



North Sea Manual on Maritime Oil Pollution Offences



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Part I: Introduction and Background

The purpose of this manual is to support the detection of maritime oil-pollution offences, the collection of evidence about such offences and the imposition of penalties on those responsible for them, thereby helping to deter further offences and improving the marine environment. As background, this section also sets out the effects of marine oil pollution.

This manual was jointly developed by the North Sea Network of Investigators and Prosecutors (NSN), a body associated with the OSPAR Commission, and the Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances, 1983 (Bonn Agreement).

This manual is a living document and will continuously be updated and further developed by NSN and the Bonn Agreement in order to take into account legal, political and technical developments in the field of maritime oil pollution offences.

Chapter 1: Introduction

This chapter sets out the aims of this manual, and the way in which it has been developed

Section 1.1: Purpose of this Manual

1.1 It is more than thirty years since the international community first adopted international rules and standards to protect the marine environment against pollution from ships. This was achieved by the 1973 International Convention on the Prevention of Pollution from Ships, which was completed and adjusted to ensure entry into force by the 1978 Protocol to it - the two instruments together being known as MARPOL. Since then the international rules and standards set out in MARPOL have been extended, improved and strengthened on many occasions.

1.2 But the best of legislation will have no impact on the real world unless it is implemented and enforced. There is still much room for improvement in the implementation and enforcement of MARPOL. This manual is intended to assist in this process in the North Sea Area – the waters covered by the Bonn Agreement¹. It is also hoped that the experience described in the Manual, will be helpful to other States.

1.3 The Manual is addressed, in the first place, to the national enforcement agencies concerned with implementing international rules and standards against oil pollution from ships, and the national legislation applying them. To achieve their purpose, this legislation must be effectively enforced. It is therefore essential that ships which contravene the legislation by illegally discharging materials are detected, prosecuted and convicted. Shipping is an international business and the North Sea Area covers some of the busiest shipping routes in the world. A pollution incident may affect more than one country. For example, a vessel may discharge an illegal quantity of oil in the exclusive economic zone (or equivalent area of jurisdiction) of one State whilst en-route between ports in two other countries. Cooperation between neighbouring States is therefore essential, and effective cooperation requires a common understanding of what is involved. This

¹ Currently, the North Sea Area covers the North Sea proper (south of latitude 62°N) and the English Channel to a line 50 nautical miles west of a line from Ushant to the Isles of Scilly. With the accession of Ireland, it will be extended to cover the waters subject to the jurisdiction of Ireland together with adjoining UK and Norwegian waters.

manual therefore aims to set out a common understanding of the impacts of oil pollution, how evidence of maritime pollution offences can be gathered, and the reliability of the methods used.

1.4 The Manual is also addressed to those involved in the processes of bringing offenders to justice - prosecutors, defence lawyers and magistrates and judges. For them, it is intended to provide an internationally agreed statement of the significance of maritime oil-pollution offences and of good practice in assembling, presenting and evaluating evidence on such offences. Since violations of the regulations on maritime pollution offences can cause serious environmental damage, and lead to heavy costs for combating the oil spills and clearing up the damage, it is essential that appropriate action is taken against the violators. This Manual is intended to support such action.

Section 1.2: Development of this Manual

1.5 At the third International Conference on the Protection of the North Sea in the Hague in 1990, the Ministers and EC Commissioner decided that common actions should be taken at national and international level in order to improve the effectiveness of prosecution for violations of the international rules and standards established by MARPOL, and the associated collection of evidence.

1.6 As a first step, Ministers invited the Contracting Parties to the Bonn Agreement to produce a Manual explaining the systems of airborne surveillance and other methods used for identifying offenders and for obtaining evidence. The Manual "Oil Pollution At Sea - Securing Evidence on Discharges from Ships" was published in 1993 by the Bonn Agreement and was disseminated worldwide through the International Maritime Organization. The Manual was addressed to authorities in charge of detecting violations, police officers, prosecutors, defence lawyers and courts in order to explain how evidence can be gathered and to indicate the reliability of the methods used. It was intended to facilitate the common understanding of the methods used for those who are not familiar with the technicalities.

1.7 Taking into account the progress made in the establishment of exclusive economic zones (EEZ), the Ministers at the Fourth International Conference for the Protection of the North Sea in Esbjerg 1993 agreed as a second step to develop common procedures with the aim of facilitating, in a harmonised way, the rendering of assistance and the admissibility of different forms of evidence and co-operation between the North Sea States. To achieve this facilitation, the Contracting Parties to the Bonn Agreement agreed to develop guidelines for personnel engaged in securing or gathering evidence as a complement to the original Manual. These guidelines were published in 1999 as the Manual "Oil Pollution at Sea - Part 2: Effective Prosecution of Offenders - Guidelines on International Co-operation".

1.8 In 2002, the Fifth North Sea Conference, held in Bergen, Norway, returned to the issue. Although the progress that had been made was recognised, the Ministers recognised that further action was needed, both internationally and nationally, in order to prevent pollution from shipping activities in the North Sea. Accordingly, they agreed to take initiatives to create a network of investigators and prosecutors to improve understanding and cooperation in the different stages of the enforcement process, and urged all North Sea States to ensure that the investigators, prosecutors and others involved in the enforcement process in their systems are aware of each other's requirements.

1.9 With Sweden as host, the Network of North Sea Investigators and Prosecutors (the North Sea Network) was established in 2002, supported by the OSPAR Secretariat. Their annual meetings have served to improve mutual understanding and cooperation. The Contracting Parties to the Bonn Agreement and the North Sea Network have collaborated to integrate, revise and up-date the two parts of the Manual "Oil Pollution at Sea" into this Manual.

Chapter 2: Oil Pollution and its Significance

This chapter provides general information on oil spills, their behaviour and effects, including an explanation of the weathering process. It also outlines the operational strategy for dealing with oil pollution at sea and on the coasts.

Section 2.1: Oil spills

Causes

2.1 The North Sea contains some of the busiest shipping routes in the world: nearly 600,000 ship movements a year take place into, and out of, the 50 main ports around the North Sea. On average, more than 400 ships a day pass through the Straits of Dover and, at the same time, 600 ships cross those straits, including 200 ferries.

2.2 This shipping activity is rapidly increasing: container traffic increased by 120% in the 1990s, and is still increasing. Bulk carriage of oil and chemicals is likewise expected to continue increasing, particularly from the expected development of oil traffic from the Siberian pipeline terminal at Murmansk, which will result in substantial traffics to Rotterdam and, through the western part of the North Sea Area, to the rest of the world.

2.3 All this activity gives rise to spills of oil. Some of these spills are the result of maritime accidents: collisions or shipwrecks which lead to the spilling of the oil on board the vessels involved, either fuel oil (bunkers) or lubricating oil for the ship itself or oil cargoes. Many of these maritime accidents result in acute pollution – the “black tides” (*marées noires*) as they are called in French. These acute incidents can result in massive oil spills: in 1993, the wreck of the *Braer* resulted in the release of 86 300 tonnes of oil.

2.4 At the same time, discharges of oil and oily wastes as part of the operations of the vessels often result in chronic oil pollution. Aerial observations in the North Sea Area detect oil spills resulting from such discharges in over 400 cases a year – more than one a day. And these are only the cases that are detected.

2.5 The offshore oil and gas industry also produces oil spills from offshore installations. In 2003, 19 spills of more than 1 tonne of oil were reported, involving 824 tonnes of oil in total. In addition, large quantities of oil are discharged in produced water (the water produced from oil and gas wells alongside the oil and gas). This is usually at low concentrations (in most cases below 30 parts per million, and rarely above 40 parts per million). Nevertheless, in 2005, 8 913 tonnes were discharged in this way.

Consequences of oil spills at sea

2.6 Oil spilled at sea threatens the environment. Resources at risk include ecologically important areas, fisheries, areas of outstanding natural beauty, industrial installations and areas used for recreation and tourism. An oil spill can present an immediate hazard by causing damage and death to birds and marine mammals and by exerting a toxic stress on subsurface organisms. Oil dissolved in the water is quickly dispersed to concentrations below the acute toxicity level but it can be taken up by organisms and affect their physiology, behaviour, reproductive potential and survival. Oil may also be transferred to the sediment, where it might persist for many years, and impact on organisms on and in the sea bed (benthos).

2.7 Once oil arrives in inshore waters and starts to come ashore, its potential to cause damage is much wider. Should oil be spilt or drift into an estuary it can pose particular problems due to the shallow waters, high levels of sediment in the water (which can absorb the oil) and the presence of vulnerable mud flats and salt marshes. In archipelago and wetland areas the spill, as a rule, leads to very high costs for combating the clean up measures.

2.8 Oil on tidal flats, leading to the death of a large number of benthic organisms and to habitat deterioration, can result in both short and long term damage. The reduction in the quantity of food (benthic organisms) and changes in the food composition may have effects on the size of the population of fish, shellfish, birds and seals. For each group of organisms there are different danger periods, the spring season for breeding birds and fish larvae, summer for benthic organisms and seals and winter for migratory or wintering birds.

2.9 Oil pollution – particularly chronic oil pollution - is a significant cause of death among seabirds. The measures that have been taken to reduce it have been successful in the North Sea – the proportion of dead guillemots polluted by oil has dropped by 50% since surveys started in the 1970s. Nevertheless, in the areas of the North Sea near the major shipping routes, the proportions of deaths of guillemots where oil pollution is a cause, or a contributory cause, is still over 10%.

Section 2.2: Behaviour of spilled oil

Development and behaviour of oil slicks

2.10 The behaviour of spilt oil is illustrated in figure 2.1.

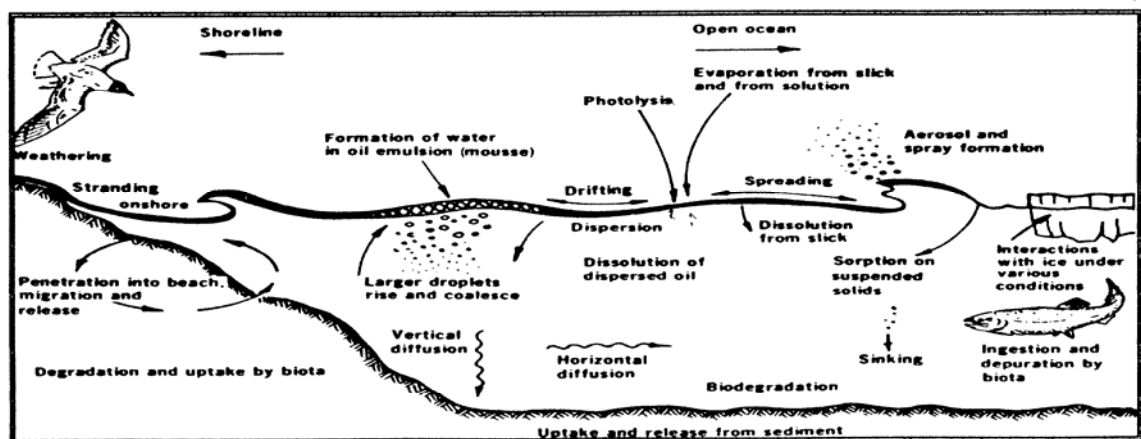


Figure 2.1: Processes taking place after an oil spill

2.11 Oil spilt on the sea surface will immediately spread. The oil will, due to its physical and chemical properties as well as external conditions, spread in an unpredictable way, resulting in an inhomogeneous spill (slick) consisting of thick patches and lumps interspersed with a thin oil film. The shape of the spill is largely determined by wind, waves and current.

2.12 The oil slick will then drift. The way an oil slick drifts at sea is determined by the following environmental factors:

- a. sea current speed and direction (including tides);
- b. wind speed and direction;
- c. wave pattern.

The current moves the spill with the water. In the absence of wind the oil normally moves at the same speed and in the same direction as the current. However, the movement of the oil is also affected by the wind, at a speed estimated as a few percent of the wind speed.

2.13 Waves are less important as they do not induce any considerable net movement of the oil spill. They are more important for the spreading and weathering processes.

2.14 Oil spilt into the sea will be affected by a number of weathering processes. As the oil spreads, the evaporation rate increases but the speed and extent of evaporation will vary considerably depending upon its composition. Light oils, like gasoline or light fuel oil, evaporate very quickly (50% within a few hours) while heavy oils evaporate more slowly. Evaporation is also affected by wind speed and temperature, the higher the wind speed and temperature the faster the evaporation.

2.15 The process of vertical dispersion and re-dispersion plays an important part in the dissolution of oil into the sea. In rough weather a significant proportion of the oil on the surface of the sea will be dispersed into the water column, mostly due to the breaking of waves. The dispersed oil droplets will tend to resurface or be re-dispersed due to buoyancy forces: large droplets will quickly resurface, whereas smaller droplets can be transported by the water current far away from the point of spillage and remain dispersed for weeks. When the oil attaches to, or forms particles with a density exceeding that of water, it may sink to the bottom of the sea in a process called sedimentation.

2.16 A further important weathering process is the emulsification of the slick, for example, the incorporation of water into the oil, thus changing the properties of the oil and the amount present on the sea surface. The water content of these emulsions, which are often known as chocolate mousse, can reach a level of up to 80-90%. Wind conditions and the viscosity of the oil are the most important factors governing the formation of emulsions, which can result in an oil spill volume double that of the spilt volume five days after the spillage.

2.17 The sun's rays change the properties of oil on the sea surface by means of photo-oxidation. This increases the spreading and stabilises the formation of emulsion.

Biodegradation

2.18 Oil spills are also subject to biodegradation, an extremely slow process but one which is important in the long run. However not all components of the oil can be degraded by micro-organisms.

2.19 An illustration of the time span and relative importance of the various processes described above is shown in figure 2.2.

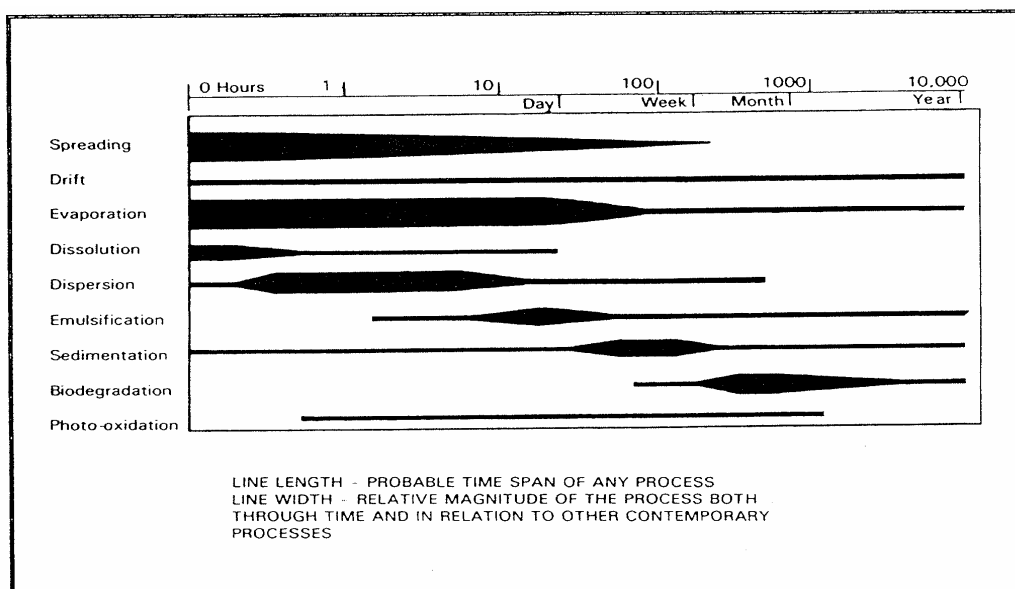


Figure 2.2: Time span and relative importance of processes acting on an oil spill

Section 2.3: Operational strategies

2.20 The operational strategy to deal with oil pollution at sea has two components:

- a. a surveillance strategy to detect and identify spillages, document the discharge and identify the polluter;
- b. a contingency plan to deal with the spilt oil: this covers determination of responsibilities, lines of command, lines of communication, location and content of stocks of equipment and available combating options. The main issues to be specified in the contingency plan are specified in the International Convention on Oil Pollution Preparedness and Response (OPRC).

2.21 The response action to minimize damage to the environment and reduce costs as much as possible is beyond the scope of this Manual.

2.22 As part of the surveillance strategy, evidence is gathered either to establish the basis for civil liability or to start legal proceedings against a violator of the MARPOL rules described in Chapter 3. This may involve a number of techniques such as:

- a. inspection of the suspected pollution source;
- b. visual observation of the spill;
- c. remote sensing;
- d. spreading and drift models (back-tracking);
- e. sampling and analysis.

Part II: The Legal and Organisational Framework

This part sets out the international rules and standards and the way in which they have been incorporated into the national laws of the States in the North Sea Area.

Chapter 3: International Law

This Chapter sets out the framework within which regional and national arrangements must work. This Chapter is subdivided in two main parts. The first part deals with the equipment and discharge regulations in MARPOL. The second part gives an overview of the legal instruments for co-operation in the field of prosecuting illegal maritime pollution.

Section 3.1: Equipment and discharge regulations in MARPOL

Introduction

3.1 The international regulations relating to the construction and operation of ships are contained in Conventions established under the auspices of the International Maritime Organization (IMO), a specialised agency within the United Nations system. IMO is also in charge of the follow-up to such Conventions, assisting in their implementation by Member States and developing guidelines, recommendations etc.

3.2 The principal regulations relating to the construction of ships are contained in the convention on the Safety of Life at Sea (SOLAS 74). This is not primarily concerned with pollution prevention.

3.3 The "International Convention for the Prevention of Pollution from Ships, 1973, as amended by the Protocol of 1978 thereto" (MARPOL) is aimed at minimising and eliminating pollution from ships. It covers two main subjects:

- a. the special construction and equipment rules for the prevention of accidental pollution;
- b. the circumstances in which discharges in the sea are authorised.

3.4 Each Contracting Party to MARPOL is obliged to incorporate the regulations in its national legislation, including provisions for prosecution of any discharge above legal limits. The regulations are different depending on whether the sea area has been declared a "Special Area" or not.

3.5 Specific sources of pollution are dealt with in the Annexes:

		(date of entry into force)
Annex I	oil	2 October 1983
Annex II	noxious liquid substances carried in bulk	2 October 1983
Annex III	harmful substances carried in packaged form	1 July 1992
Annex IV	sewage	27 September 2003
Annex V	garbage produced by ships	31 December 1988

3.6 Although the enforcement provisions described in section 3.2 apply for breaches of regulations of all annexes to MARPOL, only the relevant regulations in Annex I for the prevention of pollution by oil are described below. The summary of status of conventions on the IMO website (see section 3.2) shows that, as regards Annex I/II of MARPOL, the MARPOL Contracting Parties represented some 97 % of the total world ship tonnage at the end of 2003.

Regulations dealing with equipment

3.7 Although these regulations are mainly outside the scope of this document it is important to highlight the fact that ships built and equipped in accordance with the Convention are able to comply with the discharge regulations dealt with hereafter. For instance, as regards oil, there are two important Regulations in Annex I to the Convention which detail the required equipment.

3.8 Regulation 15 describes the equipment with which oil tankers shall be provided including:

- a. oil discharge monitoring and control systems fitted with a recording device to provide a continuous record of the discharge in litres per nautical mile and the total quantity discharged, or the oil content and rate of discharge. The system shall be such as to ensure that any discharge of an oily mixture is automatically stopped when the permitted discharge rate is exceeded;
- b. adequate means for cleaning cargo tanks and transferring dirty ballast residues and tank washings from the cargo tanks to slop tanks; and
- c. arrangements for slop tanks with a capacity sufficient to retain the slop generated by tank washings, oil residues and dirty ballast residues.

3.9 Regulation 16 contains similar regulations for the equipment dealing with oil or oily mixtures on board ships which is not carried as cargo but as fuel. These ships must be fitted with oily water separating equipment which will ensure that any oily mixture discharged into the sea after passing through the system has an oil content below the limit indicated in the tables below (I, II and III).

3.10 Compliance with the Regulations will avoid discharges above legal limits. It follows that any discharge above legal limits will be the result either of an equipment failure (and as such "clear grounds" for thorough inspection in the next port of call) or a deliberate act. Any discharge or failure of the "oil discharge monitoring and control system" should be entered in the "Oil Record Book", which has to be carried on board ship.

Discharge regulations in Annex I

3.11 For the purpose of Annex I, "Oil" is generally defined as petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products (other than petrochemicals subject to provisions of Annex II); a more detailed list of oils can be found in Appendix I of Annex I.

3.12 The oil discharge regulations in the Convention apply differently depending on whether or not the sea area has been designated a "special area" (see below). These regulations do however not apply:

- a. if the discharge is for the purpose of securing the safety of the ship, or saving life at sea, or
- b. if the discharge is the result of accidental damage to the ship or its equipment – except if the damage and discharge is caused by negligence, intent or reckless behaviour (see Regulation 11 in Annex I).

3.13 "Special areas" for oil are:

- a. the Baltic Sea

- b. the Black Sea
- c. the Mediterranean Sea
- d. the Antarctic area
- e. the Red Sea
- f. the Gulfs area
- g. the Gulf of Aden
- h. the North-West European Waters (incl. the North Sea and its approaches, the Irish Sea and its approaches, the Celtic Sea, the English Channel and its approaches and part of the North-East Atlantic immediately to the west of Ireland)
- i. the Oman Sea;
- j. Southern South African waters.

3.14 Special area status is in force for all these areas.

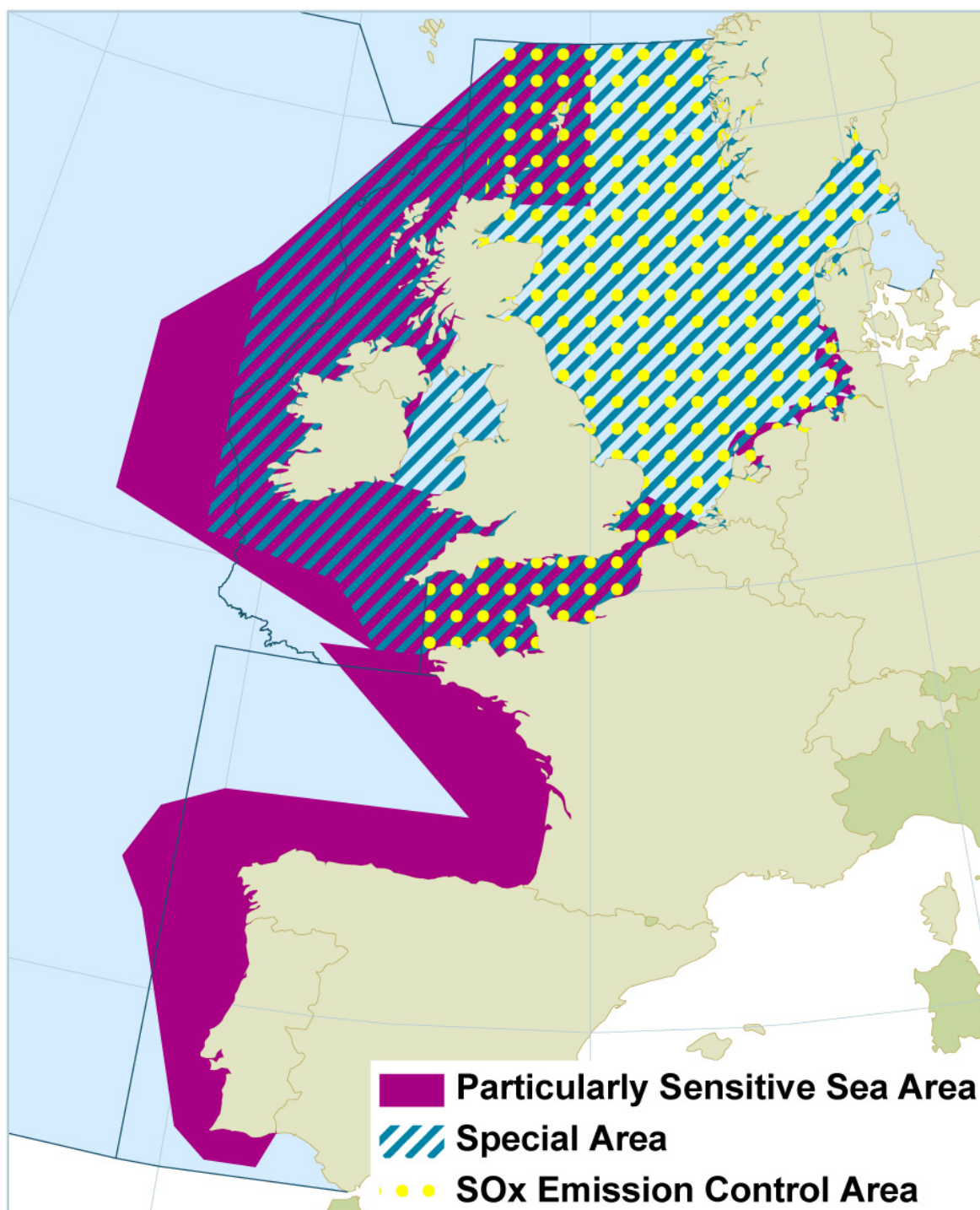


Fig. 3.1: Particularly Sensitive Sea Areas, Special Areas under MARPOL and SOx Emission Control Areas in the North-East Atlantic OSPAR Maritime Area Source: OSPAR 2009, JAMP Assessment on shipping, Publication no. 440, ISBN 978-1-906840-80-8
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3.15 Table I, II and III below describe the discharge regulations in Annex I of MARPOL (as summarized from MARPOL edition March 2003). Oil residues (sludge) which cannot be discharged into the sea in compliance with the regulations summarized in Tables I, II and III, have to be retained on board or discharged to reception facilities. MARPOL imposes on Parties a duty to establish reception facilities in their ports so that ships can discharge the residues that they are not allowed to discharge in the sea. It is however to be noted that, in some areas of the world, such facilities are not available and ships may then have difficulty in discharging their residues on land.

TABLE I OIL TANKERS OF ALL SIZES Oil discharge from cargo tank areas, including pump-room²	
Within special areas	DISCHARGES PROHIBITED Except clean or segregated ballast
Outside special areas	DISCHARGES PROHIBITED Except clean or segregated ballast, or except when: <ol style="list-style-type: none"> 1. tanker is more than 50 nautical miles from the nearest land, and 2. tanker is proceeding <i>en route</i>, and 3. instantaneous rate of oil discharge does not exceed 30 litres per NM, and 4. total quantity of oil discharged does not exceed: <ul style="list-style-type: none"> - for existing tankers 1/15 000, - for new tankers 1/30 000 of cargo which was last carried, and 5. tanker has in operation an oil discharge monitoring and control system and slop tank arrangement as per Regulation 15

TABLE II OIL TANKERS OF ALL SIZES and OTHER SHIPS \geq 400 GRT Oil discharge from machinery spaces³	
Within special areas	OIL DISCHARGES PROHIBITED, except when: <ol style="list-style-type: none"> 1. ship is proceeding <i>en route</i>, and 2. oil in the effluent without dilution does not exceed 15 part per million, and 3. ship has in operation oil filtering equipment complying with Regulation 16(5), with an automatic 15 parts-per-million stopping device, and 4. bilge water does not originate from cargo pump-room bilges, and is not mixed with cargo oil residue (on oil tanker).
Outside special areas	OIL DISCHARGES PROHIBITED, except when:

² Oil discharges from an oil tanker falling under Table I include discharges of cargo oil residue and cargo pump-room bilges. However, the conditions in Table I also apply to discharges from machinery space bilges on oil tankers where mixed with cargo oil residue or when transferred to slop tanks.

