

## **Lessons Learned from Deepwater Horizon Incident - Adapting an Integrated Command System with Governmental Takeover of the Incident Command**

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### **ABSTRACT 299596:**

Both the Norwegian authorities and the oil industry have completed assessments and evaluations with respect to the lessons learned and experiences gained from the Deepwater Horizon incident in 2010. This paper will focus on the establishment of a national system for handling very large oil spills and governmental takeover of the incident command from the responsible operating company. The Norwegian oil industry is subject to preparedness requirements following the Health, Safety and Environment (HSE) regulations for petroleum related activities. Based on this, all offshore operating companies must have contingency plans and be able to respond to an oil spill resulting from their own activities. The Norwegian Coastal Administration (NCA) has a duty on behalf of the government to maintain preparedness and respond to major instances of acute pollution and, by law, has the obligation to take command and direct major response operations.

On the Norwegian Continental Shelf there have only been two incidents involving the offshore oil industry with the release of crude oil estimated at more than 4,000 m<sup>3</sup>. The Bravo blow-out occurred in 1977, with a release of oil of approximately 12,700 m<sup>3</sup>. The Statfjord A release occurred in 2007 during a shuttle tanker loading with a release of oil of approximately

4,400 m<sup>3</sup>. The Bravo blowout lasted for eight days and resulted in a high focus on oil spill response both within the oil industry and for the authorities. The Norwegian Clean Seas Association for Operating Companies (NOFO) was established in 1978 as the industry's operational organization within oil spill contingency.

In 2013 an updated national risk picture was presented with fourteen defined scenarios. One of these is an offshore oil and gas blow-out spilling approximately 300,000 tonnes and resulting in approximately 3,000 km of polluted shoreline. Together with the lessons identified from the Deepwater horizon response in 2010 there was a need to assess and improve how spills with an extreme nature and magnitude were organized on a national level.

Within the framework of the Pollution Control act and HSE regulations a system has been developed in a joint effort between the oil industry and the authorities. The system is based on the already existing integrated command structure in Norway and will be part of the national contingency plan. The system for governmental takeover of the incident command, how the takeover is organized, and how the responsibilities are distributed is described in a bridging document. One of the main issues is how to be prepared to make full use of the Pollution Control Act and international agreements to bring added value to the spill response operations. A decision for governmental takeover will be based on a holistic assessment of the actual oil spill and the environmental consequences, and will build upon the already existing spill response organization established by the responsible operating company.

## **INTRODUCTION:**

Following the Macondo incident both the Norwegian oil industry and the Norwegian authorities initiated studies assessing ways to develop and transfer the lessons learned from the incident to the Norwegian continental shelf. This was done to reduce both the possibility of a similar incident occurring and to be better prepared if an incident of similar magnitude should occur.

The Norwegian Coastal Administration (NCA) is responsible for the national oil spill preparedness and for its compliance with the International Convention on Oil Pollution Preparedness, Response, and Co-operation (OPRC Convention), other international agreements and the Norwegian Pollution Control Act ([www.kystverket.no](http://www.kystverket.no)).

As a result of this, NCA is currently developing a national contingency plan describing the roles and responsibilities of the different governmental agencies for incidents involving oil spills from both ships and offshore installations. An important part of this contingency plan is a system for governmental takeover of the incident command from the responsible polluter.

## **NORWEGIAN CONTINGENCY REQUIREMENTS AND PREPAREDNESS:**

### **Private Industry Preparedness.**

The contingency requirements and preparedness for the industry is regulated by the Pollution Control Act: "Anyone operating an enterprise which could cause acute pollution shall

provide for the necessary emergency response system to prevent, detect, stop, remove, and limit the impact of the pollution. The emergency response system shall be in reasonable proportion to the probability of acute pollution and extent of damage and nuisance that may arise" (Pollution Control Act § 40). This means that all enterprises that have the potential to cause significant oil pollution must establish and maintain an adequate level of preparedness. The Norwegian Environment Agency makes requirements regarding contingency measures against oil and chemical contamination and supervises this aspect of preparedness. This applies, in particular, to; offshore oil and gas operating companies on the Norwegian continental shelf, crude oil terminals, refineries, companies distributing oil products, and other major industrial companies.

