for a Norwegian oil industry that is able to compete in the international arena. Second, the political system has to a certain extent managed to contain itself in order to allocate rents over time and restrict the overspending of a public fortune. The concession policies have, at least to some extent, prevented an excessive petroleum depletion rate, and the main objective of the country’s petroleum fund is to prevent politicians from spending too much money for the purpose of being reelected (Engen et al 2012).

Economically speaking, the petroleum industry is the largest single item of the Norwegian National Account and also an important driver for the industrial structure particularly along Norway’s western coast. In 2014 about 250,000 people are employed in the petroleum industry, and considering that Norway’s work force is about 2.5 million people, the significance of the sector is obvious. Other factors are the sunk costs, technological competence, and research activities connected to the oil system. Many of the engineers educated in Norway today have hopes for a future in the oil business. Energy research in Norway is also closely connected to the oil system. About 90 percent of the country’s energy-related research focuses on oil and gas. The petroleum industry accounts for about 15 percent of the Norwegian GDP and contributes to regional development, low unemployment, and economic and technological growth.

2.2 The Norwegian risk regulatory regime
So how to characterize the Norwegian regulatory regime when it comes to risk and safety? The concept regime connotes to the overall way risk is regulated in a particular policy domain (Hood et al 2001). A regulatory regime consists not only of rules and enforcement mechanisms, but also includes everything from overall policy to concrete implementation, stakeholders and agencies at various levels, as well as all formal and informal mechanisms that keep the regime together. A certain amount of stability and durability over time will also characterize a risk regulatory regime, although dynamic, changing processes and interactions between elements are important topics in regime studies. The term “robustness” is therefore useful as we attempt to capture the totality of the elements in a regulatory regime and where we also want to include normative descriptions when it comes to performance.

The economic organization and working regulation in Scandinavia it is often referred to as “the Nordic Model” (Moene et al 2009). “The Nordic model” refers to a high degree of formalized industrial relations. This implies a centralized organizational structure but at the same time a trinity of cooperation among employers, employees, and the government
concerning economic policy, exchange of information, and consultations at different levels of
the industry. Such institutional integration also supported a national system organizing the
collective negotiations between employers and employees and moreover contributed to the
institutionalization of oil companies according to the formal and informal rules of the
Norwegian institutional setting. The working conditions offshore were subjected to the same
legal framework as the working conditions onshore. The Environmental Act in 1977 gave
employees in Norway extended privileges in general and became a powerful instrument for
offshore workers in terms of influencing security and safety regulations. A safety deputy, for
instance, had the same power as the platform manager to stop the production stream if there
was any suspicion of technical or organizational irregularities that could increase the risk of
undesirable incidents.

The Nordic model is further characterized by institutional frameworks organizing and
regulating negotiations, wealth distribution, and conflict resolution. Conflicts between parties
are solved through extensive laws and systems of agreements. Historically speaking, the
Nordic model implied that employers supported unions and their professional activities to a
certain degree. Moreover, employers have several times been forced to de-emphasize short-
term profit goals to advance longer-term managerial objectives. The success of this policy
may be explained by the strength of the unions in national and local political processes. From
this perspective, we may say that the Nordic model has functioned as a stabilizing factor in
Norwegian politics and society. It has formed and shaped the political strategies concerning
how to balance a growing resource economy with other economic sectors, how to find balance
between the public and private sector, and finally how to consider challenges created by the
fact that petroleum is a nonrenewable and exhaustible resource.

The Nordic model is based on three pillars; “a trinity of collaboration”- involving employer,
employees and the government. Safety and optimal working environment is one of the
cornerstones of the model. A common feature within the Nordic model is the in-house use of
an «Occupational Health and Safety Organisation» that offers three different collaborating
structures. First, Safety Committees provide opportunities for employer and employees to
meet and discuss important issues. Second, there are independent and autonomous
«institutions» as Safety Representatives and third, there are a number of experts on
occupational health and safety, who may be called upon in disputes, either as an in-house
service or external consulting expertise.

While the US offshore regime can be characterized as “Command and Control” with a top-
down approach where regulators demand that the industry comply with the rules that they set
down, the UK and Norway follow principles of enforced self-regulation thereby relying on
the capability of the industry to manage their own risks according to accepted norms and
standards. The Norwegian regime goes even further in developing a tripartite system based on
egalitarian values and mutual trust among involved actors. In its welfare state model, Norway,
promotes a symmetrical partnership between public agencies and industrial actors, which
involves labor unions in parallel with the asymmetric role of sanctioning industry for violation
of law. This differs from a command and control regime with regulators requiring that
industry must comply with the regulators’ rules or be punished (Baram, Lindøe & Renn 2014).