³ Oil discharges from machinery spaces falling under Tables II and III include discharges of machinery space bilges and oil residue resulting from the purification of fuel and lubricating oils.

	<p>ship is proceeding <i>en route</i>, and</p> <ol style="list-style-type: none"> oil in the effluent without dilution does not exceed 15 parts per million, and ship has in operation oil discharge monitoring and control system, oily water separating or filtering equipment, or other installation as required by Regulation 16, and bilge water does not originate from cargo pump-room bilges, and is not mixed with cargo oil residue (on oil tanker). <p><u>Note</u>: unprocessed oily mixtures with an oil content in the effluent not exceeding 15 parts per million without dilution, and which (on oil tankers) do not originate from cargo pump-room bilges and are not mixed with cargo oil residue, may be discharged without other restrictions.</p>
<p style="text-align: center;">TABLE III</p> <p style="text-align: center;">SHIPS < 400 GRT OTHER THAN OIL TANKERS</p> <p style="text-align: center;">oil discharges from machinery spaces</p>	
Within special areas	<p>OIL DISCHARGES PROHIBITED</p> <p>except when oil in effluent without dilution does not exceed 15 parts per million (this condition however does not apply for the Antarctic area).</p>
Outside special areas	<p>OIL DISCHARGES PROHIBITED</p> <p>except when, at the judgement of the Flag State, all of the following conditions are satisfied as far as practicable and reasonable:</p> <p>ship is proceeding <i>en route</i>, and</p> <ol style="list-style-type: none"> oil in the effluent without dilution does not exceed 15 parts per million, and ship has in operation oil discharge monitoring and control system, oily water separating or filtering equipment, or other installation as required by Regulation 16. <p><u>Note</u>: unprocessed oily mixtures with an oil content in the effluent not exceeding 15 parts per million without dilution may be discharged without other restrictions.</p>

Section 3.2: Instruments for co-operation in the field of prosecuting illegal maritime pollution

Introduction

3.16 There are two fundamental instruments available to the international community for taking action against the perpetrators of illegal acts of marine pollution:

- the MARPOL Convention relates to the prevention of pollution from ships, and to the protection of the marine environment from violations of discharge regulations which are stipulated in this Convention - such discharges being the result of either an equipment failure or a deliberate act (see §§ 3.20 – 3.29);
- the 1982 UNCLOS Convention is a more universal instrument which relates to matters governing the Law of the Sea including the protection of marine environments from the activity of shipping (see §§ 3.30 – 3.54).

3.17 Both conventions lay down the extent of enforcement powers of the Coastal State, Port State and Flag State respectively. In order to meet the aims of these two Conventions, they must be implemented in national law through appropriate legislation.

3.18 Offences against both mentioned maritime conventions usually have an international character involving transboundary, administrative and judicial co-operation between competent authorities. The Paris Memorandum of Understanding on Port State Control and the European Port State Directive ensure an effective, coordinated and uniform system of inspection or Port State control by maritime authorities in most European ports (see §§ 3.55 – 3.64). Procedures for international co-operation between judicial authorities are laid down in a number of European criminal law Conventions (see §§ 3.65 – 3.86):

- a. European Convention on Extradition
- b. European Convention on Mutual Assistance in Criminal Matters
- c. European Convention on the Transfer of Proceedings in Criminal Matters.

3.19 Finally, the possibilities of quick and direct international Police co-operation (INTERPOL, Schengen Agreement) is briefly being discussed (see §§ 3.87 – 3.93), and information is added on recent European legislative initiatives on ship-source pollution and on sanctions for pollution offences (see §§ 3.94 – 3.95).

MARPOL

3.20 The general provision in Art. 6 of MARPOL contains the obligation of Parties acting as Flag State, Port State or Coastal State, to co-operate in the detection of violations and the enforcement of the provisions of the Convention, using all appropriate and practicable measures of detection and environmental monitoring, adequate procedures for reporting and accumulation of evidence.

3.21 Contrary to UNCLOS, MARPOL does not provide that a Port State can take proceedings when a violation takes place on the high seas or in areas under the jurisdiction of another State. So in principle, MARPOL does not deviate from the exclusive jurisdiction of the Flag State. However, a Port State may inspect a ship that enters a port or offshore terminal under its jurisdiction, which in some circumstances may lead to the detention of that ship. A Coastal State can institute proceedings under its own laws in respect of any violation that occurred within its area of jurisdiction.

Enforcement by Flag State (Art. 4 of MARPOL)

3.22 The Convention provides that any violation of the Discharge Regulations or other MARPOL requirements shall be an offence under the law of the Flag State wherever the violation occurs. If the Flag State is informed of such a violation and is satisfied that sufficient evidence is available to commence proceedings, it shall cause such proceedings to be taken as soon as possible, in accordance with its law. The Flag State shall promptly inform the Party which has reported the alleged violation, as well as the IMO, of the action taken. A Flag State may request a Port State control inspection.

Port State control (Art. 5 & 6 of MARPOL)

3.23 MARPOL provides that a ship may, in any port or offshore terminal of a Port State which is party to the Convention, be subject to inspection by port State control officers⁴ for the purpose of verifying whether the

⁴ Following *inter alia* Art. 5 and Art. 6 of MARPOL 73/78 and the provisions for Port State control in its annexes, the International Maritime Organization published a document on Procedures for Port State Control, which is intended to provide basic guidance on the conduct of Port State control inspections and to afford consistency in the conduct of these inspections, the recognition of deficiencies of a ship, its equipment, or its crew, and the application of control procedures. It sets out the IMO Resolution A.787 (19) of 23 November 1995 (containing general procedural guidelines for Port State control officers), and includes a list of addresses of Head Offices of Port State Control Administrations party to MARPOL 73/78 in order to assist Administrations and others interested in

ship has discharged any harmful substances in violation of the provisions of the regulations. However, the officers appointed or authorised by that Port State are bound to special rules on inspection of ships.

3.24 A Port State may also inspect a ship when it enters the ports or offshore terminals under its jurisdiction, if a request for an investigation is received from any Party together with sufficient evidence that the ship has discharged harmful substances into the sea. The report of the investigation is then passed on to the requesting Party and the Flag State for appropriate action.

3.25 In some circumstances, MARPOL provides that a Port State has the right to detain a ship: in cases where a ship does not carry a valid certificate on board, or when the condition of the ship or its equipment does not correspond substantially with the particulars of that certificate, the Port State carrying out the inspection shall take the appropriate steps to ensure that the ship shall not sail until it can proceed to sea without presenting an unreasonable threat of harm to the marine environment.

3.26 With respect to the ship of non-Parties, a Port State shall apply the MARPOL requirements as may be necessary to ensure that no more favourable treatment is given to such ships.

3.27 All of this is current practice between European countries participating in the Memorandum of Understanding (MOU) on Port State Control.

Enforcement by Coastal State (Art. 4 of MARPOL)

3.28 Any violation within the jurisdiction of a Coastal State party to the Convention shall be an offence under the law of that Coastal State - whether the ship flies the flag of a Party or not - and sanctions shall be imposed under that law. A Coastal State may request a Port State control inspection.

3.29 Whenever a violation occurs within the jurisdiction of a Coastal State, that State shall either take proceedings under its own laws or report the offence to the Flag State - which shall take proceedings as described above. In such circumstances most countries choose to take proceedings under their own laws, informing the Flag State that they have done so.

UNCLOS

3.30 The 1982 United Nations Convention on the Law of the Sea (UNCLOS) entered into force on 16 November 1994. Most North Sea States and the EC are Parties to this convention.

3.31 UNCLOS *inter alia* provides jurisdiction to the Coastal States in the EEZ in addition to the sovereign rights of the territorial sea (Art. 211, § 5 and Art. 220). This is very important, since all Bonn Agreement Contracting Parties have established or are in the process of establishing an EEZ or an equivalent marine area.

3.32 UNCLOS further provides a powerful legal basis for international co-operation in exercising Flag State, Port State and Coastal State powers of enforcement in the territorial seas and EEZs or equivalent marine areas, such as the UK Pollution Zone, aiming, *inter alia*, at facilitating the enforcement and prosecution of MARPOL offenders. The general UNCLOS provisions relevant to this international co-operation are discussed below.

3.33 It is important to note that these UNCLOS provisions break through the traditional supremacy of the jurisdiction of the Flag State in respect of discharge violations in areas outside the jurisdiction of a Coastal State: when a ship is voluntarily within a port, the Port State is granted extensive judicial powers in respect of a discharge violation committed by that ship outside its internal waters, territorial sea or EEZ. The provisions

contacting the pertinent authorities. This Resolution A.787 (19) revoked the former IMO Res. A 542 (13) on procedures for the control of ship and discharges under Annex I of MARPOL 73/78.

of UNCLOS concerning this universal Port State jurisdiction represent a key factor to successful prosecution of MARPOL Offenders.

3.34 With respect to the prosecution of a MARPOL offence committed in the territorial sea or EEZ of a Coastal State, UNCLOS provides the possibility for that Coastal State to:

- a. request a Port State to investigate a ship and report back to the Coastal State, for administrative or judicial proceedings;
- b. request a Port State to undertake judicial proceedings (Art. 218).

3.35 Furthermore, UNCLOS provides the possibility for a Coastal State to carry out an inspection on board and to detain or pursue a foreign ship at sea in respect of a serious discharge violation in its territorial sea or EEZ (under specific conditions) (Art. 220 + 111).

3.36 Breaking through the classic system of exclusive jurisdiction of the Flag State at sea made it necessary to establish certain guarantees to protect foreign ships. Such guarantees are provided with regard to the procedure of and conditions for inspecting ships (Art. 220 and 226), the suspension and restrictions on instituting proceedings (Art. 228), the notification to the Flag State (Art. 231), and liability of States arising from enforcement measures (Art. 232).

Enforcement by Flag States (Art. 217 of UNCLOS)

3.37 If a vessel commits a violation of MARPOL, the Flag State shall provide for immediate investigation and where appropriate institute proceedings in respect of the alleged violation, irrespective of where the violation occurred or where the pollution caused by such violation has occurred or has been spotted. Flag States conducting an investigation of the violation may request the assistance of any other State whose co-operation could be useful in clarifying the circumstances of the case.

3.38 At the request of any State, the Flag State shall investigate any violation alleged to have been committed by vessels flying their flag. If there is sufficient evidence available, Flag States shall without delay institute proceedings in accordance with their laws, and shall promptly inform the requesting State and the IMO of the action taken and its outcome.

Enforcement by Port States (Art. 218 and 219 of UNCLOS)

3.39 When a vessel is voluntarily within a port or at an off-shore terminal of a State, that Port State may undertake investigations and, where the evidence so warrants, institute proceedings in respect of any discharge from the vessel outside the internal waters, territorial sea or EEZ of that State in violation of MARPOL.

3.40 In cases where the discharge violation occurs in the internal waters, territorial sea or EEZ of another State however, the Port State may only institute proceedings upon request of that Coastal State, the Flag State, or another State damaged or threatened by the discharge violation. The Port State shall, as far as practicable, comply with these requests. It shall likewise, as far as practicable, comply with requests from the Flag State for investigation of a violation, irrespective of where the violation occurred. The records of the investigation carried out by a Port State shall be transmitted upon request to the Flag State, the Coastal State or a third State involved.

3.41 A Port State may also institute proceedings when the violation, committed in the internal waters, territorial sea or EEZ of another State, has caused or is likely to cause pollution in its own internal waters, territorial sea or EEZ.

3.42 Any proceedings instituted by the Port State on the basis of an investigation may be suspended at the request of the Coastal State (when the violation has occurred within its area of jurisdiction). The evidence

and records of the case, together with any bond or other financial security, shall in that event be transmitted to the Coastal State. Also the Flag State can suspend proceedings instituted by the Port State.

3.43 In cases where a vessel within one of its ports or off-shore terminals is in violation of applicable international rules and standards relating to seaworthiness and thereby threatens damage to the marine environment, Art. 219 of UNCLOS provides that the Port State, upon request or on its own initiative, has the authority to take administrative measures to prevent the ship from sailing.

3.44 Port States enforcement can be vital for the co-operation between North Sea States as to illegal discharges committed by foreign ships in each other's territorial seas or EEZs. A number of North Sea States have made pollution of another North Sea State's waters an offence under their own domestic law. This greatly simplifies the exercise of Port State jurisdiction.

Enforcement by Coastal States (Art. 211 §5, 220, 226 and 218 of UNCLOS)

3.45 For the purpose of enforcement, Coastal States may in respect of their EEZ adopt laws and regulations for the prevention, reduction and control of pollution from vessels conforming to and giving effect to MARPOL.

3.46 When a vessel is voluntarily within a port or at an off-shore terminal of a Coastal State, that State may institute proceedings in respect of any violation of its laws and regulations adopted in accordance with MARPOL and UNCLOS, when the violation has occurred within its territorial sea or EEZ.

3.47 If there are clear grounds for believing that a vessel navigating in the territorial sea of a Coastal State, has, during its passage therein, violated laws and regulations of that State adopted in accordance with MARPOL, that Coastal State may undertake a physical inspection of the vessel "on the spot", relating to the violation and may, where the evidence so warrants, institute proceedings, including detention of the vessel, in accordance with its laws.

3.48 Coastal States may also enforce discharge regulations in their EEZ in accordance with Art. 220 of UNCLOS, which provides that a Coastal State may request information from a ship navigating in the EEZ or the territorial sea and suspected of a violation in the EEZ. In case of a serious pollution, the Coastal State may undertake a thorough inspection of such a ship "on the spot" (following specific procedures; Art. 226), or even institute proceedings, including detention of the vessel. The extent of these actions that can be undertaken by a Coastal State at sea depends on the available evidence, the gravity of the violation and the magnitude of (possible) damage to the marine environment. Some governments are in the process of establishing objective criteria to define such situations.

3.49 In case of illegal pollution within the area of jurisdiction of a Coastal State, Art. 218 of UNCLOS provides for co-ordination and co-operation between the Coastal State and Port State.

Right of hot pursuit (Art. 111 of UNCLOS)

3.50 Art. 111 regulates the right of hot pursuit, which under certain conditions allows a Coastal State to pursue a foreign ship in the event of a violation of its laws and regulations committed within the waters under its jurisdiction, including the EEZ. It provides that the right ceases as soon as the ship pursued enters the territorial sea of its own State or of a third State. The text of the Convention does not preclude the possibility of co-operation between States on this matter; in other words, it seems evident that this restriction can be lifted in bi- or multilateral agreements.

Measures to facilitate proceedings (Art. 223 of UNCLOS)

3.51 Art. 223 of UNCLOS provides the obligation for States instituting proceedings to take measures to facilitate the hearing of witnesses and the admission of evidence submitted by authorities of another State, and to facilitate the attendance at such proceedings of official representatives of, for example, the Flag State and any State affected by pollution arising out of any violation.

Notification to the Flag State and other States concerned (Art. 231 of UNCLOS)

3.52 States must promptly notify the Flag State and any other State concerned of any measures taken against foreign vessels, and shall submit to the Flag State all official reports concerning such measures. However, with respect to violations committed in the territorial sea, the foregoing obligations of the Coastal State apply only to such measures as are taken in legal proceedings.

Suspension and restrictions on institution of proceedings (Art. 228 of UNCLOS)

3.53 Proceedings initiated by a State to impose penalties in respect of any violation of MARPOL by a foreign vessel beyond its territorial sea, shall be suspended upon the taking of proceedings by the Flag State within six months of the date on which proceedings were first instituted. When the Flag State has requested a suspension, it shall in due course make available to the State previously instituting proceedings a full dossier of the case and the records of the proceedings. Only when proceedings instituted by the Flag State have been brought to conclusion, the suspended proceedings shall be terminated.

3.54 The proceedings that were first instituted shall not be suspended however if they relate to a case of major damage to the Coastal State or if the Flag State in question has repeatedly disregarded its obligation to enforce MARPOL effectively.

Instruments relating to Port State Control

The Paris Memorandum of Understanding on Port State Control

3.55 The Maritime Authorities, consisting of 27 participating Maritime Administrations which cover the waters of European Coastal States and the North American basin from North America to Europe, cooperate in the Paris Memorandum of Understanding on Port State Control (further called MOU) on 26 January 1982. This Memorandum took effect on 1 July 1982. Some of the countries have acceded afterwards.

3.56 The MOU provides that these Maritime Authorities will maintain an effective system of Port State control with a view to ensuring that, without discrimination as to flag, foreign ships visiting the ports under their jurisdiction comply with the standards laid down in the relevant maritime conventions, *inter alia* MARPOL.

3.57 The MOU is primarily an administrative instrument for the detection of deficiencies of ships as regards maritime conventions including MARPOL, and for administrative exchange of information. When an inspection is carried out under the MOU and deficiencies are detected which are hazardous to the marine environment, the Maritime Authority will ensure that the hazard is removed before the ship is allowed to proceed to sea and for this purpose will take appropriate action, which may include detention. However, when exercising control under the Memorandum, the Authorities will make all possible efforts to avoid unduly detaining or delaying a ship. It should also be noted that in applying a relevant legal instrument for the purposes of Port State control such as MARPOL, the authorities will ensure that no more favourable treatment is given to ships entitled to fly the flag of a State which is not a Party to that instrument.

3.58 The Maritime Authority of a Port State will, upon the request of a Coastal State or Flag State, visit in port the ship suspected of a MARPOL violation and carry out an administrative and technical inspection in order to obtain information, to secure evidence relating to the suspected violation, and where appropriate to take a sample of any alleged pollutant.

3.59 Annex 2 of the Paris Memorandum of Understanding on Port State Control (<http://www.parismou.org>) describes the procedures for investigations by port State control officers within the MOU countries under MARPOL.

3.60 The MOU has introduced an electronic mail facility (mailbox system) which provides fast communication between Port State control authorities and is one of the means used to request inspection in the next port of call of a ship suspected of having violated the discharge regulations. The speed of this MOU

mailbox system is certainly an advantage in facilitating prosecution of MARPOL offenders, and it could have a strong deterrent effect. However, although the technical report may be part of the judicial file, the Port State controls under the MOU are of an administrative and technical nature and are not always adequate to deliver valid or sufficient evidence for criminal prosecution purposes. As mentioned above, the main purpose of the MOU was - and still is - to prevent the operation of sub-standard ships, and sanctions do not necessarily follow.

3.61 Also within the MOU, an information system on Port State Control inspections has been agreed and developed. The MOU authorities send daily messages on all the ships inspected in their national ports to the "Centre Administratif des Affaires Maritimes" at Saint-Malo in France (C.A.A.M.). The C.A.A.M. compiles all received messages in the central Port State Control database and information system SIRENAC. Port State Control officers can directly consult this database. Other authorities can do this by contacting the Secretariat of MOU⁵. The Secretariat, which is provided by the Ministry of Transport and Public Works and Water Management is in The Hague (Netherlands).

3.62 The possibility of also using the network of MOU Port States for the exchange of judicial inquiries and information regarding the exercise of jurisdiction under the EEZ regime should be studied. As mentioned above, it is obvious that for the legitimate institution of proceedings by Port States, an adequate legal basis relating thereto in accordance with their national legal system is required. Together with additional arrangements within the MOU-framework on the institution of proceedings as regards discharge violations, Port State enforcement in the North Sea area could thus be strengthened considerably.

European Community Port State Directive

3.63 Because there was a need for uniformity in executing the Port State Control procedures (inspection and detention), and in order to provide a clear legal basis for the actions under the MOU (being an administrative agreement), the European Community adopted the EC Directive 95/21/EC of 19 June 1995, which is regularly amended⁶.

3.64 The EC Port State Directive however provides no legal basis for the institution of proceedings by Port States. The Directive mainly aims at a more uniform execution of the MOU obligations, *inter alia* by listing (1) ships eligible for a priority inspection, (2) legitimate reasons for a detailed inspection (for example a notification report of another Maritime Authority), and (3) criteria for the detention of a ship. During the Fifth Ministerial Conference on Port State Control in Copenhagen on 14 September 1994, the MOU was amended, so that the new MOU text closely fits the European Port State Directive.

European Conventions on international legal assistance in criminal matters

3.65 As regards the prevention and control of crime, the Council of Europe⁷ has created several European Conventions in the field of Penal Law. The most relevant European Conventions on international legal assistance in criminal matters are discussed below.

5 The inspection and detention records for a ship are also passed on to the EQUASIS database of maritime authorities of *inter alia* the European Commission, the United Kingdom, France.

6 Council Directive 95/21/EC is amended by the following measures: Council Directive 98/25/EC of 27 April 1998; Commission Directive 98/42/EC of 19 June 1998; Commission Directive 1999/97/EC of 13 December 1999; Directive 2001/106/EC of the European Parliament and of the Council of 19 December 2001; Directive 2002/84/EC of the European Parliament and of the Council of 5 November 2002.

7 The Council of Europe is a regional, intergovernmental organisation, which aims at achieving a greater (political) unity between its Members States. It has set up a programme for legal co-operation in Europe, by creating legal procedures which are both less complicated and more flexible (thus making the European legal system more efficient). The Council now counts 46 Member States.

European Convention on Extradition

3.66 The European Convention on Extradition of 13 December 1957 entered into force on 18 April 1960. It has been ratified and has entered into force in all North Sea States and EU Member States.

3.67 This Convention provides for the extradition⁸ between Parties of persons wanted for criminal proceedings or for the carrying out of a sentence or detention order. Extradition shall be granted in respect of offences punishable under the laws of both the requesting and the requested Party by deprivation of liberty, or under a detention order for a maximum period of *at least* one year, or by a more severe penalty. Any requested Party has the right to refuse extradition of its nationals.

3.68 With respect to violations of the MARPOL discharge regulations in the EEZ of a European Coastal State, extradition will only be applied by way of exception, since extradition according to the Convention presupposes the threat of a custodial sentence for an individual suspect, whereas UNCLOS (Art. 73, § 3 and Art. 230, § 1) excludes imprisonment or any other form of corporal punishment as a form of penalty for such violations in the EEZ.

3.69 The same remark can also be made with respect to violations of the MARPOL discharge regulations in the territorial sea of a Coastal State. However, in case of a wilful and serious act of pollution in the territorial sea, this restriction does not apply (see Art. 230, § 2).

European Arrest Warrant

3.70 Between EU Member States, the European Arrest Warrant (EAW)⁹ has replaced the traditional extradition procedure. A EAW may be issued by a national judicial authority if the person whose return is sought is accused of an offence for which the maximum period of the penalty is at least a year in prison, or if he or she has been sentenced to a prison term of at least four months. There is, as a general principle, an obligation for the MS to execute the EAW and surrender the person. Grounds for refusal are very limited. The traditional ground of refusal in case of lack of dual criminality (*i.e.* the underlying offence must be considered a crime both in the requesting and the requested State) does not apply to 32 serious offences, amongst them environmental crime. The EAW provides that the executing MS cannot refuse to execute a EAW for these 32 offences, if they are punishable under the laws of the issuing MS by imprisonment for at least 3 years. The EAW also does not make any exceptions for the surrender of a country's own nationals. The functioning of the EAW is based on direct contacts between local courts in the different MS. The political phase of the procedure has been abolished and the procedure is purely judicial. Strict time limits for execution and surrender apply. The final decision on the execution of the EAW must be taken within 60 days after the arrest of the person and within 10 days if the consent has been given. These time limits can be extended by a maximum of 30 days at the request of the "executing" MS.

3.71 In June 2006, the Council approved the signature of a surrender agreement between the EU and Norway and Iceland which builds on a mechanism similar to the EAW. This agreement has not entered into force yet. Implementation of the agreement requires legal amendments so ratification will probably not take place before 2009.

European Convention on Mutual Assistance in Criminal Matters

3.72 All North Sea States and EU Member States are party to the European Convention on Mutual Assistance in criminal Matters of 20 April 1959 (entry into force: 12 June 1962).

⁸ Extradition means surrendering a person upon request to the requesting State, so that the person can be prosecuted or a custodial sentence can be executed in the requesting State.

⁹ Framework Decision 2002/84/JHA of 13 June 2002 on the European Arrest Warrant and Surrender Procedures between Member States.

3.73 Under this Convention, Parties agree to afford each other the widest measure of mutual assistance with a view to gathering evidence (audition of witnesses, experts and prosecuted persons, service of writs and records of judicial verdicts) or to communicate the evidence (records or documents) in criminal proceedings undertaken by the judicial authorities of the requesting Party. This legal assistance is provided for the purpose of investigations, prosecution and conviction in the requesting State.

3.74 The Convention also specifies the requirements that requests for mutual assistance and letters rogatory have to meet (transmitting authorities, languages, refusal of mutual assistance). It provides for instance that in case of urgency, letters rogatory may be addressed directly by the judicial authorities of the requesting Party to the judicial authorities of the requested Party. This direct transmission may take place through the International Criminal Police Organisation INTERPOL.

3.75 The Convention further provides for the laying of information by one Party with a view to proceedings in the courts of another Party. However, it does not imply an obligation for the latter Party to institute proceedings. This provision can be considered as the precursor or informal variant of the European Convention on the Transfer of Proceedings in Criminal Matters.

3.76 The European Convention on mutual assistance in criminal matters clearly affords greater scope. It can also serve as a basis for interpreting the provisions of UNCLOS concerning co-operation between Port State, Coastal State and Flag State in the field of providing legal assistance.

2000 Convention on Mutual Assistance in Criminal Matters between the Member States of the European Union

3.77 With the purpose of improving mutual assistance in criminal matters, the 2000 Convention on Mutual Assistance in Criminal Matters between the Member States of the European Union (hereinafter 2000 Convention) intends to supplement and facilitate the application between the Member States of existing instruments such as the 1959 CoE Convention and its 1978 Protocol, the 1990 Convention implementing the Schengen acquis and the 1962 Benelux Treaty.

3.78 According to the 2000 Convention, co-operation may be realised through *spontaneous* exchange of information or following to a Member State's *request*. In any case the request has to be made **directly between judicial authorities** with territorial competence for initiating and executing them and has to return through the same channels. The requested Member State has to comply with the formalities and procedures expressly indicated by the requesting Member State.

3.79 To facilitate a closer co-operation between law enforcement authorities, judicial authorities and other competent authorities, the 2000 Convention provides for new techniques in the field of technology such as video-conferencing, teleconferencing and interception of telecommunication. Other provisions deal with restitution of articles obtained by criminal means, the temporary transfer of persons held in custody for purpose of investigation, controlled deliveries and covert investigation.

3.80 Article 13 of the 2000 Convention provides rules concerning the setting up and the operating of joint investigation teams.

European Convention on the Transfer of Proceedings in Criminal Matters

3.81 Only a few North Sea States and/or EU Member States (Bulgaria, Denmark, The Netherlands, Norway, Romania, Slovakia, Sweden, Spain, Austria, Cyprus, Estonia, Latvia and Lithuania) have ratified the European Convention on the Transfer of Proceedings in Criminal Matters of 15 May 1972 (entry into force: 30 March 1978).

3.82 This Convention sets out rules and procedures for a Party to request another Party to take proceedings against a suspected person in its stead. The requested State shall have competence to prosecute under its own criminal law any offence to which the law of another Contracting State is applicable.

3.83 UNCLOS also provides for the transfer of proceedings, on the minimum condition that the requested (Port or Flag) State, like the requesting (Coastal) State, has claimed jurisdiction in respect of the offence for which prosecution is being sought, regardless of where the offence was committed. It should be further examined whether the rules and procedures in the European Convention on the Transfer of Proceedings in Criminal Matters appear to provide a suitable basis for the transfer of proceedings against seagoing vessels flying a foreign flag.