In the event of a major oil pollution incident from the offshore oil installations, the oil spill response resources that are administered on a daily basis by the Norwegian Clean Seas Association for Operating Companies (NOFO) will be activated ([www.nof.no](http://www.nof.no)). NOFO has its main office in Stavanger. They have five depots with oil spill response equipment and 80 response personnel at its disposal. The oil and gas operator's preparedness plans cover coordination and command of oil spill recovery operations in offshore, near shore and onshore locations. Hence the Norwegian oil industry has developed plans and build-up a substantial capacity for offshore, near shore, and onshore oil spill response operations.

#### **Municipal Preparedness.**

"Municipalities shall provide for the necessary emergency response system to deal with minor incidents of acute pollution that may occur or cause damage within the municipality, and that are not covered by the private emergency response systems" (Pollution Control Act § 43). Norway is divided into 32 intermunicipal preparedness regions, each with its own contingency plan. These plans cover the coastal waters out to the four nautical miles limit as well as onshore spills that are not covered by the private contingency. Local authorities, fire departments, port authorities, etc., all collaborate on municipal preparedness. The local authorities have the responsibility of dealing with minor acute spills occurring within the municipality due to normal activity, and have an obligation to assist the governmental preparedness in the event of major oil pollution operation. The latter applies especially to oil spill response operations involving extensive shoreline cleanup.

#### **Governmental Preparedness.**

"The government shall provide for the necessary emergency response system to deal with major incidents of acute pollution that are not covered by municipal, or private emergency response systems" (Pollution control act §43). This means, in effect, the discharge of oil from shipping and major spills from unidentified sources. In addition, the government can provide resources, such as consultants, contingency equipment, and/or personnel to response actions implemented under private or municipal management.

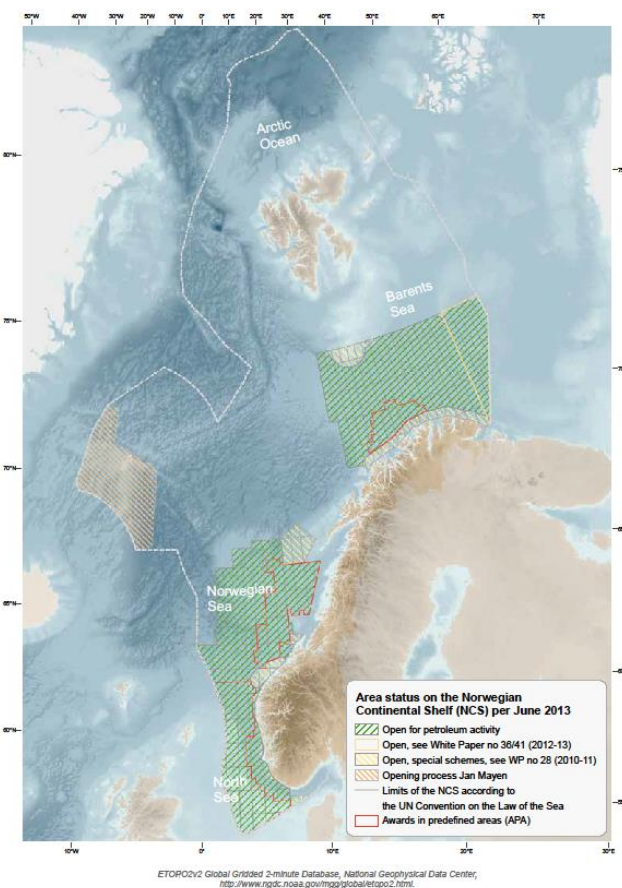
"In major cases of acute pollution or danger of such pollution the government may partially or totally take over the leadership of the efforts to fight the accident." (Pollution Control Act § 46). This gives the NCA authority, on behalf of the government, to take operational command of the spill response operation. The government also has the responsibility of coordinating private, municipal, and governmental preparedness into a national emergency

response system. The Ministry of Transport has delegated the responsibility for governmental preparedness to NCA.

