THE REDUCTION OF SHIP-GENERATED WASTE IN THE NORTH SEA: A CONTEMPORARY ANALYSIS

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ABSTRACT

Vessels continue to discharge wastes at sea despite wide-ranging legislation at all levels and the provision of port reception facilities into which a wide range of wastes can be discharged. The aim of this Thesis is to examine the development of the EU Directive on Port Reception Facilities (2000/59/EC), within the context of existing legislation and set in the North Sea and wider North East Atlantic region, to assess its potential to reduce vessel-source pollution. It will be approached from an interdisciplinary perspective, drawing on information from a broad range of areas including law, policy and the environment in order to do so.

In order to achieve the aim of this thesis, it has been necessary to make advances in the following areas: to understand the current position in respect of oil pollution in the North Sea and wider marine environment, through the collation of previously published and unpublished material; to understand the roles and positions of the many different actors involved in marine pollution control, through collation of their own published information, together with first hand communications, visits and networking; to examine the various drivers – financial, technical, cultural and legal - which influence the behaviour of these actors; to provide oversight of how legislation designed to control marine pollution in the North Sea (and more generally) has developed since the 1920s, setting the key elements of earlier legislation in the context of current legal requirements; to examine in detail the content of the EU Directive on Port Reception Facilities, its evolution through various stages of development and refinement, setting it in the context of related European legislation; and to determine what is known about current levels of provision of port reception facilities, and the funding methods available, from existing data sources and to examine trends in oil pollution levels in the region, in the context of previously existing legislation.

In light of the gaps identified in the existing data, it has been necessary to establish a more complete picture of availability of port reception facilities and the anticipated impact of the EU Directive from the perspective of ports. This has been done using a set of surveys of ports. An assessment has been made of progress towards transposition of the EU Directive into national law by the various North Sea states, and how these states have adapted the Directive to meet their own requirements. The issue of funding of port reception facilities has been considered in light of both national government information and port survey responses. Finally, conclusions have been drawn and recommendations made about the effectiveness of the Directive as a system for reducing vessel-source waste and its appropriateness as a model which could be transferred and adapted to other areas.

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PREFACE

During the process of undertaking research and writing this Thesis, a number of papers have been published in journals and conference proceedings. These publications are listed below:

Carpenter A and Macgill S M (2000). The new EU Directive on Port Reception Facilities for Ship-Generated Waste and Cargo Residues: an evaluation. C A Brebbia and J Olivella (eds). *Water Studies*, 9, pp 173-183. UK: WIT Press

Carpenter A and Macgill S M (2001(a)). Charging for Port Reception Facilities in North Sea Ports: Putting Theory into Practice. *Marine Pollution Bulletin*, 42(4), pp 257-266. Oxford, UK: Elsevier Science Ltd.

Carpenter A and Macgill S M (2001(b)). The Development of EU Legislation on the Control of Ship-Generated Waste and Cargo Residues. J P Ducrotoy, S M Shastri and M Barry (eds). In *The Marine Environment: Science and Law*. pp 87-106. UK: University of Hull Institute for Estuarine and Coastal Studies

Carpenter A and Macgill S M (2003). The EU Directive on port reception facilities for ship-generated waste and cargo residues: current availability of facilities in North Sea ports. *Marine Pollution Bulletin*, 46(1), pp 21-32. Oxford, UK: Elsevier Science Ltd.

A further paper examining the role of education in developing communication channels between scientists and lawyers in the field of environmental management has also been published. The details of this paper are:

Carpenter A, Ducrotoy J P, Holroyd J and Shastri S M (2001(c)). The role of education in building bridges between science and law. J P Ducrotoy, S M Shastri and M Barry (eds). In *The Marine Environment: Science and Law*. pp 217-227. UK: University of Hull Institute for Estuarine and Coastal Studies

A number of presentations have been given at International Conferences, as listed below:

Carpenter A (2000(a)). "The development of EU legislation on the control of ship-generated waste and cargo residues". Paper presented at the 6th Annual CERCI Conference, University College Scarborough, July 2000 (won McCain Prize for best Postgraduate Presentation).

Carpenter A (2000(b)). "The new EU Directive on Port Reception Facilities for Ship-Generated Waste and Cargo Residues: An Evaluation", Presentation at "Ports 2000" Conference, Barcelona, Spain, September 2000.

Carpenter A (2002). "The EU Directive on port reception facilities for ship-generated waste and cargo residues: current availability of facilities in the North Sea". Presentation at the Maritime Environment Conference "Ship/Port Interface - Environment and Safety", Rotterdam, The Netherlands, October 2002.

The work undertaken for this Thesis has been cited in reports and journal articles and the details of these citations are listed below:

Carpenter A and Macgill S M (2000), (2001(a) and (2002) – Papers used in the writing phase and referred to by the California Cruise Ship Environmental Task Force in "Report to the Legislature – Regulation of Large Passenger Vessels in California". Pub. Cruise Ship Environmental Task Force, California, USA, August 2003. Report and papers available on the World Wide Web: http://www.swrcb.ca.gov/legislative/2003.html

Carpenter A and Macgill S M (2001(b) and (2003), Carpenter A (2002), together with Chapter 7 of this Thesis (cited as Carpenter A (2004) in that report), have been referred to by the Marine Conservation Society in "Beachwatch 2003 – The Annual UK Beach Litter Survey Report". Pub. Marine Conservation Society, UK, May 2004. Available on the World Wide Web: http://www.adoptabeach.org.uk/OtherPages/bw03reportweb.pdf

Carpenter A and Macgill S M (2000), (2001(a)) and (2003) are the sole references in the paper "81. Richtlinie 2000/59/EG des Europäischen Parlaments und des Rates über Hafenauffangeinrichtungen für Schiffsabfälle und Ladungsrückstände Vom 27. November 2000 ABl. L 332/81" by G Rutschke-Hamburger in "EG – Verkehrsrecht Kommentar" Volume 81, pp 81-91, eds. Frohnmeyer A and Mückenhausen P. Pub. C H Beck'sche Verlagsbuchhandlung, München 2004

Carpenter A and Macgill S M (2000) cited in the presentation "Facilitating the use of Facilities: A Story About Reception Facilities" by T Wilkins, Environmental Manager, INTERTANKO at a conference on "Waste Reception Facilities in Europe" held in Gothenburg, Sweden on 20 November 2003. Presentation available on the World Wide Web: http://www.intertanko.com/pubupload/Speech-Power-Port-Reception-Facil.PPT

ABBREVIATIONS

ACOPS	Advisory Committee on the Protection of the Sea
BAT	Best Available Technology
COM	Communication of the European Commission
CONCAWE	Oil Companies' European Association for Environment, Health and Safety in Refining and Distribution
CONSSO	Committee of North Sea Senior Officials
COSS	Committee on Safe Seas
DEFRA	Department for Environment, Food and Rural Affairs
DETR	Department for Environment, Transport and the Regions, UK
DfT	Department for Transport, UK
DG	Directorate General of the EU
EMSA	European Maritime Safety Agency
EP	European Parliament
ESDP	European Spatial Development Perspective
ESPO	European Sea Ports Organisation
EU	European Union
GESAMP	IMO/FAO/UNESCO/WMO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Pollution
GT	Gross tonnage
HELCOM	Helsinki Commission
IACS	International Association of Classification Societies
IAPH	International Association of Ports and Harbours
ICS	International Chamber of Shipping
IGO	Inter-Governmental Organisations
ILO	International Labour Organization, UN
IMCO	Inter-Governmental Maritime Consulting Organization, UN
IMO	International Maritime Organization, UN
INSC	International North Sea Conferences
INTERTANKO	International Association of Independent Tanker Owners
IOPCF	International Oil Pollution Compensation Funds
ISO	International Organisation for Standardization
ITOPF	International Tanker Owners Pollution Federation Ltd.
IUCN	International Union for Conservation of Nature and Natural Resources
JMG	Joint Monitoring Group of the Oslo and Paris Commissions
l/m	Litres of oil per nautical mile
LOSC	UN Convention on the Law of the Sea
LOT	Load on top

MARPOL 73/78	International Convention for the Prevention of Pollution from Ships 1973 as modified by the Protocol of 1978
MCA or MCGA	Maritime and Coastguard Agency, UK
MEPC	Marine Environment Protection Committee of the IMO
MOU	Memorandum of Understanding on Port State Control
MSC	Maritime Safety Committee of the IMO
MV	Merchant vessel
NAS	National Academy of Sciences, US
NGO	Non-Governmental Organisations
NSC	North Sea Commission
OCIMF	Oil Companies International Marine Forum
OILPOL	Convention for the Pollution of the Sea by Oil 1954
OJ	Official Journal of the European Communities
OJ C	Official Journal of the European Communities – Information and Notices
OJ L	Official Journal of the European Communities – Legislation
OSCOM	Oslo Commission
OSPAR	Oslo and Paris Convention
OSPARCOM	Oslo and Paris Commission
PARCOM	Paris Commission
ppm	parts per million
PRFs	Port Reception Facilities
PSC	Port State Control
QSR	Quality Status Report of the North Sea Task Force
RSPB	Royal Society for the Protection of Birds
SACSA	Standing Advisory Committee for Scientific Advice of the Oslo Commission
SOLAS	Safety of Lives at Sea Convention 1974 and its Protocols
SVEAG	Sullom Voe Environmental Advisory Group
tcc	total cargo capacity
tgt	tons gross tonnage
TOVALOP	Tanker Owners Voluntary Agreement concerning Liability for Oil Pollution
UN	United Nations
UNCLOS III	Third UN Conference on the Law of the Sea
VCC	Vortex Containment Combustor
WWF	World Wide Fund for Nature

CHAPTER 1

NATURE OF THE PROBLEM: A REVIEW OF SHIP-GENERATED WASTES IN THE NORTH SEA AND RELATED IMPACTS

1.1 Introduction

The purpose of this chapter is to understand the current position with regard to North Sea oil pollution, through the collation of previously published and unpublished material from a wide range of sources. It also sets out to justify the chosen focus of this thesis on methods of dealing with ship-generated oily waste in the North Sea. It identifies the geographical area of interest, and some of the main economic issues associated with that area. It reviews the provenance, location and impacts of oil pollution. It justifies the exclusion of specific sources of oil pollution from consideration in this thesis.

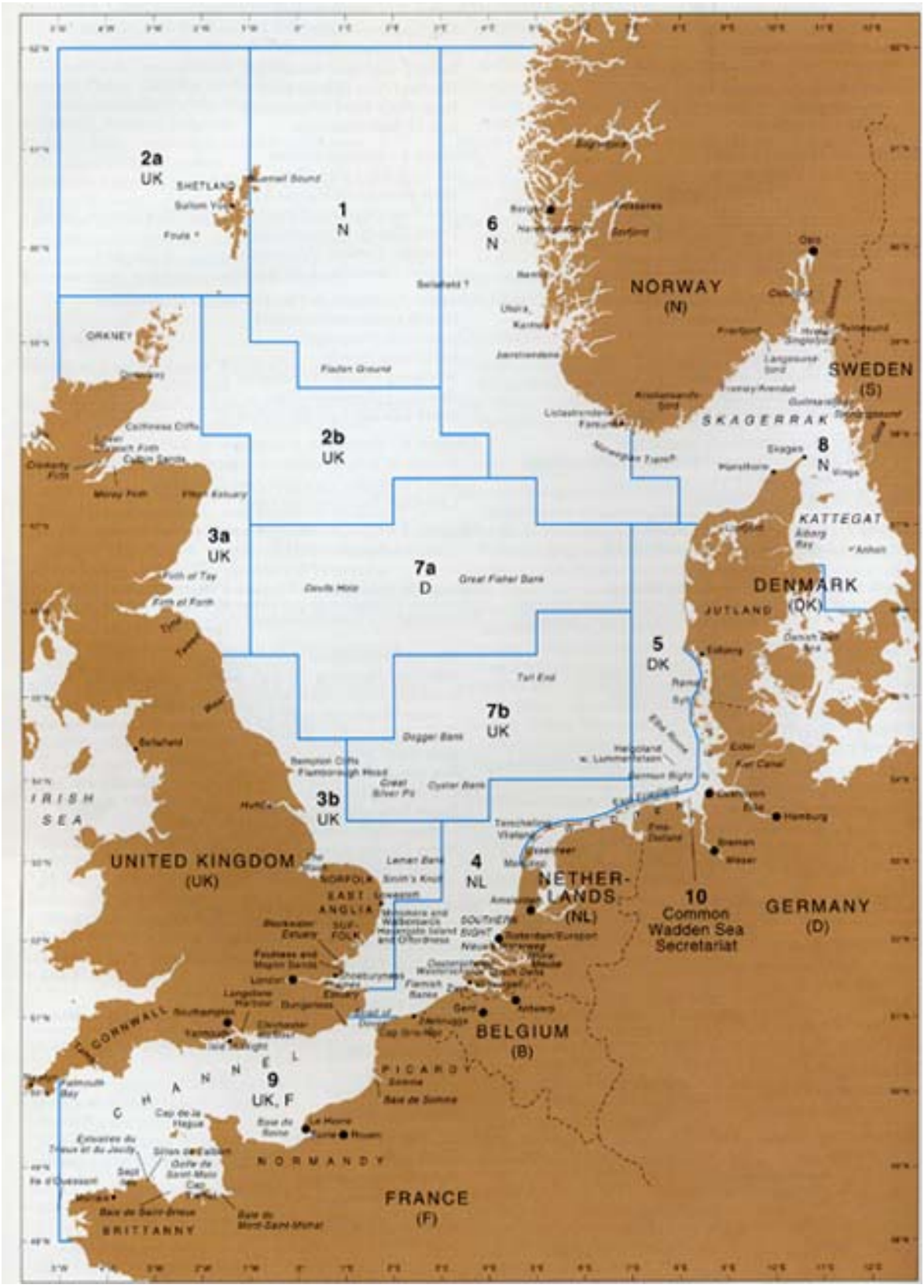
1.2 The North Sea

1.2.1 Geographical Area

The area covered by the North Sea is that bounded by the coastlines of England, Scotland, Norway, Sweden, Denmark, Germany, The Netherlands, Belgium and France (see Map 1). For the purposes of this thesis, the southern boundary of the North Sea is the Strait of Dover (Sector 4 of Map 1 at 51^{o}N), while the most northerly boundary is 62^{o}N. The boundary for the western side of the North Sea follows the English and Scottish coastlines to a point at 5^{o}W. To the east of the North Sea, all of Norway, including the area situated in the Kattegat (Sector 8). However, only those regions of Germany and Denmark actually situated in North Sea coastal areas has been included. Sweden has been excluded from the geographical area covered by this thesis.

The North Sea Task Force (1993), in its Quality Status Report (QSR) indicates that approximately 164 million people lived within the catchment area of the North Sea, with the highest population densities (in excess of 1,000 inhabitants per km$^{2)}$ occurring “in the Netherlands, Belgium and parts of the UK and Germany" (page 11). The lowest densities of around 50 inhabitants per km^{2} occur along the coastlines of Norway and Scotland.

Map 1.1 – Boundaries of the North Sea defined by the North Sea Task Force (1993)*



* Source: North Sea Task Force (1993), page 8

1.2.2 Economic Issues

The North Sea has a multiplicity of uses, carrying substantial implications for local and national economies. Direct activities include the exploitation of natural resources in the North Sea, such as oil and gas extraction, shipping, aquaculture (the production of salmon, oysters, scallops, for example), and fishing. These direct activities not only provide a large number of jobs in the countries bounding the North Sea, but also bring in significant income such as licence fees for oil extraction, tax on oil production income, and income from the large number of vessels using North Sea ports.

Indirect activities include tourism and recreation, where people choose to visit certain areas because of the natural beauty of that area, and also because of facilities available such as campsites, leisure and play areas, beaches or historic buildings. The economic impact of these indirect activities on local areas and the national economy is less easy to quantify. It will include the creation of permanent jobs plus seasonal work for hotel and campsite staff, for example. Such job creation not only benefits the people gaining employment, and the consumer and service industries in which they spend their wages, but also the national economy by reducing unemployment benefit costs and bringing in income tax revenue. There will also be additional money entering the local economy as tourists purchase souvenirs, pay entry fees to buildings, and participate in local activities. All of these can result in a better quality of life for the local population, and secure the availability of facilities such as shops which might have left the area, had the local economy been in decline.

Figures from the QSR emphasize the importance of the North Sea's coastal areas for tourism. Box 1.2 (page 13) gives examples and indicates that, in Denmark, there were approximately 9.6 million overnight stays in 1991 in the coastal area of Jutland. In the Netherlands, the North Sea coast receives around 38 million visitors annually, with 30 million overnight stays in the Wadden Sea area. In the United Kingdom, the areas around the Channel coast and in East Anglia alone receive 19 million holidaymakers annually (excluding day visitors).

1.2.3 Shipping

The North Sea is a crucial trade route for the shipment of goods and people both into and out of Western Europe. The QSR indicates that the level of shipping movements through and within the North Sea was around 420,000 (1993 figures) with the main area of activity being the Strait of Dover with approximately "150 ships per day sailing in each direction" … together with approximately 300 daily ferry crossings (page 16). In addition, there is also a high level of traffic between the North Sea and the Baltic, via the Kiel Canal. In 1988, there were approximately 46,800 shipping movements in this area.

Despite this high level of shipping movement, major accidents are very rare (QSR, 1993, page 1). Major marine accidents are defined by the Marine Safety Committee of the International Maritime Organization (IMO) as the loss of vessels of 1,600 gross tonnes (GT) or above, or where the ship involved is 500 tonnes or above and there is loss of life. There were 121 major accidents in all waters in 1990, 10 of which occurred in or adjacent to the North Sea, and of these accidents, only two involved oil pollution. At the same time, the QSR highlights the fact that 80% of accidents can be attributed to human error. The expectation is that there will be approximately 150 accidents per year in the North Sea area, the majority of which will be minor. However, even for minor accidents, there is potential for marine pollution, including by oil.

Map 1.2 shows total cargo shipments (millions of tonnes per year) in the most important ports around the North Sea in 1990. Of all the shipping movements involved, the QSR indicates that "approximately half the shipping activity in the North Sea consists of ferries and roll-on/roll-off vessels on fixed routes" while, for UK ports, "tanker traffic represents about 10% … of ship departures" (page 17).

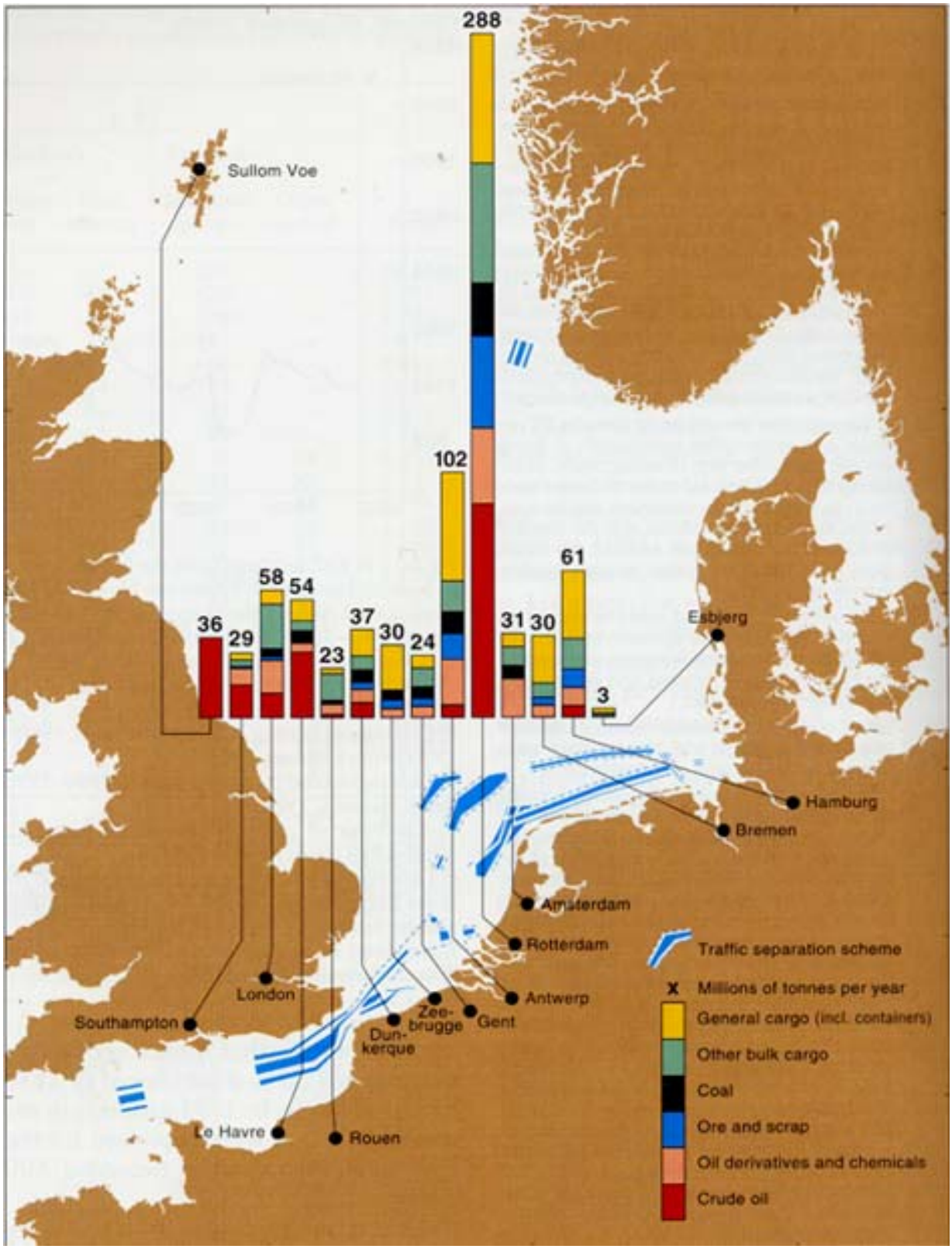
1.3 Oil Pollution in the North Sea

1.3.1 Definition of Oil

Whitham et al (1974, page 13) indicates that oil is a generic term that normally covers a very wide range of natural hydrocarbon based substances and refined petroleum products. This is the sense in which the word oil is used in this thesis. At the same time, it is acknowledged that there have also been pollution incidents involving non-petroleum oils such as fish oil, groundnut oil, rapeseed oil and other vegetable or animal oils which are transported in bulk. However, these other types of oil are not a chosen focus of interest in this thesis.

Wardley-Smith (1983, page 25) outlines the make-up of crude oil. He indicates that crude oil is made up of a complex mixture of three main chemical groups – paraffinic, napthenic and aromatic. It can range from simple, highly volatile, and easily distilled combination of substances to those containing complex waxes and asphaltic compounds, which cannot be distilled, and which can have a tar-like consistency at low temperature. At the same time, other substances such as oxygen, sulphur and a range of metals can also be contained in crude oil.

Map 1.2 – Shipping in the North Sea in 1990*



* Source: North Sea Task Force (1993), page 16

In order to obtain the wide range of petroleum products used by cars, industry and in the chemical industry, it is necessary to refine crude oil to separate out its various components. The Royal Commission (1981) outlines the process of refining, using heat to separate out the various components of crude oil. This is possible because different oil products boil at different temperatures.

Using fractional distillation, crude oil is heated in a tower and, at specific temperatures, different products vaporize, then rise within the tower until they reach a point where the temperature matches their boiling point. They then condense into separator trays, set at intervals all the way up the tower. The resulting liquid, known as a fraction, and containing all components with similar boiling points, is then drained off. These fractions (or cuts) may then be further refined to obtain a broad range of petroleum products, both for fuel and for the chemical industry. Table 1.1 details the results of first distillation on crude oil from a range of sources. It should be noted that the higher the boiling point, the higher the molecular weight of the oil product, which has a direct implication as to how easily that product disperses within the environment.

Table 1.1 Typical characteristics of crude oil from different sources

	North Africa	*North Sea*	*Middle East*	*North America*	*South America*
Density at 15^{o}C, kg/l	0.801	0.842	0.869	0.890	1.000
	Percentage yield by weight of various cuts				
Petroleum gases	3.2	2.0	1.3	0.4	0.0
Light gasoline (“petrol”) (0-70^{o}C)	8.8	5.8	4.7	2.4	0.1
Naptha (70-140^{o}C)	16.0	11.0	7.9	6.5	1.1
Kerosene (140-250^{o}C)	26.3	18.6	16.4	15.6	4.4
Diesel Fuel (250’350^{o}C)	18.2	19.1	15.3	19.6	9.6
Residue (350^{o}C+)	27.5	43.5	54.4	55.5	84.8

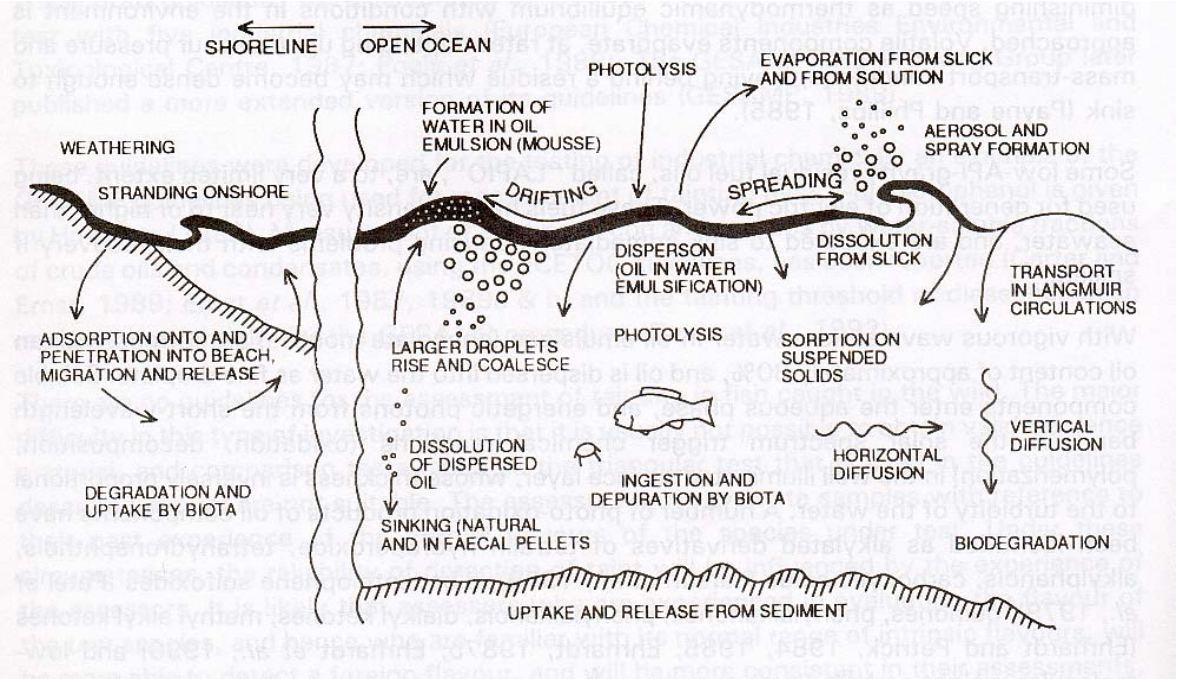
Source: Royal Commission (1981, page 9)

Refined products, including fuel oil, kerosene and gasoline are generally less of a problem in the environment because they evaporate quickly, and their impacts are generally short-term only. However, unrefined crude oil and heavy fuel oils, together with oil/water mixtures can have a much longer-term impact, remaining in the environment for a much longer period of time.

Weather conditions, including wind speed, levels of sunlight and wave motion, together with temperature, can also play a significant part in the time taken for oil to disperse. In an oil spill, the lighter fractions will evaporate quickly, leaving heavier fractions behind. Cold weather can lengthen the time taken for oil to disperse by thickening certain types of oil. In some cases, oil carried aboard a tanker has to be heated to keep it liquid so that it can be pumped between tanks,

as necessary. Alternatively, it may have some form of thinning agent to enable it to be pumped off a ship at its port of destination. Figure 1.1 shows the fate of oil spilled on the sea surface and on shorelines. It also identifies some of the key processes in the transfer of oil through the marine environment.

Figure 1.1 Schematic Diagram of Oil Spill Processes at Sea and Shorelines



Source: GESAMP (1993), page 42

In contrast, warm weather and sunshine, or heavy wave action can speed up the process of dispersion of an oil spill. However, if the remaining heavier oil fractions mix with water, the resulting "mousse" can take a long time to disperse, and is not easily cleaned up. Also following dispersion of lighter fractions, the result can be a heavy, thick, tar-like substance that can form into "tar balls".

1.3.2 Legal and Illegal Oil Discharges

Pollution by oil can occur anywhere in the marine environment and inland waters. In addition to accidental oil pollution from ships, such as *Torrey Canyon*, *Braer* and *Sea Empress*, there is also the problem of operational oil pollution, both legal and illegal.

All vessels discharge oil during their operational lifetime. Oily waste is generated in the engine rooms of all vessels, and can also enter the bilges of these vessels, whether they carry oil or not. Legal discharges occur where a ship is allowed to discharge a certain level of oil in its normal operations, such as cleaning ballast tanks, and does so within designated guidelines. Illegal discharges can also occur during normal operations, e.g. where a ship is required to clean out a

bilge or cargo tank but discharges them direct into the sea in restricted areas. If oil has entered these tanks, cleaning should normally take place at on-shore reception facilities. However, it may be that the ship's master does not know that oily waste has contaminated these tanks, perhaps through a failure of oily-water separator equipment on board the vessel. If this is the case, or if the ship's master knows of the oil contamination but has chosen not to use facilities, then discharge is considered to be illegal.

The main legislation controlling oil discharges from vessel sources currently in force is the International Convention for the Prevention of Pollution of Ships, 1973, as modified by the Protocol of 1978, known as MARPOL 73/78 (IMO, 1997). Regulation 9 of Annex 1 – Regulations for the Prevention of Pollution by Oil - strictly controls the discharge of oil from various categories of ships. Until 1999, some operational discharges of oil or oily water from ships were permissible in the area of the North Sea, as follows:

1. *Paragraph 1 covers both oil tankers and ships of 400 tons gross tonnage and above. Section (v) (oil tankers) states that "the total quantity of oil discharged into the sea (should) not exceed for existing tankers 1/15,000 of the total quantity of the particular cargo of which the residue formed a part, and for new tankers 1/30,000 of the total quantity of the particular cargo of which the residue formed a part" (page 50)*

2. *Paragraph 4, provides that "The provisions of paragraph (1) of this regulation shall not apply to the discharge of clean or segregated ballast or unprocessed oily mixtures which without dilution have an oil content not exceeding 15 parts per million and which do not originate from cargo pump-room bilges and are not mixed with oil cargo residues" (page 51).*

Prior to MARPOL, the Convention for the Pollution of the Sea by Oil (OILPOL) of 1954 was the first to set operational discharge standards for oil. Table 1.2 from Molenaar (1998, pp 68-69) outlines how discharge limits have been reduced from 1954 to the present. Until early 1999, the 15 parts per million (ppm) figure was considered the most important indicator of whether operational discharges were legal or illegal. Below this figure, discharges were legal. Above this figure, discharges are visible as an oily sheen on the sea surface, and any visible oil slick is considered illegal.

Table 1.2 Operational Discharge Standards for Oil: 1954 – 1999

Convention (in force)	Type Ship	Age Ship	Discharge Limit		Maximum total discharge
			Within Zones	Outside Zones	
OILPOL 54 (1956-67	Tanker	All	<100 ppm, < 50 miles + special areas (III(1), Annex A(1))	No standard	None
	Non-tanker	All	Upon entry into force as far as practicable from land (III(2))	No standard	None
			3 years after entry into force < 100 ppm, < 50 miles + special area (III(2), Annex A(2))	No standard	None
1962 Amendm. (1967-78)	Tanker	Existing[a]	<100 ppm, < 50 miles + special areas (III(a), Annex A)	No standard	None
		New[a]	< 100 ppm, < 50 miles + special areas (III(c), Annex A)	< 100 ppm	None
	Non-tanker	Existing[a]	Upon entry into force as far as practicable from land (III(b))	None	None
			3 years after entry into force < 100 ppm, < 50 miles + special area (III(b), Annex A)	< 100 ppm	
		New[a]	< 100 ppm, < 50 miles + special areas (III(c), Annex A)	< 100 ppm	None
1969 Amendm. (1978-83)	Tanker	All	Clean ballast, < 50 miles (III(b, c)	< 60 l/m	< 1/15,000 tcc
	Non-tanker	All	As far as practicable from land, < 60 l/m, < 100 ppm (III(a))	< 60 l/m, <100 ppm	None
MARPOL 73/78 (1983-93)	Tanker	Existing[b]	< 15 ppm, < 50 miles + special areas (I/9(1)(a), 10)	< 60 l/m	< 1/15,000 tcc
		New[b]	< 15 ppm, < 50 miles + special areas (I/9(1)(a), 10)	< 60 l/m	< 1/30,000 tcc
	Non-tanker > 400 tgt and tanker machinery spaces[d]	Existing[b]	< 15 ppm, < 12 miles + special areas (I/9(1)(b), 10)	< 100 ppm	None
1992 Amendm. present	Tanker	Existing[b]	< 15 ppm, < 50 miles + special areas (I/9(1)(a), 10)	< 30 l/m	< 1/15,000 tcc
		New[b]	< 15 ppm, < 50 miles + special areas (I/9(1)(a), 10)	< 30 l/m	< 1/30,000 tcc
	Non-tanker > 400 tgt and tanker machinery spaces[d]	Existing[b]	Before 6/7/98c < 15 ppm, < 12 miles + special areas (I/9(7), 10)	<100 ppm	None
			After 6/7/98c < 15 ppm, special areas (I/9(2)(b), 9(7), 10)	< 15 ppm	None

Source: Molenaar (1998), pp 68-69

Key to Table 1.2

[a]	Art.III(c) applies to all new vessels above 20,000 tgt and gives a definition of 'new'
[b]	For definition of 'new' see Reg. I/1(6 and 26)
[c]	Effective by 6 July 1993, provided these ships can operate with oily-water separating equipment (< 100 ppm) (Reg. I/9(7) and 16(6)).
[d]	For non-tankers < 400 tgt see Reg. I/9(2) and 10(2)(b)
tgt	tons gross tonnage
ppm	parts oil per million parts water
tcc	total cargo capacity
l/m	litres of oil per nautical mile

The Marine Environment Protection Committee (1997) – MEPC – of the IMO adopted an amendment to MARPOL 73/78 to grant "special status" to North West European Waters, coming into force on 1 February 1999. With the granting of "special status", North West European waters, including the North Sea and its approaches, were further protected under the MARPOL Convention. As a result "discharges into the sea of oil or oily mixture from any oil tanker and ship over 400 gross tonnes (were) prohibited". From 1999 onwards, any visible oil slick coming from a vessel source in the area of the North Sea was considered to be illegal.

1.3.3 Oil Pollution Occurrences

Observation of oil pollution has allowed a picture of the distribution of different types of oil to be developed, showing those pollutants that occur most frequently in a particular area. Table 1.3 outlines the general picture of pollution in both marine and inland waters. Whitham et al (1974, page 9) indicates that, although a particular pollutant is not listed for an area, this does not mean it never occurs there, only that it has not been frequently observed in that area.

Table 1.3 Most Frequent Distribution of Pollutants

Seas, beaches, coastlines	Estuaries, harbours, docks	Rivers, canals, inland waters
Bilges	Bilges	Fuel oil
Crude oil*	Crude oil	Lubricating oil
Dirty ballast	Fuel oil	Refined distillates
Fuel oil	Lubricating oil	
Tank Washings	Coal tars and products	
	Oils of animal and vegetable origin	

*unusual, unless there has been a wreck or collision

Source: Whitham et al (1979), page 9

1.3.4 Impact of Oil on Marine Life

A major economic and environmental impact of oil pollution is its effect on marine life. Where an area is heavily fished, or the local industry is dependent on shellfish such as scallops, for

example, the impact of oil pollution can be catastrophic. This has been seen recently in the cases of major pollution incidents such as *Braer, Exxon Valdez* and *Sea Empress*. Even if these incidents are cleaned up rapidly, there can still be long term cumulative effects on the environment, such as in the case of the *Exxon Valdez* where oil was washed up on gravel beaches and continues to be found many years after the accident.

The report of Lord Donaldson (1994) following the grounding of the *MV Braer* on the rocks of Garths Ness on Shetland summarized the main consequences of oil pollution on marine life. The Report states that "Seabirds are the species most generally vulnerable, particularly to floating oil and other viscous substances" (section 3.18, page 24). This is because if they land on, or dive through, such slicks, this clogs feathers and causes loss of natural buoyancy and heat protection. If birds then clean their feathers, they ingest oil. Both these factors can cause serious casualties to the seabird population.

With regard to fish and fisheries, the main damage is not to wild fish that can detect and avoid oil. Rather it is farmed fish held in cages, together with "commercial species of invertebrates [that] are not very mobile, especially those living on the seabed, and shellfish beds [that] are at risk [from] oil sinking to the bottom" (Donaldson (1994), sections 3.21 and 3.22, page 24). In addition, fishing vessel operations can also be harmed as oil can contaminate fishing gear such as nets and creels for species such as crabs and lobsters.

Donaldson (1994), in respect of other wildlife, indicates that "plant and animal plankton in the water column … are likely to be affected only immediately beneath heavy slicks (section 3.23, page 25), while marine mammals such as seals and otters can also be damaged if they live close to the site of a major spill (section 3.24, page 25). No information is given in the Report on the cumulative effect of smaller oil inputs into the marine environment, as it solely deals with the impact of a major spill.

1.3.5 Sources of Oil Pollution

Oil pollution does not just come from shipping activities. There are many other sources of oil pollution in the North Sea. McIntyre (1988, page 427) outlines figures from the US National Academy of Science (NAS) in 1985, listing petroleum inputs. These are set out at Table 1.4. Nearly half of the total inputs come from marine transportation, and almost three quarters of this is from tanker operations and other shipping activities. The next largest source is land-based sources including municipal and industrial wastewater and runoffs. Table 1.4 gives an approximate figure of 3.20 million tonnes of oil entering the marine environment annually. McIntryre (1988, page 427) notes, however, that these figures are "based on many assumptions

and extrapolations, and that it would not be appropriate to apply them directly to a particular region without modifying them in the light of local data".

Table 1.4 Petroleum Inputs to the Sea (NAS, 1985)

Source		Million tonnes annually	
Municipal and Industrial wastewater discharges and runoffs		1.00	(31.3%)
Refinery wastewater discharges		0.10	(3.1%)
Offshore oil production		0.5	(1.6%)
Marine Transportation	Tanker operations	0.70	(34.3%)
	Other shipping activities	0.40	
	Accidental spills	0.40	(12.5%)
Natural seeps and erosion		0.25	(7.8%)
Atmospheric fall-out		0.30	(9.4%)
	TOTAL	3.20	100%

Source: McIntyre (1988), page 427

GESAMP (1993, page 27) produced a range of estimates regarding the extent of oil pollution in selected regional seas and coastal waters, including the North Sea, based on 1990 estimates from the NAS. GESAMP indicate that "an estimated maximum of 260,000 tonnes of oil enters the North Sea from all sources annually, with shipping, rivers and offshore oil production being the greatest contributors". However, one paragraph later they also state that "Jones (1989) described the major sources of petroleum hydrocarbons into the North Sea as being the atmosphere, river and land run-off, the coastal oil industry, and oil and gas developments". Clearly, not only are there wide variations in the estimated oil inputs, but also with regard to the main sources of these impacts.

To show how wide a variation there is in estimates for oil inputs into the sea, Table 1.5 gives estimated inputs for 1985, based in data from the National Research Council, and reproduced by Newman and Foster (1993, page 321) in the European Environmental Statistics Handbook 1993.

Table 1.5 Estimated Annual Inputs of Petroleum Hydrocarbons into the Marine Environment (Shown in millions of tonnes for 1985)

Sources	Estimated Amount
Natural Sources[1]	2.5
Offshore Production	0.5
Tanker and other Transportation Accidents	14.7
Atmosphere	3.0
Municipal and Industrial Wastes and Run Off[2]	11.8
Total	32.5

Notes: 1. Includes marine seeps and sediment erosion

2. Includes municipal wastes, refineries, non-refining industrial wastes, urban and river run-off and ocean dumping

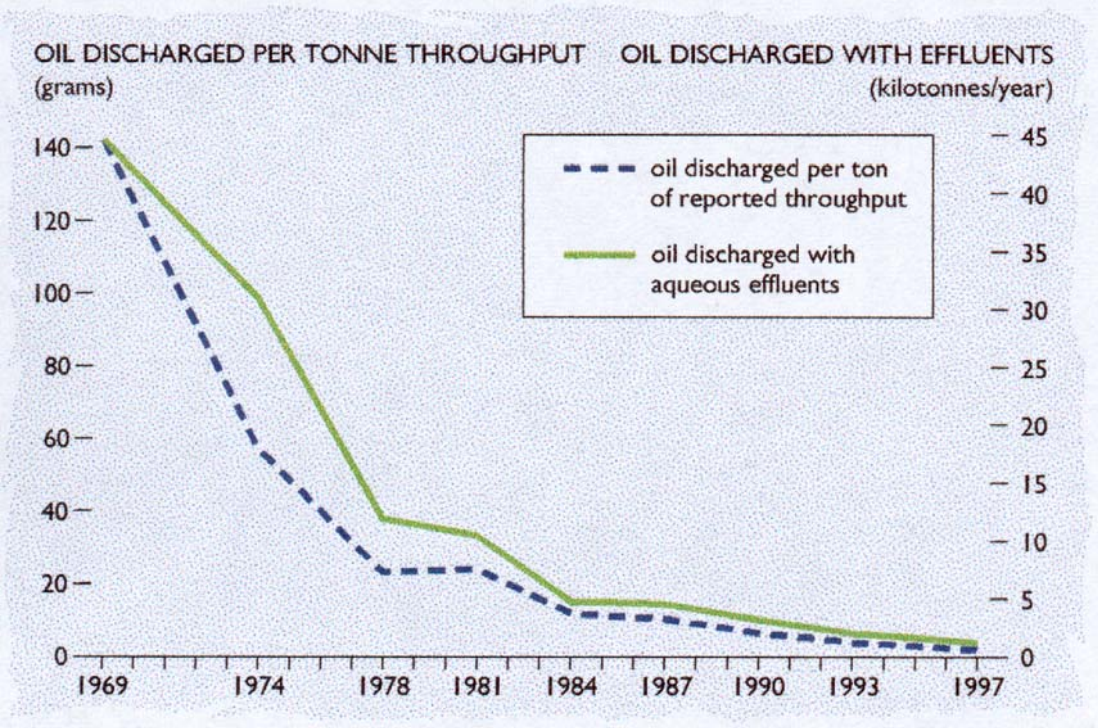
Source: Newman and Foster (1993), page 321

The estimated annual input in Table 1.5 is more than ten times greater than that in Table 1.4, highlighting a recognised problem for marine pollution – how can it be measured with any level of accuracy? What can be said, however, is that certain elements of marine pollution are easier to measure than others. For example, oil discharges from refineries are very closely monitored and, for European refineries, data on refinery effluents has been recorded since 1969 (see Figure 1.2). In this example, tanker and other transportation accidents accounts for the largest source of oil pollution, with land-based sources again being the second largest category.

CONCAWE (1998) examined a survey of European refineries, which showed big reductions in the amounts of oil discharged, despite increases over time of both of the number of refineries monitored and in the amount of oil being refined. In 1969, discharges were measured from 80 refineries and stood at 44,000 tonnes. Three to five-yearly surveys have since been conducted so that in 1997, discharges were 1,455 tonnes from 104 refineries, a 43% decrease on figures for 1993 from 95 refineries. Based on number of refineries against amount of oil processed, CONCAWE indicate that the ratio of oil discharged against that processed has fallen by 98.7% since 1969.

Map 1.3 from the North Sea Task Force QSR (1993, page 55) shows oil slicks that were detected visually and by remote sensing during aerial surveillance flights made in 1990 and 1991. The QSR notes that, although some slicks "occur close to offshore installations, the majority of sightings are confined to the major shipping corridor between the Strait of Dover and the German Bight.

Figure 1.2 Trends in oil discharged, 1969-97



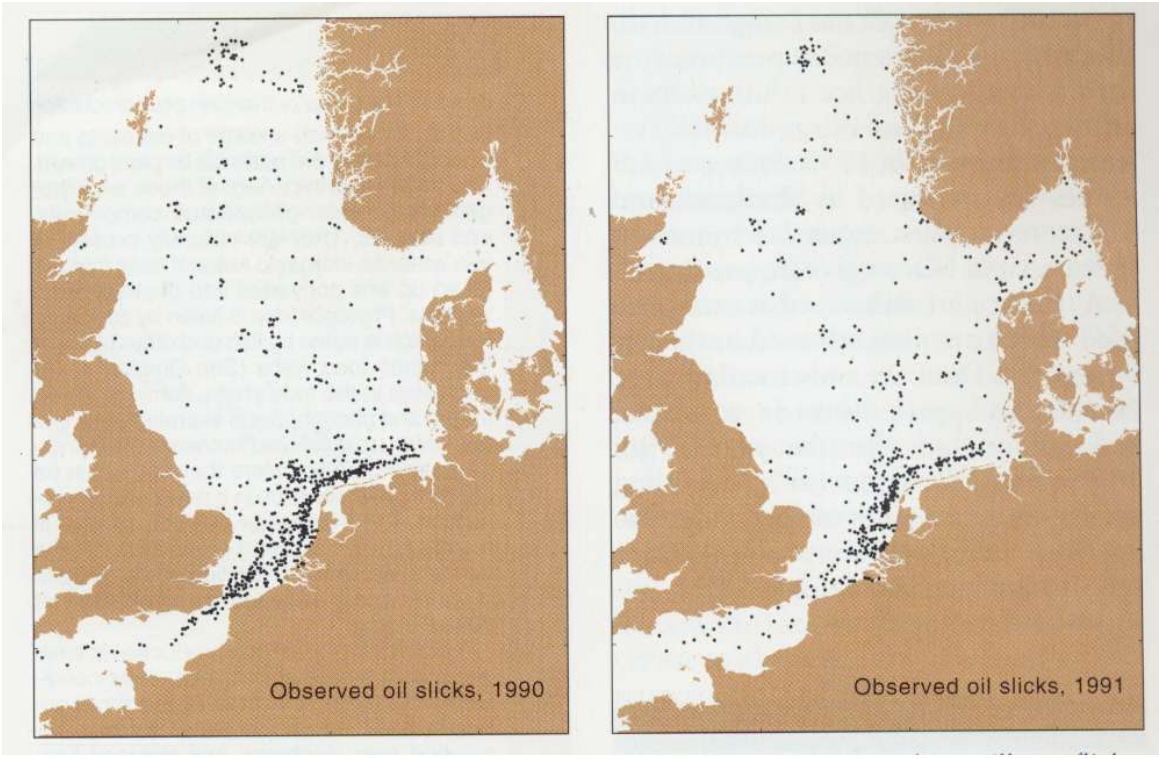
Source: CONCAWE (1998), page 20

Monitoring of oil spills at sea, including both accidental and illegal discharges, is carried out using aerial surveillance under the aegis of the Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil and Other Harmful Substances (Bonn Agreement), 1983. Under this Agreement, a number of Contracting Parties[*] including the EEC[**], agreed to co-operate in dealing with pollution of the North Sea by oil and other harmful substances. Article 5, Part 2 of the Bonn Agreement (Appendix 9) requires contracting parties to "request the masters of all ships flying their flags and the pilots of aircraft registered in their countries" to report any oil slicks seen in the North Sea. The North Sea was also divided, under Article 6, into specific zones of responsibility over which aerial surveillance flights are carried out, and the Esbjerg Report (1995, page 146) indicated that, "in the framework of the Bonn Agreement, over 3,000 flights hours per year are carried out day and night...". Aerial surveillance data for the period 1986 to 2001 is examined in Chapter 6, section 6.4.1

[*] Belgium, Denmark, France, Federal Republic of Germany, the Netherlands, Norway, Sweden, the United Kingdom, and the European Economic Community

[**] The Bonn Agreement was initiated in Council Decision 84/358/EEC of 24 June 1994

Map 1.3 Oils Slicks detected under Bonn Agreement for 1990 and 1991



Source: North Sea Task Force (1993), page 55

Based on estimates of volume of oil in slicks detected annually between 1986 and 1991, the QSR produced a table showing the upper and lower estimates for oil pollution from a wide range of sources. Table 1.6 reproduces this data which varies so widely because, as the QSR states "These estimates may be likened to a series of snapshots at the times of observation, and they do not represent the totality of slicks". This table highlights the main vessel source of oil pollution as accidental or illegal discharges from shipping.

A major potential source of oil pollution into the North Sea is the Sullom Voe crude oil handling terminal on Shetland. Westwood et al (1987, pp 253-254) indicates that this terminal, built in order that a pipeline could link many major oil production fields to land, handles approximately 45% the 125 million tonnes of oil produced in the North Sea. In order to monitor closely any pollution created as a result of the building of Sullom Voe, and its impact on marine fauna, the Sullom Voe Environmental Advisory Group (SVEAG) was established.

Table 1.6 Total oil input (10^3 tonnes/year) to the North Sea

Source	Input 10^3 tonnes/year
Natural seeps	1
Atmosphere	7 – 15
Rivers/land run-off	16 – 46
Coastal sewage	3 – 15
Coastal refineries	4
Oil terminals and reception facilities	1
Offshore oil and gas production	29 *
Sewage sludge	1- 10
Dumped industrial waste	1 – 2
Dredged spoils	2 – 10
Operational ship discharges	1 – 2
Accidental or illegal discharges from shipping	15 – 60 **
Total	**86 – 210**

* 20-30 x 10^3 tonnes/year over the period 1984-1990 (PARCOM estimates);
** from subregional assessment report for Sub-region 4

Source: North Sea Task Force (1993), page 55

Since 1978 the area around the terminal has been closely monitored, using 12 stations "placed at 1000-2000m intervals along the length of Sullom Voe" (Westwood et al, 1987, page 254). This monitoring system was deemed appropriate for large incidents around the terminal area, but in order to closely monitor the wider environment for more chronic pollution inputs, additional monitoring programmes and sites were established. Westwood et al (1987, page 264) conclude that "some localised changes have taken place in areas where chronic input and physical disturbance has occurred", but indicate that the environmental impact of Sullom Voe has been minimal, considering the amount of oil being handled by the terminal.