3. A framework for risk regulation and risk management

Within the “The Nordic Model” a particular system of legal framework has developed. This kind of framework is partly the result of the historical process of the petroleum safety regulation regime and partly on how combinations of risk regulative goals and Norwegian legal system have been exploited (Lindøe & Engen 2013).

Modes of risk regulation can be seen as discussion of the pros and cons of rule-compliance vs. risk management (Hopkins 2011), with a distinction between “hard regulation” based on “Command and Control” with prescriptive rules and “soft regulation” with concepts coined as “self-regulation” (Sinclair 1997, Short and Toffel 2010), «meta-regulation» (Gilad 2010), etc. An important question is whether these modes of regulation represent a dichotomy or whether they are complementary. Our argument follows Sinclair (1997), stating that the dichotomy is false. In practice risk regulation regimes will combine responsibilities and roles in a public-private partnership with a top-down approach with legal binding norms and a bottom-up approach with industrial standards and “best practice”. The use of legal standards becomes a “linking pin” that brings the two approaches together as indicated in the right part of figure 1.

![Figure 1 Two modes of risk regulations](image)

The Norwegian risk regulatory regime is typically function based. Function-based regulation needs some form of discretionary criteria that are considered as legal standards and provide some special interpretation challenges. The term "legal standard” refers to words or phrases in a law claim that stipulates a scale or norm beyond the law i.e a particular practice, widespread attitudes in the community or other conditions that change with time. All the while these phenomena change over time, the contents of the law do not. The use of legal standards aims to achieve an appropriate regulation of complex fields in constant
development. It can also be seen as an expression of respect for the importance of expert knowledge to ensure the safety and quality in key areas of society. The use of “legal standards” in two laws regulating Norwegian offshore industry is illustrated in figure 2.

Legal standards probably safeguard the goal of safety and quality better than if they had been fully formulated in laws and regulations. The underlying measure of the legal standards is based on an understanding of the issues, terminology and solution that are understood in the professional and scientific community. Through stakeholder involvement in the process of developing these norms, the use of legal standards may enjoy greater legitimacy than rules based on legal terminology and legal text.

A consistent application of a function-based regulation requires a comprehensive and systematic review on how the various provisions are to be understood and how the appropriate standards should be used to meet the requirements. Procedures must provide relationships between laws and regulations and technical/professional standards to comply in accordance with the laws and predictability in relation to supervisors' evaluations. For the regulatory authorities and inspectors this can be a demanding and comprehensive system to keep up to date, and it requires that the standards keep pace with developments and new knowledge. Comprehensive guidelines may also be an excuse for companies for not taking responsibility in monitoring and implementing new recognized expertise and scientific knowledge.

The Nordic model of risk regulation with stakeholder involvement, tripartite collaboration and internal control may in principle be described as a balance of power between state control and industrial degrees of freedom. Figure 2 illustrates risk regulation combining a bottom-up perspective of “self-regulation” (System I) with a top-down perspective of state control (System II).\(^1\)

Figure 2 State control vs. industrial internal control

Figure 2 can be read from the bottom-right. Economic activities within enterprises and industries are developing new technologies with input and support from many different sources; innovative entrepreneurs and suppliers, demanding customers, etc. A basic property for the enterprises is to exercise control over its production-system to minimize cost, following established industrial standards, and hamper loss. Reducing uncertainties and risk are improved by introducing rules and standards, procedures or routines guiding individual and organizational behavior. “Best practices”, being codified by industrial and scientific communities as industrial and technical standards, include safety managing systems ensuring (1) occupational health and safety, (2) protection of the environment and (3) technical integrity and safety. The development of industrial products and services is supported and enhanced by an array of managerial tools and means coined as “quality management” and organizational and technical standards. This process is enforced by global markets and the role of the national and international standardization organization (ISO). If industrial activities and their products and services are within accepted norms from the society at large the production system could operate without intervention and claims from external regulators. We may denote this mode of “self-regulation” as System I. It represents a bottom-up-process (A) where the mechanism of “self-regulation” represents a learning loop of continuous improvement within the industries.