## NORWEGIAN OFFSHORE OIL EXPLORATION AND PRODUCTION:

The Norwegian continental shelf stretches from the North Sea in the South, to North of Svalbard in the North. The area of the Norwegian territorial waters is approximately four times the land area of Norway. Oil and gas production activities started in the North Sea in the 1960s and moved north and into the Norwegian Sea by the 1980s and into the Barents Sea in late 1990s.

Most of the oil and gas production is still in the North Sea, but in the last years there have been increasing exploration activities in the Barents Sea. In 2013 the South-Eastern part of the Barents Sea was opened for exploration. This will lead to increased activities in Arctic waters, with spill response challenges due to long distances from shore, weather conditions such as icing, cold temperature and darkness in wintertime and limited infrastructure onshore. During the last few years these challenges have contributed to a significant buildup of oil spill response capacities for offshore, coastal, and shore operations, including development of new technologies and increased use of dispersion as a relevant strategy.



The following table can be found in the report “Trends in the risk level for acute spills 2001 – 2012” published by the Petroleum Safety Authority Norway (Dammen et. Al. 2013, only in Norwegian language) and reflects data on significant offshore industry oil spills in Norway:

<i>The largest oil spills in Norwegian offshore oil industry in the period 1977-2012</i>			
Year	Amount [m3]	Field/ installation	Description
1977	12,700	Ekofisk Bravo	Largest incident in the Norwegian offshore oil industry. One week long blow-out.
1989	1,400	Statfjord C	Oil leak due to a crack in a crude oil

			storage tank.
1992	900	Statfjord	Oil spill caused by a valve on a loading buoy being left open.
2003	750	Draugen	Oil spill caused by break in hose connection to a sub-sea installation.
2005	340	Norne	Oil spill caused by a manual valve in the produced water system in wrong position.
2007	4,400	Statfjord A	Oil spill caused by break in a cargo loading hose during loading of a shuttle tanker.

The Bravo blow-out in the North Sea in 1977, representing the largest accidental discharge of crude oil and the only blow-out incident on the Norwegian continental shelf (NCS), resulted in a high focus on oil spill response both within the oil industry and for the authorities. NOFO was established in 1978 as the industry's operational organization within oil spill contingency and now has the capacity to supply all oil and gas operators on the NCS with the resources identified in their oil spill preparedness plans. The Norwegian HSE regulations for petroleum related activities, including those for the emergency preparedness against acute pollution are performance and risk based. Dimensioning of pollution prevention is based on environmental risk analyses for acute pollution from the actual installations and their activities and on the sensitivity of the possible influenced environment. In the case of acute pollution there shall, as soon as possible, be produced an incident specific action plan describing how the response activities will be implemented. The plan shall be sent to the NCA and updated regularly through all the phases of the operation. The capacity need of the oil spill prevention is based on a weighted blowout rate and duration (for exploration drilling) or on a 90 percentile of possible blowout rates (from producing offshore installation and field developments). For each oil field and exploration drilling location the effectiveness of oil recovery systems are calculated dependent of the area specific weather, operational light conditions, and oil weathering data (DNV, 2010).

In 2013 an updated national risk picture was presented with fourteen defined scenarios (DSB, 2013). One of these is an offshore oil and gas blow-out spilling approximately 300,000 tons and resulting in approximately 3,000 km of polluted shoreline. Such spill scenarios are far beyond the dimensioning scenarios used as the basis for the preparedness plans. They will require e.g. coordination of resources along the affected coastline by a governmental body like the NCA. Together with the lessons identified from the Deepwater Horizon incident there was consequently a need to assess and improve how spills with an extreme nature and magnitude were organized on a national level.

**MACONDO INCIDENT – LESSONS LEARNED AND FOLLOW-UP:****US Recommendation on National Contingency Plan**

Following the Macondo incident a number of US studies and reports have addressed how the incident was handled, lessons learned and recommendations for improvement. Both the “Report to the President from the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling” and the US Coast Guard “BP Deepwater Horizon Oil Spill – Incident Specific Preparedness Review” provide important input to how Norway should handle and address worst case spill scenarios.

