THE CONGRESS
OF LOCAL AND REGIONAL AUTHORITIES

Council of Europe
F – 67075 Strasbourg Cedex
Tel : +33 (0)3 88 41 20 00
Fax : +33 (0)3 88 41 27 51/ 37 47
http://www.coe.int/cplre

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Major oil spills: the role of local authorities

Rapporteur: Anne-Grethe STRÖM-ERICHSEN, Norway,
Chamber of Local Authorities
Political Group: SOC

EXPLANATORY MEMORANDUM

Experts: ***Mr Lasse H. PETTERSSON*** *and* ***Ms Svetlana MILUTINOVIC***
(Nansen Environmental and Remote Sensing Center, Bergen, Norway)

Table of Contents

1 Introduction

Following **a European Conference on the role of Baltic Local Authorities in Responding to Major Oil Spills,** held in Helsinki, from 9 to 10 February 2004, the Congress Committee on Sustainable Development of the Chamber of Local Authorities decided, at its meeting of 1st April 2004, to prepare a report on local authorities facing oil spills, taking into account the debates and results of the Conference. For this purpose, the committee appointed Anne-Grethe STRÖM-ERICHSEN as Rapporteur. The Nansen Environmental and Remote Sensing Center in Bergen, Norway, with leading scientist Lasse H. PETTERSSON and scientist Svetlana MILUTINOVIC has contributed to the technical content of the report.

The committee on Sustainable Development of the chamber of Local Authorities has approved unanimously the preliminary Draft Recommendation and preliminary Draft Resolution during the meeting held in Strasbourg on 16 March 2005.

2 The Context

During the last few decades the pollution of the world's oceans has become a matter of increasing international concern. One source of marine pollution is shipping and maritime activities in general. In tonnage terms, the most important pollutant resulting from shipping operations is oil. The best known cause of oil pollution is that arising from tanker accidents. Although this contributes a comparatively small percentage of the total oil entering the sea in a year, the consequences of an accident can be disastrous to the immediate area, particularly if the ship involved is a large one and the accident occurs close to the coast. The wrecks of *Erica* (2000) and *Prestige* (2002) are examples, where extensive oceanic and coastal waters were contaminated (see Figure 1).

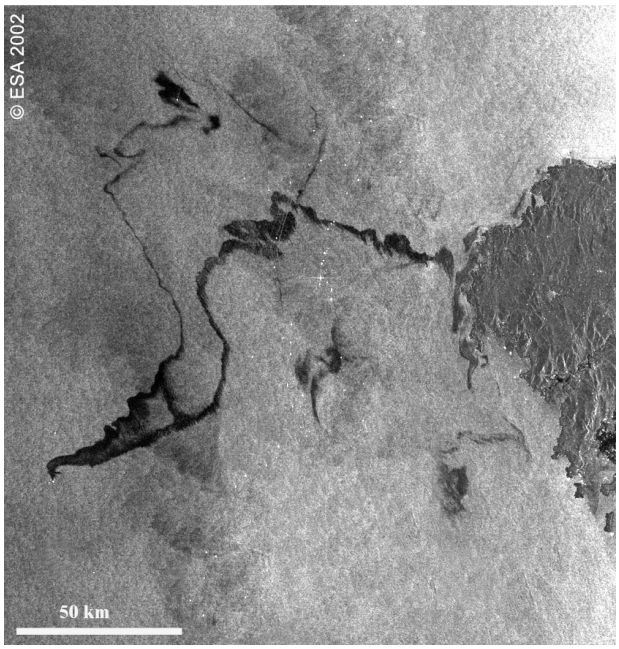

Figure 1: The radar on board the European Envisat satellite detects the extent of the oil slicks from the M/T Prestige accident. Regular surveillance of European waters by use of satellite will increase the probability for early detection of deliberate and accidental releases of oil at sea. Copyright: 20©02 ESA.

On January 19 2004 the Antiuga and Barbuda-registered vessel *Rocknes* capsized in the inner parts of the jagged Norwegian coastal line in the Vatlestraumen near the city of Bergen (Figure 2). The accident caused the loss of 18 human lives and an extensive oil spill combat operation was initiated after the immediate rescue operations. About 138 tonnes oil were collected from the seawater during the following weeks. The coastal clean up operations lasted for more than six months and the costs amounted to 108,5 mill NOK (13 mill €), involving during the most intense period up to 150 individuals and 30 boats. The total clean-up operation represented 11000 person days of effort. Totally 1153 m^3 of oil-contaminated substance were recovered during the clean-up operations estimated to equivalent of 228 tonnes of oil. This implies that more than five times more contaminated substance needed to be collected to clean up the oil from the sea and coastal areas.

Figure 2: The capsized Rocknes *vessel and the oil film spreading from the wreck in the Vatlestraumen near the city of Bergen in January 2004. Courtesy: Norwegian Coastal Administration.*

Figure 3: Clean up operations after the oil pollution from the Rocknes *vessel.*

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- "On the safe side – maritime safety and oil pollution preparedness (in Norwegian)" ("På den sikre siden – sjøsikkerhet og oljevernberedskap"), Report to the parliament no. 14 (2004-2005).
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3 The current situation

Much of Europe is surrounded by semi-enclosed and enclosed seas, e.g. the Mediterranean, Black, Caspian, and Baltic Seas. Such seas have a limited exchange of water with the open ocean, which makes them highly sensitive to pollution. Nevertheless, the European coasts open to the Atlantic are also affected by pollution, mainly from land-based sources, offshore production of oil and gas, shipping operations and accidental oil spills. Much of the dynamics of the more open waters are confined to strong coastal current circulation systems, implying that pollution released in these areas are transported within the coastal water, i.e. the cyclonic circulation from continental Europe, via Skagerrak to the Norwegian Coastal Current (see Figure 4).

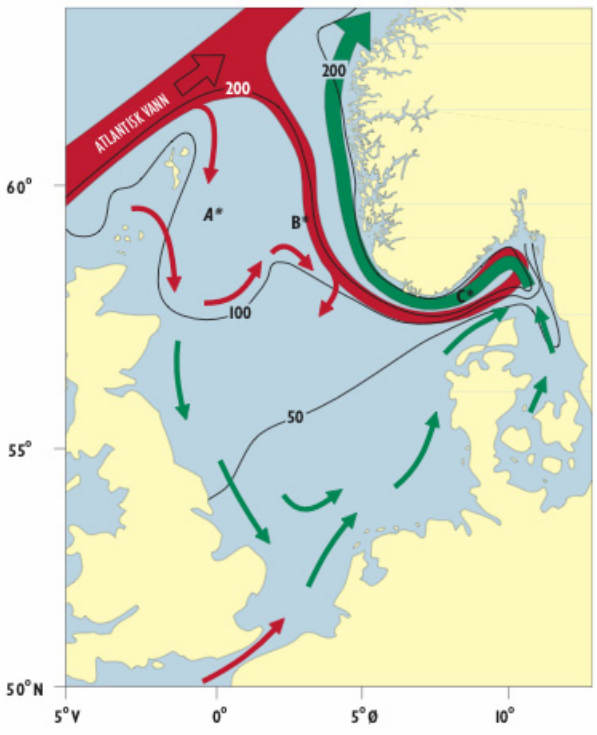

Figure 4: The major ocean currents circulation pattern of the North Sea region (Courtesy: Institute of Marine Research, Bergen Norway).