Industrial activities based on System I and the state as external controller following System II are developing different path and logics of standard setting and adaptation to safe practice. That implies that adjustment from one system towards the other represents a change in goal setting, use of legal binding norms, industrial standards, professional and legal competence, etc.
Responsibilities regarding the safe conduct of activities transferred or delegated from regulators to companies, provide for new cooperative approaches in the implementation of regulatory regimes (Olsen and Lindøe 2009). In Norway this transfer took place after major focusing events and became guiding principles for the regulators i.e extensive self-control and degree of freedom for the companies however under strong surveillance of the regulatory agencies.

4 Focusing events and Public Policy in the Norwegian context

According to Birkland & Warnement the “influence of focusing events on policy change, regulatory change and other behavior of regulators themselves would account for the fact that policymakers, at whatever level government of responsibility, do not sit and wait passively for directions from subordinate levels of government. Indeed, regulators may have strong incentives to be seen as proactive problem solvers.” (Birkland & Warnement pp xx in this book). Taken out of context this could be a perfect description of Norwegian regulator bodies either acting after a major crises or in the aftermath of less serious incidents. The Nordic model of risk regulation has as mentioned above been event driven where the events have opened up a window for policy change. This opportunity has however more often been utilized by regulatory agents than politicians in order to change the regulatory modes for safety and sophisticate the system i.e. show evidence from learning from the events. In this section we will walk through the phases of the development of the Nordic Model and highlight certain focusing events that contributed to the forming and shaping of the Nordic risk regulating regime offshore. According to the model in the chapter by Balleisen et al (in this book), we will argue that the Norwegian risk regulating regime has undergone one substantive policy change and several following cosmetic makeovers which together provided its character.

4.1 The Aftermath of Bravo & Alexander Kielland

As mentioned above, the blow-out on Bravo (1977) and capsize of Alexander Kielland (1980) marks a paradigm shift in the Norwegian history. The two accidents served as focusing events in two ways. The first underlined the environmental risk of offshore oil production and even though environmental perspectives had been discussed at the very outset when the international oil companies approached the North Sea, the Bravo accident visualized not least through a huge international media coverage what kind of environmental forces that actually could be activated. Accordingly the blow-out on the Bravo platform in 1977 was a wakeup regarding the environmental risk, while the capsizing of the Alexander Kielland platform with 123 lives lost became a shocking reminder of the human risk. The newly established Norwegian Petroleum Directorate (NPD) started a process of developing new regulations, and in 1981 new rules concerning licences’ internal control were established, followed in 1985 by the Regulation of Internal Control. The Bravo accident, but particularly Alexander Kielland illustrates how policy makers and regulators have strong incentives in being active problem solvers. This was also amplified by an enormous public focus and media attention followed
by new collective narratives about risk and responsibility connected to offshore industrial activities (see chapter xx by Mayer in this book).

According to Bang & Thuestad (2014) the Alexander L. Kielland induced an overall goal of simplifying and enhancing the efficiency of risk regulation on the Norwegian continental shelf in general. The accident had underlined the importance of being able to establish and maintain a high level of safety with clear regulatory boundaries. Hence the regulatory regime that was established consisted of two elements: A single agency - at that time the NPD - was assigned responsibility to draw up detailed regulations and to make overall safety and working environment assessments. Formal agreements with the pollution control authorities for the natural environment and with the health authorities for health-related issues were also negotiated and implemented. Coordination and support between many different governmental agencies represented however a new approach to administration and differed from the common model which implied that single agencies were responsible for their individual aspects of safety and working environment.

This coordination of supervision gradually identified the need for developing a joint set of regulations based on a number of overall considerations, including safety and the working environment, the natural environment and occupational health. The industry response was not only that the reform represented a clear simplification and efficiency enhancement, but the more integrated HSE-regulations also made it possible and stimulated to a greater degree of participation and collaboration in influencing risk regulation in general. The regulator could now supervise the business on a more unified basis. However the challenge became to handle collaboration issues and possible conflict of interests across government agencies through formal procedures and agreements in order to ensure that the system functioned well in practice.