The Report to the President from the National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling in chapter nine presents the commission’s recommendations, and recommendation C2 states “EPA and the Coast Guard should establish distinct plans and procedures for responding to a “Spill of National Significance.”” (Deep Water, 2011, pp 267).

In the Incident Specific Preparedness Review it is stated that; “ACPs (Area Contingency Plans) in the Gulf generally did not contain worst case discharge scenarios involving offshore oil exploration activities, resulting in an lack of preparedness for such events” (ISPR, 2011, pp 25). This is followed by a recommendation “The Coast Guard should request the National Response Team review and revise the NCP (National Contingency Plan) as necessary to incorporate advances in response management and planning, including Incident Command System doctrine and prescribe mission assignments for a Spill of National Significance event” (ISPR, 2011, pp28).

“The spill’s magnitude calls into question whether the National Contingency Plan establishes an appropriate relationship between the federal government and the responsible party, as the public demanded in the weeks and months following the Deepwater Horizon spill that the government demonstrate control of the response. The responsible party that caused the spill is clearly legally responsible for containing the spill and mitigating its harmful consequences. The federal government, not the responsible party, must be in charge of those efforts. As this spill demonstrated, the government unfortunately lacked both the expertise and the capacity to oversee aspects of the response at the outset of the spill—particularly the effort to control the well. Only as the full scope of the disaster unfolded and the government gathered and focused its resources from a variety of agencies was the government ultimately able to take charge.” (Deep Water, 2011, pp267).

“Many of those interviewed specifically stated that the National Incident Management System/ Incident Command System (ICS) worked as intended. Because the NIMS/ICS is scalable, adaptive, and dynamic, responders were able to tailor the response organization to need. The ICS organization experienced numerous challenges, such as external communications taking place outside the ICS hierarchy, and political pressure applied to various levels of the respond organization. Nonetheless, the ICS organization worked well during this event.” (ISPR, 2011, pp 13).

Based on the above it is clear that worst case scenarios should be addressed in a National Contingency Plan and that communication between the involved local, regional and national authorities is important to ensure that all involved parties are aware of their duties and expected roles. Further it is clear that the Incident Command System with a National Incident Commander worked as intended.

### **Norwegian oil industry recommendations**

In the report “Deepwater horizon – Lessons learned and follow up”, The Norwegian Oil and Gas Association (formerly The Norwegian Oil Industry Association - OLF) presented 45 specific recommendations to the Norwegian oil industry (Deepwater Horizon, 2012). Recommendation number 35 states that “OLF will continue working closely with the Norwegian Coastal Administration to make a case for implementing the principles of unified command for incidents of national significance on the NCS.”

The rationale behind this recommendation is that the principles of a Unified Command within an Incident Command System as practiced in the US during the Macondo incident are not applied in Norway. The regulations state that the operator will lead and coordinate the use of oil spill response resources, even for a major spill of national significance involving public resources. Pursuant to the Pollution Control Act, however, the Norwegian Coastal Administration (NCA) can choose to take command if it deems this to be necessary. But the criteria for taking over the command are not defined, and this situation is not part of training and exercises. OLF considers that the Norwegian authorities should adopt the principles of unified command in order to ensure that the readiness and efficiency exists to manage a major accident or oil spill in a national context. The main driver for OLF is the scenario of an oil spill on the NCS where the oil company would be the responsible party. Work should be conducted within the current regulatory framework. Responsibilities and the “polluter pays” principle will remain unchanged. OLF acknowledges that a UC should be established and led by the government, but in conjunction with the responsible party. The overall goal is to enhance the efficiency of individual response organizations. In moving forward, the NCA should clarify criteria for establishing a UC with the relevant government agencies and ministries before the actual work can start. Criteria for establishing a UC should be agreed, and a unified organizational model developed.