3.1 North-East Atlantic and North Sea

Large volumes of both crude oil and refined petroleum products are transported on board tankers within this region, creating a high risk of grounding or collisions. Also extensive merchant shipping and fisheries activities increase the risks for collision accidents with tankers as well as the release of bunker oil from these ships. A part of the crude oil traffic goes past the costs of Portugal, Spain and France, supplying the domestic refineries in these countries. Another part passes through the English Channel on its way to the refineries in the Netherlands, Germany and the Baltic states. The intense traffic has led to a number of major oil spills in the region, mainly as a result of stranding. Recently, some of the most serious disasters, such as those of the tanker *Erika* off the coast of Brittany in December 1999 and the tanker *Prestige* off the Galician coast in November 2002, have led to a number of initiatives to improve maritime safety in the area.

The North Sea is an area of intense oil production and related transport activities. Although total discharges of contaminated water from oil production facilities are increasing (as oil production is rising and the oil fields are getting older), the concentration of oil in seawater is still low, and dispersion and dilution are rapid. Strict regulations and monitoring limits the regular releases of oil with produced waters from the oil and gas production platforms. The tanker traffic generates a risk of oil pollution. It was shown that the number of illegal spills decreased steadily in the period 1990-2000.

3.2 Norwegian and Barents Seas

Until recently, tanker traffic in the northern Norwegian Sea and the Barents Sea was limited, and the risk of incidents occurring in the region was low. However, this risk has risen considerably due to a sharp increase in oil transport from Russian Arctic via the port in Murmansk along the Norwegian coast to the west European and U.S. markets (data from 2003 show that about 200 oil tankers pass Norwegian coast every year). The outlook for the development of this transport by 2010 is 150 million tonnes a year, of which 80 millions will be carried by tankers of 250,000 tonnes deadweight and the rest will be shipped by smaller tankers of 100,000 tonnes deadweight. Ecosystem characteristics of the Barents Sea are such that they make it especially vulnerable to pollution. Also oil spill combat operations in the harsh Arctic environment are much more demanding than in lower latitude regions. Norway will therefore declare the Barents Sea a Particularly Sensitive Sea Area (PSSA) through the International Maritime Organization (IMO). This would allow Norwegian government to ban vessels from coming within 50 nautical miles of the coast, require the mandatory reporting of ship movements in the area and set demands for tanker quality. Monitoring and preparedness for possible accidents with these tanker operations are a major increasing future challenge.

3.3 Baltic Sea

It is estimated that the Baltic Sea receives 30,000 to 60,000 metric tonnes of oil pollution annually. Estimates say that 80% of the total oil pollution originate from land-based sources (such as industry, oil refineries, runoff from urban areas). Amounts of oil that come from other sources in the Baltic region are hard to be estimated with certainty. It is likely that the main ship-based source is intentional discharging of oily wastes and contaminated water from ship machinery spaces and cargo holds, mainly during cleaning and maintenance operations (see Figure 5). The Baltic is a region of vigorous shipping. The Helsinki Commission (HELCOM) data show that around 2,000 sizeable vessels (including large oil tankers, ships carrying hazardous and potentially polluting cargoes and large passenger ferries) are at the Baltic at any moment. HELCOM predicts that by the 2015 the total amount of oil transported in the Baltic will be more than 130 million tonnes a year. It is expected that the amount of goods transported over the Baltic will double by 2017 and the probability of a collision involving tankers will rise by 20% by 2020. There is a high probability that a major oil spill due to an accident will occur in the next 5-10 years, which would cause severe damage to the Baltic ecosystem.

3.4 Mediterranean Sea

The Mediterranean has a great physical diversity, containing many smaller seas, including the Adriatic Sea, the Aegean Sea, the Balearic Sea, the Ionian Sea, the Ligurian Sea and the Tyrrhenian Sea. The Mediterranean has been exposed to degradation from increased coastal zone development, chronic pollution from agricultural and industrial runoff and illegal discharges at sea (see Figure 5). Although accidental oil spills are not a major contributor to the deterioration of the Mediterranean environment, they pose a constant threat of acute pollution. Some of the tanker accidents that occurred in the Mediterranean (*Haven* in 1991 and *Irenes Serenade* in 1980) are among the world's ten largest oil spills ever recorded. All types of activities that are generally related to oil pollution hazards are found in this region. These includes exploration and production of oil and gas, transport of oil from offshore wells to the land by ships or underwater pipelines, regional and export shipment of crude oil, refined products and residual oils, and large scale commercial and passenger transport. A review of all large tanker accidents in the Mediterranean since 1960 shows that almost two-thirds of the disasters were caused by collisions or groundings, while the remainder was the result of equipment or hull failure and fire. High risk for collisions is present in particularly narrow waters of the Dardanelles, the Strait of Messina and the Strait of Gibraltar. However, tanker catastrophes have been most frequent in and around major ports. Another serious problem for many areas in the region is cross traffic of smaller vessels, especially fishing boats and ferries. This increases the risks for collisions.

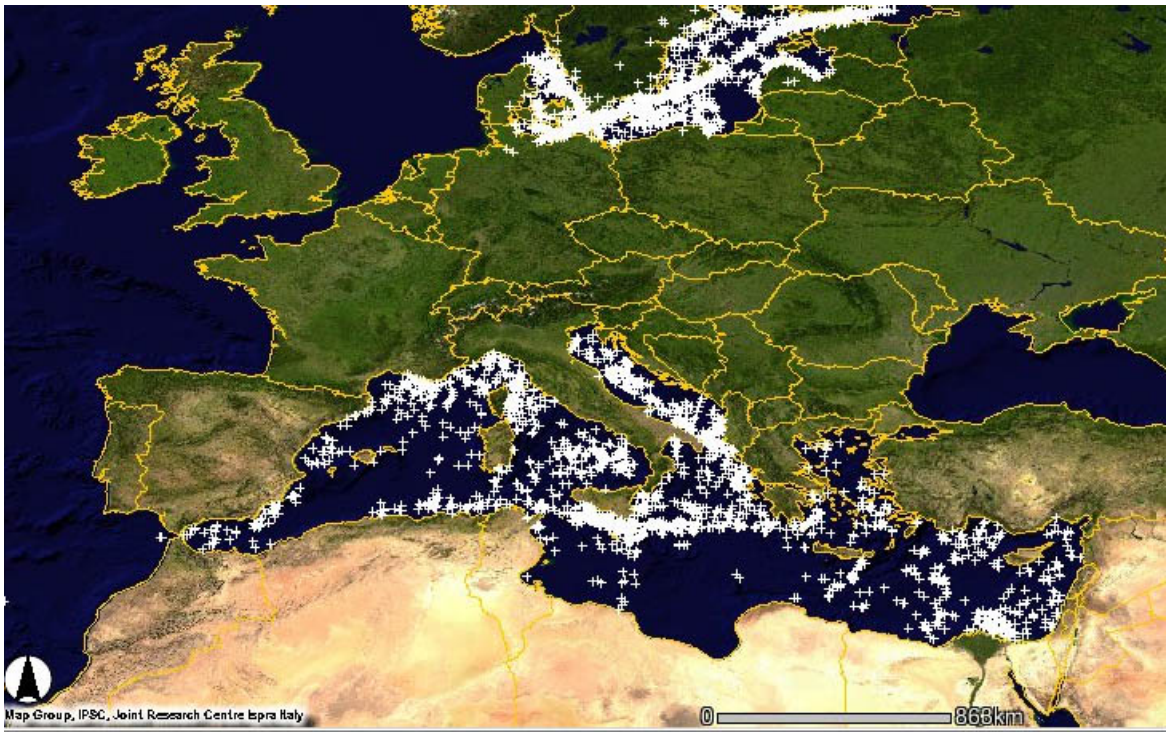

Figure 5: Possible oil spills in the Baltic and Mediterranean Seas during the years 1998 to 2002, as mapped by satellite, airborne and in situ observations. Courtesy: EC OCEANIDES project (http://oceanides.jrc.cec.eu.int/).