With regard to oil production platforms, Henderson et al (1999, page 1141) indicates that the main source of pollution is as a result of the production methods using seawater which is pumped into the oil bearing formation or reservoir. This is done in order to maintain reservoir pressure so that oil can be pumped out more readily. As the production site becomes older, more water needs to be pumped into the reservoir to maintain pressure and more water is also discharged as oil is removed. This 'produced water' can be "several times the volume of oil produced" and the volume of produced water discharged into the North Sea has grown from 187 million tonnes in 1993 to 234 million tonnes in 1997 in just the UK sector of the North Sea. Once the oil has been pumped out of a well, the oil and water needs to be separated and a wide

range of chemicals are used in this process. The produced water is then discharged into the environment. A number of surveys have been carried out in order to monitor the toxicity of the various chemicals used, and also the levels of oil remaining in the produced water on discharge. At the same time, Henderson et al (1999, page 1142) indicates that, since 1978, produced water discharges in the UK Sector of the North Sea have been regulated with reference to 'total' oil concentration, and so it is apparent that, for UK waters at least, oil production platforms are very closely monitored.

In addition to the Bonn Agreement, discussed previously, various other treaties have been introduced to deal with oil and other pollution from a variety of sources, and these are discussed in more detail at Chapter 4. However, in 1974, the Paris Convention (Convention on Prevention of Marine Pollution from Land-Based Sources) was introduced, and came into force in May 1978. This Convention included emission standards for discharges from oil platforms and refineries. The 1972 Oslo Convention (Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft) included pollution problems such as dumping of industrial waste, contaminated sewage sludge, incineration at sea and dredge spoil.

There is a very wide range of legal regimes and monitoring systems in place to deal with various sources of oil pollution entering the North Sea. In the case of rivers/land run-off, and coastal sewage, monitoring also takes place under various National Laws and EU Directives. In the case of coastal sewage, the EU Bathing Quality Directive 76/160.EEC, for example, provides for monitoring of water quality which will pick up any oil pollution present. For rivers/land run-off, monitoring of industrial sites and rivers also takes place, for example under the aegis of the UK's Environment Agency.

1.4 Conclusions

The scope of the thesis, while considering availability of port reception facilities in North Sea ports to deal with a wide range of waste streams, mainly focuses on oil pollution from vessel sources, excluding accidental oil spills. With the development of inspection and surveillance regimes, it has become possible to identify many incidents of pollution, even at a small scale. However, unless a ship can be directly linked to a particular oil slick, whether as a result of aerial surveillance, or because another vessel has seen an oil slick trailing behind it, it is still nearly impossible to apportion blame for a slick and claim any costs incurred where clean-up operations are required.

Table 1.7 has been compiled to compare the proportion of oil spilled in European waters with worldwide levels, from spills over 34 tonnes. While the number of spills in European waters as a proportion of all spills are generally less than 5%, the proportion of oil spilled is often very

high - in 1993 and 1996, the figure is over 36%. As a result, Europe has been seen as a "hot spot" for oil spills for over 35 years (Oil Spill Intelligence Report, 1997, page 1).

Table 1.7 Worldwide Spills over 34 Tonnes from all sources (1968-1997) [(a)] and Tanker Spills in Europe over 34 Tonnes (1964-1997) [(b)]

Year	Number of Spills			Amount spilled				
				Tonnes		Gallons		
	World	Europe	Europe as % of World	World	Europe	World	Europe	Europe as % of World
1964		2			116		34000	
1965		3			3500		1029000	
1966		5			29201		8585000	
1967		2			130058		38237000	
1968	256	5	1.95	283398	21422	83319000	6298000	7.56
1969	220	4	1.82	226338	2170	66543000	638000	0.96
1970	199	4	2.01	399919	27990	117576086	8229000	7.00
1971	152	4	2.63	295925	108554	87001900	31915000	36.68
1972	193	7	3.63	346206	39459	101784500	11601000	11.40
1973	195	7	3.59	164833	9095	48460770	2674000	5.52
1974	215	10	4.65	336616	13745	98877000	4041000	4.08
1975	181	9	4.97	410263	98509	120617200	28961500	24.01
1976	179	13	7.26	442025	124650	129955400	36647000	28.20
1977	176	10	5.68	450655	37861	132492500	11131000	8.40
1978	279	12	4.30	920906	307605	270746400	90436000	33.40
1979	307	22	7.17	1464674	160874	430614200	47297000	10.98
1980	315	15	4.76	576604	144493	169521600	42481000	25.06
1981	252	11	4.37	2178343	382517	64044000	11246000	17.56
1982	235	9	3.83	141554	5752	41617000	1691000	4.06
1983	241	7	2.90	896381	32891	263536000	9670000	3.67
1984	250	8	3.20	124979	1310	36743700	385000	1.05
1985	214	13	6.07	184529	15510	54251500	4560000	8.41
1986	259	7	2.70	185295	2602	54476800	765000	1.40
1987	291	12	4.12	139086	16160	40891300	4751000	11.62
1988	283	6	2.12	333694	3007	98105900	884000	0.90
1989	304	10	3.29	295953	33303	87010200	9791000	11.25
1990	391	10	2.56	190851	14551	56110080	4278000	7.62
1991	293	9	3.07	1139907	22293	335132700	6554000	1.96
1992	313	6	1.92	549492	76259	161556000	22420000	13.88
1993	303	8	2.64	257207	93476	76206900	27482000	36.34
1994	297	8	2.69	322220	2756	94732600	810200	0.86
1995	216	4	1.85	78778	401	23160800	118000	0.51
1996	173	3	1.73	198839	73109	58458700	21494000	36.77
1997	120	4	3.33	165730	6928	48724500	2036700	4.18
TOTAL	7371	269	3.65	13701200	2042127	3452268236	499170400	14.90

Sources: (a) Etkin, Dr D S (1998, pp 8-9); (b) Oil Spill Intelligence Report (1997, pp 1-4)

Table 1.7 highlights the significant level of oil spills from tankers in European waters where, between 1960 and 1977, there were 44 spillages of over one million gallons. 12 of the 44 were over 10 million gallons, and the *Amoco Cadiz* spill of March 1978 was the second largest oil spill of all time (at 68,668,000 gallons). Despite the significant levels of oil spilled in tanker accidents, it is important to note that the main vessel source of oil pollution occurs during

normal operations of vessels and may be the result of accidental or intentional discharges from shipping. Although international legislation has generally considered slicks of less than 15 ppm to be legal, Section 1.2.3 notes that, as a result of the granting of special status by the IMO's MEPC to North West European waters including the North Sea and its approaches in 1997 (entry into force February 1999), any visible oil slick from a vessel source is considered to be illegal.

The aim of this thesis is to examine the development of the EU Directive on Port Reception Facilities (2000/59/EC) and its potential to reduce such intentional illegal discharges of wastes into the marine environment. In order to establish a reference base for this aim, this Chapter has set out the problem in detail. The next priority is to consider the roles and positions of the various actors involved in marine pollution control, through collation of a wide range of materials including published matter, together with the results of first hand communications, visits and networking. Consideration of the various drivers – financial, technical, cultural, legal and other drivers – that influence the behaviour of these actors will complement this.

The thesis will then consider the development of legislation designed to control marine pollution globally, and more specifically in the North Sea region. This legislation has been developed since the 1920s and those aspects that are still relevant at the current time are highlighted and brought up to date. The content of the EU Directive will then be considered, looking at the various stages of development and refinement of the Directive, and setting it within the context of other European legislation in related areas. The Directive required all member states to transpose it into national law by December 2002. However, this process was ongoing by the summer of 2004, with delays occurring as some Member States sought to adapt the Directive to meet their own national requirements.

In order to determine what is currently known about levels of provision of port reception facilities and also trends in oil pollution within the North Sea region, existing data will be examined in the light of previously existing legislation. An examination of the different funding systems available for ports to charge vessels for the waste they discharge is also made at this stage. In light of gaps identified when looking at the existing data, and in order to provide a more complete picture of availability of port reception facilities, surveys of North Sea ports have been undertaken and the results are analyzed in chapter 7 and used to examine the anticipated impact of the EU Directive from the perspective of ports.

The development of any new legislation requires the decision to be taken that there is a requirement for that legislation. A model process to assist in reaching such a decision will be

set out, together with of the key elements that should be contained in any new legislation, should the decision to proceed be reached.

Finally, conclusions will be drawn as to the potential effectiveness of the EU Directive as a means of reducing illegal discharges from vessels, and recommendations made arising from these conclusions. The appropriateness of the EU Directive as a model which could be transferred to other regions will also be considered at this stage.

CHAPTER 2

ACTORS IN THE DEVELOPMENT OF MARITIME LEGISLATION ON SHIP-GENERATED WASTE

2.1 Introduction

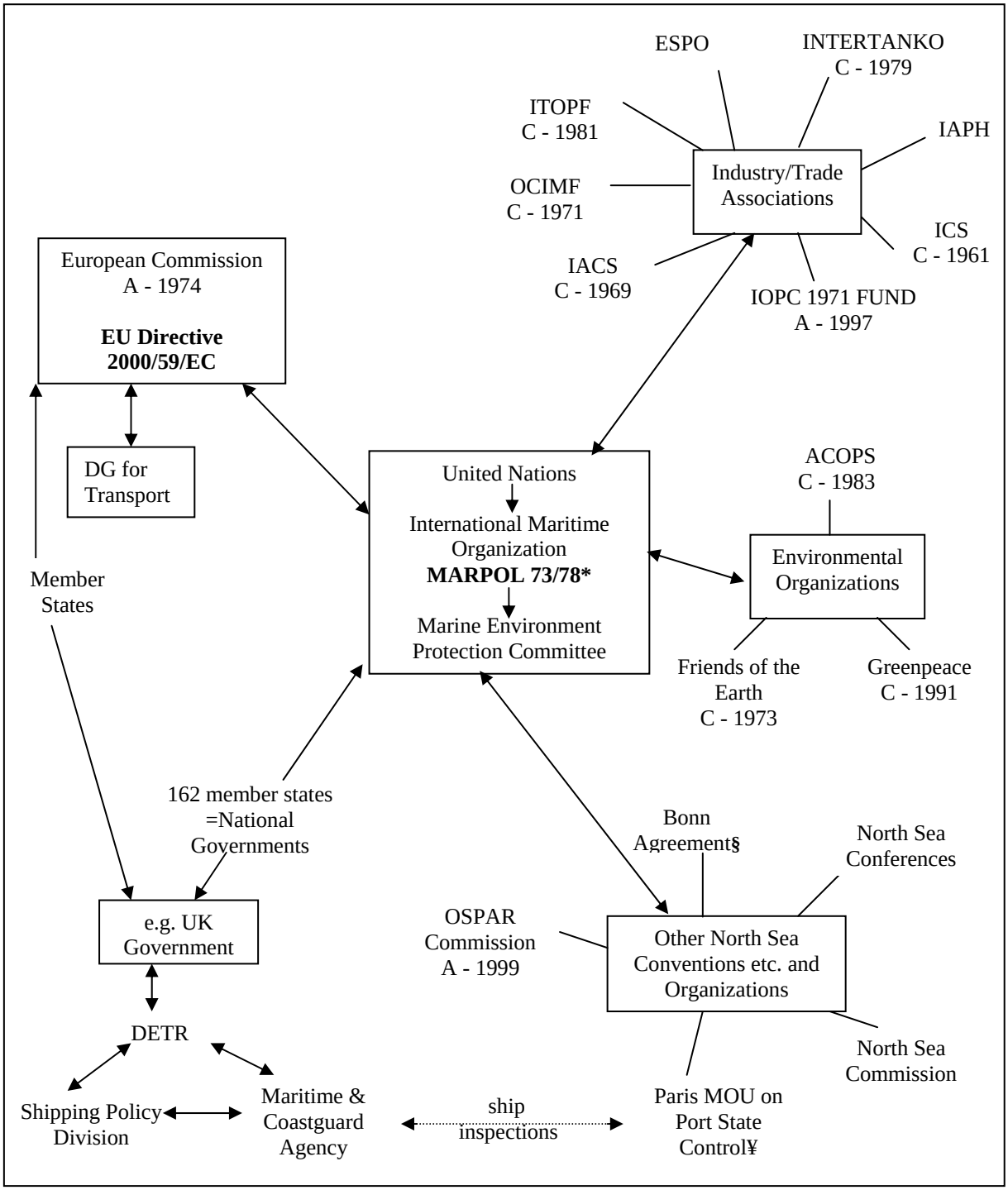
Marine pollution is transboundary in nature, i.e. generally not limited to the waters of one specific country. Control of such pollution in the North Sea region therefore needs concerted action by organizations in all countries bordering the region, and all agents using the North Sea. Such organizations include agencies of the United Nations, European Union, regional bodies and various national Government departments. As the Directive being examined in this thesis specifically deals with ship-generated waste and the provision of facilities in ports to remove such waste, organizations representing the full range of activities undertaken by the shipping and port industries also have a role to play in the development of such legislation.

In order to obtain a comprehensive picture of the very wide range of institutions that are involved in the development of pollution legislation at international, regional and national levels, a diagram of participants in the North Sea waste reduction process has been compiled at Figure 2.1. Information about the various bodies involved has been sought both through a review of literature and by examining the websites of many of the organizations, making use of their published mission statements, descriptions of their activities and historical background data. In addition, personal communications with many of the organizations, through letters, visits and networking has been used in the development of the diagram and overview of the various institutions outlined in this Chapter.

2.2 Participants in the North Sea waste reduction process:

A wide range of participants, from international and national bodies, through government agencies, industry, Non-Governmental and Inter-Governmental Organizations, the media and also the general public are, or can be, involved in the development of legislation which seeks to reduce levels of waste being introduced into the sea.

Figure 2.1 Some Participants in North Sea Pollution Prevention



C = NGO with consultative status at the IMO
A = IGO Agreements of Cooperation with IMO
* Covers reception facilities, port state control, ship standards, etc
§ Covers monitoring and surveillance
¥ Covers port inspection of ships
NOTE: Arrows in Fig 2.1 represent the direction in which information flows between the various groups outlined.

Figure 2.1 sets out a sample selection of these bodies, and identifies links between them, including the flow of information. Arrows show that information can flow in either direction between groups within the chart. All groups are able to provide information to the various Committees of the IMO, which deal with the development of Conventions and the setting of standards. Many of the same organizations are also able to make an input into the decision-making processes of the EU.

It is not possible to show all the relevant bodies on Fig. 2.1. For example, the IMO (2004(a)) listed 37 Inter-Governmental Organizations (IGOs) that have concluded agreements of cooperation with IMO and of the 63 Non-Governmental Organizations (NGOs) in Consultative Status with IMO at November 2004, many of which will have an interest in the development of legislative controls on the discharge of wastes into the North Sea and broader European Waters. Comprehensive lists of these IGOs and NGOs are available from the IMO website at all times.

In the development of Figure 2.1, a selection has been made of those bodies and organizations most directly connected with the development of legislation or having a specific interest in the issue of marine pollution in European and, more specifically, North Sea waters. However, a number of additional organizations are discussed in this Chapter, under the headings of "Environmental Organizations" and "Other North Sea Conventions".

2.2.1 United Nations

In the centre of Figure 2.1 is a box containing the United Nations and the **International Maritime Organization**. The IMO, in 1982, superceded the Inter-Governmental Maritime Consulting Organization, which was established in 1958. Both IMCO and IMO were established as specialized United Nations agencies and the IMO is the United Nations Agency with responsibility for the safety of life at sea and the protection of the marine environment. All the groups of organizations that surround this central box are able to contribute in some way to the development of IMO Conventions, whether through the submission of reports, or by direct participation in the various IMO Committees.

As a result of its establishment, Molenaar (1998, page 37) notes that the IMO "is the main international organization dealing with vessel-source pollution", and goes on to state that "it seems quite remarkable that the maritime industry, with its obvious international character demanding intensive international cooperation, failed to establish an international organization until 1958". However, with the establishment of the IMO, an international body was now mandated to deal with all aspects of the maritime industry**.**

Molenaar (1998, page 37) outlines the main purposes of the IMO, as set out in Article 1(a) of the IMO Convention. This Article states that the purposes of the IMO are: "To provide

machinery for co-operation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade; to encourage and facilitate the general adoption of the highest practicable standards in matters concerning maritime safety, efficiency of navigation and prevention and control of marine pollution from ships …". The phrase "the prevention and control of marine pollution from ships" was added through the 1975 amendments to the IMO Convention. The IMO (2004(b)) notes that the organization is also empowered to deal with administrative and legal matters related to these purposes.

The IMO has adopted over 25 Conventions, including 6 in the field of Marine pollution:

- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)
- International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (INTERVENTION), 1969
- Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Dumping Convention - LDC), 1972
- International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990
- Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000 (HNS Protocol)
- International Convention on the Control of Harmful Anti-fouling Systems on Ships, 2001

For the purposes of this thesis, the key legislation of the IMO is MARPOL 73/78, which covers pollution from vessels by Oil (Annex I), Noxious Liquids (II), Packaging (III), Sewage (IV), and Garbage (V). The Convention was modified by a Protocol in 1997 to also include Air Pollution (Annex VI). The development of MARPOL 73/78 is examined in Chapter 4, Section 4.4.

162 countries are signatories to MARPOL 73/78, including all EU Member States. As mentioned previously, 63 NGOs have been granted Consultative Status with the IMO while 37 IGOs have concluded an agreement of cooperation with the IMO. This latter includes the Commission of the European Communities, which concluded an agreement on 28 June 1974. In Figure 2.1, these organizations are identified by the letters C or A, followed by a date, which indicated when consultative status or agreement was concluded. All these bodies have some form of input into the IMO's decision-making processes.

Finally, in the United Nations section of Fig 2.1, is the **Marine Environment Protection Committee** (MEPC), one of a large number of IMO Committees which deal with all aspects of the marine environment. The MEPC, since its inception in 1974, has been the Committee of the

IMO with responsibility for MARPOL 73/78 and which regulates all measures to prevent and control pollution from ships. Its activities have included involvement in the development of regulations for the design of oil tankers, such as the introduction of double hulls, in order to reduce the risk of pollution from these vessels in the event of damage resulting from collisions or grounding. It is also involved in the ongoing development of measures to prevent the transfer of marine plants, animals and microbes in the ballast water of ships which, when discharged into new environments, can seriously damage the native ecology of those environments.

Information available from the MEPC on the actual provision of port reception facilities for Annex I oily wastes in the North Sea and North East Atlantic is examined in Chapter 6, Section 6.2.

2.2.2 Industry/Trade Associations

The top right hand corner of Figure 2.1 shows a broad range of industry/trade associations from the insurance, shipping and ports industries which have a role to play in the development of legislation concerned with the protection of the marine environment. Other bodies which deal with cargo handling in ports, waste disposal companies, road haulage companies, and other industries involved in the actual disposal of waste once it has been received in port waste reception facilities, will also have a role to play. These bodies will have a very specific role in attempting to put forward an agenda to meet the requirements of their member companies, and to protect those companies as much as possible from the impacts of any legislation.

Many of these industry/trade associations will have been involved in the development process of the EU Directive which is examined in Chapter 5. These bodies are also able to contribute at an international level, and are involved directly in consultations within both the MEPC and also within the IMO as a whole, as discussed in Section 2.2.1. These associations are examined below, information having been obtained from their websites and also from first hand communications and visits.

The **International Association of Classification Societies (IACS)** has held consultative status with the IMO since 1969. Classification societies, for example Lloyds Register of Shipping based in London, are responsible for the inspection, certification of seaworthiness, and insurance of vessels of all types.

IACS, which has 10 member organizations and 2 associates, is unique in that it is the only non-governmental organization with Observer status at the IMO which is able to develop rules. IACS (2004) indicates that “Classification societies are organizations that establish and apply technical standards in relation to the design, construction and survey of marine related facilities

including ships and offshore structures" The 10 member and 2 associate member organizations that make up ICAS account for some "94% of all the commercial tonnage involved in international trade worldwide". (page 2).

The classification process, as outlined by IACS (2004, page 4) requires: "a technical review of the design plans and related documents for a new vessel to verify compliance with the applicable rules; attendance at the construction of the vessel" and at the facilities providing key components "by a classification society surveyor(s) … to verify that the vessel is constructed in accordance with the classification rules"; and "the shipowner's request for the issuance of a class certificate [is then] considered by the relevant classification committee … for the assignment of class [and issue of] a certificate of classification".

Finally, for ships already in service, surveys are undertaken to ensure that all vessels holding a Certificate of Class continue to meet all the necessary standards set out for vessels of that class under international law, including the International Convention for the Safety of Life at Sea (SOLAS) and the International Convention on Load Lines. IACS (2004, page 2) notes that "should any defects that may affect class become apparent, or damages be sustained between the relevant surveys", the ship's owner is required to inform the society without delay, in order to ensure that the ship "is maintained in class".

Compliance with international conventions is mandatory for the issue of statutory certificates, either by or on behalf of a member state. Without certificates, ships cannot legally operate internationally and failure to meet the required conditions of the vessel's class can lead to suspension, withdrawal or revision to a different notation (classification type), either temporarily or permanently (page 5). Loss of classification can result in a vessel no longer being able to trade.

IACS is able to make submissions to meetings of the IMO and its various committees on issues including vessel safety, the provision of port reception facilities and ship design such as developments of double hulled tankers. Its representatives participate as observers and as technical advisers to Member States at meetings of the IMO Assembly, Maritime Safety Committee (MSC) and Marine Environment Protection Committee (MEPC), together with their many sub-committees and working groups. IACS also co-operates with Port State Control (PSC) initiatives globally, and specifically in the activities of the Paris MOU (see Section 2.2.4) which allow states to ensure that foreign flag vessels using their ports meet all required standards. IACS will, therefore, play a major role in ensuring that vessels entering European waters meet any standards set under the EU Directive including, for example, any future requirements to monitor the creation and disposal of wastes generated by vessels during their voyages into or within European waters.

Many industry/trade bodies, including IACS are global in nature. Other examples include the International Association of Ports and Harbours (IAPH) and the International Chamber of Shipping (IACS) and these are examined in more detail below.

The International Association of Ports and Harbours (IAPH), founded in 1955, is also the World Ports Association. The IAPH website (2005) notes that the organization currently comprises 230 Regular Members which it identifies "leading ports in 90 countries and economies, who are public port authorities, private port operators and government agencies". It also indicates that, in 2002, "a total of 7.1 billion tons - accounting for some 60% of the world sea-borne trade - was handled by IAPH member ports", and that, in 2001, "over 80% of world container traffic … was handled by them".

Member ports vary widely in type and include ports owned and operated by public port authorities, that can be national, state or municipal, and also private port/terminal operators and those which are a joint venture between the public and private sectors. In addition, IAPH also covers other aspects of the port industry with Associate Membership comprising "more than 100 shipping, stevedoring and warehousing businesses, national and regional port associations, port and maritime research institutes, and manufacturers of port-related products".

The International Chamber of Shipping (ICS), which has held IMO Consultative Status since 1961, is the international trade association for merchant ship operators. ICS represents the collective views of the international industry from different nations, sectors and trades including bulk carrier operators, tanker operators, passenger ship operators and container vessels through national ship owners' associations representing over 50% of the world's merchant fleet.

The ICS website (2005) indicates that it is unique in that it "represents the global interests of all the different trades in the industry: bulk carrier operators, tanker operators, passenger ship operators and container liner trades, including shipowners and third party ship managers". It further notes that the ICS is "committed to the principle of maritime regulation being formulated at an international level" so that "the regulations that apply to a ship when it sails from Buenos Aires must apply equally when it arrives at Brisbane".

The main objective of ICS is, therefore, "the maintenance of a sound and well considered global regulatory environment in which well-run ships can operate safely and efficiently", rather than the development of unilateral or regional regulation. In order to achieve this objective, it is involved in representing the interests of ship owners and operators in negotiations concerning the development of international regulations covering issues such as ship safety and standards and environmental protection.

Two other organizations within the shipping side of the industry deal with the consequences of oil spills. The first of these is the **International Oil Pollution Compensation Funds (IOPCF)** which reached an Agreement of Cooperation with the IMO in 1997.

The IOPCF website (2005) indicates that the Funds are part of an international regime which provides compensation for oil pollution caused by spills from oil tankers and under this system, the owner of a tanker is liable to pay compensation for oil spill damage from oil tankers, up to a certain limit. Where the cost of such oil spills exceeds that limit, funding is available from the IOPC 1992 Fund where "the damage occurs in a State which is a Member of that Fund". Funding comes from levies on certain types of oil transported by sea, these levies being paid by "entities which receive oil after sea transport", rather than by State Members. It is important to note that "anyone who has suffered pollution damage in a Member State may make a claim against the IOPC Funds for compensation", not just the governments of those States.

There are two IOPC Funds: the 1971 Fund and the 1992 Fund (for the dates when they were established). These two IGOs different maximum amounts of compensation and had different Member States. However, membership of the 1992 Fund increased following the cessation of the 1971 Fund Convention in May 2002 and therefore the 1971 Fund no longer has any members. However, the 1971 Fund continues to operate to deal with pollution incidents that occurred in the waters of Member States prior to its cessation.

A new Fund, the IOPC Supplementary Fund, is to be set up in March 2005 to supplement compensation available under the 1992 Fund. Membership of the Supplementary Fund will be optional and open to any Member of the 1992 Fund. However, the Supplementary Fund will "only pay compensation for pollution damage in Member States … for incidents which occur after the Fund has been set up".

The **International Tanker Owners Pollution Federation Ltd (ITOPF),** has had Consultative status with the IMO since 1981. The ITOPF website (2005) states that it is a non-profit making organisation, funded by the vast majority of the world's shipowners, and that it devotes considerable effort to a wide range of technical services, the most important of which is responding to oil spills. Our technical advisers have attended on-site at 500 spills in 88 countries.

ITOPF was established in 1968, following the grounding of the *Torrey Canyon* on the Seven Stones Reef, near the Scilly Isles and 11 miles off the coast of Britain. It was set up to administer the voluntary compensation agreement, the Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution (TOVALOP) under which Pritchard (1987) notes "some

90% of tanker owners … agreed to clean up oil pollution themselves or to reimburse governments and public agencies for any oil pollution damage" with the level of liability being limited to about "$14 million per vessel per incident" (page 166). ITOPF was established to assure the adequate and timely payment of compensation of the funds available under TOVALOP to those affected by oil spills.

TOVALOP ended in February 1997 and ITOPF now provides a wide range of technical services, the main one being the availability of a small team to assist at marine oil spills anywhere in the world. The ITOPF website notes that this service "is normally undertaken on behalf of [its] tanker-owner members and their oil pollution insurers … or at the request of governments or international agencies such as the International Oil Pollution Compensation Fund".

Two examples of organizations representing the oil industry are also identified in Figure 2.1. The first is the **International Association of Independent Tanker Owners (INTERTANKO).** The INTERTANKO website (2005) indicates that this organization was established in 1970 to represent the interests of independent tanker owners around the world with full membership available to all non-oil company and non-state-controlled tanker owners. INTERTANKO is involved in the development and implementation and regulations within the tanker industry and gained Consultative status with the IMO in 1979.

In May 2003, INTERTANKO had 242 members controlling more than 2,160 tankers totaling 160 million tons deadweight which represents approximately 70 per cent of the independently owned tanker fleet above 10,000 dwt (deadweight). INTERTANKO also has an associate membership of 273 companies.

The INTERTANKO website (2005) identifies the three main goals of the organization as being "Safe transport, cleaner seas and free competition". It also indicates that the organization is committed to "strengthening the position of the Independent Tanker Owners in the tanker industry in particular and in society in general".

The **Oil Companies International Marine Forum (OCIMF)** is, as outlined in the OCIMF website (2005), a voluntary association of oil companies which have an interest in marine transport and terminalling of crude oil and its products and provides a forum for its members to represent their views to Inter-Governmental bodies, to national governments and to other industry organizations. OCIMF was established in April 1970 and was, initially, the oil industry's response to increased public awareness of marine pollution, particularly from oil, following the *Torrey Canyon* incident. OCIMF has held Consultative Status with the IMO since 1971.

OCIMF's mission is to be "the foremost authority on the safe and environmentally responsible operation of oil tankers and terminals, promoting continuous improvement in standards of design and operation". Through its Consultative status with the IMO, OCIMF has been organised to co-ordinate oil industry views at IMO meetings, to review technical proposals circulated by IMO and to advise its membership on legislative activities as they develop.

OCIMF also has consultative status with the UN Economic and Social Council, and with the International Organization for Standardization (ISO). It also presents its members' views before individual national governmental authorities and has close links with other industry bodies and associations. OCIMF's role in producing technical and operational guidelines, either by itself or in co-operation with these other industry associations is seen as making an important contribution to the overall safety of the industry.

As highlighted particularly in the example of OCIMF, many of the industry/trade organizations operate on a global basis and will, therefore, also have a role to play at both national and regional level. Many of these organizations will have been involved, in some form, in the development of the Directive on Port Reception Facilities, together with other Directives being developed by the EU which affect both the port and shipping industries.

Regional industry/trade associations also have had a role in the development of this legislation. An example of such a regional organization is **the European Sea Ports Organization (ESPO)**. The ESPO website (2005) indicates that ESPO was founded in 1993 **"**in response to a growing demand that the sea port sector would present its views and opinions to serve the interests of seaports with regard to the development of the European Community, the single market and its common transport policy".

ESPO, which has direct contacts with approximately 500 ports throughout Europe, represents the port authorities, port associations and port administrations of the seaports of the European Union. ESPO's General Assembly, the principal decision-making body, is attended by three national delegates of ports from each of the thirteen maritime member states and is also open to observers from seven further states "which may ultimately seek membership of the European Union."

ESPO also operates in co-operation at a global level with bodies such as IAPH. An example of this global co-operation was a workshop jointly sponsored by both bodies, which was held in Rotterdam in the summer 2001. This ESPO / IAPH Workshop on Port Reception Facilities for ship generated waste and cargo residues, included presentations and discussions by a wide range

of parties interested in the development of the Directive, and included participants from both industry and academia.

ESPO's website (2005) sets out its mission which is "to influence public policy in the EU to achieve a safe, efficient and environmentally sustainable European port sector, operating as a key element of a transport industry where free and undistorted market conditions prevail, as far as practicable." Its key objectives are:

- To ensure that the economic importance of European ports is recognized in the EU and its Member States and that the sector is consulted on any measure likely to affect it;
- To promote free and fair competition in the port sector;
- To ensure that European ports play their full part in delivering economic efficiency;
- To promote the highest possible safety standards in European ports;
- To encourage ports to be proactive in protecting the environment.

2.2.3 Environmental Organizations

The organizations specifically identified in Fig 2.1 include the **Advisory Committee on the Protection of the Sea (ACOPS)**. The IACMST (1998, page 26) indicates that ACOPS is a private, independent and non-political organization, which is based in London and holds UK charitable status. It was one of the world's first environmental NGOs. Originally concentrating on encouraging international agreements to reduce marine oil pollution, ACOPS now undertakes research into the problem of marine pollution, from both vessel and land-based sources. It seeks to actively participate in the formulation of policy and the conduct of studies in co-operation with central and local governments and intergovernmental agencies. It also undertakes educational programmes and public awareness campaigns to increase awareness into the issues associated with marine pollution.

Friends of the Earth and Greenpeace International are both environmental organizations holding consultative status with the IMO, operating at national, regional and global levels. **Friends of the Earth UK -** in a briefing produced following of the sinking of the *Erika*, Friends of the Earth (2000) outlines a campaign covering environmental liability issues following such an incident in European waters. In this briefing, it calls for the UK Government to introduce a Marine Conservation Bill to promote the sustainable conservation of marine habitats and species, including provisions on the quality of the wider sea. Friends of the Earth UK also produces a range of briefing documents on a broad range of other environmental issues including global warming and biodiversity. **Greenpeace UK** and **Greenpeace International** also run campaigns regarding marine pollution issues, undertake scientific research, and put pressure on national governments and bodies such as the EU to act to prevent pollution or all types.

To those environmental organizations identified in Fig 2.1 can also be added the **International Union for Conservation of Nature and Natural Resources** (IUCN – consultative status, 1981), the **World Wide Fund for Nature** (WWF – consultative status, 1993), and the **Baltic Marine Environment Protection Committee (Helsinki Commission)**, an IGO that concluded an agreement of cooperation with the IMO in December 1982. This latter is included as its membership is made up of many EU countries such as Germany, Denmark, and Sweden, together with a number of Baltic States, for example Latvia, which became members of the European Union in the Spring of 2004.

The **Helsinki Commission (HELCOM)**, plays a major role in setting standards in the Baltic Sea, and has responsibility for setting standards for the provision of port reception facilities in that area under the Helsinki Convention, 1974. There is a large degree of overlap between this Convention and the EU Directive and this is discussed in greater detail in Chapter 3, Section 3.2. As a number of Member States of HELCOM are also North Sea states, HELCOM could be placed in the category of other North Sea organizations. However, its activities through its marine environment protection committee also places it in the category of an environmental organization and these activities will have a direct impact on those states which must meet the standards of both HELCOM and the EU.

2.2.4 Other North Sea Conventions and Organizations

The **Bonn Agreement** is operated by a Secretariat responsible for implementing the requirements of the "Agreement for Cooperation in Dealing with Pollution of the North Sea by Oil and other Harmful Substances" of 1983. Its activities, set out by the Bonn Agreement (1997, page 2) include the maintenance of an aerial surveillance programme, operated by eight countries bordering the North Sea (see footnotes, thesis page 14), who "work together within the Agreement to undertake aerial surveillance using specially equipped aircraft and specialised personnel". This programme has been in operation since 1986. The aerial surveillance activities undertaken by Bonn Agreement states play a significant role in monitoring levels of oil pollution and showing trends regarding oil spills, and are discussed in greater detail at Chapter 6, Section 6.4.1.

The Bonn Agreement also sets out guidelines for the co-operation of two or more North Sea states which can include the EU, in the event of an oil spill incident, so that these states can act quickly to clean up such a spill on an operational basis. Its Counter Pollution Manual also provides assistance in the selection of the most appropriate method of dealing with such spills. As such, the Bonn Agreement plays an important role in the environmental protection of the North Sea.

The **North Sea Commission (NSC)** indicates, on the NSC website (2005) that it was founded in 1989 to "facilitate and enhance partnerships between regions which manage the challenges and opportunities presented by the North Sea.". The Commission promotes cooperation between regional authorities around the North Sea, and is made up of 67 Regional Authorities from 8 countries – Scotland, England, Belgium, The Netherlands, Germany, Denmark, Sweden and Norway. The Commission is also active in promoting joint initiatives and ensuring cooperation between the governments of North Sea states and plays an active role in political lobbying at the EU.

The NSC (2003 indicates that, in order to "influence both the debate and the decision making process concerning EU policies … [it] … will work closely with the Commission and the European Parliament …" and … "close cooperation will be maintained with European networks such as the … Committee of the Regions to ensure that the aspirations of the region are heard in the corridors of power" (page 12).

In addition to its other activities, the NSC is also responsible for the **International Conferences on the Protection of the North Sea (North Sea Conference)**. The first Ministerial Conference was held in Bremen in 1984 with ministers from the National Governments of the NSC member countries, together with France and the EU participating. The aim of the conference, outlined by the Norwegian Ministry of the Environment (2002) was to "provide political impetus for the intensification of the work within relevant international bodies, and to ensure more efficient implementation of the existing international rules related to the marine environment in all North Sea States". These included the Oslo Convention on dumping at sea, the Paris Convention on pollution from land-based sources, and the IMO Convention on shipping issues.

There have been five full Conferences (1984, 1987, 1990, 1995 and 2002) and the Ministerial Declarations arising from these Conferences are political commitments "which have played an important role in influencing legally binding environmental management decisions both nationally and within the framework of competent international bodies". In addition, two Intermediate Ministerial Meetings (1993 and 1997) have also taken place while regular meetings of senior officials from all member states and the European Commission were established at in 1997, through the Committee of North Sea Senior Officials (CONSSO), which has its secretariat in the Norwegian Ministry of the Environment.

The **Paris Memorandum on Port State Control (Paris MOU)** was signed in January 1982 by 19 countries, including all North Sea states. This Paris MOU website (2002, page 2) requires that all signatory states undertake a "system of port state control with a view to ensuring that,

without discrimination as to flag, foreign merchant ships calling at a port of its State, or anchored off such a port, comply with the standards laid down in the relevant instruments".

There are three main bodies of the Paris MOU. Representatives of the maritime bodies of all member states form its Executive Committee which holds meetings on all aspects of the MOUs work. An example of such work is the development of harmonized procedures so that the MOU is implemented fairly on all vessels, irrespective of state of origin. The MOU has a secretariat based in the Netherlands and also operates a computer centre based at St Malo in France. This latter receives information on vessel inspections and deficiencies from relevant bodies appointed by the member state to conduct vessel inspections in their ports – for example, the Maritime and Coastguard Agency in the UK.

At the current time, the Paris MOU website (2005) indicates that these relevant instruments are:

- International Convention on Load Lines 1966, as amended, and its 1988 Protocol, (LOADLINES 66/88);
- International Convention for the Safety of Life at Sea (SOLAS), 1974, its Protocol of 1978, as amended, and the Protocol of 1988, (SOLAS 74/78/88);
- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978, as amended (MARPOL 73/78);
- International Convention on Standards of Training, Certification and Watch keeping for Seafarers 1978, as amended (STCW 78);
- Convention on the International Regulations for Preventing Collisions at Sea 1972, as amended (COLREG 72);
- International Convention on Tonnage Measurement of Ships 1969 (TONNAGE 1969);
- Merchant Shipping (Minimum Standards) Convention, 1976 (ILO Convention No. 147).

With regard to the last instrument**, i**nspections on board ships under ILO Convention No. 147 relate to eight further conventions including those on minimum age of seafarers, food and catering on board vessels, and the competency of a vessel's officers.

Paris MOU inspections – inspections of 25% of foreign flag vessels calling in at a member state's ports for a range of deficiencies - are undertaken by the relevant agencies of each member state. In the case of the UK, this is the Maritime and Coastguard Agency. These deficiencies can include physical problems with the vessel, standards of crew training and certification, together with documentation on board. As a result of such inspections, vessels can be detained in port until the deficiencies are corrected, can be allowed to move on to another port if specialist equipment is required, a vessel's owners can be fined, or vessels can be blacklisted and excluded from all Paris MOU ports. The results of these inspections will be examined further in Chapter 6.

The final agency in this section of Fig 2.1 is the **OSPAR Commission.** The OSPAR Commission website (2005) states that the Commission is responsible for the operation of the Convention for the Protection of the Marine Environment of the North-East Atlantic, 1992 (OSPAR Convention). This Convention superceded the 1972 Oslo Convention on Control of Dumping from Ships and Aircraft, and the 1974 Paris Convention for the Prevention of Marine Pollution from Land Based Sources. These earlier conventions are examined in more detail at Chapter 4, Section 4.3.2. The Commission, which normally meets once a year, is the forum through which Contracting Parties co-operate.

The OSPAR Commission website (2005) further notes that meetings of the Commission, together with its main committees and working groups "are attended by observers from observer organisations" including "intergovernmental organisations working in similar fields, and international non-governmental organisations". There NGOs include industry and trade organisations, organisations of regional and local authorities and environmental campaigning groups.

All North Sea states, together with eight non-North Sea States and the European Commission are signatories to the OSPAR Convention which contains five specific Annexes. The first four of which were adopted in 1992 and the fifth was added in 1998. These Annexes are:

- Annex I Prevention and elimination of pollution from land-based sources
- Annex II Prevention and elimination of pollution by dumping or incineration
- Annex III Prevention and elimination of pollution from offshore sources
- Annex IV Assessment of the quality of the marine environment
- Annex V Protection and conservation of the ecosystems and biological diversity of the maritime area.

The Convention was signed by the European Commission at its inception. The OSPAR Commission went on to establish an Agreement of Cooperation with the IMO in 1999.

2.2.5 National Governments

The example given in Fig 2.1 is the United Kingdom. The Governments of all North Sea States are signatories to MARPOL 73/78 and are required, as such, to implement all the requirements of the Convention. They are also members of the North Sea Conferences, at ministerial level, and are signatories to other treaties and conventions including the Bonn Agreement, the Paris MOU and the OSPAR Convention. At the same time, these states (apart from Norway) are also members of the European Union and are therefore required to implement Directives and

Regulations being developed by the European Commission, including the Directive on Port Reception Facilities.

At the time of the development of the Directive, the relevant Department responsible for setting the UK Government's viewpoint in negotiations was the Department for the Environment, Transport and the Regions (DETR) which appears in Fig 2.1. This has now become the Department for Transport (DfT)

Two agencies of the **Department for Transport** are involved in all aspects of maritime activity. The first of these is **Shipping Policy Division**, which is involved in the development of both UK and international legislation and in the implementation of such legislation. Chapter 16 of the DETR (1999) Annual Report outlined the Government's plans for the future of shipping and ports. It states that the Government is "determined to maximise the vital economic contribution that shipping and ports make to [the UK's] prosperity, and to minimise the effect on the sea and coast from pollution caused by ships. It is also set on improving safety for all … who go to sea, whether as passengers or workers."

The DETR (1999) Annual Report also highlighted work in Europe on strengthening pollution prevention standards for ships and, at that time, the DETR's Shipping Policy Division had been heavily involved in developing the new EU Directive on Port Reception Facilities. In the case of the EU Directive, the Shipping Policy Division of the Department for Transport undertook a Consultation Process in August 2002, details of which appeared on its website, (Department for Transport, 2002). This consultation process sought information from all interested parties on the Directive, its implementation, and implications for the port industry, for example. The results of this consultation process were included in the development of national legislation, with the Directive entering UK national law under Statutory Instrument 2003 No. 1809[*] in the summer of 2003.

The second body, an executive agency of the DfT, involved in maritime activities is the **Maritime and Coastguard Agency (MCA** - also known as MCGA**).** This body was established on 1 April 1998 following the merger of the Coastguard Agency (TCA) and the Marine Safety Agency (MSA). It is responsible for carrying out the functions of both organizations, and for the UK's inspection of ships under the Paris MOU. The primary aim of the Agency, as set out in a policy framework from the Secretary of State, is "to develop, promote and enforce high standards of maritime safety and pollution prevention; to minimise

[*] Statutory Instrument 2003 No. 1809 Merchant Shipping. *The Merchant Shipping and Fishing Vessels (Port Waste Reception Facilities) Regulations 2003"*. Pub. The Stationery Office Ltd., UK. 2003

loss of life amongst seafarers and coastal users; and to minimise pollution from ships to the sea and coastline".

The MCA deals with all aspects of vessel safety including the operation of coastguard stations around the UK coastline. It also handles the enforcement of national and international standards on vessels operating in UK waters. This, as previously stated, includes the provision of inspectors to undertake the requirements of the Paris MOU. Similar national bodies operating in other North Sea States will also be involved in all aspects of shipping, including maritime safety, pollution prevention measures, crew certification and standards, vessel inspections, etc. and also in the wide range of activities of their ports.

In each country, the ports and shipping industry will also have input into the development of national policy, and in the implementation of international regulations, whether originating from the IMO, from the EU or from one of the other bodies concerned with the maritime industry. The various Industry and Trade Associations that represent these ports and shipping companies will also have a role to play in representing the interests of their members in the negotiation and development process of both national and international legislation affecting their members.

2.2.6 European Commission

The final section of Fig 2.1 covers the European Commission which, under the aegis of its **Directorate General VII – Transport** was, in 1999, the Directorate responsible for the development of the Directive on Port Reception Facilities. At that time, DG Transport's mission was "to work with national, regional and local authorities, business and non-governmental organizations to improve the way in which Europe's transport system serves the economic, environmental and social aspirations of European citizens". Its main areas of work covered environmental, safety and social standards for transport; competition, market forces and fair and efficient pricing in transport; catalyzing investment in transport; supporting research and technical development in transport; and transport links with countries outside the European Union.

DG VII – Transport has since been superceded by the **Directorate-General for Energy and Transport** which is responsible for the development and implementation of European policies in the transport sector. It has responsibility for the development of legislation in the field of all aspects of maritime policy, including responses to oil spill incidents such as the sinking of the *Erika* in December 1999 and the *Prestige* in November 2002.

Figure 2.1 sets out only communications between the Commission and the IMO, with which it concluded an Agreement of Cooperation in 1974, and also communication between the

Commission and national governments. However, the Commission also has links with many of the organizations shown on the chart, as described in the relevant sections, which are able to provide an input into the decision making process, either as representatives of trade associations, or of NGOs such as ACOPS or Friends of the Earth. The Commission also plays a role in the activities of the OSPAR Commission, being a signatory to the OSPAR Convention, and in the Bonn Agreement and the North Sea Commission CONSSO.

2.3 Conclusions

Figure 2.1 serves to provide a framework showing the complex nature of the system of control of marine pollution in the North Sea region, and this is further emphasised by the examination of the range of bodies that contribute towards that framework. There are a wide range of disparate organizations - governmental, industry-based and environmental - which can contribute towards discussions on the development of legislation. This legislation can include EU Directives and Regulations, together with global and regional conventions and agreements of many different types.

Figure 2.1 also identifies the complexity of consultations and of information flows between the different types of organizations. These consultations can be at a formal level, through Agreements of Co-operation or Consultation with the IMO and attendance at meetings of the IMO Committees. They can also include meetings at a ministerial level by representatives of the EU member states, through debates in the European Parliament, and through the various EU DGs or Committees. At a more informal level, they can include the Consultation Process undertaken by the UK Government, prior to transposition of the Directive into UK national law, or be between industry bodies directly affected by legislation, as in the example of the joint ESPO/IAPH workshop on the EU Directive. Information can also be transmitted and disseminated in a formal manner, for example through the publication of EU Legislation in the Official Journals of the European Community. It can also be informal, taking the form of Trade Association Newsletters, press releases, or news items published on the Internet.

The process of developing the EU Directive has produced overlaps between the activities of a range of the bodies discussed in this Chapter, and with other legislation including MARPOL 73/78, the Bonn Agreement and the Paris MOU. The development of legislation such as MARPOL 73/78 is, therefore, examined in greater detail in Chapter 4. Data provided by the MEPC, the Bonn Agreement and the Paris MOU Secretariat is also examined, in Chapter 6, to assist in developing a picture of the availability of reception facilities and aspects of non-compliance including the discharge of oil at sea, and the failure of vessels to meet standards set out in legislation.

In order to better understand the roles that the bodies identified in this chapter can have in the development of legislation, it is also important to understand their motivations in terms of how an organization's agenda and specific needs can influence their contribution in any debate during the development stage of legislation. Chapter 3 will, therefore, examine how representatives of the port and shipping industry, together with other bodies, can drive forward change changes in the control of pollution within the North Sea region.

CHAPTER 3

DRIVERS OF CHANGE IN THE CONTROL OF NORTH SEA POLLUTION

3.1 Introduction

The aim of this chapter is to examine the impacts of legal, technological, financial and cultural/social factors in driving forward change in the behaviour of actors, identified in Chapter 2, involved in the control of North Sea pollution. Drivers of change are defined, for the purposes of this chapter, as: *any mechanism which can alter the status quo, whether for the better or the worse, including physical, economic, social and legal mechanisms.*

The various actors involved in the legislative process interact at different levels: through complementary business activities; through membership of working parties developing legislation; or in fora to develop international legislation on the marine environment. These actors will seek legislation that is beneficial to them, if they represent a business, or fulfills an agenda held by a political party or NGO. Many actors involved in the development of legislation such as the EU Directive seek specific outcomes from that legislation, and will promote change or take action to achieve those outcomes.

Table 3.1 has been compiled to identify some of the broader factors that can influence change and illustrates that there is a degree of overlap between the different drivers. In order to better understand how these drivers can influence the behaviour of the various actors involved specifically in the development and implementation of the EU Directive, each will be examined within the context of that Directive. Those groups of actors most closely associated with legislative, technological and financial drivers are identified in Tables 3.2 to 3.4. In the case of cultural and social drivers, issues of culture, ethics, politics and the impact of the media on the behaviour of actors are examined.

Table 3.1 Drivers of Change – the Broader Context

Driver	Factors which can influence change
Legislative	*Political developments*: growth of single issue politics; decline in voting at elections; loss of trust in politicians *Expansion of EU*: need to introduce legislation into larger number of countries with different legal systems; EU moves towards regional rather than national governance, e.g. introduction of regional assemblies *Existing legislation*: Possible conflict between domestic and international legislation, e.g. standards, penalties; change in other international treaties or conventions; lack of compatibility between different legislative requirements *Environment*: importance placed on protecting the environment through legislation by richer v poorer states
Technological	*New technology*: cleaner technology on vessels and new types of vessels which are less polluting; increased demand for technology via expansion of application into new markets; improved fuel efficiency *Waste reduction and recovery*: reduced levels of waste generation with consequent reduction in demand for waste recovery, combined with improved waste disposal and recovery systems *Environmental issues*: limited resources e.g. decline in fossil fuels: search for alternative energy sources; poorer countries must meet higher legislative requirements of joining EU; protection of ecosystems: loss of biodiversity
Financial	*Globalisation*: multi-national trade; competition between rich v poor countries for business; businesses move jobs to areas with low wages and less legislation; increase in imported goods from poor producer to rich consumer nations *Wealth Distribution*: inequalities between high employment/high pay areas versus low employment/low pay areas, both within the EU and between EU/non-EU countries *Population movement:* migration from poorer to richer states in search of higher wages and standard of living; financial burden on richer states from increased demands on housing, education, transport and health care associated with influx of workers; loss of green areas for housing plus high concentration housing in urban areas
Cultural/ Social	*Demographic Change*: increase in global population - lower levels of infant mortality in poorer states plus higher life expectancy in richer states *Employment Issues*: richer states face skill shortages/lack of manual workers as less value placed on practical skills; EU Working Time Directive; influx of migrant workforce to fill manual/low pay jobs requiring housing, healthcare. *Social Inequality:* North/South divide within Europe may change to West/East divide with expansion of EU *Societal Values:* self first; demand for better standard of living; decline in church membership; increase in non-Christian religions through immigration; increased racial intolerance; loss of national identity *Communication:* global communication – TV, internet; awareness of inequality between poor v rich countries; increased militancy e.g. anti-G8/WTO demonstrations; greater awareness of environmental issues

3.2 Legislative Drivers:

Legislation, in its broadest terms, consists of the range of laws, regulations, treaties and agreements, which can be developed at domestic, regional, EU or global level. Legislation can both drive forward change and also be changed in response to other legislation or the behaviour of the actors covered by it. Table 3.2 has been compiled to show how legislation can impact on the behaviour of specific actors/groups of actors.