### **Norwegian Authorities’ Recommendations**

As part of the Norwegian authorities work connected to the management plans for the Norwegian sea areas, a group consisting of shipping, petroleum, coastal, and environmental authorities was established to assess the overall risk level in a given area (risk assessment group). This group was tasked at looking into the question of what would happen if a Macondo type incident happened on the Norwegian continental shelf.

The conclusion in the report “Accident in the Gulf of Mexico”, by an inter-governmental risk assessment group on this issue, was to recommend that the Norwegian authorities look into how oil spill response operations of a magnitude similar to the Macondo incident are organized in Norway (Risikogruppen, 2010). Based on this, the NCA assessed that it would be beneficial to include the organization and handling of very large oil spills from the offshore oil industry into the national contingency plan. Further, it was also decided to look into whether a system similar

to the US unified command concept should be applied in Norway. As described above, the NCA already has the power to take operational control from a polluter. The report concluded that a new system should be implemented within the framework of the current legislation.

### **ESTABLISHING AN INTEGRATED COMMAND SYSTEM WITH GOVERNMENTAL TAKEOVER OF THE INCIDENT COMMAND:**

Based on the recommendations above, NCA took the initiative to establish a joint working group between the oil industry and the NCA. The task of the group was looking into the question of whether adapting an integrated command system with governmental takeover of the incident command could be a solution for Norway.

#### **Joint Working Group Between Oil Industry and NCA**

The group had the following mandate:

“The assessment is to be based on oil spill scenarios of an extreme magnitude where the oil industry is responsible. The roles, responsibilities and tasks between the industry and governmental response organizations, and the associated resources during a very large spill response operation must be described. The group shall describe how an incident command led by the NCA can be established within the framework of the Pollution Control Act in which national and international private and governmental spill response resources are included. Further, the group shall give recommendations as to how such a system can be organized, trained and maintained.”

In June 2012, the working group gave their recommendation to establish a system for governmental take over with integrated command to handle pollution incidents with an extreme magnitude from the offshore oil industry (NCA, 2012).

#### **Transition of Operational Command from the Oil Industry to the Authorities**

The responsibility for the level of preparedness and the obligation to act lies with the operating company. The level of preparedness is dimensioned based on environmental risks and should be on a level that enables the operator to deal with oil spills caused by the operator's activities. An oil spill response operation that escalates to a level where the authorities will take operational command will begin as an operation led by the operating company.

In the phase before the takeover of operational command, the NCA and the Petroleum Safety Authority (PSA) will maintain governmental oversight and supervision of the operations. PSA will follow all actions related to the safety of the installation and the operations aimed at stopping the spill at the source, whereas NCA will follow all actions related to the oil spill response operation, and assess whether the actions taken are adequate. NCA and PSA will maintain close coordination and most likely both send liaisons to the operator's incident command post. NCA will further assist the operator with resources such as equipment and system operators.

In the phase following takeover of operational command, NCA will establish the incident command structure based on the existing system for governmental oil spill response operations. PSA will continue their supervisory role overseeing the operator's operations for stopping the



spill at the source. Hence, the system for takeover will only cover the oil spill response operations, and not the source control operations.

The decision to assume operational command and take over the operation is based on the Pollution Control Act § 46 and lies with the NCA. However, the decision will normally be taken based on discussions between the operator and the NCA, and a set of criteria established in order to give both the operating company and the authorities' predictability. As the takeover by the authorities is based on a pollution incident of an extreme magnitude it is not seen as suitable to have criteria based on spill volume. It will be the situation as a whole that will form the basis for the takeover. The following criteria may be the basis (but are not limited to):

- An incident with possibly large geographical spreading and associated shoreline pollution;
  - Incident afflicting several counties or several inter-municipal response areas (IUA) having the need for coordination across several administrative sections and with several governmental authorities involved.
  - Incident needing more resources than described in the contingency plan and agreed upon, resources that may come through international agreements and are available through NCAs statutory authority.
- An incident with large social considerations, including;
  - Incident with possibly large national consequences for the environment both in the short and long term perspective.
  - Incident with possibly large national consequences for the economy and the reputation.
  - Incidents with the possibility to drift into and afflict neighboring states.