3.5 Black Sea

The Black Sea is one of the biggest inland marine environments in the world, with the only link to the rest of the oceans through the narrow Bosporus Strait. The marine environment in this region has been considerably degraded, which is only in part the result of oil pollution. The vast majority of the oil input is chronic, originating from land-based sources. The possible sources of oil spills include oil production, loading of oil at terminals and shipping accidents involving tankers. Since the Black Sea is not a major oil production area it self, the risk of pollution from that source seems to be minimal. However, the general shipping activities are large and the potential for releases of bunker oil due to collisions or grounding are a threat to the region. On the other hand, transit trade in crude oil and refined petroleum products is considerable and is increasing, e.g. through building of terrestrial pipelines from the Caspian Sea region. Occurrence of large tanker spills in the Black Sea itself has been low, but there have been a number of big incidents in the congested, 30-km long, narrow and heavily trafficked Bosporus Strait, where vessel traffic has grown to roughly 50,000 ships per year, 5,000 of which carry crude and refined oil or liquid natural gas. Risk related to shipping are a strong argument that long-distance pipelines routed directly to external seas should be built. Nevertheless, so long as oil export is increasing, new pipelines cannot be expected to lead to immediate closure of shipping routes, but will rather add on to the total amount transported at sea.

3.6 Caspian Sea

The Caspian Sea is the largest isolated inland sea in the world. Due to its long isolation from the world seas and low salinity of its water, the Caspian marine ecosystem is unique but also vulnerable. The Caspian region has significant oil reserves, both undersea and in surrounding terrestrial fields, leading to a number of activities that generate risk of oil spills, such as offshore oil exploration and production, transport of oil to land terminals, export of oil by various means and shipment of refined oil products to ports around the sea. In spite of the large offshore reserves, exploration and production of oil are still relatively limited due to political uncertainties about the division of resources among the Caspian countries. Once these uncertainties are resolved, the production will surely increase and the risk from oil pollution will rise. Even now, the Caspian is under considerable pressure from exploratory drilling, offshore production and related shipment. However, to this moment there have been no major oil spills in this sea. Both risk from regular ocean transport and harsh winter conditions with sea ice are making oil pollution preparedness and combat operations in the Caspian Sea a challenge.

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4 Sources of pollution

4.1 Hydrocarbons

In tonnage terms, the most important marine pollutant resulting from shipping operations is crude or bunker oil. Coastal regions close to busy ship traffic are exposed to a particularly high risk of oil pollution, both deliberate and accidental releases. Oil spills have both instant and long-term impacts. For example, the *Erika* disaster was followed by immediate kills of shellfish in the coastal waters of western France. The contamination of seawater persisted for several months and the cleanup operations were tedious and expensive. Oil was stranded on rocky coasts and trapped in inshore sediments, causing direct kills and habitat losses, but was also a longer-term source of contamination, hampering the re-opening of some coastal fisheries. Among the most immediate and noticeable casualties of oil spills at sea are the seabirds. The lethal impact of oil on seabirds does not necessarily reflect the size of a spill, and is larger in areas where flocks of seabirds are located. However, after proper cleanup operations the longer-term impact on the marine ecosystem seems minor.

Crude oil is a mixture of various hydrocarbons, most of which are non-aromatic. Every type of oil consists of thousands of these compounds in exact proportions, which enables us to determine where oil in an oil spill originates from. This is used to fingerprint and legally identify the source of pollution for an identified oil spill. Depending on how many rings their molecules are composed of, we can distinguish between monocyclic aromatic hydrocarbons and polycyclic aromatic hydrocarbons (PAHs). The monocyclic ones are more abundant than PAHs, and also more volatile. They have toxic effects but evaporate so fast (within a few days) that only the organisms that cannot escape are affected. The smaller and more water-soluble PAH molecules are directly toxic to marine animals. Some studies have shown that direct toxic effects of PAHs are amplified if ultraviolet radiation is present. This causes concern for animals that live in the surface layer of the water column. Larger PAH molecules can initiate cancer after ingestion both in fish and humans. Besides, reproduction of fish and other aquatic organisms can also be affected by PAHs. Most PAHs are not very soluble in water and tend to accumulate in sediments. In the aftermath of major oil spills, high concentrations of PAHs can be found in shellfish. After such disasters, fisheries are often closed in order to protect human consumers from the intake of PAHs.

4.2 Chemicals

Although most public concern about marine pollution has concentrated on problems associated with crude or bunker oil, many of the chemicals carried by sea are far more dangerous to the marine environment and living organisms. These contaminants can be divided into three main groups:

- Trace metals
- Organic compounds
- Radioactive elements

The effects of these substances on marine organisms depend on their behaviour and fate after they have been released to the environment. Following the release, they may remain in water, be deposited in sediments or be taken up by organisms. Therefore, a more precautionary approach has been recommended.

Trace metals are natural components of the Earth's crust. They can be released from it by weathering of crustal rocks. Hence, their presence in the environment is not an automatic indicator of pollution. Nevertheless, human activities have increased the rate at which trace metals are discharged to the environment. The man-made sources of trace metals include industry, agriculture and urban pollution. Some of trace metals, e.g. copper and zinc, are essential for normal functioning of organisms; however, they can have toxic effects at too high concentrations. Other trace metals, e.g. mercury, lead and cadmium, are not needed for life processes, but may have negative impact if they accumulate in organisms.

A wide range of commercial products in common use contains organic compounds, some of which may be harmful to the marine environment (e.g. organotin compounds, organochlorines and other persistent organic pollutants).

An organotin compound tributyltin (TBT) has been used in production of some antifoulants. TBT is an extremely toxic compound, exhibiting serious harmful effects on shellfish in almost undetectable concentrations. The TBT-based antifoulants have been banned from use on small vessels for ten years, and their use on large ships is currently the largest input source of TBT to the ocean. The use of antifoulants based on TBT on large vessels should also be phased out by 2008, following international agreement. By that time, the most efficient and least environmentally hazardous alternatives will have to be selected.

Organochlorines comprise a number of compounds, such as polychlorinated biphenyls (PCBs) and various pesticides, that present a significant threat to the environment. PCBs were used in a variety of products before their production ceased in the mid 1970s. Due to their extremely slow degradation, the concentrations of PCBs in marine environment have taken long to decline. Besides, there still may be some inputs of PCBs (e.g. leaking from old equipment, buildings or other sources). PCBs are readily taken up by marine animals. Their concentrations are particularly high in blubber deposits of marine mammals. The use of organochlorine pesticides has been or will soon be banned but, as PCBs, they will probably remain in the marine environment for a long time, due to their resistance to degradation.

The sources of radioactivity can be natural or man-made. There are three main groups of man-made contamination:

- Historic
- Accidents
- Industrial processes.

Any industrial release of radioactive elements must be authorised and monitored. The major sources contaminating the ocean are from the earlier testing of atmospheric radio nuclear explosions, atmospheric transport from accidents such as Chernobyl, and releases from processing plants such as the European reprocessing plant in Sellafield. Most radionuclides are long lived and their life time in the marine environment can be decades and more.

Chemical substances can also enter the sea when transported by marine vessels. Chemicals are carried either in bulk (thousands of tonnes) by special tankers, or packed as dangerous goods in containers and tanks aboard any vessel, including passenger ferries. In case of an accident, dangerous substances can be discharged into the sea, as was the case with sinking of the *Ievoli Sun* (2000) in the English Channel or the accident of the *Balu* in the Bay of Biscay (2001), to mention just a few recent examples. In the first case, 3,000 tonnes of styrene (corrosive chemical insoluble in water) and 1,000 tonnes each of the solvents isopropanol and methylethyl ketone were discharged from the ship's wreck on the sea bottom. In the second case, 8,000 tonnes of sulphuric acid were spilled.