Implications for the implementation of UNCLOS

3.84 Most of the articles of UNCLOS that are mentioned above deal with, or presuppose, international co-operation in criminal matters. Such cooperation, and the enforcement of MARPOL, can be underpinned by the general Conventions on legal assistance in criminal matters, which the Council of Europe has developed.

3.85 For instance, some European countries (such as Germany or Belgium) already call upon the European Convention on Mutual Assistance in Criminal Matters in the follow-up of cases of deliberate marine pollution: acting as a Coastal State, they use the procedure as described in this Convention to transmit urgent requests of legal assistance to a Port State via INTERPOL (for judicial investigation on board of a suspect vessel in the port of that State).

3.86 Further examination is needed, however, of the extent to which the rules and procedures provided in the other European Conventions do (or do not) meet the specific restrictions and conditions which UNCLOS imposes, or how they can be applied, with respect to legal co-operation between Coastal State, Port State and Flag State in instituting proceedings against suspect ships (for example requests from Coastal State to Port State to institute proceedings, or ways for a Port State to oblige a ship to provide financial security on behalf of another State, and transferring it to that State).

ICPO-INTERPOL

3.87 The International Criminal Police Organisation INTERPOL (ICPO-INTERPOL) aims to ensure a co-ordinated international police co-operation between the police forces of INTERPOL Member States. It plays a vital role in supplying criminal information of a transboundary nature to the national police forces. One of INTERPOL's prime objectives is to ensure that INTERPOL Member States have a rapid, reliable, secure and permanently available electronic computer-to-computer mail service. In addition to the transmission of text messages, this mail system also enables law enforcement agencies to instantly transmit images, photographs, etc.

3.88 INTERPOL's permanent departments constitute the General Secretariat (in the Headquarters in Lyon, France), whose close contacts with the INTERPOL National Contact Bureaux (NCBs) in the various member countries provide the framework for day-to-day international police co-operation. The Organisation - through the NCBs - provides logistic support in police co-operation and requests for legal assistance (for example letters rogatory in urgent cases). The NCBs can rapidly transmit requests for legal or police co-operation made by their own courts or police departments to the NCBs of other countries. The contacted NCB will ensure that the police actions or investigations requested by another country's NCB are carried out on its territory. INTERPOL covers all types of criminal activity with international ramifications.

3.89 Close co-operation in combating environmental crime¹⁰ is also encouraged via the INTERPOL network. This means for instance that, with respect to a MARPOL offender, request for police or judicial investigation of a suspect ship at the next port of call may be sent directly and rapidly from one law enforcement agency to another through INTERPOL.

¹⁰ Environmental offences can be classified as "international" because of the behaviour of the offenders (for example, an offender may escape across a border after committing his offence).

Schengen Agreement

3.90 Closer and direct police co-operation between several European Member States is also provided in the Convention from 19 June 1990 applying the Schengen Agreement of 14 June 1985. The 13 EU Member States party to this Convention are Belgium, Germany, France, Luxembourg, The Netherlands, Italy, Greece, Austria, Portugal, Spain, Denmark, Finland and Sweden; two non-Member States, Iceland and Norway, have been associated with the development of the Schengen acquis¹¹ since 1996 and signed an extended association agreement with the EU in 1999. The association agreement with Switzerland entered into force on 12 December 2008.

3.91 In the context of Article 39, the Convention provides that States should ensure that their Police authorities shall, in compliance with national legislation and within the limits of their responsibilities, assist each other for the purposes of preventing and detecting criminal offences, insofar as national law does not stipulate that the request is to be made to the legal authorities and provided that the request or the implementation thereof does not involve the application of coercive measures by the requested State.

3.92 Article 51 of the Convention limits the grounds of refusal for letters rogatory for search and seizure.

3.93 Article 53 (1.) of the Schengen Convention enables the 16 States party to or associated to the Convention to directly transmit urgent requests for legal assistance (for hearings, investigation of vessel in port) to the judicial authorities of the requested State. Belgian judicial authorities already make use of this possibility of directly transmitting such urgent requests to the judicial authorities in a port State if that State is party to/associated to the Convention.

European Union initiatives on ship-source pollution and on sanctions for pollution offences

3.94 As a result of concerns raised at the European Council in 2002, the European Union (after long discussion) adopted in July 2005 a set of two legal instruments:

- a. Directive 2005/35/EC which requires (as part of EC law) that discharges of oil or other noxious substances from ships must be regarded as an infringement and punished accordingly when committed with intent, recklessly or as a result of seriously negligent behaviour. The Directive is applicable to any person in the transportation chain and to any discharge committed at sea;
- b. Framework Decision 2005/667/JHA which obliged Member States (as part of their EU (not EC) obligations) to ensure that illegal discharges of polluting substances, participation in and incitement to carry out such discharges were penalised as criminal offences. These penalties had to be effective, proportionate, dissuasive, and had to be applied to anyone deemed responsible (the ship owner, the owner of the cargo, or any other implicated person). For the most serious cases, *i.e.* instances that cause significant and widespread damage to water quality, animal or vegetable species or parts of them, or the death or serious injury of persons, each Member State had to include imprisonment among possible penalties. Each Member State also had to make the necessary provisions to ensure that legal persons could be held liable when an offence was committed for their benefit by an individual with managerial or representative powers within that body, or where such an individual had been subject to insufficient supervision or control. The Framework Decision set certain minimum levels for maximum penalties both concerning imprisonment for natural persons and fines for legal persons.

Following a request from the European Commission, in October 2007 the European Court of Justice annulled the Framework Decision for having in part a wrong legal basis. In March 2008,

¹¹ The Schengen Agreement of 1985, the 1990 implementing Convention, and measures, protocols and accession agreements which followed constitute the Schengen acquis.

the Commission presented a proposal for a Directive based on Article 80 (2) EC Treaty (Transport policy) which is intended to amend the above mentioned Directive 2005/35/EC with those provisions of the Framework Decision which, according to the ECJ, can be adopted on this legal basis. This will include the definition of the criminal offence as well as the scope of liability for natural and legal persons. Member States will be required to ensure that the offences are punishable with effective, proportionate and dissuasive sanctions which have to be of a criminal nature for natural persons.

3.95 In June 2006, the High Court in England and Wales (in a case brought by a group of the main international organisations representing ship-owners against the UK Secretary of State for Transport) referred to the European Court of Justice a set of questions seeking rulings on whether the Directive is consistent with international law in relation to the territorial seas and exclusive economic zones of Member States and the high seas, whether the Directive is contrary to the right of innocent passage and whether the use of the term “serious negligence” is consistent with legal certainty. It will be some time before these questions are clarified.

ANNEX 1 to Chapter 3

TABULAR SUMMARIES OF JURISDICTIONS

TABLE IV: Enforcement by Flag State	
• MARPOL offences, irrespective of location	(Legal instruments)
<ol style="list-style-type: none"> 1. A Flag State may request a Port State control 2. A Flag State shall institute proceedings (if sufficient evidence) when receiving a request/report from another State 3. A Flag State may request the legal assistance of a Port State and Coastal State 4. A Flag State may request a Port State to institute proceedings in cases where the offence took place in the area of jurisdiction of a Coastal State 5. A Flag State can suspend proceedings instituted by a State in respect of an offence beyond its territorial sea, upon the taking of proceedings within six months of the date on which proceedings were first instituted (with certain exceptions) 	<ul style="list-style-type: none"> - MARPOL, Art. 6 - via MOU on PSC - MARPOL, Art. 4 - UNCLOS, Art. 217 - UNCLOS, Art. 217 - European Convention on Mutual Assistance in Criminal Matters, via INTERPOL in urgent cases - Direct transmission of request on the basis of Schengen Convention - UNCLOS, Art. 218 - UNCLOS, Art. 228 - (*)
• MARPOL offences in the territorial sea of a Coastal State	
<ol style="list-style-type: none"> 6. A Flag State cannot suspend proceedings instituted by the Coastal State; however, the Flag State has the obligation to institute proceedings if it receives a request thereto from that Coastal State 7. If so, then the Flag State has the same powers of enforcement as mentioned in points 1. to 4. 	<ul style="list-style-type: none"> - MARPOL, Art. 4 - UNCLOS, Art. 228 <p>(see above)</p>

(*) = unknown request procedure in urgent cases

TABLE V: Enforcement by Coastal State

MARPOL offences in the territorial sea	(Legal instruments)
<ol style="list-style-type: none"> 1. The Coastal State may request a Port State control (administrative investigation) 2. The Coastal State may institute proceedings or report to the Flag State 3. If the Coastal State decides to institute proceedings: <ul style="list-style-type: none"> - it may request the Port State for legal assistance (letters rogatory, judicial investigation) - it may request the Port State to institute proceedings 4. In cases where a Port State has instituted proceedings, the Coastal State may request that Port State to suspend its proceedings. 5. The Coastal State has a right of hot pursuit (under certain conditions). 6. When the suspect ship is navigating in the territorial sea, the Coastal State may undertake a physical inspection, which can lead to instituting proceedings, including the detention of the ship. 	<ul style="list-style-type: none"> - <i>MARPOL, Art. 6</i> - <i>Via MOU on PSC</i> - <i>MARPOL, Art. 4</i> - <i>UNCLOS, Art. 218</i> - <i>European Convention on Mutual Assistance in Criminal Matters, via INTERPOL in urgent cases</i> - <i>Direct transmission of request on the basis of Schengen Convention</i> - <i>UNCLOS, Art. 218</i> - (*) <p><i>UNCLOS, Art. 218</i></p> <p><i>UNCLOS, Art. 111</i></p> <p><i>UNCLOS, Art. 220</i></p>
<ul style="list-style-type: none"> • MARPOL offences in the EEZ 	
<ol style="list-style-type: none"> 7. The Coastal State has the same powers of enforcement as mentioned in points 1. to 5. 8. When the suspect ship is navigating in the EEZ or the territorial sea, the Coastal State may, depending on the conditions, ask for information or undertake a thorough inspection, which can lead to instituting proceedings, including the detention of the ship. 9. Proceedings shall be suspended upon the taking of proceedings by the Flag State within six months of the date on which proceedings were first instituted (with certain exceptions). 	<p>(see above)</p> <ul style="list-style-type: none"> - <i>UNCLOS, Art. 220</i> - <i>UNCLOS, Art. 228</i>

(*) = unknown request procedure in urgent cases

TABLE VI: Enforcement by Port State	
• MARPOL offences outside the territorial sea + EEZ	(Legal instruments)
<ol style="list-style-type: none"> 1. A Port State can execute an administrative Port State control upon request of another State, which can lead to a temporary detention of the ship; the report of this investigation is passed on to the requesting State. 2. A Port State may undertake investigations and institute proceedings (if the universal Port State jurisdiction is established in national law), or may report to the Flag State. 3. In cases where the offence takes place in the area of jurisdiction of another State, a Port State may only institute proceedings : <ul style="list-style-type: none"> - upon request of that Coastal State, - upon request of the Flag State, - upon request of another State damaged or threatened by the offence, - if the offence caused or is likely to cause pollution in its own territorial sea or EEZ. 4. Any proceedings instituted by a Port State on the basis of an investigation may be suspended at the request of a Coastal State. 5. A Port State shall as far as practicable comply with requests from the Flag State for investigation of an offence (irrespective of location). 6. Proceedings shall be suspended upon the taking of proceedings by the Flag State within six months of the date on which proceedings were first instituted (with certain exceptions). 	<ul style="list-style-type: none"> - <i>MARPOL, Art. 5 & 6</i> - <i>UNCLOS, Art. 219</i> - <i>MOU on PSC</i> - <i>UNCLOS, Art. 218</i> - <i>MARPOL, Art. 4</i> - <i>UNCLOS, Art. 218</i> - (*) - <i>UNCLOS, Art. 218</i> - <i>UNCLOS, Art. 218</i> - <i>UNCLOS, Art. 228</i>
• MARPOL offences inside the territorial sea + EEZ	
<ol style="list-style-type: none"> 1. Port State acts as Coastal State. 	<i>(see Table V)</i>

(*) = unknown request procedure in urgent cases

WEB-SITES GIVING INFORMATION ON INSTRUMENTS MENTIONED

- IMO, incl. MARPOL: <http://www.imo.org/>
- UNCLOS: <http://www.un.org/Depts/los/index.htm>
- Paris MOU on Port State Control: <http://www.parismou.org/>
- EQUASIS database: <http://www.equasis.org/>
- European Port State Directive: <http://europa.eu.int/scadplus/leg/en/lvb/l24072.htm>
- Council of Europe: <http://www.coe.int/>
- Council of Europe Treaty Office: <http://conventions.coe.int/>
- INTERPOL: <http://www.interpol.int/>
- Schengen acquis:
http://europa.eu/legislation_summaries/justice_freedom_security/free_movement_of_persons_asylum_immigration/l33020_en.htm

Chapter 4: National Law

This chapter summarises the national provisions by which the international rules and standards described in chapter 3 are implemented.

Section 4.1: Belgium

Introductory note

4.1 The Ship Pollution Prevention Act, dating from 1995 and amended in 1999, has been modified in 2007, in order to implement the Directive 2005/35/EC on ship-source pollution and on the introduction of penalties for infringements (accompanied by the Council Framework Decision 2005/667/JHA to strengthen the criminal-law framework for the enforcement of the law against ship-source pollution) and to be in agreement with the ratification of Annex VI of MARPOL.

4.2 This modification consists mainly of four major changes: the extension of the principal application of this law to ships flying a foreign flag, the introduction of imprisonment as a possible penalty, the more stringent application of MARPOL in the EU Member States and the extension of the discharge prohibition to discharges at sea into the atmosphere.

Offences

4.3 Article 5 of the Ship Pollution Prevention Act (hereinafter SPPA) prohibits the discharge of any harmful substance into the sea or at sea into the atmosphere, except in cases, or in ways, for which provision is made by or under MARPOL or the SPPA. In 2007, this article was modified in order to comply with the Directive 2005/35/EC. Pollution resulting from damage to a ship or its equipment, as described in MARPOL, Annex I, Regulation 11, under b) and Annex II, Regulation 6, under b) no longer falls under the exceptions to the discharge rules in the territorial sea and the internal waters, including the ports, of Belgium or any other EU Member State.

4.4 Article 10 SPPA requires the captain of a Belgian ship, covered by a Royal Decree, to keep a journal of all activities relating to the transport, handling and discharge of harmful substances, and their residues. The captain of a Belgian ship or of a ship flying a foreign flag that has a duty to maintain such a journal, must permit the competent authorities to examine the journal or take note of it. Failure to fulfil either duty is an offence under article 29 SPPA.

Ships and areas

4.5 The prohibition to discharge, imposed by article 5 SPPA, applies to both Belgian ships and ships flying a foreign flag, in accordance with international law. The prohibition to discharge is applicable to the Belgian marine waters, the marine waters of the EU Member States, the marine waters of non-EU Member States and even to the high seas. The specific application depends, of course, on the different status of each of these zones, in accordance with international law.

Those liable and the penalties

4.6 Under article 29 SPPA, the persons liable for an offence under article 5 SPPA (discharge prohibition) are:

Category 1: the owner, the cargo owner, the manager and the charterer of a ship;

Category 2: the captain or the skipper;

Category 3: the officers.

4.7 For the first category, fines may vary between 2.500.000 EUR and 5.000.000 EUR and between 50.000 EUR and 125.000 EUR for pleasure crafts and fishing boats. Fines are to be doubled if the offence is committed during the hours of darkness, and can be doubled for an additional offence committed within three years of the last one. For the second category, fines may vary between 50.000 EUR and 125.000 EUR for captains and between 15.000 EUR and 125.000 EUR for skippers of pleasure crafts and fishing boats. For the third category, fines between 10.000 EUR and 50.000 EUR may be imposed.

4.8 In 2007, imprisonment penalties, ranging between one month and five years, have been introduced in a new article 29bis SPPA, applicable on the following cases:

- the offence caused significant and widespread damage to water quality, to animal or vegetable species or to parts of them; or
- the offence was committed within the framework of a criminal organisation, as defined by article 324bis of the Penal Code.

4.9 Imprisonment penalties can be doubled for an additional offence committed within three years of the last one. If the offence has led to the death of a person, imprisonment penalties can range between five and ten years.

4.10 Since the form of guilt is not explicitly mentioned in the SPPA, intent or negligence has to be proven in order to convict the offender.

4.11 General provisions are applied to these fines, which:

- allow for a case to be settled by a payment (not less than 10% of the minimum fine) without any conviction being recorded, and
- require a person paying a fine to pay 20% of that amount to the National Environment Fund.

Significant features of the enforcement and prosecution processes

4.12 The SPPA sets up a system for investigation and prosecution of pollution offences, including the detention of ships, which is based on the UNCLOS system and is modified in accordance with the Directive 2005/35/EC. The main investigative principles are the following:

- a. a ship flying a foreign flag that lies voluntarily in a Belgian port or offshore terminal can be subjected to an appropriate inspection, if suspicion exists that a discharge of harmful substances has taken place in the Belgian territorial sea, the exclusive economic zone or the high seas. If the ship anchors in a foreign port or offshore terminal, the competent authority will need to cooperate with the EU Member State in order to inspect and to take appropriate measures or to request non EU Member States to take appropriate measures;
- b. if clear grounds exist to assume that a ship has committed an offence in the territorial sea, an investigation on board can be carried out and the ship can be detained or derouted to a Belgian port;
- c. if clear grounds exist to assume that a ship has carried out a significant discharge in the exclusive economic zone and the ship has refused to administer information or the administered information differs clearly from the factual situation, an investigation on board can be carried out in the exclusive economic zone or in the territorial sea. In cases where objective proof exists that the ship has carried out a significant discharge, resulting in substantial damage or a risk of substantial damage to the marine environment or the Belgian coastal interests, the ship can be detained or derouted to a Belgian port.

4.13 The SPPA considers:

- a. the presence of visible traces of the discharge on or under the water surface, in the wake of or in the immediate neighbourhood of the ship, automatically as 'clear grounds';
- b. an initial estimation of the discharge that exceeds a thousand litres of oil automatically as objective proof that the ship has committed a significant discharge, resulting in substantial damage or a risk of substantial damage to the marine environment or the Belgian coastal interests.

4.14 An offence against the SPPA can be prosecuted in Belgium, as far as permitted by international law, in cases where an offence has been committed:

- a. within the Belgian territory or the Belgian exclusive economic zone; or
- b. by a Belgian natural person, under certain conditions, or in favour of a Belgian legal person; or
- c. on board a ship that is authorised to fly the Belgian flag; or
- d. outside the Belgian territory, but resulting in (possible) damage within the Belgian territory or the Belgian exclusive economic zone, the ship lying voluntarily in a Belgian port or offshore terminal; or
- e. on the high seas, and the ship lies voluntarily in a Belgian port or offshore terminal; or
- f. in the maritime zone under jurisdiction of an other coastal state, on exclusive demand of that coastal state or the flag state.

4.15 Prosecutions are procedurally based on a formal report (*procès verbal*) produced by an authorised authority (the maritime police, the maritime control authority, the port captain, the commander of a patrol vessel or aircraft, the MUMM and the Marine and the Directorate-General for Environment). This formal report specifies the facts that give rise to the offence, and constitutes legal proof that the offence has been committed unless and until the contrary is shown. The formal report must set out the penalties that may be imposed, and is served on the captain, the skipper or the owner of the ship within fifteen days of the conclusion by the officer concerned that an offence has been committed. Within fourteen days, the recipients of such a notification can appeal against the formal report to the Minister competent for Maritime Affairs. Such an appeal does not suspend the effect of the formal report, which may lead either to prosecution or to measures such as detention, a requirement to move the ship to a particular place or a prohibition on leaving Belgian waters.

4.16 Any form of evidence can be submitted by the prosecutor for the purpose of confirming that there are serious grounds for thinking that a discharge has taken place, including eyewitness reports, photographs and films, the variations of colour on the surface of the sea and any other standardised means of evaluation that have been agreed at international or regional level and that are recognised by Belgium. In addition, any visible trace left by a ship on the surface of the sea, in its wake or in the immediate surroundings shall be grounds in itself to conclude a discharge has taken place.

Section 4.2: Denmark

4.17 In 1993, by Act No. 476 of 1993 on the Protection of the Marine Environment, a number of global conventions, including the MARPOL Convention (MARPOL), were implemented into Danish law. The Act has since been amended on an ongoing basis, for example to further specify the provisions on enforcement of the Act in relation to foreign ships. In addition, the level of the fines imposed for offences such as oil

pollution has been raised significantly¹². Today, Act No. 476 of 1993 with its later amendments are compiled in a consolidation act, *i.e.* Act No. 1073 of 20 October 2008 on the Protection of the Marine Environment.

Offences

4.18 Oil is defined as covering “any form of mineral oil and mixtures thereof, including crude oil, natural gas condensates, oil sludge and waste oil, together with fuel oil and other refined products except petrochemicals”.¹³

4.19 Discharge of oil as referred to in the Act means any discharge, spill or disposal into the sea of substances or materials derived from the normal operation of ships or floating or fixed platforms.¹⁴

4.20 It is prescribed by the Act¹⁵ that no discharge of oil may take place in Danish territorial waters.¹⁶ The prohibition applies to oil in any concentration whatsoever.

4.21 Outside the Danish territorial sea and internal waters, “discharges of oil may only take place in accordance with rules established by the Environment Minister”. The Minister is authorised “to lay down more detailed rules to implement international conventions on the discharge from oil tankers and other ships ... of oil and ballast water containing oil. As part of this, the Minister may specify positions where discharge may take place and how discharge shall be conducted (including requirements on the use of recognised systems and on the quantities that may be discharged, including the speed of discharges.”¹⁷

4.22 The Act then provides that breaches of prohibitions and requirements laid down by these provisions (or subordinate legislation authorised by them) shall be punished.¹⁸

4.23 It is furthermore a requirement under Danish law¹⁹, that any oil tanker with a gross tonnage of 150 and above and any other vessel with a gross tonnage of 400 and above must keep and maintain an oil log²⁰. Oil logs must be designed as indicated in Annex III to Schedule I of MARPOL and kept in conformity with the rules thus prescribed and with the guidelines²¹ indicated specifically in the Executive Order. Failure to observe the rules is subject to a penalty of either a fine or a term of imprisonment. The Executive Order applies to Danish ships and to foreign ships in Danish ports, in Danish territorial waters and in the exclusive economic zones to the extent that it is consistent with international law²². Companies etc. (legal persons) may be subjected to criminal liability in conformity with the provisions of Part 5 of the Criminal Code²³.

Ships and areas

4.24 Section 2 of the Marine Environment Act specifies the ships, aircraft and platforms to which the Act applies. Thus, it is indicated in section 2(1) that the Act covers as follows:

1. Danish ships and ships operating in Danish territorial waters;

¹² Act No. 474 of 31 May 2006 to amend the Marine Environment Act and certain other acts

¹³ Consolidation Act No. 1073 of 20 October 2008, section 9(1)

¹⁴ Consolidation Act No. 1073 of 20 October 2008, section 4(1)

¹⁵ Consolidation Act No. 1073 of 20 October 2008, section 11(1)

¹⁶ For a definition of Danish territorial waters, refer to Act No. 200 of 1999 on the Definition of the Limits of the Territorial Sea

¹⁷ Consolidation Act No. 1073 of 20 October 2008, section 11(2)

¹⁸ Consolidation Act No. 1073 of 20 October 2008, sections 59 and 61

¹⁹ Executive Order No. 9653 of 28 June 2007

²⁰ Executive Order No. 9653 of 28 June 2007, section 2(1)

²¹ Executive Order No. 9653 of 28 June 2007, section 2(2 – 5), subsection (7) and section 5

²² Executive Order No. 9653 of 28 June 2007, section 1(1)

²³ Executive Order No. 9653 of 28 June 2007, section 7(1 - 2)

2. Danish aircraft and aircraft operating in or over Danish territorial waters;
3. Danish platforms and platforms operating in Danish territorial waters or in the area of the Danish continental shelf;
4. Danish pipelines for the transportation of hydrocarbons and additional substances, and pipelines for the transportation of hydrocarbons and additional substances in Danish territorial waters or in the area of the Danish continental shelf;
5. Foreign ships operating within the exclusive economic zones, as far as this is consistent with international law²⁴, and
6. Foreign ships operating outside the exclusive economic zones, as far as this is consistent with international law.

4.25 Subsection (2) of section 2 provides that the Act does not apply to naval ships and other ships owned or operated by a State and used for the time being only in non-commercial government service.

Those liable and the penalties

4.26 Unless some other legislation also applies and provides for a higher penalty, the basic penalty is a fine. The amount of the fine is left to the discretion of the court, but the amount of oil discharged is to be taken into account in the penalty²⁵.

4.27 After the recommended level of fines was raised by the amendment of the Act in 2006, the fine to be imposed for discharges of approx. 50 litres must in principle be fixed at DKK 25,000 (approx. EUR 3,350), for discharges of approx. 500 litres it must be fixed at DKK 150,000 (approx. EUR 21,100) and for discharges of approximately 1,000 litres the fine must be DKK 250,000 (approx. EUR 33,500), with a linear rate of the price for one litre of oil for volumes exceeding 1,000 litres (meaning DKK 250 (approx. 33 euros) per litre of oil). The amount of fines may be adjusted both upward and downward in view of aggravating or mitigating circumstances. In fixing of the amount of a fine, conditions such as the degree of *mens rea*, the environmental damage caused and any prior contraventions of a similar nature will be taken into account.

4.28 "The penalty may be increased to detention or imprisonment for up to two years where the violation has been caused deliberately or with gross negligence, and where it has:

- a. caused damage to the environment or a serious risk of such damage; or
- b. been done, or been intended, to achieve an economic benefit (including avoiding an expense) for the person who has himself caused the violation or for some other person".²⁶

4.29 For a contravention of the law committed from foreign ships in the exclusive economic zone the penalty imposed may only be a fine. For contraventions committed from foreign ships in Danish territorial waters, the penalties imposed may be imprisonment for a term of up to two years in case they involve a wilful act causing serious pollution of the marine environment or the air²⁷.

²⁴ Denmark is thus able to enforce all international regulations and norms laid down in conventions and established as the custom under international law in the exclusive economic zones.

²⁵ Consolidation Act No. 1073 of 20 October 2008, section 59(2): When the amount of a fine for violation of section 11(1) or (2) [discharge of oil] is determined, a more severe fine must be fixed on the basis of the volume of oil discharged

²⁶ Consolidation Act No. 1073 of 20 October 2008, section 59(3)

²⁷ Consolidation Act No. 1073 of 20 October 2008, section 59(4)

4.30 Under the Act, companies etc. (legal persons) may be subjected to criminal liability in accordance with the provisions of Part 5 of the Criminal Code²⁸. In Danish law, the liability of the legal person is the primary consideration. There may, however, also be grounds to raise charges against one or more natural persons, in case they have acted wilfully or with gross negligence.

4.31 In addition, a possibility has been introduced in the Act for the Defence Minister to issue administrative, fixed penalties in cases concerned with discharging oil into the sea. It is a requirement, however, that the person involved admits being guilty of the violation of the Act and declares his acceptance of paying the fine thus imposed within a specified time limit. In a similar way a claim, such as a claim for confiscation of proceeds (the savings) that the person involved has obtained by violating the Act, may be enforced without any trial²⁹. Also when administrative fixed penalties are imposed, the party held criminally liable will be the company primarily. For example, a ship's mate may still be subjected to criminal liability if he has acted wilfully or with gross negligence.

Significant features of the enforcement and prosecution processes

4.32 It is possible to conduct searches in cases concerned with violation of the provisions of the Act on the Protection of the Marine Environment or regulations issued under the Act. A search must be conducted in conformity with the rules of the Administration of Justice Act³⁰ on searches conducted in cases that may, under the law, lead to a custodial sentence³¹.