While the Alexander L. Kielland catastrophe had impact on the regulatory regime, the general political consequences were more moderate. The opposition was reluctant in criticizing the government and thereby obtaining political benefits. Accordingly, no minister or industrial managers were forced to leave their positions. The political turbulence that followed in the aftermath of the accident was more connected to how the memorials should be organized, not channeling the responsibilities in any particular direction. However, Alexander L. Kielland became a part of the Norwegian collective narrative of the cost and risk of being an oil producing country (Ryggvik & Smith Solbakken 1997, Ryggvik & Øye Gjerde 2011) and created a momentum towards new regulatory approaches.

4.2 Focusing and amplifying event: Piper Alpha

From a perspective of “focusing events” the Piper Alpha disaster in 1988 played a similar role on the British continental shelf as Alexander L. Kielland on the Norwegian shelf. While Alexander Kielland was a drilling rig with a flotilla that overturned because one of the platform legs broke, Piper Alpha was a productions platform where the accident was induced by a fire and explosion within the production facilities. 167 people were killed. The accident
sent shock waves in the entire international petroleum industry and created a redesign of the British regulatory regime and to other petroleum regulatory authorities as well. The investigation reports revealed a complex mixture of failures on all levels rooted in culture, structure and the procedures of the operating oil company (Occidental Petroleum), but also underlying factors such as short termed financial focus, lack of coordination by regulatory authorities and neglect of safety issues by the British government (Patè - Cornell 1993).

The second volume of the Cullen Report (1990) on the Piper Alpha disaster of 1988 played a major role to change the regulatory regime, both through its recommendation of a specific HSE regime and by spreading Formal Safety Assessment (FSA) presented as «Safety cases» to other industries. To some extent the British safety regime looked to Norway when redesigning its regulatory regime. The HSE requires that all operations are covered by detailed safety cases in which potential hazards, their consequences, and the methods of controlling any risks are described and explained. The overall responsibility for safety on an installation falls on the Safety Case Duty Holder who appoints an Offshore Installations Manager (OIM) to discharge this responsibility. In the case of mobile drilling rigs, the duty holder is the drilling contractor. This is similar with the principle of internal control at the Norwegian sector which implies that responsibility is assigned the operator. Before an operator brings a drilling rig into the UK or operates a fixed platform, they have to prepare a safety case for the Health and Safety Executive to approve. The Operator, or Licence Holder is subject to separate and additional verification requirements under the Design and Construction Regulations in the form of well-examinations carried out by an independent and competent person. All parties involved have legal duties to cooperate with both the OIM and the Well Operator when the well is under construction. The Safety Case Duty Holder and the Well Operator must demonstrate how their safety management systems will operate together, who has primacy in an emergency, and who has overall responsibility. However as argued by Patterson (2014) the safety case approach may remain the best option among alternatives (especially detailed prescriptions), question remain as to whether it has been implemented as well as it might (Paterson 2014).

The consequences on British offshore regulation after Piper Alpha were a confirmation that the Norwegian regulatory regime was on right track. According to the official Norwegian petroleum history, Magne Ogedal (the leader of the Safety Department of NPD) was assigned a significant role in the public hearings after the accident - apparently so momentous that the Cullen report by certain British observers later on was nicked-named “the Oggedal Report”. (Ryggvik & Smith Solbakken 1997). Accordingly, the process in the aftermath of Piper Alpha illustrates how regulators play a vital and proactive role in redesigning the regulation. Even though there were no criminal charges against the companies, the impact on the Scottish society and the British regulatory system was similar to the Norwegian experiences after Alexander L. Kielland. From a Norwegian perspective we may also claim that the influence of the “Nordic model” on the British process and the direct participation of central Norwegian regulatory agents also contributed to strengthen the Norwegian system and induced further regulative developments on other industrial sectors. In Norway the general regulations relating to internal control regulation on Health, Environment and Safety, which
came into force on January 1, 1992 was to a large extent inspired by the positive experiences from safety regulation in the North Sea after the large accidents.