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5 Origin of marine pollution

Oil can be released into the marine environment in different ways. Public attention is usually drawn to accidental spills of bunker and cargo oil from shipwrecks and due to ship collisions. There are however other, less obvious sources but important sources, such as:

- deliberate discharge of oily wastes and contaminated water from ships' machinery spaces and cargo holds
- offshore oil and gas exploration and production, both direct oil spills and oil contaminated water from the production process
- coastal oil refineries and petrochemical industry
- runoff from urban areas
- natural seeps from natural oil reservoirs at the seafloor
- atmospheric deposition of PAHs.

However, deliberate and accidental releases from the international maritime traffic cause near a half of the oil pollution at sea. Although much-publicised accidental ship collisions and groundings can release large volumes of oil into the sea, a much greater quantity of oil enters the sea as a result of intentional discharges (tank-cleaning; routine loading, unloading and bunkering operations at oil terminals; disposal of bilges, used oils, oily waters and other products that contain hydrocarbons). This type of pollution is generated both by oil tankers and non-oil carriers, like merchant ships, fishing boats, leisure craft and warships. Globally, the total annual input of oil into the marine environment amounts to about 3.2 million tonnes. It has been estimated that 1/3 of the total global maritime oil pollution comes from big shipping accidents, while routine shipping operations and land-based activities (either discharging directly or by means of rivers) account for 2/3. Even though the International Maritime Organization (IMO) obliges ships' crews to keep hydrocarbon waste onboard until it can be disposed of in a port reception facility, many vessels discharge waste oils into the sea in order to avoid the costs of pumping these wastes into onshore tanks for controlled destruction upon reaching a port. The IMO's regulations permit the discharge of hydrocarbons only when it is for safety reasons, or when the output consists of oily waters from engines whose hydrocarbon contents are lower than 15 parts per million by volume. Such permitted emissions must be made at least 50 miles from the coast and while the ship is sailing. They may not exceed 30 litres per mile travelled and the total output may not be more than 1/30,000 of the ship's cargo. In the worst-case scenario, the total permitted discharges in European waters would be between 33,000 and 53,000 tonnes per year, far below the observed amount. The illegal and deliberate dumping causes chronic hydrocarbon contamination, which imposes a roughly three times higher threat to the environment than the acute pollution from oil tanker accidents. Although the majority of such violations against regulations goes unnoticed, around 3,000 such cases are detected in European waters every year. The Mediterranean is by far the most affected by illegal oil pollution, which has been estimated at more than 400,000 tonnes a year. In the North Sea, the annual amount of illegal discharges is assessed at between 15,000 and 60,000 tonnes. In the Baltic, it is assumed to be up to 5,000 tonnes per year.

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6 Current regulations of environmental damage

Regarding the maritime environment, the United Nation Convention of the Law of the Sea (UNCLOS, 1982) is the key overall regulatory framework at global level for all activities at sea. Supporting this at global level (Figure 6) are the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78), the Framework for prevention of dumping of pollutant material (London Dumping Convention 72) and the Framework for oil pollution response (OPRC, 90). These latter are thus of paramount importance with respect to accidental or deliberate oil discharges. MARPOL, moreover, began as a means to reduce the risks and impacts of oil spills but has since become the vehicle for the control of many wider issues, such as the control of SO_x and NO_x emissions from ships, designed to implement specific aspects of agreements on mitigating climate change. They are also now including surveillance responsibilities.

One of the main points to note with respect to protection of the marine environment in Europe is the wide range of international bodies, treaties, conventions and organizations concerned with different aspects of protection and monitoring at regional and national levels (Figure 6). These include specific conventions and agreements relating to particular maritime regions, such as the Oslo and Paris Commission (OSPAR) for the north-east Atlantic, the Helsinki Convention (HELCOM) for the Baltic, the Barcelona Convention for the Mediterranean, the Copenhagen and Bonn Agreements for many of the EC and national economic zones.

UNCLOS defines the rights and obligations of flag states, port states and coastal states with respect to marine transport and potential threats to the environment while MARPOL establishes specific practices that are to be put in place by flag states, classification societies, port states and coastal states. These includes:

- responsibilities for ensuring sea-worthiness of oil tankers
- the establishment of vessel routeing and traffic management systems in congested or sensitive areas
- in effect, a complete ban on illegal discharge of oil in designated areas
- responsibilities on port states to provide appropriate facilities for handling waste.

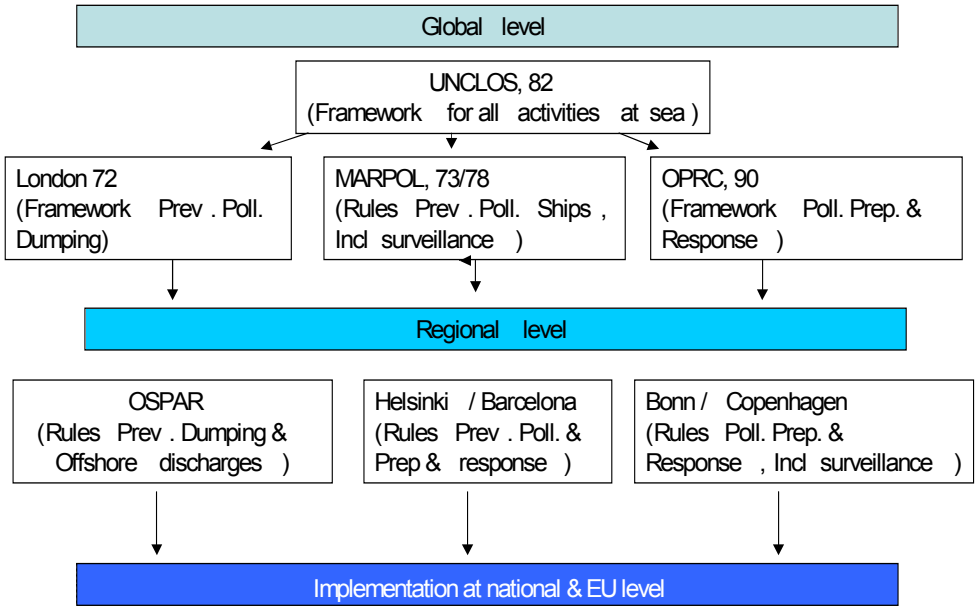

Figure 6: Policy tools (legal framework and agreements) for sustainable development and protection of the seas at global, regional and national levels.

Nations having ratified these treaties are consequently responsible for the following:

- monitoring the status of shipping certified under their national regime, including the activities of the classification societies delegated to carry out specific analysis tasks
- setting up appropriate monitoring and control procedures to ensure compliance with discharge restrictions in their national waters
- deploying and operating appropriate vessel routeing and traffic management services in designated areas.

At international level it is important to note the existence of two foci for protection strategy:

- setting up and operation of a regime in which the risk or potential for accidental or illegal discharge of oil into the marine environment is reduced to the minimum practical level
- setting up and maintaining an operational infrastructure to ensure rapid and effective response when a pollution event occurs.

The international context for the latter element is the International Maritime Organization (IMO) sponsored International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), which entered into force in 1995. This requires each individual state to operate an effective pollution response infrastructure as well as providing a framework through which states can cooperate in responding to pollution in an international context.

By themselves UNCLOS and MARPOL could be implemented by signatory states through the definition of suitable national legislation and designating an appropriate national entity responsible for enforcement of discharge limitations. In general this is the case in most signatory states where roles and responsibilities for national organizations (e.g. the Norwegian Coastal administration - Kysteverket) and port authorities are well defined with respect to enforcing pollution control and providing the legal infrastructure to prosecute offenders and deter further discharge. However, using national legislation to prosecute offenders leaving national waters and hence deter further offences is extremely difficult in practice. As a result, a number of regional agreements have been set up to facilitate cooperation with respect to surveillance, prosecution and analysis as well as to reinforce pollution response capabilities.