Table 3.2 Legislative Drivers on the Behaviour of Actors

Actor	Driver	Behaviour
North Sea States	EU Directives, Regulations, etc.	EU states to implement Directives, and enforce through compliance system including fines.
		Governments influence content of legislation during development/transposition by suggesting changes to make it more effective, but also meet national agendas, e.g. election promises
	Other International Legislation	States are signatories to other legislation with conflicting requirements - problems of which has priority - therefore may act to adapt either EU or other legislation to overcome problem.
Ports/Shipping Companies/ Trade Organizations	Threat of sanctions	Implement Directive/law to avoid sanctions - compliance
	Protection of Business Activities	Participate in development process to influence legislation/seek changes if impacts on business
	Conflicts between legislation	Pressure to meet different legislative requirements therefore participating in development/seek change as above
NGOs/Other Interested Parties	Main agenda e.g. protection of environment	Take action to influence legislation to meet agenda, e.g. participation in development process, suggest changes to existing laws

3.2.1 North Sea States

In the case of legislation as a driver of change, it is its impact on the State, and the State's response, which can result in the greatest pressure for change. The State may initiate legislation, or be required to implement and comply with it, while seeking to achieve political and economic agendas, meet election promises and remain attractive to business. It is important, therefore, to ensure that State signatories to legislation implement it in such a way that it complies with the spirit of the law and not just with the word of the law. On the issue of government compliance, Mitchell (1994, page 27) asks three simple questions "Do nations and their citizens adjust their behaviour to comply with environmental treaties? Can we improve environmental treaties to make compliance more likely? If so, how?". Mitchell (1994, page 27) indicates that while governments "spend considerable resources drafting and redrafting treaties to resolve international environmental problems [and] environmental groups commonly support these

efforts … business groups regularly oppose provisions of environmental treaties as excessively costly and burdensome [and] policy analysts and pundits regularly highlight the problems with existing treaties and propose new treaty provisions to address them".

Considering the first question - "Do nations … adjust their behaviour to comply with environmental treaties?" - Mitchell (1994, page 30) defines compliance as "an actor's behaviour that conforms to a treaty's explicit rules". These rules include all treaty provisions, not just selected ones that a nation feels able to comply with while ignoring others. As Mitchell (1994, page 31) notes, "Evaluating compliance against treaty provisions … makes more sense than speaking of compliance with the treaty as a whole. Parties often comply with some treaty provisions while violating others". However, compliance with individual treaty provisions may require action on the part of different organizations: national and local government departments, industry, and NGOs. A Government could be in compliance with a treaty, when considered as a whole, but if aspects that are the responsibility of others are not met, full compliance is not achieved.

Mitchell (1994) identifies two reasons why Governments or other bodies comply:

1. Independent Self-Interest – compliance furthers the interests of the government/business involved, promotes their interests or helps them avoid "legal obligations that might be harmful to them". The government leading the development of legislation can adapt it in such a way that it needs to make little or no change to achieve compliance, but other states may have to change their behaviour to do so. Such legislation may have limited requirements and most states may already comply. (Mitchell, 1994, page 32).

2. Interdependent Self-Interest – co-ordinated action between two or more governments/businesses to include both their own self-interest in the process and also "include their expectations regarding the impact their own compliance will have on others". The originating nations will be in a strong position to gain what they want from the legislation, possibly at the expense of other nations not included in the process. (Mitchell, 1994, page 38).

There are also a number of reasons for non-compliance by governments and other bodies:

- cost of compliance is greater than its benefits – where a government or business is faced with significant costs in complying with legislation, but these costs are more than any fines for non-compliance, then the decision may be made to not comply.
- a Government might be willing to comply but does not possess the financial means necessary to do so.

- a Government may not be able to meet the standard set out in the legislation at the time required, despite their best efforts.

All North Sea states were required to implement the EU Directive by December 2002. However, several failed to do so and de Palacio (2003) announced plans for the European Commission to initiate infringement proceedings against a number of countries, including Belgium, the Netherlands and the UK. The Netherlands failed despite being actively involved in the development of the Directive, with compliance still not achieved by Spring 2004. UK compliance was delayed as the Department for Transport (2002) produced a Consultation Document seeking the opinions of interested parties prior to transposition of the Directive into domestic law. Interested parties included representative bodies of ports (for example the British Ports Association), shipping companies (Chamber of Shipping), national and regional government (MCA, Moray Council), and NGOs and environmental groups (RSPB, Scottish Nature). The results of the consultation process were published by the Department for Transport (2003) on its website, at the same time as the Directive was transposed into national law over six months late (see also section 2.2.5)..

Other European legislation can also have an impact on the development/implementation of legislation in a manner not foreseen when it was first written. One example of this is the European Spatial Development Perspective (ESDP, 1999), a voluntary planning instrument of the EU, which aims to work towards balanced and sustainable development within the EU. The European Commission (1999, page 7) notes that "with growing economic and social integration, internal borders are increasingly losing their separating character and more intensive relationships and inter-dependencies are emerging between cities and regions of the Member States". Spatial planning under ESDP requires that any proposed new infrastructure in one area be considered in light of its impact on what already exists in the region and on future developments in any part of the region.

ESDP is an issue that also falls into the categories of financial and cultural/social drivers, in that it deals with issues of demographic change, changes in employment and population movement. Vestby (2000, page 46) indicates that "a major target for ESDP is to improve the 'rural regions' ability to develop themselves as attractive alternatives to the more central parts of the European territory". This can result in a loss of skilled workers and economic decline in rural areas, and over-population or further expansion of cities and damage to the surrounding environment as this expansion occurs.

Many smaller ports are situated in rural areas, and one of the problems they face from the EU Directive is the requirement to provide reception facilities when very few vessels normally call into those ports. Vestby (2000, page 46) states that this may be "economically much more difficult for a small port than a larger one" as it requires "big investments with limited depreciation [and] may result in an irrational and expensive service". Many ports in a region may act in co-operation and development of facilities for a group of ports under ESDP could counter some of the economic problems faced by small ports. The EU Directive already allows ports to develop waste management plans on a regional basis, small ports combining to produce one plan that provides an overview of the facilities provided across a region.

The 1974 Helsinki Convention[*] can be used to highlight the issue of how similar legislation may drive forward legislative change. This is a comprehensive system of protection of the Baltic marine environment, and includes the provision of port reception facilities. Those Baltic States that are also EU states are required to implement both the Helsinki Convention, to which the European Community became a signatory in 1994, and the EU Directive. The EU Directive also contains measures that duplicate the Helsinki Convention's Baltic Strategy. Bodin (1999, page 3) identifies these as:

- The capacity and technical standard of the reception facilities available …
- The fee system and the implementation of the "No Special Fee" system, and
- The development and implementation of "Port Waste Management Plans

Other requirements of the Helsinki Convention are, however, contradictory. HELCOM, in Recommendation 17/11 of 1996, called for a "harmonized fee system" to encourage both waste delivery into shore facilities and prevent waste being transferred between ports in the region so that all ports share the burden of receiving waste. HELCOM (2001) indicate that this, together with a number of other recommendations, was updated in March 2001 in HELCOM Recommendation 22/3, to provide unified interpretations to ensure harmonized and effective implementation of the strategy for port reception facilities and associated issues.

Recommendation 22/3 includes a continued requirement for the application of the "no-special-fee" under which all vessels contribute to the cost of reception, handling and disposal of waste within the harbour fee, irrespective of whether waste is delivered or not. In contrast, the Directive does not

[*] 1974 Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea area (updated 1992)

specify a particular charging regime, other than to require that all ships calling into a port shall contribute significantly towards the costs of facilities and there will be no incentive for vessels to discharge waste at sea. If Baltic ports continue to use the "no-special-fee" system while others use a system requiring a significant contribution, the result could be a reduction in levels of waste discharged in North Sea ports but also a reduction in trade for those ports. Baltic ports could then see increased levels of trade, but also receive increased levels of waste.

Finally, with regard to international legislation, the most significant driver of change may be the ratification of Annex IV of MARPOL 73/78 covering sewage wastes in September 2002, which was due to enter into force in September 2003 but which has been delayed at lease until August 2005. The situation with regard to Annex IV is considered in more detail in Chapter 7, section 7.3.3.

Article 16 of the Directive allows for provision of facilities following entry into force of Annex IV to be delayed for a further 12 months. Ports could, therefore, introduce facilities for sewage wastes at a date to comply with MARPOL 73/78 or a date to comply with the EU Directive. A further complication is the 12-mile limit under international maritime law outside which sewage waste can be legally discharged at sea. While this limit exists, vessels can discharge sewage wastes legally outside the 12-mile limit and will not require facilities. In order to make it cost effective for sewage facilities to be provided, there would be a requirement for additional legislation to "opt out" the 12-mile limit for sewage wastes in EU waters so that vessels had no option other than to use reception facilities.

3.2.2 Ports/Shipping Companies/Trade Organizations

In respect of legislative drivers, the main business actors involved in negotiating the development of legislation dealing with ship-generated waste will come from both port and shipping companies, and their associated trade organizations such as IAPH, ESPO, INTERTANKO and OCIMF. The specific areas of interest and activity of these bodies are identified in Chapter 2, section 2.2.2.

A range of factors can impact on compliance behaviour of business actors including:

- ability to pay (financial or other constraints);
- the extent to which new legislation goes beyond what already exists and the ability of businesses to reach the new requirements (standards); and
- making it more cost-effective to comply than not to do so.

In this latter case, a system where sanctions are more expensive to the business than any economic gains that might be achieved through non-compliance could be used.

Compliance can, however, be achieved using a system of inducements which can include rebates, tax concessions, and grants. One example is the use of tradable permits that allow a company to abstract from or emit into the environment. These permits can be 'sold on' to another company, if the first company does not need its full permitted allowance and the first company may receive an economic benefit from the transfer, possibly through tax credits or rebates proportional to the difference between actual and permitted levels. DEFRA (2000, page 15) examined the use of permits in the context of water abstraction, noting that "there are two common forms of trading programmes in operation". These are:

- Closed trading systems: typically non-voluntary; ceilings or caps are placed on all permits at a level designed to achieve/maintain environmental objectives; or
- Open trading programmes: typically voluntary: often used to supplement existing regulation with the aim of providing a cost-effective means of maintaining environmental standards.

During the development of the EU Directive, port industry representatives at the wider European level such as ESPO will have their own agenda on what should be achieved by the legislation, and will also have a role in providing information on the practicalities involved in the running of ports. At the transposition stage more country-specific inputs could be made, for example by the British Ports Association, based on how ports operate in a specific country. Information could include how ports currently charge for facilities; availability of necessary technology; knowledge of reputable disposal companies; and how to assess vessel needs. After implementation, ports will have to comply with the Directive, but can also identify difficulties arising from it and feed information back through to any future consultation on the Directive.

Similarly, shipping company representatives such as INTERTANKO and OCIMF would also have a role to play throughout the legislative process, again bringing their practical experience into the setting of the initial agenda and in carrying this through to actual legislation. In terms of stating their specific requirements, these can include the feasibility and costs of introducing green technology to reduce the need to use facilities through waste reduction/recycling methods on board vessels, and how to calculate reduced fees for vessels using such technology. They will also seek to ensure that it remains profitable for them to continue to operate in European waters, since any large increase in costs could lead to the transfer of business outside the region.

In the shipping companies and their trade organizations, there is pressure to meet a wide range of international legislative requirements and standards, since standards in Europe may not be the same as those in other areas. Shipping companies operating globally may be faced with conflicting demands in different ports, for example. Similarly, global port trade organizations such as the IAPH will also have member companies which own ports operating to different standards. Consequently, these businesses and organizations will seek to influence the requirements of the Directive and other legislation in order to achieve common standards and rules across all areas where they operate, and this may also influence any future changes made to the Directive.

3.2.3 NGOs/Other Interested Parties

Other bodies involved in the consultation process will include: regional bodies such as the North Sea Commission and the OSPAR Commission, national and local government agencies responsible for the marine environment (MCA, Scottish Nature), environmental NGOs (Friends of the Earth, ACOPS), together with local action groups, which may be single issue groups based around a particular port, and would also include local tourist boards, for example. All of these bodies will have a specific agenda that they will seek to achieve by influencing legislation, either through its development stages or by suggesting changes once it has been introduced. These agenda might include minimizing any potential developments within ports that could be seen as detracting from the environment and driving away tourism, or alternatively a call for such development as a way of bringing new jobs into an area of high unemployment.

When developing legislation at any level, it is important to consider its impact on a much wider range of groups than those directly impacted upon by legislation. Involvement of this wide range of interested parties in the development process may help to ensure the successful implementation of the legislation and minimise opposition to the legislation in the future. A lack of consultation may result in opposition to the legislation, and mean that it fails to take into account practical issues that directly impact on the legislation.

3.3 Technological Drivers

In the broadest terms, technological drivers are those developments in technology that can result in physical changes in equipment such as new designs, the way equipment is produced, improved levels of efficiency, reductions in energy consumption, and reductions in the levels of waste generated. As such technology becomes more widely available, or is adapted to meet the particular needs of its users, demand will increase if it is seen to either be more efficient, more cost effective or less polluting. This can result in higher levels of compliance with legislation, either through a physical reduction in wastes generated, or because lower costs reduce any

financial disincentive to discharge wastes illegally. Within the context of the North Sea environment, such technology would play a major role in making the EU Directive effective in its aim of controlling or reducing the volumes of pollution being illegally discharged into European waters.

Technology, both what is already available and what is being developed, is a key area that can drive forward both the behaviour of the various actors involved in the generation, reception and disposal of ship-generated waste and also potentially require changes in the EU Directive at a future stage. Table 3.3 has been compiled to show how technology can impact on the behaviour of those actors involved directly in aspects of waste handling and waste generation, i.e. the port and waste industries and the shipping industry

Table 3.3 Technological Drivers on the Behaviour of Actors

Actor	**Driver**	**Behaviour**
Port Industry	EU Directive	Increased provision of PRFs – increased vessel uptake plus higher income through element of harbour dues. Does not guarantee use of best available technology (BAT)
	New applications for PRFs	Extend availability to land-based sources of waste to maximise uptake and increase profitability.
	Improved waste recovery systems	Increased volumes of waste means BAT can be used to recover more by-products from wastes e.g. oil recovery, for onward sale and income generation
Waste Industry (Waste Disposal/ Recovery/ Recycling Companies)	EU waste legislation	Broad raft of legislation (see Chapter 5, Figure 5.2) means reduction in waste types which can be discharged at sea therefore increase in types and volumes of waste received in PRFs
	New applications for PRFs/Improved waste recovery systems	As port industry above
Shipping Industry	EU Directive	Compulsory uptake of PRFs in ports (with exceptions) with consequent higher costs and longer time spent in port may result in
	Waste reduction on board vessels e.g. green technology	• Introduction of equipment on board so less waste generated and reduced need to use PRFs; potential rebate on fees • Recycling of wastes, e.g. glass, plastics, becomes more cost effective
	Increased fuel efficiency	More fuel efficient engines results in reduced volumes of oily waste being generated

3.3.1 Port Industry and Waste Industry

Many ports do not own or even operate reception facilities directly. In most cases, they are contracted in from private waste contractors. Chapter 7, section 7.3.2 examines the results of two surveys of North Sea ports regarding physical type and ownership of facilities and notes that, in terms of "ownership", over two thirds of ports use contractors to run reception facilities while in nearly half of these ports, the contractors are the sole operators and providers. The port and waste industries have therefore been combined here as many technological developments will not just have an impact on the ports, but will also extend to the range of private companies offering waste disposal services, since it is the provision of facilities into which the ships owners discharge waste, and the technology available to deal with that waste, which is being considered, rather than the actual organization providing those facilities.

As technology is developed and introduced in one port/group of ports, information may be disseminated to other ports through membership of national trade organizations, or internationally through membership of trade bodies such as IAPH, which can publicise such developments on its website or through trade journals, for example. At all levels, ports are faced not only by ever-changing legislation, but also by the need to be profitable. Improvements in efficiency of waste recycling, the ability to extract more usable by-products from waste, and the ability to open up facilities to take waste from land-based as well as sea-based sources could all make such activities more profitable, and thus more likely to be offered through ports.

This is an example of how, although the Directive is specifically aimed at the port and shipping industries, other industries will also be impacted by it. Such companies may include barge operators which transfer waste from vessels into shore-side tankers operated by road haulage companies, waste processing companies (if waste is cleaned and recycled), or landfill sites (if wastes are dumped). If technology on board vessels reduces the amount of waste available to go into shore-based reception facilities, moves to offer services for land-based waste will also be vital to ensure that anything other than the most basic of facilities are provided in ports.

There are a number of potential problems associated with the provision of equipment in ports, including: size of port; number of vessels which use it; and the volumes of waste which could potentially be discharged, if all vessels comply with the requirements of the Directive. In larger ports, with high levels of vessel movements and high volumes of waste discharge, it should not prove too difficult for the port or external contractors to provide adequate, cost effective facilities for vessels. The potentially much greater volumes of waste being discharged as a result of the Directive should make it more attractive for companies operating these facilities to

introduce new technology so that they recover a higher proportion of waste by-products that can be sold on at a profit.

Technology, both in terms of its effectiveness, cost, and whether it can deal with the types of waste stream entering a port, will play a key role in the decision made by ports on whether to invest in new infrastructure directly or to bring in waste recovery firms to provide reception facilities. While larger ports may be able to invest in new technology, for the smaller ports receiving only small volumes of waste, obtaining suitable equipment may be difficult, as would persuading waste firms to operate in those ports. The types of facility most likely to be provided in smaller ports are bins on the quayside for garbage and oily rags, for example, and small tanks for oily wastes that are not segregated into different types. When ports are further required to provide facilities for sewage waste, lowest level technology would be additional storage tanks or some form of fixed connection to the sewage system of the port, for onward transmission to the local sewage works.

Such low level technology is unlikely to provide much profit for contractors which supply the bins and tanks, particularly if they are faced with transporting them over large distances by lorry to small, remote ports. In addition, the volumes of waste discharged are unlikely to provide any opportunity to waste recovery or recycling. Small volumes of mixed oil products, for example, may not be suitable for the equipment operated by the contractors. Contractors may not, therefore, wish to provide facilities in smaller ports, leaving those ports to either invest in new equipment in the knowledge that they are unlikely to recover that investment, to have all wastes placed in bins and skips and delivered to the nearest landfill site with no attempt at recovery or recycling, or finally to simply not comply with the Directive.

In this example, the introduction on a regional basis under ESDP of low cost technology able to handle small volumes of waste would be vital to increase levels of provision in smaller ports. It would also be more cost effective for waste contractors to operate such equipment and this would drive forward compliance with the Directive in terms of providing facilities for vessels normally using these ports. Vessels using those ports would no longer be able to use the excuse of inadequate provision as a reason for discharging waste at sea. The issue of inadequacy of provision is examined in Chapter 5, Section 5.3.1. The requirement for provision in the Directive provides an opportunity for the manufacturers and providers of waste reception and recovery equipment to find an increased market for that equipment. It will also drive forward changes in technology to develop equipment that is appropriate for different sizes of port.

Receipt of waste from land-based sources to create economies of scale for reception facilities may also result in problems. With the low levels of vessel uptake of facilities in the past, one

way to maintain the viability of facilities in ports has been to also take waste from land-based sources and, in some cases, the receipt and handling of waste from land-based sources may actually be the main business activity. Legislation covering wastes generated by both land-based and vessel sources will, therefore, apply to these companies. However, different standards may apply to the waste in terms of content or mix of components or the concentrations of contaminants, for example. Chapter 5, Figure 5.2 outlines the wide range of EU waste legislation currently in force.

Where technology has to be adapted to fulfill the requirements of legislation covering land-source wastes, then the types of waste recovered from vessels may no longer meet the standard required for disposal by that particular technology. This could be because it is not possible to recover or recycle a specified proportion of the waste or to reduce the levels of by-products and contaminants within the waste generated by vessels. In this case, if a company is not dependent on vessel-source waste to continue to operate, the situation may arise where the new technology, designed to meet the requirements of its main supplier of waste on land, cannot handle waste from vessels. Developments and adaptation of technology resulting from changes in legislation could also reduce the level of facilities available in some ports. Vessel owners, faced with having to invest in new technology, or with having to find a new company to deal with the waste generated if they cannot meet that standard, will then have a choice. They can pay for the new equipment, operate in a less suitable port where they can discharge without the new equipment, or they might choose to dump waste at sea and hope they are not caught.

Drewitt (1999)[*] provided an example of waste being unsuitable for the facilities in one port in the North East of England. This port unknowingly received oily waste that had been contaminated with chemicals and, as all vessels discharged oily waste into a tank where it was mixed together, the source of the contaminated waste was unidentifiable. The port was not able to deal with the waste directly and was forced to transport it to a specialist company in Wales and had to bear the cost of the special disposal.

Irrespective of size, ports are faced with the need to comply with the requirement of the EU Directive to provide facilities for vessels normally calling in at them. Therefore, any technological developments which make them better able to meet this requirement should have a positive impact on provision in the future, and result in increased volumes of waste being discharged by vessels.

[*] Drewitt, J L (1999). Personal Communication - Meeting held at Tees and Hartlepool Port Authority Offices, Middlesborough. 27 February 1999

3.3.2 Shipping Industry

Prohibitions are already in force, under international legislation, to prevent some types of waste from being discharged by vessels in certain sea areas. Chapter 1, section 1.3.2 notes that "special status" has been granted to North West European waters, including the North Sea and its approaches. The MEPC (1997) indicates that "discharges into the sea of oil or oily mixture from any oil tanker and ship over 400 gross tonnes [are] prohibited". This prohibition should mean high levels of uptake of reception facilities for oily wastes under the Directive. However, the situation is different for other types of waste.

While technological developments may play a significant role in increasing the provision of facilities in ports, the need for vessels to make use of facilities could be reduced by technological developments taking place on the shipping side of the equation. Financial pressure on shipping companies to reduce expenditure, and also to remain competitive, means that many companies will seek ways to minimise waste generated and thus reduce their costs. In terms of technological drivers, the development of new technology to better deal with ship-generated wastes is ongoing.

The provision and uptake of facilities for sewage waste is already low due to factors such as delay in entry into force of MARPOL 73/78 Annex IV and the 12-mile limit. This low level could be further reduced by developments in technology to deal with sewage wastes. Reader et al (1997) indicates that, in future, sewage will be "identified as nil-discharge waste material … [and] … there may soon be a requirement for onboard sewage systems that are capable of meeting this requirement" (page 2334). Reader et al (1997) provides an examination of existing technology – marine diesel engines – that can be used as a means of destroying the solid content of sewage. Currently, most vessels have little or no storage capacity for sewage waste, and it would be expensive to provide storage on board without either reducing cargo capacity of making "major modifications to the ship's constructional configuration" (page 2335). Such onboard systems could, if introduced on larger vessels such as cruise ships, mean that facilities for these vessels would be required only infrequently, and so there would be little incentive for ports which serve mainly cruise ships to invest in these facilities.

Reader et al (1997, pp 2334-2337) examines whether technology would be effective for specific vessel types, where the marine diesel engines could be used to burn up solid sewage wastes while a vessel was moving. For cruise ships, such a system would be effective while the vessel was moving between ports, but would require storage on board while the vessel was at anchor as the engines would not be operating at a level sufficient to allow destruction to take place. For ferries, this system could be effective in terms of the sewage production and the level of engine use, and it could also be used on cargo vessels with relatively small crews, which generate low

levels of sewage, and have a high level of engine use. If the development of this technology led to a system being useable by a wide range of vessels, there would be a consequent reduction in uptake of reception facilities for sewage waste, particularly in ports taking larger cargo or cruise vessels. Any decline in uptake could make the need for provision under the Directive irrelevant in some ports, and may result in changes to the Directive specific to this waste stream.

The need to protect military vessels from detection at sea is also a driver of change as the naval sector is involved in developing methods to reduce waste generation. Military vessel may be at sea for many months, and it will not be possible to store all the waste on board. However, if waste was discharged at sea, it could be used to track that vessel's whereabouts. By developing technologies that greatly reduce the amount of waste they have to dispose of, naval vessels can both extend the length of time between port visits, and also reduce the risk of detection.

Research into the use of technology on board vessels to destroy sewage waste has been undertaken by the US military. Schadow (2000) describes the development of an advanced thermal disposal system for sludge, in line with IMO and other emission requirements. This system combines an afterburner (effectively a jet engine) with a "cyclone-type Vortex Containment Combustor (VCC) for the treatment of liquid wastes (sludges)" (page 1). This system increases the waste throughput of a commercially available marine incinerator by using an afterburner to burn both the solid matter in the sludge and some of the resulting gases.

Schadow (2000) goes on to note that "this new technology has potential applications in future compact, efficient marine and shore/port based incinerators with active combustion control, continuous emission monitoring and automated control" (page 2). Such technology, were it to be introduced onboard vessels or in ports, could play a significant role in the more efficient disposal of sludges, including sewage wastes, together with the associated gas by-products of incineration. The system would also be able to handle sewage wastes from land-based sources, and this could provide an alternative source of wastes to ensure that reception facilities remained in operation, if there was a decline in volumes of wastes generated by vessels.

In terms of other waste types, the disposal of plastic waste is a serious issue since this particular waste can exist in the marine environment for very long periods of time. Dehner (1995, page 9) indicates that among the newest technology for dealing with plastic waste is "a plastic processor, which condenses plastic waste [into] discs which can be stored for shore disposal". Additionally, new types of plastic are being developed including one, plastic chitins, which is said to "chemically resemble natural plastics such as those found in the shells of marine crustaceans and biodegrade in seawater".

A further example of technology, and one which is already available for dealing with a wide range of wastes on board cruise vessels, is a system produced by Deerburg Systems (2000?), which provides a "state of the art multi purpose waste management system" able to deal with burnable waste, food and wet wastes, other dry wastes, glass and tins, sludge oil and sewage. Such a system, on board larger vessels, can further minimize the volumes of waste available to discharge into port reception facilities.

3.3.3 Summary

As technology continues to be developed, and is fitted on different vessels for a range of waste types, the requirement for vessels to discharge into port reception facilities may be reduced, and the provision of facilities could become economically unviable for ports. If, at a later date, ports sought to stop providing specific facilities, the result may be conflict with the provisions of the Directive. In this situation, it might be more appropriate to provide facilities on a regional, rather than port-by-port, basis, an option available under ESDP.

The three-year review of the Directive would allow developments in both port and vessel technology to be taken into account, and could lead to amendment of the Directive. The Directive does not exist in a static, stable situation, and will need to be responsive to future developments including introduction of new technology and its impact on the economic viability of port provision of facilities.

3.4 Financial Drivers

Financial factors can also influence the behaviour or decision making of those actors participating in a particular activity. In the case of the North Sea and pollution control, those actors not only include the ports and vessels which operate within the region but also the national governments and their agencies that are responsible for implementing the requirement of the Directive, and also the EU itself in seeking to establish legislation that is effective but also does not drive away trade and have a detrimental impact on the economy of the region. Table 3.4 has been compiled in order to identify the key financial drivers that can affect the behaviour of actors in the context of the EU Directive.

3.4.1 North Sea States

A direct consequence of the Directive for North Sea states will be the need to monitor vessel compliance with the Directive, and to ensure that a system of sanctions is in place so that vessels do not find it cheaper to dump waste illegally and pay a small fine, rather than pay for reception facilities in ports. In order to achieve this level of compliance, the use of vessel

inspections will be vital, in addition to those already undertaken under the aegis of the Paris MOU, as outlined in Chapter 6, section 6.4.2.

Table 3.4 Financial Drivers on the Behaviour of Actors

Actor	Driver	Behaviour
North Sea States	EU Directive	States introduce sanctions, e.g. fines, for: non-compliance, to cover inspection/administration costs; to cover clean-up costs of illegal discharges
	Maintain trade	Take steps to protect economy by ensuring that vessels continue to trade in ports, e.g. minimal fee or generous rebates for "green" vessels
Port and Waste Industries	Maintain Profits	Provide incentives for vessels to use your port/company rather than go elsewhere; Seek other sources of waste, e.g. land-based, to protect investment if there is a reduction of vessel source wastes
	Costs of PRFs	Recoup costs through fees; minimise costs by using low level technology; only use BAT if can recoup costs through sale of by-products recovered from waste
Shipping Industry	Maintain Profits	Introduce waste minimization methods on board to obtain rebates on port dues and minimise delays in ports; Use ports which offer low tech/low cost facilities; Discharge waste in "free of charge" ports
	Sanctions	Decisions on whether to illegally discharge may be based on whether fines are more or less than cost of using facilities

The increased provision of reception facilities under the Directive means that Government agencies will need to provide additional inspectors to cover a much broader range of ports and larger number of vessels than was the case prior to the Directive. These agencies will then need to recoup the costs of additional inspectors including, for example, extra central administration, travel costs for inspectors moving between ports, and associated salary and pension costs. These costs might be recouped through a levy on the element of port dues specifically covering reception facilities, through a direct fee charged to vessels, or through the financial sanctions. These sanctions may be imposed on vessels found to have discharged illegally, but may also be imposed on ports which fail to provide facilities.

There is also a further incentive for states to promote the use of the Directive in the North Sea region. If, as anticipated, the Directive leads to a reduction in pollution entering the marine environment in North Sea states and other EU seas, a reduction in the cost of cleaning up waste and increased tourism in coastal areas will produce an economic benefit at both a national and regional level. Increased employment in ports, the tourist industry and service sectors, and

within Government agencies will also benefit national and regional government, through a reduction in welfare payments for those people obtaining these jobs and increased tax revenue. Higher tourism levels will also bring money into local and regional economies as those tourists pay for accommodation, food and gifts, or visit tourist attractions. This in turn will create more jobs and bring more investment into these regions, again benefiting the economy at all levels.

The maintenance of trade within the region is very important to national and the wider European economy. It is important that the Directive, particularly through the use of sanctions, does not result in vessels being driven away to operate in other areas because, as outlined in Chapter 5, section 5.2.1, maritime trade accounts for around 90% of external and 35% of internal movement of goods within the EU. The cost of using reception facilities in a "tight" market, where margins of profit may be minimal, and where there is intense competition for business, could make it uneconomic for some vessels to continue to use EU ports. The result would be transfer of trade and jobs to other countries or to other modes of transport such as road or rail, with a resultant economic downturn in ports where there is reduced trade as vessel numbers fall.

At the broader EU level it is, therefore, important to consider issues such as finance, technology, and skill levels, for example, to ensure that all member states are capable of implementing the Directive, rather than being excluded or hampered by limited resources in one or more of these areas. When considering the issue of finance, it can be stated that what might be possible, affordable and appropriate for a "rich" state may not always be feasible for a "poor" one, and this is not necessarily just in terms of economically "rich" or "poor". This can also apply to technology, education, and availability of skilled workforce at the front line.

The introduction of the Directive may be appropriate and practicable for those countries which have the financial and technological ability to carry it out, and clearly this will (or should) have been considered during the decision making process and the development of the Directive. However, the question can be asked whether consideration was also given, in this process, to the ability of those states seeking membership of the EU to also undertake the requirements of the Directive, when potentially these states do not have the same resources to do so.

With the accession of a number of Baltic Sea states – Estonia, Latvia, Lithuania and Poland - to the EU in 2004, for example, these issues may need to be considered at the three-year review of the Directive. These states are formerly members of the Soviet Bloc and may have lower pay rates for workers in general, not just in ports, and also have very different economic, technological and skill resources available, or different environmental standards compared to richer Western states. Those states may, therefore, have problems in meeting the requirements of the Directive.

However, such states may also gain an economical advantage from these “problems”. Where a new member state has different environmental standards and has been allowed a period of time to bring those standards up to the EU norms, during that transition period the new member state could take advantage of lower standards to dispose of wastes more cheaply than is possible for other EU countries and gain an economic advantage in doing so. While, in this example, trade would stay within the EU, it might be transferred from “richer” states that can handle wastes in an environmentally sound manner, to “poorer” states that may not have the technological and skill levels required to deal with them. Thus the Directive, which seeks to reduce ship-generated pollution for the benefit of the environment of all member states, might result in the transfer of waste to a region which is much less able to deal with them and cause damage to the environment of that region. It might also result in damage to the economy of those regions where ports have lost business and jobs, and cause a degree of animosity in the relations between the member states involved.

3.4.2 Port Industry and Waste Industry

Port and waste industries are driven by the need to be competitive and to provide services to their users at the least possible cost, while seeking to maintain profits. As noted in section 3.3.1, waste companies are often contracted-in by ports as a sole operator to receive waste. In larger ports, however, there may be a number of competing companies offering a waste disposal service or certain specific shipping lines may have arranged contracts direct through their shipping agents. Whether they are sole operators or competing for business, these companies need to dispose of the waste as cheaply and with as much profit to shareholders as possible. In a situation where, for example, the cost of recovering usable oil from oily wastes means that they can make a profit – usually when the barrel price of oil is high – then companies will use a higher level of technology in order to recover more waste and make more profit. When the barrel price of oil is low, however, there is little financial incentive for them to do so.

In examining an example of the financial costs associated with the introduction of the Directive with regard to specific vessel types operating within the North Sea region, Chapter 7, Table 7.4 indicates that, for Category A – Bulk Carriers, 43 of the 77 ports responding to both surveys received this vessel type and provided reception facilities for them. A further 5 ports received vessels but did not provide facilities to accept waste generated by them. Facilities were actually used in 39 of the 43 ports. With the requirement of the Directive (Article 4) that they provide facilities for all vessels normally calling in at the port, the 5 ports not providing facilities for Category A vessels are faced with the requirement to make arrangements to deal with waste generated by them.

For ports, the provision of additional facilities would have financial implications in terms of financing infrastructure, administration and additional employees, if fixed facilities were built. If external contractors were brought in, they might also face higher costs from additional employees and administration, together with transport costs for transferring waste from the port to the disposal plant and, potentially, increased investment in infrastructure if current capacity to deal with wastes in insufficient. In addition, unless the port makes use of more than one contractor for waste disposal, leading to competition for contracts with the port, the price set by a contractor might also be so high that it is unaffordable for vessels operating on very tight margins.

The result of the introduction of additional facilities is likely, therefore, to be that ports increase their charges to vessels, to recoup costs, resulting in vessel owners or captains potentially choosing to take their business elsewhere. In that situation, the port may then be faced with having facilities available but no vessels calling in to use them. For smaller ports, where few vessels call in and these only rarely need to make use of facilities for small volumes of waste, the financial cost of implementing the Directive may be the difference between continuing to operate and closure of the port. The cost of any sanctions introduced for non-compliance of the Directive by ports might also be sufficient to drive these ports out of business. Unless ports could find another source of wastes to ensure that facilities remained cost effective, then provision of facilities on a regional basis under ESDP may be necessary to ensure their continued operation. If this did not happen, the closure of ports and the loss of jobs may have a disproportionately high cost of the local economy around a small, rural port compared to ports in more urban areas or where there are a number of different employment opportunities available.

3.4.3 Shipping Industry

Continued profitability will also play a major role in the decision by vessel owners of whether to continue to operate within EU waters. When ship owners are faced with increased costs through higher port dues to pay for facilities, it may be necessary to provide some form of financial incentive to offset these increased costs. One such incentive may be the use of “green awards” or rebates on port dues to owners of vessels with technology on board to minimise waste, so that they continue to use EU ports. An additional benefit of green awards to vessel owners would be publicity leading to increased business for the shipping companies holding an award, or through lower insurance premiums than the industry norm, as the potential for pollution from such vessels would be reduced, as would the risk of illegal discharges. A system of awards could also provide an incentive for other companies to improve their environmental credentials by taking measures to obtain their own “green award”. A direct consequence of such an awards system for Governments would be a reduction in costs for clean up of pollution incidents. Such

a scheme could also be used to generate good publicity and enhance the “green” credentials of the Governments at the same time.

By making financial incentives available to ships that generate less waste, this should drive forward the introduction of waste minimisation technology on board more vessels to take advantage of any possible reduction in waste charges. However, this could result in a decline in port income as ports would receive a lower fee from these vessels and the more such vessels there are, the lower the level of total fees generated to cover administration and other costs of the port reception facilities, although expenditure on administration and facilities might also be reduced.

In the case of vessels which do not introduce technology, but which continue to produce larger volumes of waste, these vessels may be charged a proportionately higher share of the costs of facilities within the port dues, together with charges for actual volumes of waste discharged. If vessels are faced with high costs, they may choose to discharge wastes illegally rather than bear these costs. A system of sanctions, including fines, will therefore be required to act as a disincentive against this behaviour. It will be necessary for both ports and vessels to maintain records of uptake of facilities and volumes of waste discharged, and this requirement of the Directive should make it easier to recognise potential polluters. Vessel inspections can then be targeted at these vessels to ensure compliance. However, these vessels may no longer find it cost effective to operate in European ports, in light of higher fees in ports or the threat of fines, and consequently transfer their business to other regions. The result of a combination of incentives and penalties should, it is anticipated, be an increase in “green” vessels travelling in European waters, with a consequent reduction in volumes of waste generated.

3.5 Cultural and Social Drivers

Rees (1990) states that “human beings are continually surveying the physical environment and assessing the value of particular organic and non-organic elements within it” (page 12). Over time, man has been transformed from “primitive food gatherers into farmers” while “the subsequent introduction of metal-based technologies … began a cumulative process of change in the structure and organization of society”. As a result, Rees (1990, pp 12-13) indicates that “the cultural significance of elements within the natural environment varies markedly between societies”. Using the example of a stretch of marshy ground, Rees (1990, page 14) states that this “may be regarded as a crucial natural conservancy area by an ecologist …, a nuisance which lowers agricultural productivity by the farmer, and may not be regarded at all by the unemployed urban dweller”, going on to state that it is “these differences in valuation that lie at

the heart of so many of the current conflicts over the use and allocation of environmental resources".

In terms of social inequality, the way a value is allocated to issues such as damage to or loss of ecosystems, loss of biodiversity or how to control inputs of pollutants into the marine environment will differ widely between richer and poorer states. In richer states, legislation to protect the environment is seen as a major issue being championed by a wide range of NGOs and environmental organization, and these groups will have a high level of visibility and power to influence the political agendas of Governments, particularly though their use of the media to raise awareness of environmental issues. However, in poorer states, where a government faced with basic concerns such as providing food and clean water for its citizens, such groups are unlikely to such a high level of impact on agenda setting.

Gregory (1999, page 53) notes that "concern for environmental values has become far more significant to many individuals and to social policies during the last 25 years, going on to indicate that this increase in significance is demonstrated in a number of ways, including:

- behavioural responses – increase in outdoor activities
- prominence of interest groups, which seek to protect the natural environment. In the case of marine pollution, this would include ACOPS, Friends of the Earth and WWF.
- increased use of legislation. Examples here include increased EU legislation (see Chapter 5) and other legislation (see Chapter 4) to protect the marine environment

In order to protect the natural environment, Gregory (1999, page 53) indicates that each initiative taken at either national or at a lower level requires "individuals and society to make decisions that acknowledge the trade offs between environmental and other types of values". These other types of values might include, for example, the roles and expectations placed on specific members of society such as politicians and businessmen, and what is considered to be acceptable behaviour for these groups. In the example of business behaviour, in some countries it is normal practice to present a potential business partner or government official with a gift as part of the negotiation process; in other countries, this could be classed as bribery and be subject to legal sanctions.

There are wide variations between the member states of the EU at the current time, and even within those member states, in terms of economic prosperity, rates of pay, rates of taxation, and cost of living. There are also variations in other factors including natural resources, levels of technology, population size and concentration, for example. In addition, North Sea states have differences, relevant to the Directive, including geographic location, size and number of ports,

and the economic value these ports have for the economy of that country. These variations could become increasingly significant following accession of a number of Baltic Sea states, for example.

An ethical value system is also important within the unwritten norms of a society, and can be used to place pressure on Governments and businesses to comply with legislation and to press for action against those who fail to comply. Dower (1989, page 11) states that "when we talk of environmental ethics we are usually talking of that set of values which those concerned with environmental problems believe ought to be accepted …", and that these will be "a set of principles, values or norms relating to the ways in which we interact with our environment". The result of this interaction, and the level of "value" set on the environment, as a whole or as separate elements, means that different societies, and different groups within those societies, value the environment to a greater or lesser extent, depending on the uses made of it.

Politics also has a role to play as the European Union seeks to implement a new Constitution which will transfer power away from national governments towards the EU, and at the same time seeks to increase levels of regional governance within its member states, again taking power away from central government. There has also been a decline in the level of trust of politicians at both national and EU levels resulting from, for example, the threat of political leaders of various EU states being taken to court over corruption issues, while the EU's accounts have not been certified for a number of years because of various instances of corruption. This decline in trust may lead to a decline in levels of voting for government at all levels, or lead to an increase in the number of votes cast for single issue parties, for example the election of members of the United Kingdom Independence Party as MEPs in the 2004 European Parliament Elections.

The role of the media, and the importance it places on issues such as the environment, and the level of involvement of the various environmental NGOs, can lead to pressure on all levels of government - national or EU - to introduce legislation to deal with specific environmental problems, including marine pollution. The threat of bad publicity on the television, in newspapers, or using the Internet, can also place pressure on a specific industry to comply with legislation. Agenda setting by NGOs through the use of friendly media can also increase public awareness of a particular issue and generate pressure on a government to introduce legislation, particularly if an issue is handled in such a way as to skew public perception onto a particular "message", irrespective of whether evidence is available to the contrary.

In the case of major pollution incidents, the issue of "symbolic impact" and the role of the media in disseminating information are important. Events such as the sinking of the *Erika* in

December 1999 inevitably cause public outcry which influences policy-making decisions, both at the national and EU level. Legislative developments resulting from the sinking of the *Erika* are discussed in Chapter 5, Section 5.4.2. However, what are the objectives of such actions – are they to do something that is practical and which will have a positive impact, or is it to look good in the eyes of the electorate? Although the Commission does not have an electorate *per se*, Commissioners are appointed through political patronage and hold the chairmanship of EU Directorates through that patronage. Failure to act could reflect back to the originating country of a Commissioner, and on the political party or leader that nominated that Commissioner.

The media can actively increase the levels of public outcry by frequently showing such incidents on the television and also by the range of articles published in national newspapers. As an example of this, Anderson (2002, page 7) indicates that “A series of oil spills since the late 1960s [including the *Torrey Canyon* (1967), the *Exxon Valdez* (1989), and the *Sea Empress* (1996) have attracted considerable attention from the news media” which have “their own particular vested interests [and which] compete to secure representation of the issues”.

Anderson (2000, page 7) further notes that “Environmental organizations, industry, scientists and government offer their own particular competing accounts of the "reality" of the situation”. By specifically selecting people to be interviewed on the television and radio from environmental groups, or by allowing representatives of these groups to write articles in the newspapers, the media can actively promote an organization’s agenda concerning an incident. This will raise levels of public perception about both the incident and the organization. If, at the same time, bodies representing tanker owners such as OCIMF are not included in televised debates, for example, then information to counter claims by environmental groups may not be available to the general public, again distorting reality to meet the agenda of a particular organization.

Other groups with a specific interest in control of pollution in the North Sea include the growing numbers of people who choose to live in coastal areas, and who demand measures to maintain or even improve the amenity value of the areas in which they live. There are also many industries that generate profit from the sea and its margins, including the tourist industry, which seeks to maintain the attractiveness of an area, or the fishing industry, which seeks reduction in pollution that damages fish or shellfish stocks. These industries also have a role to play in putting on pressure to introduce waste reduction measures such as the Directive.

When a major pollution incident takes place, both the residents of the coastal regions hit by that pollution, and the fishing and tourism industries, which see significant financial losses as a result of such incidents must also be considered. These groups may be approached by the media

for their opinions, resulting in a much more personal view of the impacts of pollution, for example in terms of loss of amenity, financial loss, or closure of businesses.

It is apparent, therefore, that the media can have a considerable influence on both the content of news regarding a pollution incident, both through whom it chooses to interview and how it chooses to present the incident. This influence may also extend to the allocation of blame for an incident. In the case of the *Exxon Valdez*, Anderson (2002, page 8) notes that "Coverage of the oil spill tended to be framed around the allegation that it was caused by the drunken state of the captain" which "played down other possible angles concerning cutbacks in maritime safety standards". In other cases, blame may be allocated to a ship's owners, builders or, following the sinking of the *Prestige* in November 2002, to the EU for not introducing regulations to outlaw single hulled tankers. However, in this latter case, the EU had already taken action following the sinking of the *Erika*, to phase out the use of such tankers in EU waters.

Cultural and social drivers can play an important role in driving forward the development of legislation. The different norms existing in different states may, however, result in problems in this process, since these states will place different values on the issue being legislated for. There is also some indication that legislation is not always appropriate or even necessary, had more time been taken to examine what is already in existence and also seek advice on the actual practicalities of such legislation. Cultural and social drivers are, by their nature, much more intangible than the other drivers examined in this chapter. They are, therefore, much less predictable in terms of how they might drive forward change in the behaviour of actors involved in developing legislation to control marine pollution.

3.6 Conclusions

In order to examine how legislation has been developed, and indeed continued to develop, it is important to consider all the different groups involved in the process, as in the example at Figure 2.1. It is also important to remember that all participants can have their own agendas that drive forward development of adaptation of legislation. These agendas can, for example, be influenced by the type of organization a body is, the types of rules it operates under, and its motivations – whether it is seeking a cleaner environment or to make a profit. It is vital to include, at an early stage, all those organizations which are required to implement legislation within the decision-making process, in order to introduce an element of practicability into it. It is also important that when they reach a conclusion and decide on a course of action, the decision makers do not say "implement this", only to find that it is not feasible in reality.

The development of international law in the area of the marine environment is an ongoing process. Legislation is developed and changes in response to a number of factors including: introduction of other legislation; developments in technology; new knowledge of the environmental impact of wastes; the financial effects of a pollution incident; and to societal changes. The basis on which legislation is developed needs to reflect these factors, to ensure that it remains appropriate to the task for which it was designed.

The decision to review the impact of the Directive on Port Reception Facilities after three years is, therefore, an important one. Considering just one driver to change, developments in vessel technology to minimize waste generation or to handle waste on board vessels, this might reduce the need for vessels to use port reception facilities so that there is no take-up of these facilities in some ports. This could then, potentially, result in it being more attractive to provide facilities on a regional, rather than port-by-port, basis, if a number of ports are geographically close enough to cooperate in such a way.

Chapter 4 will examine the development of legislation at national, regional and global levels, prior to the development of the EU Directive, while Chapter 5 will consider the development of the Directive itself, and set it within the context of other European marine pollution legislation. It will also consider how other European legislation being developed will impact on the Directive at a future date, and thus drive forward change in that Directive.

CHAPTER 4

THE DEVELOPMENT OF LEGAL CONTROLS ON NORTH SEA POLLUTION (PRE-DIRECTIVE)

4.1 Introduction

Although the main focus of this thesis is on the development and implementation of the EU Directive on Port Reception Facilities, it is important to set it within the context of the very broad field of legislation, both international and regional, which is also relevant to the governance of marine pollution. The Directive does not stand alone, but sits within a framework of multiple treaties, regulations, directives and conventions, as already discussed in Chapter 2, which looks at some of the broad range of bodies involved in the legislative process.

In order to better understand the legislative framework, this chapter will first examine the history of how various international and other agreements have developed since the first national legislation in 1918 in the UK leading through to the London Convention of the 1950s. It will then provide an overview of the broad range of regional marine pollution treaties and agreements in existence since the late 1960s, particularly considering those which specifically cover the North Sea.

Finally, the chapter will examine the role of the United Nations in the development of Conventions to deal with marine pollution. It will look specifically at MARPOL 73/78 which covers vessel-source pollution from oil, noxious chemicals, garbage and sewage waste. It will also look at the UN Convention on the Law of the Sea (LOSC) and, in particular, examine its role in setting general rules to prevent, reduce or control marine pollution, no matter what its source.

4.2 History of Marine/Oil Pollution Treaties[*]

A wide range of environmental legislation has been ratified by the European Union, and its predecessors, in the period since the late 1960's. Table 4.1 has been compiled to outline relevant legislation on marine pollution that has been developed to protect the marine environment in general, and the North Sea and North East Atlantic in particular. Although this chapter will examine many of the pieces of legislation identified in this table, it is not a comprehensive picture of all the legislation that has been developed to try and counter marine pollution. This section will, therefore, examine the history of legislation developed between the end of the First World War until the 1950s.

[*] Material for this section has previously been published in Carpenter and Macgill (2001(a))

Table 4.1 Relevant Legislation on Marine Pollution Ratified by the European Union

Year	Legislation
1969	Agreement for cooperation in dealing with pollution of the North Sea by Oil (Bonn Agreement)
1972	Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft (Oslo Convention)
1973	International Convention for the Prevention of Marine Pollution from Ships (MARPOL) and Protocols (MARPOL 73/78)
1974	Convention for the Prevention of Marine Pollution from Land-based Sources (Paris Convention)
1974	Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention)
1982	Memorandum of Understanding on Port State Control in Implementing Agreements on Maritime Safety and Protection of the Marine Environment (Paris MOU)
1983	Agreement for cooperation in dealing with pollution of the North Sea by Oil and other harmful substances (Bonn Agreement) – superceding 1969 Agreement
1992 (ratified 1998)	Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) which supercedes the Oslo and Paris Conventions

4.2.1 Early National Legislation – UK and USA

Pritchard (1987, page 1) indicates that, even as early as the end of the First World War, the problem of "widespread oil pollution from ships … caused fire hazards and damage in ports and health risks in coastal resorts". As a result, the first piece of legislation specifically dealing with ship-generated wastes was introduced in the United Kingdom to deal with this hazard. In 1918, wartime instructions were issued by the British Admiralty and Ministry of Shipping "to control oily discharges from ships". These instructions required ships masters to "discharge oily ballast and cleaning water from their ships outside the three-mile limit of territorial waters and to take precautions against leakages of oil when loading, unloading, or re-fuelling at port".

However, despite this instruction, problems continued after the war when responsibility for preventing oil pollution reverted to port officials, rather than national authorities, resulting in damage to fisheries and harbour amenities, and also harbour fires. Pritchard (1987, page 2) indicates that even if a port had introduced local bye-laws to combat the problem of harbour pollution "port officials noted that their powers to curb pollution in harbours dated to an era when oil ships were an oddity … and penalties were so ridiculously low as to invite defiance". These bye-laws were originally introduced during the reign of King Henry VIII in 1543, and had a maximum fine of £5.

Resulting from these problems, the British Government developed legislation during the early 1920s to deal with the problem of oil pollution in UK harbours. In the development stage, "all parties agreed that the best way of preventing the oil pollution problem was the provision of

port reception facilities … into which the oily water from ships or tankers could be transferred" (Pritchard, 1987, page 4). This is the first known example of port reception facilities being proposed as a means of dealing with pollution and, at this time, the suggestion proved highly controversial.