4.33 Searches for the purpose of extracting oil samples in cases concerned with unlawful discharge of oil from ships may be carried through by the Defence Minister or anyone authorised by the Minister for that purpose and in conformity with the provisions applying to searches contained in the Administration of Justice Act³². However, the police may also conduct searches at any time.

4.34 All examinations must be carried out subject to the rules of the Administration of Justice Act, and may therefore be conducted exclusively if there are reasonable grounds to assume that an unlawful discharge of oil has taken place. Examinations require a warrant from the court unless the aim of the examination would thereby be missed. In connection with examinations of ships at sea, this requirement is presumably nearly always fulfilled in practice. If examinations are carried out without any prior warrant, the case must be submitted to the court within 24 hours in case the person against whom the measure is aimed so requests³³. Where examinations have not been carried out by the police, the 24-hour time limit must be reckoned from the hour when the case was passed on to the police³⁴.

4.35 Searches of foreign ships are regulated specifically by section 63(2) and (3) of the Protection of the Marine Environment Act, which prescribes as follows:

"Subsection (2). Where a foreign ship is travelling in the external territorial waters while passing Denmark, a search under the first and second sentences of subsection (1) may only be conducted if:

1. The ship is suspected on reasonable grounds to have violated the provisions of this Act or regulations issued under this Act while in internal territorial waters;

²⁸ Consolidation Act No. 1073 of 20 October 2008, section 62

²⁹ Consolidation Act No. 1073 of 20 October 2008, section 63A

³⁰ Administration of Justice Act Part 73 (sections 793 – 800)

³¹ Consolidation Act No. 1073 of 20 October 2008, section 63(1) the first sentence

³² Consolidation Act No. 1073 of 20 October 2008, section 63(1) the second sentence

³³ Administration of Justice Act, section 796(3)

³⁴ cf. the principle of section 807A of the Administration of Justice Act

2. The ship is suspected on reasonable grounds to have violated the provisions of this Act or regulations issued under this Act while in external territorial waters at a time when it was not in passage;
3. There are grounds to suspect that, while passing through external territorial waters, the ship has violated the provisions of this Act or regulations issued under this Act; or
4. There are grounds to suspect that in the exclusive economic zone the ship has violated the provisions of this Act or regulations issued under this Act, thereby causing a substantial discharge which has led to or threatens to lead to significant pollution of the marine environment and the ship has rejected to give information as stated in section 62A³⁵, or in case the information given by the ship is deviating evidently from the facts of the situation.

4.36 Subsection (3). Where a foreign ship is in the exclusive economic zone, it may only be subjected to a search under the first and second sentences of subsection (1), if there are grounds to suspect that in the exclusive economic zone or in the territorial waters, the ship has violated the provisions of this Act or regulations issued under this Act thereby causing a substantial discharge which has led to or threatens to lead to significant pollution of the marine environment and the ship has rejected to give information as stated in section 62A, or in case the information given by the ship is deviating evidently from the facts of the situation.”

4.37 The provisions referred to above do not apply in case the ship's flag state consents to a search being conducted.³⁶

4.38 If a foreign ship is pursued in direct continuation of its violation of the law from one sea area to another sea area further away from the Danish coast, the conditions for conducting a search that applied in the area of the sea where the pursuit was commenced will apply.³⁷ This provision ensures that a coastal state is able to pursue a ship out of the territorial waters in which the violation of the law was committed without any impairment of its scope for action against the ship.

4.39 In addition, the Act makes it possible for the police or the Minister of Defence, in practice the Royal Navy, to arrest ships if this is necessary in order to secure a claim for payment of a fine, costs of trial or confiscation, including confiscation of valuable property³⁸. A measure of arrest must be implemented in accordance with the rules of the Administration of Justice Act and the restrictions following from the international law of the sea. In addition, foreign ships that travel in external territorial waters while passing or operate in the exclusive economic zone are subject to a number of rules on when ships may be arrested³⁹. These rules largely correspond to the rules on when foreign ships may be subjected to searches. In respect of foreign ships in external territorial waters suspected of a violation of the law committed in the exclusive economic zone and foreign ships that operate in the exclusive economic zone, there is a requirement that there must be clear, objective evidence of violation⁴⁰.

³⁵ Consolidation Act No. 1073 of 20 October 2008, section 62A : "...information concerning its identity and port of registration, its last and next port of call and other relevant details that are necessary to determine whether a violation of the Act has been committed."

³⁶ Consolidation Act No. 1073 of 20 October 2008, section 63(4)

³⁷ Consolidation Act No. 1073 of 20 October 2008, section 63(5)

³⁸ Consolidation Act No. 1073 of 20 October 2008, section 63B(1)

³⁹ Consolidation Act No. 1073 of 20 October 2008, section 63B(4)

⁴⁰ Consolidation Act No. 1073 of 20 October 2008, section 63B(4)(4) and subsection (5)

Section 4.3: France

Offences

4.40 Articles L218-11 and L218-13 of the Environment Code creates an offence for “the captain of a vessel covered by MARPOL of being blameworthy in failing to comply with the requirements of regulations 15, 34 and 38 of Annex I of MARPOL (as they stand from time to time) prohibiting discharges of oil” (as defined in the Convention, which of course also covers oily mixtures)⁴¹.

4.41 According to article L218-10 of the Environment Code, penalties apply to every kinds of ship⁴².

4.42 The fact of not establish or provide a report after an invent linked with harmful substances, according to provisions of protocol I of MARPOL convention, is a criminal case.⁴³

Ships and areas

4.43 The provisions that are now in articles L218-11 to L218-31 originally applied only to French vessels. They still apply to French vessels wherever they are located, but they now also apply to all ships (even if registered in States that are not Contracting Parties to MARPOL) within the French exclusive economic zone, the “marine ecological protection zone”⁴⁴, the territorial sea, French internal waters and ship canals (except for harbour craft, barges and river tankers). Therefore, the law excludes the imposition of prison sentences on French nationals when pollution intentionally or unintentionally was committed beyond the territorial waters (because of Article 230 of the UN Convention for the Law of the Sea).

Those liable and the penalties

4.44 The principal person liable is the captain of a vessel. Penalties of articles L218-11 and following can be applied to every person responsible in the ship.

4.45 In addition, article L218-18 imposes the same penalties on a range of other possible offenders. These are “the owner, the manager or (where either of these is a corporation) their legal representative or the person who is, in effect, in charge, or any other person who exercises control over the captain or person in charge of the vessel (or over the management or sailing of the vessel), either legally or in practice, provided

⁴¹ Code de l'environnement, article L218-11: “ Est puni de 50 000 euros d'amende le fait, pour tout capitaine ou responsable à bord d'un navire, de se rendre coupable d'un rejet de substance polluante en infraction aux dispositions des règles 15 et 34 de l'annexe I, relatives aux contrôles des rejets d'hydrocarbures, ou en infraction aux dispositions de la règle 13 de l'annexe II, relative aux contrôles des résidus de substances liquides nocives transportées en vrac, de la convention Marpol. En cas de récidive, les peines encourues sont portées à un an d'emprisonnement et 100 000 euros d'amende. »

⁴² Code de l'environnement, article L.218-10: “ le terme : " navire " désigne soit un bâtiment de mer exploité en milieu marin de quelque type que ce soit, notamment les hydroptères, les aéroglisseurs, les engins submersibles et les engins flottants, soit un bateau ou un engin flottant fluvial, lorsqu'il se trouve en aval de la limite transversale de la mer » ;

⁴³ Code de l'environnement, article L.218-17: Est puni de deux ans d'emprisonnement et de 200 000 euros d'amende le fait, pour tout capitaine de navire ou responsable à bord d'un navire auquel est survenu, en mer ou dans les eaux intérieures et les voies navigables françaises jusqu'aux limites de la navigation maritime, un des événements mentionnés par le protocole I de la convention Marpol, ou pour toute autre personne ayant charge dudit navire, au sens de l'article 1er de ce protocole, de ne pas établir et transmettre un rapport conformément aux dispositions dudit protocole.

⁴⁴ As defined in Law No 76-655 of 16 July 1976.

that such a person is behind the discharge that has taken place in breach of articles L218-11 to L218-17 and L.218-19 or has failed to take the measures necessary to avoid it.”⁴⁵

4.46 Although, in principle, the offences require that the offender is blameworthy (*coupable*), there is also provision to extend the liability to the captain or other person responsible in some cases where there is no *culpa*. The cases covered are where carelessness, negligence or failure to comply with legal requirements⁴⁶ which have resulted in a marine accident which would justify State intervention, and which has polluted the territorial sea, internal waters or ship canals.

4.47 The owner, manager and those in effective charge of the vessel (as defined for article L218-18) can also be liable for carelessness, negligence or failure to comply with legal requirements, in the same way and to the same extent as the captain⁴⁷.

4.48 The law of 1st August 2008 introduced the European concept of “major neglect”. This is the “serious misconduct that exposes the environment to a risk of a particularly risk that its author can not ignore.”⁴⁸.

4.49 The penalties can be imposed differ according to the type of vessel. Fines may be imposed are now capped to 15 million euros in the most serious cases. It is no longer refers to the value of the cargo or the ship. The maximum imprisonment incurred remains 10 years.

4.50 The maximum penalties can be summarised as follows:

⁴⁵ Code de l'environnement, article L218-18: “ au propriétaire, soit à l'exploitant ou à leur représentant légal ou dirigeant de fait s'il s'agit d'une personne morale, soit à toute autre personne que le capitaine ou responsable à bord exerçant, en droit ou en fait, un pouvoir de contrôle ou de direction dans la gestion ou la marche du navire ou de la plate-forme, lorsque ce propriétaire, cet exploitant ou cette personne a été à l'origine d'un rejet effectué en infraction aux articles L. 218-11 à L. 218-17 et L.218-19 ou n'a pas pris les mesures nécessaires pour l'éviter.”

⁴⁶ Code de l'environnement, article 218-19 I: “...l'imprudence, la négligence ou l'inobservation des lois et règlements...”

⁴⁷ Code de l'environnement, article L218-19 I.

⁴⁸ Code de l'environnement, article L. 218-19 II

	Rejet volontaire de substances polluantes, d'hydrocarbures, de résidus de substances liquides nocives transportées en vrac (article L.218-11)	Rejet volontaire de substances nuisibles transportées en colis (article L.218-14)	Rejet volontaire d'ordures (article L.218-15)	Absence de rapport suite à un événement mettant en cause des substances nuisibles (article L.218-17)	Pollutions accidentelles « simples » (article L.218-19)	Pollutions accidentelles « simples » ayant causé un dommage irréversible ou d'une particulière gravité à l'environnement	Pollutions accidentelles aggravées soit par la violation manifestement délibérée d'une obligation particulière de sécurité ou de prudence soit par une faute caractérisée exposant l'environnement à un risque d'une particulière gravité	Pollutions accidentelles aggravées ayant causé un dommage irréversible ou d'une particulière gravité à l'environnement
Navire-citerne d'une jauge brute < à 150 tonneaux ou tout autre navire d'une jauge brute < à 400 tonneaux dont la machine propulsive a une puissance installée > 150 kilowatts (article L.218-12 du code de l'environnement)	10 ans et 15 millions d'euros	7 ans et 1 million d'euros	1 an et 200 000 €	2 ans et 200 000 €	400 000 € (article L.218-19 I 1°)	4,5 millions d'euros (article L.218-19 I 3°)	3 ans et 4,5 millions d'euros (article L.218-19 II 2°)	5 ans et 7,5 millions d'euros (article L. 218-19 III 1°)
Navire-citerne d'une	10 ans et	7 ans et	1 an et	2 ans et	800 000 €	7,5 millions	5 ans et 7,5	7 ans et 10,5

jaugé brute > ou = à 150 tonneaux ou tout autre navire d'une jauge brute > ou = à 400 tonneaux. (article L. 218-13 du code de l'environnement)	15 millions d'euros	1 million d'euros	200 000 €	200 000 €	(article L. 218-19 I 2°)	d'euros (article L.218-19 I 4°)	millions d'euros (article L.218-19 II 3°)	millions d'euros (article L. 218-19 III 2°)
Autres catégories de navires (article L.218-10 du code de l'environnement)	50 000 € (en cas de récidive 1 an et 100 000 €)	7 ans et 1 million d'euros	1 an et 200 000 €	2 ans et 200 000 €	4 000 €	4 000 €	6 000 € (article L.218-19 II 1°)	6 000 €

4.51 Where the court thinks fit, and has summoned the owner or manager before it, it can decide that the penalties which would otherwise be imposed on the captain or person in charge on board shall be imposed on the owner or manager⁴⁹.

4.52 Where an individual is fined or imprisoned, their name and other details can also be publicised at their expense⁵⁰. Indeed, individual offenders can be sentenced to a complementary penalty : the decision of the court can be publicised in the conditions of article 131-35 of Criminal Code.

4.53 Where a corporation is fined, it can also be made subject to certain other penalties⁵¹.

Significant features of the enforcement and prosecution processes

4.54 The enforcement and prosecution process is based upon formal reports (*procès verbaux*) prepared by officials who are active in the fields of navigation management, environmental protection and related fields, as well as by the judicial police and captains of French naval vessels and military aircraft. Other public officials (such as the senior staff of IFREMER) are also required to report any possible cases to the officials who are authorised to prepare formal reports⁵². The formal reports are sent to the local public prosecutor and to the officer responsible for response action. The formal reports are binding evidence of the facts that they contain, unless and until the contrary is proved to the satisfaction of the court⁵³.

4.55 Where a ship is said in a formal report to have been involved in an offence of this kind, it can be detained by an order of the public prosecutor or the judge responsible for investigating the case, at least until security is given to the satisfaction of the relevant court⁵⁴.

4.56 It is acknowledged the possibility for a local authority whose territory is affected by environmental damage (including a marine pollution) to bring civil proceedings if it suffers damage, whether direct or not.

4.57 To increase the efficiency of the judicial treatment of polluting discharges at sea, the law of 3rd May 2001 and Decree of 11th February 2002 have established 6 specialized courts of seaboard. They are located in Le Havre, Brest, Marseille, Fort-de-France in Saint-Denis de la Reunion and Saint Pierre et Miquelon.

4.58 The law of 15th April 2003 about the establishment of an ecological protection zone in the Mediterranean and the law of 9 March 2004 increased the jurisdiction of the courts. This jurisdiction extends to involuntary and voluntary pollution committed in the territorial waters and voluntary pollution in exclusive economic zone and ecological protection zone⁵⁵. Consequently, these specialized courts provide the bulk of this judicial treatment of marine pollution.

4.59 The law on environmental liability of August the 1st 2008 extended the jurisdiction of the Tribunal de Grande Instance de Paris at the stage of the investigation to matters of great complexity. The Tribunal de

⁴⁹ Code de l'environnement, article L218-23 I : "Le tribunal peut, compte tenu des circonstances de fait et notamment des conditions de travail de l'intéressé, décider que le paiement des amendes prononcées à l'encontre du capitaine ou du responsable à bord, en vertu des articles L. 218-11 à L. 218-19, est en totalité ou en partie, à la charge de l'exploitant ou du propriétaire. Le tribunal ne peut user de la faculté prévue à l'alinéa précédent que si le propriétaire ou l'exploitant a été cité à l'audience."

⁵⁰ Code de l'environnement, article L218-23 II: "Les personnes physiques coupables des infractions prévues par la présente sous-section encourent également, à titre de peine complémentaire, la peine d'affichage de la décision prononcée ou de diffusion de celle-ci dans les conditions prévues à l'article 131-35 du code pénal."

⁵¹ Code de l'environnement, article L218-24 [details of the penalties have not yet been traced]

⁵² Code de l'environnement, article L218-26 and 27.

⁵³ Code de l'environnement, article L218-28.

⁵⁴ Code de l'environnement, article L218-30.

⁵⁵ The law of 15th April 2003 and the Decree of 8 January 2004 have established a "zone of ecological protection in the Mediterranean", allowing the prosecution beyond the territorial sea.

Grande Instance de Paris remains the only court for accidental releases committed in exclusive economic zone and ecological protection zone and for all offences committed by the French ships on the high seas.

4.60 The jurisdiction of the specialized courts can be summarised as follows :

SUMMARY TABLE CONCERNING THE COMPETENCE OF THE SPECIALISED JURISDICTIONS FOR THE MARITIME COASTS

	Offence <i>(intentional or accidental) committed in territorial waters</i>	Discharges <u><i>intentional</i></u> <i>Committed in EEZ or EPZ</i>	Discharges <u><i>accidental</i></u> <i>Committed in EEZ or EPZ</i>	Offence <i>intentional or accidental pollution committed in open seas</i>
Investigation/ Legal proceedings	<i>jurisdiction specialised (in competition with the Paris TGI for very complex cases)*</i>	<i>jurisdiction specialised (in competition with the Paris TGI for very complex cases)*</i>	<i>Paris TGI (exclusive competence)</i>	<i>Paris TGI (exclusive competence)</i>
Instruction	<i>jurisdiction specialised (in competition with the Paris TGI for very complex cases)*</i>	<i>jurisdiction specialised (in competition with the Paris TGI for very complex cases)*</i>	<i>Paris TGI (exclusive competence)</i>	<i>Paris TGI (exclusive competence)</i>
Court decision	<i>jurisdiction specialised (in competition with the Paris TGI for very complex cases)*</i>	<i>jurisdiction specialised (in competition with the Paris TGI for very complex cases)*</i>	<i>Paris TGI (exclusive competence)</i>	<i>Paris TGI (exclusive competence)</i>

*in competition with the jurisdictions mentioned under article 706-109 of the penal code of procedure.

Section 4.4: Germany

Offences

4.61 In Germany, there are two forms of offence: there are criminal acts (*Straftaten*) under the Penal Code (*Strafgesetzbuch*) and contraventions against other legal requirements (*Ordnungswidrigkeiten*).

4.62 The relevant provision of the Criminal Code penalises anyone “who, without authorisation, pollutes a body of water or otherwise adversely affects its quality”. An attempt to do such an act is also penalised⁵⁶. In line with the Water Management Law (*Wasserhaushaltsgesetz* (WHG)), the term “a body of water” (*Gewässer*) is interpreted to cover not only all surface water and groundwater within German territory, but also all the sea under the jurisdiction of the Federal Republic.

⁵⁶ Strafgesetzbuch “Wer unbefugt ein Gewässer verunreinigt oder sonst dessen Eigenschaften nachteilig verändert”.

4.63 Offences in the form of contraventions of legal requirements have been created by the MARPOL Administrative Penalties Order (*MARPOL-Ordnungswidrigkeitenverordnung*) made under the MARPOL Law (*MARPOL-Gesetz*⁵⁷). These cover

- a. failures to comply with the requirements of regulations 14 and 15 of Annex I to MARPOL (and, of course, in respect of other MARPOL requirements);
- b. failure to maintain an oil register, failure to make entries or to make them correctly, fully or promptly and failure to preserve the register⁵⁸

Ships and areas

4.64 The criminal provisions of the Penal Code apply, by virtue of the general provisions of the Penal Code, to acts within internal waters and the territorial sea, on any German ship and within the exclusive economic zone. This is the result of provisions that:

- a. "German penal law applies to criminal acts committed within German territory (*Inland*). This covers internal waters and the territorial sea";
- b. "independently of the law of the place where the act is done, German penal law applies to acts committed on board a ship which is entitled to fly the German Federal Flag"⁵⁹;
- c. "independently of any law applying to the place where the act is done, German penal law applies to the following acts done outside German territory (*im Ausland*)": 11^o environmental crimes under § 324...330...which take place in the German exclusive economic zone, in so far as international conventions for the protection of the sea permit the acts to be prosecuted as crimes"⁶⁰.

4.65 In addition, the law ratifying the UN Convention on the Law of the Sea extends the provisions on the crime of water pollution to the parts of the North Sea (and the Baltic Sea) outside German jurisdiction: "German penal law applies to environmental crimes under §§ 324, 326, 330, 330 which are committed from a ship in the North Sea or the Baltic Sea outside the German exclusive economic zone through breach of duties under administrative law which serve to implement international conventions for the protection of the sea. This applies to acts done in the territorial sea and inland waters of another State to the extent that such acts are punished by the law of that State. The North Sea is the area within the boundaries established by article 2 of the Agreement for Cooperation in Combatting Pollution of the North Sea by Oil and Other Harmful Substances of 13 September 1983 [the Bonn Agreement]"⁶¹. This formulation excludes the possibility of

⁵⁷ Originally called the Law on the 1973 International Convention on the Prevention of Marine Pollution by Ships and the 1978 Protocol to this Convention (*Gesetz zu dem Internationalen Übereinkommen von 1973 zur Verhütung der Meeresverschmutzung durch Schiffe und zu dem Protokoll von 1978 zu diesem Übereinkommen*).

⁵⁸ "Ordnungswidrig handelt, wer als Schiffsführer entgegen Absatz 1 ein Öltagebuch nicht mitführt, nicht, nicht richtig, nicht vollständig oder nicht rechtzeitig ausfüllt oder nicht aufbewahrt."

⁵⁹ Strafgesetzbuch §4: "Das deutsche Strafrecht gilt, unabhängig vom Recht des Tatorts, für Taten, die auf einem Schiff...begangen werden, das berechtigt ist, die Bundesflagge...der Bundesrepublik Deutschland zu führen."

⁶⁰ Strafgesetzbuch §7: "Das deutsche Strafrecht gilt, unabhängig vom Recht des Tatorts, für folgende Taten, die im Ausland begangen werden: 11^o Straftaten gegen die Umwelt in den Fällen der §§ 324, 326, 330, 330a, die im Bereich der deutschen ausschließlichen Wirtschaftszone begangen werden, soweit völkerrechtliche Übereinkommen zum Schutze des Meeres ihre Verfolgung als Straftaten gestatten".

⁶¹ Ausführungsgesetz Seerechtsübereinkommen 1982/1994, article 12: "Das deutsche Strafrecht gilt für Straftaten gegen die Umwelt in den Fällen der §§ 324, 326, 330 und 330a des Strafgesetzbuches, die von einem Schiff aus in der Nordsee oder Ostsee außerhalb der deutschen ausschließlichen Wirtschaftszone durch Einleiten von Stoffen unter Verletzung verwaltungsrechtlicher Pflichten (§ 330d Nr. 4, 5 des Strafgesetzbuches) begangen werden, welche der Durchführung völkerrechtlicher Übereinkommen zum Schutz des Meeres dienen. Soweit die Tat in den Hoheitsgewässern eines anderen Staates begangen wird, gilt dies, wenn die Tat nach dem Recht dieses Staates mit Strafe bedroht ist. Für die Abgrenzung der Nordsee ist Artikel 2 des Übereinkommens zur

prosecution for some act which would be criminal if committed within German jurisdiction, but which is not prohibited by MARPOL or some other international agreement for the protection of the sea.

4.66 The provisions creating the administrative penalties penalise acts by anyone, German or foreigner, within German internal waters, territorial sea and exclusive economic zone, and on board a German ship, wherever it is⁶². They are not, however, extended to acts in the parts of the North Sea and Baltic Sea outside German jurisdiction.

Those liable and the penalties

4.67 In respect of the criminal offences, the description of the persons who bring about an illegal discharge are very general (see the previous section), and do not limit the offence to a particular person responsible (such as the captain).

4.68 However, this is strongly qualified by the general provisions of the penal code, which mean that:

- a. failure to act is treated as criminal only if the person failing to act “has a legal obligation to take care that the result does not happen and if omission is equivalent to bringing about the factual situation described in the law by a positive act”⁶³;
- b. liability does not arise for acts actually done by others, and liability which requires a person to have certain characteristics (such as being the undertaker of an enterprise) can only arise for another person lacking those characteristics if that person has a formal legal status as agent or partner⁶⁴. The effect of this is that the criminal provisions do not apply to corporations (“legal persons”).
- c. “it is only intentional acts that are penalised, unless the statute expressly penalises negligent acts”⁶⁵ - §324 does, however, clearly apply to negligent pollution (see next paragraph).

4.69 The penalties for the criminal offence under §324 are up to five years’ imprisonment for a deliberate act and up to three years’ imprisonment for pollution caused by negligence. In both cases, there is the alternative of a fine, which is subject to no limit but which is left to the judgement of the court.

4.70 The Penal Code also provides for a higher penalty in certain cases of water pollution. The maximum imprisonment penalty is increased to ten years⁶⁶. Specific examples of cases justifying such higher penalties are given, but only in general terms – other cases may be “especially serious” or cases described may have redeeming features. Those relevant to MARPOL implementation are:

- a. a body of water is so affected that the effects can only be removed at extraordinary expense or after a long time
- b. a population of animals or plants which is threatened with extinction is seriously damaged;

Zusammenarbeit bei der Bekämpfung der Verschmutzung der Nordsee durch Öl und andere Schadstoffe vom 13. September 1983 (BGBl. 1990 II S. 70) maßgebend.”

⁶² In the case of ships flying the flag of a State which is not a Contracting Party to MARPOL, the obligation is only imposed if the vessel comes into German internal waters from outside the territorial sea (UNCLOS MARPOL-Gesetz §2a).

⁶³ Strafgesetzbuch § 13(1): “Wer es unterläßt, einen Erfolg abzuwenden, der zum Tatbestand eines Strafgesetzes gehört, ist nach diesem Gesetz nur dann strafbar, wenn er rechtlich dafür einzustehen hat, daß der Erfolg nicht eintritt, und wenn das Unterlassen der Verwirklichung des gesetzlichen Tatbestandes durch ein Tun entspricht.”

⁶⁴ Strafgesetzbuch § 14. Acting for another (Handeln für einen anderen).

⁶⁵ Strafgesetzbuch § 15: “Strafbar ist nur vorsätzliches Handeln, wenn nicht das Gesetz fahrlässiges Handeln ausdrücklich mit Strafe bedroht.”

⁶⁶ Strafgesetzbuch 330(1): “In besonders schweren Fällen wird eine vorsätzliche Tat nach den §§ 324.. mit Freiheitsstrafe von sechs Monaten bis zu zehn Jahren bestraft.

- c. the act was done with a view to profit" (the latter may often be the case for oil discharges at sea, but the intention may be hard to prove)⁶⁷.

4.71 The provisions on administrative penalties place the liability

- a. for breaches of the discharge prohibitions, on the captain and the person who actually made the discharge;
- b. for the record-keeping requirements on the captain or the other crew member responsible for keeping the records. In the case of ships flying the flag of a State not a Contracting Party to MARPOL, the more limited obligation applies only to the captain.

4.72 The penalties that can be imposed administratively are:

- a. for discharge contraventions: up to Euro 50 000;
- b. for record-keeping contraventions: up to Euro 25 000⁶⁸.

Significant features of the enforcement and prosecution processes

4.73 The Penal Procedure Order (*Strafprozessordnung*) imposes very significant limitations on the availability of information about those prosecuted for offences. In general, personal details that might enable the offender to be identified can only be given to those involved in the investigation or prosecution of offences or (subject to requirements designed to protect anonymity) to those carrying out research into offences of the kind concerned.

4.74 Contraventions of legal requirements other than the Penal Code give rise to administrative proceedings, rather than prosecutions in court. The relevant administrative authority (in this case, the Federal Navigation and Hydrography Agency (*Bundesamt für Seeschifffahrt und Hydrographie*)) takes a formal decision to impose a financial penalty, which is then binding unless the offenders apply to the local court. If they do, the court then holds a hearing at which the public prosecutor is allowed to present the case against the offenders, and the court can take any decision that the administrative authority could originally have taken.