Regional agreements and policy tools of relevance can be split into two categories:

- regional cooperation agreements
- EU policy driven tools

The former includes the OSPAR Convention, which addresses pollution in the North Atlantic and North Sea areas, the HELCOM Convention which deals with pollution and sustainable development in the Baltic Sea and the Barcelona Convention which is a UN sponsored initiative to support sustainable development and pollution reduction in the Mediterranean Sea. In addition, there are regional agreements related to cooperation with respect to data gathering and to ensuring effective regional pollution response capabilities (e.g. the Bonn Agreement). The Annex of this document gives a brief tabular overview of the main policy elements of the individual treaties and agreements presently in place according to their relevance in terms of response to oil spill pollution, signatory states, responsibilities, relationship with other treaties and organizations, and implementation.

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7 Role of international maritime safety organisations

Recognition that safety at sea is best improved by setting up international regulations followed by all shipping nations led to the establishment of **International Maritime Organization (IMO)** in 1948. IMO is a United Nations agency, responsible for the development and application of highest standards in matters of maritime safety, efficiency of navigation, and prevention and control of marine pollution from ships. The Organization is authorized to handle administrative and legal matters regarding its goals. IMO's first achievement was the adoption of the most important treaty concerned with maritime safety - the International Convention for the Safety of Life at Sea (SOLAS), in 1960. SOLAS was followed by a number of international collision regulations and global standards for seafarers, international conventions and codes related to search and rescue, as well as policies concerned with load lines, the carriage of dangerous goods and tonnage measurements. The general safety measures apply to oil tankers as well as other ships, but there are some special requirements for tankers. For instance, the danger of fire is much greater on board ships that carry oil and refined products, so fire safety provisions are much stricter for tankers than ordinary dry cargo vessels. Besides, the empty tanks or spaces left above the oil in loaded tanks must be filled with inert (i.e. non-explosive) gas. Furthermore, all tankers have to be equipped with an emergency towing arrangements. As mentioned in the previous section, the most important IMO measures designed to prevent tanker accidents and alleviate their consequences, as well as to tackle pollution caused during routine ship operations, are presented in the MARPOL Convention. IMO has also adopted treaties concerned with liability and compensation issues. Another important measure introduced by IMO was the development of a Global Maritime Distress and Safety System (GMDSS), an integrated communication system, which combines satellite and terrestrial radio communication techniques and ensures fast, automated sending and receiving of distress alert. Other IMO regulations are related to the safety of containers, bulk cargoes, liquefied gas tankers and other types of vessels. Special consideration has been given to raising standards of management and shipboard personnel. All these measures are expected to greatly improve maritime safety and pollution prevention at sea in the future. However, adopting these rules and standards does not suffice – they have to be implemented and enforced by individual countries. IMO has therefore developed mechanisms for cooperation among its 164 Member States in the field of governmental regulation and practices related to shipping. The Organizations' activities towards its goals have so far achieved a significant success – ship casualty rates have decreased and ship generated oil pollution has declined.

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8 Community strategies in enforcing environment protection regulations

As a result of recent high profile incidents such as the *M/Ts Prestige* and *Erika* tanker accidents, oil pollution of the marine environment is very high on the political agenda of the EU. As part of a strategy presently under development (e.g. "Towards a strategy to protect and conserve the marine environment") together with appropriate elements of the 6th European Action Plan, the EC states that the following objectives are to be achieved:

- ensure full compliance with existing discharge limits of oil from ships and offshore installations by 2010 at the latest
- eliminate all discharges from these sources by 2020.

The EC recognises the utility of existing international agreements in these objectives. Hence, the focus of oil pollution related activity is to ensure that the EU Member States comply with these agreements to the maximum extent. To this end, an analogous dual strand approach is being implemented to cover:

- pollution prevention through improved traffic monitoring and control, port state requirements and tighter regulation of classification societies
- pollution response preparedness through coordination measures and the establishment of cooperation mechanisms and requirements.

A series of EC directives, regulations and council decisions have been issued in support of the first element that include setting up the ***European Maritime Safety Agency (EMSA)*** and the establishment of Vessel Traffic Systems. The main focus of this line is transport related legislation. An important role enabled by these actions is to facilitate more effective information exchanges between Member States so that vessels making illegal discharges in national waters of one Member State can be apprehended and prosecuted in the national waters or port area of another. Another area where the EU has implemented additional legislation is that related to classification societies. Experience from both the *Erika* and the *Prestige* tanker accidents demonstrated that documentation from certain classification societies may not have been reliable and that port or coastal states had only limited redress against an unrepresentative or misleading certification.

In the context of these changes in maritime policy, the establishment of EMSA was a logical step. EMSA should help improve and strengthen the general maritime safety system within the EU. Beside the 25 Member States, Norway and Iceland participate fully in the work of EMSA as well. The agency started to work effectively in May 2003. However, it is still in its development phase, so certain operational and administrative activities are going to be extended and new tasks will begin in the course of this year. Also, new and unpredicted circumstances in the field of marine safety and marine environment protection may induce new activities in the Agency. Generally, EMSA should play a major role in reducing the risk of maritime accidents, marine pollution from ships and the loss of human lives at sea. EMSA has no legislative or policy-making function. It is expected to provide scientific and technical advice to the European Commission in the updating of the existing instruments and the development of new legislation. This includes assistance to the Commission regarding EC policies related to IMO and regional organisations (e.g. HELCOM, OSPAR, the Bonn Agreement and the Barcelona Convention).

For example, EMSA will observe the international progress related to liability and compensation issues, and will assist the EC with its legal and technical expertise in this field. Its prime responsibility will be insurance of a proper, harmonized and effective implementation of the vast number of EU legislation concerned with maritime safety and oil pollution prevention. It will organize and structure dialogue and cooperation between the 27 member countries and the European Commission, with special attention to the new Member States. EMSA will also monitor the implementation of the EU maritime policy and evaluate its effectiveness. The key areas of EMSA's activities includes:

- auditing of EU-recognized classification societies
- consolidation of the Port State Control regime
- building up of a common methodology for investigating maritime accidents
- development and utilization of monitoring and information networks that would provide all data relevant for effective maritime safety and counter pollution measures (vessels' movements and cargoes, waste deliveries by ships visiting European ports, early alerts on any incidents that involve European interests).

In 2005, some of the Agency's tasks specifically related to oil pollution response, as determined by the Action Plan on Oil Pollution Preparedness and Response (Regulation 724/2004/EC), are:

- technical and scientific assistance to the Member States in their operational responses to marine oil spill pollution
- setup of a centre of knowledge containing information on most suitable pollution response techniques in dealing with different types of oil and dangerous substances
- development of information systems for pollution from ships, including monitoring and early identification of ships, and aerial/satellite surveillance of oil slicks.

For the pollution preparedness element, the main focus is to reinforce national environmental legislation and this includes setting up the Civil Protection and Environmental Accidents Unit within EC DG Environment who lead a coordination infrastructure as well as being an approved activation unit for accessing satellite Earth observation (EO) data under the International Charter on Space and Major Disasters.

At the lowest level with respect to implementation and enforcement, national legislation and its execution is the responsibility of EU Member States. This must ensure the following elements:

- the existence of appropriate legal instruments designating particular actions (e.g. discharge of oil in the marine environment) as a violation to be prevented, prosecuted and punished
- the assignment of responsibility to appropriate organisations for the collection of information and initiation of the legal process to prosecute offenders – this may include national, regional and local level institutions
- the assignment of responsibility to appropriate organizations to apprehend offenders and subject them to the national legal process.