### **Bridging document describing the operational takeover of command**

When the decision to take operational command is taken, the NCA will take charge of the most central functions in the ELS system (ELS is a Norwegian adaption of the ICS system and translates loosely into uniform management system) by merging into the existing incident command established by the operating company. These functions are the following and also highlighted in figure 1:

- Incident commander
- Operations
- Logistics
- Planning and Environment

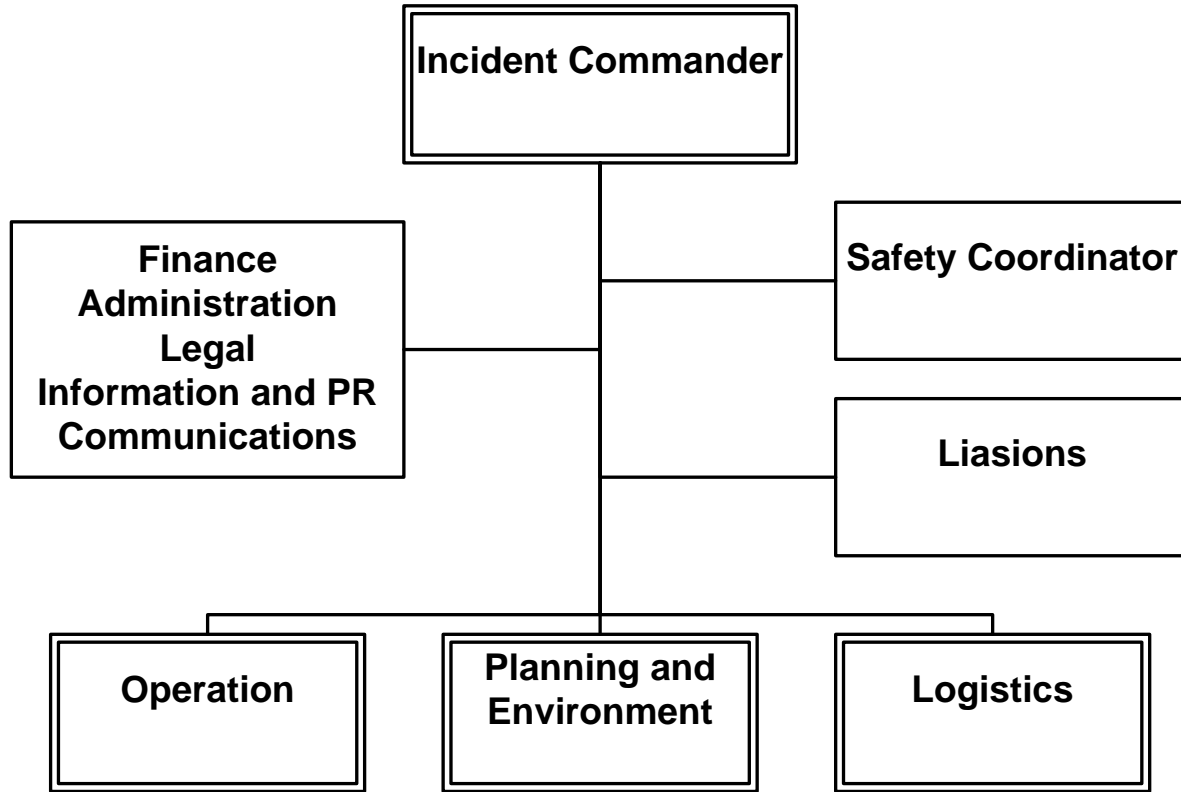


Figure 1 - Incident command structure

All functions will be staffed by personnel from both the operator and the authorities. The operating company remains responsible for all costs.

#### **WAY FORWARD:**

The draft bridging document was tested at a table-top exercise between the oil industry and the NCA in November 2013, and the general principles were agreed upon between the oil industry and the authorities. There are still some questions that need further clarification. How to handle media communication is probably one of the most important issue yet to be resolved.