4.3 Challenging the Nordic model: NORSOK, Snorre, Gullfaks & Deep Water Horizon

The regulatory regime established after Alexander Kjelland was challenged from many directions. Among the Norwegian authorities and the regulatory agents a similar accident as Alexander Kjelland was unthinkable. At the same time there was also an increased consciousness among the industrial actors and certain representatives from the government that the general cost level of developing petroleum fields on the Norwegian Continental shelf was far too high. This was clearly visualized by the general fall of the world oil prices in the mid-eighties. In 1993 a Norwegian cost efficient program was introduced denoted NORSOK. NORSOK (an abbreviation for “NORsk SOkkels Konkurranseposisjon”, in English “The competitive situation of the Norwegian Shelf) was an industrial program for development of new technologies and standards, organisational development and new contractual relations, regulations, and new initiatives for co-operation and negotiations between oil companies and their suppliers. The main objective was to reduce average costs by as much as 50 %. The program was inspired by the similar British initiative, CRINE (Cost Reductions In a New Era). NORSOK represented a break with the infant industry policy of the seventies and eighties and a political shift from an active and interventionist oil policy to a more passive one that sought to link various actors rather than dictating terms to them. NORSOK introduced a process that allowed the both oil companies and main suppliers enjoyed greater freedom when choosing technological concepts, subsuppliers, location of bases, headquarters etc.

The incidents and number of accidents however increased during the nineties. According to Hovden (2003) several trends in the risk picture could be identified: First an increase in major hazards related to problems with gas leakage, and second increased risk and uncertainty regarding the safety level for floating installations. This was mainly related to new technology. The Norne accident in 1998, a helicopter accident at the Norne field in the Northern part of the North Sea, illustrated very clearly the high risk arena of shuttle traffic by helicopters. 12 people died. There were also increased accidents related to the activities of service vessels and increased vulnerability caused by increased use of ICT systems, automation and reduced manning on the installations. However, most studies showed low and stable frequencies of occupational accidents.

The exact reasons for these incidents and accidents are not unambiguous. Some are due to lack of maintenance, but also a large part can be traced back to new technology and contractual relations. The investigation report after the Norne accident discusses how tighter schedules and increased use of rotating teams increase the risk of such type of accidents. Norne is also a floating installation with reduced capacity with respect to living quarters and therefore also dependent on shuttling people more frequently. New contractual relations implied that the oil companies became less responsible for design and accomplishments of the development projects and also less responsible for general HSE. The increased economic pressure combined with lack of knowledge and experiences in risk and safety management
constituted new vulnerabilities and reduced robustness in the socio-technical system. Accordingly the glue that characterized the governance structure and institutional mechanism of the Nordic model was put under pressure. NORSOK implied shifts in the technology and organization and the regulatory system - as exemplified with Norne - was not able to follow up the requirements of new technology and working procedures. If we refer to figure 2 we see an institutional inertia where risk regulation and safety management were sacrificed on the altar of new cost efficient technological solutions (Engen 2014).

Either the Norne accident or other smaller accidents or incidents on the Norwegian shelf changed the regulatory regime in a substantial way. There were heavy discussions concerning changes, but the main principles established in the wake of Alexander Kielland remained more or less stable. The struggle of cost efficiency, increased rate of accidents, and the processes of the NORSOK program induced periods of conflicts between different groups of actors. The unions expressed distrust towards the oil companies which strained the climate of collaboration concerning safety. Just before the millennium shift, this controversy threatened to disintegrate the tripartite collaboration on HSE. The Norwegian historian Helge Ryggvik (2003) has characterized the Norwegian HSE controversy in 1999 and 2000 as the “major accident that never happened” and accordingly it can be considered as a focusing event because it induced action both from the Norwegian politicians and regulatory agents. In September 2000 the NPD issued a letter to the licensees on the Norwegian shelf requesting new actions to improve safety. Two regulatory bodies for collaboration were established, “Safety Forum” and “Working for safety”. In 2001 NPD launched the project “Risk Level on the Norwegian shelf in order to get a better control of risk governance and management and close to Christmas 2001 the Ministry of Work and Administration issued the white paper “About health, environment and safety in the petroleum sector”. Altogether these events opened up the window for the regulatory agents to sophisticate the principles of tri-partite collaboration which implied facilitating arenas where unions and industrial associations meet regularly in order to discuss safety issues. Such ability of self-correction as response to focusing events is important for the resilience of a regulatory regime. Such processes may be described as “boxing and dancing” where the authorities “promoted a process where converging sense making and the development of organizational structures for collaboration mutually reinforced each other” (Rosness & Forseth 2014, pp 336).