Problems of ports being unwilling to invest in new infrastructure and ships being unwilling to use facilities because of delays in turn-around time and additional costs were raised during the development of the UK Oil in Navigable Waters Act of 1922 (effective January 1923). This "became the first national law against oil pollution [bringing] temporary relief [from] pollution in ports and harbours" (Pritchard, 1987, page 5). Similar problems have also been associated with the introduction of the EU Directive on port reception facilities. However, because of problems during the development of the 1922 Act, and despite recognition that port reception facilities would be the best method of dealing with oil pollution, no legal obligation was placed upon ports to provide them. Vessels were allowed to continue to discharge outside the three-mile limit. Pritchard (1987, page 19) indicates, customary international law of the time "admitted only a three-mile width of territorial seas within which the coastal state had the right to regulate ships". Customary international law is examined in Box 4.1.

Box 4.1 Customary International Law

McDorman (2000, page 256) notes that "the contents of a treaty can emerge as part of customary international law and become binding on all states". However, this requires "acceptance …on the part of states that a concept or rules has become customary international law". Where a state "persistently objects to the existence of customary international law, any rule that emerges is not applicable to the objecting state".

McDorman (2000, page 256) also notes that customary international law is most effective when dealing with "broad concepts such as vessel rights of innocent passage or a coastal state's right to an exclusive economic zone. More technical issues such as the development of rules by the IMO the United States and the EU to phase out single hull tankers, for example, are unlikely to achieve such status.

Also in the early 1920s, the United States had recognized that it had little protection against oil pollution and took action in an attempt to overcome this problem. Pritchard (1987, pp 6-7) indicates that, in an attempt to legislate for the problem, six bills were presented to the US Congress between 1922 and 1924, leading to the US Oil Pollution Act of 1924. This Act was more effective than the British Act in that enforcement fell under the remit of the US Coastguard (as opposed to UK port operators), while the maximum fine for oil pollution was set at $2000 (compared to £100 in the UK).

4.2.2 1926 International Conference on Oil Pollution/Draft Washington Convention

Following national legislation introduced in the UK and US, in June 1926 the first International Conference on Oil Pollution took place in Washington DC, with representatives from 13 states including all the North Sea states. Pritchard (1987, pp 17-19) identifies the key measures resulting from this Conference which were: establishment of a Technical Committee "to consider the ships which would be regulated and to define the types of oil pollution to be prohibited" (page 17); setting of standards for the purity of waste water which could be discharged, based on oily water being cleaned up so that the oil content was 500 ppm – parts per million (page 18); and an examination of where ships could actually discharge their wastes, with the establishment of a Committee on Zones (page 19).

Finally, Pritchard (1987, page 17) indicates that, at this time, there was no "internationally-acceptable definition of pollution" and agreement was therefore sought on such a definition. The 1926 Washington Conference established what has become a lasting precedent, its definition of pollution control being based not on "absolute purity of discharges from ships but, on a standard of water contamination within the limit of available technology" (Pritchard, 1987, page 18). This definition continues to be used today.

The IMO (2000(a), pp 59-61) states that MARPOL 73/78 allows vessels to discharge "clean or segregated ballast or unprocessed oily mixtures which without dilution have an oil content not exceeding 15 parts per million and which do not originate from cargo pump-room bilges and are not mixed with oil cargo residues" (Reg. 9, Para (4), page 59). Such discharges should only take place outside the 12 mile limit (12 nautical miles from the nearest land) if the area in question is not in a special area. North West European Waters including the North Sea and its approaches have held special area status since February 1999. (Reg. 10, Para (1)(h), page 61).

Problems with the draft Washington Convention included opposition from a number of maritime states that did not want to see international obligations placed on their vessels. A major concern was the introduction of zones inside which ships could not discharge their waste. Arguments about who would have jurisdiction for prosecuting vessels which did discharge, and also on the size of zones (ranging between 50 and 150 nautical miles at a time when there was a 3 mile limit) led to significant disagreements between states. Pritchard (1987, page 31) also indicates that "other developments in the maritime industry, the decrease of pollution, and the onset of the Great Depression in 1929 – 1934", with its consequent impact on shipping levels, led to a more cautious approach in dealing with vessel source pollution. Plans for the introduction of an oil pollution treaty, anticipated from the Washington Convention, were abandoned.

The issue of jurisdiction was, and remains, a significant one in the development of legislation to combat ship-source pollution. It was one of the factors that led to the failure to sign the draft Washington Convention, since flag states were unwilling to allow other states to prosecute their vessels. An examination of the issue of jurisdiction appears in Box 4.2.

Box 4.2 Jurisdiction

Mitchell (1994, pp 75-76) states that "International Law categorizes nations as flag, coastal, or port states based on their relationship to a given vessel. A flag state is the state of registry, a coastal state is a state through whose territorial waters a vessel passes, and a port state is a state into whose ports a vessel enters". It is the *Flag State*, in most instances, which has jurisdiction under international law, to "monitor, investigate, prosecute and penalize violations of their domestic laws" by those vessels which are registered in that state "no matter where such violations occur".

In the event of pollution occurring in the territorial waters of a *Coastal State*, unless the vessel then enters one of that state's ports, the coastal state which is faced with the resulting pollution is only able to collect evidence regarding the pollution incident and forward it to the flag state which retains jurisdiction in this situation. With regard to pollution incidents in a coastal state's waters, where the vessel then enters a port of that state, the state then becomes a *Port State* and has "internationally authorised jurisdiction to investigate, prosecute and penalise the [vessel]" should the vessel have violated international law.

Identification of which state actually held jurisdiction became increasingly complex in the early 1920s with the introduction of Prohibition in the United States and the introduction of *Flags of Convenience*. As Alderton and Winchester (2002, page 36) indicate, following a treaty between the US and Panama to exempt shipping profits from taxation, a "number of United States passenger ships were transferred to the Panamanian registry in order to avoid the prohibition laws". Many European ships, particularly from Spain, were also re-registered to Panama. Currently, Alderton and Winchester (2002, page 39) list 37 states operating flags of convenience.

The issue of jurisdiction can lead to significant difficulties in enforcing marine pollution legislation on vessels flying a flag of convenience. The scale of the potential problem is highlighted by Vorbach (2001, page 31) who notes that nearly half of all the worlds ships sail under flags of convenience and states that "while some flags of convenience … do a better job than national flags in enforcing international standards on the ships they flag" there are some cases where "flag of convenience registries collect fees … but fall short in their efforts to uphold internationally agreed upon standards".

Ellis (1995, page 33) also indicates that problems occur with conventions because "national sovereignty prevents effective enforcement". An international convention is only binding following voluntary ratification by a state. It is then up to that state to enforce it and take action under the convention against vessels registered in that state. If a state has not ratified a convention and a breach occurs in another state's waters, even if that latter state is a signatory to the convention, it has little recourse "should the flag state do nothing".

4.2.3 1935 League of Nations Draft Convention

The use of port reception facilities waste was also raised through the League of Nations when, in 1935, it sought to develop a draft convention to deal with oil pollution and to hold an international conference at which this convention could be finalised. The draft convention, like the Washington Convention, sought to introduce a system of zones into which "oil or oily wastes could not be discharged by ships belonging to the states which adhere to the treaty" (Pritchard, 1987, page 54). However, the problem remained of who would have jurisdiction over these zones and, as Pritchard (1987, page 55) notes, "what use were these pieces of paper if they could not be enforced?"

A draft League convention and draft Final Act arising from it was issued in 1935. However, despite a favourable response to establishing an oil pollution agreement, the draft treaty was abandoned without an international conference ever taking place. With the onset of the Second World War and its aftermath, in terms of loss of infrastructure, destruction of shipping, and the post-war economic crisis and period of reconstruction in Western Europe, the region faced many problems other than dealing with marine pollution prevention. At the same time, the League of Nations had been superceded by the United Nations which, in 1948, established the convention of the Inter-Governmental Maritime Consultative Organisation (IMCO, which later became the IMO). Although the convention was ready for signature, it took until 1958 for IMCO to come into operation. Concern over the issue was still apparent, however, and pressure, mainly from the UK, led to an international attempt to legislate for the problem in the early 1950s.

4.2.4 1954 International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL)

After the Second World War, problems of oil pollution increased in line with increasing demand for Middle East crude oil in western countries, and tankers were discharging increasing levels of crude oil as a result of tanker cleaning and other operations. As a result, there were many complaints in the UK and elsewhere in Europe regarding oil spills on beaches.

The UK Government continued to search for international agreement to deal with oil pollution. As a result of the delay in establishing IMCO, the UK Government decided to work towards legislation which was acceptable both domestically – to shipping and ports industries, and to environmental groups – and internationally. In the face of increasing pressure from interest groups and the formation of ACOPS (the Advisory Committee on Pollution of the Sea), the Faulkner Committee was appointed by the UK Government to examine all aspects of the oil pollution problem. At the same time, ACOPS - which consists of NGOs such as the RSPB, tourist organisations and local government - sponsored "the first international conference by a non-governmental body in London in October 1953" (Pritchard, 1987, page 84). Representatives from governments, oil and shipping interests, port authorities and environmental groups were invited by ACOPS to participate in this conference.

The 1953 Faulkner Report covered aspects such as inadequacy of provision of reception facilities, sources of pollution, types of oil entering the environment, equipment to minimize waste production, and the use of zones where oil could not be discharged. The Report became the main driver to UK policy on marine pollution by oil and led, in 1954, to the UK Government sponsored International Conference on the Pollution of the Sea, held in London. Pritchard (1987, page 85) indicates that this conference was attended by 31 countries, representing 95% of the world's shipping and "all delegations (except that of the United States) [had] full powers to frame and sign an international convention".

Considerable difficulties were experienced during negotiations at this Conference because of "Cold War" politics, and disagreement between Governments over how much oily waste should be allowed. As Mitchell (1994, page 84) notes "The United Kingdom proposed to limit discharges throughout the ocean, essentially requiring all tankers to stop discharging waste oil at sea rather than merely discharging as far from shore as possible under a zonal approach". All waste would be retained on board tankers and only discharged in port reception facilities. Most countries were unwilling to adopt a system which would require significant costs in terms of infrastructure, particularly when they had little incidence of oil pollution in their coastal waters or on their beaches.

The final 1954 OILPOL Convention resulted in a system where vessels were prohibited from discharging "above a certain limit within specified zones, defined as 100 ppm and fifty miles" (Mitchell, 1994, page 85). There was no restriction placed on discharging outside these limits and only a very limited requirement for reception facilities. However, as Mitchell (1994, page 85) indicates, these were to "meet to needs of non-tankers, [and] did not require equivalent measures for tankers, ensuring that tankers would have limited alternatives to discharging at sea". OILPOL was finally ratified in 1958 and was the first international convention regulating

oil discharges. However, because of dissatisfaction with the original agreement, and with increasing levels of oil transport and consequent pollution, further conferences sponsored by ACOPS and IMCO took place, leading to amendments to OILPOL in 1962 and 1969. The UK and other North Sea states had pressed for the closure of the North Sea to all dumping – as finally happened when the area gained special status under MARPOL 73/78 – but this did not take place.

The main result of the 1962 amendments (entry into force 1967) was that new tankers over 20,000 tons were banned from discharging anywhere. Three companies – Shell, British Petroleum and Esso – in 1964 announced the development of the LOT (Load on Top) system, under which tankers would load oil on top of the oily slops in their holds, while discharging the ballast water that had been pumped into these holds at the same time. However, this system "required tanker owners to determine visually when to stop discharging water from beneath oil slops [and the] oil companies admitted that … this would frequently result in discharges exceeding 100 ppm by large amounts" (Mitchell, 1994, page 89).

In terms of the 1969 amendments (entry into force 1978), Mitchell (1994, page 92) indicates that, in return for a redefinition of the main rules on discharges so that "compliance would not require the installation of expensive equipment", oil companies agreed to standards which were both enforceable and would result in a reduction in oil pollution. The international rules now "required that the amount of oil entering the oceans be reduced rather than redistributed". This significant as it is the first attempt to seek a reduction in vessel-source oil pollution, rather than merely allowing vessels to continue to pollute at the same level, as long as it was outside the specified zones.

4.3 Regional Agreements

Hey (2000, pp 325-326) states that "If one were to search for a treaty especially designed to serve the protection and preservation of the North Sea … one might be disappointed to find only one treaty, the so-called Bonn Agreement". In addition, Hey (2000) notes that the only forum, apart from the Bonn Commission, which is specifically concerned with the North Sea is the International Conferences on the Protection of the North Sea. Hey (2000, page 325) does, however, state that "The international regime for the North Sea functions within a complex network of multilateral and regional treaties and institutions, without the existence of a treaty that focuses on the overall protection of the North Sea ecosystem".

Hey (2000, page 326) suggests that, to get a more complete picture, "one should direct one's search at the large number of treaties and legally non-binding documents that include the North

Sea as an area of concern". This section will look at some of the regional agreements that have been developed to deal with marine pollution in the North Sea and wider North-East Atlantic Area. When considering these Regional Agreements, however, it is important to remember that they are not static but continue to respond to changes in knowledge, technology, legislation and also in response to economic developments.

There are many examples of how legislation has continued to develop over time. This development is often in the form of the addition of various protocols, annexes and amendments in response to new information, and to changes in industry practice or vessel standards, for example. An example of this development is the case of the Oslo and Paris Conventions which, it was felt in 1992, did not adequately control all sources of pollution.[*] The Oslo and Paris Conventions were, therefore, replaced by the combined Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention) in 1992. These three Conventions are, therefore, considered as a group at Section 4.3.2.

4.3.1 1969 Agreement for cooperation in dealing with pollution of the North Sea by Oil (Bonn Agreement) and its 1983 Amendments

The 1969 Bonn Agreement was established to aid in the protection of the North Sea environment in the event of oil pollution incidents. Membership is made up of the 8 North Sea states together with the EU. Hey (2000, page 333) notes that the 1969 Agreement "was the first treaty with relevance for the protection of the North Sea ecosystem from polluting substances". Article 1 of the original Agreement[**] established a system of cooperation between states when there was a "grave and imminent danger to the coast or related interests of one or more contracting parties". The Agreement covers areas such as co-ordination and information-sharing on prevention and safety measures, contingency planning and general environmental policy. While this Agreement recognizes in its Preamble that "grave pollution of the sea by oil in the North Sea area involves danger to the coastal states", it does not restrict itself solely to oil pollution.

In its 1983 Amendments, the name of the agreement was amended to show that it dealt with "pollution of the North Sea by Oil *and other harmful substances*". In order to do so, Hey (2000, page 333) indicates that the Bonn Agreement "divides the North Sea into emergency response areas and regulated co-operation among its parties in case of calamities involving oil or other harmful substances".

[*] Material for this section has previously been published in Carpenter and Macgill (2001, page 90)
[**] Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil, 1969

4.3.2 The Oslo, Paris and OSPAR Conventions

1972 Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft (Oslo Convention)

The Oslo Convention of 1972, which entered into force in April 1974, was established with two main objectives. The Green Globe Yearbook (1995, page 152) outlines these as the prevention of "pollution of the sea by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities, or to interfere with other legitimate users of the sea". This was to be done by "prohibiting the dumping of harmful substances from ships and aircraft and by providing a system of permits or approval for the dumping of other substances".

All North Sea states were signatories to the Oslo Convention, together with a number of other states such as Greenland and Iceland, the geographic scope of the Convention being the North East Atlantic and the North Sea. The Oslo Commission (OSCOM) was the main executive body of the Convention and worked with the Paris Commission (PARCOM). The two Commissions had a common secretariat, but set up their own scientific groups. The Oslo Commission established the Standing Advisory Committee for Scientific Advice (SACSA) at its first meeting. There was, however, a combined scientific committee, the Joint Monitoring Group (JMG) which is the scientific committee common to both Commissions. As a result, scientific advice could be used when making policy decisions with many of the activities resulting from the Conventions being coordinated by the two bodies through the common secretariat.

Sand et al (1992, page 185) note that the Oslo Convention was "one of the earliest regional agreements for the protection of the marine environment [which] represents an initial attempt at international regulation of marine pollution by dumping". It established a general prohibition on dumping of any materials unless a permit or approval from the appropriate national body had been obtained in advance. More importantly, Sand et al state that "[t]his Convention has an actual bearing on global marine environmental protection because it actually sets down a number of ground rules which did not exist before." One example of this is the classification of polluting substances into 'black' and 'grey' lists (see Box 4.3) in the Annexes to the Convention. Such lists are, Sand et al (1992, page 185) notes, "now to be found in practically all international treaties or marine pollution".

Finally, co-operation between member states also forms a part of this Convention. Sand et al (1992, page 187) indicates that, while each "Contracting Party shall take appropriate measures to prevent and punish conduct in contravention of the provisions of this Convention (Art.15(3))". In addition, all "Contacting Parties also undertake to assist one another as appropriate in dealing

with pollution incidents involving dumping at sea (Art.15(4)), and to work together in the development of co-operative procedures for the application of the Convention, particularly on the high seas (Art.15(5))".

Box 4.3 Black and Grey Lists

The Green Globe Yearbook (1995) identifies the main differences between the two lists as follows:

Black List Substances:

- Cannot be dumped at all
- Land-based emissions of these substances should be eliminated, if necessary in stages
- Originally included mercury, cadmium, and organohalogen compounds

Grey List Substances:

- Can only be dumped subject to permission
- Emissions are strictly limited
- Originally included arsenic, chromium, copper, lead, nickel and their compounds

Substances not covered under original 'black' and 'grey' lists required amendment to annexes so that they could be covered

1974 Convention for the Prevention of Marine Pollution from Land Based Sources (Paris Convention)

The Paris Convention of 1974 entered into force in May 1978. The Green Globe Yearbook (1995, page 154) outlines its objective as taking "all possible steps to prevent pollution of the sea by adopting individually or jointly measures to combat marine pollution and by harmonizing the Parties' policies in this regard". The Paris Convention covered all North Sea states, its main executive body being PARCOM.

Sand et al (page 195) indicate that the main difference between the two Conventions was that the Paris Convention was one of the first international agreements aimed at the prevention of pollution from land-based sources. Although, both Conventions include a requirement that Contracting Parties act in co-operation and make use of the same categories of 'black' and 'grey' list substances, Hey (2000, page 333) indicates that "[w]hile the Oslo and Paris Commissions held joint meetings and shared a secretariat, *which also served as the secretariat to the Bonn Agreement*, initially their links were mainly of an administrative nature". Each Convention determined its own agenda, held its own meetings and set its own programme of work. Only in the case of the scientific Joint Monitoring Group did separation not occur.

The main characteristic of both Conventions was the focus on prevention or reduction of substances entering the marine environment, not on reducing overall production of these pollutants. As a result, the Conventions would not necessarily lead to a reduction in such pollutants but rather their transfer elsewhere. The monitoring system for these Conventions also measured concentration of substances and not their biological effects or the state of the environment. Success was, therefore, measured by whether levels of different substances were decreased and not, as Hey (2000, page 335) indicates, by "whether the state of the marine environment was improving or whether it was continuing to deteriorate and thus required the taking of further measures".

Finally, because new substances were not covered by the 'black' or 'grey' lists without changing the Annexes to the Conventions, there was nothing to prevent these substances from being dumped until all Contracting Parties agreed to amend the Annexes. In addition, as scientific knowledge improved and the environmental damage caused by pollutants was better understood, Annexes would need to be amended to take account of this new knowledge. There was, therefore, a level of inflexibility and delay built into both Conventions which, in part, led to them being superceded by the 1992 OSPAR Convention.

1992 Paris Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention)

The OSPAR Convention of 1992 entered into force in March 1998. The Green Globe Yearbook (1995, page 156) sets out its objectives as safeguarding "human health and to conserve marine ecosystems and, when practicable, restore marine areas which have been adversely affected". Additionally, it sought to "take all possible steps to prevent and eliminate pollution and enact the measures necessary to protect the sea area against the adverse effects of human activities".

The decision, taken in 1990, to establish the OSPAR Convention to supercede the Oslo and Paris Conventions was, as Hey et al (1993, page 2) indicate, "fuelled by developments in marine environmental policy and law which had taken place since the adoption of the two conventions". As a result, it was apparent that the work being undertaken by the separate Commissions no longer corresponded to the requirements of the conventions and action was required to make the conventions more relevant to the current time.

At the same time, there was pressure to increase the scope of the conventions as a result of the International North Sea Conferences (INSCs) of 1984, 1987 and 1990. At these Conferences, several legally non-binding decisions were taken at ministerial level that could be made legally binding if they were adopted under the Oslo or Paris Conventions. The Conferences also

required specific action to be taken by the Paris and Oslo Commissions through a series of Ministerial Declarations.

Hey et al (1993, page 3) outline a major problem arising from this situation in that the decisions of the INSCs only relate to North Sea states. However, because contracting parties to the Conventions extended beyond the North Sea, those states which were party to the Oslo and Paris Conventions but "which did not participate in the INSCs saw themselves confronted with already negotiated texts which they were urged to adopt without modification". In order to overcome this problem, both Commissions adopted a procedural arrangement in 1988 that allowed these states to meet these requirements of the conventions at a later date.

Even more significant, however, was the traditional use of 'black' and 'grey' lists as opposed to use of the *Precautionary Principle* (see Box 4.4) which placed greater emphasis on the potential rather than actual threat from pollutants entering the marine environment. Lack of scientific knowledge about the impact of a substance was no longer considered a reason to take no action in preventing its dumping.

Box 4.4 Precautionary Principle and Polluter Pays Principle - Definitions

1. Precautionary Principle

Principle 15 of the Rio Declaration (1992) defines the Precautionary Principle as:

> "*In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation*."

2. Polluter Pays Principle

Principle 16 of the Rio Declaration (1992) requires that:

> "*National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment*".

Declaration XVI of the 1987 INSC, detailed in the Ministerial Declarations (1995, page 49), indicates that the Ministers of North Sea states agreed "to accept the principle of safeguarding the marine ecosystem of the North Sea by reducing pollution emissions of substances that are persistent, toxic and liable to bioaccumulate at source by the use of the best available technology and other appropriate measures. This applies especially where there is reason to assume that certain damage or harmful effects on the living resources of the sea are likely to be caused by such substances, even when there is no scientific evidence to prove a causal link between emissions and effects ("the principle of precautionary action")."

Hey et al (1993, page 11) indicate that the precautionary principle had not, previously, "been part of an internationally legally binding document specifically related to the protection and preservation [of] the North East Atlantic Ocean [and its] mandatory prescription … [was] an important achievement". Adoption of the precautionary principle and increasing numbers of substances being identified as potentially hazardous led to increasing pressure on Contracting Parties to amend both Conventions. However, it was decided to combine the two Conventions into the OSPAR Convention as there was already co-operation between the two Commissions in terms of procedural and financial issues, together with some duplication in the work of both.

The OSPAR Convention also required all Contracting Parties to adhere to a second principle, the *polluter pays principle* which Hey et al (1993, page 13) indicates "had not previously been adopted in the framework of the Paris or Oslo Commissions [but had] … been included in several related recent treaties". The European Commission (1975, page 1), for example, received a Council Recommendation indicating that, in the event of an accident resulting in serious pollution, the Commission would be required to "study the steps necessary to ensure a more efficient application of the "polluter pays" principle". Under this principle, the person deemed responsible for the pollution "must pay the cost of measures to prevent or control [it]".

The OSPAR Convention resulted, therefore, from a number of factors including: a recognition that the Oslo and Paris Conventions were no longer appropriate in light of increasing scientific awareness of the impact of pollutants on the marine environment; the criticism of the inflexibility of the 'black' and 'grey' lists mentioned previously; and the increasing adoption of both the Precautionary and Polluter Pays Principles in other treaties and regimes, both globally and regionally.

Hey et al (1993, page 49) conclude that the OSPAR Convention is important in that it "goes beyond what has been achieved in other regions and for this reason its envisaged role in interregional cooperation will be an important one". However, Hey et al (1993, page 49) also state that "legal texts such as this Convention in themselves do not protect the marine environment." The final sentence "It is up to the Contracting Parties to generate the political will to use the Convention to achieve this purpose" is significant since it is the State as signatory to such a Convention that is responsible for taking the necessary actions, rather than one over-arching body. This requirement that the State is responsible for taking action under an agreement is also the case with the EU Directive on Port Reception Facilities. Individual states must introduce national legislation to bring in the Directive's requirements, and are therefore allowed to take into account national concerns in this process.

4.3.3 1982 Memorandum of Understanding on Port State Control etc. (Paris MOU)

Molenaar (1996, page 241) notes that, towards the end of the 1970s, there was increasing concern regarding the growth in substandard ships and about the “environmental and safety aspects in international shipping". At a meeting of European Ministers responsible for maritime safety in 1980, Kasoulides (1990, page 182) indicates that ministers “unanimously agreed that the elimination of substandard shipping should be their mutual aim, best served by preventive action”. As a means of taking such preventive action, a draft text was placed before a second Ministerial Conference held in Paris in 1982. This draft text was agreed by all participants and became the Paris Memorandum of Understanding on Port State Control which entered into force in July 1982.

The Paris MOU provides for a system of Port State Control under which a foreign merchant ship can be inspected upon entry into a member state’s port to ensure that it complies with standards laid down under a number of relevant instruments when entering a member states ports. These relevant instruments are listed at Chapter 2, Section 2.2.4.

In terms of jurisdiction over vessels entering a member state’s ports, Kasoulides (1990, page 182) notes that “(a) the chief responsibility for the effective application of standards lies with the flag state; and (b) that the rights and obligations of the participating states are supreme under any international agreements”. However, Kasoulides, (1990, page 185) states that MOU partners are also required to “regard the ships of another MOU partner as foreign ships for the purpose of their inspections” (to ensure that vessels flying the flags of non-MOU states are not treated more unfairly than MOU state vessels. Although, as Kasoulides (1990, page 185) notes, while no penalties “are imposed on the master or the crew of the vessel”, the port state is still able to “impose penal sanctions and fines in compliance with its other international or national requirements”. As a result, this recognises the right of a state to enforce its own legislation within its own territory.

Around 25% of vessels entering an MOU port are inspected each year, and where deficiencies are identified, the Paris MOU allows for action to be taken by the port state. The Paris MOU (2002) set out at 3.7.1 the requirement that “In the case of deficiencies which are clearly hazardous to safety, health of the environment, the Authority will … ensure that the hazard is removed before the ship is allowed to proceed to sea … [and] appropriate action will be taken”. This appropriate action, which is taken by the port state irrespective of where the vessel is flagged, may include “detention or a formal prohibition of a ship to continue an operation due to established deficiencies which … would render the continued operation hazardous”.

Deficiencies are not necessarily physical problems and Chapter 6, Section 6.4.2, examines the nature of deficiencies in more detail. However, in the case of significant deficiencies outlined under 3.7.1, vessels may be delayed or detained until appropriate remedial work is carried out. In a situation where a vessel cannot be repaired at the port where it has been inspected and detained, there is scope under 3.8 to allow a vessel to proceed, under certain condition, to the nearest appropriate repair yard available.

The Paris MOU has continued to develop and adapt to meet changes including a broadening of its membership and changes in the types of vessels calling in a member's ports. This latter issue includes aspects such as ageing vessel fleets for some types of vessels, the phasing out of other types of vessels such as single hulled tankers under the MARPOL 73/78 Convention, and the introduction of new types of vessels. The Paris MOU does not operate in isolation however. Since its introduction, MOU Regimes have been developed in other areas including the regional Port State Control agreements of the Tokyo MOU Asia Pacific Region, the Viña del Mar Agreement Latin American Region and the Indian Ocean Memorandum of Understanding.

The issue of Port State Control provides an example of how the EU has also developed its own legislation that mirrors or duplicates the legislation developed by other bodies. Salvarani (1996, page 225) notes that this was the result of concerns that member states were not applying the requirements of the Paris MOU – for example, the required 25% level of inspections of all vessels. Increasing numbers of substandard ships were also entering European ports. The EU therefore introduced a Directive on Port State Control[*] which entered into force in July 1996. The main objective of the Directive was "to force EU Members to enhance the effectiveness of, and to obey the rules and standards" for Port State Control. The Directive also includes a "binding commitment to inspect at least 25 per cent of all ships entering a port and, by inference, an obligation to employ qualified staff proportional to the task".

4.4 United Nations response to vessel-source oil pollution

The United Nations has played a major role in developing both legislation and plans for action to deal with marine pollution globally. Through the creation of IMCO in the 1950s and the development of Conventions such as MARPOL 73/78 and the UN Convention on the Law of the Sea (LOSC 1982), resulting from the Third UN Conference on the Law of the Sea (UNCLOS III), the UN has worked to reduce marine pollution for more than 50 years. This section examines these Conventions and the Law of the Sea Conference, to illustrate how they

[*] Directive 93/75/EC on Port State Control. Pub. Official Journals of the European Communities, No. L247 of 5.10.93, page 19.

have contributed to the overall structure of legislation which has been developed to deal with marine pollution.

4.4.1 1973 International Convention for the Prevention of Marine Pollution from Ships (MARPOL) and Protocols (MARPOL 73/78)

In 1973, the Inter-Governmental Marine Consultation Organization of the United Nations (IMCO) – superceded in 1982 by the IMO - sponsored the International Conference on Marine Pollution held in London. One of the main objectives of this Conference, as outlined by Pritchard (1987, page 170), was to "draft a comprehensive new convention that would completely eliminate the wilful and intentional discharge into the seas … of oil and noxious or hazardous substances … and the minimization of accidental spills by all types of ships". The result of this Conference was the 1973 MARPOL Convention which entered into force in October 1983. This new convention was intended to update the original 1954 version of OILPOL and make it more relevant to contemporary activities in the tanker industry in 1973. It was also intended to expand the scope of pollution control legislation to cover not just oil but also noxious liquids and chemicals, packaging, sewage and garbage.

In terms of oil pollution, Annex I of the 1973 MARPOL Convention went much further than existing legislation in that it introduced special areas such as the Mediterranean Sea, Black Sea, Baltic Sea and the Persian Gulf where no oil discharges were allowed in any circumstances. The North Sea gained similar status in February 1999. Additionally, tighter restrictions were placed on all new tankers, halving the discharge limits set on existing tankers.

Pritchard (1987, page 175) states that "the 1973/78 Marine Pollution Convention [was] the world's first treaty to regulate all forms of marine pollution from ships", excluding the licensed dumping of land-source wastes under the 1972 London Dumping Convention. The original 1973 Convention consisted of twenty Articles and two Protocols, covering five Annexes, while the 1978 Protocols were added to strengthen the original Convention. The IMO (1997) set out in one volume all the Annexes of the original Convention and the 1978 Protocol, together with all the amendments which have been made since it entered into force, up to 1995.

Further highlighting the importance of MARPOL 73/78 for both the shipping and port industries, as a result of this Convention many improvements in shipping standards have been introduced which have had a significant impact on levels of oily waste. In addition to its requirements for ships, MARPOL 73/78 also requires member states to make available port reception facilities for a range of wastes including oil, chemicals and garbage.[*]

[*] Material for this section has previously been published in Carpenter and Macgill (2001(a))

Each Annex of MARPOL 73/78 sets out specific requirements on vessels in line with the type of pollutant covered. In the case of Annex I, for example, Regulation 1 has 30 definitions covering a wide range of aspects including: what are oil, oily mixtures and oil fuel; the different types of vessel its covers such as oil tankers, combination carriers, new ships and existing ships; what constitutes special areas where discharges are not allowed; specific vessel design issues such different types of oil storage tanks; and a range of other factors. The Annex also has 24 Regulations, an example of which is Regulation 12 (pp 57-58), which sets out the specific requirements for the provision of facilities to deal with oily wastes. Section (1) indicates that the Government of each Party is required provide facilities at all types of ports where ships have an oily residue to discharge. These should be capable of receiving "such residues and oily mixtures as remain from oil tankers and other ships adequate to meet the needs of the ships" and should cause no undue delay to vessels using them.

MARPOL 73/78 is, therefore, a comprehensive set of rules and standards covering a broad range of pollutant types and vessels. It sets standards and technical requirements and has been developed and adapted over time, in response to changes in both scientific knowledge about the impact of pollutants on the marine environment, and also in response to the development of new vessel types, the phasing out of older vessels, and the introduction of technologies to reduce wastes generated by vessels. The IMO has, for example, responded to the issue of air pollution by limiting sulphur oxide and nitrogen oxide emissions from ships exhausts, and has also been working towards measures to reduce carbon dioxide and other climate change gases. Annex VI covers Air Pollution from Ships and was added to MARPOL 73/78 in 1997.

However, MARPOL 73/78 is not the sole convention dealing with marine pollution developed by the UN. Pritchard (1987, page 171) indicates that, as a result of the concurrent negotiations taking place in the development of both MARPOL 1973 and at UNCLOS III, the issue of enforcement of MARPOL was drawn up in such a way as to leave the interpretation of the term 'waters within [the] jurisdiction' of the coastal state vague enough to include any extension of territorial waters at the UNCLOS negotiations".

4.4.2 Third United Nations Conference on the Law of the Sea (UNCLOS III), 1973 and the UN Convention on the Law of the Sea (LOSC), 1982

Even at the early stages of the development of the 1973 MARPOL Convention, the issue of jurisdiction continued to be a major issue. Pritchard (1987, page 171) identifies the issue of enforcement of the Convention in light of a "growing demand for greater powers to be granted to coastal authorities at the expense of … flag states". However, a further complication was the convening of the Third United Nations Conference on the Law of the Sea (UNCLOS III). This Conference was convened in 1973, and the subsequent Convention on the Law of the Sea

(LOSC) was completed in December 1982. However, the Convention did not enter into force until November 1994, over 10 years later than the MARPOL Convention.

The LOS Convention covers all seas and oceans, irrespective of any national jurisdiction, and contains over 300 Articles and 9 Annexes. It has two main objectives, as set out in the Green Globe Yearbook (1995, page 150). These are: to "establish a comprehensive legal order to facilitate international communication and promote peaceful uses of the oceans, rational utilization of their resources, conservation of living resources, and the study and protection of the marine environment"; and to "establish basic rules on global and regional cooperation, technical assistance, monitoring, and environmental assessment and adoption and enforcement of international rules and standards and national legislation with respect to all sources of marine pollution".

In respect of the second objective, there is a certain level of overlap with MARPOL 73/78 as both call for co-operation, technical assistance and monitoring, for example. However, MARPOL 73/78 does differ in that it sets some of the technical rules and standards for which LOSC seeks adoption and enforcement. The emphasis of the two conventions is, therefore, somewhat different – a general approach to marine protection under LOSC compared to the technical, rules-based approach of MARPOL 73/78.

This difference in emphasis was intentional. Franckx (1998, page 311) notes that even at the earliest stages of negotiations at UNCLOS III, agreement was reached that "the new Convention should not determine technical rules and regulations directly applicable to the parties". Rather, it was intended to set out "general rules … which would determine competences but … leave all technicalities to the relevant conventions already existing or still to be elaborated". Into the 'still to be elaborated' category would fall MARPOL which, as previously stated, was being developed concurrently with LOSC.

Part XII of LOSC (1982), covering protection and preservation of the marine environment, is the most relevant section of the Convention in terms of marine pollution. The main aim of LOSC in this respect is set out at Article 194 (Section 1) which requires states to take measures, both individually and cooperatively, to prevent or reduce pollution from all sources including vessels, installations such as oil rigs, and land based sources. In addition, Article 199 (Section 2) requires states to jointly develop and promote contingency plans to respond to marine pollution incidents.

In terms of more specific articles dealing with pollution prevention, Section 5 sets out the requirements placed on states to adopt laws and regulations to prevent, reduce or control

pollution from a range of sources. These sources are, by Article: 207 - land-based sources; 208 - sea-bed activities subject to national jurisdiction; 209 - activities in the area undertaken by vessels, installations, structures etc.; 210 – dumping; 211 – vessels; and 212 - through the atmosphere (which covers both vessels and aircraft).

As noted previously, LOSC was developed to set out general rules. Sand et al (1992, page 187), in examining the (potential) achievement of LOSC, note that "since the convention contains [a] global framework of general rules, realisation of its objectives depend on the whole fabric of international and domestic law". In terms of pollution from ships and dumping, Sand et al (1992, page 168) further state that LOSC's requirements "have been put into practice to a considerable degree by the 1973/1978 MARPOL Convention" and other conventions, together with regional agreements including the 1974 Paris Convention (PARCOM, see Section 4.3).

As a result of LOSC, a broad framework exists within which both parties and non-parties to the Convention can work when considering both the specific issue of prevention or reduction of marine pollution, and in other areas such as seabed mining, marine research etc. The LOSC can, therefore, be seen as an area of "common ground" in the negotiating process since many parties have signed up to the convention even it they have not yet ratified it.

4.5 Conclusions

Legislation to combat marine pollution, whatever its type and source, has been developed over many years at national, regional and international levels. During the more than 80 years since the UK's 1918 wartime instructions, a broad structure of legislation has been put in place, covering issues such as jurisdiction, standard setting, a definition of what marine pollution actually is, and measures to reduce or even eliminate marine pollution in certain areas. The process of developing such legislation is clearly not static. It has to respond to changes in knowledge, in technology, to economic issues in both the port and shipping industries, and to the development of other legislation. It also has to respond to improvements in scientific knowledge that mean that substances once considered safe and suitable to be dumped at sea without causing harm to the marine environment have subsequently been banned as their true impacts become known.

From this chapter it is apparent that the North Sea in particular, and European waters in general, have a considerable range of legislation intended to protect them from marine pollution. At the same time, however, marine pollution from vessels is still considered to be a significant problem. Chapter 3, section 3.5 outlines, for example, how incidents such as the sinking of the *Erika* in December 1999 can lead to pressure on the EU to develop legislation to deal with the

sinking of oil tankers, while Chapter 5, section 5.4.2 examines legislative developments as a result of this particular incident. The main focus of Chapter 5 is, however, the development of the EU Directive on Port Reception Facilities which seeks to overcome the problem of inadequacy of provision of reception facilities, both in the context of the existing marine pollution legislation covered in this chapter, and in light of other EU legislation.

CHAPTER 5

THE IMPETUS OF EUROPEAN LEGISLATION, AND IN PARTICULAR THE DIRECTIVE ON PORT RECEPTION FACILITIES

5.1 Introduction

The EU Directive on Port Reception Facilities for Ship-Generated Waste and Cargo Residues (Directive 2000/59/EC), while being the main legislative focus of this thesis, does not stand alone in European legislation. There are a number of other European measures established to deal with the issues of marine pollution and waste management. This chapter will examine the Directive and place it within the context of that other European legislation.

Although the European Union has now developed a broad raft of legislation to protect the environment, when the Treaty of Rome was signed in 1957 establishing the European Economic Community, there was nothing specifically covering environmental policy within it. As Gallego (2001, page 342) notes, the main aim of the Treaty of Rome was "the establishment of the common market without considering other policies [such as environmental policies] that did not help directly towards the achievement of this common market". Gallego (2001, page 342) goes on to note that it was only in 1972, at a Summit meeting in Paris, that "the community environmental policy came into being". This community policy took the form of a series of Environmental Action Programmes (1973, 1977, 1983, 1987, 1993 and 2001).

It was not until July 1987, when the Treaty of Rome was amended by the Single European Act, that specific provisions to the treaty were introduced to protect the environment. Gallego (2001, page 342) notes that the most important of these new provisions was Article 130r92) which stated that "environmental protection requirements shall be a component of the Community's other policies" and that "with the adoption of the Single European Act an environmental policy was formally accepted by the Community ".

The First Environmental Action Programme in 1973 was important in establishing three principles in dealing with pollution, the principles of prevention, polluter-pays and most appropriate level of action. It is only since the early 1970's, therefore, that the European Community has taken action to introduce legislation designed to protect the environment. Prior to that time, protection of both the general environment and the marine environment was left to Member States signing up to international and regional legislation, such as that set out in Chapter 4.

This chapter will initially examine the development of Directive 2000/59/EC, considering the stages and process of its development. It will then consider the main requirements of the Directive in terms of its potential effectiveness relative to existing practices, and of its potential weaknesses. It will also examine how the Directive effectively duplicates or complements existing international legislation. Finally, the chapter will place the Directive within the wider European legislative context, and provide an overview of how European legislation has developed since the early 1990's in the fields of waste management and maritime transport. It will also consider the potential impact of more recent legislation on the Directive since its publication in December 2000.

5.2 The Development of Directive 2000/59/EC on Port Reception Facilities etc.

5.2.1 Role of "A Common Policy on Safe Seas" in development of the Directive

European legislation specifically dealing with the marine environment has been developed to cover issues including crew training and certification and standards, marine safety and pollution at sea. A major "scene-setter" of European legislation was the European Commission (1993) communication "A Common Policy on Safe Seas", which highlighted many of issues regarding the marine environment for which the EU has been or is developing legislation.

Part one of the Common Policy (hereinafter CP) emphasized the importance of shipping to the community, stating that the Community is "to a large extent dependent on reliable, cost effective and safe shipping services … [which] … carry 90% of its total external trade with the rest of the world … [and] … 35% of total goods transport[ed] between Member States" (Paragraph 1, page 1). As a result, the CP emphasized the need for action on safety of vessels including: identification of vessel deficiencies through ship inspections carried out under the Paris MOU; poor safety record of the high numbers of aging vessels; and problems of vessels flying flags of convenience.

The CP also recognised that, in terms of vessel safety, "existing international safety standards" were mostly "an adequate framework" (CP Para. 12, page 10). However, recognising that there still remained a "continuing high level of risk of casualties", the CP stated that this was "not primarily determined by the absence of adequate international rules, but rather by *laxity in their application and enforcement*". It is this laxity that the Commission sought to overcome through the recommendations made in the CP.

The document further highlighted a lack of uniform enforcement of international rules, stating that there was "no consistent application of safety rules; no systematic system for inspection or detention of ships; no efficient and transparent data exchange mechanisms; and no uniform legal

basis for the enforcement of agreed rules" (CP Para. 46, pp 18-19). It therefore recommended an approach under which there would be "uniform and binding application of common criteria" for measures including: controls over certain types of ships; evaluation of deficiencies; and sanctions including detention and possible prohibition of access to ports for vessels falling below international standards (CP Para. 48, page 19).

In referring to pollution prevention and the monitoring of compliance, the CP set out why legislation on port reception facilities was required. It stated that "under international rules, all parties are obliged to provide and maintain facilities in their ports for the discharging of waste, including bunker oil" (CP Para. 115, page 61). However, Para. 115 identified wide variations in reception facilities offered between ports. Port policies were, therefore, seen as having the potential to "give rise to deflection of trade for instance through weak application of the law to encourage access to the port … a fact potentially leading to unlawful discharges at sea".

Community-wide initiatives were proposed as a means of producing better results than "individual action by Member States [which] would have at best a more marginal result" (CP Para. 119 page 62). These initiatives included:

- ensuring that Community ports install facilities adequate to meet the "specific waste discharges required by the type of shipment operations";
- encourage compliance where adequate facilities are available using "a common system …whereby movements of ships refusing to make use of the facilities would be closely monitored" with residues on board a vessel being measured and notified to the next port of call. Subsequent checks in that port would "enable the competent authority to ascertain whether illegal discharges have occurred";
- ships refusing to use facilities without a valid reason would also receive a much closer port state control inspection by the Paris MOU for its compliance with the MARPOL, SOLAS and Load Line Conventions.

As a further measure, the CP (Para. 119, page 62) suggested that the "Community could closely examine the consequences of imposing mandatory discharging of oil residues and oily mixtures by all ships using Community ports".

Finally, the CP set out an Action Programme of proposals for Council Directives and Decisions to be adopted by the Commission in 1993, and 1994-1995 (CP Annex I, page 72). Although these proposals covered issues including the carriage of dangerous goods, tighter measures for vessel inspections, and common safety rules for marine equipment, only brief mention was made of the development and use of reception facilities with no specific timeline attached to it.

5.2.2 Process of Development of the Directive

The stages in the development of Directive 2000/59/EC are outlined in Table 5.1 which has been compiled using a wide range of documentation available on the European Union's "Europa" Website, together with information published in the Official Journals of the European Union. Table 5.1 indicates that the initial proposal for a Directive was adopted by the Commission in July 1998, and the Directive finally being signed in November 2000.

When it was first proposed, the Directive was to be decided under the Co-operation Procedure introduced under the Single European Act in 1986. However, entry into force of the Treaty of Amsterdam meant a change to the co-decision procedure (first set out under the 1993 Maastricht Treaty), requiring that the Directive be introduced under this procedure. Box 5.1 has been compiled in order to identify the main differences between the different decision making processes.

Box 5.1 Decision making procedures of the European Union

Consultation Procedure. The Council is required to consult the European Parliament (EP) on proposed measures to obtain an opinion. However, the Council is under no legal obligation to accept any amendments put forward by the EP.

Co-operation Procedure. Introduced under the Single European Act in 1986, the Council was required to co-operate with the EP for legislation on certain subjects, giving the EP greater authority to influence legislation.

Co-decision Procedure. Introduced under the 1993 Maastricht Treaty; expanded under the 1999 Treaty of Amsterdam. Requires co-operation between Commission, EP and Council, leading to increased influence for MEPs at the early stages of development of legislation. Requires majority vote in favour by the EP to succeed. Where EP puts forward amendments, if these are not agreed by the Council, the proposal must then go to the Conciliation Committee to reach agreement on a joint text.

Brandt and Martin (1999, page 13) illustrate the Co-decision procedure, post Amsterdam, in their figure 2 which appears as Figure 5.1.

Table 5.1 Timetable of Events in the development of Directive 2000/59/EC

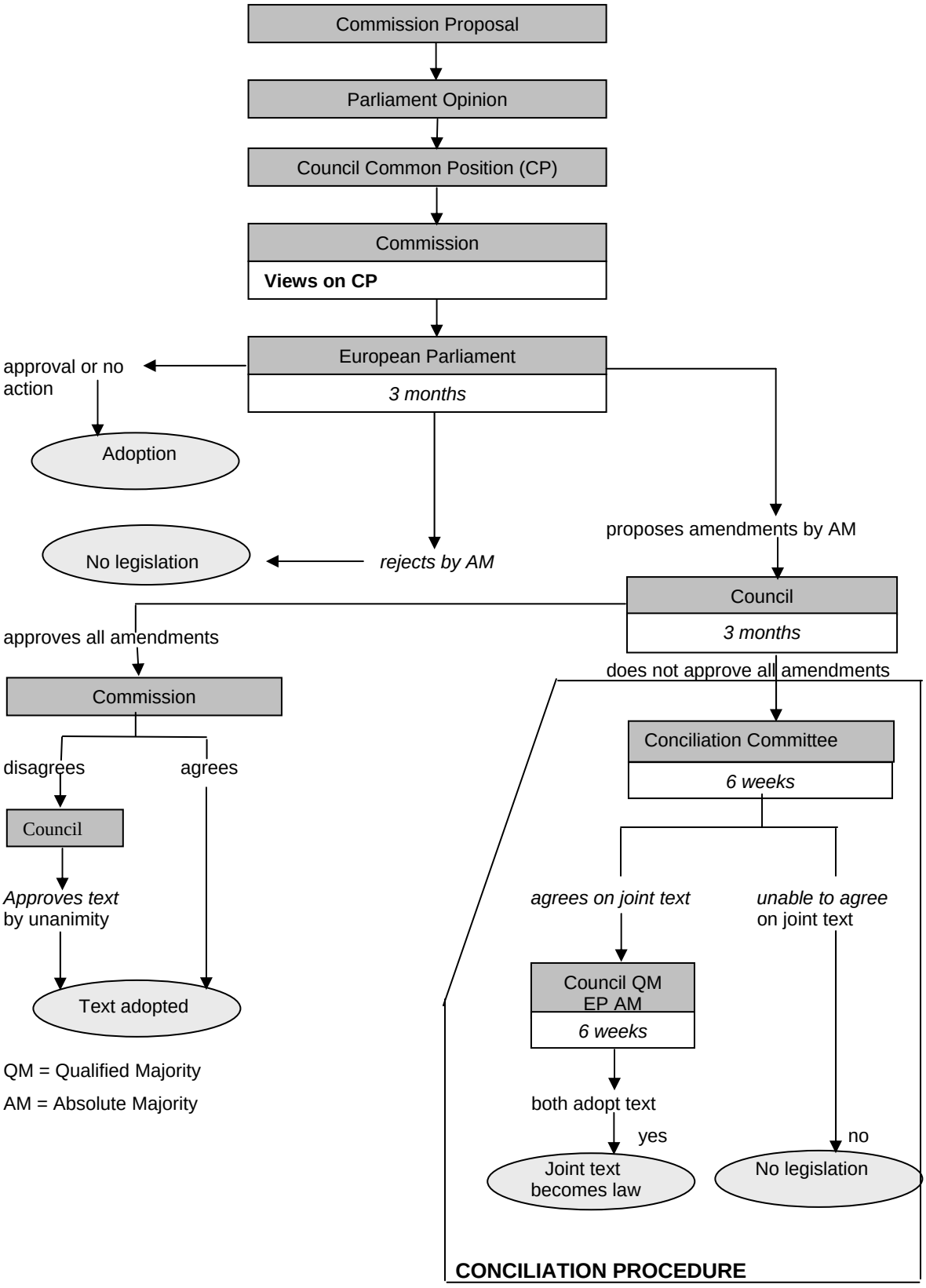
Date	Event	Doc. Ref or OJ Ref, if known	Notes
17.7.98	Proposal of the Commission for a Council Directive - Adopted by Commission - Transmitted to Council - Transmitted to European Parliament	COM (1998) 452 final OJ C 271 of 31.8.98	Proposal to be dealt with under the Cooperation Procedure
20.1.99	European Parliament Committee Report 1 (hereafter EP)	A4-0023/99 OJ C 150 of 28.5.99	The Committee on Transport & Tourism considered Commission proposal and adopted the draft legislative resolution unanimously
11.2.99	EP Opinion, 1st Reading	OJ C 150 of 28.5.99	Debate of the EP. Approval of the Commission proposal with amendments.
11.3.99	Opinion of the Committee of the Regions	OJ C 198 of 14.7.99	Adopted unanimously.
24.3.99	Opinion of the Economic and Social Committee	CES/1999/328 OJ C 138 of 18.5.99	Adopted opinion, 91 votes in favour and 3 abstentions
14.4.99	Working Party on Transport Questions (Maritime Transport)	Inter-institutional File: 98/0249(SYN)	Examined proposal and put forward amendments to the Directive and its Articles.
19.4.99	Adoption of Amended Proposal	COM (1999) 1049 final OJ C 148 of 28.5.99	Commission adopted an Amended Proposal under the Co-operation procedure, incorporating wholly or in part 8 of the 18 amendments proposed by the European Parliament (EP)
20.4.99	Transmission of Amended Proposal to the Council and the EP		
1.5.99	Change in Legal Basis		A change in the legal basis by the Commission requiring consultation with the Committee of the Regions. Co-decision procedure to be used.
17.6.99	Agreement of Common Position	PRES/1999/134	Political agreement of Council on draft Directive
16.9.99	EP 1st Reading of Amended Proposal	A5-0005/1999 OJ C 54 of 25.2.00	EP confirms Opinion in framework of Co-decision Procedure
8.11.99	Adoption of Common Position by Council	PRES/1999/329 OJC/2000/10	Unanimous adoption of Common Position (EC) No. 1/2000*
12.11.99	Transmission of both the Council and the EP Declarations on Common Position		

Table 5.1 (continued)

Date	Event	Doc. Ref or OJ Ref, if known	Notes
19.11.99	Common Position referred by EP to Committee on Regional Policy, Transport & Tourism		
22.2.00	Committee on Regional Policy etc. meeting		Adopted draft decision by 21 votes to 10; 9 abstentions
29.2.00	Committee on Regional Policy etc. tables recommendation to European Parliament for 2nd Reading	A5-0043/2000 final	
14.3.00	European Parliament 2nd Reading under Co-decision procedure	OJ C 377 of 29.12.00	Adoption, at second reading, of favourable position including 15 amendments to the common position
14.3.00	Commission Position on EP amendments	52000PC0236	13 of the 15 amendments of the EP incorporated in the recommended proposal of the Commission, in total or following redrafting.
19.4.00	Adoption of Commission Opinion - Transmission of Council Opinion - Transmission of European Parliament Opinion	COM (2000) 236 final	
23.5.00	Convening of Conciliation Committee		
26.6.00	Conciliation Committee Decision	PRES/00/236	Agreement reached between European Parliament and Council on Directive, and in particular on cost recovery system to be used.
21.8.00	EP Delegation to the Conciliation Committee		Adoption of draft legislative resolutions by 13 votes to 1.
29.8.00	Report tabled to EP on joint text approved by Conciliation Committee	A5-0213/2000	
6.9.00	EP Decision at 3rd Reading	OJ C 135 of 7.5.2001	EP debate and approval of Conciliation Committee joint text
14.9.00	Council Decision at 3rd Reading`	PRES/2000/283	Approval of Conciliation Committee joint text and Council adoption of Directive
27.11.00	Signature by EP and Council	OJ L 332 of 28.12.00	Directive signed 27.11.00 and entry into force following publication in Official Journal on 28.11.00

* NOTE: As the Proposal for the Directive was pending at 1 May 1999, the entry into force of the Treaty of Amsterdam required a change in the legal basis and legislative procedure, so that the Co-decision procedure could now be used.