The way forward in operationalizing the system is first to arrange a table top in the spring of 2014. During this table top other authorities and stakeholders in addition to the NCA and the oil industry will be invited to take part in and observe the exercise. Secondly, a full scale exercise in the autumn of 2014 will be used to finally verify the system. It is further proposed to keep the system operational by an annual exercise.

**CONCLUSIONS:**

The Macondo incident made both the Norwegian oil industry and the Norwegian authorities look into how we would organize a spill response operation of a similar magnitude. Jointly, we have established an integrated command system in which the government will take the role as incident commander. We have also developed a set of criteria that make the takeover more predictable than was the case before. The bridging document describing the connection between the operators' contingency plan and NCA's will be one important part of Norway's National contingency plan.

**REFERENCES AND BIBLIOGRAPHY:**

BP Deepwater Horizon Oil Spill, Incident Specific Preparedness Review (ISPR), Final Report, January 2011.

<http://www.uscg.mil/foia/docs/dwh/bpdwh.pdf>

Dammen, T., Børsting, A., Halseth, I.K., Karlsen, A., Årstad, I., Røslund, I., Gundersen, J., Kierulff, N.S. 2013. Risikonivå i petroleumsvirksomheten - Akutte utslipp- Norsk sokkel - 2001–2012

<http://www.ptil.no/akutte-miljoeutslipp/category1069.html> (in Norwegian language only).

Deep Water, The Gulf Oil Disaster and the Future of Offshore Drilling, Report to the President, National Commission on the BP Deepwater Horizon Oil Spill and Offshore Drilling, January 2011, ISBN: 978-0-16-087371-3

Deepwater Horizon, Lessons learned and follow-up. A Norwegian Oil Industry Association (OLF) report with contributions from the Norwegian Clean Seas Association for Operating Companies (NOFO) and the Norwegian Shipowners' Association (NSA), 2012,

<http://www.norskoljeoggass.no/no/Publikasjoner/Handboker/Deepwater-Horizon---lessons-learned-and-follow-up/>

DNV, 2010, Summary of differences between offshore drilling regulations in Norway and U.S. Gulf of Mexico. Report no/DNV Reg No.: 2010-1220/ 12P3WF5-9 Rev 02, 2010-08-26.

<http://www.norskoljeoggass.no/PageFiles/6754/Report%20no%202010-1220%20Summary%20of%20differences%20REV%20202010-08-27%20signed.pdf>

DSB – Direktoratet for samfunnssikkerhet og beredskap, Nasjonalt risikobilde 2013, ISBN: 978-82-7768-308-9 [http://dsb.no/Global/Publikasjoner/2013/Tema/NRB\\_2013.pdf](http://dsb.no/Global/Publikasjoner/2013/Tema/NRB_2013.pdf) (in Norwegian language only).

NCA, KLIF and DSB, Veileder om enhetlig ledelsessystem (ELS), 2011,

<http://www.kystverket.no/Nyheter/2012/Januar/Bedre-handtering-med-enhetlig-ledelse> (in Norwegian language only)

NCA, 2012. Rapport om etablering av aksjonsledelse, ledet av Kystverket innenfor forurensningslovens rammer for statlig overtakelse, med bakgrunn i forurensningssituasjoner med ekstremt omfang der petroleumsvirksomheten er ansvarlig. In Norwegian only.

Pollution Control Act - Act 13 March 1981 no 6 relating to protection against pollution and relating to waste. Last amended by Act 10 December 1999 no 83,  
[http://www.ptil.no/getfile.php/Regelverket/Forurensingsloven\\_e.pdf](http://www.ptil.no/getfile.php/Regelverket/Forurensingsloven_e.pdf)

Risikogruppen, Ulykken i Mexicogolfen – Risikogruppens vurdering, 2011,  
[http://www.regjeringen.no/nb/dep/kld/dok/rapporter\\_planer/rapporter/2010/ulykken-i-mexicogolfen.html?id=626552](http://www.regjeringen.no/nb/dep/kld/dok/rapporter_planer/rapporter/2010/ulykken-i-mexicogolfen.html?id=626552) (in Norwegian language only)