Section 4.5: Ireland

Offences

4.75 The Sea Pollution Act 1991 (which was amended by the Sea Pollution (Amendment) Act 1999) enables the relevant Minister (currently the Minister for Transport) to make regulations prohibiting discharges of oil, oily mixture, noxious liquid substance, harmful substance, sewage or garbage. Any prohibitions of this kind are made subject to the usual MARPOL exclusions of discharges needed to secure the safety of the ship or to save life, or resulting from damage to the ship or its equipment (provided all reasonable steps are taken to minimise pollution after the damage is discovered).

4.76 The Sea Pollution (Prevention of Oil Pollution) Regulations 1994 and their amendments incorporate into Irish law the requirements of MARPOL, for all ships to which the legislation applies.

⁶⁷ Strafgesetzbuch 330(1) "Ein besonders schwerer Fall liegt in der Regel vor, wenn der Täter

1. ein Gewässer...derart beeinträchtigt, daß die Beeinträchtigung nicht, nur mit außerordentlichem Aufwand oder erst nach längerer Zeit beseitigt werden kann,...
3. einen Bestand von Tieren oder Pflanzen der vom Aussterben bedrohten Arten nachhaltig schädigt oder
4. aus Gewinnsucht handelt.

⁶⁸ MARPOL-Gesetz, as amended by the 10e Gesetz über die Einführung der Euro.

Ships and areas

4.77 The Sea Pollution Act (as amended) applies to all ships registered in Ireland and to all ships within the sea area to which the Act applies.

4.78 The Sea Pollution Act (as amended) applies to all sea areas that are included in:

- a. the inland waters of Ireland;
- b. the Irish territorial seas; and
- c. any area lying within a line, every point of which is 200 nautical miles from the baselines of the territorial sea,

but with a proviso that the application of the Act to the areas under (c) is not a claim by the State to any area that is recognised by Ireland as under the jurisdiction of another State. This somewhat complicated provision is clearly intended to ensure that there is no gap or overlap under Irish law between the Irish and United Kingdom jurisdictions, without necessarily recognising the entire jurisdiction claimed by the United Kingdom.

Those liable and the penalties

4.79 Under section 29 of the Sea Pollution Act 1990 (as amended by section 15 of the 1999 Amendment Act and the introduction of the euro), any breach of the requirements is made an offence. The maximum penalties are uniform for all offences:

- a. on summary prosecutions, a fine of Euro 2,000 or 12 months' imprisonment (subject to the MARPOL exclusion of imprisonment as a penalty for foreign vessels where the offence takes place in the EEZ);
- b. on prosecution on indictment (that is, before a senior judge and with a jury) under the Act: a fine of up to Euro 12,700,000 or 5 years' imprisonment (with the same exception).

Section 4.6: The Netherlands

Offences

4.80 Article 5(1) of the 1983 Ship Pollution Prevention Law, as amended, prohibits "the discharge from a ship into the sea of a harmful substance, except in the cases and in the ways to be laid down in a general administrative measure"⁶⁹. ("General administrative measures" are the highest form of subordinate legislation in the Netherlands. They are adopted by a Royal Decision).

4.81 Article 11(1) of the Law also makes it the duty of the captain of a ship which is in a category specified in a general administrative measure to "ensure that a record is kept on board in which activities are recorded relating to the transport and discharge of harmful substances" in accordance with rules laid down by general administrative measure⁷⁰. Article 11(3) requires the captain to provide copies to authorised officers on request. The details required in this "oil journal" are specified in Article 20 of the Royal Decision.

Ships and areas

4.82 The prohibition on the discharge of harmful substances applies to all ships entitled to fly the Netherlands flag (wherever they are) and to foreign ships in the territorial sea of the Netherlands and, since

⁶⁹ Wet van 14 december 1983, houdende regelen ter voorkoming van verontreiniging door schepen (WVVS), article 5(1): "Het is verboden vanaf een schip een schadelijke stof in zee te lozen behoudens in de gevallen en op de wijze vast te stellen bij of krachtens algemene maatregel van bestuur."

⁷⁰ WVVS, article 11(1): "De kapitein van een schip, behorend tot een bij algemene maatregel van bestuur aan te wijzen categorie, zorgt dat aan boord een journaal wordt bijgehouden waarin handelingen met betrekking tot het vervoer en de lozing van schadelijke stoffen worden aangetekend, met inachtneming van de... regelen" which are laid down in the general administrative measures authorised by article 11(2).

the 2005 amendment, to ships in the Netherlands exclusive economic zone, to the extent permitted by international law. There is power to exempt categories of ships wholly or partly from this prohibition⁷¹.

4.83 The duty to ensure the keeping of a record of activities involving harmful substances applies to Netherlands ships. The duties to provide copies of the record is applied both to Netherlands ships and to foreign ships by article 11(5), but (as in Belgium) there is no specific requirement that foreign ships keep a record.

Significant features of the enforcement and prosecution processes

4.84 The task of enforcement is placed in the first place on the Navigation Inspectorate (Netherlands Shipping Inspectorate (NSI)), who are authorised to enter Netherlands ships (including the living quarters) and foreign ships that are in a Netherlands port or in the Netherlands territorial sea on their way to or from a Netherlands port⁷².

4.85 A foreign ship may be investigated if it is in a Netherlands port and a discharge has been made outside the Netherlands territorial sea in breach of MARPOL requirements.⁷³

4.86 An officer of the Navigation Inspectorate may detain a Netherlands ship which lacks certificates required by MARPOL, does not conform to those certificates, is otherwise a risk to the marine environment or where he is hindered in the execution of his duty⁷⁴. Likewise, a foreign ship from a State which is a Contracting Party to MARPOL which is in a Netherlands port may be detained for inspection by an official of the flag State for a breach of the flag State's legislation implementing MARPOL⁷⁵.

4.87 Any such detention order may be appealed to the Minister of Transport and Water Management by a written appeal that goes (except where he is personally involved) *via* the Head of the Navigation Inspectorate. The Ministry decides whether the detention order is to be suspended pending the appeal.⁷⁶

4.88 The captain of any ship which is suspected of having breached the prohibition in article 5 of discharges of harmful substances can be ordered to keep his ship in Netherlands waters, at least until a sufficient bond has been given to cover any fines or costs that may have to be paid. Such an order is given by the judge of the relevant court, on the application of the Officer of Justice (the investigating officer).⁷⁷

Section 4.7: Norway

Legislation

4.89 In Norway, pollution control and marine safety actions against pollution can be enforced under the Act of 16 February 2007 No. 09 relating to Ship Safety and Security (The Ship Safety and Security Act). The law came into force on 1st July 2007. In addition, in actions taken after accidental pollution the Act of 13 March 1981 No 6 concerning protection against pollution and concerning waste applies.

4.90 The Ministry of Environment may make certain regulations for the prevention of pollution pursuant to the Ship Safety and Security Act as well as the Act of 13th of March 1981 No 6 concerning protection against pollution and concerning waste.

4.91 The main regulations regarding prevention of pollution from ships are:

⁷¹ WVVS, articles 2, 4 and 5(3).

⁷² WVVS, articles 15 and 17.

⁷³ WVVS article 19.

⁷⁴ WVVS article 20.

⁷⁵ WVVS article 21.

⁷⁶ WVVS article 27.

⁷⁷ WVVS article 37.

- Regulation 16 of June 1983 No 1122 concerning hindrance of pollution from ship (the MARPOL-regulation)
- Regulation 1st of June 2004 No 931 concerning minimizing of pollution chapter 20 – 23 and 41.
- Regulation 9 of July 1992 No 1269 concerning warning of acute pollution or danger of acute pollution
- Regulation 20 of November 2003 No 1388 on the prohibition of organotin compounds on ships
- Regulation 7 February 2007 No 850 concerning inspection, stopping and boarding of foreign ship with suspicion of violation of environmental legislation
- Regulation 17 June 2008 No. 607 concerning insurance and other security for oil spills from ships relating to The Bunkers Convention 2001 and The Responsibility Convention 1992
- Regulation 27 June 2008 No. 74 concerning the duty to notify and report

4.92 All the annexes of MARPOL are implemented into Norwegian law through acts and regulations. Hence, there is established a general duty to take care and to take timely action to avoid pollution from ships and to limit the effects of pollution regarding oil discharges, noxious liquid substances in bulk, discharge of sewage, discharge of garbage, how to carry harmful substances in packaged form and emission to the air. The regulations states which areas discharges may be made and precautions to be taken over such discharges.

Jurisdiction

4.93 The Ship Safety and Security Act applies for all Norwegian ships wherever situated. Furthermore, the Act applies to foreign ships, in accordance with international law, in Norwegian territorial sea including Svalbard, in Norwegian economical zone, on the Norwegian continental shelf and pipelines linking them to the shore and the exclusion zones around them.

Offences

4.94 Administrative actions (*forvaltingstiltak*) are placed in chapter 8 of The Ship Safety and Security Act. A duty to take specific actions (*pålegg*) in order to comply with requirement in statutes or regulation may be imposed on the ship owner. Penalties (*tvangsmulkt*)⁷⁸ may be imposed on those who do not comply with requirements imposed in accordance with provisions in statutes and regulations, certificates may be withdrawn and the ship may be forbidden to leave harbour or obliged to go to harbour, stopped or boarded on voyage and other necessary action may be taken. Foreign ships may be refused permission to enter Norwegian sea territory.

4.95 Administrative sanctions are regulated in chapter 9 of The Ship Safety and Security Act. Fines (*overtredelsesgebyr*)⁷⁹ may be imposed by the administrative authority.

4.96 Criminal liability and punishment is dealt with in chapter 10 of The Ship Safety and Security Act. Section § 58 imposes criminal liability with penalties or imprisonment up to 2 years for anyone acting on behalf of the ship owner who deliberately or negligently substantially omits to establish, maintain and develop a safety management system.

4.97 Furthermore, The Ship Safety and Security Act section 64 imposes criminal liability with penalties or imprisonment up to 2 years for anyone acting on behalf of the ship owner who deliberately or with gross negligence substantially violates requirements to the technical environmental safety of the ship and to the running of the ship in statute and regulations.

⁷⁸ Discretionary power of the regulatory authority to impose a penalty as a mean to press the ship owner to comply with requirements, but not with the purpose of punishment.

⁷⁹ May be imposed by the regulatory authority. The fine is meant to be a punishment for an unlawful act.

4.98 The Ship Safety and Security Act section 65 imposes criminal liability with penalties or imprisonment up to 2 years for the master of the ship who deliberately or with gross negligence substantially violates duties regarding the environmental safety of the ship, whereas section 66 imposes criminal liability with fines or imprisonment up to 1 year for others who work on the ship who deliberately or with gross negligence substantially violates requirements regarding the running of the ship, including amongst other acts discharge, dumping, ballast water management, bunkers and bunkering.

4.99 In addition, according to the General Civil Penal Code of 22 May 1902 No. 10 under section 152b the punishment for water pollution offences could be imprisonment for up to 10 years and up to 6 years for harming protected species intentionally or with gross negligence.

4.102 Under both acts, where an offence has been committed by someone who is acting in the course of business, the firm can be made subject to penalty even if no individual can be punished for the contravention. This means that companies and other corporate bodies can be made subjects to penalties.

Significant features of the enforcement

4.100 The Ship Security and Safety Act provides powers consistent with MARPOL and the UN Convention on the Law of the Sea for the Maritime Directorate to investigate on board ships and to detain ships.

Surrender agreement between the EU and Norway and Iceland

4.101 In June 2006, the EU Council approved the signature of a surrender agreement between the EU and Norway and Iceland, which builds on a mechanism similar to the European Arrest Warrant (EAW). Implementation of the agreement requires legal amendments and ratification will probably not take place before 2009.

Section 4.8: Sweden

Offences

4.102 The MARPOL convention and the UNCLOS is implemented in Swedish law by the 1980 Law on Precautions against Pollution from Vessels⁸⁰. This law prohibits the discharge of oil from ships in the areas to which it applies. The offence of breaching this prohibition applies to deliberate actions as well as negligence⁸¹.

4.103 In addition to criminal proceedings, the 1980 Law makes provision for an administrative “water pollution charge” (*vattenföroreningsavgift*), which can be imposed where there is a breach of the oil discharge prohibition. There is no need to show intention or negligence in order to impose such a charge – the unlawful discharge of oil is sufficient. Through a combination of sanctions, an offence will result in personal criminal fines for the person responsible (normally the captain and/or the chief engineer) and the administrative pollution charge for the owner of the ship.

4.104 The 1980 Law provides for the Government, or an authority to which it delegates the task, to lay down further rules regarding prohibition of oil discharge and on record-keeping. Such rules have been introduced in accordance with MARPOL.

Ships and areas

4.105 The prohibition against discharge of oil, and the consequent provisions on offences and water pollution charges, applies to all Swedish ships wherever the location of the offence. It also applies to foreign ships within Swedish internal waters and, with the limitations of UNCLOS, within Swedish territorial waters. Further limitations in jurisdiction apply in the EEZ. The construction of the law seems to extend the jurisdiction as far as possible under international law. In addition there are rules set to extend the Swedish jurisdiction to apply to certain offences by non-Swedish vessels within territorial waters and EEZs of other

⁸⁰ Lag om åtgärder mot förorening från fartyg (SFS (1980:424).

⁸¹ SFS 1980:424, chapter 10, §1.

member states of the EU. These rules are however strongly limited by the condition that the discharge must have caused severe damage to the coast of Sweden or Swedish assets in the territorial sea or the EEZ. These rules also apply to offences in the high seas. The fact alone that a foreign ship which has violated the prohibition of polluting waters outside Swedish territory and EEZ has voluntarily called at a Swedish port does not give jurisdiction unless the offence in some rather severe aspect has caused damage to Swedish interests⁸².

Those liable and the penalties

4.106 The offences under the 1980 Law can be committed by “anyone who, deliberately or through negligence, causes an illegal discharge of oil”. The captain of the ship is, likewise, liable if he “has, deliberately or through negligence, failed to exercise appropriate supervision to prevent an illegal discharge of oil in accordance with the requirements by, or under, the law. If the captain has delegated the duty of supervision to another officer, that officer is also liable in the same way as the captain”.⁸³ Owners and managers who similarly fail in their duty to ensure appropriate supervision are also liable⁸⁴

4.107 Water-pollution charges are levied on “the individual or the corporation who at the time of the contravention was the owner or manager of the vessel. If the owner shows that he or she has had no influence over the management of the ship, the charge is not to be imposed on him or her. If a water pollution charge is imposed on part-owners who share ownership of a ship, they are jointly and severally liable” (that is, any one of them must pay the whole charge, but can recover their shares from the other part-owners if they still exist and are solvent).⁸⁵

4.108 The amount of the water pollution charge is related to the gross tonnage of the vessel and the size of the illegal discharge. It is calculated according to a table set out in the 1980 Law, updated by a price index.⁸⁶

Significant features of the enforcement and prosecution processes

4.109 The criminal investigation is conducted by the Coast Guard under supervision of a prosecutor. The investigation concerning the administrative charge is parallel to the criminal investigation but under the sole responsibility of the Coast Guard. A criminal fine as well as administrative charges can be issued as an written order to pay the fine. This is the case when the liable persons or companies comply with the accusation and the amount of fines/charge. If not, the cases will be brought to the local court competent for admiralty questions. In court the prosecutor will bring forward the case in both the matter of criminal offence and the water pollution charge.

Need for Swedish legal assistance?

4.110 The Swedish authorities can provide urgent assistance in the following cases:

⁸² The demand for « damage to Swedish interest » does not apply when Sweden has complied with a request from a Contracting Party to the European Convention of 15th of May 1972 on the transferrance of criminal proceedings.

⁸³ SFS 1980:242, chapter 10, §1 and §2: “...den som uppsåtligen eller av oaktsamhet bryter mot förbud som gäller enligt 2 kap. 2 § första stycket...”; “...befälhavaren, om han eller hon uppsåtligen eller av oaktsamhet har brustit i den tillsyn som behövs för att utsläpp inte skall ske i strid med denna lag eller föreskrifter som har meddelats med stöd av lagen. Om befälhavaren har delegerat ansvaret för tillsynen över hanteringen ombord av skadliga ämnen till ett annat befäl eller om ett visst befäl har sådant ansvar till följd av tjänstens beskaffenhet, gäller vad som nu har sagts i motsvarande mån det befälet.”

⁸⁴ This refers to general provisions concerning company fines.

⁸⁵ SFS 1980:242, chapter 10, §2: “Vattenföroreningsavgiften skall påföras den fysiska eller juridiska person som vid överträdelsen var fartygets ägare eller redare. Om ägaren visar att han eller hon har saknat inflytande över fartygets drift får avgift dock inte påföras honom eller henne. För vattenföroreningsavgift som delägarna i ett partrederi skall betala enligt första stycket, svarar de solidariskt.”

⁸⁶ SFS 1980:242, chapter 8, §3.

- if the violating vessel is sailing under Swedish flag, a Swedish prosecutor will always have jurisdiction to institute a criminal investigation when reasonable suspicion can be established. This can be initiated through any informal means such as a telephone call, telefax or an e-mail describing the circumstances. This means of communication could be particularly useful in cases where a Swedish vessel is suspected of having discharged oil in the waters of other states, and is en route to a Swedish port.
- in cases where a suspected vessel (regardless of nationality) is expected to call at a Swedish port it could be useful to make a *request for legal aid* (not only a Port State Control). This could also be done in a quick and easy way by contacting the Coast Guard and the prosecutor on duty. The request must be made by a competent authority (as defined by the requesting state's legislation). Special requirements concerning the contents of the request could be taken care of gradually.

4.111 The National Contact Point on a 24/7 basis is +46 455 35 35 35 (Coast Guard). The Duty Officer is in contact with the criminal investigator and the special prosecutor on duty (24/7).

Section 4.9: The United Kingdom

4.115 Although the United Kingdom contains two separate legal systems in the parts facing the North Sea (England & Wales, and Scotland), the legislation on oil discharges is common to them both. The only differences are therefore in procedural matters, where the differences between the two systems remain. In practice, these differences are not significant, because practically all prosecutions are brought within the system for England and Wales, since they are handled by the local court for the headquarters of the Maritime and Coastguard Agency at Southampton.

Offences

4.112 The Merchant Shipping Act 1995, section 131(1), makes an offence the discharge from a ship of oil, or a mixture containing oil in United Kingdom national waters. Regulations can, however, create exemptions from this rule.

4.113 Section 128 of the 1995 Act also empowers the making of an Order-in-Council (the most formal kind of delegated legislation in the United Kingdom) to give effect to, *inter alia*, MARPOL. Use has been made of this power to create an offence of breaching the requirements of MARPOL.

4.114 These offences are subject to a number of defences – that is, once a *prima facie* case has been established that an offence has been committed by showing that a prohibited discharge took place from the ship in question, those liable can show that they are not guilty by bringing forward evidence that one or more of these defences applies. The defences are that:

- a. if the discharge takes place during the transfer of oil between ships, or from the ship to land, the other ship or the land installation was responsible for the act or omission causing the discharge;
- b. the discharge took place while a harbour authority was trying to prevent an obstruction or a danger to navigation, or while disposing of a sunk or abandoned ship. If the prosecution can, however, then show that the harbour authority failed to take reasonable steps to prevent, stop or reduce the discharge, the defence will not be made out;
- c. the discharge was reasonably necessary for securing the safety of a ship, preventing damage to any ship or saving life;
- d. the discharge was due to damage to the ship and as soon as practicable all reasonable steps were taken to stop or reduce the discharge;
- e. the discharge was due to an accidental leak, and as soon as it was discovered all reasonable steps were taken to stop or reduce the discharge.

4.115 In line with general criminal law, the prosecution has to prove a case “beyond reasonable doubt” – a phrase which is more properly expressed by saying that the court must be sure that the facts are as the prosecution allege. And the more significant and important the case is, the more sure the court must be. Defences, however, need only to be proved “on the balance of probabilities” – it is sufficient if the court thinks that it is more likely that the facts on which the defence rests are true, since then they cannot be sure that the offence has been committed.

4.116 There is a parallel offence under the Water Resources Act 1991, of allowing toxic, polluting or noxious substances to enter water. This does not at present allow for the defences that are available under the Merchant Shipping Act⁸⁷. The Government is committed to legislating to correct this.

Ships and areas

4.117 The offence created by section 131 of the 1995 Act applies to “United Kingdom national waters”, which are defined by reference to a set of co-ordinates which are the same as the boundaries of the UK continental shelf. This approach is adopted because the United Kingdom has not yet decided to declare an exclusive economic zone, but wishes to take advantage of the sovereign jurisdiction over pollution matters conferred by Article 56(1)(b)(iii) of the UN Convention on the Law of the Sea.

4.118 The offence can be committed by any ship in this area.

4.119 The Order-in-Council giving effect to MARPOL applies to illegal discharges of oil by any ship on the high seas or in the territorial sea or exclusive economic zone (EEZ) of another State. Provision is made for any prosecution in respect of a discharge in another State's exclusive economic zone to be discontinued if the State in whose EEZ the offence was committed requests such discontinuance. There is no specific provision limiting the bringing of a prosecution in respect of another State's EEZ, since the 1995 Act limits prosecutions for the offences it creates to central Government authorities, and they will only commence a prosecution if so requested. There is no requirement for any specific formality for such requests.

4.120 In appropriate circumstances, therefore, a prosecution can be brought for a breach of a MARPOL requirement in respect of a discharge by any ship in any part of the world.

Those liable and the penalties

4.121 The penalty is imposed on the master (captain) of the ship and its owner. There is no need to show that the master or owner were at fault. The offences are of a category known in English law as “absolute”. It is sufficient to show that the event which constitutes the prohibited act took place. The person responsible need not even have known that the event happened. The justification for this approach is that the offence is of a kind where it is important to ensure that those responsible take adequate measures to ensure that the prohibited act does not occur.

4.122 The penalty varies according to whether the offence is prosecuted summarily or on indictment. On summary conviction, the maximum penalty is a fine of approximately Euro 375 000. On indictment, the fine is left to the discretion of the court. Although the *Sea Empress* case was under the Water Resources Act, not the Merchant Shipping Act, the principles for establishing the penalty are the same, and in that case the original fine was approximately Euro 6 000 000, though this was reduced on appeal on the grounds that the defendant was a public body, the proper performance of whose functions would be endangered by a fine of that size. A commercial operator could well face a fine of that size.

4.123 It is standard practice for the Maritime and Coastguard Agency to issue a press notice giving details of any person or company fined for an offence.

⁸⁷ The reason for this is that the Merchant Shipping Act aims at implementing the provisions of MARPOL, and therefore included the defences. The Water Resources Act is a consolidation of older legislation which has gradually been extended to cover sea areas. The conflict between the two approaches was not really registered until a prosecution was brought under the Water Resources Act in the *Sea Empress* case.

Significant features of the enforcement and prosecution processes

4.124 The prosecution is either summary or on indictment.

4.125 A summary prosecution is initiated by an application to a magistrates' court for a summons. This application is made by an "information" – a written statement by the prosecutor of the essential facts that are alleged. The magistrates' court will then issue a summons to the defendant to appear to answer the case. Witness statements will be served on the defendant, showing what it is expected that the various witnesses will give as their evidence. Unless the defendant wishes to contest such evidence, the statements can be accepted as evidence. The eventual trial will usually be held before a district judge or a bench of three lay (not legally qualified) magistrates, advised by a legally qualified clerk. The judgement of the magistrates' court may either be appealed to the Crown Court, where it will be heard by a circuit judge and two lay magistrates (in this case, the appeal is a re-hearing of the case from the start) or, on purely legal grounds, to the High Court, where it will be heard by a Divisional Court of two senior judges.

4.126 A prosecution on indictment would only be used in a very serious case. An initial "committal" hearing will normally be held by a magistrates' court, to ensure that the evidence is sufficient to justify committal for trial on indictment. This will normally be done by written submissions without an actual court appearance. The eventual trial will be before a circuit judge and a jury of 12 (a majority of at least 10-2 is required for their findings). The relevant law is decided by the judge, as is the penalty if the defendant is convicted. The defendant may appeal against conviction or penalty to the Court of Appeal. The prosecutor has no right of appeal (though if the Attorney General thinks that the judge has made a serious error in the law, he can refer the case to the Court of Appeal for a declaratory opinion – this does not affect the acquittal).

4.127 The majority of offences under UK Merchant Shipping Legislation are triable either way. That is by summons by Magistrates in a Magistrates Court or on indictment at Crown Court. Magistrates are non legally locally appointed members of the public who are guided by a legal Clerk. They decide on the guilt or otherwise of the defendant and pass sentence. They have limited sentencing powers and can refer matters to the Crown Court for trial or sentencing. The Crown Court will consist of a Judge and Jury. The jury will decide on guilt and the judge responsible for sentencing.

Draft Chapter 5: Gathering and Presenting Evidence

This chapter deals with the general considerations that apply to different types of evidence that can be necessary in order to achieve the imposition of a sanction on a polluter. The current text provides a short summary of the envisaged content and will be developed further in due course. When agreed the fully developed text will be inserted into the on-line version of the manual.

The manual *INTERPOL (2007): Illegal Oil discharges from vessels* provides valuable information on gathering and presenting evidence and should be consulted until finalisation of Chapter 5 (Investigators and prosecutors can access the document on the pass word protected manuals section of the INTERPOL website: <http://www.interpol.int/Public/EnvironmentalCrime/Pollution/>. A translation in French is available on CD at the INTERPOL Secretariat).

The nature of the offence and the evidence needed

Absolute offences and other offences

5.1 The nature of the offence under the national legislation creating it will have a significant implication for the evidence needed. In some jurisdictions (for example the United Kingdom), maritime oil pollution offences are regarded as “absolute offences”. That is, it is necessary only to show that the pollution occurred, and it is not necessary to show that:

- a. the polluter deliberately caused the pollution; or
- b. the polluter negligently caused the pollution; or even
- c. the polluter knew that the pollution was being caused.

The offence is fully established if it is shown that the pollution occurred and that the polluter was in one of the categories of people who are responsible for any pollution caused (for example, the owner or captain (master) of a vessel).

5.2 There may be specific defences provided in the legislation against such absolute offences, but it is then usually for the alleged offender to prove the facts that establish that he or she is entitled to benefit from the defence. If he or she produces evidence to this effect, the prosecutor will then need to provide evidence negating this claim. (This approach has been held to be consistent with the presumption of innocence under Article 6(2) of the European Convention on Human Rights – see, for example, *Salabiaku v. France* (10519/83)).

5.3 Nevertheless, it will be relevant to gather evidence on the knowledge of those concerned about the polluting discharge, since this will be relevant to the scale of the penalty.

5.4 In other jurisdictions, it will usually be necessary to show that the alleged offender deliberately or negligently caused the pollution, or at least knew that the pollution was happening and did nothing to prevent it. This requirement significantly extends the evidence that is needed to prove the offence, since it will be necessary to have evidence of the alleged offender's intentions and/or knowledge of the circumstances. The fully developed chapter will consider the evidence by which motivation or knowledge of the alleged polluter can be shown.