Figure 5.1 Co-Decision Procedure in the European Union



Source: Brandt and Martin (1999), page 13

The Directive was first adopted by the Commission in July 1998. However, even before this time, a considerable amount of work had been done in meetings of working groups to develop and adapt a draft proposal suitable for adoption by the Commission. The draft proposal, initially entitled the Draft Directive on Shore Reception Facilities for Ship-Generated Waste was already in its third version in December 1997, its text being prepared on the basis of discussions with government experts and also from the written comments of some Member States. This document does not have an official EU Reference.

At the time of the development of the draft Directive on Shore Reception Facilities, its main purpose was to reduce discharges of waste, particularly illegal discharges into the sea by improving availability of reception facilities (Article 1). This has remained virtually unchanged in the final Directive. Although there are differences between the draft of 1997 and the final Directive of 2000, the main elements remain fundamentally the same. These elements are:

- Article 3 – the Directive applies to all ships, irrespective of flag (excluding warships and other naval and state owned and/or operated vessels);
- Article 4 - Member states to ensure the availability of adequate facilities in ports for ships normally calling in at the ports, without causing undue delay;
- Article 6 - Vessels to notify ports in advance of arrival. The draft version then outlines details of exemptions (Article 9, final version), while Article 6a (draft) also outlines delivery of waste (Article 7, final version);
- Article 8 (draft)/Article 5 (final) - Ports to produce a waste management plan. While the draft version allows exemptions for smaller ports, the final version allows plans to be developed regionally if necessary for reasons for efficiency, but facilities in each port to be identified separately/specifically;
- Article11 (draft)/Article 8 (final) - Fees - both indicate the fees should cover cost of infrastructure, operation of facilities, and treatment and disposal of ship-generated waste. Annex III (draft) sets out types of cost recovery systems. Article 8 (final) provides no details of fee systems, but notes it should provide no incentive for ships to discharge at sea, and all ships shall contribute significantly to the costs; and
- Article 12 (draft)/Article 11 (final) - enforcement requirement for vessel inspections to ensure compliance with the relevant articles requiring disposal of wastes – Article 6a (draft) and Articles 7 and 10 (final). The final version has two Articles as cargo residues are covered under the Directive but not in the draft version.

A direct comparison can be made between the working party draft, the official proposal submitted by the Council in July 1998 and the final version of the Directive and Table 5.2 has

been compiled from these documents in order to examine the similarities and differences between the three versions of the Directive, for specific Article headings.

Tables 5.1 and 5.2 provide evidence that the process of developing the Directive has been a long one. Delays due, for example, to the entry into force of the Treaty of Amsterdam and the resultant change to the Co-decision procedure led to a much later entry into force date than was originally anticipated when the Directive was first proposed by the Commission.

5.3 Potential Strengths and Weaknesses of Directive 2000/59/EC and its overlap with other legislation*

As has been highlighted in Section 5.2, there are a number of key elements arising from the Directive, which require action both on the part of the ports and also from vessels using those ports. In order to evaluate the need for a Directive, in light of existing legislation such as MARPOL 73/78 and the Paris MOU, the main requirements of the Directive are identified in Box 5.2. This section will examine how these requirements either duplicated by or differ from existing legislation. Each requirement will also be examined in terms of their potential effectiveness and potential weaknesses related to existing practices, with recommendations being made on how to overcome such weaknesses.

Box 5.2 Specific Requirements of Directive 2000/59/EC

The specific requirements of the new Directive are that:

- all EU ports are to provide adequate reception facilities and to develop waste reception and handing plans (*Mandatory Provision*)
- all wastes are to be delivered to reception facilities unless there is capacity on board for retention until next port of call (*Mandatory Discharge*)
- all ships are required to notify ports in advance of intention to use facilities and quantities of waste on board (*Notification Requirement*)
- a fee system will be introduced to encourage use of facilities (*Charging System*)
- there will be a system of monitoring of compliance, plus adequate sanctions for non-compliance - non-compliance data to be forwarded to next port of call (*Compliance and Monitoring*)

* Material in this section has previously been published in Carpenter and Macgill (2000), (2001(a)) and (2001(b))

Table 5.2 Comparison between versions of Directive on Port Reception Facilities

Subject Heading	Working Document	Proposed Directive	Final Directive
Purpose	Article 1 (A1)	A1. As working document (WD), plus reference to cargo residues and to enhanced protection of the marine environment.	A1. As proposed Directive (PD).
Definitions	A2. List of categories. Includes competent authorities; excludes cargo residues.	A2. As WD but competent authorities no longer appears; cargo residues introduced.	A2. As PD.
Scope	A3. Has a section 2 referring to other relevant legislation on waste disposal.	A3. As part 1 of working document.	A3. As PD, plus inclusion of fishing vessels/recreational craft. Measures by Member States to ensure excluded vessels still deliver waste consistent with Directive.
Facilities	A4. Basic requirements to meet the needs of vessels normally calling in at port.	A4. Port to receive all categories of waste from normal vessels and to expand facilities as required. Inadequacy notification under IMO reporting procedures.	A4. As PD but also takes account of size and geographical location of port, together with exemptions under Article 9.
Waste Reception and Handling Plans	A8. Plans are specified under Annex II in document. Exemptions for smaller ports. Plans need re-approval every 3 years.	A5. Development of plan set out under Annex I.	A5. As PD but includes consultation with relevant parties. Allows for the development of plans on a regional basis.
Notification	A6. Advance notification other than for fishing vessels/recreational craft. Annex I outlines exemptions for ferries and other vessels making regular vessel movements.	A6. Advanced notification similar to WD. Information at Annex II. No exemptions. Information from notification to be held on board and made available on request.	A6. Advanced notification similar to WD. Recreational craft limited to no more than 12 passengers. Information at Annex II. Information retained on board at least until next port of call.
Delivery of Ship-Generated Waste	A6a. Disposal of waste required to ensure sufficient capacity on board to proceed to next port of call.	A7. Vessel can proceed if provides proof of sufficient storage capacity on board to travel to next port of call plus for all waste generated during that journey.	A7. As PD but vessels required to discharge if reason to believe facilities at next port are inadequate or port not known and there is a risk of discharge at sea.
Delivery of Cargo Residues	A7. Delivery in accordance with MARPOL 73/78.	A10. As WD plus fee to be paid by user of facilities.	A10. As PD.

Table 5.2 continued

Subject Heading	Working Document	Proposed Directive	Final Directive
Exemptions	A6, part 2. Exemptions at Annex II.	A9. Ships engaged in scheduled traffic exempt if evidence of arrangement for waste delivery/payment of fees in a port. May also be exempt from 6, 7 & 8. Commission informed of exemptions by Member States	A9. As PD but Commission to be updated with details of exemptions granted by Member States at least annually.
Fees	A11, Choice of system at Annex III. Evidence to be provided to Commission that system works. Exemptions under 6a if evidence of disposal contract with specific port. Reduction in fee for evidence of equipment to reduce waste generated.	A8. No incentive to discharge at sea. All vessels make a substantial contribution towards costs (in port dues or separately). Fees differentiated by size/type of vessel. Additional fee to cover actual cost of waste discharged. Reductions for equipment on board. Fees to be transparent, fair and non-discriminatory; calculations clear to users.	A8. As PD but exclusion added so does not cover fishing vessels and passenger craft with no more than 12 passengers.
Enforcement	A12. Priority for inspection of those vessels not providing advance notice under A6.1 and not exempt under A6.2. Inspections to ensure compliance with A6a before vessel allowed out to sea. Procedures to be established for fishing vessels and recreational craft to ensure compliance.	A11. Inspections to ensure compliance with A7 & A10 for vessels failing to notify under A6. Vessels held in port to comply with A7 & A10 if fail inspection. Next port to be informed if vessel goes to sea and there is evidence of non-compliance. Vessel to be detained in next port for inspection. Procedures as for WD.	A11. As PD, but with the addition of a 25% vessel inspection requirement. Procedures as for working document but recreation craft to carry no more than 12 passengers.
Penalties	A16. System of penalties set out for breaching national provisions. Penalties to be effective, proportionate and dissuasive.	A3. As WD.	A13. As WD.
Evaluation	A17. 3-yearly reports from Member States to Commission on effectiveness of Directive. Commission to evaluate system and report to the EP and the Council on the basis of the 3-yearly reports.	A17. As WD.	A17. As WD.

5.3.1 Mandatory Provision of Port Reception Facilities

MARPOL 73/78 has, since its introduction, required ports to provide facilities for vessels to discharge waste under its various Annexes. However, as has been noted previously, the argument has been made that there is (or appears to be) a lack of such facilities in ports so that vessels have no choice but to discharge wastes at sea. Petersen (1998, page 538) notes that "It is a sad fact that while the MARPOL Convention obliged states to provide adequate reception facilities, such facilities are often not provided". He further notes that it is easier to "persecute the transgressor", the vessel from which pollutants have been discharged because there are no facilities in a port, than it is to "persuade port authorities to provide adequate facilities".

In light of claims of inadequacy, the IMO investigated these claims at the 42nd and 43rd Sessions of the Marine Environment Protection Committee in July 1998 and March 1999. As a result of these investigations by a Correspondence Group on Reception Facilities, the IMO (1999, page 2) set out a definition of adequacy of suitable port waste reception facilities as being:

> *"To achieve adequacy the port should have regard to the operational needs of users and provide reception facilities for the types and quantities of waste from ships normally using the port"*.

With regard to undue delay, the IMO (1999, page 2) further indicated that regard must be given to the operational needs of the master of ship owner, and a definition of undue delay was outlined indicating that:

> *"The time of transfer [of waste] should be mutually agreed upon and transfer of waste should take place during the cargo-handling working hours of the port unless the ship's normal call at the port is not at a time within this period"*.

The EU, through Directive 2000/59/EC, has sought to improve levels of provision within EU ports, particularly in smaller ports, to ensure that they are capable of receiving waste from vessels normally calling in at them, irrespective of waste type or quantity. In this way, the Directive should strengthen the effectiveness of MARPOL 73/78 in EU ports by expanding availability of facilities within the North Sea region, and reducing any claims that inadequacy is a problem.

Ports are also required to produce a Waste Management Plan (which can be done on a regional basis), including information on type and location of facilities, notification requirements, details of providers and costs. These plans would be available to all port users, to ensure that vessel needs are met promptly and with no undue delay. Delays can occur if a vessel does not give advance notice and is then forced to wait for access because a later arriving vessel has given notice. The "undue delay" requirement also mirrors Annex 7 of MARPOL 73/78, which calls for all possible efforts to be made to avoid delays. These plans effectively transfer best practice

from the DETR (1998) which required all UK harbours to "prepare a waste management plan with respect to the provision and use of facilities within its jurisdiction.

There are, however, a number of potential problems with mandatory provision. As identified in Chapter 7, many ports do not actually own or operate facilities, but contract them in from external companies. As a result, was a ship's master or agent to arrange for facilities to be provided without the involvement of the port, this could lead to problems of access to facilities. Many smaller ports are restricted in size with facilities only available at certain berths. Even in larger ports, it may not be cost effective or physically possible for facilities to be provided at all berths. If a vessel was already in a designated berth and making use of facilities, and another vessel arrived which had made direct arrangements with external contractors, there could be problems in bringing that contractors equipment alongside, or waiting for access to the designated berth, leading to delays.

Ports will be required to keep records of vessels using facilities, including the types and quantities of waste discharged. The use of external contractors, brought in directly by a vessel without consultation with the port, could lead to incomplete or patchy records. This would result in inaccurate data on vessel uptake and amounts of waste discharged, unless there was a specific requirement that contractors copy all information to the port administration.

5.3.2 Mandatory Discharge Principle

Article 3 of the Directive requires that all vessels (excluding fishing vessels and pleasure craft carrying no more than 12 passengers) discharge ship-generated wastes before leaving port, irrespective of the flag registry, with certain exemptions. These exemptions include:

- warships and other state owned/operated vessels;
- vessels operating scheduled port calls (for example ferries) where there is proof of a contract for regular waste disposal/payment of fees within their normal operations;
- vessels with sufficient capacity on board to transport waste to their next port of call, together with any additional waste resulting from the voyage to that port; and
- if a vessel has a legitimate reason for not discharging in a port, for example a contract with the next port or the vessel has only have a small volume of waste on board resulting from "green technology" to reduce waste generation.

In order verify exemptions, a system of inspections will be required, and this is examined at Section 5.3.5.

The requirement for mandatory discharge will demand stringent record keeping by ships' masters to ensure that they can account for all the waste generated on board their vessel. This will include details such as: volumes of oil taken on board as fuel and the waste residues resulting from a voyage; numbers of crew on board; volumes of sewage and other wastes generated; and types of cargo carried and relevant cargo residues. A system of ship logbooks is already used by oil tankers under MARPOL 73/78, providing information on how much oil is carried and of what type, where it is held on board and where it is discharged. An expansion of logbooks to a broader range of vessels and for different waste streams could be introduced for all vessels using EU ports to ensure that the necessary records are maintained. Vessels would then be able use these logbooks, where an inspection was carried out, to show that they had not illegally discharged wastes at sea.

Although the use of logbooks may allow a vessel's master to offer proof that there is capacity on board to travel to the next port of call, they might also be falsely completed to offer such proof. Difficulties may, therefore, arise if an inspector considering that a vessel's paperwork is incorrect, particularly for vessels that only call into EU ports very infrequently, or for those arriving for the first time from outside the EU. Such vessels are unlikely to have the necessary documentation for all categories of waste, other than those specifically required for oil tankers by MARPOL 73/78 for example. As maintaining a logbook on waste is not a requirement of international legislation for most vessels, if problems were to arise in an EU port such as detention of a vessel, it could be argued that this is discriminatory to non-EU vessels.

Such problems can only be overcome after the Directive has been in operation for some time. Information will be required on who conducts inspections and how they are funded, on the level of accuracy of vessel documentation, and on whether non-EU vessels appear to be detained more frequently than EU vessels.

5.3.3 Notification

Article 6 of the Directive requires a ship's master to notify the port for which it is bound of its intention to call in at that port, with a notice period of 24 hours in most cases. Only vessels exempted under the Directive do not have to provide such notification. Annex II to the Directive sets out the specific information to be notified including: name, call sign and, where appropriate, IMO identification number of ship; Flag State; estimated time of arrival/departure; previous/next port of call; last port and date when ship generated waste was delivered; whether all/some/none of the vessel's waste is to be delivered; and type and amount of waste to be delivered/stored on board plus maximum storage capacity

This last section, type and amount, requires considerable detail from the vessel on different types of both waste oils and garbage to be delivered, with specific figures being requested for: volumes of waste to be delivered; maximum dedicated storage capacity on board for each type of waste; how much of each type is being retained; and where that retained waste will be delivered. It also calls for an estimate of the amount of each type of waste that will be generated between submission of this information and the vessel's arrival in its next port of call. Estimates of types and volumes of waste are also required for cargo-associated waste and cargo residues.

A vessel logbook would greatly assist in the notification process since a vessel's master or agent will be required to provide very specific information in advance of the vessel's arrival in port, and such information will also be useful if a vessel inspection takes place. As the person responsible for completing the notification is required to sign the notification form, confirming that all details are both "accurate and correct" and that there is "sufficient dedicated onboard capacity to store all waste generated between notification and the next port at which waste will be delivered", the signatory could be held responsible for any discrepancies found during an inspection. For those vessels covered by the Directive, the notification requirement may make considerable demands in terms of time and effort to generate the required information. It may, however, be difficult for vessels to produce accurate figures if they have not previously been required.

Considering the example of oil, the issue of pollution from smaller vessels may prove more difficult to deal with than for larger vessels. Many smaller vessels are excluded from the Directive and are not required to notify ports of volumes of waste on board. Smaller vessels, operating out of smaller ports with limited facilities available, may generate only limited volumes of waste. This might include oily rags used to wipe down machinery, oily waste in the engine room or oil in ballast water. Such small volumes are likely to be more expensive to dispose of legally, as it is more costly for a company to receive the waste, in terms of the effort required to physically go and collect small amounts from ports with limited volumes of vessel traffic. Even for vessels not required to notify in advance, using facilities will require time and effort on the part of the vessel to dispose of its waste. This may not be cost effective for vessels undertaking frequent journeys based on a very tight timescale, as it could affect their ability to generate sufficient income to continue operating.

A situation where limited or even no records were kept prior to the introduction of the Directive, combined with high disposal costs, may provide a motive for vessels to discharge illegally, even in the face of the threat of prosecution., particularly if it is felt that it is unlikely that the vessel can be identified as the source of a small volume of pollution and that it is also unlikely to be

inspected. However, in this situation, small volumes of waste dumped on a regular basis are likely to have a cumulative effect, building up gradually in the environment and, at the same time, it will be very hard to monitor such waste in terms of its source and impacts.

Many of the problems identified for oil pollution will also apply for garbage, sewage and other wastes. A lack of facilities in ports prior to the Directive, and an absence of reliable data on waste generated by vessels using these ports, may cause difficulty in assessing the impact of the Directive, in the shorter term. Only in the longer term, with the introduction of the system of notifications, inspections, better record keeping and the use of some form of environmental monitoring to examine levels of pollution in the area of the port, will it be possible to state whether the Directive has had the required effect of reducing vessel source pollution locally. However, such a system is likely to be costly in terms of putting in place the physical infrastructure and the administration to allow it to work, particularly if it is not made clear where funding will come from. The notification system may, therefore, prove to be a weakness for the Directive, at least in the shorter term, until it has been operating for a period of time sufficient that no vessel owner can feel safe from prosecution if they continue to ignore the Directive and discharge waste illegally.

5.3.4 Common Charging System*

Article 8 of the Directive requires that the cost of port reception facilities, including treatment and disposal costs, are to be covered through the collection of a fee from ships. No specific system is proposed for the collection of this fee, and the guidelines under the Directive merely state that there should be no incentive for ships to discharge waste at sea, and that all ships calling at a port will be required to make a significant contribution towards the costs of the facilities, irrespective of actual use. Although an earlier version of the Directive, outlined by the European Parliament (2000, page 8), stated that “all ships calling at a port of a Member State shall contribute significantly, i.e. at least 90% of the costs” of port reception facilities including treatment and disposal of waste “irrespective of actual use of the facilities”, the figure of 90% was omitted from the final Directive, and no specific percentage figure is mentioned.

Chapter 6, Section 6.3 examines a range of charging systems available to ports. However, in specifying that all vessels should make a significant contribution toward the cost of providing reception facilities, the EU has sought to remove any economic incentive to discharge illegally. It has also sought to recover a sufficient level of cost to support progressive improvement in technology, and to achieve an equitable distribution of costs. Although Article 130(r) of the Single European Act, as set out by the European Commission (1992) states that “environmental damage should as a priority be rectified at source, and that the polluter should pay” the

* Material for section 5.3.4 has previously been published in Carpenter and Macgill (2001(b))

requirement of the Directive that all vessels contribute towards the cost of facilities, irrespective of actual use, moves away from the direct application of the "polluter pays principle". This move occurred because it was considered that direct application of 'polluter pays' could, in the case of the Directive, result in an economic incentive for discharge of waste at sea. Only in the case of a Direct Charging System would the 'polluter' truly pay for the waste they generate.

Under the Directive, there is scope for ports or Member States to choose a charging system to meet their own economic or other needs. If a truly common charging system was implemented across all EU ports, this would require specific guidelines on the system to be used, with charges taking account of factors such as vessel type, engine type, length of journey and speed of travel, number of crew and number of passengers. A number of potential benefits could arise from a common charging system, including the fact that vessels would know in advance how much waste disposal was going to cost and could budget accordingly. All ports in a country or region could be required to charge a similar amount, reducing both the possibility of unfair competition between ports and also waste tourism, where vessels take their waste to the cheapest port. Favourable treatment could also be given to vessels using clean technologies or waste minimisation schemes on board, providing an incentive for schemes that result in lower levels of waste being generated.

The lack of a common charging system can be seen as a major weakness of the Directive, as it fails to overcome problems such as unfair competition between ports. Those ports that choose to implement a scheme with a high charge to all vessels will provide a disincentive to vessel uptake of facilities and, potentially, an incentive to vessels to continue to dump waste at sea. Those ports with a low charge to vessels will potentially see increased levels of uptake from vessels with high volumes of waste retained on board specifically to visit such a port. The 3-year review of the effectiveness of the Directive would provide an opportunity to examine what is happening in practice, and make changes to the Directive to overcome any problems arising from variations in charging systems. However, until such a time as a truly common charging system is introduced, the Directive may not achieve its full potential in making it economically unviable for vessels to continue to discharge at sea.

5.3.5 Compliance and Monitoring

Articles 7 and 10 of the Directive set out a system to ensure that vessels comply with the Directive by discharging waste, together with a system of monitoring to identify those vessels which continue to discharge illegally.

In terms of compliance, Article 11 notes that, in order to ensure that vessels deliver all ship-generated waste and all cargo residues, inspection of 25% of vessels shall be undertaken to

ensure that they do not leave port until all such waste has been discharged. A system of inspections is already in place under the Paris MOU with 25% of vessels being inspected to ensure compliance with a range of international legislation, and these inspections are examined in Chapter 6, Section 6.4.

While both the Paris MOU and the Directive require inspection of 25% of vessels to ensure compliance, these need not necessarily be the same 25%, although it is highly unlikely that different vessels will be inspected. In most EU states, it is probable that the inspection agency conducing Paris MOU inspections will undertake "Directive" inspections, but it is not clear how they are to be paid for.

In the example of the UK, the MCA/MCGA undertake Paris MOU inspections. If the MCGA is required to carry out additional "Directive" inspections, it would need to employ more inspectors, with the consequent increased costs, for inspections in smaller ports where inspections have not previously taken place. Inspectors could be required to operate between groups of ports, reducing the coverage available in larger ports. Finally, if an inspector was to detain a vessel that, in his/her personal opinion, did not have the capacity on board to carry its waste to the next port of call, there might be a case for a vessel's owner seeking compensation if detention results in a loss of business. In this situation, there would be the additional question of whether liability for compensation will lie with the Agency conducting the inspection, the Government which that agency represents, or with the inspector who made the decision to detain the vessel.

The second element required is the monitoring of the effectiveness of the Directive in reducing levels of oil and other pollution at sea. In this case, monitoring of oil slicks at sea is already undertaken with the use of aerial surveillance under the Bonn Agreement, and this is examined at Chapter 6, Section 6.4.1. It is anticipated that, rather than introduce a separate monitoring system, the EU will continue to use the data collected by the Bonn Agreement in order to assess the effectiveness of the Directive in terms of observed levels of oil spills at sea. However, for other waste streams, this will be much more difficult to monitor. In the case of garbage, although regular surveys of litter washed up on beaches may be one way of monitoring levels, such a method may be extremely inaccurate since garbage from outside the North Sea region can be carried onto beaches in the region by the prevailing winds and tides.

5.3.6 Recommendations

In order to ensure that vessels are able to comply with the requirement of the Directive to discharge wastes in ports, a number of measures are required. Firstly, it is important that a comprehensive picture of availability of facilities is collected and maintained by the EU, which

is made available to all vessels through a database. The Official Journal (2000, Para. 20, page 82) identifies the SIRENAC Information System, established under the Paris MOU, as a source of information in this respect. Accurate information would both ensure that vessel masters/owners cannot argue lack of knowledge of availability as an excuse to dump waste, and also allows vessels that find that facilities are not available to report back to the EU so that pressure can be put on ports to improve provision. Secondly, vessels would be required to maintain much more comprehensive and accurate records of waste generation and disposal than has been required in the past, particularly in the case of smaller vessels. In order to produce these records, a system of record books is required, containing information on levels of waste generated through normal operations. Additional records will also be required for cargo wastes. Thirdly, a system will be required to reimburse a proportion of the costs of facilities to vessels with green technology on board, to recognise their efforts to minimise waste generated.

In terms of the requirements on ports, firstly they will have to provide the EU with accurate, up to date information on both availability and cost of facilities, and would have to report to the EU on measures taken to extend the availability or type of facilities provided. Secondly, ports will need to maintain records on vessels that notify of an intention to call in and on the amount of wastes that they discharge. Records will also be needed for vessels not required to give advance notice. In both cases, records can be used to assist in determining whether the Directive has had a positive impact, and also used in conjunction with the inspection system. For inspections, ports may be required to provide administrative assistance to ensure that inspectors are notified of vessel movements. This will be particularly important for smaller ports with no “on site” inspector, as arrangements will have to be made for an inspector to visit from another port.

With the continued use of aerial surveillance figures for waste oil, and the proper collection of records from vessels, the EU would be able to more accurately assess the situation regarding illegal dumping at sea, and this information should provide positive evidence if any reduction takes place. Up to date, accurate information on the availability of facilities can also be used to identify how successful the Directive has been in promoting usage of facilities, and to identify those vessels which fail to do so. Evidence of increased availability and a reduction in pollution levels would allow the EU to claim that the Directive has made a contribution towards protecting the marine environment from ship-generated wastes.

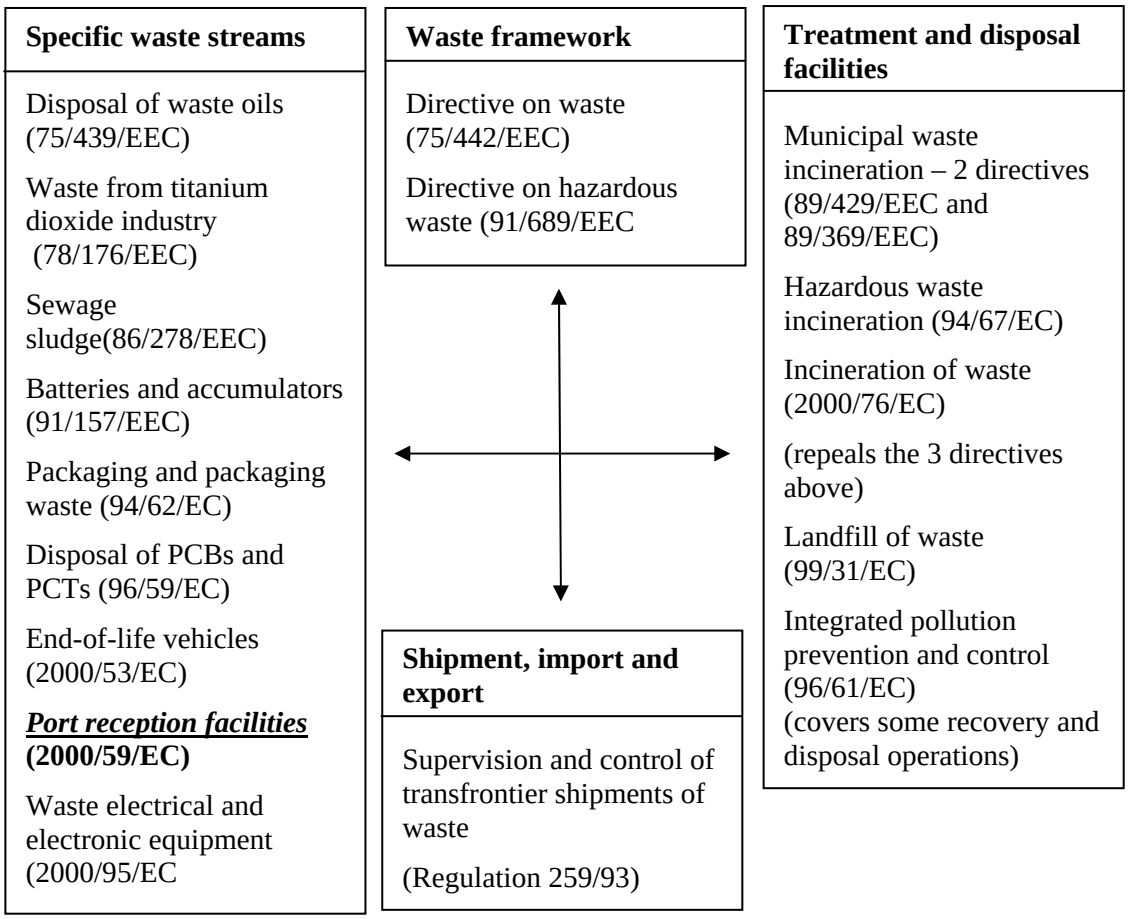
5.4 Directive 2000/59/EC within the framework of other European Legislation on the marine environment

5.4.1 Waste Legislation and Maritime Transport Legislation

Waste Legislation

The Directive fits within frameworks of legislation for both maritime transport and waste legislation. The First Environmental Action Plan of 1973 was the origin of much of the earliest environmental legislation of the European Community, leading directly to Directives on the elimination of waste oil (75/439) and waste in general (75/442). Legislation in the field of waste is considered first, and the European Commission (2003(a), page 10) sets out a waste legislation framework and this appears as figure 5.2.

Figure 5.2 Overview of EU Legislation on Waste currently in force:



Source: European Commission (2003 (a)), Figure 2.1, page 10

In this figure, the waste framework box contains the Directive on Waste (75/442/EEC) which "lays down requirements for all types of waste, unless they are specifically regulated by other directives" (page 10) while the Directive on Hazardous Waste (91/689/EEC) provides for the "management, recovery and correct disposal" of such wastes. The box on specific waste

streams covers those wastes for which there is specific regulation, including the Directive on Port reception facilities. The treatment and disposal facilities box covers a group of directives dealing with the incineration of municipal and hazardous wastes, the use of land-filling, and Directive 96/61/EC on Integrated Pollution Prevention and Control which covers the requirement for specific permits to deal with certain types of waste. The final box, on shipment, import and export, covers only the specific Regulation dealing with the trans-frontier shipment of wastes.

Within the three groups of legislation at Figure 5.2, there are a number of different types of legislation:

- *Regulations* – compulsory for all States; not open to adaptation by national legislation; normally, deadline for final implementation concurrent with date of entry into force.
- *Directives* – compulsory for all States; open to adaptation and interpretation when transposed into national legislation; normally fixed deadline for implementation at a later stage than date of entry into force.
- *Proposals for Directives* – Commission proposals set out objective and requirements of a Directive for consideration by the EP and other relevant bodies; political agreement on Proposals reached on adoption by all parties, but not yet formally adopted; no deadlines set for entry into force or final date of implementation until formal adoption
- *Proposal for a Council Decision* – proposal made for Council Decision on a specific subject; consultation procedure established for negotiation by Member States, third countries and international organisations; requires consideration by the EP and other relevant bodies. Member States undertaking bilateral negotiations with a third country must notify the Commission and other Member States in advance.
- *Commission Communication* – Communication of the European Commission which makes proposals for short or long term legislative measures requiring development of Regulations or Directives.

Maritime Transport

The European Union (2003) provides a summary of legislation in the field of Maritime Transport. Figure 5.3 has been compiled to illustrate the broad range of EU legislation in three specific areas:

- General Scheme: covers freedom to provide services, vessel reporting formalities, and legislation relating to vessel manning and working practices;
- Maritime Safety: covers the enforcement of international standards on ship safety, the safe transport of oil, and rules and standards for passenger ships;

- Port Infrastructures: covers the provision of services in sea ports and includes the Directive on port reception facilities.

5.4.2 Impact of the 1999 Erika Oil Spill on European Legislation

The development of European legislation is, in line with other international and regional legislation, an ongoing process, which is responsive to changes in knowledge, science, and societal pressures, for example. However, it is also responsive to physical evens such as pollution incidents. With regard to the Erika I and Erika II measures which appear in the Maritime Safety Section of Figure 5.3, Box 5.3 has been compiled to identify the main areas of legislative development with respect to sets out these particular measures, as an example of the EU taking rapid action in response to a pollution incident.

Box 5.3 Erika I and Erika II Measures

Erika I – Commission Communication on the Safety of the Seaborne Oil Trade **(COM (2000) 142 final)**

- Accelerated phasing-in of double-hulled oil tankers **(Regulation (EC) No. 417/2002, which repeals Regulation (EC) No. 2978/94)**

Erika II – Commission Communication on a second set of community measures on maritime safety **(COM (2000) 802 final)**

- Proposal for a Directive on Community monitoring, control and information systems for maritime traffic **(COM (2000) 802 final)**
- Proposal for a Regulation establishing a compensation fund for oil pollution damage **(COM (2000) 802 final)**
- European Maritime Safety Agency **(Regulation (EC) No. 1406/2002) (implemented by Directives)**

Following the sinking of the *Erika* in December 1999, a number of proposals were set out by the European Commission to prevent such an incident from occurring again. In a communication from the European Commission (2000(a)), two groups of proposals were outlined. In the first raft of proposals (page 5), the Commission proposed:

- to ban all from EU ports all ships older than 15 years that have been detained more than twice in the course of the two proceeding years, on the basis of a “black list”;
- that “there must be stricter monitoring of the classification societies to which Member States delegate power to inspect the quality of ships”; and
- that it “proposed to generalise the ban on single hull oil tankers according to a timetable similar to that applied by the USA (2005, 2010 and 2015), depending on tonnage”.

Figure 5.3 Overview of EU Legislation on Maritime Transport

General Scheme

Freedom to provide services: competition etc. (Reg (EEC) No. 4055/86

Freedom to provide services (maritime cabotage) (Reg 3477/92/EEC)

Directive on reporting formalities for ships (2002/6/EC)

Proposal for a Directive on vessel manning conditions (COM (2000) 437 final)

Directive on organization of seafarers' working time (1999/63/EC)

Directive on statistical reporting (95/64/EC) - covers carriage of goods and passengers at sea

Communication on short-distance transport by sea (COM (95) 317 final)

Proposal for Council Decision on External Relations (COM (96) 707 final)

Communication on seafarer training and recruitment (COM(2000)188 final) (COM (2000) 188 final)

Port Infrastructure

Green Paper on Seaports and Maritime Infrastructure (COM (97) 678 final)

Commission Communication on Quality of Service in Sea Ports (COM (2001) 35 final)

Proposal for Directive on Market Access to Ports Services (COM (2001) 35 final)

Directive on port reception facilities (2000/59/EC)

Maritime Safety

Directive on requirements for vessels carrying dangerous of polluting goods (93/75/EEC and amendments)

Proposal for Directive on European vessel reporting system (COM (93) 647 final and COM (94) 220 final)

Directive on common rules and standards for ship inspection (94/57/EC and amendments)

Directive on Port State Control* (95/21/EC and amendments)

Directive on safe loading and unloading of bulk carriers (2001/96/EC)

Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) (Regulation (EC) No. 2009/2002)

Erika I and Erika II Measures (see figure 5.4)

Segregated ballast oil tankers: tonnage measurements (Regulation (EC) No. 2978/94)

Safety management of Ro-Ro passenger vessels (Regulation (EC) No. 3051/95 as amended)

Directive on mandatory surveys of ro-ro ferry etc. (1999/35/EEC and amendments)

Directive on marine equipment (96/98/EC and amendments)

Directive on safety rules and standards for passenger ships

(98/18/EC and amendments)

Directive on registration of persons sailing on board passenger ships etc. (98/41/EC and amendments)

**Note: this Directive covers international standards on ship safety, pollution prevention and shipboard living and working conditions*

In its second raft of proposals (page 6), the Commission also proposed:

- "systematic exchanges of information between all the actors in the maritime community by further developing the EQUASIS [communication] system in particular;
- improved surveillance of navigation, particularly in those areas where oil tanker traffic is most dense;
- the possible establishment of a European structure for maritime safety, whose prime task would be to monitor the organisation and effectiveness of national inspections in order to ensure greater uniformity; and
- development of the liability of the various players in the seaborne oil trade".

Such a rapid response to a physical incident can, however, lead to confusion in the legislative process. Using the example of the "European Structure for maritime safety" identified in the Erika II proposals, this refers to a proposal set out by the European Commission (2000(b)) for a regulation establishing a European Maritime Safety Agency (EMSA). Article 1 (European Commission, 2000(b), page 98) indicates EMSA is being established for the purpose of "ensuring a high, uniform and effective level of maritime safety and pollution prevention within the Community". It would also provide Member States and the Commission with both "technical and scientific assistance … and with a high level of expertise in order to help them apply Commission legislation in the field of maritime safety properly".

However, an amended proposal of the European Commission (2000(c), page 2) covering a Committee on Safe Seas (COSS) notes that "the Commission also wishes to take account of new developments since it adopted its original proposals [for a Committee on Safe Seas]", taking into account Commission's ERIKA proposals. Specifically, it refers to the proposals for legislation, "most notably … establishing EMSA". Although it indicates that EMSA and COSS are completely different, it states that "in the course of discussions" within EU institutions, "it became clear that there was real confusion between the separate tasks of these two bodies".

This confusion led to a Commission proposal to amend its original proposal for COSS to clarify its role and the European Commission (2001(a), pp 4-5) set out the roles of COSS as:

- centralisation of the "tasks of the committees set up under the Community legislation on maritime safety;
- the prevention of pollution from ships and the protection of shipboard living and working conditions; and
- to assist the Commission on all matters of maritime safety and prevention or reduction of pollution of the environment by shipping activities". (Para. 3, pp 4-5).

Although the Commission sought to clarify the separate roles of EMSA and COSS, there seems to be overlap as both indicate they will be involved with maritime safety and the prevention of pollution. However, the amended proposal for a Regulation on COSS specifically took into account the Directive on port reception facilities (European Commission, 2001(a) page 3). While this was not covered in the original proposal for a Regulation (European Commission, (2000(c)), the Regulation will have a direct impact on the Directive in the future, and this is examined in section 5.5.

5.5 Other Legislation with relevance to Directive 2000/59/EC

At the time of the two surveys of North Sea ports, conducted in the summer of 2000 and autumn of 2002, the results for which are outlined in Chapter 7, Directive 2000/59/EC had not yet been implemented in all EU North Sea States. However, even while the Directive was being transposed into national law, developments in other EU legislation meant that, as a direct result of that legislation, changes to the Directive would be required at a future date. In 2002, the Regulation establishing a Committee on Safe Seas was published, while two Proposals for Directives were also being developed. All of these make specific reference to Directive 2000/59/EC. These pieces of legislation, together with their anticipated impact on the Directive, are examined below.

5.5.1 Regulation (EC) No 2099/2000 establishing a Committee on Safe Seas

Directive 2000/59/EC was subject to many delays and amendments before it finally entered into force in December 2000 and has been further amended as a result of the final version of the Regulation establishing COSS, published in the Official Journal (2002). Article 1 sets out its purpose as being "to improve the implementation of … Community legislation" (page 2). This includes, at Article 2(l) (page 3), the Directive on port reception facilities.

The COSS Regulation resulted in some specific amendments to the Directive, and these appear in the Consolidated Text (2002) of Directive 2000/59/EC. Although the majority of the Directive remains unchanged, the Official Journal (2002, page 10) notes that Article 14 - Regulatory Committee - has been amended at Paragraph 1 as follows:

Original Text[*]	*"1. The Commission shall be assisted by the Committee set up pursuant to Article 12(1) of Directive 93/75/EEC …, hereinafter referred to as 'the Committee'"*

[*] Official Journal (2002).

Revised Text[*] *"1. The Commission shall be assisted by the Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) created by Article 3 of Regulation (EC) No 2099/2002 of the European Parliament and of the Council establishing a Committee on Safe Seas etc."*

The EEC Directive[**] referred to in the original text concerns minimum requirements for vessels carrying some form of dangerous or polluting goods. The Committee in Article 12(1) is "composed of representatives of the Member States and chaired by the representative of the Commission". This Committee has, as a result of the COSS Regulation, been superseded. Its role will now be fulfilled by the Commission, assisted by members of COSS.

Directive 2000/59/EC is further amended at Article 15 by the addition of a paragraph in the Consolidated Text (2002, page 10) stating that "The amendments to the international instruments referred to in Article 2 may be excluded from the scope of this Directive, pursuant to Article 5 of Regulation (EC) No 2099/2002". However, this amendment may lead to confusion because, at first reading, it is unclear whether the "Article 2" referred to is from the Directive or the Regulation. On closer examination, Article 2(b) of Directive 2000/59/EC has been amended to allow MARPOL 73/78 to be applied "in its up-to-date version" (Consolidated Text, 2002, page 5), and this is the only international instrument mentioned in what is actually a series of definitions.

The "Article 2" referred to is, therefore, from the COSS Regulation which states that "1. 'international instruments' shall mean the conventions, protocols, resolutions … and provisions adopted by an international conference, the International Maritime Organisation (IMO), the International Labour Organisation (ILO) or the parties to a memorandum of understanding referred to in the provisions of the Community maritime legislation in force;" (Consolidated Text, 2002, page 2). Article 5 of the COSS Regulation then states that, in order to reduce potential conflict "between the Community maritime legislation and international instruments, Member States and the Commission shall cooperate … in order to define, as appropriate, a common position or approach in the competent fora." (Consolidated Text, 2002, page 3).

The COSS Regulation has the potential to make significant changes to the Directive on port reception facilities in the future. While much of the Directive applies the standards set by MARPOL 73/78 for provision of facilities, for example, the Committee on Safe Seas could choose to enforce even tighter standards or shorter deadlines for implementation of aspects of

[*] Consolidated Text (2002)

[**] EEC Directive (1993). "Council Directive 93/75/EEC of 13 September 1993 concerning minimum requirements for vessels bound for or leaving Community ports and carrying dangerous or polluting goods". OJ L247, 05/10/1993 pp 0019-0027. Official Journal of the European Communities, 1993

such a convention. This would have an immediate impact on the Directive, without any requirement for the Directive to be specifically amended.

5.5.2 Proposed Directives COM (2001) 139 final on protection of the environment through criminal law and COM (2003) 92 final on ship-source pollution and on the introduction of sanctions etc.

In 2001, the European Commission (2001(b), page 2) set out a Proposal for a Directive which would guarantee a high level of protection for the environment, using criminal law to tackle what was seen as "the increasing problem of environmental crime" because "sanctions currently established by the Member States are not always sufficient to achieve full compliance with community law". This earlier proposal did not cover all activities "regulated by Community law, but only important types of pollution which can be attributed to individuals or legal persons" (European Commission, 2001(b), page 3). Offences under this Directive include, at Article 3(a), the discharge of hydrocarbons, waste oils or sewage sludge into water; and 3c) the discharge of waste on land or into water (European Commission, 2001(b), page 8). As a result, the Annex listing Community laws specifically covered by this Directive includes Directive 2000/59/EC on port reception facilities (European Commission, 2001(b), page 15).

Directly stemming from this proposed Directive was a further Proposal of the European Commission (2003(b), page 2) for a second Directive that would impose sanctions on ship-source pollution. The introduction to this second proposal emphasizes the fact that it is not just high-profile accidents such as the sinking of the *Erika* that is responsible for the problem of ship-source pollution. It notes that "The main part of the world-wide ship-source pollution by oil is the result of deliberate discharges". This is accounted for by 'operational' i.e. intentional discharges from ships "including tank-cleaning operations and waste oil disposal [which] is still widely practiced in the coastal waters of Member States and beyond". The European Commission (2003(b), page 2) notes that this continued practice is evidenced by 596 oil slicks detected in the North Sea in 2001 using aerial surveillance under the Bonn Agreement.

This second Directive has been proposed to "fill in some of the most important remaining regulatory gaps" in the area of ship-source pollution, and will cover both accidental and deliberate discharges (European Commission, 2003(b) page 3), and it cites a lack of adequate waste reception facilities in ports as promoting illegal discharges. Although it notes that Directive 2002/59/EC has been adopted to overcome this problem and also introduces specific waste inspections of vessels as a further deterrent against illegal discharges, the proposal notes that while such "instruments represent important steps to eliminate illegal discharges, they do not go all the way in addressing the problem at Community level" since the offence of violating pollution standards is "not fully covered by EC law" (European Commission, 2003(b), page 4).

For example, implementation of MARPOL 73/78 “shows variations, both in practice and in law”, and there is also variation in levels of inspection, prosecution of offenders and in the penalties imposed on such offenders.

In order to overcome these problems, the proposed Directive sets out two measures (European Commission, 2003(b), page 7) which are: incorporation of applicable international discharge rules for ship-source pollution into Community law, together with regulations to enforce these rules; and violations of discharge rules shall be criminal offences. Guidance on criminal offences and sanctions, including specific details of penalties available, is outlined in Article 6 (European Commission, 2003(b), pp 14-15) and such sanctions can include fines, confiscation of proceeds resulting from an offence, a temporary or permanent ban on commercial activities and, potentially, imprisonment. In addition, to ensure consistency of application of international rules, Annex I of the proposal provides a summary of the relevant regulations under MARPOL 73/78, covering oily wastes and noxious liquid substances (European Commission, 2003(b), pp 18–25).

Although the Directive on the introduction of sanctions has yet to be agreed, it will, at such a time as agreement is reached and it enters into force, have a direct impact on Directive 2000/59/EC. In the first instance, it should lead to greater consistency in application of the rules on discharge standards by Member States. At the same time, the introduction of a consistent set of sanctions, including the threat of fines or imprisonment, on vessels illegally discharge in EU waters should provide greater incentive for vessels to use port reception facilities. With the requirement for vessel inspections under Directive 2000/59/EC, together with port state control inspections under the Paris MOU, vessels found to have insufficient levels of waste on board would be faced with much more stringent penalties than have hitherto been available.

5.6 Conclusions

This chapter has outlined the chronological development of Directive 2000/59/E, and the impact of external developments such as the Treaty of Amsterdam on the length of time taken to bring it into force. As early as 1993, the European Commission (1993) recognised the need for some form of legislation on the provision of port reception facilities as a means of combating illegal discharges of waste at sea. This document highlighted the perception held at the time that levels of provision of facilities were inadequate under MARPOL 73/78 and that action was required to overcome this inadequacy.

Following meetings of the working group preparing a draft proposal for a Directive on Shore Reception Facilities, the draft Proposal of the Council for a Directive was finally tabled in July

1998 and entered into force in December 2000. The differences between three versions of the Directive – working group document, proposed Directive, and final Directive – have been considered in this Chapter. An examination has also been made of the key elements of the final Directive, under a number of headings, and these have also considered potential strengths and weaknesses of the Directive, together with any elements of duplication with already existing legislation. The chapter has then set the Directive within the broader framework of European Waste Legislation and Marine Transport Legislation.

This chapter has highlighted the complex nature of the EU legislative framework within which Directive 2000/59/EC sits. It has also emphasised the nature of legislation on the environment in general and the marine environment in particular, which does not stand alone from other areas and which is responsive both to perceived problems and also to actual physical incidents such as the sinking of the *Erika.* The result of future legislative developments within the EU will mean that the Directive will develop and change over time. As change takes place, it may provide an opportunity to adapt the Directive to better fulfil its aim of reducing illegal waste discharges in response, for example, to technological developments in the port or shipping industries, as set out in Chapter 3, section 3.3.

CHAPTER 6

EXISTING DATA ON RECEPTION FACILITIES, AND LEVELS OF COMPLIANCE AND MONITORING IN THE NORTH SEA REGION

6.1 Introduction

The aim of this chapter is to examine the level of provision of port reception facilities, prior to the introduction of the EU Directive, and to assess trends in oil pollution levels in the North Sea region, in order to establish a baseline standard against which the Directive can be measured in the future. In particular, this chapter will examine the effectiveness of existing legislation developed to control the discharge of wastes into the marine environment, as outlined in Chapter 4, as it relates to the main requirements of the EU Directive set out in Chapter 5, section 5.3. Three of these requirements are examined in this chapter, using data collected by the bodies responsible for MARPOL 73/78, the Bonn Agreement and the Paris MOU.

The first main requirement of the Directive is mandatory provision of reception facilities, which is examined at section 6.2. The IMO has published data on the provision of reception facilities for oily wastes in a number of Circulars. In order to assess the level of provision of these facilities in the North Sea region, data from these circulars has been collated and analysed to assess whether there has been any change in levels of provision of facilities for the period March 1985 to October 1998. Those ports in Denmark, Germany and the UK that lie outside the geographical area of this thesis, outlined in Chapter 1, section 1.2.1, have been excluded from this analysis.

The second main requirement of the Directive is the use of a charging system to encourage use of facilities, and this is examined at section 6.3. This section makes use of material previously published in Carpenter and Macgill (2001(b)), together with other material, to assess the range of charging systems available to ports, using examples from countries using these systems.