During the first decade after the millennium shift there was only one substantial incident on the NCS, namely the Snorre A incident. Snorre A is a floating installation in the north of the North Sea and operated by Statoil. In 2004 a gas leakage was discovered and the platform became evacuated. The investigation report showed afterwards that it was only a minute away from ignitions and a very serious accident. The Snorre incident created a lot of attention in the media, but also in this case there was not any serious debate whether the ground principles in the Norwegian regulation model should change. Statoil was however challenged both from the PSA and the Unions to improve their procedures concerning compliance and learning. Several internal organizational programs where introduced, but these programs were to a certain degree overshadowed by the merger between the two biggest Norwegian Oil companies Statoil and Hydro Oil & Gas in 2007.
The next focusing event unfortunately happened between December 2009 and May 2010, when the Gullfaks C field, operated by Statoil, was subjected to several critical incidents with leakages of hydrocarbons from wells. The initial well trajectory was plugged during the fall of 2009, and drilling in a sidetrack well started in December 2009. During the next couple of months, Statoil experienced three serious well-control incidents in the well, the most critical one resulting in a complete loss of well control on May 19, 2010. Again, the investigation showed that the incident was only minutes away from becoming a full-scale disaster. An assessment was made by an independent research institute. The strong Norwegian environmental group Bellona used the report as an indication that Norway the sooner the better should adapt EU-regulations in order to avoid major oil pollution in the future. In this case, Bellona proposed a major critique not only towards Statoil, but also towards PSA and thus the Norwegian regulatory regime in general.

The Gullfaks C incident became a focusing event on the Norwegian shelf that triggered the Norwegian government to start an evaluation of the character of the robustness of the regulatory regime. Two large investigations were launched: One carried out by the Norwegian Petroleum Safety Agency (PSA) and one independent carried out by a Norwegian research institute. PSA’s report aimed to clarify to what extent Statoil had met the regulatory safety requirements related to the planning and preparation process for the well. The investigation points to deficiencies in connection with risk management and compliance with internal requirements for drill operation planning and execution. In sum, it was identified that Statoil had specific challenges related to the quality of the planning process, quality and precision within execution processes, risk comprehension, compliance and management.

Based on the PSA report, Statoil was requested to further clarify why such an incident actually happened and identify and carry out improvements concerning quality and resilience in the organization as a whole. Statoil interpreted this request as an instruction to accomplish an independent study and after a procurement procedure, the International Research Institute in Stavanger, Norway (IRIS) was assigned the task. The report was critical towards Statoil and created a public debate after being published, including the Question Hour in the Parliament.

Gullfaks C happened in the international context of Deep Water Horizon which fortified the incident as a focusing event and created further momentum, media and NGO pressure not only in Norway, but also among most European countries. After the Macondo disaster, members of the EU Parliament raised the question of how robust the existing risk regulatory approaches for offshore health and safety regulation were among the member states. The authorities and industry in Norway and UK formed groups with the purpose of reviewing and assessing lessons learnt to make necessary recommendations with regard to well control and safe offshore operations. In UK, some instances rapidly declared that offshore regulatory standards, as exemplified by the “Safety Case Regime” were superior to those which were found in the Gulf of Mexico at the time of the Deep Water Horizon disaster. Both in UK and Norway, the reaction towards those who wanted to utilise the focusing event as an engine of regulatory change was unambiguous: the functionality and robustness of the North Sea regulatory
regimes the best way of organising safety which implied that redesign towards a more standard prescriptive directions was not applicable.

5 Conclusive discussion

The major accidents occurring in the North Sea during the 1970s and 1980s brought the issue of technical safety and integrity on the offshore installations on the political agenda. The global oil and gas industry has many common features. Major operators, entrepreneurs and sub-contractors are operating with similar exploration-, drilling- and production- equipment and procedures. They are subject to similar industrial standards created by a network of experts within an international scientific and technical community. These activities involve sophisticated analytic methods, advanced engineering, large scale investment and complex projects. They must be managed appropriately to ensure that benefits are gained without incurring major accidents and other unacceptable harms to the public, the workers involved, and the human and natural environments. However, major accidents such as the Macondo blowout and oil spill in the Gulf of Mexico in 2010, and near accidents Snorre A and Gullfaks C in the North Sea the last years have demonstrated that combining productivity and safety is still a major challenge, particularly in deep-water regions and other difficult areas.