The enlargement of the EU has led to larger divergences in safety performance standards among the member countries. Moreover, some of the new Member States have very large fleets under their flags. Hence, the EU fleet has almost doubled in tonnage, which requires a significant increase in the scale of activities focused on convergence and harmonization of safety level.

As mentioned earlier, a considerable amount of marine oil pollution is not generated at sea, but comes from rivers and land sources. This fact illustrates that coastal areas cannot be treated as isolated from the inland regions. It is one of the problems that point out to the need for establishing a truly integrated management of the coastal regions. Prompted by the increasing degradation of various resources in many of the European coastal regions, the EC and Member States initiated a ***Demonstration Programme on Integrated Coastal Zone Management (ICZM)***, which was operated from 1996 to 1999 (see: http://europa.eu.int/comm/environment/iczm/demopgm.htm). The purpose of the ICZM Programme was to identify the best practice in dealing with the coastal problems. The Programme resulted in adoption of two documents:

- Communication on ICZM: A Strategy for Europe (COM/00/547), and
- Recommendation concerning implementation of ICZM in Europe (2002/413/EC).

The Communication defines the promotion of the EU-wide ICZM strategy through various EC instruments and programmes, while the Recommendation addresses the development of national strategies for ICZM. These documents stress the importance of integrated approach to the management of costal areas, in order to achieve a truly sustainable development. The term "integrated" has the widest possible context here. None of the coastal issues can be tackled in isolation, without considering the whole range of other issues it is interweaved with. These issues can extend to other districts or across national borders as well as belonging to diverse sectors (e.g. energy, transport, agriculture, fisheries, aquaculture, tourism…), and accordingly be regulated by various policy instruments at different levels of administration. ICZM approach requires that all these elements be harmonized, in order to set up coherent measures and avoid possibly conflicting actions. Compatibility of sectoral laws and policies, which have either direct or indirect impact on coastal zones, needs to be improved. Decisions affecting coastal regions ought to be taken at the most appropriate level. Interests of the local communities should always be a starting point in decision-making, but local activities should also be coordinated with regional, national and EU policy-makers to prevent unintended conflicts among different levels of government. Furthermore, it is crucial for the success of coastal planning and management that not only government officials and policy-makers but also other interested parties, such as local businesses, residents and NGOs, fully participate in the process. In the case of countries sharing a coastline on the same sea, cross-border cooperation is required.

The EU ICZM strategy underlines the importance of accurate and sufficiently detailed information in appropriate and compatible formats. Such information is crucial for making good decisions and could be used at all levels – from local to European. It would be provided by an integrated approach to the monitoring of sustainable development in coastal areas. The provision of this information requires strengthening of the knowledge about coastal and marine processes. Moreover, communication between practitioners and scientific and technical community has to be improved.

ICZM is planned to be a dynamic and evolving process, sufficiently flexible to adjust to possibly altered conditions in the future, which may be harmful but cannot be predicted with certainty. This can be achieved by applying the "precautionary principle" for actions whose sustainability is not fully clear, i.e. trying to anticipate potential future damage.

The principles of ICZM are an essential part of the ***Water Framework Directive*** (WFD, Directive 2000/60/EC), the basic document of the EU water protection policy. The operative provisions of several older EU water-related directives are being integrated into the WFD, allowing them to be repealed, which will rationalize the Community's legislation. Recognizing that water knows no administrative or political boundaries and that the coastal areas face the threat of pollution from both marine and inland sources, the WFD introduces a novel strategy for tackling the problems of coastal pollution, based on the concept of individual river basins as natural geological and hydrological units. This concept brings together all the partners at national, regional and local levels who can have an influence and are interested in the supply of good quality water flowing from natural springs into the sea within a river basin they share. The EU Member States are expected to set up well-coordinated measures for the protection of water resources as a substantial part of a common River Basin Management Plan for a particular river basin. Once established, these plans have to be updated every six years. The authorities, policy-makers and stakeholders at all levels, including citizens, as well as actors in various sectors, are required to cooperate closely in managing water use and pollution, in order to assure that different policy areas and actions that have a potential impact on aquatic environment are harmonized. As for the coastal zones, the WFD will secure that all interested parties acts consistently in tackling pollution, whether it comes from the sea or the land. The requirement for close cooperation of all the parties assumes the development of coherent data collection and information supply by means of geographic information systems. This should ensure that data from different sources are easily comparable.

The WFD has a number of objectives related to the protection of water quality. The key one is achieving good ecological and chemical quality of all surface waters. Good ecological status is defined by characteristics of biological communities, as well as hydromorphological and physico-chemical characteristics. Good chemical status is determined by compliance with all quality standards for chemical substances that are put in place at the EU level. These standards can be renewed and the new ones established if necessary. The deadline for all inland and coastal waters to meet "good status" is set at 2015.

References:

- Johannessen, J.A., L.H. Pettersson, and S. Milutinovic, 2004: Policy Foundations Review. Report to ESA under ESA ESRIN Contract No. 17066/03/I-IW. NERSC, 2004.
- http://www.emsa.eu.int/Docs/workprogram/final%20version%20wp2005.pdf

9 Industrial policies

Oil and gas producers and tanker owners have been exposed to an increasing pressure from external stakeholders regarding the environmental impact these companies exert on society and communities. This cannot be ignored by the industry, since the companies' ability to operate in individual countries depends on their reputation and credibility in relation to environmental issues. It is, therefore, in the industry's best interest to develop and sustain environmentally responsible business practices. In order to find long-term solutions that join economic growth with environmental protection and social progress, the industries have established a number of associations, such as the International Petroleum Industry Environmental Conservation Association (IPIECA), the International Association of Oil and Gas Producers (OGP), the Oil Companies International Marine Forum (OCIMF), the International Tanker Owners Pollution Federation (ITOPF) and the International Association of Independent Tanker Owners (INTERTANKO). Due to the extensive oil production activities within the Norwegian territories the preparedness for pollution combat by the industry is organized in Norwegian Clean Seas Association for Operating Companies (NOFO)[1]. These associations help their members to better face environmental challenges, by facilitating discussion and exchange of information and best practices among petroleum producers and shipping companies through workshops, publications, committees, work groups etc. The members are provided with essential information on a number of environmental issues that influence the industry. This way, the industry can better anticipate the emerging environmental trends, which may affect its business. These organizations facilitate networking and partnership of the industry experts, thereby promoting realistic, science-based and economically sound solutions of key environmental problems, including oil spill preparedness and response. Through these activities, the industry consensus on global environmental issues is built. By establishing and maintaining relationships with individual national governments and intergovernmental organizations (e.g. the United Nations Environment Programme, the International Maritime Organization, the International Organisation for Standardisation, the World Bank, the European Commission and the European Parliament), the views of the industry are effectively communicated to other stakeholders and decision-makers at all levels. The industry associations are also devoted to providing consultative and technical services (e.g. in responding to oil spills) on behalf of their members or at the request of authorities and international agencies.

References:

- http://www.ipieca.org/
- http://www.ogp.org.uk/
- http://www.ocimf.com/home.cfm?pageid=10
- http://www.itopf.com/
- http://www.intertanko.com/
- http://www.nofo.no/

[1] NOFO is an oil spill response organisation etablished by the operating companies on the Norwegian continental shelf. Its objective is environmental protection, assuring that the oil spill recovery guidelines are followed by the industry.