The third main requirement of the Directive is the collection of data to assess levels of compliance and monitoring, in order to assess the effectiveness of the Directive. Data has already been collected, prior to the introduction of the Directive, under the Bonn Agreement and the Paris MOU, and this data is examined at section 6.4. Data published by the Bonn Agreement Secretariat, both in paper and electronic format, has been collated and analysed to identify trends in the levels of oil pollution in the North Sea region, both in whole and by country. Data published by the Paris MOU Secretariat, again in paper and electronic format, on vessel inspections between 1985 and 2002 has also been collated and analysed, in order to

determine the level of vessel deficiencies identified during inspections due to non-compliance specifically with MARPOL 73/78, and to identify any trends in these vessel deficiencies.

Finally, Section 6.5 will draw conclusions regarding the existing data in terms of whether any trends have been identified regarding levels of pollution entering the North Sea area or on the effectiveness of the existing legislation. The impact of the Directive on Port Reception Facilities will also be considered, with particular reference to whether it will be possible to use existing data as a comparator in order to determine the effectiveness of the Directive.

6.2 Mandatory Provision of Reception Facilities

Provision of reception facilities for a wide range of waste types including oily wastes and chemical wastes is a requirement of MARPOL 73/78, as outlined in Chapter 4, section 4.4.1. In the case of oily wastes, the IMO has collected data on the provision of port reception facilities from all signatories to the Convention for many years. Since 1985, this data has been published by the Marine Environment Protection Committee (MEPC) of the IMO in a number of Circulars. Ports have been asked to provide information to the IMO on the availability of facilities in the following categories:

1. Dirty Ballast Water
2. Tank Washing (Slops)
3. Oily Mixtures containing chemicals
4. Scale and Sludge from tank cleaning
5. Oily Bilge Water
6. Sludge from fuel oil purifiers

A summary of the data provided to the MEPC by ports within the North Sea region appears at Appendix 1 which has been compiled by collating data published by the IMO in 7 MEPC Circulars between 1985 and 1998. No up to date Circulars were available at the time of the Surveys in 2001 and 2002, the next complete Circular being published in November 2003 (MEPC.3/Circ 4).

The summary table outlines the specific categories of Annex 1 facilities available in each port, together with the number of separate companies providing facilities within these ports, where there is more than one provider. Many ports do not provide their own facilities but rather contract them in, and so the companies providing facilities can change over time, as can the range of categories of facilities provided. For example, in Port UK43 which identifies a total of 16 providers of facilities across all MEPC Circulars, the five companies providing facilities in

1985 are not the same as those in 1996. Identification numbers used for ports are those allocated to ports to which surveys were issued in the summer of 2001 and autumn of 2002, irrespective of whether those ports provided a response to the surveys.

The returns provided by ports in the MEPC Circulars are examined by country.

Belgium

No data for Belgium appears prior to July 1995 and, for the 3 MEPC Circulars containing information regarding Belgian ports, no breakdown of actual facilities is provided. For all Belgian returns, there is merely a comment that Annex I facilities are provided, but not which categories or whether all categories are provided. The reporting system used therefore makes it impossible to get a clear picture of what facilities are actually available in that country's ports

Only 3 ports are identified, with 5 companies identified as providing facilities. However, a further 38 companies are identified as being able to provide mobile facilities for the 3 ports, and 27 companies are identified as providing facilities for other regions of Belgium shown as B - other in Appendix 1, a total of 65 companies. Although apparently well provided for in terms of numbers of companies, from the MEPC Circular data it is difficult to draw any conclusions about actual levels of provision in Belgium. This is a particular problem of the way information has been provided to the MEPC as it does not identify what is available by specific Annex I waste categories. It can be assumed, however, that more complete information will be provided to vessels, on request, so that arrangements can be made for the discharge of wastes.

Denmark

Although 76 ports in Denmark provided information for the MEPC Circulars, the large majority of these lie on the Baltic Sea coastline and have been omitted as they fall outside the geographical area covered by this thesis. Only 6 Danish North Sea ports provided information for 5 MEPC Circulars between 1988 and 1996. A breakdown of responses appears in Table 6.1:

Table 6.1 Responses from Danish Ports

No. of Ports	No of returns	Breakdown of Categories Provided
4	all	all categories provided
1	all	all between 1985 and 1996; 5 in 1998
1	all	3 categories

Facilities for the handling of oily wastes have generally been available to vessels seeking to discharge wastes in Danish ports since at least the late 1980's, the only change being the port that reduced the level of facilities in the final circular.

Germany

As with Denmark, many more ports (73) provided information for the MEPC Circulars than are included in this section, because only a small proportion of these ports (13) lie within the geographical area covered by the survey. 12 German ports provided information for up to a maximum of 6 MEPC Circulars between 1985 and 1998, and a breakdown of responses appears in Table 6.2.

Table 6.2 Responses from German Ports

No. of Ports	No of returns	Breakdown of Categories Provided
5	all	• 3 x all categories; • 1 x 5 in 1985, all in 1998 and 1990 and 2 in 2995-1998; • 1 x 4 in 1985 and 1995-1998 and 5 in 1988 and 1990
5	4	• 1 x 5 in 1985 and all in 1995-1998; • 1 x 1 in 1985 and 5 in 1995-1998; • 2 x 1 in 1985 and 4 in 1985-1998; • 1 x 2 in 1985 and all in 1995-1998
1	3	2 in 1995-1998
1	1	1 in 1985

There is no apparent consistency regarding levels of provision in ports not providing all facilities, and also no clear trend in changes of provision. 6 ports recorded increased provision after 1985 and 1 recorded a reduction from 1995 onwards. With regard to the number of companies providing facilities, 4 ports list more than one company providing facilities - 2, 2, 3 and 6 respectively. Of the port detailing 6 separate providers (which provided all facilities in all 6 Circulars), 5 companies provided facilities to the port in the Circulars of 1998 and 1990, but only 1 company (the same company in all cases) provided facilities in 1985, 1995, 1996 and 1998.

In terms of the North Sea region, reception facilities have been provided in German ports since at least the mid-1980s and, while all facilities are not provided in all ports, vessel owners would easily be able to visit a port to make use of specific facilities without having to travel a great distance to do so and without leaving German waters.

The Netherlands

9 ports provided information for 5 Circulars, and a breakdown of responses appears at Table 6.3. All facilities were provided by private companies and bunkering services are contracted direct through local shipping agents, rather than through the port. Only one port reported an increase in provision between 1985 and 1996; there were no reported reductions in any port. In all cases, no indication is given of the number of companies providing the facilities.

As with Germany, all types of Annex I facilities are available to vessels within Dutch waters, although only one port provided all categories. However, vessels can easily travel to a port with specific facilities within Dutch waters, should they need to do so.

Table 6.3 Responses from Dutch Ports

No. of Ports	No of returns	Breakdown of Categories Provided
1	all	all categories provided
7	all	2 x 5; 1 x 4; 3 x 2 and 1 x 1
1	all	1 x 3 in 1985, 1990 and 1995 and all in 1996 and 1998

Norway

Just over 60 ports provided data in 6 MEPC Circulars. However, of these, only 25 are outlined in Appendix 1, as only those ports for which contact information was available for the surveys outlined in Chapter 7, have been included. For both Norway and the United Kingdom, a large number of additional ports provided information to the MEPC but contact details could not be obtained to include those ports in the surveys. Responses from Norwegian ports appear in Table 6.4.

Table 6.4 Responses from Norwegian Ports

No. of Ports	No of returns	Breakdown of Categories Provided
2	all	all categories provided
4	all	all post-1994, increasing from 2 x 5, 1 x 4 and 1 x 3 pre-1994
4	all	all pre-1994 reducing to 1 x 4, 2 x 3 and 1x 2 post-1994
5	all	• 1 x all in 5 circulars reducing to 5 in 1994; • 1 x 3 in all circulars; • 1 x all pre-1994, reducing to 3 in 1994 and 2 post-1994; • 1 x 3 pre-1994, increasing 4 post-1994; • 1 x all pre-1994, reducing to 3 post-1994
1	4	2 categories from 1994 onwards
9	2	3 x all, 1 x 5, 1 x 4 and 4 x 3 – for 1985 and 1990 circulars

Norway was the only country that provided information for the 1994 MEPC Circular when it changed its Annex 1 reporting categories from 6 to 5. Where all new categories are reported as being available, this appears as “all” in Appendix 1. The information provided by 25 ports in the MEPC Circulars is summarised below:

13 ports indicated that facilities were provided by more than one company between 1985 and 1998. Only in 6 instances do all the companies operate at the same time. As with Germany, there is no apparent trend in the levels of provision with 5 ports showing an increase in

provision and 7 showing a reduction between circulars. No conclusions can, therefore, be drawn as to whether levels of provision of facilities has changed significantly in Norway, particularly when considering only 25 of the 60+ ports which provided returns for the MEPC Circulars.

United Kingdom

56 ports, or groups of ports, appear at Appendix 1. As with Norway, only North Sea ports for which contact information was available have been included here. 6 MEPC Circulars between 1985 and 1998 have been examined, and the breakdown of results for the UK, set out in Table 6.5, is much more complex than other countries. 13 ports indicate a reduction in the range of facilities provided, 2 show a temporary increase and then return to the previous level, and only 5 have indicated increased provision over time, although in 3 cases this is only across 2 circulars. This would appear to show a decline in facilities in UK ports in the region, but the limited number of ports involved means that this decline may not be consistent across all ports.

Table 6.5 Responses from UK Ports

No. of Ports	**No of returns**	**Breakdown of Categories Provided**	
		No Change	**Change**
13	all	2 x all categories provided	• 2 x reduction and 1 x increase in 1996 then return to previous level; • 7 x reduction in 1996 and 1998; • 1 x reduction in 1998
5	5	2 x all and 1 x 2	• 1 x increase in 1995 then return to previous level; • 1 x reduction in 1996
7	4	2 x all, 1 x 5, 1 x 4 and 1 x 3	2 x increased provision over time
1	3	all in 1988 then 4 in 1996 and 1998	
15	2	4 x all and 3 x 4	3 x increase and 5 x reduction in provision
15	1	• 1998 – 3 x all, 1 x 4, 1 x 3, 1 x 2 and 3 x 1 category only • 1996 – 1 x 2 categories and 1x1 category only • 1995 – 2 x all categories	

In terms of the number of companies providing facilities, 37 ports indicate only 1 provider of facilities, normally shown as the name of the port, although the port is not necessarily the actual provider. Although the remaining 19 ports list multiple providers of facilities, these are not necessarily provided simultaneously. In the case of the 3 ports with the largest number of providers (9, 10 and 16 respectively), these ports are all located on estuaries and cover a very extensive area. In these examples, each provider may cover just one specific section of the port, or the whole area.

For Norway and the UK, the long coastlines and widespread distribution of ports means that, where facilities are not available in one port, vessels may have to travel greater distances to find them in another port in the same country, based on the ports providing MEPC returns. However, in both countries, there are many ports not included in this analysis as contact details could not be found for the purposes of the two surveys. In addition, other ports were identified which did not provide returns for the MEPC Circulars and, as a result, the picture of actual provision is sketchy and may be much greater than outlined above.

6.3 Charging Systems for Port Reception Facilities*

The IMO (2000(b), Chapter 11, page 258) identify six separate systems that can be used to recoup the cost of reception facilities. These costs include: capital costs; the acquisition of land; labour costs (including operation of facilities, supervision, administration and training); maintenance costs; and the cost of disposal of the waste). The six charging systems are:

- Direct Fee System (also known as Direct Cost Recovery);
- Non-Special Fee System (all costs of disposal are included in port dues);
- Free of Charge System;
- Contract System;
- Fixed Fee System; and
- Combined System.

Table 6.6 has been compiled in order to provide a detailed analysis of the main aspects of each charging system, including advantages and disadvantage. In terms of the practical application of each system, only those on the first sheet of the table are (or have been) used in North Sea ports and so these are considered in more detail.

* Material for this section has previously been published in Carpenter and Macgill (2001(b))

Table 6.6 Summary of Charging systems for Port Reception Facilities

Charging System	Advantages	Disadvantages
Direct Fee (or Cost Recovery)	• Adheres to Polluter Pays Principle • All costs are passed on to vessel • Vessels charged directly for waste discharged	• May prevent use of fixed facilities in ports • Use of contractors can result in high administrative burden • May promote illegal dumping • May encourage "lowest level" technology • No consistency in charges between ports – fee levels open to manipulation
No-Special Fee	• All vessels make a contribution therefore certain income level guaranteed to ports • May promote introduction of fixed facilities • Ports may introduce Best Available Technology to recover/recycle wastes and recoup some costs	• Vessels pay whether they use or not – therefore not Polluter Pays • Vessels may retain waste on board, despite calling in at other ports prior to arrival, and effectively "import" waste from elsewhere • Little incentive for waste reduction on board vessels
Free of Charge	• Vessels only pay for waste above a certain fixed volume which is known in advance, or in exceptional circumstances • Promotes disposal in port as no incentive to dump	• Not Polluter Pays • Requires taxpayers money to fund facilities
Contract	• Vessels have contract with port for fixed level of waste – guaranteed income for port/proof for exemption of vessel in other ports • Minimises administration/incentive to illegally dump for those vessels • May promote better technology on board at end of contract • "Cleaner" vessels charged less	• Only for specific vessels/fleets therefore not applied to all vessels calling into port • Still requires administration for other vessels • Little incentive to introduce waste reduction technology at start of contract
Fixed Fee	• Income to port guaranteed as all vessels pay, whether discharging waste or not • Less incentive to dump if vessel already paying • Fee may be lower overall for vessels discharging since all vessels are contributing • Administration costs should not be high	• Little incentive for waste reduction on board vessels • Not polluter pays • Administration costs may rise if vessels which call in frequently negotiate a reduced fee level

Table 6.6 (continued)

Charging System	Advantages	Disadvantages
Combined	• Guaranteed income from fixed fee to all vessels • Additional (direct) fee to vessels discharging therefore partially Polluter Pays • May promote waste reduction methods on board to reduce costs	• Illegal discharge may be promoted to avoid the additional element of the fee • Direct fee element of charges open to manipulation

NB: All systems will require an inspection regime using vessel logbooks of waste generated, for example, with an associated administrative cost.

6.3.1 Direct Fee System

This is the most commonly used charging system, and is used both in the UK and the Netherlands. Under this system, independent, certified contractors are contacted either directly by the vessel, or via the port, to receive that vessel's waste, and the vessel is then invoiced directly for the cost of disposing of that waste. Port costs under this system are minimal, covering the licensing and inspection of contractors to ensure that they carry out waste disposal to a satisfactory standard, and are often recovered by a small levy on vessels. However, the problems associated with this system are that it may promote illegal dumping by vessels to avoid disposal costs, and it may also encourage the use of the cheapest treatment and disposal methods available, rather than more efficient but more expensive methods. Finally, the cost of disposing of some types of waste are higher than other types, and vessels may be disinclined to correctly segregate wastes. In particular, if all of a particular waste type was discharged into a common tank as is often the case for oil, it would be very difficult to identify the source of any contamination, leaving the port to bear the cost of any additional treatments to deal with that waste.

6.3.2 Non-Special Fee System

Under the non-special fee system, all ships pay a fee, within the harbour dues, to cover the cost of reception and treatment of wastes. As a result, it is anticipated that vessels will make use of reception facilities since they have already paid for them. In order to make facilities cost effective, best available technology is used to improve the efficiency of the facilities and allow for the extraction of as much of the recoverable waste as possible. In the case of oil, this can then be sold to recoup some of the costs of the facilities.

Problems associated with this system are that vessels may be delayed in port while waiting to access facilities, and the cost of such delays may lead to them choosing to dump waste illegally rather than bear these costs. Additionally, vessel owners will be disinclined to introduce clean

technology on board (such as oily water separators) to reduce waste generation, if they have to pay a set fee, irrespective of the actual volume of waste produced. Vessels may also choose to visit ports operating this system specifically to offload high levels of waste at a fixed price, rather than pay the real cost of disposal, as would happen if they visited a port using the Direct Fee system. It may, therefore, be uneconomic for a port to bear the cost of disposing of a high volume of waste, and act as a disincentive to such a port introducing additional facilities. This is a particular problem where a port, as a commercial operator, must try and achieve a profit for its owners.

6.3.3 Free of Charge System and German 3-year "Free of Charge" Experiment

In order to assess the effectiveness of the Free of Charge system in reducing the input of chemical and oily wastes into the environment, the German Federal Government introduced a three-year pilot project in the Coastal States of Bremen, Hamburg, Niedersachsen and Schleswig-Holstein in May 1988. This system was based on the belief that vessels would make use of facilities, rather than illegally discharge at sea, if they did not have to bear the cost of using them. Noelke, (1992, pp 2-3) indicates that facilities were paid for with money provided by the Federal Government and the Coastal States, with a total annual budget of DM 13.5million. While there is an incentive under this system for vessels to make use of facilities, it does not meet the "significant contribution" requirement of the Directive.

As with the non-special fee system, there is little incentive for vessels to introduce clean technology since those which can dispose of their wastes under this system will not have to bear the cost. However, for ships unable to meet the requirements of the free of charge service, there may still remain an incentive to dump wastes illegally rather than be delayed in port and pay the costs of using the facilities. In addition, there will be little incentive for contractors receiving waste to introduce best available technology since they will receive a guaranteed income from the port, together with additional income from those vessels which have to pay for facilities. In this case, it is to those companies advantage that they use low cost methods to maximise profits.

While the pilot scheme was successful in increasing levels of uptake of facilities, it was the taxpayer rather than the waste producer who bore the cost of this system, and so the pilot scheme was not extended beyond three years. Noelke (1992, page 12) states that the State Governments of Hamburg, Niedersachsen and Bremen/Bremerhaven decided to continue to offer facilities for oily residues free of charge. However, in January 1992, the harbour dues in Bremen and Bremerhaven were increased by 9%, and a number of restrictions were introduced to limit the vessels able to take advantage of the free of charge facilities. It was not clear whether the increase in harbour dues was intended to directly subsidise the free facilities for oily residues or whether an additional administrative cost had to be met under this system. If a

subsidy was being operated, then this would make the system more similar to the “No Special Fee” system.

Evidence of the impact of the German trial on pollution levels is limited. However, Fleet & Reineking (2000, page 123) examined “changes in the oil-rate of the Guillemot and the annual number of oil pollution incidents recorded in the Traffic Separation Scheme area”. This is a measure examining the number of guillemots washed up on beaches and collected during the specific period of an annual winter survey of beached birds.

The results of this examination, using a 5-year rolling mean to eliminate short term discrepancies, showed that on the German North Sea coasts, “the oil-rate of the Guillemot dropped from 77% at the end of the eighties (1984/85-1988/89) to 52% at the beginning of the nineties (1989/90-1993/94) and rose again to 62% at the end of that decade (1993/94-1997/98)” (page 123). Fleet & Reineking (2000, page 124) further indicate that the amount of oil being disposed of in German harbour facilities increased steadily following the introduction of the three-year pilot project. The volume disposed of “reached a peak in 1993 and decreased from 1994 … when Hamburg began to set limits on the extent of free disposal”. Bremen opted out of the free disposal system in 1996.

Fleet & Reineking (2000, page 124) conclude that there was a real reduction in oil pollution in the southern North Sea connected directly to the provision of free facilities in German Harbours. They further conclude that “the general decrease in the oil-rate from the end of the eighties to the end of the nineties indicates that pollution levels in the southern North Sea have generally declined over the last 15 years”.

6.4 Compliance and Monitoring

In order to determine whether the Directive on Port Reception Facilities has any effect on the levels of oil and other pollution entering the North Sea, it will be important to use monitoring data to examine trends in pollution levels both prior to the introduction of the Directive and following its entry into force. Such monitoring data has been collected under the aegis of the Bonn Agreement through its aerial surveillance programme, and also under the Paris Memorandum of Understanding for Port State Control (Paris MOU). Where Figures illustrating data appear in this section, associated tables showing the actual data appear in Appendix 2.

6.4.1 Bonn Aerial Surveillance Data

Aerial surveillance data has been collected under the Bonn Agreement since 1986, with information being recorded on the number of flight hours undertaken by signatory states and the

number of oil slicks observed during these surveillance activities. Information was provided by Belgium, Denmark, Germany, the Netherlands, Norway, Sweden and the United Kingdom for the period between 1986 and 2001, while France commenced providing information in 1993.

The Bonn Agreement Secretariat (2003, page 2), in its 2001 Annual Report, notes that "estimates of the total amounts of oil discharged based on aerial surveillance data" are not included because "current data is too sparse and too diverse to allow reliable overall estimation of oil inputs, and that presenting such inputs … could be misleading".

The 2001 Annual Report (page 3) further notes that flight hour data up to 1999 is based on absolute numbers but, from 2000 onwards, has been adjusted so that surveillance data produced by SLAR (side-looking radar) can be included. In order to achieve this, a Standard Bonn Agreement speed (335 km per hour) is applied to flights. However, point 12 (2001 Annual Report, page 3) notes that some countries including Belgium and the UK use different speeds, and so data after 2000 is not directly comparable. Despite these caveats, the information provided in the Annual Reports can be used to provide a picture of trends in observed oil pollution incidents since the mid-1980s.

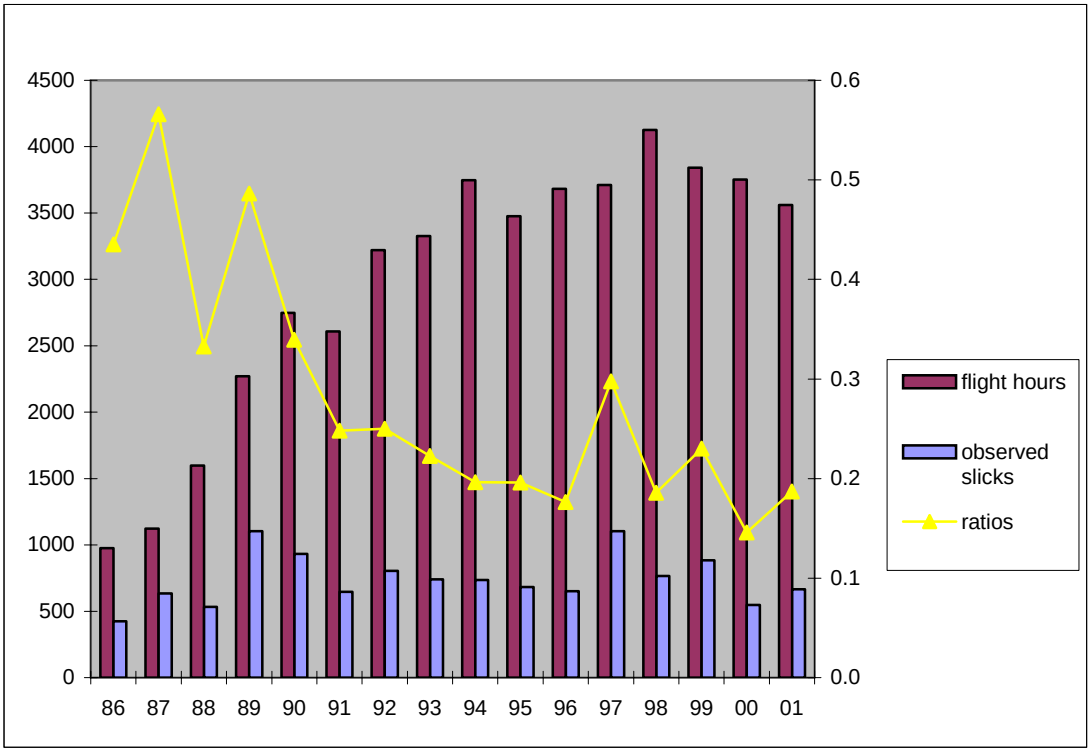
Figure 6.1 provides a basic summary of all aerial surveillance data collected between 1986 and 2001. This summary, the data for which appears in Appendix 2 - Table 1, has been compiled using both paper and electronic reports published by the Bonn Agreement Secretariat. During that period, flight hours rose from 977 for all countries in 1986 to a peak of 4126 in 1998, and were between 3500-3900 for the 3 years thereafter. The number of flight hours has nearly quadrupled since 1986. The level of observed slicks, ranging from a low of 425 in 1986 to a high of 1181 in 1997, have not risen in line with the increase in flight hours. Only in one third of years has the number of slicks been over 800 (1989, 1990 and between 1997 and 1999). Only in 1989 and 1997 did the number of observed slicks rise to over 1100.

The calculated ratio of flight hours versus observed slicks for all countries has fallen from the highest three values of 0.44, 0.55 and 0.49 slicks per flight hour in 1986, 1987 and 1989 respectively, to 0.19 slicks per flight hour in 2001. The lowest value is 0.15 slicks per flight hour in 2000. Although an increase in the ratio is apparent in 1997, the actual value for the ratio is 0.29, or one slick observed approximately every 3 hours.

The majority of flights take place during daylight hours. However, since 1992 the annual reports have provided a breakdown of flight hours and observed slicks in daylight and darkness hours, as improved night-time surveillance technology made it possible to identify slicks in darkness. This accounts for some of the increase in both flight hours and observed slicks.

Figures for slicks pre-1992 might well have been higher had such technology been available at the time as it can be assumed that, prior to its introduction, vessels would have used the cover of darkness to hide illegal discharges of oil. They would then have been able to travel considerable distances following discharge and could not be linked with a specific oil slick. However, the overall decline in the ratio of flight hours versus observed slicks is, therefore, even more significant since the possibility of illegal discharges being observed in now much higher.

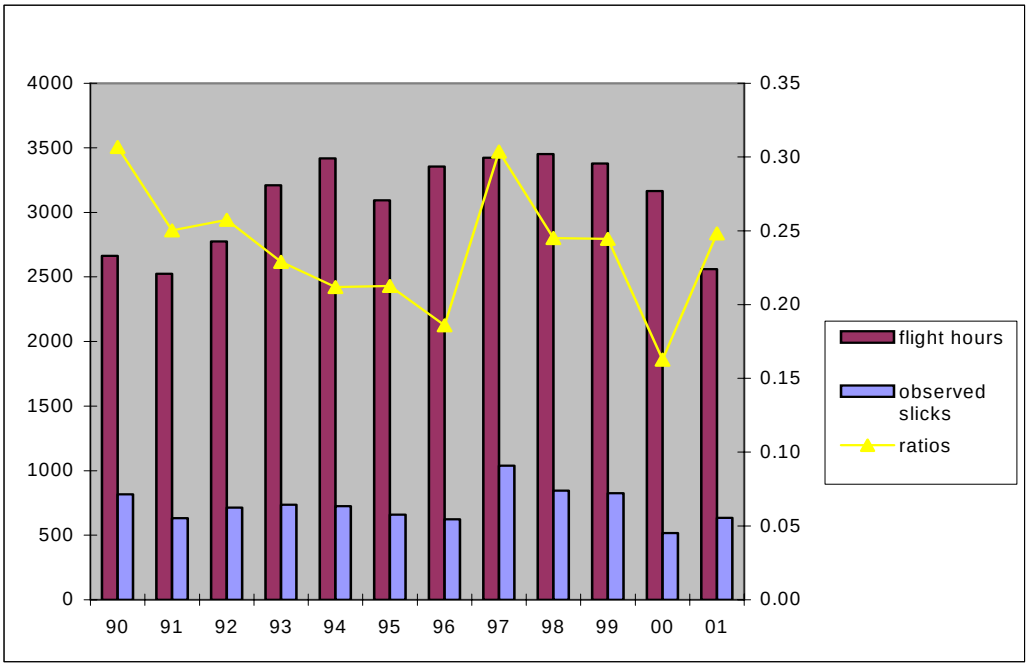
Figure 6.1 Bonn Agreement Data 1986-2001 (including Sweden and France)



For the Bonn Agreement area as a whole, there does appear to have been a reduction of levels of observable oil slicks entering the marine environment for the period 1986-2001. However, as Sweden and France are excluded from this thesis, a further examination of the Bonn Agreement Aerial Surveillance data has been undertaken to omit these countries.

Since 1990, country-specific data has been provided by the Bonn Agreement Secretariat. Figure 6.2, the data for which appears at Appendix 2 – Table 2, shows a breakdown of aerial surveillance flights and observed slicks between 1990 and 2001 for Belgium, Denmark, Germany, the Netherlands, Norway and the UK.

Figure 6.2 Bonn Agreement Data 1990-2001 (excluding Sweden and France)



The exclusion of data from France and Sweden, when compared to the results shown for all countries in Figure 6.1, leads to the disappearance of the large increase in pollution incidents identified in 1989, but the increase in observed slicks and in the ratio of flight hours to observed slicks in 1997 is still apparent. As country specific data is not available pre-1990, it is not possible to make a comparison of the high ratios for all countries in 1986, 1987 and 1988 shown in Figure 6.1, to identify whether it is linked to any specific country. Generally, across the period 1990-2001, flight hours have always been over 2,500 for the 6 countries while the number of observed slicks has been between 600-850 in all but 2 years (a high of 1039 in 1997 and a low of 515 in 2000). The ratio of slicks has been less than 0.30 slicks per flight hour in all but 1990 (0.31).

A comparison of ratios for all countries versus North Sea data (Tables 1 and 2, Appendix 2) for the period 1990-2001, shows that only in 1988 and 2001 was there any real difference between the two sets of data. The North Sea value was 0.03 higher in 1998 and 0.06 higher in 2001 compared to all countries. In all other years except 1990 and 1991 where the ratios were identical, the North Sea ratios have been 0.01 higher than those for all countries. There is, therefore, little real difference between the combined data for the North Sea states and that for all countries.

Tables 3 to 8 in Appendix 2 have been compiled by separating out country-specific information from both paper and electronic reports from the Bonn Agreement Secretariat. Using this country-specific data, Figures 6.3 to 6.5 have been produced to allow a comparison to be made

for each country against the combined North Sea data in respect of observed slicks, flight hours and the ratio of flight hours to slicks for the years 1990 to 2001. A summary of the results for each country is then provided.

Figure 6.3 Comparison of Observed Slicks for 6 North Sea States

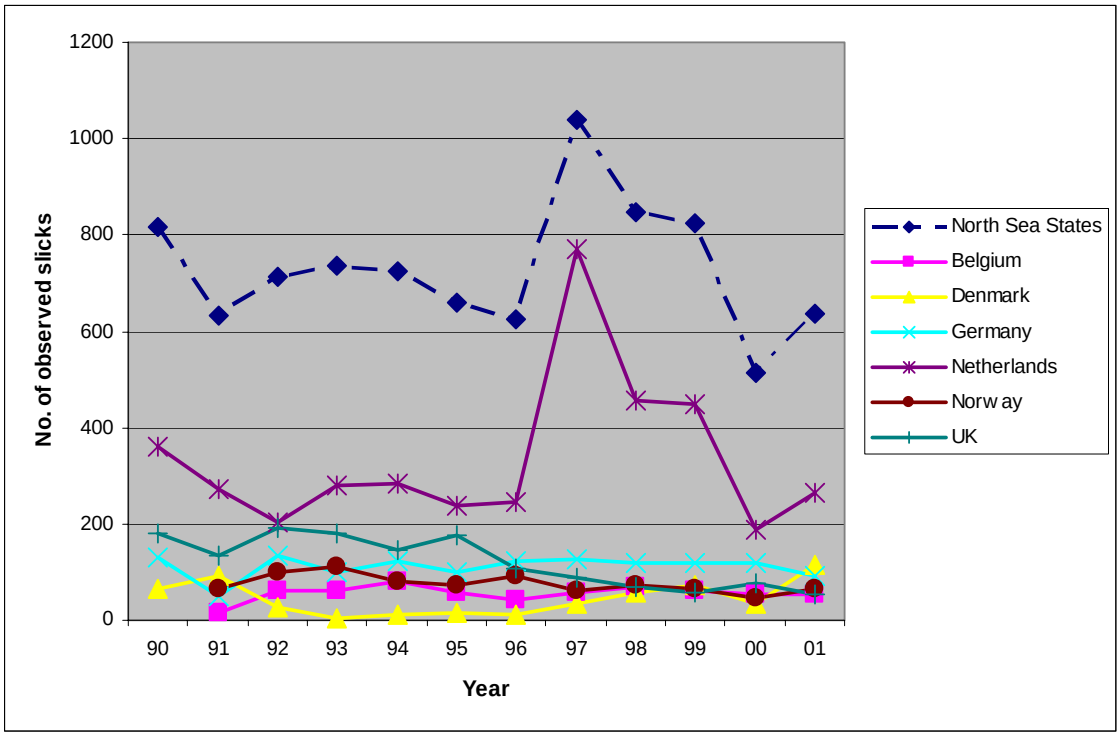


Figure 6.4 Comparison of Flight Hours for 6 North Sea States

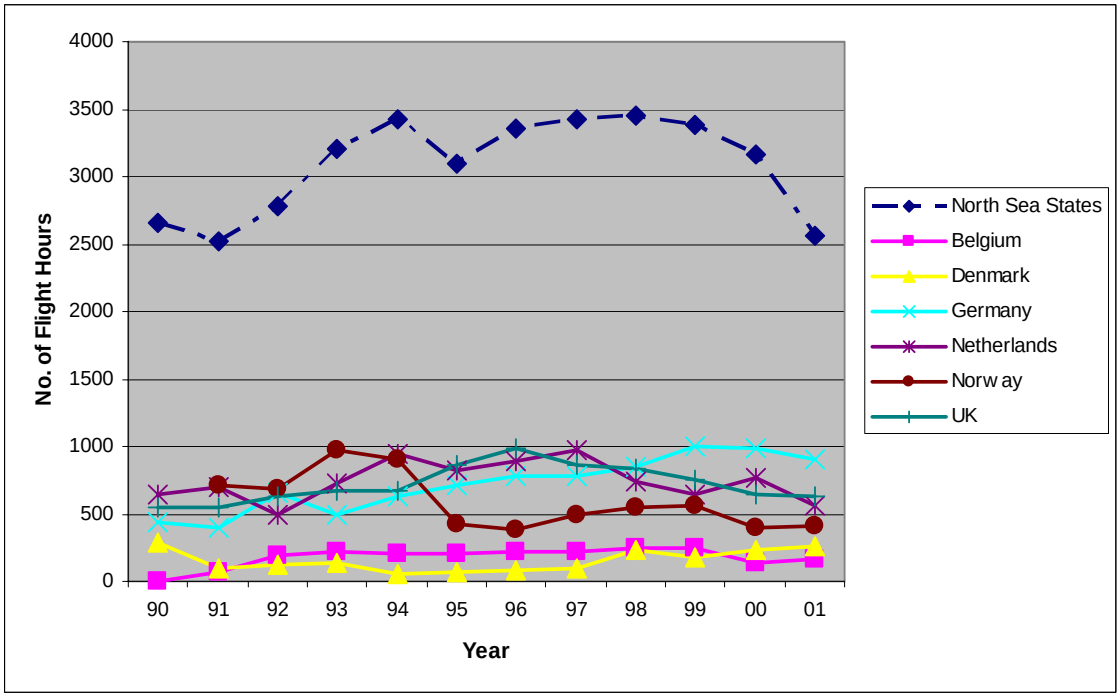
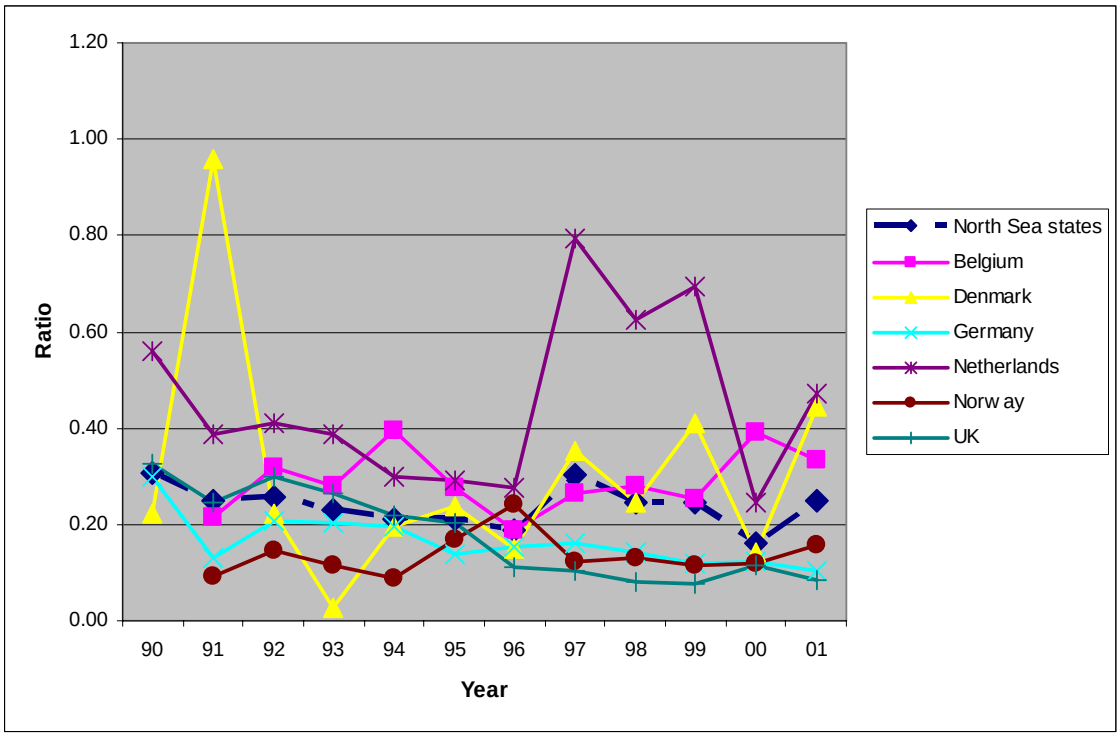


Figure 6.5 Comparison of Ratio of Flight Hours versus Observed Slicks for 6 North Sea states



Belgium

Belgium, together with Denmark, undertakes the lowest number of flight hours under the Bonn Agreement of the six North Sea states. Less than 100 flight hours were recorded in 1991 and between 200-250 were recorded for all years between 1992 and 1999. This number then fell to less than 150 flight hours in 2000 and 2001.

The high ratio of flight hours versus slicks identified in 1997 is not mirrored in the Belgian figures, but which identify the highest ratios for that country in 1994 and 2000. This does not compare either with the North Sea states or all countries results. In fact, the all countries results for 2000 show the lowest ratio of flight hours to slicks of any year.

Denmark

As with Belgium, Denmark undertakes a low number of flight hours and the figures for Danish aerial surveillance vary more widely between 1990 and 2001 than for any of the other North Sea states. The largest number of flight hours by Denmark (nearly 300) were recorded in 1990, followed by a large drop to less than 150 flight hours between 1991 and 1997 – the lowest number of flight hours of any of the North Sea states. The number of flight hours have increased significantly since 1998.

There are also wide variations in the number of observed slicks. Almost as many slicks as flight hours were identified in 1991, giving a ratio close to 1 slick per hour. By comparison, in 1993,

virtually no slicks were identified from a round 150 hours of surveillance flights, giving a ratio of almost zero. While the 1997 peak in the ratio of observes slicks per flight hour in both the North Sea and all countries data is apparent in the Danish data (0.35 slicks per flight hour), the actual number of observed slicks (36) is only 3% of the total observed slicks for North Sea states (1039).

The Danish results show two further peaks in 1999 and 2001 (ratios of 0.41 and 0.45 slicks/flight hour respectively), and in both those years the actual number of observed slicks are much higher, as are the number of flight hours. For 1999, the Danish results account for 9% of the North Sea total of slicks (74 out of 826) and, for 2001, they account for 18% (114 out of 635). Only the results for the Netherlands show similar peaks in these two years. The Danish results may be the result of an ad hoc increase in pollution incidents in 1999 and 2001. However, it would be necessary to analyze the data for that country for a number of years after 2001 to determine whether the increase in observed slicks is an ongoing trend in Danish waters.

Germany

Germany undertook around 400 flight hours in 1990 and 1991, rising to around 1000 hours in 199 and 2000. However, the number of observed slicks has been quite stable at around 120 to 130 for all except 4 years, the lowest being 51 slicks in 1991 and the remaining 3 being around 90 slicks. As a result, the ratio of flight hours to slicks is less than 0.21 in all years except 1990 when it stood at 0.30. The 1997 high level identified in the both the North Sea states and all countries data is not mirrored in the German data.

The Netherlands

The Netherlands, with over 620 flight hours in all years except 1992 and 2001 (492 and 565 respectively), is the only country where there have been more than 200 identified slicks for almost the entire period that country specific data is available. Only in 2000 was there less than 200 slicks recorded (187).

The Netherlands also sees the highest ratio of flight hours to oil slicks of any individual country, 4 years showing a ratio of over 0.5 (in 1990, 1997, 1998 and 1999), i.e. more than one slick observed for every 2 hours flight time. In fact, in 1997, the ratio was 0.79 so that, for every ten hours of flights, almost 8 slicks were observed. The surveillance data from the Netherlands appears, therefore, to account for much of the high value for both the North Sea states and all countries ratios in 1997, with 771 of the 1039 slicks observed by North Sea states (74% of the total). These were observed from 970 (28%) of the 3422 total combined flight hours for North Sea states.

Similarly, for the peaks identified in 1999 and 2001, the Netherlands data accounts for 54.5% and 42% of the total number of observed slicks in those years, while 19 % and 22% of total flight hours in those years were undertaken. Table 6.7 has been compiled to illustrate the proportion of observed slicks in the six North Sea states that can be accounted for by the Netherlands data, when compared with the number of flight hours undertaken. All percentage figures are shown to the nearest 0.5%.

Table 6.7 Netherlands Data as a % of 6 North Sea States

Year	Total No. of Slicks - North Sea States	Total No. of Slicks – Netherlands	%	Total No. of Flight Hours – North Sea States	Total No. of Flight Hours – Netherlands	%
1990	817	362	44	2663	648	24
1991	632	273	43	2524	703	28
1992	714	202	28	2774	492	18
1993	735	279	38	3209	721	22.5
1994	724	283	39	3418	949	28
1995	658	238	36	3094	819	26.5
1996	624	247	40	3355	897	26.5
1997	1039	771	74	2422	970	40
1998	846	458	54	3451	734	21
1999	826	450	54.5	3378	650	19
2000	515	187	36	3165	764	24
2001	635	266	42	2559	565	22

Table 6.7 shows that, for the years 1997 to 1999, over half of all observed slicks identified by the North Sea states were in Dutch waters, and only in 1992 was less than one third of all slicks observed in Dutch waters. In terms of the proportion of flight hours undertaken, in 1997 the figure is 40% of the total but, in all other years, it is close to or less than 25%.

Although Germany and the UK indicate broadly similar levels of flight hours, those countries identified a much lower number of identified slicks in all years. From these results, it is clear that a large proportion of all slicks in all years are accounted for by discharges into Dutch waters. However, while it is unclear whether the higher observation rate is the result of better observational techniques or the inclusion of smaller slick sizes in the observations, there is a clear problem of high numbers of oil discharges from vessels travelling through Dutch waters or heading into some of the largest ports in the North Sea region which are situated in the Netherlands.

Norway

Norway has indicated that over 400 hours of flights were undertaken in all but one year, with the highest numbers (over 900) in 1993 and 1994 and the lowest (387) in 1996. At the same time, the number of observed slicks was less than 100 in all years except 1993 (113 observed

slicks). The Norwegian data shows a ratio of flight hours to slicks of less than 0.20 in all years except 1996, the year with the lowest number of flight hours, when the value was 0.24 and there were 93 slicks observed during 387 flight hours.

Generally, the level of identified slicks is low in the Norwegian waters covered by aerial surveillance flights.

United Kingdom

Over 500 hours of flights were undertaken in all years between 1990 and 2001, with over 800 in the years 1995 to 1998. At the same time, over 100 slicks were identified in each of the years 1990 to 1996 (the highest number being 191 in 1992). There have been less than 90 slicks observed in the years 1997 to 2001, with the lowest number (52) in 2001.

From a high level of 0.32 in 1990, the ratio of flight hours to observed slicks has fallen to around 0.10 between 1996 and 2001. The UK data shows a lower level of slicks per flight hour in all years when compared with the data for both all North Sea states and all countries.

Summary

From the disaggregated Bonn Agreement aerial surveillance data, it is apparent that, although the Netherlands accounts for approximately one quarter of all survey flights undertaken in most years, the number of oil spills in Dutch waters as a proportion of the 6 North Sea states is much higher. Only between the years 1991 and 1995 and in 2000 was the proportion of oil spills less than 40%. In 1997, when there is a peak in both the number of observed slicks and in the ratio of observed slicks to flight hours, over 70% of the total spills for North Sea states were in Dutch waters.

Disaggregation of the data has identified a problem of vessel-source oil pollution in Dutch waters over many years. Although a decline was seen in 2001, it is apparent that action was required in the area to reduce vessel-source pollution. Directive 2000/59/EC may play a role if any such reduction is to take place, but it will be important to continue to monitor the area closely in the future, together with the rest of the North Sea region. In this way, Bonn Agreement data may provide a means of identifying whether the Directive has had any specific impact on pollution levels at sea.

6.4.2 Paris MOU Data

In order to achieve the stated aim of the Paris MOU of preventing substandard shipping from entering Western European ports, parties to the MOU are required to undertake inspections of 25% of foreign flag vessels entering its ports, the vessels of other MOU states being considered

foreign flag vessels for the purposes of these inspections. Vessels are to be inspected for a range of deficiencies under international law (see Chapter 4, Section 4.3.3). Deficiencies under the inspection scheme include failure to meet the requirements of MARPOL Annexes I, II, III and V.

19 states are parties to the Paris MOU including Belgium, Denmark, Germany, the Netherlands, Norway and the United Kingdom. The other 13 parties include countries as disparate as Canada, Sweden, Spain, Poland, Finland, Italy and the Russian Federation. The Paris MOU (2001, 2003) provided figures on inspection rates by member states. Figure 6.6 examines how successful the 6 North Sea states have been in meeting the 25% target for inspections of foreign flag vessels together with cumulative data for all states. Data for this figure appears in Appendix 3, Table 1.

Since 1991, for all countries, the 25% inspection target has been achieved in every year except 1996. However, looking at the individual countries, only the UK has met the inspection target in all years while the remaining North Sea states have each failed to achieve the 25% target in 3 or more years. The country with the most failures is Denmark, only meeting the target in 2 of the 12 years where data is available, closely followed by Belgium with only 3 years achieving the 25% target.

Figure 6.7 provides a picture of the trends in ship inspections, detentions, deficiencies and delays between 1985 and 2002, and is based on the data compiled in Appendix 3, Table 2 on Basic Port State Control Figures. A logarithmic chart has been used to allow a more direct comparison between different categories of data.

In all years, the number of inspections is higher than the number of ships inspected. Many vessels are inspected on several occasions during one year, particularly if deficiencies have been detected on a previous occasion which did not require immediate detention for those deficiencies to be corrected. Ships may, if facilities are not available in the port of inspection, be allowed to travel on to another port with the facilities to rectify a particular deficiency. Further inspections will take place at a later date to ensure that any corrective work has been undertaken. This is possible because of the monitoring system of the Paris MOU – the SIRENAC system mentioned in Chapter 5, section 5.3.6 - that allows ships to be tracked between ports based on an identifying number allocated by the IMO. This allows repeat inspections of the same ship, even if it changes its name during the intervening period. The number of deficiencies observed is also much higher than the number of individual ships since some may have many deficiencies identified during the course of an inspection.