In a dynamic relationship and mutual learning across the North Sea, the regulators on both sides developed a regime promoting technical integrity and safety with core elements such as risk assessment and documentation, continuous improvement and learning, involvement and legitimate role of stakeholders and development of technical standards and norms. It follows the logic of System I claiming control over the production-system by minimizing costs, controlling deviation from established norms/standards and hampering loss. In developing an effective control mechanism, a dilemma arises. Reducing uncertainties and risk are improved by introducing rules and standards (expressed as procedures or routines) guiding individual and organizational behavior. By increasing the degree of procedures, technical processes as well as human activities and practices became more predictable and safer. However, by increasing the control-regime (e.g. proceduralization) the opportunity set for adapting to unexpected events, experimenting, technological change and innovative solutions are reduced (Bieder and Bourrier 2013). The mechanism of the “cybernetic loop” in System I is designed to promote internal risk assessment proved against the industries’ own technical and professional standards. However, the precondition is a relationship among stakeholders that promotes trust and mutual learning (Tharaldsen 2011). In System II the regulatory agencies are gathering information from the industry, setting detailed standards and imposing sanctions to control industrial behavior in a relationship tending to be antagonistic.

Focusing events have formed the Norwegian regulatory regime and strengthened its robustness. The Norwegian regime is function-based. Compliance with such kind of legislation rests on a number of assumptions, not least that there is trust between the regulators (Ministry, PSA), companies and industry-partners i.e. both employees (unions) and employers (industry associations). “Trust” means that the people/organisations that interact with each other act in expected ways. To rely on another means further that one expects that
the person or organizations will for example use the functions-based system and framework of norms in a way that is in accordance with the rules and overall objectives. However displaying trust in others makes oneself also vulnerable in relation to the same “other”. They might act differently than expected, and opposite one’s own interests and desires. In a regulatory regime such as the Norwegian the robustness is fundamentally based on trust between the key players, but where trust is a vulnerable concept and may easily turn over to distrust. In a function-based and trust-based system where distrust always is a possibility, there is a vulnerability built in as a potential risk and thus a threat to the robustness of the system. In order to make the function based system work there have to be mechanisms that balance trust and distrust between the actors. Such mechanism may be governmental agents that act as mediators or facilitators. However playing such a role also assumes a certain kind of trust from the other players and power to exercise such a role.

Hence to reduce vulnerabilities of fragile trust relationships is through power relations and the exercise of power. “Power” can be defined as a persons’ ability to achieve his/her will, despite resistance from others. Maintaining authority e.g. through governmental actors such as PSA may reduce vulnerability by exercising its legitimate power through legally binding rules and following up with sanctions. Strong governmental agents can exercise power by binding up companies and suppliers and thereby reducing the scope that occurs in the space of legal standards. In the Norwegian safety regime there has traditionally been established a balance of power and trust (Balance between System I and II). The way this is done in the future has great significance for how risk is managed, robustness is maintained and how development and change may occur.

The function-based regulations give greater leeway than detailed and prescriptive rules would. By “greater leeway” we mean that both companies and the PSA have been given autonomy to decide how they will handle the HSE field compared with the action potential that prescriptive regulations could provide. But the regime rests on the assumption that the involved parties have a common interest in that the system is maintained and that the conflicts of interest that may arise will naturally be solved without threatening the foundation of the trust between the involved parties. How much power each of the involved agents actually will possess will vary depending on the character of the event. Over the last 10-15 years we have seen several examples where the parties have used their power base in a way that has reduced their trust in each other, and in some cases it has turned into distrust and blocking of cooperation. Such situations have often occurred in connection with focusing events such as Gullfaks C.

However a hierarchy of norms may develop into a system characterized by complexity. Overlapping legislation, legal standards, standardization and detailed management documentation (for companies) are further challenging aspects of the robustness of the Norwegian regime. To master such complexity requires knowledge and skills, but it also gives power to those who possess knowledge i.e handling and navigating in the system. For those who do not handle complexity, this can easily develop into distrust towards those who possess knowledge. Complexity thus creates an imbalance between power and confidence, as those
with competence get increased power, while those who lack knowledge respond with distrust. Such a disparity can be further developed where there is a significant scope to apply industry standards or other "best practices". New studies also show how unions in Norway are experiencing an increasing lack of knowledge, while at the same time reducing their confidence in the function-based system.