Other issues to be covered in the chapter

5.5 The other issues to be covered by the fully developed chapter are intended to be:

- a. **corroboration:** in some jurisdictions (for example, Scotland), it is necessary for evidence to be corroborated – that is, the rule applies which is summarised by the Latin maxim *testis unus, testis nullus* (a single witness is insufficient proof); evidence from one witness may need to be corroborated (strengthened) by another witness or other forms of proof;
- b. **proof of pollution:** methods of proving that the pollution occurred and linking it to the vessel in question, including:
 - (i) visual observation, including the elements needed to prove the veracity of a photograph – how far it is necessary in different jurisdictions to show the chain from the pressing of the camera button to the print produced in the procedure, and the extent to which statements are required from all those involved – and different issues may come up with digital cameras. It is also desirable that operational logs and reports are accompanied by supporting material containing:
 1. the details of the member(s) of the aerial surveillance crew that is/are responsible for the observation. This should include name, rank, and length of service in aerial surveillance operations and in the present rank;
 2. the details of training in aerial observation that the person(s) responsible for the observation have received;
 3. (where relevant) the details of the training in the application of the Bonn Agreement Oil Appearance Code that the person(s) responsible for the observation have received;
 - (ii) remote sensing, usually from observation aircraft. A distinction can be made between
 1. remote-sensing systems which document the results on “one-time” material – the typical example is a traditional camera which records the results on a negative, where any subsequent changes can (at least in the large majority of cases) be observed by an expert;
 2. remote-sensing systems which document the results on material which is inherently capable of modification – the typical example is the digital camera, where the file is capable of being manipulated considerably, without the resulting file necessarily showing any changes.

Where the recording medium has little possibility of being changed without leaving traces, documenting the handling chain between the operator of the remote-sensing device and the evidence for production to the court or other decision-taking authority requires, ideally, a record of the person who was the operator of the remote-sensing device; and a record of his/her qualifications for operating the device efficiently; and either his/her confirmation that the evidence is the recording medium which he/she used (for example, a polaroid-camera photograph) or that it is a true print or copy of that recording medium or confirmation of each step in the chain between the making of the record on the recording medium and the evidence produced.

Where the recording medium is susceptible to change, there is also a need for confirmation by all those who have handled the recording medium that at no stage has it been changed.

- (iii) chemical analysis to link oil recovered from the sea or the shore to the vessel in question. Analytical evidence will normally need to be accompanied by a detailed report by the person responsible for carrying out the analysis. This will need to:
 1. identify the person responsible for the analysis and his/her qualifications for carrying it out and drawing conclusions from the results;

2. explain the background to the analytical work, possibly drawing on the material from the work of the BONN expert group;
 3. describe in detail what has been done;
 4. describe what conclusions about the oil and its origins can be drawn from the results of the analysis.
- (iv) modelling the oil slick from its observed track to show that it originated from a point at which the vessel in question could be located;
- (v) the elements needed to prove the identification of a ship by means of a transponder;
- c. **official reports:** in some jurisdictions (for example, France), official reports (*procès verbal*) can carry a special weight. The requirements for such official reports are therefore significant;
- d. **estimating the quantity of oil involved:** this is relevant to levels of sanctions;
- e. **nature of oil:** showing particular problems caused by the nature of the oil involved is also relevant to levels of penalty;
- f. **costs of remediation:** in some jurisdictions, offenders may have to pay compensation for the costs of cleaning up the pollution that they have caused. Questions of the valuation of such costs may therefore arise;
- g. **record-keeping offences:** in cases of failure to keep proper records, the proof required of the records that are alleged to be deficient.
- h. **administrative penalties:** the procedures leading to the imposition of an administrative penalty.

Part III: Means of Securing Evidence

This part of the Manual reviews the various ways in which the necessary evidence can be collected.

Chapter 6: Visual Observation

This chapter deals with direct visual observation as one of the most effective ways of recognising and assessing an oil spill exceeding the legal limits of MARPOL. The approximate volume of the oil contaminating a sea area can be estimated by assessing the coverage and observing the appearance and colour of the oil.

Section 6.1: Introduction

6.1 Visual observations can be made:

- a. from aircraft and helicopters
- b. from ships in the vicinity
- c. by land-based observers

6.2 The nature of oil spills and the light reflected from them often makes it difficult to assess their extent and volume from the deck of a ship or from land. The ideal is to observe from immediately above the area of interest. The difficulties are therefore greatly reduced if an aircraft or helicopter is used.

6.3 Any observer can recognize different features on the surface of the sea and such observations can provide valuable evidence. In order to obtain maximum benefit from an observation however the observer should be sufficiently experienced to interpret accurately what he sees.

Section 6.2: Appearance of oil spills

6.4 An oil spill will generally consist of one or several patches with thin sheens which may include concentrations of relatively thick layers. The thick patches of oil are indicated by dull colours, patches of intermediate thickness display a blue or rainbow colour while the thinnest patches appear as grey or silvery sheens.

6.5 When a ship is actually discharging oil into the sea, the resulting sheen or layer on the sea surface shows itself in the wake (see Figure 6.1 below).



Figure 6.1: Oil discharges in the wake of ships

6.6 A ship may sail through an existing oil slick or sheen, which resulted from a discharge from another vessel. If this is the case, such a slick or sheen will be "opened" by the vessel. In some cases, depending on the circumstances, a continuous sheen will be observed after passing of this ship (see Figure 6.2 below).



Figure 6.2: Ship sailing through pre-existing oil slick

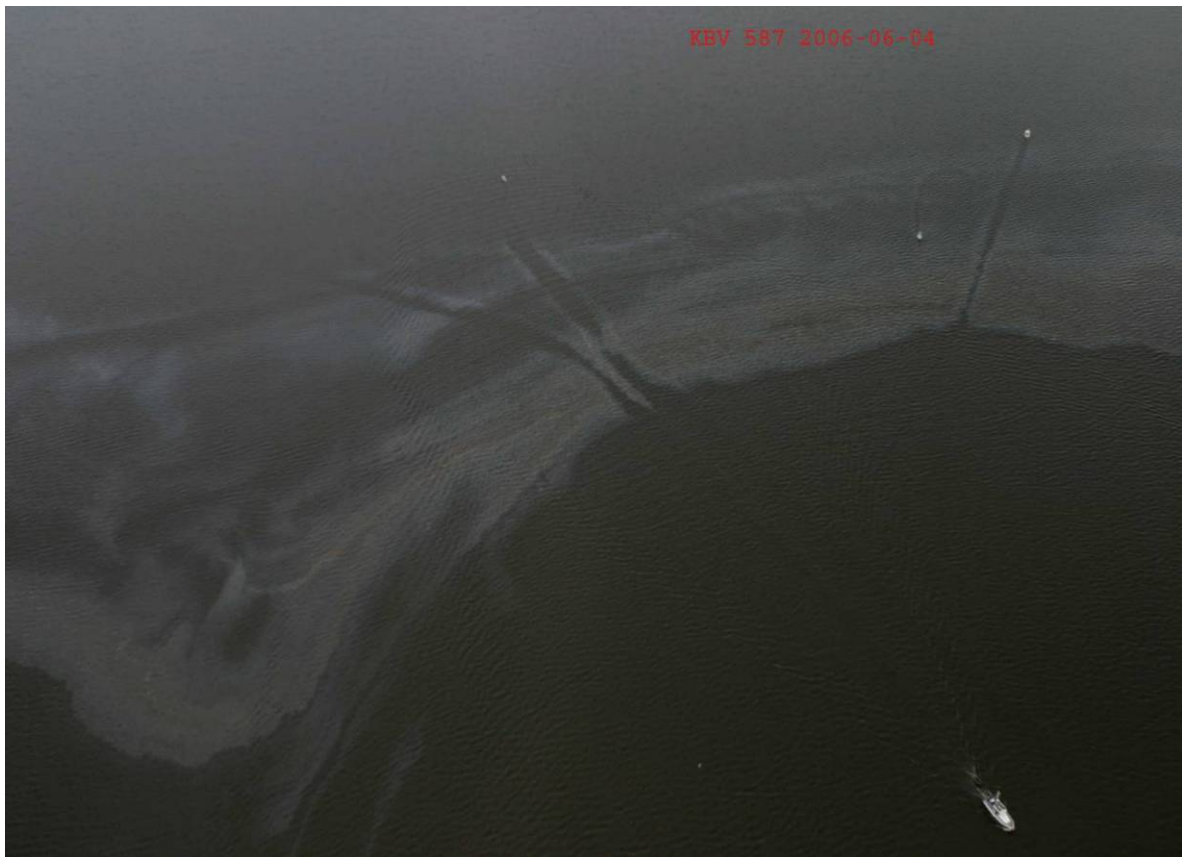


Figure 6.3: Slick after passage through it by another ship

6.7 The two situations, actually discharging or sailing through an existing oil slick, can easily be distinguished by any experienced observer, thus enabling the observer to establish whether or not the slick or sheen is a result of a discharge from the observed ship or from another ship.

6.8 Other phenomena also produce anomalies on the sea surface. Such phenomena include cloud shadows, seaweed, jellyfish, plankton blooms and subsurface sand banks. However, these phenomena will never appear similar to oil in a ship's wake resulting from an operational discharge.

6.9 Experienced observers are able to determine the difference between these phenomena and oil. They can also distinguish between the different colours which are displayed by patches of oil of different thicknesses.

6.10 It is however sometimes difficult for even experienced observers to determine purely from visual observation whether certain spills result from operational spillages or are non-Annex-I products or vegetable oil. In such circumstances an inquiry as to the cargo aboard the vessel will resolve the problem. Certain products which are transported and discharged under the Regulations of Annex II of the MARPOL Convention may, when discharged into the sea, form layers on the water surface which could be similar to oil layers. In such an event, only inspection on board can produce a decisive answer as to whether or not the discharge exceeded the criteria of Annex I or Annex II of the Convention.

Section 6.3: Observations as evidence of violations of MARPOL

Discharges of oil or oily mixtures from the machinery spaces of all vessels

6.11 Investigations have taken place during various trials and intercalibration tests to ascertain whether discharges which are within the limits set by MARPOL (see tables II and III, chapter 2) can be seen by an observer.

6.12 The following conclusions can be drawn from the test results:

- a. no discharge with an oil content of 15 PPM or below has ever been detected by visual observation*;
- b. discharges with an oil content greater than 15 PPM but less than 100 PPM cannot be observed under normal aerial surveillance conditions, as they never form continuous films or sheens with length greater than a few decimetres. However, discharges between 50 and 100 PPM have been visible under very special conditions (high discharge rate, low ship speed, low wind speed and calm sea).

Discharges from cargo tanks of oil tankers

6.13 Tests indicate that discharges of cargo residues allowed under MARPOL (*i.e.* beyond 50 nautical miles from the shore) may be observed as a blue or rainbow sheen, sometimes with brown patches, behind the vessel.

6.14 The results of investigations indicate that the discharge of oil or oily mixtures from cargo areas of oil tankers in compliance with applicable Regulations may result in oil traces which are visible on the water surface. These oil traces mainly appear as blue or rainbow sheens, although brown patches of oil may occur in the wake of the ship (see photo below). The results of an investigation carried out on board the discharging vessel should give a decisive answer as to whether or not the discharge exceeds the criteria of Regulation 9 of Annex I to the MARPOL Convention.

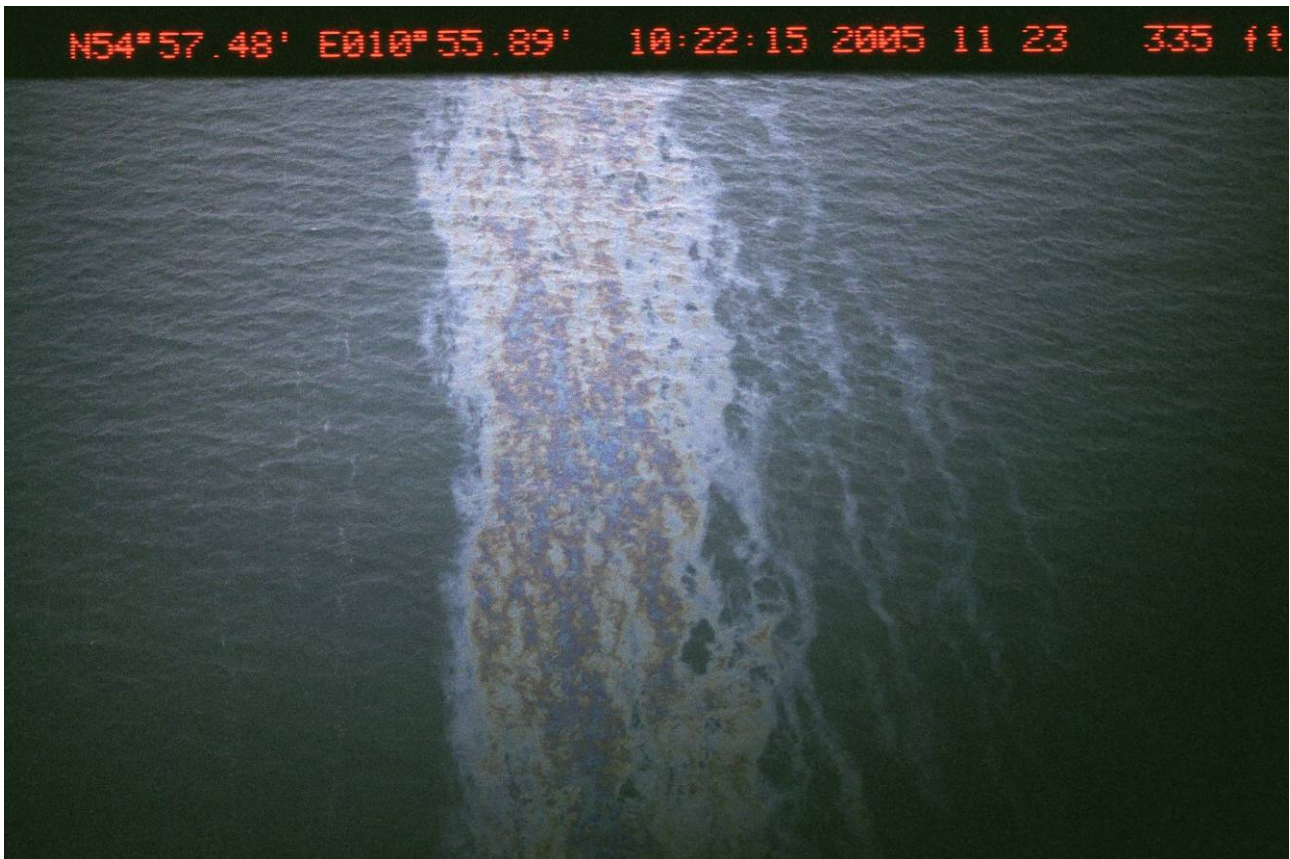


Figure 6.4 Blue or rainbow sheens with brown patches

6.15 For a detailed description of the tests referred to in this section, and their results, the reader is referred to the bibliography.

* See IMO Resolution MEPC 61(34) "Visibility Limits of Oil Discharges of Annex I of MARPOL 73/78".

Section 6.4: Assessment of oil quantity

6.16 Although it has been established that evidence through visual observation is sufficient to determine whether a breach of MARPOL has occurred, it may also be useful to estimate the quantity of oil spilled. Such information could be used to assist in determining the level of the penalty which may be imposed.

6.17 It is possible to estimate the quantity of oil by establishing:

- a. the extent of the area affected by pollution;
- b. the extent of the oil coverage within the area;
- c. the thickness of the oil film as estimated by its appearance.

6.18 Research under the auspices of the Bonn Agreement has shown that there is a reliable relationship between the visual appearance of the oil slick and its thickness. This relationship has been tabulated in the Bonn Agreement Oil Appearance Code (BAOAC):

BONN AGREEMENT OIL APPEARANCE CODE

CODE	Description	Layer thickness interval (µm)	Litres per km ²
1	Sheen (silvery/grey)	0.04 - 0.30	40 – 300
2	Rainbow	0.30 – 5.0	300 – 5000
3	Metallic	5.0 – 50	5000 – 50,000
4	Discontinuous true oil colour	50 – 200	50,000 – 200,000
5	Continuous true oil colour	200 – more than 200	200,000 – more than 200,000

6.19 Codes 4 and 5 are subject to further evaluation.

6.20 Detailed guidelines on the application of the Bonn Agreement Oil Appearance Code have been published by the Bonn Agreement. In summary, a specially trained observer should estimate the area covered by the whole slick, the percentage of that area covered by the oil and the code that is applicable. The area should then be multiplied by the percentage and the appropriate number of litres per square kilometre in order to produce an estimate in litres of the amount of oil involved. It is commonly regarded as appropriate to use the lower end of the range of litres for each code for purposes of enforcement of offences, since this is the minimum amount that the research shows will be involved. (For response purposes, it may be more appropriate to use the upper end of the range, since this will ensure that the response allows a sufficient measure of precaution).

Section 6.5: Reporting visual observation

6.21 The Bonn Agreement and the Helsinki Commission have established common forms for a Standard Pollution Observation/Detection Log and for a Pollution Observation/Detection Report on Polluters and Combatable Spills (Annexes A and B to this chapter). These will normally be completed by the observers.

6.22 Where they are to be used for enforcement purposes, it is also desirable that these operational logs and reports are accompanied by supporting material containing:

- a. the details of the member(s) of the aerial surveillance crew that is/are responsible for the observation. This should include name, rank, and length of service in aerial surveillance operations and in the present rank;
- b. the details of training in aerial observation that the person(s) responsible for the observation have received;
- c. (where relevant) the details of the training in the application of the Bonn Agreement Oil Appearance Code that the person(s) responsible for the observation have received.

6.23 Wherever possible, a report of a visual observation should be accompanied by a photograph. Details on photographic possibilities are given in Chapter 7.

Annex A

☐ HELCOM
 ☐ BONN AGREEMENT
 STANDARD POLLUTION OBSERVATION / DETECTION LOG
 ☐ NO POLLUTION DETECTED

REPORTING AUTHORITY	AIRCRAFT REG	MISSION No	CAPTAIN	CO PILOT	OPERATOR	OBSERVER	DAY	DATE	MONT H	YEAR

FLIGHT TYPE	ROUTE / AREA				TIME OVER THE SEA DAY		TIME OVER THE SEA NIGHT		TOTAL TIME OVER THE SEA	
					hrs	mins	hrs	mins	hrs	mins

No	AREA CODE	TIME UTC	POSITION		DIMENSIONS		AREA COVER %	OILED AREA Km ²	OIL APPEARANCE COVERAGE (PERCENTAGE - %)						MINIMUM VOLUME m ³	MAXIMUM VOLUME m ³	COMBAT Y / N
			LATITUDE 'NORTH'	LONGITUDE 'EAST/WEST'	LENGTH Km	WIDTH Km			1	2	3	4	5	Oth			

No	POLL TYPE	DETECTION						PHOTO	VIDEO	FLIR	WEATHER							REMARKS
		SLAR	IR	UV	VIS	MW	LF	Y / N	Y / N	Y / N	WIND		CLOUD		VIS	SEA	Wx	
											°			FT				
											°			FT				
											°			FT				
											°			FT				

No	REMARKS	OIL APPEARANCE TABLE			
		No	OIL APPEARANCE DESCRIPTION	MINIMUM VOLUME m ³ / km ²	MAXIMUM VOLUME m ³ / km ²
		1	SHEEN	0.04	0.30
		2	RAINBOW	0.30	5.00
		3	METALLIC	5.00	50.0
		4	DISCONTINUOUS TRUE COLOUR	50.0	200
		5	TRUE COLOUR	200	>200

STANDARD POLLUTION OBSERVATION LOG COMPLETION GUIDE

HELCOM:	Tick HELCOM Box if the flight is in HELCOM Area																												
BONN AGREEMENT:	Tick BONN AGREEMENT Box if flight is in Bonn Agreement Area																												
NO POLLUTION DETECTED:	Tick NO POLLUTION DETECTED if no pollution is detected																												
REPORTING AUTHORITY:	National Authority Responsible for Pollution Control.																												
AIRCRAFT REG:	Aircraft Registration Letters / Numbers.																												
MISSION No:	Nationally Assigned Mission Number.																												
FLIGHT TYPE:	National Designation for Flight Type as follows: NAT - National REG - Regional EXER - Exercises OPS - Operational Flight. RIG - Oil Rig Patrol SHIP - Shipping Patrol TDH - Tour de Horizon Flight CEPCO - Co-ordinated Extended Pollution Control Operation																												
CAPTAIN OF AIRCRAFT:	Name of Captain																												
CO PILOT:	Name of Co Pilot																												
OPERATOR:	Name of Operator																												
OBSERVER:	Name of Observer																												
DAY:	Number Assigned to the Day of the Week as follows: Monday - 01 Tuesday - 02 Wednesday - 03 Thursday - 04 Friday - 05 Saturday - 06 Sunday - 07																												
DATE/MONTH/YEAR:	Two number designation for each of date/month/year of Flight																												
ROUTE / AREA:	Flight Route or Area																												
TIME OVER THE SEA – DAY:	Time over the Sea during Daylight																												
TIME OVER THE SEA – NIGHT:	Time over the Sea at Night																												
TOTAL TIME OVER SEA:	Total time between Coasting Out and Coasting In.																												
No:	Number allocated to pollution detection.																												
AREA CODE:	The international telephone code for the country (Area) in which the pollution is located: Bonn Agreement <table><tr><td>Belgium</td><td>32</td><td>Denmark (+ Helcom)</td><td>45</td></tr><tr><td>France</td><td>33</td><td>Germany (+ Helcom)</td><td>49</td></tr><tr><td>Netherlands</td><td>31</td><td>Norway</td><td>47</td></tr><tr><td>Sweden (+ Helcom)</td><td>46</td><td>United Kingdom</td><td>44</td></tr></table> Helcom <table><tr><td>Estonia</td><td>372</td><td>Finland</td><td>358</td></tr><tr><td>Latvia</td><td>371</td><td>Lithuania</td><td>370</td></tr><tr><td>Poland</td><td>48</td><td>Russia</td><td>7</td></tr></table>	Belgium	32	Denmark (+ Helcom)	45	France	33	Germany (+ Helcom)	49	Netherlands	31	Norway	47	Sweden (+ Helcom)	46	United Kingdom	44	Estonia	372	Finland	358	Latvia	371	Lithuania	370	Poland	48	Russia	7
Belgium	32	Denmark (+ Helcom)	45																										
France	33	Germany (+ Helcom)	49																										
Netherlands	31	Norway	47																										
Sweden (+ Helcom)	46	United Kingdom	44																										
Estonia	372	Finland	358																										
Latvia	371	Lithuania	370																										
Poland	48	Russia	7																										
TIME UTC:	Time of pollution detection.																												

POSITION:	Latitude and longitude of pollution (degrees, minutes and seconds // WGS / 84 Datum).
DIMENSIONS:	Length and width of pollution in kilometres.
AREA COVER %:	Observer's assessment of the percentage of the boxed dimensioned area (length x width), covered with pollution.
OILED AREA:	<p>Oiled Area covered with pollution; calculated by multiplying length, width and cover %</p> <p>Example:</p> $\frac{\text{Length} \times \text{Width} \times \text{Cover \%}}{2 \text{ Km} \times 1 \text{ Km} \times 50\%, \text{ gives...}}$ $[2.0] \times [1.0] \times [0.5]$ $= \text{Oiled Area} = 1 \text{ Km}^2$
OIL APPEARANCE COVERAGE %:	<p>Allocation of Percentage of the 'Oiled Area' to the Appearance of the pollution.</p> <p>Example:</p> <p>1/2 cover – Rainbow- Column 2 = 50%</p> <p>1/4 cover - Metallic - Column 3 = 25%</p> <p>1/4 cover - True Colour - Column 5 = 25%</p>
MINIMUM VOLUME:	<p>Minimum Quantity of Oil Pollution in cubic metres.</p> <p>Calculated as follows:</p> $[\text{Oiled Area}] \times [\text{Appearance Code Minimum Thickness Value}] \times [\text{Decimal Percentage of Appearance}]$ $[1 \text{ Km}^2] \times [0.3 \text{ m}^3/\text{km}^2] \times [0.50] = 0.15 \text{ m}^3$ $[1 \text{ Km}^2] \times [5.0 \text{ m}^3/\text{km}^2] \times [0.25] = 1.25 \text{ m}^3$ $[1 \text{ Km}^2] \times [200 \text{ m}^3/\text{km}^2] \times [0.25] = 50 \text{ m}^3$ $\text{Minimum Total Quantity} = [0.15] + [1.25] + [50] = 51.4 \text{ m}^3$
MAXIMUM VOLUME:	<p>Maximum Quantity of Oil Pollution in cubic metres.</p> <p>Calculated as follows:</p> $[\text{Oiled Area}] \times [\text{Appearance Code Maximum Thickness Value}] \times [\text{Decimal Percentage of Appearance}]$ $[1 \text{ Km}^2] \times [5.0 \text{ m}^3/\text{km}^2] \times [0.50] = 2.5 \text{ m}^3$ $[1 \text{ Km}^2] \times [50 \text{ m}^3/\text{km}^2] \times [0.25] = 12.5 \text{ m}^3$ $[1 \text{ Km}^2] \times [>200 \text{ m}^3/\text{km}^2] \times [0.25] = > 50 \text{ m}^3$ $\text{Maximum Total Quantity} = [2.5] + [12.5] + [>50] = > 65 \text{ m}^3$
No:	The same number as previously allocated to the pollution detection.
POLLUTION TYPE:	<p>Pollution Type as follows:</p> <p>OIL - Oil</p> <p>CHEM - Chemical</p> <p>FISH - Fish Oil or Waste</p> <p>VEG- Vegetable Oil or Waste</p> <p>OTH- Other (Amplify in Remarks)</p> <p>UNK- Unknown</p>

Note: For Algae Detection, use the Algae Observation Log.

DETECTION:	Detection Sensor.
	SLAR - Radar
	UV - Ultra Violet
	IR - Infrared
	VIS - Visual
	MW - Microwave
	LF - Laser Fluorosensor
PHOTO:	Photographs of pollution
VIDEO	Video of the pollution
FLIR	Forward Looking Infrared of the pollution
WEATHER:	Weather at the time of pollution observation / detection
	Surface Wind: Direction and Speed (knots or beaufort as required by national authorities),
	Cloud: Coverage in Octas or aviation description (scattered / overcast)) and Base in feet,
	Visibility: Nautical Miles or Kilometres
	Sea State: Using the description code given in the Abbreviations
	Weather: Rain, Snow, Haze, Mist etc
REMARKS:	Any Amplifying Remarks.

Note: For all Detections / Observations Boxes write:
‘Y’ Sensor used and pollution detected
‘N’ Sensor used but pollution not detected
‘-’ Sensor was not used or not available

POLLUTION OBSERVATION / DETECTION REPORT ON POLLUTERS AND COMBATABLE SPILLS (IMO)

1. REPORTER:

- a. Reporting State: :
- b. Observer (Organization/Aircraft/Platform) : Call Sign.....
- c. Observer(s)(Family Name(s)) : 1.....2.....