Figure 6.6 Paris MOU Inspection rates for North Sea States and All Countries 1991-2002

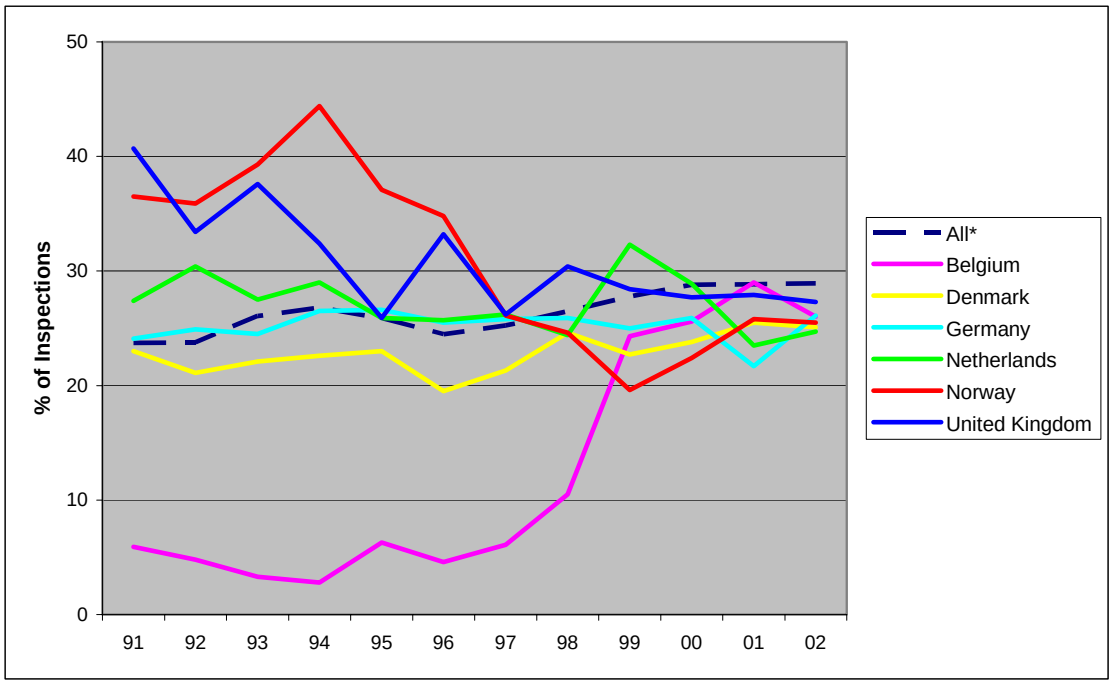
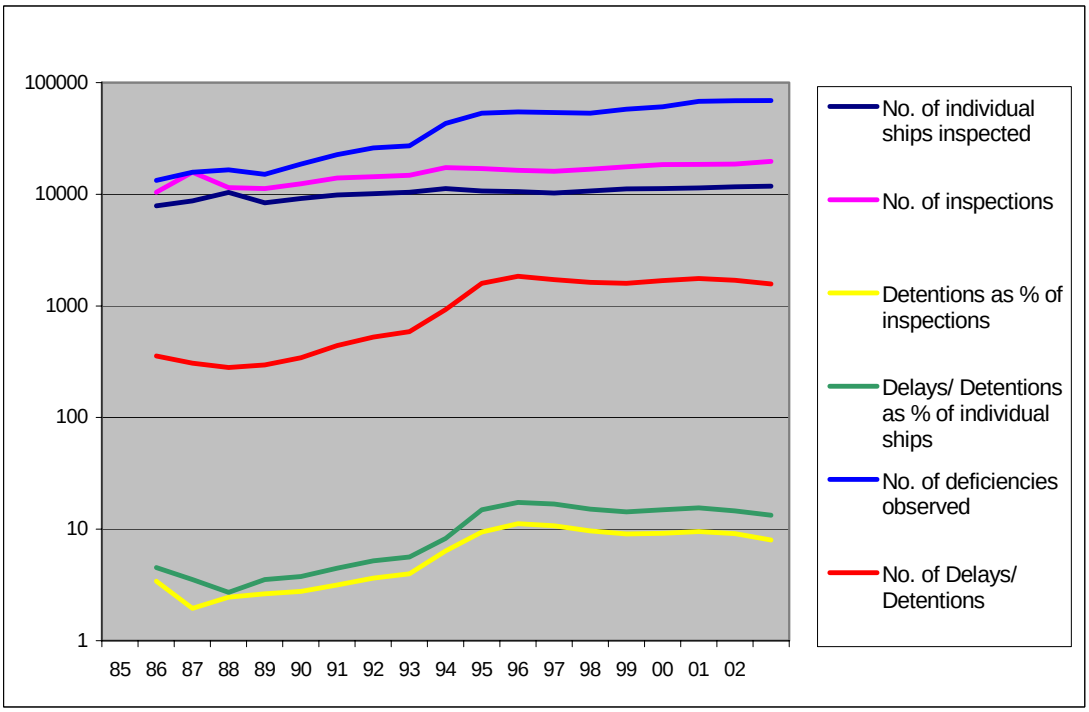


Figure 6.7 Basic Port State Control returns 1985-2002



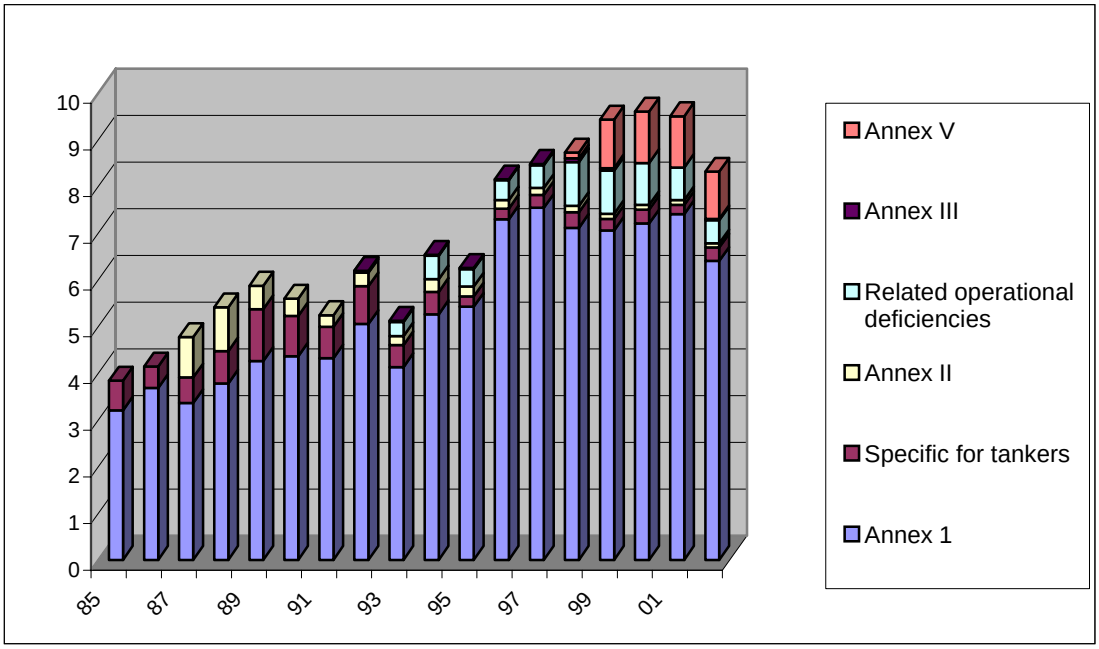
In terms of trends in the basic port state control returns, the number of individual ships inspected rose steadily from nearly 800 in 1985 to nearly 12000 in 2002. Similarly, the number of inspections also rose steadily from nearly 10500 in 1985 to almost 20000 in 2002. The number of observed deficiencies rose more rapidly - from just over 13000 in 1985 to nearly 70000 in 2002 - and has risen in all years except 1996 and 1997. However, in terms of delays and detentions of vessels which failed inspections, this showed a large increase from 356 in

1985 up to a high value of 1837 in 1995, following which the number has remained fairly stable between the high 1500s and high 1700s.

Detentions as a percentage of inspections show that less than 2% of vessels were detained in 1986, the lowest result, while over 11% were detained in 1994 and 10.7% in 1995. Since that time, there has been a fairly steady detention rate as a percentage of inspections of around 10%. These returns are broadly comparable with those for delays/detentions as a percentage of individual ships, although the lowest level here was in 1987 with 2.71% of individual vessels being delayed or detained. The highest delay/detention rate was 17.39% in 1995.

Figure 6.8 (see Appendix 3, Table 3) identifies the proportion of deficiencies made up by failures to meet the requirements of the different MARPOL Annexes between 1985 and 2002, as a percentage of total deficiencies. In this figure, MARPOL Deficiencies account for less than 10% of all deficiencies identified in all years, and was, for the first 11 years, less than 6% of the total. Annex I – oily wastes – is the largest category of all MARPOL deficiencies in all years, at less than 5% for the first 11 years, and just over 7% for all but 2002 in the remaining years.

Figure 6.8 MARPOL Deficiencies as % of total deficiencies 1985-2002



Data for Annex II – noxious liquid substances - was first made available in 1987 and only in 1989 did it account for more than 1% of all deficiencies. Similarly, Annex III – packaging – data is available from 1993 and reached a high of 0.08% of all deficiencies in 1997, being less than 0.03% in all other years. Returns for Annex V – garbage – were not provided until 1998, and this represented just over 1% of all deficiencies in all but its first year.

Figure 6.9 (see Appendix 3, Table 4) considers MARPOL deficiencies as a proportion of the number of inspections carried out. Annex I is the largest of any of the categories shown and represented around 5% of all deficiencies in the first 4 years, rising to almost 25% in 1996-1999 and over 25% in 2000 and 2001. However, the combined MARPOL figures account for less than 30% of deficiencies as a percentage of inspections in all but 3 years (1999–2001).

Figure 6.10 (see Appendix 3, Table 5) also shows that Annex I forms the greatest proportion of MARPOL deficiencies for individual ships. In this example, the cumulative values range from less than 10% in 1985 to nearly 60% in 2000 and 2001, with Annex I deficiencies ranging from less than 5.5% in the mid 1980s to nearly 44% in 2000 and 2001

In both Figures 6.9 and 6.10, it is apparent that the identification of deficiencies under MARPOL Annex I has become more common since the mid-1990's. The Paris MOU (2003) lists the range of categories for which a vessel can fail an inspection or be identified as having deficiencies. These categories include:

- 15 categories of deficiencies under MARPOL Annex I;
- 15 categories for Specific Tankers (oil and chemical tankers and gas carriers);
- 9 categories for MARPOL Annex II;
- 4 categories of MARPOL related operational deficiencies;
- 5 categories for MARPOL Annex III; and
- 4 categories for MARPOL Annex V.

Details of the most common deficiencies for MARPOL Annexes I and II were recorded in the Paris MOU Annual Reports until 1996. This information appears at Appendix 3, Tables 6 and 7 respectively. In the case of Annex I, records have been kept since 1986. Although an extra category was added in 1996, the maintenance of an accurate "oil record book" is the most common deficiency identified during inspections for all years, with either the "oily water separator" or "other" categories being second and third highest in all years.

In the case of Annex II, where records commenced in 1987, failure to keep accurate records is also the most common deficiency, although these records can be either the "cargo record book" or the "P&A manual". The combined figures for these records were less than 50% only in 1994, 1995 and 1999. In other years, the combined figures have been close to or even above 60%. The third largest category in all years is "other", which is not specified.

Figure 6.9 MARPOL Deficiencies as % of the number of inspections 1985-2002

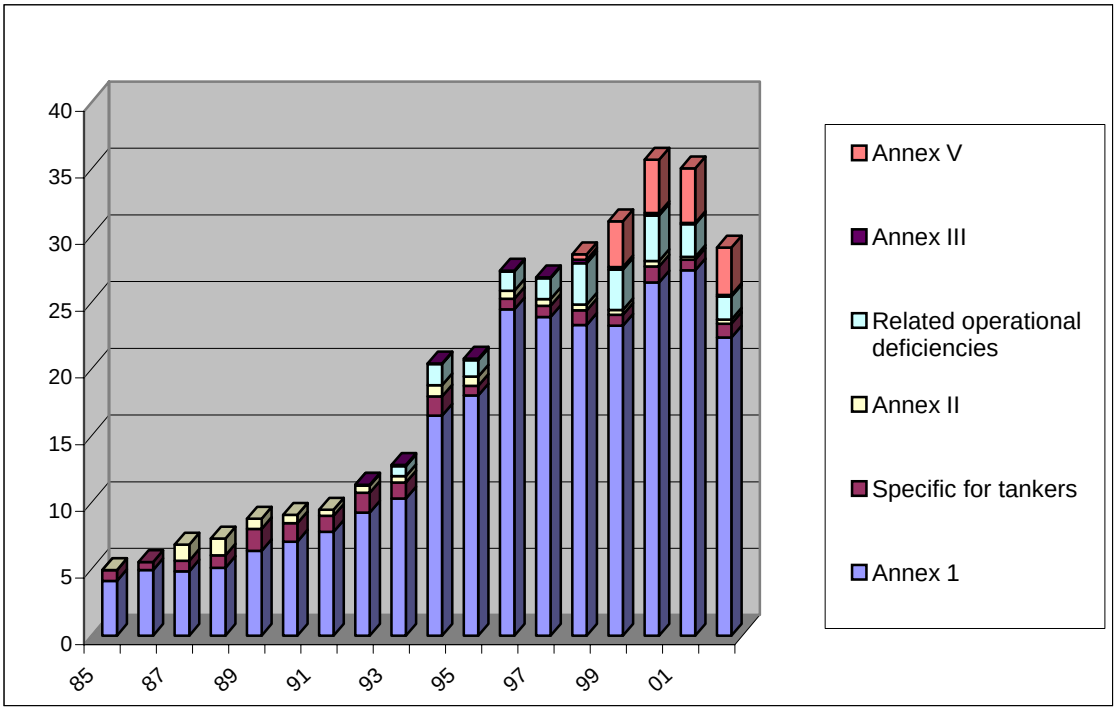
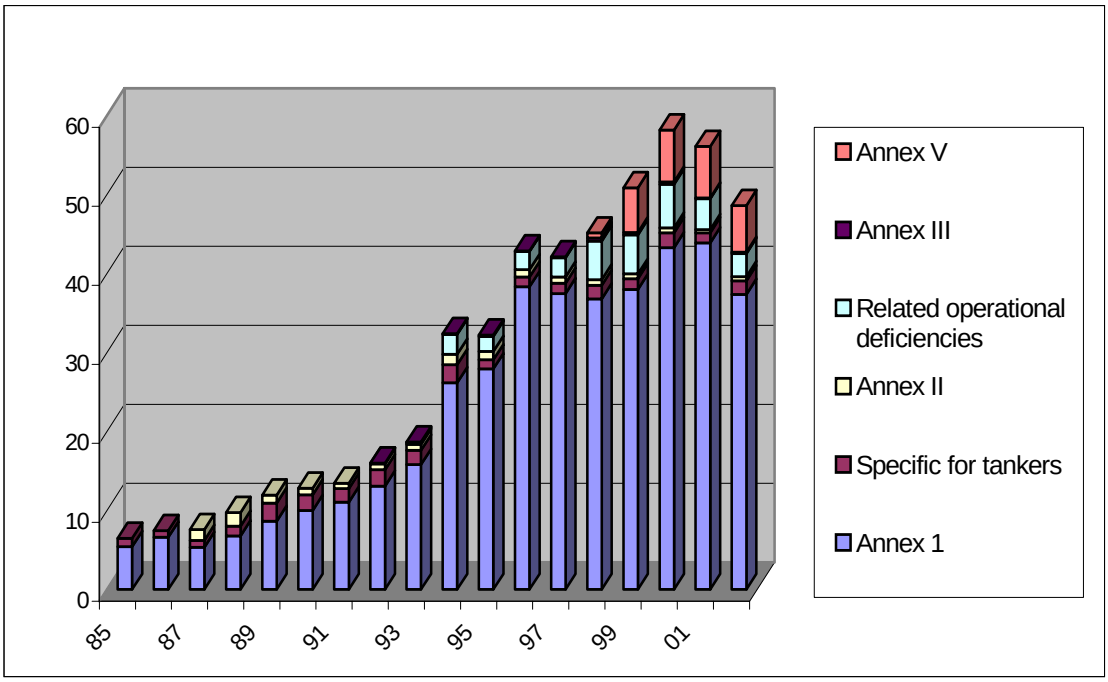


Figure 6.10 MARPOL Deficiencies as a % of individual ships 1985-2002



6.5 Conclusions

MEPC Circular data covering ports contacted through the summer 2001 and autumn 2002 surveys highlights an incomplete picture of availability of reception facilities for oily wastes, as outlined in Section 6.2. The data is limited as those ports that provide returns to the MEPC are generally larger ports or ports that operate as oil terminals, for example, rather than the wide

range of much smaller ports such as fishing ports which exist in the North Sea region. The result is that there are large gaps in the picture of availability in this region. In order to fill these gaps, and to provide a more complete picture of the availability of port reception facilities in the North Sea region, two postal surveys have been conducted. The results of these Surveys are examined in Chapter 7.

No information could be obtained on levels of actual uptake of facilities in ports, or on volumes of waste discharged by vessels. It will not, therefore, be possible on the basis of the existing data to determine whether the Directive leads to an increase in vessels using facilities or to increased volumes of discharges. Although the surveys examined in Chapter 7 attempted to obtain information on levels of uptake, responses from ports were sparse as they have not normally been required to obtain such information. The result is that it will only be possible for the EU to measure the effectiveness of the Directive in terms of increased provision and increased uptake following the introduction of the Directive, once a data collection system is implemented. In order to ensure the accuracy of such a system, data will need to be collected from all ports, irrespective of size, rather than just larger ports or oil terminals. If this does not happen, then the problems identified with the MEPC data could well remain.

Charging for reception facilities has been examined with reference to specific countries. No one system is specified under the Directive and it is likely that ports will continue to charge vessels in the same manner as before the introduction of the Directive. In its present format, it is unclear how the effectiveness of the charging element of the Directive can be measured, particularly as there is already little consistency between North Sea states. In order to make a direct comparison between the different systems, so that modifications can be made to the Directive at a later date, information will be required on levels of uptake, costs to vessels and ports, and identification of any reduction in pollution levels associated with a particular system. In this latter aspect, the collection of data under the Bonn Agreement may prove a useful method under which any change in the number of observable inputs of oil to the North Sea region, possibly resulting from the Directive, can be measured.

An examination of Bonn Agreement aerial surveillance data for the 6 North Sea states between 1990 and 2001 shows a fairly consistent level of observed slicks, apart from a large increase in 1997 and a reduction thereafter. Virtually the whole of this 1997 increase can be accounted for by an increase in identified slicks in Dutch waters. Figures provided by the Netherlands for observed slicks are higher than for any other North Sea state in all years. While it is clear from the disaggregated data that higher levels of discharges take place in Dutch waters than those of the other North Sea states, it is not possible to establish why there are so many more pollution

incidents, other than to note that many of the largest ports in the region are situated in the Netherlands and there are very high levels of vessel traffic into those ports.

Changes in the recording of flight hours since 2000, to take into account SLAR figures, means that data from that year onwards cannot be directly compared with figures prior to that date. It may, therefore, prove difficult to use Bonn Agreement data as means of determining whether the Directive has resulted in any measurable reduction in oil pollution incidents compared with the situation prior to its entry into force. However, Bonn Agreement survey data can be used to monitor the effectiveness of the Directive by comparing levels of observed slicks per country against levels of uptake of facilities in that country's ports, once such data is collected by the EU and making reference to the cost of facilities.

In terms of the returns provided in the Paris MOU Annual Reports, since only the UK met the requirement to inspect 25% of foreign flag vessels in all years between 1991 and 2002, it can be assumed that the actual level of deficiencies examined in Figures 6.7 to 6.10 would have been higher in these years, had all Paris MOU states met the inspection target. However, because of the wide variations in actual inspection rates between the various North Sea states in the 1990s, it would be difficult to use Paris MOU data as a means of examining the impact of the Directive compared to the situation before its entry into force.

The Paris MOU inspections are conducted for a broad variety of deficiencies under a number of different legislative instruments and, if this system is to be used by the EU in identifying non-compliance under the Directive, it will be necessary for the EU to specify exactly what deficiencies it wishes to use as a measure of the impact of the Directive, and to determine whether vessels have discharged waste illegally. The SIRENAC system would allow additional data to be collected on deficiencies under the Directive, and for a comparison against other deficiencies.

This chapter has highlighted both the types of data already available which may be used to assess the impact of Directive 2000/59/EC, but it has also identified a number of gaps in that data, particularly the data available on provision of port reception facilities from the MEPC circulars. In order to obtain a more comprehensive picture of availability of facilities in the North Sea region, the results of two surveys of ports conducted in the summer of 2000 and the autumn of 2002 are examined in Chapter 7.

CHAPTER 7

NEW DATA: LONGITUDINAL SURVEYS OF PORT RECEPTION FACILITIES

7.1 INTRODUCTION*

7.1.1 Aim of Chapter

A major stumbling block of MARPOL 73/78 has been the lack of accurate data regarding the availability of facilities. A similar lack of data could undermine the new EU Directive, unless steps are taken to collect data from a broader range of ports than that covered under MARPOL 73/78. Only by having a complete picture of availability, including any lack of facilities so ports can be required to introduce them, would it be possible to assess whether the use of reception facilities offers a successful method of reducing marine pollution from discharge of waste at sea.

The aim of this chapter is, therefore, to provide a comprehensive picture of the availability of reception facilities in the North Sea and wider North East Atlantic region. This will overcome the problem, outlined in Chapter 6, Section 6.2, of an incomplete picture of availability under MARPOL 73/78. The chapter will examine the availability of facilities in line with the categories set out in various Annexes of MARPOL 73/78, i.e. Annex I – Oily Waste; Annex II – Noxious Liquid Substances; Annex IV – Sewage: and Annex V – Garbage. It will also examine levels of uptake of facilities in ports.

7.1.2 Survey Methods

In order to achieve a clear picture, two postal surveys were conducted within the North Sea region in the summer of 2001 and the autumn of 2002. Postal surveys were selected as the most appropriate method as details of postal addresses were easily obtainable. The survey was too long to be conducted using telephone calls, since data might not be in an easily accessible form, and it was anticipated that some ports would require time to collect together all the requested information. Electronic methods were also excluded as many smaller ports did not have access to the internet or have email contact details, and so a survey could not be posted on a website or sent by electronic mailing for completion.

Sample surveys appear at Appendix 4 and were issued to North Sea ports in the United Kingdom, The Netherlands, Belgium, Denmark, Germany and Norway. Although Norway is not a member of the European Union, Norwegian ports were included in order to provide a complete picture of availability of facilities within the North Sea region.

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* Material for this section has previously been published in Carpenter and Macgill (2000) and (2003)

The first survey was conducted during the summer of 2001 and an evaluation of its results appears in Carpenter and Macgill (2003). The survey was developed and trialled through a meeting with the Harbour Master of a large port in the North of England, part of a larger grouping of UK ports, together with an external consultant working for that port company and for many other ports in the UK and Ireland. Following that meeting, and telephone discussions with representatives of a number of ports in the region, the survey was adapted and sent to all North Sea ports using contact details available from the IMO through its MEPC Circulars, and from information contained in the Fairplay Ports Guide (2001). This Guide provides information on both the location of ports and the services provided within them, including contact details for shipping agents, suppliers of provisions and equipment, and waste companies that are licensed to operate in those ports.

For MARPOL Annex 1 (Oily Waste), the categories used in the MEPC Circulars (at Appendix 1) differ slightly from those used in the Surveys and outlined at Appendix 10. This was because the trial survey indicated that the categories used in the MEPC Circulars were more relevant for larger ports and, in the case of smaller ports, the revised categories used in the survey were easier for ports to provide information on and therefore likely to increase the response rate.

195 ports were approached for Survey 1 and 82 provided data in a format that could be used to determine the availability of facilities and levels of uptake in the region. The purpose of the first survey was to examine the preparedness of ports to meet the requirements of the EU Directive on port reception facilities[*], in advance of its introduction in December 2002. Data was collected prior to final agreement being reached on the Directive, and at a time when a number of ports were not aware of its existence.

The second survey was conducted just prior to entry into force of the Directive, and aimed to see whether any changes in provision or uptake of facilities could be identified that had taken place as a direct result of the development of the Directive. The recipients of Survey 2 were therefore separated into two categories:

- Group 1 - all ports that had provided a useable response to survey 1. These ports received a survey containing their previous answers, an example of which appears at Appendix 4, and were asked to indicate whether any changes had taken place, including any increase in the level of provision. An additional section, seeking information on aspects including transposition of the Directive into national law and whether there had been any change in the methods of charging for facilities, in vessel inspections or in administrative activities. An analysis of responses to these additional questions appears in section 7.4.

- Group 2 - the second group included all those ports that had sent an unusable response to survey 1, together with those that did not respond in any way. These ports were sent a further copy of the original survey.

An analysis of the data collected from the two surveys has been undertaken, with all tables and figures compiled using the survey data. Section 7.2 will examine some of the general background results of the surveys, including the location and physical type of ports within the North Sea region, business activities conducted in those ports, and the number of vessels calling in at them, for example. The availability of facilities, as determined by the two surveys, will then be examined in section 7.3. Section 7.4 will consider the impact of the Directive on ports, as determined by the additional section of the second survey issued to Group 1 ports. Section 7.5 will examine the validation of the survey data using a variety of sources of data and, finally, conclusions will be drawn in Section 7.6 regarding any identifiable impact of the Directive on the responses to the two Surveys.

7.2 North Sea Ports – General Background Information

Using the two surveys of North Sea ports, contextual information for the activities of those ports has been obtained from questions about business activities, physical location and other factors. These responses emphasize the broad variety of port types and size, and the range of vessel types and sizes within the region. Table 7.1 provides a breakdown of response details for the 195 ports to which surveys were issued, based on contact information published for MARPOL 73/78 Annex I in IMO MEPC Circulars and also using the Fairplay Ports Guide (2001).

In total, 82 ports provided usable responses to either one or both surveys. Several other ports provided either partial responses or port brochures which could not be used for this analysis. Full details of all responses and non-responses appear at Appendix 5.

There were some complications arising from returns, specifically for two UK ports. Although 83 surveys were issued to UK ports, with a total of 42 providing one or more returns, the responses from UK47 and UK53 in Appendix 5 each cover three separate port identities, bringing the total for UK ports to 48. However, in the case of UK47, the return for that port actually identifies 7 separate port identities, which would bring the UK total up to 52 ports. All tables and charts in this Chapter therefore specify the number of survey responses to each question, with those from ports UK47 and UK53 being treated as single entities in all the relevant sections and Appendices.

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[*] "*Directive 2000/59/EC of the European Parliament and of the Council on port reception facilities for ship-generated wastes and cargo residues*". Pub. Official Journal of the European Communities, L332, pp 81 to 89 of 28 December 2000.

Table 7.1 Survey Response Details for Surveys: (1) Summer 2001 and (2) Autumn 2002.

Outline of details of the number of surveys issued and returns by country for each of two surveys. "Other" represents those ports which were either unable to provide returns or for which correct contact details were not available.

Country	Survey response details					
	Surveys issued	Returns details				No response
		Survey 1 only	Survey 2 only	Both surveys	Other	
Belgium	8	0	0	1	3	4
Denmark	7	1	0	2	0	4
Germany	13	0	4	3	1	5
The Netherlands	23	1	1	4	6	11
Norway	61	8	6	9	4	34
United Kingdom	83	11	7	24	13	28
Totals	195	21	18	43	27	86

7.2.1 Business Activities

Figures 7.1 and 7.2 provide a breakdown of responses with reference to the type and number of business activities which are undertaken in 78 ports. A full breakdown of business activities appears at Appendix 6.

Within the 78 ports in Figure 7.1, the main business activity is unloading/loading. Only 12 do not provide this service: 3 in Norway and 9 in the UK. Of these 12 ports, 5 are solely oil terminals (1 Norway, 4 UK), 2 are fishing ports only and 3 are fishing ports combined with some other business activity (all UK), and 2 offer a mixture of activities (both Norway). Of the 67 ports which undertake loading/unloading activities, 2 (1 Germany, 1 UK) indicate that this is the sole activity undertaken, while the remainder combine it with other forms of activity. The second largest category in Figure 7.1 is Pleasure Craft Marinas – 43 ports undertaking this business activity. Pleasure craft are exempt from the requirements of the EU Directive unless they carry more than 12 passengers. As a result, the 43 ports will not be required to provide facilities for this type of vessel under the Directive.

While Figure 7.1 illustrates the very wide range of different business activities that take place in North Sea ports, Figure 7.2 illustrates the numbers of activities undertaken by ports. This varies widely from one port (NE17) outlining 16 different business activities and 9 ports – 7 of which have been identified previously - undertaking just one business activity. The majority of ports undertake 5 or fewer activities, with the average number being 4.11.

Figure 7.1 Types of Business Activities in 78 North Sea ports

Illustration of the range of business activities undertaken in 78 North Sea ports with the top 3 activities being Unloading/Loading operations, Pleasure Craft Marina and Bulk Cargo operations.

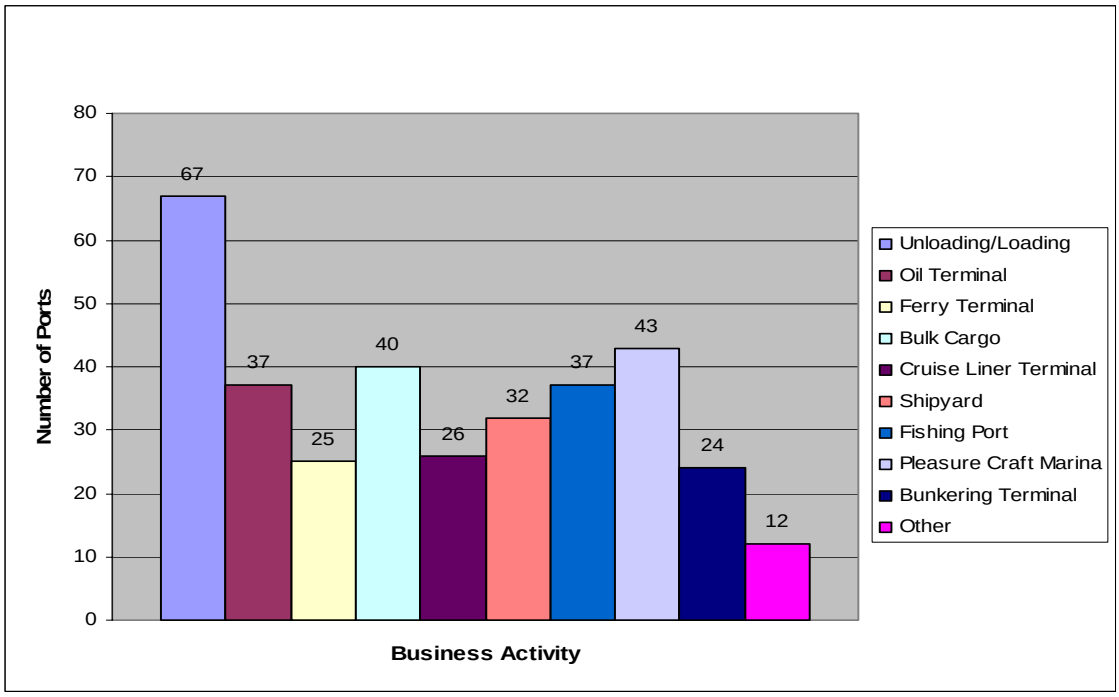
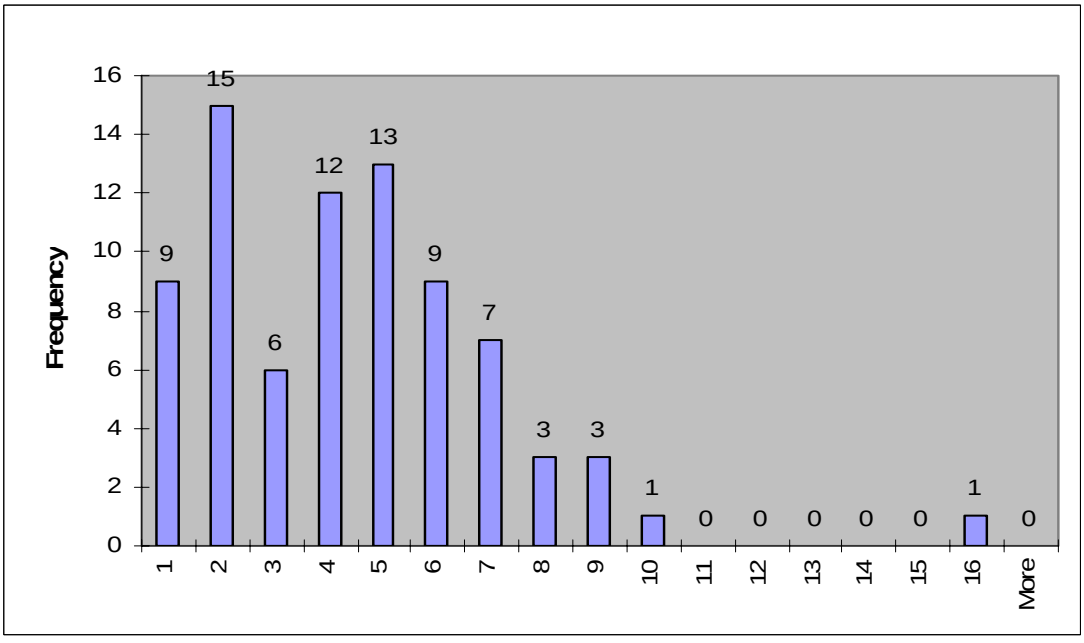


Figure 7.2 Histogram of Business Activities in78 North Sea Ports

Illustration of the number of business activities conducted in 78 ports, where the majority of ports operate 5 or less activities and only one port operates more than 15.



7.2.2 Physical Environment and Geographical Locations of Ports

The data for physical environment and geographical location appears at Appendix 7. The physical environments of 49 ports and geographical locations of 76 ports were identified from Surveys 1 and 2. Table 7.2 details the physical environments by country and, of the 49 ports providing information, 24 are based in one physical area only – 18 in industrial areas, 1 in an oil refinery and 5 in storage areas. A further 13 are based in 2 areas – 11 of these are in combined industrial and storage areas – while 5 operate in 3 areas and 7 in all 4 areas. The physical environments of ports are, therefore, very varied. However, a large number of ports did not provide this information – 29 out of 78 – and of these 29 ports, 26 are in the UK.

Table 7.2 Physical Environment of 49 Ports

Outline of the physical environments in which 49 North Sea ports are operating, with 25 ports operating in more than one physical environment.

Country	Industrial Area	Oil Refinery	Chemical Plant	Storage for Oil & Chemicals	Total No. of Ports
Belgium	1	1	1	1	1
Denmark	3	0	1	1	3
Germany	5	1	0	2	4
Netherlands	4	3	2	3	4
Norway	16	0	1	10	18
UK	12	6	6	12	18
Totals	**31**	**11**	**11**	**29**	**49**

76 ports provided information on their geographical location and Table 7.3 sets out these locations by country. It illustrates that most ports operate in an urban area and also includes a number of the ports in a "mixed" category. In terms of these "mixed" locations, one Netherlands port (NE17) operates in all areas including "Other" which is a recreational beach area. One UK port (UK47(a)) under the "mixed" category heading also includes "Other" which, for this port; is a specially built leisure marina.

Table 7.3 Geographical Locations of 76 Ports

Outline of the geographical locations in which 76 North Sea ports are situated, with ports categorised as "mixed" operating in more than one geographic location.

Country	Urban Area – City	Urban Area – Town	Rural Area	Other	Mixed	Total No. of Ports
Belgium	1	0	0	0	0	1
Denmark	0	2	0	0	1	3
Germany	1	3	0	0	2	6
Netherlands	2	1	0	0	2	5
Norway	5	9	2	0	6	22
UK	6	15	6	6	6	39
Totals	**15**	**30**	**8**	**6**	**17**	**76**

For the remaining "mixed" locations, the Danish and German ports are located on the boundaries between town and rural areas. 2 Norwegian and 5 UK ports also operate in this combination of areas. Of the remaining 4 Norwegian ports, 2 are in City/Town areas, one in a City/Rural area and the last is a combination of City/Town/Rural. Finally, of the 6 UK ports listed solely under "Other", 4 provided additional information: 2 are fishing ports, 1 is a concrete structure built in the mouth of an estuary and 1 is a floating buoy using a 3 mile long pipeline connection to shore to transport oil so that vessels do not have to travel further upriver. These returns show that the physical and geographical identity of ports differs widely within the region and that there is no one "typical" North Sea port. This wide variation is also apparent for the numbers and types of vessels calling in at ports, and is discussed in section 7.2.3.

7.2.3 Vessel Traffic in Ports

77 ports provided information on numbers, types and sizes of vessels calling in during a 12 month period and also identified whether any reception facilities were provided for each vessel category. 22 ports provided information for Survey 1 only, 16 for Survey 2 only and 39 for both Surveys. Table 7.4 outlines the number of ports which provide facilities and whether they are used or not, together with numbers of ports which specifically do not provide facilities for each vessel category. Information on vessel numbers, types and facilities available appears at Appendix 8 which is separated into Cargo Vessels and Passenger Vessels. Category N – "Other" covers a wide range of vessels such as fishing vessels, pleasure craft and offshore supply vessels, which have not been given a separate category.

Table 7.4 Facilities Provided/Not Provided by Vessel Type – 77 Ports

Outline of the number of ports offering reception facilities by vessel types, including the number of ports where facilities are provided but not used. This table also identifies the number of ports specifically not providing facilities for each of the vessel types.

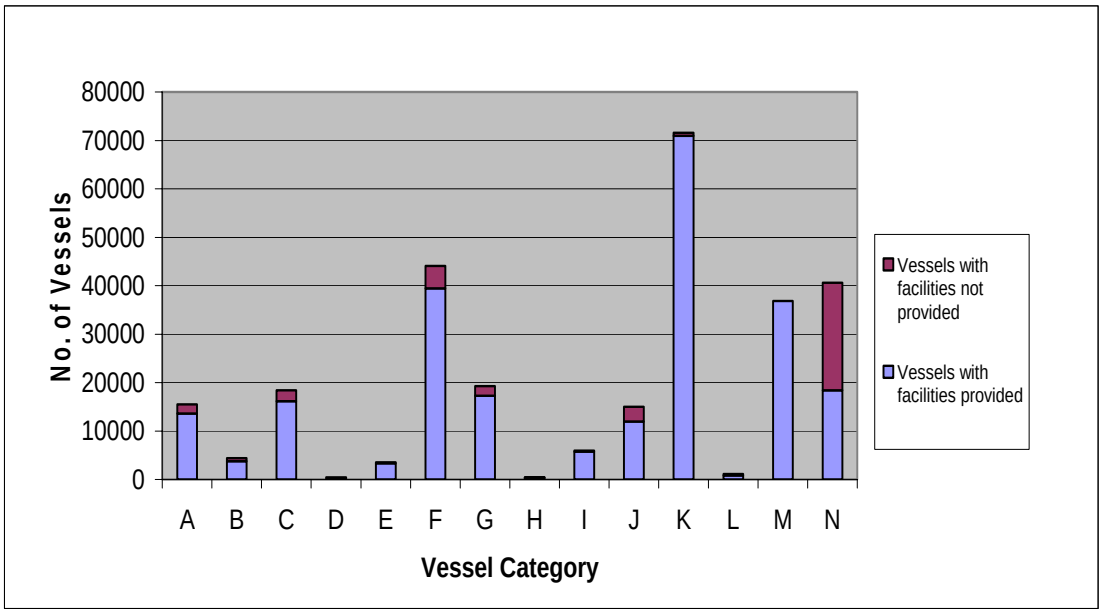
Vessel Type	Facilities Provided		Facilities Not Provided
	Facilities Used	Facilities Not Used	
A. Bulk Carrier	39	4	5
B. Chemical Tankship	14	7	3
C. Container Ship	25	9	3
D. Factory Ship	5	8	2
E. Gas Carrier	16	5	2
F. General Cargo – Multipurpose	41	6	8
G. Oil Tankship	35	1	6
H. Ore/Bulk/Oil Carrier	12	8	1
I. Refrigerated Cargo Ship	16	6	4
J. Ro-Ro Cargo Ship	23	6	5
K. Passenger Ferry	19	9	1
L. Cruise Ship	22	2	4
M. Ro-Ro Passenger Ferry	11	7	0
N. Other	16	1	16

- 24 ports do not provide facilities for all vessel types calling in at them – the lack of a particular type of facility is indicated by figures in red in Appendix 8. While some ports appear to provide no facilities at all, this may be result from a failure to indicate availability under the relevant question. A number of ports do indicate later in their responses that facilities are provided (see Section 7.3.5, Provision of Facilities by Vessel Type).
- 51 ports indicate that they provide facilities for all vessel types – ranging from one category through to all categories including 11 different vessel types under Category N (NE17).
- 26 ports indicate that even when facilities are provided for a particular Category of vessel, they do not necessarily make use of them. In one example (UK47(a)) although facilities for Categories A to I are provided, no vessels appear to make use of them.

The survey responses indicate that, in the majority of ports, facilities were already being provided for vessels normally calling in at them at the time of the surveys. This is one of the key requirements of the Directive 2000/59/EC which states at Article 4 that "Member States shall ensure the availability of port facilities adequate to meet the needs of the ships normally using the port …" (Official Journal (2000), page 83).

Figure 7.3 Vessels calling in at 77 North Sea Ports per annum

Illustration of the proportion of vessels in each of the categories identified in Table 7.4 for which reception facilities are or are not provided, based on the total number of vessels in each category calling in at 77 North Sea ports.



Actual uptake of facilities is also very varied: port D34 provides facilities for Category A with no uptake while 25 vessels of unknown type under Category N have no facilities provided for them; port NE17 provides all categories A - N including for 11 vessel types under Category N,

but 6 categories of vessels do not use the facilities provided. Using the data from Appendix 8, Figure 7.3 is based on the most recent data provided by ports (summarised in Table 7.5) and illustrates the numbers of vessel movements and levels of provision/non-provision of facilities for each of the 14 vessel categories calling in at 77 ports. Of the 77 ports in Figure 7.3, vessel movements can be broken down as follows:

- 24 receive non-passenger vessels (categories A – J) only
- 21 receive all categories A – N
- 19 receive both non-passenger and passenger vessels (categories A – M)
- 9 receive non-passenger and other vessels (A – J and N)
- 2 receive passenger and other vessels (K – M and N)
- 2 receive other vessels only (category N)

Table 7.5 Vessel numbers in 77 North Sea Ports by Category

Outline of the reported total number of vessels in each category calling in at 77 North Sea ports and the numbers for which facilities are or are not provided in those ports.

Vessel Category	Vessels with facilities provided	Vessels with facilities not provided	Total number of vessels
A	13633	1862	15495
B	3800	586	4386
C	16143	2248	18391
D	412	18	430
E	3324	212	3536
F	39458	4603	44061
G	17280	1997	19277
H	376	52	428
I	5754	221	5975
J	11972	2992	14964
K	70956	629	71585
L	828	267	1095
M	36840	0	36840
N	18409	22218	40627

Notes:

- 1857 of the vessels in Category B with facilities available are shared with Category F (port UK43)
- 861 of the vessels in Category J with facilities available are shared with Category M (port UK53)
- 79.63%, i.e. 58500 of 70956 vessels in Category L with facilities available are from 2 ports (28000 from NO17 and 28500 from NO51)
- 67.86%, i.e. 25000 of 36840 vessels in Category M with facilities available are from 1 port (UK14)
- Over 60 different types of vessels appear in Category N including dredgers, car carriers, offshore supply vessels, passenger vessels and fishing craft. The actual number of vessels ranges from 1,546 vessels of 11 different types in port NE17 to 3 vessels of unknown type in port NO9.

In order to examine whether there has been any change between the two surveys, Appendix 8 also presents comparative data showing numbers of vessels entering ports for each of categories A – J (non-passenger vessels) plus category N (other). This data indicates that only 9 out of the 39 ports providing information on vessel types in both surveys saw any change – 5 had slightly increased and 4 slightly decreased vessel numbers calling into the port.

For non-passenger vessels, category F – General Cargo, has the largest number of vessel movements in 49 ports, at over 44,000 vessels. This is the second largest category overall while category N, Other is third largest with 40,381 vessel movements in 32 ports. However, by far the largest number of vessel movements is for category K – Passenger Ferries, with 71,585 vessels calling in at 20 ports, with over two thirds (56,500) of these vessels calling in at two Norwegian ports (NO17 – 28,000 and NO51 – 28,500).

Figure 7.4 compares passenger numbers against vessel type. Where two surveys have been completed, the most up to date figures from Appendix 8 have been used as two ports indicated a change between the surveys. 34 Ports provided information on passenger vessels, and figures for passenger ferries were provided by 14 ports, for cruise ships by 20 ports and for ro-ro passenger ships by 7 ports. Many ports have over a million passengers travelling through them each year and Table 7.6 outlines the top 10 ports, in terms of passenger numbers.

Figure 7.4 Vessel and Passenger Numbers by Vessel Type for 34 North Sea ports

Illustration of the reported number of passenger vessels calling in at 34 North Sea ports, and the number of passengers (in '000's) making use of those vessels.

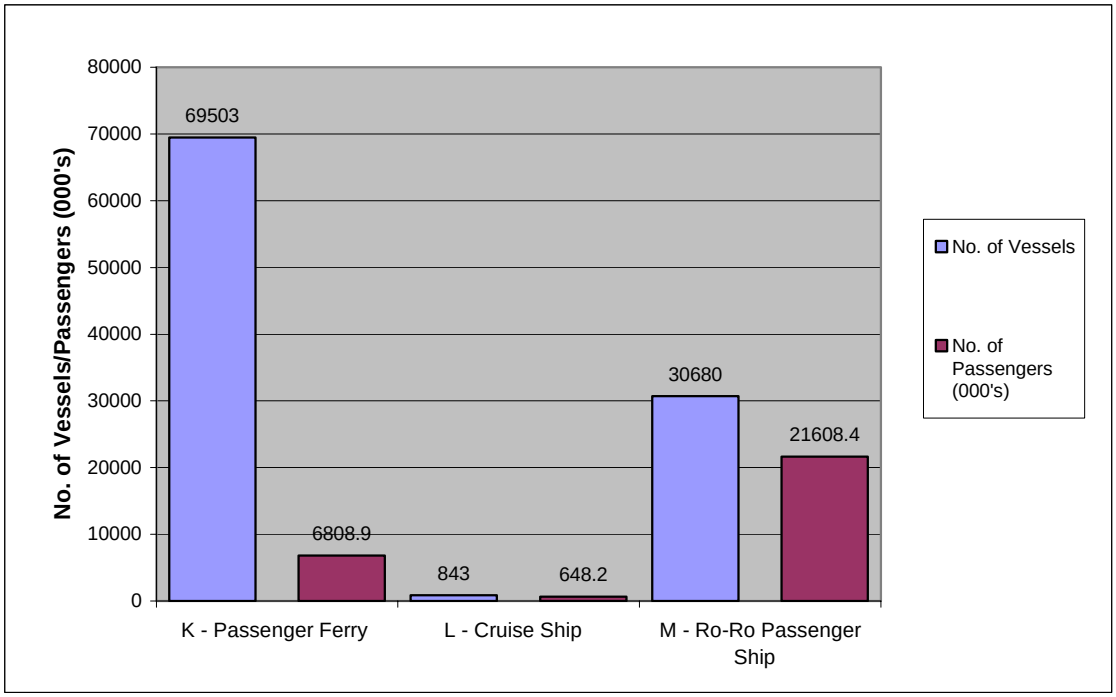


Table 7.6 illustrates the importance of passenger shipping in the North Sea region, and particularly in Norway and the UK. In Norway, nearly 6.5 million passengers travelled through 14 ports using over 62,000 passenger vessels of all types. Ports NO17 and NO51 account for the majority of vessel numbers; however NO17 ranks only tenth in terms of passenger numbers. Excluding these two ports, the remaining 11 account for nearly 3 million passengers using over 5,500 vessels. These results emphasize the importance of this mode of transport in Norway.

Table 7.6 Port Rankings by Passenger Numbers

Outline of the ranking of the top 10 North Sea ports based on the reported number of passengers travelling through those ports in one calendar year using the specified vessel type(s). Port UK14 would also be ranked 11th if the passenger numbers for Ro-Ro Ferries and Cruise Ships were considered separately.

Rank	Port No.	No. of Passengers p.a.	No. of vessels p.a.	Vessel Type(s)
1	UK14	16,300,000	25,000	Ro-Ro Ferries
		150,000	120	Cruise Ships
2	NO51	3,250,000	28,500	Passenger Ferries
3	NO24	2,000,000	900	Ro-Ro Ferries
4	D3	1,980,000	1,650	Ro-Ro Ferries
5	UK26	1,335,570	999	Passenger Ferries
6	NE14	1,059,000	1,750	Ro-Ro Ferries
7	G4	686,603	1,534	Passenger Ferries
8	UK39	328,500	3,885	Passenger Ferries
9	NO59	315,000	1,750	Passenger Ferries
10	NO17	290,000	28,000	Passenger Ferries

The figures for the UK dwarf those for Norway, with 18.5 million passengers travelling through 9 ports using over 32,000 passenger vessels, the vast majority of these passengers travel through port UK14, which is by far the largest port in the region in terms of passenger numbers. Excluding those passengers and vessels, figures for the remaining 9 UK ports are 755,634 passengers using over 7,000 vessels. The actual numbers are set out in Table 7.7 which sets out a country-specific disaggregation of passenger vessel data.

In addition to wide variations in vessel types, there are also wide variations in terms of size. Under the 1969 International Convention on Tonnage Measurement of Ships, the IMO (2004(c)) defines gross tonnage as a measure of vessel size that was adopted in order to introduce a universal tonnage measurement system. Gross tonnage is used in a wide number of other IMO regulations including ship manning levels and safety rules and is, together with net tonnage, used in the calculation of port dues. In this respect, it could be used in the setting of fees within those port dues for the use of reception facilities. Gross tonnage uses the dimensions of the ship to calculate the volume of all covered spaces.

Table 7.7 Country-specific information on passenger vessels

Outline of country-specific information on the reported total number of passenger vessels and passengers making use of ports in one calendar year. Where responses were received to both surveys, the figures for the second survey have been used.

Country	Vessel Numbers	Passenger Numbers	Number of Ports
Belgium	40	40000	1
Denmark	1650	1980000	1
Germany	2942	808021	5
Netherlands	1875	1211500	4
Norway	62244	6484746	13
Norway ex. NO17 and NO51	5639	2912746	11
UK	32328	18541204	10
UK ex. UK14	7155	755634	9

53 ports provided data on both maximum and minimum vessel sizes that can use the port and its reception facilities, and this appears at Appendix 9. Port UK29 is able to accept the largest vessels in the "maximum size" category and receives oil tankships of up to 300,000 GT. Port UK46 has the smallest "maximum size" capacity, receiving general cargo vessels up to 180 GT. In terms of minimum sizes, Port UK29 does not accept vessels that are smaller than 70,000 GT – this port can receive many of the largest vessels in the region and even the smallest vessel using the port is much larger than the maximum that can be accepted more than 40 other ports in the region. Port NO17 indicates that it is capable of receiving the smallest vessels in the region at 50 GT. Its main business activity, as discussed previously, is passenger ferries, with smaller numbers of General Cargo and other vessels also making use of this port. A breakdown of maximum and minimum vessel sizes is set out at Figures 7.5 (a) and (b).

More than half of the survey ports take vessels up to a maximum of 10,000-20,000 GT and a further 19 take vessels of between 60,000-120,000 GT. Only 6 ports accept vessels larger than this size.

In terms of minimum sizes, 30 take vessels of 11,000 GT or less, 14 take vessels of between 15,000-20,000 GT and one has a minimum vessel size of 70,000 GT. The wide variation in vessel size further illustrates the broad range of both vessels and ports for which the EU Directive legislates.

Figure 7.5 (a) Maximum Vessel Sizes in 53 ports

Illustration of the maximum size of vessel in Gross Tonnage (GT) which can be accommodated by the berths or facilities provided by 53 North Sea ports.