The function-based character of the Norwegian regulatory regime also opens up for processes where focusing events may result in that the HSE field is being politicized. "Politicization" refers to how a field like health, environment and safety, where the agents basically seek neutrality and academic reasoned decision making, instead is becoming a political "battlefield". This happens because different groups have different interests in the field, and where the groups who have the formal power to protect their interests also use this power directly in the decision making processes. Politicization is not a problem in itself, but may affect the robustness of the regime, for example where such processes end up in questioning the legitimacy of governmental agents such as PSA. Politicization may in other words disturb trust and power relations. Politicization of the Nordic regulatory model is thus problematic because decisions may be made on the basis of "random" policy and to encourage intervention without clear theoretical or normative grounds such as risk analysis, ALARP principles and cost benefit analysis. In this context we may also claim that politicization has the same effect as risk narratives. It could create and fortify changes, but also exclude rational actions and risk decisions.

The function-based character of the regulatory regime creates a large degree of autonomy for how employers and companies can design the safety practices they think are appropriate. Such autonomy can be advantageous for employers in several ways, also financially. It has not least an intrinsic value for the employer side because they can decide the choice of means by themselves instead of being overruled by the authorities. Similarly, the employees have a vested interest in the regime because it gives them relatively large influence - at least formally. This is provided through the formal arenas for collaboration. The regime has thus given unions more power than other regulatory regimes would provide. The various groups' use of power to protect their (special) interests in the HSE field represents a type of politics that can be a challenge for the regime, including its robustness. This is especially true in cases where special interest groups have such large impact, ending up in a situation where more reason based solutions are excluded.

Accordingly defining the balance of a System I (bottom-up) and System II (top-down) is one of the most complex questions concerning the robustness of the Norwegian regulatory regime. The issue depends on a multitude of factors and on defining how the different roles and responsibilities should be distributed between the state, the industry and the scientific and professional stakeholders. Factors influencing are how the actual risk is perceived and interpreted among the stakeholders, the capability of the regulator and regulated, the power relation among stakeholder and interest groups, regulatory and legislative culture, etc. (Lindøe & Engen 2013)
Detailed and prescriptive rules provide no incentives for enterprises to engage in innovative practise, and bind them to the established technology and organizational solutions. The more prescriptive rules and technical standards the regulator takes as legally binding, the more responsibility and greater "burden of proof" are imposed on themselves. Explicit, detailed requirements certainly are highly predictable and easily interpreted, but they soon may stiffen in technologies from the past. It is difficult to see how safety critical issues related to management, organization and technology can be improved by using additional or more detailed rules by the authorities.

In a system of “enforced self-regulation” based on voluntary technical standards, and linked to legal standards, compliance with requirements to implicit norms and written in the legal standards become the responsibility of the enterprises. Requirements formulated as legal standards follow developments in technology and societal demands. But their interpretation requires continuous dialogue between the relevant actors in the sector. From legal history we may learn that the development of legislation under the common law principle requires a very active “legislative zone”, in which different parties may claim their interests and independent bodies, typically courts, sort out the disputes (Kaasen 2014).

The roles and tasks of the regulator and the regulated need to be clarified when combing top-down and bottom-up approaches. In reliance upon functional, risk-based requirements formulated as legal standards, the role as rule-maker should be separated from the role as controller. A decision from the “combined” rule-maker and controller should be able to be appealed to a superior, independent body before they are brought to the court. A division between the different aspects of regulatory functions (legislative, executive and judicial) is not only of high value regarding legal protection of individuals and enterprises, but may also stimulate the necessary dialectics to support a regulation based upon continuously developing legal standards to live up to the best practice in safety management at any time.

6 Final remark
The function based Norwegian regulatory regime based on principles of the Nordic Model has until 2014 survived; perhaps because there has not been a similar focusing event after Alexander L. Kielland. The incidents on Snorre A and Gullfax C have however visualised that the seemingly robust character of a function-based regulatory regime may have certain weaknesses and demand continuous improvements and learning in order to keep its strengths. At the same time it requires strong and competence based regulators which enable to balance between system I and system II and also have the power to renew the regime. The Nordic model of risk regulation has shown that risk regulation emphasizing legal writings and text may appear without substance without a proactive and strong regulator and empowered industrial actors working in mutual communities of practice. In determining a robust regulatory practice, many elements must be weighed toward a legal framework: the maturity of the industry, its use of standards and “best practices,” and the commitment of external and internal stakeholders to utilise information about unsafe conditions to make improvements in order to make safety management systems more efficient.
References


Bieder, C. and M. Bourrier (2013). *Trapping Safety into Rules. How Desirable or Avoidable is Proceduralization?* Ashgate.