10 Role of local and regional authorities

Private enterprises and industry have the major responsibility for preparedness and combat of acute pollution they may cause to the (marine) environment. This responsibility does not apply for the merchant shipping industry, which place a high responsibility of preparedness and contingency on the national and regional authorities in coastal regions near the major sailing routes. The pollution regulations are based on the fact that the risk for pollution events should be minimized through advance actions and preparedness. In case of accidents measures to prevent or limit damage to life, environment and values, in prioritized order, come into force. In case of accidental or deliberate pollution events the principle of the polluter "pays" is the basis for the international marine pollution legislation and regulations. For the practical organisation and implementation of pollution combat operations regional knowledge, human resources and experience, local infrastructure and last but not least highly specialized equipment and trained personnel are essential components of an efficient and successful damage prevention and combat operations in case of major marine pollution events. The damage and environmental impact effects are also in general of major local or regional concern and inconvenience. Accordingly, the regional authorities have a major interest in the best possible preparedness for pollution events and to limit the damage and impact of acute events. The level of preparedness is however due to be scaled based on a risk assessment of ***normal*** activities in the region and accordingly the level of preparedness for worst case scenarios may be fare beyond the regional capacity and level of preparedness. The regular regional level of preparedness and actions may accordingly be limited to handling of minor acute spills, while major accidental events will require contingency plans fare beyond the level of local preparedness. For such scale pollution events benefits must be drawn on local, regional, national and international cooperation.

The most efficient strategy for combat of marine oil spills is mechanical collection of the spilled oil as close as possible to the source of pollution. This type of "fixed" pollution sources is mainly from sources such as off-shore oil production and exploration installations as well as oil loading and refinery plants. In Europe these potential point source locations are mainly confined to the North Sea region, the Norwegian continental shelf and more recently the Barents and Kara Seas. For most European waters, however, pollution from ship collisions or wrecks is the largest potential treat. For combat of acute oil pollution from ships the accident and source could be everywhere within the European waters, however with larger possibility in heavily trafficked areas along the major sailing routes. Often experience with major pollution events has improved the local level of preparedness and contingency plans and the expertise is unevenly distributed among the European regional or local authorities. Accordingly a flexible solution based on local to international cooperation is essential in order to maintain a comparable high level of preparedness and capability in all potential accidental waters of the European continent.

Contingency plans for oil pollution preparedness and combat should be organized according to comparable/similar structure at national, regional and local level and preferable also at international level. International cooperation is essential in order to share the established high level expertise from past events as well as assuring efficient use of highly specialized and expensive combat equipment and expert personnel. For minor pollution events the local/regional preparedness should be sufficient to handle the combat operations. In regions with low risk and high vulnerability of the environment the level of preparedness will be pending on the local knowledge and the availability more centralized infrastructure and equipment. For major oil pollution events a national level of coordination is needed, however taking advantage of the regional/local knowledge and expertise. During such major pollution events national and international resources in terms of equipment and expert knowledge should be mobilized. The use of Norwegian equipment and personnel in the *M/T*

Prestige combat and clean up operations is one such example of international cooperation. One may consider at European Community level to build up an expert pollution combat team with portable equipment and infrastructure to support the regional and national contingency plans in case of major pollution events. This will also require regular training at all levels in order to integrate the international resources into the national and regional contingency plans.

With respect to limit the risk for accidents and reducing the damaging effects of acute marine oil pollution preparedness and the contingency plans should among others include:

- Legislation, reporting routines and monitoring, including AIS (Automatic Identification System) ship identification combined with airborne and satellite monitoring of pollution at seas, in order to early detect potential oil pollution events and identify polluters
- A network of available tug boats to early assist ships in possible distress situations with an acute possible pollution risk
- Availability of equipment and trained personnel to early undertake emergency unloading of oil from ships in distress
- Establish plans for a network of emergency ports and coastal grounding locations for landing of ships in distress, in order to limit the spreading of possible oil pollution
- Regional, national and international availability of oil spill combat and clean up equipment, chemicals (dispergation) and trained personnel for limiting of the environmental impact as well as undertake the clean up operations
- Establish a network for waste collection, handling and destruction of waste containing oil spill and chemicals
- Develop and maintain beach zone cleanup contingency plans with trained and professionally qualified personnel, equipment and endurance to limit the immediate and long-term damage to the environment of an acute marine oil spill.

The relatively high risk of oil pollution in Norwegian marine territories have resulted in that oil spill preparedness cannot be judged by the government's resources alone. Norway has a strong tradition for cooperation both within state bodies and between state bodies and private actors. Accordingly the Norwegian emergency preparedness system for acute pollution consists of four major elements, which may form a model for improving the pan-European preparedness in combating marine oil pollution:

- Private preparedness - to handle acute pollution incidents caused by own activity.
- Municipal preparedness - to handle smaller incidents of acute pollution not covered by the private preparedness.
- Governmental preparedness - directed towards the combating of acute pollution, which is not covered by private or municipal preparedness.
- International preparedness agreements - in case of larger acute accidents it may be relevant to request for assistance from Norway's neighbouring countries, regulated under the Copenhagen and Bonn Agreements.

References:

- Final declaration of the European Conference on the role of Baltic Local Authorities in responding to major oil spills, Helsinki, 9-10 February 2004.
- "On the safe side – maritime safety and oil pollution preparedness (in Norwegian)" ("På den sikre siden – sjøsikkerhet og oljevern beredskap"), Report to the parliament no. 14 (2004-2005).

11 Annex to Report

The main policy elements of the individual documents regulating marine oil pollution response:

United Nations Convention of the Law of the Sea (UNCLOS)

Main elements of relevance	UN law of the sea. Governance of all aspects of the ocean space. Sets the framework for basically all activities related to the global ocean, including pollution.
Signatory States	Global agreement including participation from all EC and ESA Member States (with the exception of Estonia and Latvia).
Responsibilities of Signatory States	Governments of the signatory states, represented by the relevant ministry, directorate and agency are responsible for implementation of the regulations activated by the law.
Relationship with other treaties and organisations	Compliant with the International Convention for the Prevention of Pollution from Ships (MARPOL) and the International Maritime Organisation (IMO).
Implementation	They shall detain and prosecute, under their own national legislation, any activity in the global ocean found to be in violation of this law.

International Convention for the Prevention of Pollution from Ships (MARPOL)

Main elements of relevance	- Prevention and minimisation of pollution from ships due to operational and accidental causes. - Designation of special areas where all dumping is prohibited (includes Baltic, Mediterranean and Black Seas).
Signatory States	Global agreement including participation from all EC and ESA Member States.
Responsibilities of Signatory States	- MARPOL does not specify monitoring requirements. Information collection and compliance is through the generation and inspection of appropriate process certification records (e.g. transfer of ballast from one set of tanks to another or discharge records from port facility). - Enforcement is based on detection and prosecution of violations. This is limited to violation under the jurisdiction of any party to MARPOL and is punishable under the law of either the state having the jurisdiction at the time of detection/infringement or under the law of the flag state. - Signatory states have two options for enforcement; a) regular control of certification and prosecution on detection of irregularities, b) implement and operate systematic surveillance system to detect infringements as they occur; in practice this is likely to be more effective with respect to prosecution and deterrence. - Signatory parties which are coastal or port states therefore must draft appropriate national legislation and identify appropriate organisations to take responsibility for detection of violations. EC and ESA Member States assign such surveillance responsibility consistently across requirements for all international, regional and European agreements, treaties and legislation.
Relationship with other treaties and organisations	MARPOL is maintained by the International Maritime Organisation (IMO). Hence responsibility for monitoring and reporting on its implementation rests with national government transportation or shipping departments.
Implementation	Governments of the signatory states, represented by the relevant ministry, directorate and agency should investigate the facts bearing on the issue of whether there has been a violation of the regulation. They shall furthermore detain and

	prosecute, under their own national legislation, any ship operator found to be in violation of this regulation.

Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Dumping Convention)

Main elements of relevance	The Convention aims to prevent marine pollution caused by dumping of waste and other matter that could endanger human health, damage living resources and marine life, harm amenities or interfere with other legitimate uses of the sea.
Signatory States	Global agreement including participation of the majority of EU coastal countries (except Estonia, Latvia and Lithuania) and Norway.
Responsibilities of Signatory States	- To establish authorities for issuing permits, keeping records and monitoring the condition of the seas. - To implement the Convention on all the vessels and aircraft under their jurisdiction or on those loading in their territories/territorial seas matter that is to be dumped. - To enter regional agreements for prevention of marine pollution in areas of particular interest. - To cooperate in training of personnel, supply of equipment for monitoring and research, and measures that prevent or mitigate pollution caused by dumping. - To develop procedures for the assessment of responsibility and the settlement of disputes regarding dumping. - To promote measures to prevent pollution by hydrocarbons, including oil and their wastes, other noxious or hazardous matter transported for purposes other than dumping, wastes generated in operation of vessels and other man-made structures, radioactive pollutants and matter related to the exploration of the sea bed.
Relationship with other treaties and organisations	There is a relation between the London Convention and UNCLOS, whose article 210 legally bounds all its parties to take legislative and other measures to control pollution by dumping. These measures must not be less effective than the global rules and standards, which are given by the London Convention. Other international agreements and programmes complementary to the London convention are the Basel Convention (1989), MARPOL and the UNEP Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA).
Implementation	The Convention covers a wide range of measures for its implementation. Each party has obligation to implement and enforce these measures, thereby ensuring that no illegal dumping is carried out and that the waste is dumped at the sites selected for that purpose only.

Baltic Marine Environment Protection Commission (Helsinki Commission – HELCOM)

Main elements of relevance	The Helsinki Commission, or HELCOM (first implemented in 1974 and whose terms of reference were modified in 1992), works to protect the marine environment of the Baltic Sea from all sources of pollution (land, marine, atmosphere) through intergovernmental co-operation.
Signatory States	Denmark, Estonia, the European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.
Responsibilities of Signatory States	The governments of the Contracting Parties must act on recommendations for the protection of the marine environment in their respective national programmes and legislation.
Relationship with other treaties and organisations	UNCLOS, MARPOL, International Council for the Exploration of the Sea (ICES).
Implementation	HELCOM request ICES to organise systematic data collection, analysis and reporting activities and advice on an annual basis. The Programme Implementation Task Force (PITF) includes, in addition to the HELCOM contracting parties, the governments of Belarus, Czech Republic, Norway, Slovak Republic and Ukraine, the Council of Europe Development Bank, the European Bank for Reconstruction and Development, the European Investment Bank, the Nordic Environment Finance Corporation, the Nordic Investment Bank, the World Bank and the International Baltic Sea Fishery Commission. HELCOM is also responsible implementing the Baltic Sea Joint Comprehensive Environmental Action Programme (JCP) established in 1992 to facilitate and monitor the elimination of the 132 most polluting sources within the Baltic Sea catchment area - known as "hot-spots".

Oslo-Paris Commission for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)

Main Elements of relevance	The Convention for the Protection of the Marine Environment of the North-East Atlantic ("OSPAR Convention") was opened for signature at the Ministerial Meeting of the Oslo and Paris Commissions in Paris on 22 September 1992. It entered into force on 25 March 1998. The OSPAR Convention seeks to prevent and eliminate pollution of the marine environment from all kinds of sources, and protecting the marine area against the adverse effects of human activities.
Signatory States	Belgium, Denmark, EC, Finland, France, Germany, Iceland, Ireland, the Netherlands, Norway, Portugal, Spain, Sweden and the United Kingdom of Great Britain and Northern Ireland, Luxemburg and Switzerland.
Responsibilities of Signatory States	The contracting parties must comply with the prevention of dumping within OSPAR area. In so doing, their respective national programmes and legislation are activated.
Relationship with other treaties and organisations	UNCLOS, MARPOL, ICES.
Implementation	The Commission established by the OSPAR Convention is authorized to adopt binding decisions and to establish rights of access to information about the maritime area of the Convention. OSPAR secretariat designated ICES as responsible for provision of regular reports on status of marine environment for OSPAR area. ICES then organise systematic data collection, analysis and reporting activities and advice on an annual basis.

Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention)

Main Elements of relevance	The Barcelona Convention is the legal and institutional framework of the Mediterranean to monitor the state of the Mediterranean Sea and to identify the major environmental issues and their causes. In particular it aims to prevent and abate pollution caused by land based sources, discharges and dumping from ships and aircraft, or resulting from exploration and exploitation of the sea bed.
Signatory States	France, Spain, Italy, Greece, Turkey, Slovenia, Croatia, Algeria, Tunisia, Libya, Cyprus, Egypt, Malta and Morocco.
Responsibilities of Signatory States	The contracting parties must comply with the regulations for prevention of pollution. In so doing, their respective national programmes and legislation are activated.
Relationship with other treaties and organisations	UNCLOS, MARPOL, ICES
Implementation	A regional Centre, now called REMPEC, was created in 1976 and based in Malta. A new totally revised 'Protocol Concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea' was adopted on 25 January 2002.

Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil and Other Harmful Substances (Bonn Agreement)

Main Elements of relevance	The Bonn Agreement is an international agreement by North Sea coastal states, together with the EC to offer mutual assistance and co-operation in combating pollution (oil and other harmful substances) and execute surveillance as an aid to detecting and combating pollution and to prevent violations of anti-pollution regulations.
Signatory States	Norway, Sweden, Denmark, Germany, Netherlands, Belgium, UK and France + EC (Ireland has observer status, Spain and Portugal invited). Presidency resides with Maritime Coastguard Agency (MCA), UK.
Responsibilities of Signatory States	The contracting parties must comply with the agreement and offer assistance and cooperation on surveillance and combating pollution in the North Sea.
Relationship with other treaties and organisations	UNCLOS, MARPOL, ICES.
Implementation	There is specific provision for collaborative airborne surveillance to detect spillages of oil and other harmful substances that can threaten the marine environment. Accidental spillages or those made in contravention of international conventions will be registered and if possible sampled both from sea surface and on board the suspected offender.

Copenhagen Agreement

Main Elements of relevance	Prevent marine pollution from oil and other harmful substances.
Signatory States	Norway, Sweden, Denmark, Finland and Iceland.
Responsibilities of Signatory States	Undertake the necessary measures to limit and prevent marine pollution from oil and other harmful substances. Include surveillance tasks.
Relationship with other treaties and organisations	UNCLOS, MARPOL, ICES.
Implementation	

European Water Framework Directive (WFD)

Main Elements of relevance	A thorough restructuring process concerning European Water Policy has been undertaken in the European Commission, and the adoption of a new operational Water Framework Directive has established the objectives for water protection in this century. It is recognized that in the protection of coastal zones from inland-generated pollution, washed into the sea via watercourses, approach based on individual river basins has to be taken as the starting point. This approach aims to ensure that all stakeholders, who influence the quality of water flowing from springs into the sea, act in a coordinated way. It also calls for the development of coherent data collection and information supply by means of geographic information systems.
Signatory States	All EC Member States, Norway, Switzerland.
Responsibilities of Signatory States	WFD requires members, among others, to: 1. expand the scope of water protection; 2. achieve good status for all waters by a set deadlines; 3. conduct water management based on river basins approach; 4. streamline legislation.
Relationship with other treaties	For the marine part of the river basins there is connection to UNCLOS and MARPOL. It also replaces seven existing directives on surface water and related directives on measurement methods, sampling frequencies, exchange of information, ground water, and dangerous substances discharges.
Implementation	River basin management plan.