2. DATE AND TIME:

- a. Date (yymmdd) b. Time of Observation (UTC) : Date..... Time.....UTC

3. LOCATION OF THE POLLUTION:

- a. Position of the Pollution (Lat/Long) : Begin.....N,W/E
: End.....N,
.....W/E
- b. Inside/Outside Territorial Waters : ☐ Inside ☐ Outside

4. DESCRIPTION OF THE POLLUTION:

- a. Type of Substance Discharged :
- b. Estimated Quantity :m³
- c. Length (km) d. Width (km) e. Coverage (%) : Length.....km Width.....km Coverage.....%
- f. Oiled Area (km²) : Oiled Area.....(km²)
- g. Percentage of Oiled Area by Appearance (%) 1:.....% 4:.....%
- 1=Sheen 2=Rainbow 3=Metallic 2:.....% 5:.....%
- 4=Discontinuous True Colour 5=True Colour 3:.....% Other:.....%

5. METHOD OF DETECTION AND INVESTIGATION:

- a. Detection (Visual, SLAR, IR, UV, Video, MW : ☐ Visual ☐ SLAR ☐ IR ☐ UV ☐ Video ☐ MW,
LFS, Identification Camera, Other) : ☐ LFS ☐ Video ☐ Ident.Cam ☐ Other
- b. Discharge Observed c. Photographs Taken : Observed: Yes / No Photos Yes / No
- d. Samples Taken e. Need of Combating : Samples: Yes / No Combat: Yes / No
- f. Other Ships/Platforms in Vicinity (Names) :

6. WEATHER AND SEA CONDITIONS:

- a. Wind Direction b. Wind Force c. Visibility : Direction.....Degrees Force.....Bft/Kts Vis.....kms
- d. Cloud Coverage e. Wave Height : Cloud.....Octa Wave Ht.....m
- f. Current Direction : Current Direction.....Degrees

OBSERVATION OF A DISCHARGE OF HARMFUL SUBSTANCES BY A SHIP UNDER ARTICLE 6(3) OF MARPOL

7. SHIP INVOLVED:

- a. Name :
- b. Callsign c. Flag State : Callsign:..... Flag State:.....
- d. Home Port :
- e. Type of Ship :
- f. Position (Lat/Long) :N,W/EUTC
:N,W/E
.....UTC
- g. Heading h. Speed : Heading.....Degrees Speed.....kts
- i. Colour of the Hull :

- j. Colour of the Funnel and Funnel Mark :
- k. Colour / Description of Superstructure :
- l. Vessels IMO Number :
8. INFORMATION BY RADIO CONTACT:
- a. Radio Contact b. Means of Communication : Contact: Yes / No Means VHF / Teleph,Ch / Freq
- c. Last Port of Call :
- d. Cargo e. Last Cargo :
- f. Next Port of Call, ETA (yymmdd) :ETA.....
- e. Statements of Captain/Officer on Duty :
-
-

OBSERVATION OF A DISCHARGE OF HARMFUL SUBSTANCES BY AN OFFSHORE INSTALLATION

9. OFFSHORE INSTALLATION INVOLVED:
- a. Platform Name :
- b. Position (lat/long) : NW/E
- c. Type of Platform (Production/Drilling etc) :
- d. Company Name :
10. INFORMATION BY RADIO CONTACT:
- a. Radio Contact b. Means : Contact Yes / No Means VHF / Teleph,Ch / Freq
- c. Contact with (position) :
- d. Statements :
-
-
-

11. REMARKS AND ADDITIONAL INFORMATION:

.....

.....

.....

Chapter 7: Remote Sensing

This chapter deals with airborne remote sensing systems, which are an efficient means of detecting discharges of oil at sea and supplying information for use as evidence. The data collected from all sensors is stored and can be examined either in flight or after landing. Also, stills or frozen images and conventional high-resolution photographic prints annotated with date, time, position and other mission data can be stored or transferred to the ground via an image link.

Section 7.1: Features and operational capabilities

General

7.1 Most remote sensing instruments compare the radiation or reflection from the unpolluted sea with radiation or reflection from the polluted area. Investigations have shown that traces of oil which are detected by remote sensing equipment exceed discharge limits as specified in MARPOL Annex I.

7.2 Modern civilian airborne remote sensing systems are based on a multi-sensor concept with all-weather and day/night capability and are designed for maritime surveillance. The major use of these systems is the detection and monitoring of oil spills at sea but they can also be used for detection of other harmful substances, for example chemicals, and for the detection of algae. Visual observations and the various sensors complement each other to produce evidence of a violation.



Foto: Mikkel Skjold Hansen, NAVIAIR ©

Figure 7.1 Surveillance aircraft

7.3 The design of remote sensing systems varies but they are usually designed with the following functions:

- a. Day/night and all-weather capability
- b. Real-time presentation of images and selected information on the operator's display
- c. Large-area coverage and long-range detection of small targets
- d. High quality photography
- e. Automatic annotation of all images with date, time, position etc.
- f. Automatic positioning of targets selected by the operator
- g. Information storage

7.4 Certain systems may also enable:

- a. Measurement of spill film thicknesses, mapping of thickness variations within the spill (thus enabling determination of spill volume)
- b. Identification (in bad visibility and at night) of ships (suspected of causing a spill)
- c. Identification of the pollutant and determination of the type of oil
- d. Detection of pollutants below the water surface
- e. Documentation support to surface- and ground-based units by image link systems
- f. Ground-based image-processing

7.5 The following sensors are found in existing operational systems:

- a. Side Looking Airborne Radar (SLAR)
- b. Infra-Red line scanner (IR-scanner)
- c. UltraViolet line scanner (UV-scanner)
- d. MicroWave Radiometer (MWR)
- e. Photographic cameras and videocameras
- f. Image intensifiers; Low Light Level TeleVision (LLLTV)
- g. Synthetic Aperture Radar (SAR)

7.6 The capabilities of different remote sensing systems are compared in the following tables. These sensors have different capabilities and therefore in a multi-sensor concept can complement each other and the visual observations. Operationally, the surveillance procedure makes use of these capabilities in the following ways.

- | | |
|--------------------------------|--|
| 1. Spill detection: | SLAR or visual |
| 2. Spill/source investigation: | IR/UV, MWR, LLLTV, Videocamera or visual |
| 3. Spill identification: | LFS or visual |
| 4. Documentation: | All means |

7.7 Most systems have a data presentation and management console which consists of computer signal processor, monitors, data storage, frame memory, hard copy unit, and control panels for different sensors as shown below.

TABLE I

	SENSOR					
	Human eye	Photograph c a m e r a	Video c a m e r a	LLLTV	UV-	IR-
Working principle	passive; visible light; reflection	passive; visible light; reflection	passive; visible light; reflection	passive; visible light; (UV) reflection	passive; UV; reflection	passive; thermal IR
Capability						
Real time	X	X	X	X	X	X
Day	X	X	X	X	X	X
Night				X		X
All weather						
Oil type determination	(X)	(X)	(X)			
Film thickness determination	(X)	(X)	(X)			
Subsurface oil detection	(X)	(X)	(X)	(X)		
Mapping	(X)	X	X	X	X	X
Detection range	variable				0.5 - 2.5 km depending on altitude	
Electronic image transmission			X	X	X	X
Ship identification	X	X	X	X		
Position documentation	X	X	X	X	X	X

X = Capability

(X) = Capability depending on circumstances

TABLE II

	SENSOR		
	Side-Looking Air borne Radar	Microwave radio meter (1 frequency)	Microwave radio meter (3 frequencies)
Working principle	active; microwave; backscatter	passive; microwave emission	passive; microwave emission
Capability			
Real time	X	X	X
Day	X	X	X
Night	X	X	X
All weather	X	X	X
Oil type determination			
Film thickness determination		0.1 - 2 mm	0.05 - 3 mm
Subsurface oil detection			
Mapping	X	X	X
Detection range	40 - 160 km	500 m	500 m
Electronic image transmission	X	X	X
Ship identification			
Position documentation	X	X	X

X = Capability

Data presentation and management console

7.7 A basic principle of airborne remote sensing systems is the handling and recording of all received information on board the aircraft. This is accomplished by a central management console where the operator can inspect the remote sensing data presented, either as images in real-time, or as replayed recordings.

7.8 An annotation computer can be fed, manually, by the operator with data before every flight mission. During the flight the annotation computer may continuously and automatically be fed with position data, aircraft heading and altitude. The computer can then automatically furnish all recorded images with information on day, time and position, as well as data related to the sensors, the aircraft and the flight mission.

7.9 At the console, the operator can select information from the different sensors. The output from the sensors can be displayed, in black and white or colour, as real-time images on a monitor (TV display). Two

channels can usually be shown at the same time, for example IR-UV or IR-MWR channels side by side - so assisting oil spill quantity assessment.

Data documentation and transmission

7.10 After processing, the information from all sensors is stored by digital cassette recorders and/or hard disks. These recordings can be replayed for evaluation, either in flight, or after landing. Also, stills or frozen images from conventional TV cameras or low light level TV cameras can be stored digitally and replayed afterwards. Modified single reflex cameras can give conventional high resolution photographic prints annotated with date, time, position and other mission data. All information can be transferred to the ground via an image link and be reproduced as large hard copies.

Calibration

7.11 As remote sensing instruments work on differences between signals rather than absolute signal strength they do not require a pre-flight calibration. The quantitative capabilities of the systems are tested in regular exercises.

Section 7.2: Brief description of sensors

General

7.12 Registration and documentation of an oil spill can be accomplished as illustrated in the picture shown in figure 7.2. The way in which this is carried out will depend on different factors, such as visibility, cloud-base and wind.

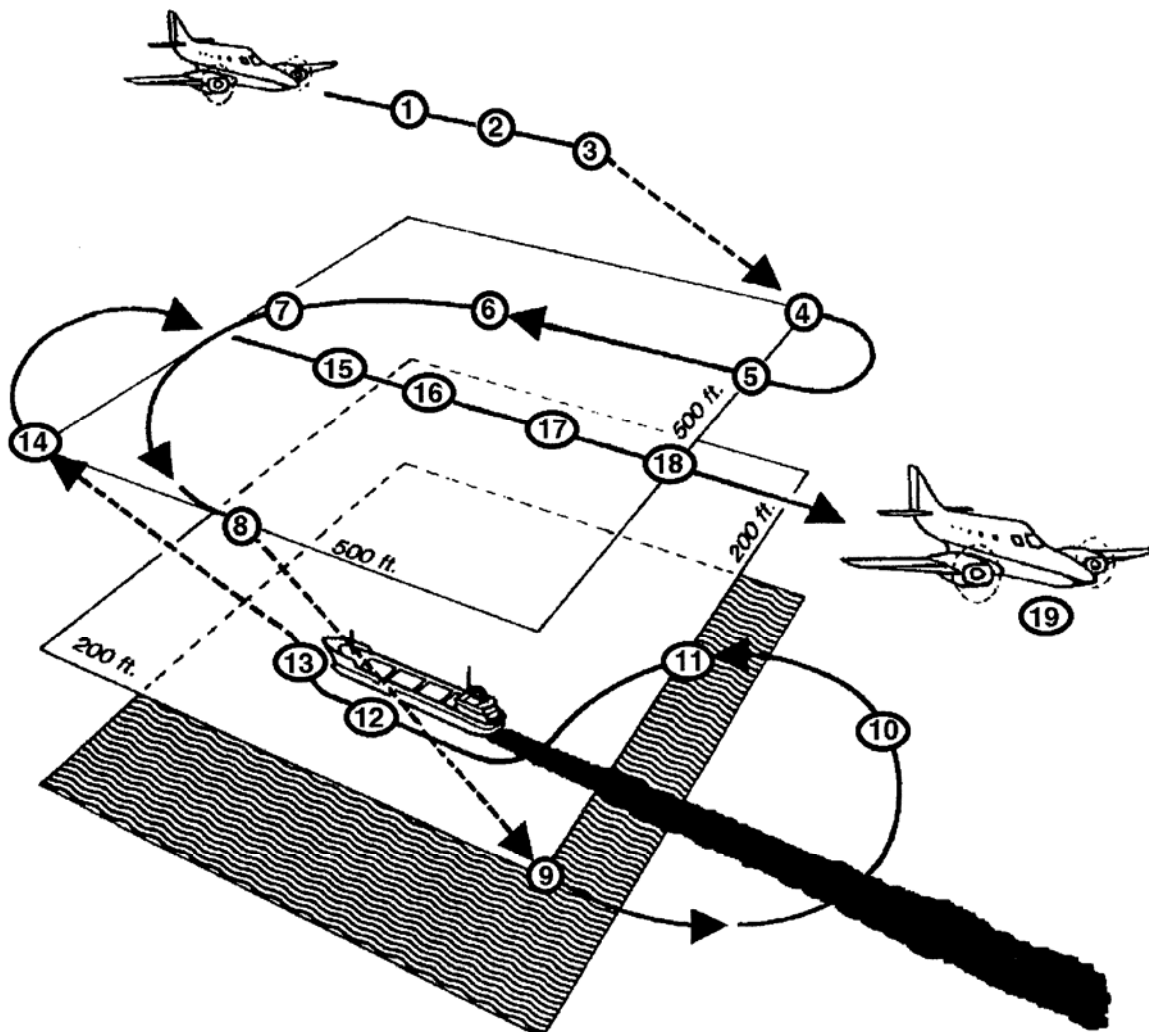


Figure 7.2 Airborne registration and documentation of an oil spill

Legend to Figure 7.2:

Action point	Action
1.	Detection
2.	SLAR and camera registration
3.	Storing of SLAR images
4.	Descending to 500 ft
5. - 8.	Camera registration of the ship's wake
9.	Descending to 200 ft
10.	Obtaining camera registration of the spill
11. - 13.	Obtaining camera registration of the ship (name etc.)
14.	Ascending to 500 ft
15. - 17.	Registration by IR/UV, MWR, and LSF
17. - 18.	Storing of IR/UV images
19.	Documentation and reporting, including tape recording of radio-communication between ship and aircraft

Photographic camera systems

7.13 An aerial camera system is a common tool for recording violations. The system normally used includes modified 35 mm single reflex cameras with special data boxes mounted on the back. It is often used as supporting evidence to visual observations. Data is exposed onto the film and appears as a data strip along the upper part of the developed photograph. This data includes date, time, position, aircraft heading and picture identification numbers. The data boxes are connected to the annotation computer.



Figure 7.3 Photo with data strip

Video Cameras

7.14 Video cameras are also frequently used. The data, as with photographic camera systems, is recorded on the videotape.

Side-looking airborne radar (SLAR)

7.15 The radar signal of the SLAR is returned when there is reflection from the sea surface (sea clutter). Such reflection is caused by capillary waves which are present on the sea surface even at very low wind velocities. If these capillary waves are smoothed by the presence of a substance on the sea surface, for example oil, little or no signal is returned to the emitting radar. The SLAR can therefore detect such a substance by comparing the level of return from the different parts of the sea. Even a thin oil film makes the sea surface smoother than the surrounding area.

7.16 The SLAR requires a fixed antenna mounted under and along the aircraft fuselage. The radar beam can be directed either to one side or to both sides of the aircraft and is perpendicular to the aircraft's direction of motion. A continuous scan of the ground or sea is obtained due to the aircraft's forward motion. The swath immediately below the aircraft cannot be surveyed because of the construction of the antenna with side-radiating beams.

7.17 A signal processor in the SLAR system integrates several hundred radar pulse responses into one TV line. The resulting image is then presented on a TV monitor. In this way, the clean sea is presented on the screen as a grey background, oil spills appear as dark areas, while vessels and other objects on the surface show up as white spots. It is often also possible to observe patterns in the sea clutter itself, indicating sea currents, large wave systems, and underwater structures in coastal areas. A discovered dark area is investigated further in order to determine whether it is oil or not.

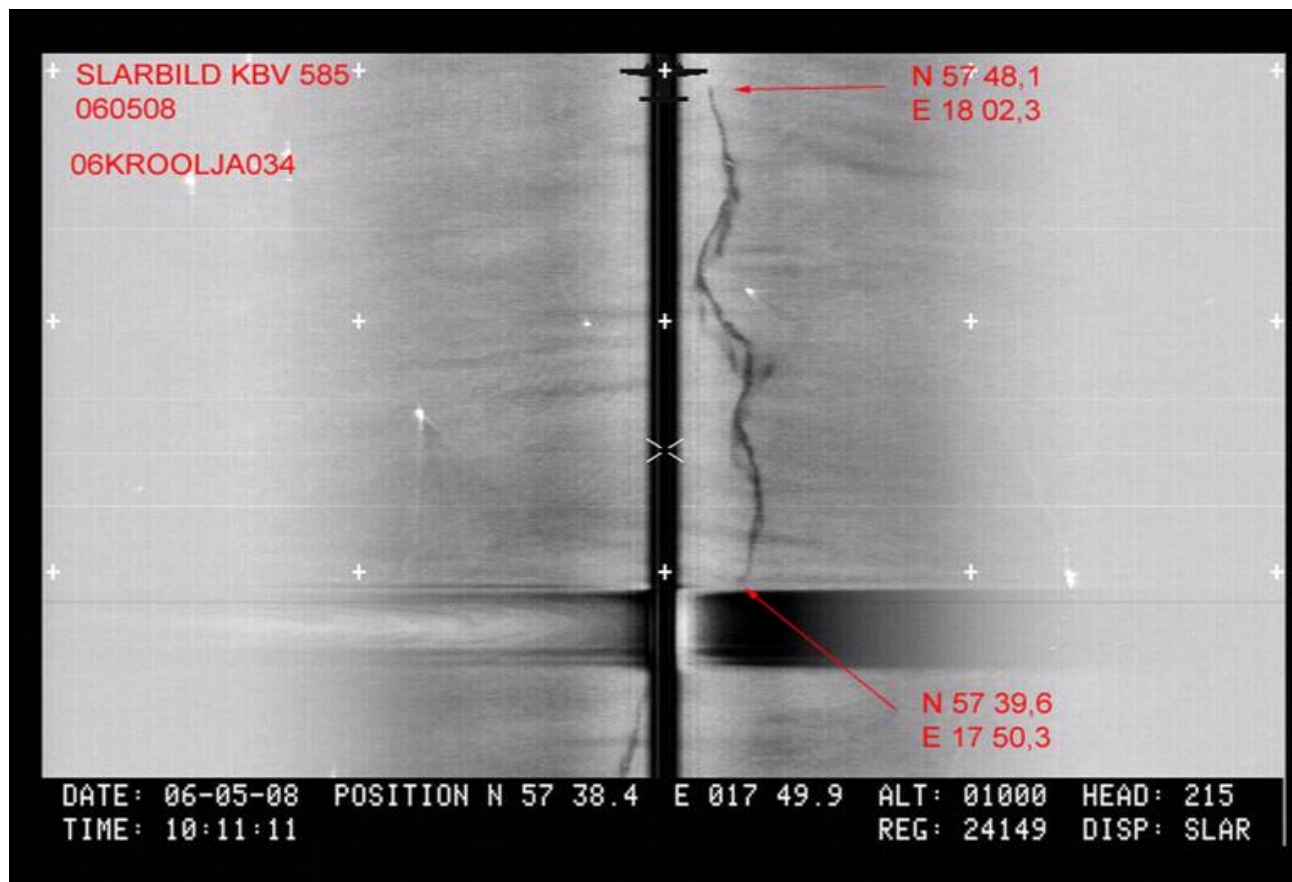


Figure 7.4 SLAR picture showing oil spill and data strip

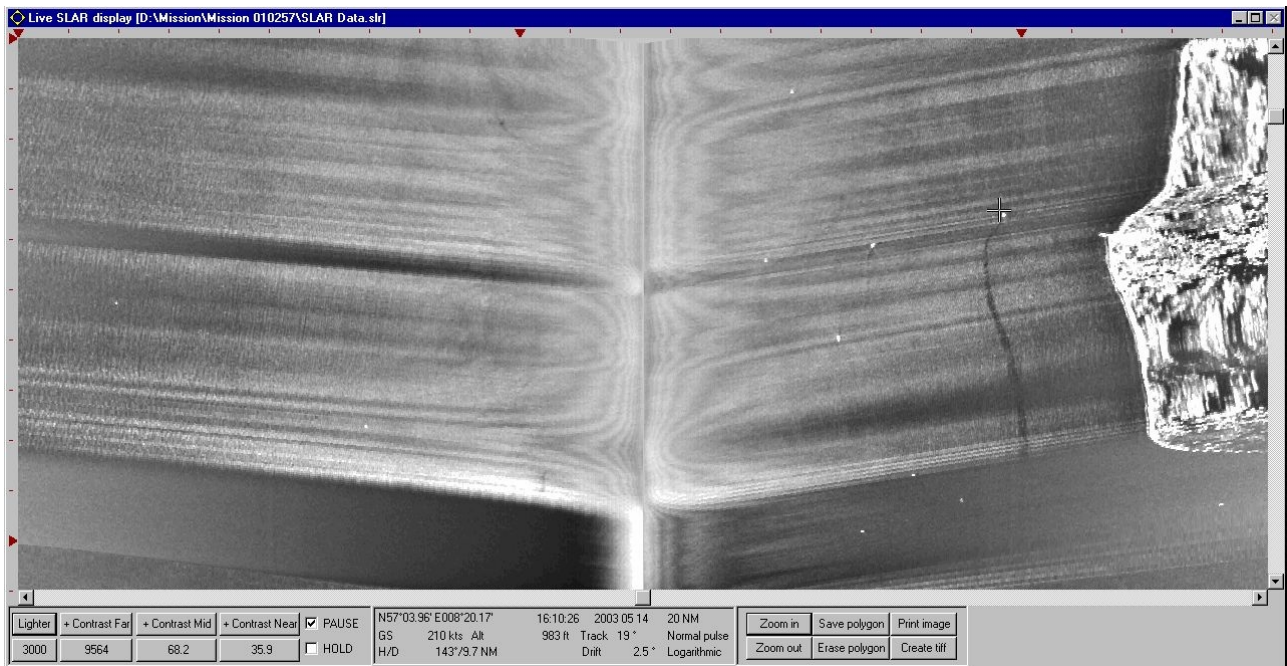


Figure 7.5 SLAR picture showing oil spill and data strip

7.18 One common feature of SLARs is automatic target positioning. The operator can use a special light or roller pen to point at a target on the monitor screen. The position of the target is then automatically calculated and immediately presented as latitude and longitude in the data block together with the other annotation data of the SLAR image.

7.19 For oil spills the detection range by a SLAR, depending on weather conditions, is normally about 30 km on each side of the aircraft and the surface coverage could, depending on the aircraft's speed, be 15 000 km² per hour.

Infrared/ultraviolet (IR/UV) scanner

7.20 The IR-channel can make day and night registrations when there is no mist or clouds between the plane and the sea. It measures the thermal radiation, which is generally less from an oil film than from the water. The thicker parts of an oil spill differ more in their radiation from the water than the thinner parts. Consequently the IR-channel gives some indication of film thickness variations in an oil spill.

7.21 The UV-channel can only be used in daylight and clear conditions. It registers the UV-light which is being reflected by the oil. An oil film, even if it is extremely thin, reflects UV-light better than the clean water surface. The reflectivity is not influenced by the film thickness. Thus the UV-channel maps the whole spill area, even the very thin oil films. The contrast variations only show reflectivity differences in the oil spill and do not indicate thickness variations.

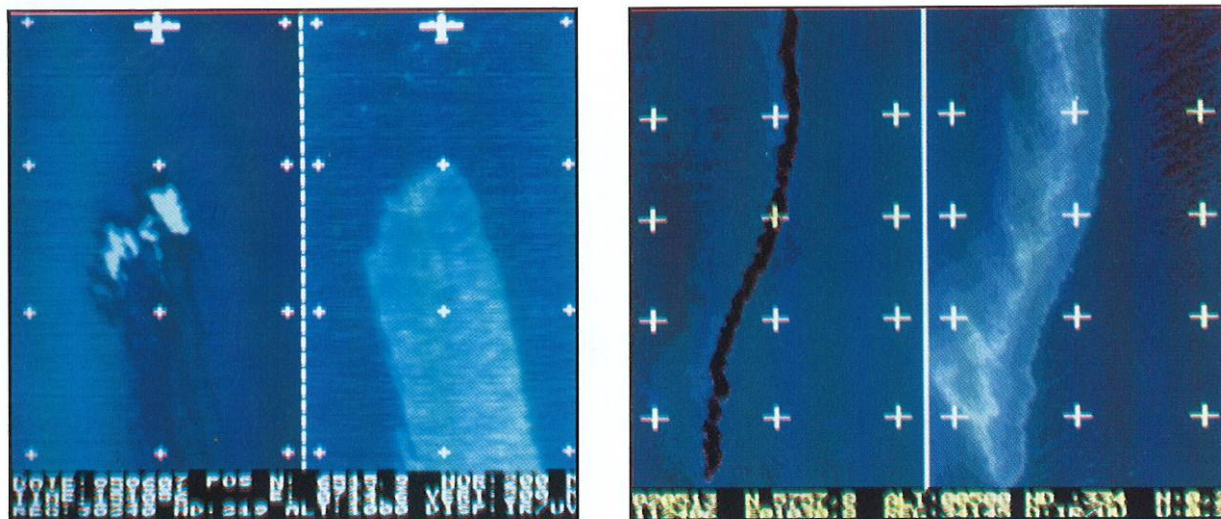


Figure 7.6 IR/UV scanner registrations of oil spills

(with the IR channel to the left and UV to the right for each spill)]

7.22 The IR- and UV-channels complement each other. The IR shows the thicker and thinner parts of the spill whereas the UV shows the total coverage (see figure 7.6) The IR-channel on the left half of the picture shows the thicker oil layers as darker in colour. The UV-channel to the right shows the whole oil spill and confirms that the IR-image results from the presence of a substance and not another phenomena affecting the sea surface temperature. The contrast variations in the UV-channel are caused by differences in UV reflections and do not indicate thickness variations.

7.23 An IR/UV scanner has a much smaller coverage than a SLAR, generally 300 - 500 m width depending on the altitude of the aircraft.

Microwave radiometer (MWR)

7.24 The sea surface radiates naturally microwaves of a wavelength up to a few centimetres. An oil spill on the sea surface will increase this radiation as a function of the thickness of the oil film. An airborne microwave radiometer records the radiation and, when starting a mission, will calibrate itself on the natural radiation.

7.25 With a scanning microwave radiometer (coverage generally 300-500 m width) it is possible to map the thickness variations in the oil film and thus calculate the volume of the spill. The console computer calculates the volume of the spill automatically.

7.26 A modern microwave radiometer, using three frequencies simultaneously, can measure the radiation of oil films within a thickness interval from 0.05 to 3 mm (when the thickness is more than 3 mm the MWR measures 3 mm and therefore underestimates the volume of the spill). Experience has shown that most oils, even rather high viscosity types, soon spread out to these film thicknesses.

7.27 The microwave radiometer registration of an oil spill can be presented on a monitor screen as a colour picture where different thicknesses are coded with different colours for easy interpretation. The microwave radiometer is mainly a tool to measure the quantity of an accidental oil spill. As it does not measure thicknesses below 0.05 mm, it will usually not detect operational discharges.

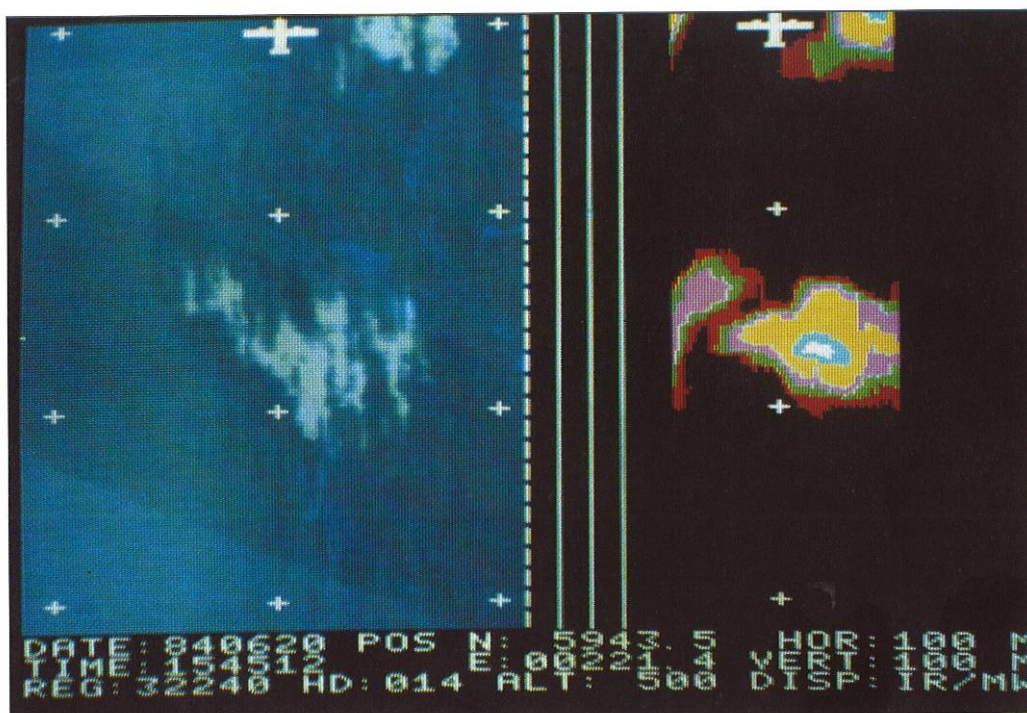


Figure 7.7 IR/MWR scanner registrations

(with the IR channel to the left and MWR channel to the right)

7.28 The MWR image in figure 7.7 shows the thicknesses in different colours for easy interpretation. This figure does not represent an operational discharge.

Synthetic-aperture radar (SAR)

7.29 SAR is especially suited for satellite-borne applications. The first European remote sensing satellite ERS-1, which was launched in July 1991, carries an imaging SAR. The SAR can survey the world's oceans for large oil spills.

7.30 The drawback of a satellite-borne SAR system is the lack of flexibility. The desired place for surveillance cannot be chosen in the same way as for an airborne system. Besides this, the frequency of passage over any given point is at present very low. Satellite-borne systems can therefore not replace the airborne ones. But the satellite-borne systems have the advantage of covering remote areas, which are seldom surveyed by oil spill surveillance aircraft, and could therefore be useful for statistical studies. The SAR is, however, unlikely to be usable for detection and investigation of operational discharges in the predictable future.

Section 7.3: Satellite surveillance

7.31 Cameras and other forms of remote sensors can be mounted on satellites, and can provide information about areas of the sea where the sea-surface appears to be modified in some way. Skilled interpretation of such information can identify areas where such changes may be the result of spilled oil.

7.32 However, there is as yet no technique which can definitely identify oil slicks at sea from satellite observation.

7.33 Satellite surveillance is therefore still only a tool for identifying circumstances which require more detailed investigation by visual observation or remote sensing. Nevertheless it is a very useful tool, and one of growing importance for this purpose.

Section 7.4: Documenting remote-sensing results

7.34 A distinction can be made between:

- a. remote-sensing systems which document the results on “one-time” material – the typical example is a traditional camera which records the results on a negative, where any subsequent changes can (at least in the large majority of cases) be observed by an expert;
- b. remote-sensing systems which document the results on material which is inherently capable of modification – the typical example is the digital camera, where the file is capable of being manipulated considerably, without the resulting file necessarily showing any changes.

7.35 Where the recording medium has little possibility of being changed without leaving traces, documenting the handling chain between the operator of the remote-sensing device and the evidence for production to the court or other decision-taking authority requires ideally:

- a. a record of the person who was the operator of the remote-sensing device; and
- b. a record of their qualifications for operating the device efficiently; and either
- c. their confirmation that the evidence is the recording medium which was used (for example, a polaroid-camera photograph) or that it is a true print or copy of that recording medium; or
- d. confirmation of each step in the chain between the making of the record on the recording medium and the evidence produced.

7.36 Where the recording medium is susceptible to change, there is also a need for confirmation by all those who have handled the recording medium that at no stage has it been changed.

Chapter 8: Modelling the Behaviour of Spilt Oil

It is possible, using a computer, to run a mathematical model of the behaviour of spilt oil, the direction and speed at which it moves and the way in which it spreads and changes its properties. It is also possible to use these techniques to follow a spillage back to the geographical area whence it originated.

Section 8.1: Introduction

8.1 This chapter must be read in the knowledge that the technique described here is at best, a secondary tool with which to identify potential suspects. Further evidence will always be needed to make a positive identification.

8.2 Whether something lying on the surface of the sea remains in one position or moves depends upon the effect of the wind, the waves and the current at any given time. In the case of oil, this analysis is too simple and there are additional factors, such as the changes which take place in the spill itself, to be taken into account.

8.3 Using various parameters such as those already mentioned it is possible to formulate a series of equations which describe, mathematically, and with some degree of certainty, the behaviour of an oil spill.

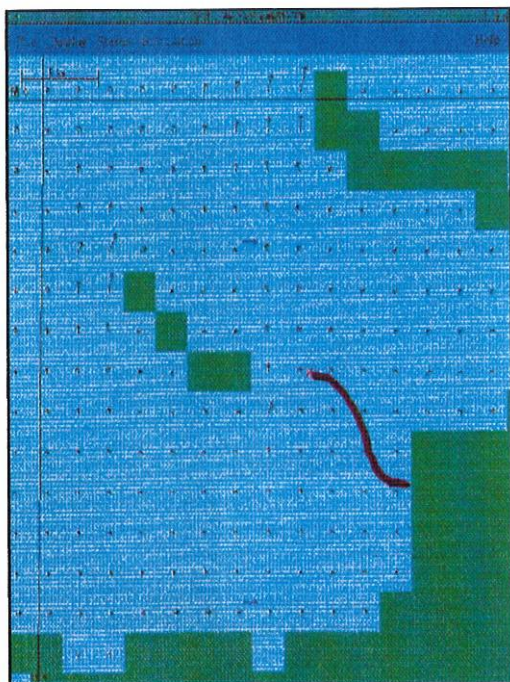


Figure 8.1

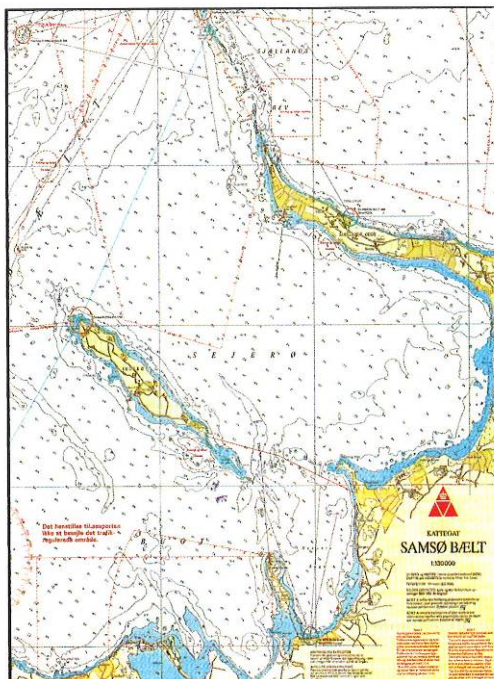


Fig 8.2

Computer display (Figure 8.1) compared with the corresponding sea chart (Figure 8.2)

8.4 The technique is useful in pollution combating operations when it is possible to use weather forecast, tide and current predictions to predict where the worst of the spillage will be at a given time in the future. This technique is used as part of contingency planning.

8.5 From the point of view of finding the source of the pollution, however, this technique is useful in reverse. This is the process known as backtracking.

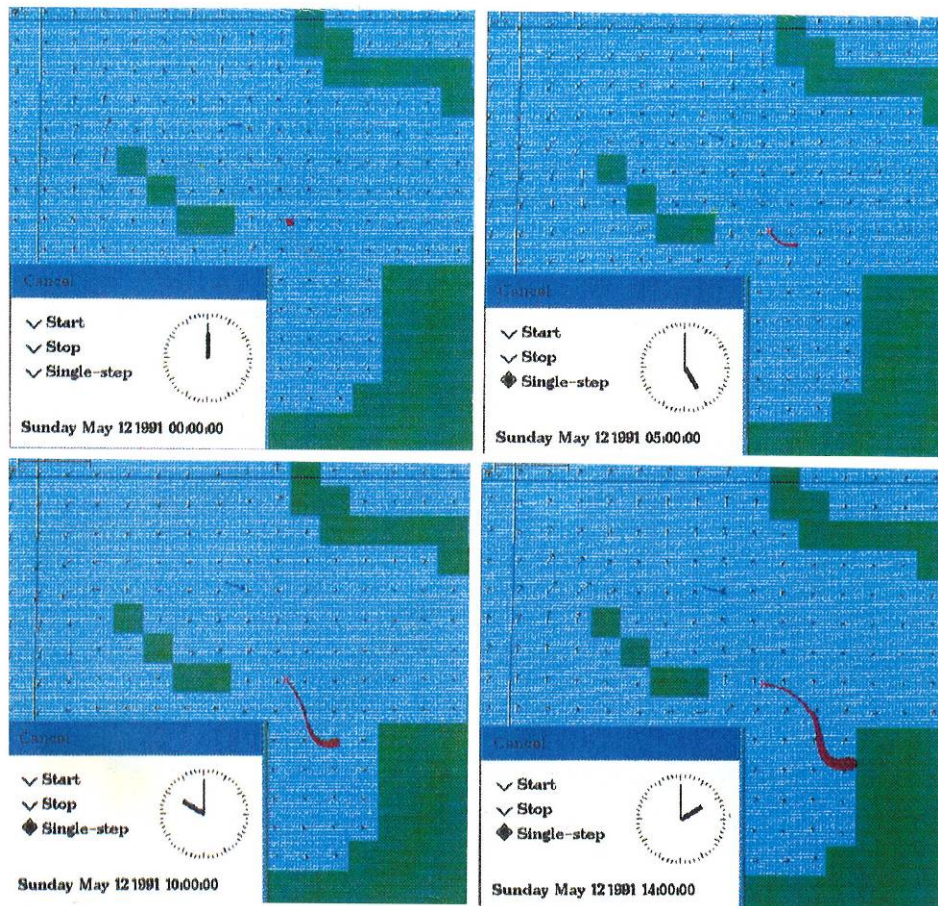


Fig 8.3 Example of graphical presentation of calculated drift and spreading of oil

Section 8.2: Backtracking

8.6 Starting from a spill of known position at a given time and using data of observed wind and current and taking into account the behaviour of the oil, it is sometimes possible to calculate to a reasonable high degree of accuracy, where the spill was at given times in its past history. (Heavy oil drifting below the surface can only be backtracked if the influence of wind is removed from the model.)

8.7 When the various positions thus obtained, together with the times at which the oil theoretically reached these positions are plotted on a chart, a "track" for the spillage is generated, this is a line on the chart showing how the oil has moved since it was discharged.

8.8 If similar tracks (with time references) for the ships in the relevant area are available these can be plotted onto the same chart as the track of the oil. Where a vessel's track passes close to the track of the oil, both in terms of distance and time, that vessel is a possible suspect.

8.9 It is important therefore to be able to identify the vessels in the relevant area and to be able to plot their tracks with an indication of time. The latter is reasonably straightforward if there is radar coverage of the area in question, the former extremely difficult without there being in force a legal requirement that vessels identify themselves, their position, course and speed to the coastal state. If the suspect vessel or vessels can be identified, it may be possible to confirm the polluter's identity by taking samples of the spilt oil and the oils aboard the suspected vessel and analysing the samples.

8.10 Backtracking has been used successfully by some authorities to identify a polluting vessel and to eliminate a suspected polluter from their enquiries.

Chapter 9: Sampling and Analysis

When there is doubt as to whether the observation on the sea surface corresponds to oil, sampling of polluted water is one way to remove the doubt. When traces of the oil discharged remain onboard the suspected ship, comparisons of samples of oil taken onboard the ship and in the spill or contaminated area may assist in the identification. There are several techniques for such comparisons. Combined gas chromatography and mass spectrometry techniques (GC/MS) is one system currently in use. It can provide a very detailed pattern which is characteristic of the oil analysed, a "fingerprint".

Section 9.1: General

9.1 If the only concern is to establish that there is oil in the sea, a simple analysis of a sample will confirm whether or not the oil discharged in the sea is not allowed under MARPOL (there are other means for that such as enquiry on board the ship).

9.2 When, on the other hand, there is doubt as to the identity of the ship which discharged oil, a comparison of samples may be a powerful piece of evidence as a result to the accuracy of the GC/MS method described below. Samples may also be compared when several oil slicks are suspected of originating from the same source. This is particularly relevant in civil liability cases.

9.3 The rest of this chapter deals with the case where comparison of samples is carried out. Such comparison is irrelevant when the oil or oily residues which existed onboard were actually discharged in such a way that no trace remained onboard the ship (for instance when the discharge concerned oil residues from the bilges, from a carefully cleaned tank or from an oil drum).

9.4 Samples are collected at several spots in the spill area. Even in small spills at least two samples would normally be taken. Care is always taken in order to prevent contamination of samples. All samples are clearly marked to avoid sample confusion and are transported to an authorised laboratory as quickly as possible.

Section 9.2: Gas-chromatography/mass-spectroscopy techniques

9.5 Different analytical techniques have been used in the past, but in recent years an increasing number of laboratories have adopted gas-chromatography/mass-spectroscopy (GC/MS) techniques for identification of oil samples. GC relies on the fact that each oil is a different mixture of a number of components. The technique separates the oil into single components according to their boiling points. The result is a very detailed pattern, which is characteristic for the specific oil analysed. GC will show a pattern representing the main components in the oil. Fig 9.1 is an example where four samples containing crude oils were analysed. Two of them are identical.

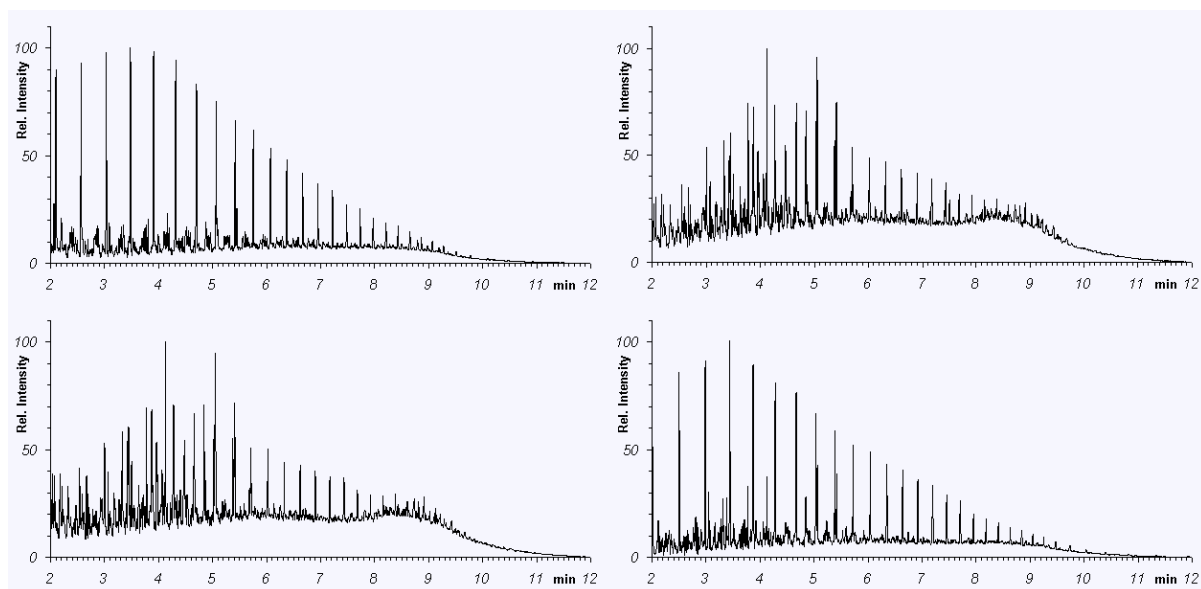


Figure 9.1 Screening with GC of four oil samples

9.6 In the figure each of the peaks represents single chemical components from the oil. It is sufficient for present purposes to regard the whole pattern as a "fingerprint".

9.7 Screening by GC shows the main components of the oil. If the screening reveals no similarities, then the samples are not of the same origin. There is therefore no reason to continue with the more expensive and time-consuming MS analysis. If there are some similarities, then the identity must be confirmed by MS.

9.8 The GC/MS technique is GC with a selective detector (the MS part) added. The oil is still separated into single components, but in addition the MS shows the component types the chemist has chosen. This means that characteristic components in the oil which cannot be seen by the GC screening, can be fingerprinted. The chemist is free to choose how many alternative fingerprints he needs in order to characterise the oil. The variations are practically unlimited.

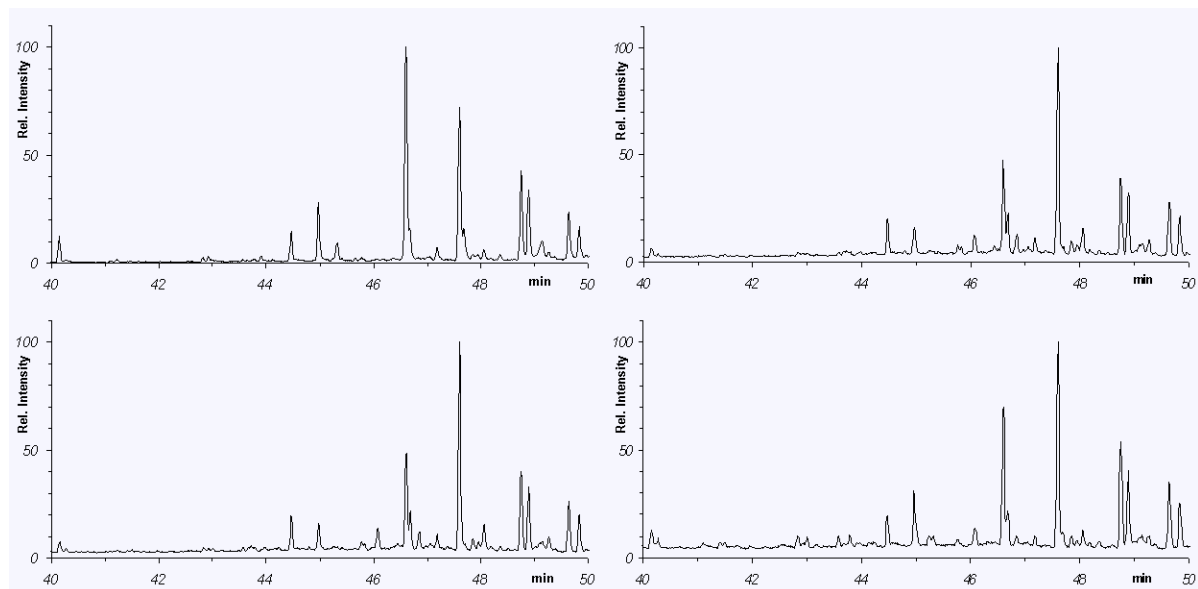


Figure 9.2 GC/MS fingerprinting of the same samples as in Figure 9.1

9.9 Figure 9.2 shows one of the fingerprints taken by MS on the same four samples as shown in Figure 9.1. The similarities and differences are even more pronounced for the pattern selected here.

9.10 In summary, the combined GC/MS techniques allow for optimal fingerprinting providing a greater amount of detail (due to the separation technique), which increases the reliability of the identification, and

high selectivity (due to the MS detector). This makes it possible to trace nearly any component groups, even when analysing samples with low oil content.

Section 9.3: Component types used for fingerprinting

9.11 The flexibility of the GC/MS technique makes it possible to measure an almost unlimited amount of information from a single oil. In order to keep the time for the analysis within realistic limits, it is necessary to select a limited number of component types for the routine fingerprinting.

9.12 The selection of component types is based on the way in which oil has been formed. This explains differences between oil types. All oil is formed from plants which lived millions of years ago. Each plant type contains a unique composition of specific natural products, some of which can still be found in the resulting oil in a modified form called biomarkers. It is thus possible to distinguish between oils from different fields - in some cases even from different wells in the same field. These differences are reflected in the refinery products too, and in mixtures of these.

9.13 The complexity of oil is increased, accordingly, when two or more oil products are mixed. Sludge residues, from machinery room spaces from ships for example, form the most complex mixtures of oil. The handling of different oil products aboard a ship leads to a unique composition of these residues. Matching of samples achieved by GC/MS in the case of sludge residues is a very strong indication that the polluter has been identified.

Section 9.4: Weathering

9.14 The GC/MS method is able to correct for the effects of weathering. The biomarkers are extremely resistant to weathering, and will still maintain their characteristic pattern even in heavily degraded oils.

9.15 Here weathering means all changes in the composition of the oil, which occur after the spillage.

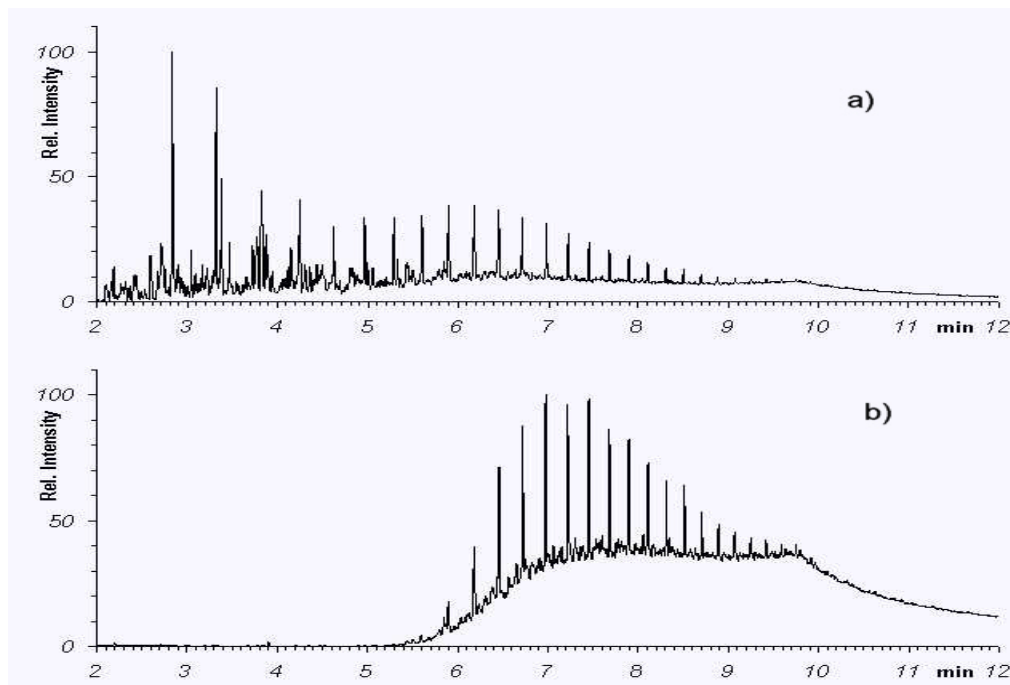


Figure 9.3 Example of heavy weathering (screening GC) a) is the original oil, b) is a heavy weathered sample from the beach.

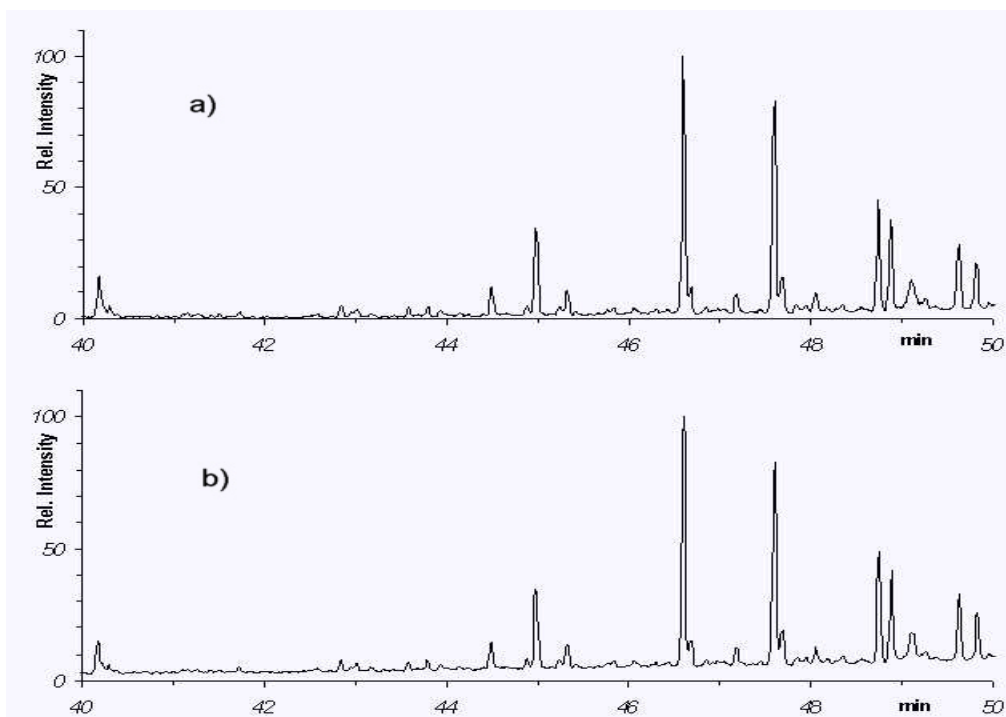


Figure 9.4 Example of one of the biomarker patterns from the same two samples as in Figure 9.3

9.16 Figure 9.3 is an example of heavy weathering. It shows the GC screening of a sample taken from the ship (top), and a sample taken from the beach after a spill. The sample shown from the beach was heavily degraded. At a first glance, the GC screening seems to indicate that the two are different. However by means of the MS method, the results of which are shown in Figure 9.4, it was revealed that the fingerprints from the biomarkers were identical.

Section 9.5: Presenting analytical evidence

9.17 Analytical evidence will normally need to be accompanied by a detailed report by the person responsible for carrying out the analysis. This will need to:

- a. identify the person responsible for the analysis and his/her qualifications for carrying it out and drawing conclusions from the results;
- b. explain the background to the analytical work, possibly drawing on the material above;
- c. describe in detail what has been done;
- d. describe what conclusions about the oil and its origins can be drawn from the results of the analysis.

Chapter 10: Vessel Identification

Automatic Identification Systems (AIS) for vessels enable both shore-based and airborne observers and other vessels to identify vessels automatically. This has particular uses in linking observed oil slicks to the relevant vessels.

Section 10.1: Automatic Identification Systems

10.1 Under the International Convention on the Safety of Life at Sea (SOLAS) (Chapter V), provides for the fitting of Automatic Information Systems (AIS). Since 1 January 2005, all passenger ships and tankers and all other ships of 300 gross tonnage and upwards are required to fit AIS. Ships fitted with AIS must maintain AIS in operation at all times except where international agreements, rules or standards provide for the protection of navigational information.

10.2 The AIS is a shipboard broadcast system that acts like a transponder, operating in the VHF maritime band, that is capable of handling well over 4,500 reports per minute and updates as often as every two seconds. It uses Self-Organizing Time Division Multiple Access (SOTDMA) technology to meet this high broadcast rate and to ensure reliable ship-to-ship operation.

10.3 On board ship it can give a radar display, with overlaid electronic chart data, that includes a mark for every significant ship within radio range, each as desired with a velocity vector (indicating speed and heading). Each ship "mark" could reflect the actual size of the ship, with position to GPS or differential GPS accuracy. By "clicking" on a ship mark, you could learn the ship name, course and speed, classification, call sign, registration number, Maritime Mobile Service Identities, and other information. Manoeuvring information, closest point of approach (CPA), time to closest point of approach (TCPA) and other navigation information, more accurate and more timely than information available from an automatic radar plotting aid, can also be available. Display information previously available only to modern Vessel Traffic Schemes operations centres is now available to every AIS-equipped ship.

10.4 With this information, any ship can be called over VHF radiotelephone by name, rather than by some imprecise means.

Section 10.2: Use in surveillance

10.5 Automatic ship identification systems can be used by aerial surveillance aircraft to obtain accurate identifications of the vessels in which they are interested.

Section 10.3: Recording of identification

10.6 [Discussion is needed of how AIS output can be used to prove a ship's identity if this is challenged]



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