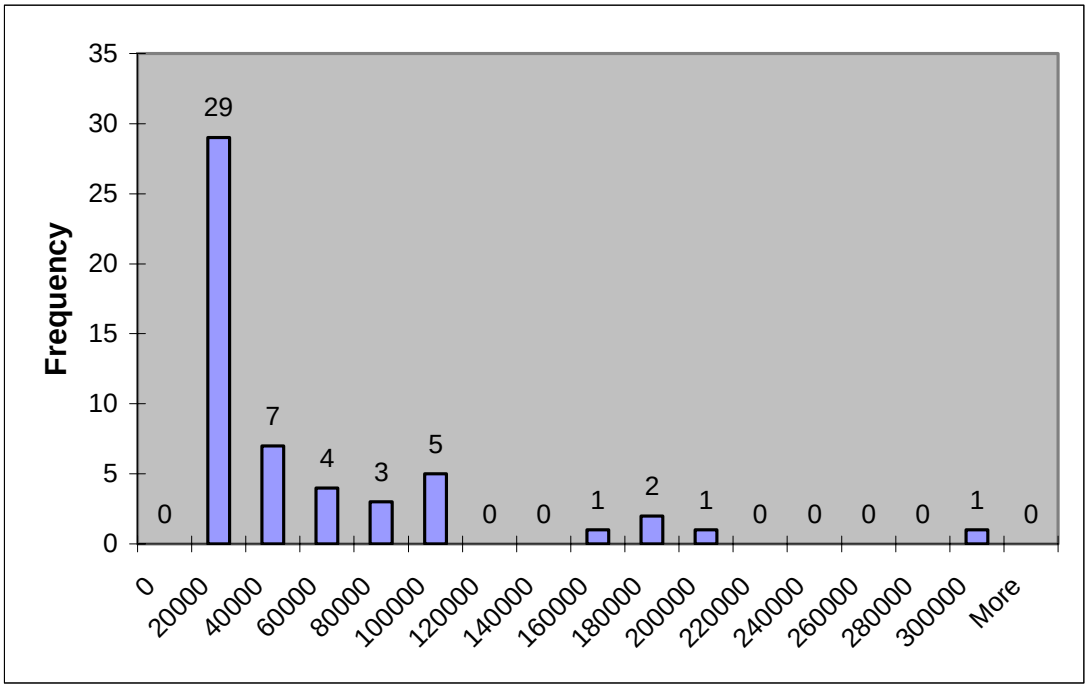
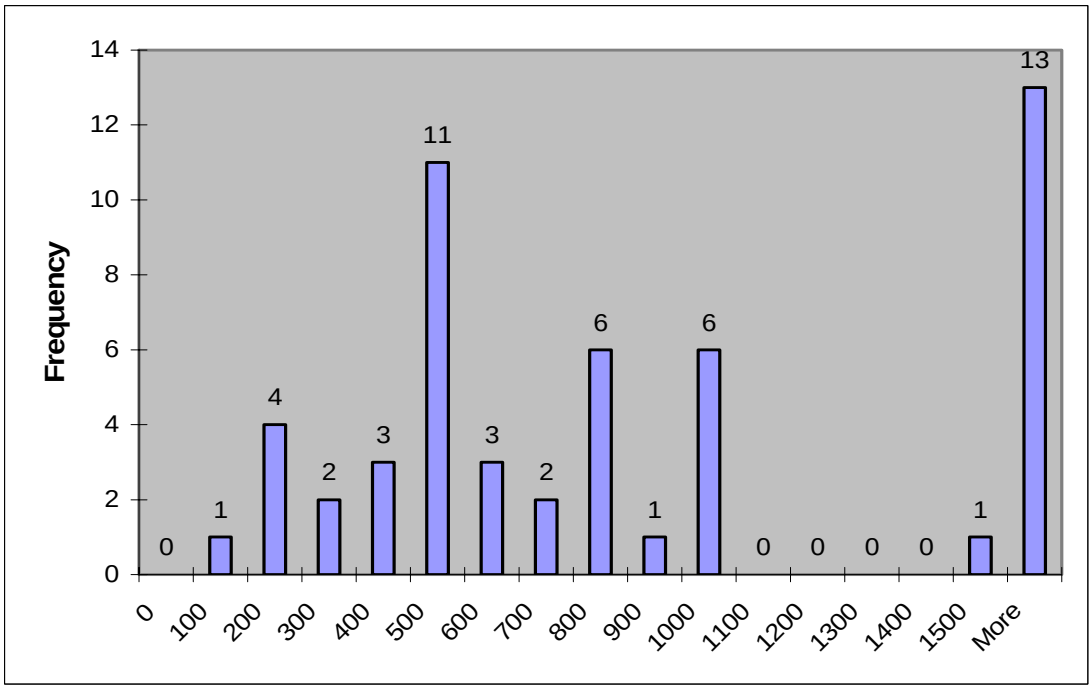


Figure 7.5 (b) Minimum Vessel Sizes in 53 ports

Illustration of the minimum size of vessel in Gross Tonnage (GT) which can be accommodated by the berths or facilities provided by 53 North Sea ports.



7.2.4 Summary

The data collected from the two surveys serves to illustrate that ports operate in a very wide range of physical environments and geographical locations, and that they offer many different business activities for vessels of a wide variety of sizes. North Sea ports range from small, rural fishing ports, with only limited numbers of vessels calling in them, of very small size, through to large, industrial port areas covering many types of physical environment and operating a wide range of business activities with many and varied vessel types. The EU Directive is, therefore, required to legislate for extremely wide variations in both ports and vessels when calling for the provision of facilities for vessels normally calling in at a port. The two surveys therefore sought information on what facilities were already available in ports for the different MARPOL Annexes, and the results are examined in Section 7.3.

7.3 Port Reception Facilities in North Sea Ports – Longitudinal Analysis of Survey Responses

7.3.1 Awareness of Directive in Ports

81 ports responded to a question on whether they had previously been aware of the EU Directive prior to Survey 1. 3 out of 58 EU ports (NE10, UK3 and UK18) only became aware of the Directive when they received that Survey. Most ports had been made aware of the Directive by the relevant Government departments or by trade organizations such as ESPO. In Norway, although the EU Directive is not applicable in that country, only 7 out of 23 ports had not previously been aware of the Directive. The majority had been provided with information by the Norwegian Government, ESPO or the Norwegian Ports Authority.

No port responding for the first time under Survey 2 indicated that they had not previously been aware of the Directive. As the Directive was due to enter into force shortly after ports received the second Survey, i.e. survey sent Autumn 2002 and Directive entry into force 28 December 2002, it would have been unexpected had any port indicated no knowledge.

7.3.2 Physical Type and Ownership of Facilities

69 ports provided information on the types of facilities operating in their ports, and this information is set out in Figure 7.6. The largest category is mobile facilities such road tankers or skips which are transported to and from the port in order to remove both liquid and solid wastes from vessels, and these facilities are the sole type provided in 20 out of 34 ports. 19 ports provide all 3 types of facilities, and therefore 53 ports make use of mobile facilities. The second largest category is fixed facilities that are physically connected to the quayside and cannot be moved. These are available in 28 ports and are the sole facility provided in 17 ports. Floating facilities, normally barges which can tie-up alongside vessels in a port and receive various types of waste, are provided in 7 ports and are the sole type provided in 2 ports.

Figure 7.6 Physical Types of Facilities in 69 ports

Illustration of the physical types of reception facilities that can be provided in 69 North Sea ports.

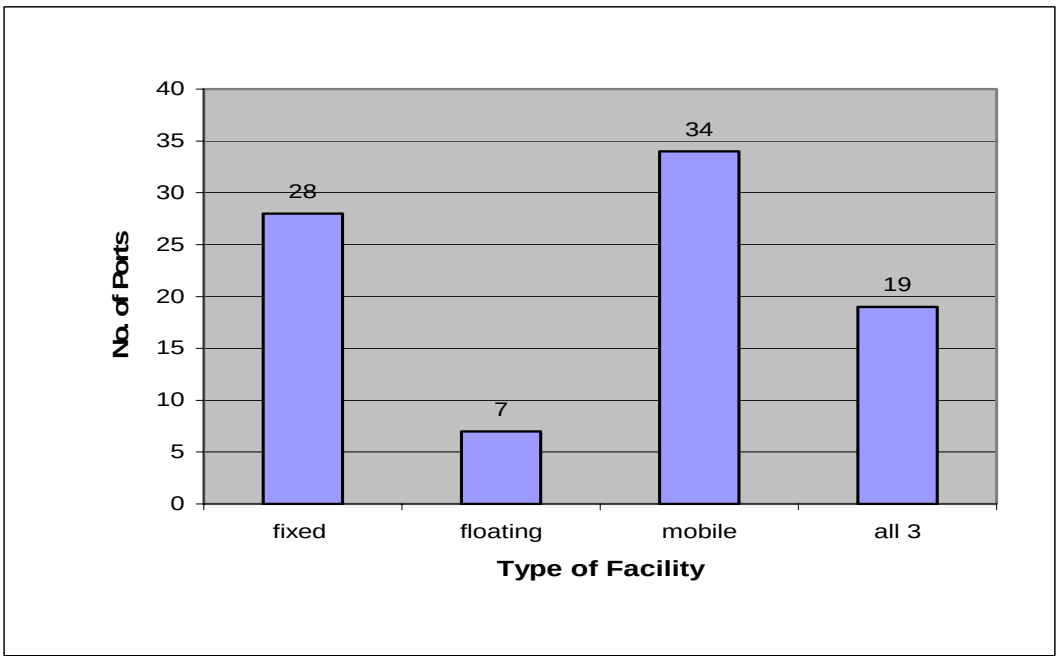
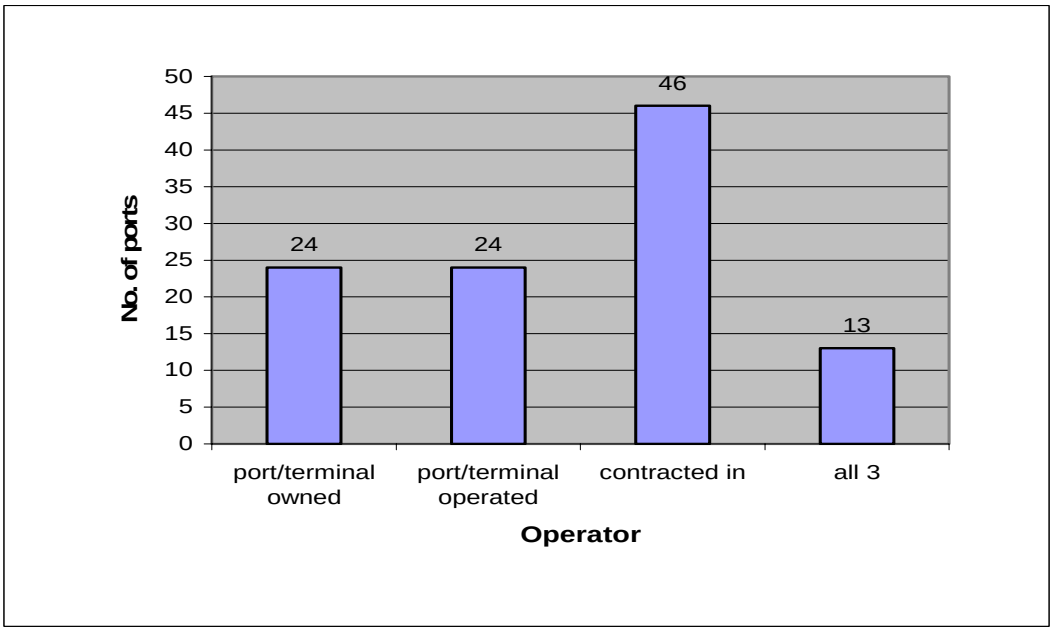


Figure 7.7 Reception Facility Operation/Ownership in 75 ports

Illustration of the operation and ownership of reception facilities that can be provided in 75 North Sea ports.



In terms of ownership and operation of facilities, a breakdown of responses appears at Figure 7.7. Only 24 out of 75 ports actually own and operate their own facilities, as the sole type of

ownership. A further 13 have a combination of port owned/operated, port operated but with an external owner, or facilities contracted in from an external owner who also provides operators for those facilities. 37 ports own and operate at least some of the facilities that they provide. The largest group of facilities provided are those which are contracted in and are operated by those contractors. 46 ports only use contracted-in facilities while a further 13 use this in combination with other types of provision, making 59 ports. 24 ports operate facilities that are brought in from an external source and, together with the 13 providing all types, 37 ports operate facilities that are not owned by them.

7.3.3 Provision and Uptake of Facilities by MARPOL 73/78 Annex

Annex I – Oily Wastes

81 ports provided information on availability of Annex I facilities, and the response data appears at Appendix 10. Of the 81 ports, 41 responded to both surveys. Table 7.8 outlines the number of ports with facilities available for each of the Annex I waste categories set out under MARPOL 73/78, and also examines the type of facility. In terms of "other" facilities, this includes skips or drums on the quayside into which small volumes of liquid can be placed, or bins for oily rags.

Table 7.8 Facilities available for Annex I – Oily Wastes

Outline of the range of facilities under MARPOL 73/78 Annex I (Oily Wastes) available in 71 North Sea ports by waste category and type

Waste Category	No. of Respondents with Facilities Available	Type of Facility			
		Quayside Tank	Roadside Tank	Terminal Facility	Other
Oily Tank Washing	49	11	31	15	6
Dirty Ballast Water	41	9	25	12	7
Oily Bilge Water	59	10	43	10	10
Oily Sludge	57	12	43	7	11
Used Lubricating Oil	62	17	41	9	11

For those ports not providing Annex I facilities, 8 specifically do not provide them, one indicated that it could order facilities in from other ports in the region, should it be asked to do so, and one stated that, although no facilities were provided under the MARPOL 73/78 categories, skips were placed on site and oily waste might be placed in these.

For the 71 ports with facilities available:

- 34 ports provided all categories of Annex I facilities
- 10 ports provided 4 categories

- 13 ports provided 3 categories – including 1 port in Survey 1 that indicated, although it had 2 categories at that time, that a further category was under construction and would be available within 12 months
- 14 ports provided only 1 or 2 categories

Overall, a large proportion of North Sea ports provide facilities for Oily Bilge Water, Oily Sludge and Used Lubricating Oil. In the majority of these ports, roadside tankers are used to remove the wastes from the port area, either for recycling/recovery or to be disposed of through incineration or by the use of landfill.

Only one port, where an extra category of facilities has been built, indicated any change in availability between the two surveys. However, in order to examine whether any change in levels of uptake occurred, the χ^2 two-by-two contingency table method was used to assess whether there was any statistically significant change between the two surveys, based on the proportion of vessels using facilities. The data on uptake of facilities appears at Appendix 11, Section 1.

26 and 24 ports provided information on both total numbers of vessels calling in and the number of vessels actually using facilities for Surveys 1 and 2 respectively. The respective percentage uptake rates were 7.88% and 7.98%, with a χ^2 value of 0.83 and a p (1 degree of freedom) value of 0.36. These figures show that there is no statistically significant difference between the two surveys, and the percentage change in uptake levels was a 0.1% increase.

Analysis of only those 20 ports which completed both surveys produces a similar result. The percentage uptakes were 8.70% for Survey 1 and 8.63% for Survey 2. The χ^2 value was 0.42 and the p (1 degree of freedom) value was 0.51. While 3 ports showed an increase in percentage uptake between the 2 surveys, one port indicated a reduction and this port accounts for the decline between the two surveys – 0.07%. Again, there was no statistically significant difference between the two surveys.

Annex II – Noxious Liquid Substances (Chemical Wastes)

82 ports provided information on availability of Annex II facilities, and the response data appears at Appendix 12. Of the 82 ports, 42 responded to both surveys. Table 7.9 outlines the number of ports with facilities available for each of the Annex II waste categories set out under MARPOL 73/78, and also the type of facility.

Under the MARPOL 73/78 categories, Category A is the most hazardous to both aquatic life and human health while Category D is virtually non-toxic to aquatic life. The category "Other

liquid substances" refers to substances which have not been categorised elsewhere. These may be re-categorised at a later data, based on any new scientific evidence, for example following amendments to "black" and "grey" list substances under the Oslo, Paris or OSPAR Conventions, discussed at Chapter 4, Section 4.3.2 and at Box 4.3.

Table 7.9 Facilities available for Annex II – Noxious Liquid Substances

Outline of the range of facilities under MARPOL 73/78 Annex II (Noxious Liquid Substances) available in 39 North Sea ports by waste category and type

Waste Category	No. of Respondents with Facilities Available	Type of Facility			
		Quayside Tank	Roadside Tank	Terminal Facility	Other
Category A	39	5	27	5	5
Category B	38	5	27	5	6
Category C	38	5	27	5	5
Category D	37	5	26	5	5
Other Liquid Substances	33	4	22	7	6

41 ports specifically state that they do not provide Annex II facilities; one port would bring them in on request from other ports in the region; one stopped providing facilities after the first survey; and one has never had any requests but could make facilities available, if required and 44 ports are therefore counted as not having facilities available. For the 39 ports with facilities available for Annex II wastes:

- 32 ports provided all categories of Annex I facilities
- 6 ports provided 4 categories
- 1 port provided only 1 category

The vast majority of ports providing Annex II facilities provide them for all categories. As with Annex I, the main type of facility provided is roadside tankers. Table 7.2 indicates that 11 ports are located in chemical plants and 29 in an area providing storage for oil and chemicals. Even the port accepting only 1 category of noxious liquid takes Category A, the most hazardous. Ports that do not operate in these types of physical locations are not likely to be visited by vessels carrying Annex II wastes except in unusual circumstances, for example in the event of a storm. These ports would not be required to provide facilities for Annex II wastes in the event of such a vessel being forced to call in.

10 ports provided information on both total numbers of vessels calling in and the number of vessels actually using facilities for each of Surveys 1 and 2. In total, 13 ports provided information, with 7 responding to both surveys. Only one port (NO19) indicated any change

between the two surveys, with the number of vessels calling in rising from 130 to 150 between the surveys, 100 of which actually used the facilities in each survey. This gave an uptake rate of 76.92% and 66.67% respectively for that port. Between the two groups of 10 ports for each survey, the respective percentage uptake rates are 3.32% and 2.90%.

The χ^2 two-by-two contingency table method, using the data on uptake of Annex II facilities in Appendix 11, Section 2, produces a χ^2 value of 18.60 and a p (1 degree of freedom) value of 0.000016. For a result to be significant the p value must be less than 0.05 and, in this case, it is much less therefore this is a statistically significant result. However, with the low overall uptake rates and very small numbers of vessels using facilities, it may be that port NO19 alone is responsible for the significance of this result.

Annex IV – Sewage Wastes

With respect to Sewage wastes, this is an optional Annex of MARPOL 73/78, along with Annex III which covers harmful substances in packaged form. Annex IV required ratification by at least 15 states whose combined merchant fleet represented not less than 50% of the world's merchant fleet by tonnage, in order to enter into force, and was finally ratified at the end of September 2002, when Norway deposited its instrument of acceptance. This meant that the entry into force criteria set for that Annex of MARPOL 73/78 had finally been met and the Annex was due to enter into force on 27 September 2003. The IMO (2002), in announcing the ratification of the Annex, stated that:

> *"The Annex sets out in detail how sewage should be treated or held aboard ship and the circumstances in which discharge into the sea may be allowed. It requires Parties to the Convention to provide adequate reception facilities for sewage .."*.

The Annex will apply to ships engaged in international voyages, as follows:

> On entry into force, it will immediately cover "*all new ships of 400 gross tonnage and above and new ships of less than 400 gross tonnage which are certified to carry more than 15 persons."*
>
> There will be a five year delay following entry into force for "*existing ships of 400 gross tonnage and above and of less than 400 gross tonnage and above but certified to carry more than 15 persons."*

However, the IMO (2004(d)) subsequently announced that Annex IV, having formally been adopted by the IMO's Marine Environment Protection Committee at its 51st Session in April 2004, is now expected to enter into force on 1 August 2005. The continued delay of entry into force of Annex IV results in the first of two specific complications with the provision of facilities in ports under this Annex:

1. There is provision for the ongoing delay in ratification of Annex IV under the terms of Article 16 of the EU Directive. Under this Article, implementation of the Directive for Annex IV wastes was suspended for 12 months after MARPOL 73/78 Annex IV entered into force. Provision of Annex IV facilities could, therefore, be further delayed until August 2006 as a result of this Article.

2. The IMO (2004(b)) indicates that there are some exceptions to the prohibition of discharging sewage wastes at sea. Where a vessel has uses an approved sewage treatment plant at least 3 nautical miles from the nearest land, or where a vessel is discharging sewage which has not been comminuted (reduced to small particles) or disinfected outside the 12 mile limit, then vessels will still be allowed to discharge. As a result, vessels may choose to discharge Annex IV waste at sea, irrespective of whether facilities are available in their destination port.

Across both surveys, 71 ports provided information on availability, and this data appears at Appendix 13. The responses from ports can be summarised as follows

- 36 ports responded to both surveys. 12 provided facilities on both occasions; 22 did not, and 2 had introduced facilities by the time of the second survey (ports NO45 and UK47).
- 17 ports responded to the first survey only. 7 provided facilities and 10 did not.
- 18 ports responded to the second survey only. 7 provided facilities and 11 did not.

Although provision of Annex IV facilities was not compulsory at the time of the second survey, some 28% of ports reported that they had some facilities available. These ranged from waste bins on the quayside, roadside tankers to pump out waste, or connections direct to the local sewage works.

In terms of actual level of uptake, 9 ports provided information on both total numbers of vessels and also numbers using facilities. 7 ports provided information for Survey 1 and 6 for Survey 2, of which 4 completed both surveys and reported no change. The percentage uptakes were 0.74% for Survey 1 and 0.78% for Survey 2. This represents 235 and 210 vessels respectively making use of the facilities provided and a change in percentage uptake of a 0.04% increase between the surveys. The χ^2 two-by-two contingency table method, using the data on uptake of Annex IV facilities in Appendix 11, Section 3, produces a χ^2 value of 0.39 and a p (1 degree of freedom) value of 0.53. There is, therefore, no statistically significant difference between the Survey 1 and Survey 2 respondents.

Overall, the level of provision of Annex IV facilities is patchy, and until States or the EU introduce a specific requirement for ports to provide such facilities, and for vessels to make use of them, the proportion of vessels which dispose of sewage wastes in ports rather than discharging them at sea is likely to remain extremely low.

Annex V - Garbage

Under MARPOL 73/78, Annex V wastes are divided into 6 categories and these are:

Category 1 Plastic

Category 2 Floating dunnage, lining or packaging material

Category 3 Ground paper products, rags, glass, metal, bottles, crockery etc.

Category 4 Paper products, rags, glass, metal, bottles, crockery etc.

Category 5 Food waste

Category 6 Incinerator ash

Across both surveys, 76 North Sea ports provided information on the categories of Annex V reception facilities provided in those ports, and this data appears at Appendix 14. In terms of responses to the surveys, 17 ports completed Survey 1 only, 40 ports completed both and 19 completed Survey 2 only. A breakdown of survey responses in terms of the number of categories of facilities actually provided shows that:

- 42 ports provided all categories of Annex V facilities
- 22 ports provided categories 1 to 5
- 12 ports provided 4 or less categories of facilities

Table 7.10 provides a breakdown of the types of facilities available for Annex V wastes. The use of contractors to collect and dispose of waste is the most common type of facility provided for all waste categories. Although segregation and recycling does occur, the highest number for any category of waste is 13 ports providing segregation for categories 3 and 4. However, most ports provide some form of facilities, and in the majority of cases they are able to take all categories of garbage waste.

Table 7.10 Facilities available for Annex V – Garbage

Outline of the range of facilities under MARPOL 73/78 Annex V (Garbage) available in 76 North Sea ports by waste category and type

Waste Category	No. of Respondents with Facilities Available	Type of Facility		
		Segregation/ Recycling	Contractor Disposes	Other
Cat. 1	72	10	50	6
Cat. 2	68	12	41	7
Cat. 3	73	13	49	6
Cat. 4	72	13	49	6
Cat. 5	71	12	47	8
Cat. 6	42	3	26	6

When examining the actual uptake of facilities by vessels, Carpenter and Macgill (2000) indicated a figure of 39.06% of vessels using Annex V facilities. However, corrected figures for survey 1, based on ports which provided data on both volumes of traffic and number of vessels actually using facilities, show that the uptake rate in 26 ports was 32.31%. This figure includes 10 ports where 100% of vessels use facilities – 2 in Germany where it is a mandatory requirement that vessels discharge Annex V wastes in port, and 8 in the UK. Similarly, in Survey 2, an uptake rate of 33.29% is achieved by 24 ports with 3 German, 1 Norwegian and 9 UK ports indicating a 100% uptake level.

A comparison of uptake levels for Annex V facilities appears at Appendix 11, Section 4. The χ^2 two-by-two contingency table method, comparing the 26 ports for Survey 1 and the 24 ports for Survey 2, produces a χ^2 value of 0.17 and a p (1 degree of freedom) value of 0.68 and there is no statistically significant difference between the Survey 1 and Survey 2 respondents.

Comparison of the 21 ports responding to both surveys indicates that 4 ports saw a change in uptake levels between the two surveys. 2 ports saw an increase in percentage uptake of facilities and 2 saw a reduction. The comparative uptake rates for the 21 ports are 30.75% and 32.38% respectively, an increase of 1.63%. With a χ^2 value of 48.61 and a p (1 degree of freedom) value of 3.1×10^{-2}, this is a statistically significant change. However, again considering that the percentage change is 1.63%, in physical terms this may not have any major impact of actual volumes of garbage being disposed of in ports or being dumped at sea since the raw data shows a slight increase in the number of vessels using facilities against a slight decrease in the total number of vessels entering ports between Surveys 1 and 2.

7.3.4 Provision of Facilities by Vessel Type – further discussion

Table 7.4 in Section 7.2.3 identified the number of ports providing facilities by vessel type and whether they were used by vessels calling in at those ports. In that section, it was noted that 24 ports appeared not to provide facilities for all vessel types calling in at them, based on answers to a specific survey question on provision by vessel type. However, further examination of the responses to ports covering provision of MARPOL 73/78 facilities indicates some discrepancies with the earlier data.

While a number of ports indicated that they had no facilities available for one or two categories of vessels, but did have facilities for the majority of vessel types, 8 ports indicated that they did not have facilities for all vessel types calling in at them. These ports, from Appendix 8, are:

- G12, UK15 no facilities for “Other”
- NE10, NO9 no facilities for 3 categories including “Other”
- NO16 no facilities for single category of vessel – general cargo vessels

- NO51 no facilities for 4 categories (not “Other”)
- UK24 no facilities for 6 categories (not “Other”)
- UK32 no facilities for 10 categories (not “Other”)

The data on facilities available in ports by the separate MARPOL 73/78 Annexes (Appendices 10, 12, 13 and 14) shows that 6 ports did provide facilities under specific Annexes, as follows:

- G12, NE10, NO51 facilities available for Annexes I and V
- NO9 facilities available for Annexes I, II and V
- UK15 facilities available for all 4 MARPOL 73/78 Annexes
- UK24 facilities available for Annex II only

The two ports which do not provide facilities are:

- NO16 confirms that no facilities are provided in the port, but can be bought in upon request from other ports in the region
- UK32 did not provide answers regarding Annexes I, IV and V. Facilities are specifically not available for Annex II

The answers to the additional questions on provision by vessel type indicate that a larger number of ports provide facilities for vessels calling in at them than was apparent in Section 7.2.3. However, this does not mean that those ports with multiple vessel types calling in at them can accommodate all those vessel types in the particular MARPOL 73/78 facilities provided.

7.3.5 Waste Reception and Handling Plans

One of the main requirements of the EU Directive was the introduction of Waste Reception and Handling Plans which is discussed in Chapter 5, Section 5.3.1. This section notes that “Ports are … required to produce a Waste Management Plan … including information on type and location of facilities, notification requirements …” and that “these plans would be available to all port users”. In order to assess the impact on the Directive on ports with regard to these plans, the Surveys questioned whether plans were available in ports, whether they contained specific information on waste reception facilities, and what parties would have access to them.

It was anticipated, for Survey 1, that the majority of UK ports would have a plan available, as it was already a requirement that UK ports produce them under Merchant Shipping Notice MSN 1709 (M&F) (DETR, 1998). The use of plans would make information on availability of reception facilities more accessible, and was intended to assist in preventing undue delays to vessels using facilities, and to remove lack of knowledge of the availability of facilities as an excuse to discharging waste at sea.

The responses to the question on Waste Reception Plans appear at Appendix 15. 80 ports provided information: 20 for Survey 1, 18 for Survey 2 and 42 for both surveys. A breakdown of the survey responses shows that:

Survey 1 only: 14 ports had plans – 1 x Danish, 3 x Norwegian and 10 x UK
6 ports did not have plans – 1 x Dutch, 4 x Norwegian and 1 x UK

Survey 2 only: 10 ports had plans – 3 x Norwegian and 7 x UK
8 ports did not have plans – 4 x German, 1 x Dutch and 3 x Norwegian

Surveys 1 and 2: 26 ports did have plans for both – 1 Danish, 2 Norwegian and 23 UK
11 ports did not have plans – 3 German, 2 Dutch and 6 Norwegian
4 ports had introduced plans between surveys – B1, D3, NE17, UK72

Of the 42 UK ports completing the survey, only one (UK2) did not have a plan in place. This port completed Survey 1 only and indicated that it would develop a plan in its own right. The only other changes with regard to Waste Management plans in UK ports was that one port (UK5) indicated that it had made the plan available to additional groups. With respect to the other countries, only two ports (NO19 and NO33) showed any change between the two surveys, indicating that they would be developing plans on a different basis than was set out in the Survey 1 response.

For those ports that needed to develop Waste Management Plans, Article 5 of the EU Directive allows for the development of Waste Reception Plans on a regional as well as individual port basis. Table 7.11 indicates how those ports which did not have a plan at the time of the one or both surveys intended to develop plans.

Table 7.11 Development of Waste Management Plans

Outline of the number of ports by country that did not have a waste management plan and the types of plans that were to be developed in those ports

Country	No. of Ports	Develop plan for port	Develop plan for region	Develop for both	Not specified
Denmark	1	1			
Germany	7	1	2	4	
Netherlands	4	2	2		
Norway	13	6	1	4	2
UK	1	1			

In total, over two thirds of ports already had existing waste management plans. An examination of the accessibility of these plans shows that 34 of the 54 ports providing information made their plans available to groups A-D, i.e. port users, waste contractors, terminal operators and

local government agencies. Of these 34, 12 ports (1 Norwegian, 11 UK) also made the plans available to other groups including local environment bodies, boat owners associations and local councils. Of the remaining 20 ports, only 2 indicated that plans were accessible to a single group, with the remainder making them accessible to 2 or 3 groups.

The accessibility of plans, with the requirement that they contain information on port reception facilities, will make it more difficult for vessel owners to claim that they had to discharge waste illegally because they did not know that facilities were available. However, 26 ports did not provide information on groups with access to plans (including one UK port), although it may be the case that, where plans have been produced, they are accessible to all relevant parties.

Waste Management Plans will play an important role in removing one of the key excuses used by vessels that they had no choice but to discharge waste illegally because they were unaware that facilities were available. In addition, they will also be unable to claim that they were unduly delayed since the information on notification times, capacity of facilities, pumping rates for liquid wastes and other relevant information should be made available in these plans.

7.4 Additional Questions – Transposition, Charging, and Inspection and Administration

In autumn 2002, when the second survey was issued to ports, a number of additional questions were added in order to better assess the impact of the EU Directive on port operations. These additional questions appear at Appendix 4. The first group of questions posed were on the transposition of the EU Directive into national law. Ports were then asked for information on the charging system in operation to cover the cost of waste received in port reception facilities, and the final group of questions posed were on which bodies undertook vessel inspections and how these inspections would be undertaken and administered as a result of the EU Directive. Responses to these three groups of questions are examined below.

7.4.1 Transposition of EU Directive into National Law

This group of questions sought information on whether the Directive had yet been transposed and, if it had, asked for details of the national legislation that had been developed. These questions were not relevant to Norwegian ports which were, therefore, excluded. Only limited information was provided by ports, as only very few were able to provide any answers to the questions. The one Belgian port indicated that the Directive had been transposed at the federal level by December 2002 and at the regional level by March 2003. Two Danish ports also indicated that transposition had taken place at December 2002. In Germany, three ports provided information on transposition, two indicating that it took place in January 2003 and the third that it took place in November 2002. The Directive had also been transposed into regional legislation specific to each of the three ports.

In both the Netherlands and the UK, transposition had not taken place by December 2002. Port NE17 indicated that it was unlikely that this would actually take place until mid-2004, as a number of discussions were taking place regarding the Netherlands legislation, including issues of charging, inspection and administration. These discussions had been delayed by the Ministry of Environment requiring the port to verify that all wastes had been treated properly before the port paid the contractors. Port NE17, the largest in the North Sea region was opposed to this proposal. Oily sludge from NE17 is sent to the UK to be burnt as it cannot be burnt on the continent. The port questioned how it could verify that sludge sent to the UK for burning was actually burnt, and considered that it would need to employ an agent in the UK to go on site in order to verify that this had happened. As a result, delays in negotiations had taken place, with the port's lawyers involved requesting that additional requirements be added to the Directive, including the introduction on inspectors at waste recycling plants.

In the case of the UK, while all ports were aware of the EU Directive and that it would need to be implemented by UK ports, transposition had not taken place by the deadline of December 2002. Despite this, one harbourmaster believed that the Directive had already entered into force in December 2002 without any need for national legislation while another believed that a statutory instrument was already in place at that time. Statutory Instrument 2003 No 1809 was not actually introduced until July 2003 (Chapter 3, Section 3.2.1). Other ports believed that the transposition date would be anywhere between February 2003 to May 2003, with a six month grace period for ports to implement its requirements.

The confusion in the UK appears to arise from a number of factors. This includes information being provided by a broad range of sources - Government bodies, trade associations and shipping companies - each of which might have its own agenda associated with the EU Directive, as discussed in Chapter 3 which considers the drivers of behaviour of the various actors. In addition, a number of larger ports participated in the Department for Transport Consultation Process of May 2003 - "Port Waste Reception Facilities: A Consultation Process", of May 2003 (Department for Transport, 2003). However, many smaller ports were not aware that this consultation process had taken place. UK ports were not, therefore, able to provide accurate information to the questions on transposition at the time of the second survey.

7.4.2 Charging for Waste Reception Facilities

Chapter 6, Section 6.3 outlined the various systems available for charging for port reception facilities. The systems normally used in the North Sea region are the Direct charge, the Indirect charge (or no special fee), or the combined system. However, as a result of the Directive, it was considered that there was the possibility of national governments requiring ports to charge for facilities using a specific system, which could be based on factors such as vessel size, the

number of passengers or crew, engine size, journey times, or volumes of waste. Details of the port responses to this group of questions appear at Appendix 16.

33 ports provided information on both the current system for charging for facilities, and on whether this would change as a result of the Directive. The general picture from these responses is that there is unlikely to be any change in the charging systems used at the current time in North Sea ports. Only in Germany and Netherlands does there seem to be even the suggestion of change. In the case of Germany, this is at the Regional, rather than the Federal Government level. In ports G2 and G5, it would appear that the indirect fee currently being operated will change to a "no special fee" system in G2, although generally these are considered to be the same system, while port G5 will introduce a scale of charges based on 5 categories of vessel size. In the case of the Netherlands, port NE17 noted that by the end of 2002 there were two pricing systems under discussion by the Government and that no decision had been made on what system should be used, or ever whether one system would be applied to all Dutch ports.

In both Norway and the UK, all ports indicate that there is no Government-specified system for charging for facilities, although one UK port (UK14) believed that this might take place in the future. In both these countries, a range of different charging systems were used, and only two ports indicated any change – port UK14 would include charges in its port dues from October 2003 or from any date specified in UK legislation, while port UK46 moved from a combined system to an indirect charge in January 2003. It would appear, in Norway and the UK, that only if the national Governments set out specific charging systems which were mandatory on ports would any major change be made to the charging systems currently used in those countries ports.

7.4.3 Vessel Inspections and Administrative Issues

With reference to vessel inspections, and the associated administrative costs, the final group of questions examined whether arrangements had been made as a result of the Directive for extra vessel inspections to be carried out. These inspections would be in addition to those undertaken under the Paris Memorandum of Understanding for other legislative instruments, as outlined in Chapter 6, Section 6.4.2. Only EU ports were asked to provide information in this section, as the Directive is not applicable in Norway.

23 ports, of which 15 were UK ports, provided information on current inspection bodies, and the data appears at Appendix 17. One port (D7) indicated that, as a fishing port, it did not have arrangements for vessel inspections and therefore this section deals with the responses of 22 ports. Only one port (G5) indicated that it will have two different bodies undertaking inspections – the Marine Police for Paris MOU Inspections and the Port Authority for

"Directive" Inspections; the remaining 21 indicated that vessel inspections for both the Paris MOU and Directive would be undertaken by the same body currently operating in those ports.

With regard to arrangements for additional administration staffing and costs, only 5 of the 22 ports indicated that any decisions had been made, or were under discussion, regarding this issue. Of these, port B1 indicated that the Belgian Government had set out guidelines on this issue, port G1 indicated that funding would come from a surcharge on harbour dues and port G2 indicated that it would need to employ three additional staff at a cost of €170,000 per year. Port G2 was the only port indicating that it would need to employ additional staff. In the Netherlands, the situation was still under negotiation with the Government. Port NE17 was seeking to increase port dues by 2.5% to cover costs, while the Government were calling for an increase of 3.5%. This was seen as too high by the port, which was negotiating for the Government to cover the 1% difference. This was a further issue leading to the delay in transposition of the Directive in the Netherlands. Finally, port UK18 felt that charges would have to increase, but gave no additional information.

In terms of staffing to deal with the increased administrative burden, as noted above only port G2 indicated that it would need to employ additional staff, while port NE17 indicated that the administrative duties would have to be undertaken by "other" staff not within the port. The remaining 20 ports all indicated that administrative duties would be undertaken by staff already employed within those ports.

7.5 Data Validation

As outlined in the introduction and Section 7.2, the port surveys were trialled with port representatives and were designed to be easy to complete and also totally confidential, in order to promote a high return rate, particularly from smaller ports. A large number of these ports had not previously been required to provide information on reception facilities as they were too small to accept vessels covered by the various Annexes of MARPOL 73/78. These ports also did not normally receive vessels requiring inspection under the Paris MOU.

In order to validate the data provided by ports in the two surveys which is the primary data outlined in Appendices 6 to 17, a number of data sources have been examined. These include IMO MEPC Circulars outlined in Appendix 1 which are all dated prior to the two surveys and two additional MEPC Circulars which were published after the surveys. Port, Regional and National websites have also been visited and a large section of UK data has been validated using the MCA (2000) Research Project Report of November 2000. Appendix 18 provides a breakdown of the data which has been verified, together with the source of that verification.

However, it did not prove possible to obtain corroborating data for 1 Dutch, 11 Norwegian and 1 UK port, all of which do not appear in any identifiable websites and have not provided any data to the IMO.

In order to maintain the confidentiality of the port data and to prevent, as far as possible, the identification of any of the ports examined in this thesis, no information has been provided that might enable such identification.

The data from ports has been validated in two ways: using IMO MEPC Circular data for Annex I (oily wastes), as outlined in Appendix 18, Section (A) and discussed in Section 7.5.1 below; and making use of other sources of information outlined in Appendix 18, Section (B) which is discussed in Section 7.5.2.

7.5.1 Validation of data using IMO MEPC Circular Data for Annex I wastes

In order to validate the data from ports which appears in Appendix 10 on the provision of port reception facilities for oily wastes, a comparison has been made with the IMO MEPC Circular data appearing in Appendix 1. However, this data, the latest of which was published in October 1998, is not contemporaneous with the data obtained from ports in the summer of 2001 and the autumn of 2002 which is outlined in Appendix 10. A comparison has, therefore, been made with two further MEPC Circulars dated September 2002 and November 2003. The September 2002 data is the most contemporaneous of all the data available from the IMO.

For 70 ports indicating that they provided some form of Annex I facilities in the surveys, the data from 70% (48 ports) agrees with one or more MEPC Circulars. 75% of these (36 ports) agree on all occasions and 25% (12 ports) agree on at least one occasion. In all these 12 ports, identified as showing partial agreement in Appendix 18, Section (A), it is apparent that the range of facilities provided have changed over time and this change has been identified for each port.

For 20% of the ports (14 ports), no data has ever been provided to the IMO and so it has not been possible to validate the data in this section. There is also no data available on the provision of Annex I facilities for these ports using the additional sources of data outlined in Section 7.5.2 and it has therefore not been possible to confirm the provision of these facilities in ports. However, for ports NE14 and UK78, it has been possible to validate other types of data from additional sources, resulting in 12 ports here where no validation of data has been possible.

For the final 10% of ports (7 ports), there is no agreement between the data provided in the surveys and that provided to the IMO. However, using the additional sources of data, it has

been possible to validate the survey returns on MARPOL Annex I for ports UK5 and UK41. As a result, only for 5 ports has it not been possible to confirm the survey data and the reasons for the discrepancies are outlined below:

G5, NO51, UK2 and UK59 – the types of facilities available under each MEPC Circular are different before and after the survey dates, as well as being different to that provided in the surveys. It is therefore not possible to confirm the survey data as there is no agreement anywhere in the available data.

NO59 – there was no match with the data appearing in Appendix 1 and there were no returns made to the IMO for MEPC Circulars published after the data of the surveys. Again it is not possible to confirm the accuracy of the survey data as the levels of provision may well have changed in the intervening period.

7.5.2 Validation of data using internet and other sources

In order to validate other categories of data from survey returns, an internet search was conducted for all ports. Appendix 18, Section (B) outlines those Appendices where matching data has been available, either on the port website, or a national or regional website. Where the port website has provided date, this has not been identified in order to protect the identity of the port. In addition, for the UK, an investigation of the provision of port reception facilities in a range of different ports was undertaken on behalf of the Maritime and Coastguard Agency. The data from this report (MCA, 2000) has also been used to confirm the returns from ports.

For the 30 ports identified in Appendix 18, Section (B), confirmation has been provided for the various Appendices to this thesis as follows:

Appendix 6 – Business Activities	24 ports
Appendix 7 – Geographical Location and Physical Environment	14 ports
Appendix 8 – Vessel Numbers, Types and Sizes	19 ports
Appendix 9 – Maximum and Minimum Vessel Sizes	6 ports
Appendix 10 – Availability of Annex I facilities	16 ports
Appendix 12 – Availability of Annex II facilities	5 ports
Appendix 13 – Availability of Annex IV facilities	3 ports
Appendix 14 – Availability of Annex V facilities	10 ports
Appendix 15 – Waste Reception and Handling Plan data	21 ports

For Appendix 15, this shows that all UK ports had a Waste Reception and Handling Plan, as was already required under UK national law at the time of the surveys, together with 4 out of 5 Dutch ports.

Only in 2 ports, D3 and NE7, is a single Appendix confirmed. For port NE7, this is in addition to confirmation of Appendix 10 data by IMO MEPC Circulars. Therefore, for 29 ports there has been confirmation for more than one Appendix, and for 19 of these ports IMO MEPC Circular data has also confirmed survey data.

7.5.3 Summary

For a large number of the ports providing survey returns, it has been possible to corroborate at least part of those survey returns from other sources including the IMO MEPC Circulars. It has been possible to validate multiple types of data for 18 ports which appear in both Sections of Appendix 18. This serves to strengthen the quality of the survey data discussed in this Chapter as there is independent evidence to support data set out in a range of Appendices produced from the survey returns.

While data is not available to validate the returns from many of the smaller ports, this may be because they had not previously been required to provide data on the provision of reception facilities in their ports. The fact that they have provided data for the Surveys is a result of the trialling of the first survey, prior to it being issued to ports, in order to make the survey as "user friendly" as possible and to promote a high level of return, and the high return rate and primary data provided by those returns has served to fill a previously identified gap in knowledge about levels of provision of facilities in the North Sea region.

7.6 Conclusions

From the information collected in the two surveys, a broad picture of the wide variations in port sizes and types, vessel numbers and types and level of provision of facilities has been developed. From the survey data, it is also apparent that many of the requirements of the EU Directive were already being met, prior to its entry into force. These requirements included the provision of Waste Reception and Handling Plans, as set out under UK legislation, which has been transferred as "best practice" into the Directive, and also the requirements of MARPOL 77/78 Annexes to provide reception facilities in ports. Although Annex IV for sewage wastes was not ratified until after the two surveys were issued, a number of ports were already providing facilities for this waste stream.

With regard to the North Sea region, the availability of reception facilities for most categories of waste is widespread. In the case of Annex I, the vast majority of ports already provide some form of facility to receive oily wastes and, where they do not receive all categories, there are many ports in the region that do so and vessels would not need to made long journeys to find appropriate facilities. While some ports may consider investing in new infrastructure to meet the requirement of providing for vessels normally calling in, this may not always be possible because of the size or location of a port (see Chapter 5, Section 5.3.1). As a result, the development of both facilities and Waste Reception Plans on a regional basis might be a more appropriate way of expanding the provision of facilities.

For Annex II, the situation is also very clear. All those ports which receive vessels with noxious liquid substances already make provision to remove the relevant wastes. Most noxious liquids will be delivered in chemical plants with trained staff and appropriate facilities. The large number of ports offering storage for oil and chemicals will similarly be able to provide the appropriate facilities, on request. As there is no need for ports not normally receiving such vessels to provide facilities, it is unlikely that there will be any expansion in provision into additional ports.

For Annex IV facilities, until such a time as it becomes mandatory for vessels to use these facilities, and the 12-mile limit (or the 3 mile limit for those vessels with appropriate equipment on board) is removed so that vessels do not have the option of discharging outside that limit, it is unlikely that provision of facilities will greatly increase. In the case of larger ports, if facilities were to be provided for all vessels, then the costs are likely to be extremely high. These might include the building of physical connections to local sewage plants, or an increase in road transport using tankers to those plants, with resultant increases in road traffic and associated pollutants. In both cases, there would also be associated costs of new infrastructure or expansion of sewage works in order to handle increased volumes of wastes.

For Annex V wastes, facilities are also widely available throughout the region, although these vary from very comprehensive facilities taking a wide range of wastes and undertaking segregation and recycling, through to small ports with skips or bins on the quayside into which assorted bin bags of waste can be places. If it was made compulsory for all vessels to discharge garbage wastes in ports, there will again be additional costs associated with increased volumes of waste being removed from ports, including higher volumes of road traffic and increased levels of waste being delivered to landfill or incinerator sites. In addition, any future requirement for increased segregation and recycling of wastes will add further costs in terms of physical infrastructure to receive those wastes and manpower to handle them. These costs would also apply to vessels if they were required to segregate waste on board, prior to

discharging it into ports. Many vessel owners/masters may argue that their crews are already working to capacity, and that economic pressures would mean they could not afford to employ additional crew to deal with sorting wastes.

What is clear from the results of the survey is that, in the majority of cases, unless there is local legislation which makes the discharge of waste compulsory for all vessels – for example in those German ports where all vessels must use Annex V facilities – then the actual uptake levels are extremely low. The figures are summarised in Table 7.12 which sets out the uptake rates for all ports indicating both total number of vessels calling in and the number using facilities. The figures for Annex V are, as indicated above, potentially inflated by the mandatory use of these facilities in German ports. Only in the case of Annex V is there a statistically significant difference in uptake levels between surveys and this is the case only if those ports responding to both surveys are examined. For these ports, the rates are 30.75% and 32.38% respectively.

Table 7.12 Uptake of Reception Facilities – All MARPOL 73/78 Annexes

Outline of the range of facilities under MARPOL 73/78 Annex II (Noxious Liquid Substances) available in 71 North Sea ports by waste category and type

Annex	I	II	IV	V
Survey 1	7.88	3.32	0.74	32.31
Survey 2	7.98	2.73	0.78	32.39

In order for the EU Directive to be effective in reducing the volumes of waste available to be discharged illegally, the main emphasis would appear to be to promote increased uptake of facilities. The requirement of Article 7 of the Directive that vessels can only proceed to their next port of call if there is sufficient capacity on board to retain the current level of waste, together with any additional waste generated during that voyage, should result in increased uptake of facilities. The direct result of any such increase would be that it would become more cost effective for ports to provide facilities and may, in the longer term, lead to increased provision. However, it is important that the initial focus is on ensuring that vessels discharge waste in ports, and that systems of inspections and sanctions are in place to make sure such discharges actually happen.

Finally, with regard to the transposition of the Directive, and its impact on charging for reception facilities and on increased vessel inspections, with associated administrative and financial costs, the transposition process was delayed in a number of countries so that, at the time of the second survey, neither the UK nor the Netherlands had transposed the Directive into

national law. Although transposition took place in the UK in the summer of 2003, discussions between Dutch ports and the Dutch Government meant that transposition had still not been completed by the summer of 2004. There appears to be little change in terms of charging for reception facilities, and in vessel inspections, resulting from the Directive. Only in Germany does there appear to be a change in both charging system and an increase in harbour dues to cover the additional administrative costs associated with vessel inspections. The two different charging systems under discussion in the Netherlands was just one of the issues leading to delayed transposition of the Directive into Dutch national law.

CHAPTER 8

A MODEL PROCESS FOR THE DEVELOPMENT OF LEGISLATION

8.1 Introduction

The aim of this chapter is to establish a model process that can be applied to legislation in the marine and wider environment. The rationale is to provide a more effective process for the future, so that problems evident in the case of the EU Directive can be avoided. In order to achieve this aim, the process already used within the EU in the development of Regulations and Directives is referred to, as an established example of how legislation can be initiated through to its final adoption.

In previous chapters, the roles of actors in the field of vessel-source pollution have been examined, together with the various drivers that influence their behaviour. The broad range of legislation covering vessel-source marine pollution, both within and outside the EU, has also been examined, from the early 1920s through to the development of the EU Directive on port reception facilities. Data collected both prior to the Directive and at the time of its expected implementation was then examined, to assess whether any changes had taken place in North Sea ports that could be attributed to the introduction of the Directive.

For legislation to be developed to counter a specific problem, it is important that all the various actors are involved so that the legislation is "fit for its purpose" in the sense of being appropriate to the organizations affected, and can be implemented in such a way that it achieves its stated aims. In the example of the EU Directive and other legislation on vessel-source pollution, the main aim is to prevent a wide range of pollutants from being discharged by vessels into the marine environment. If all actors are not involved in the process of legislative development, and the requirements of the legislation are consequently too stringent, or if the actors charged with monitoring compliance do not have the capacity to undertake that task, then the legislation may not achieve its aims. In this situation, it may require amendment to the legislation and inputs from other agencies to make it work.

The procedures for decision-making within the EU have been outlined in Chapter 5, Box 5.1, and the different types of EU legislation are set out in Chapter 5, section 5.4.1. Legislation relating specifically to EU member states most commonly takes the form of Regulations or Directives. Raworth (1993) outlines the main differences between these as being that "regulations are mainly used for legislative acts directed against specific persons [and] undertakings of Member States" while Directives are "binding instructions to Member States to

enact particular provisions" (page 17). While Directives normally require national legislation to become a legal requirement, Raworth (1993) notes that "the Court of Justice has ruled that provisions of community directives that are 'unconditional or sufficiently imprecise' may be relied on directly before national courts in the absence of implementing legislation" (page 17).

Chapter 5, Figure 5.1 sets out the example of the co-decision procedure in the EU as an example of the process through which European legislation goes from the original Commission Proposal for a Regulation or Directive, through to its being adopted or a decision being taken that there should be no legislation. In this process, the Commission sets out a proposal and seeks the opinion of both the Parliament and the Council, so that a Common Position is achieved. The Commission then presents its views on the Common Position to the Parliament, which takes the decision whether to adopt legislation, reject it, or to propose amendments to that legislation.

However, even before the Commission Proposal has been passed on to the European Parliament for its opinion, the first stage in Figure 5.1, a process to develop the proposal has already taken place. Raworth (1993), in examining the initiation of legislation within the EU, outlines a number of steps through which a Commission proposal normally goes. These including the emergence of the idea, use of a preliminary study, a preliminary draft proposal, a final draft proposal and, finally, formal Commission Proposal. Within the EU, therefore, there is a clear progression for the development of legislation, with the Commission initiating almost all legislation. This, Raworth (1993) notes, allows the Commission to "control the legislative agenda of the Council and Parliament" (page 24). However, not all legislating bodies will have such a highly structured decision making process. Section 8.2 will, therefore, examine the process of legislative development in the context of the different stages of development, making reference to the various actors and drivers that can be associated with each stage of the process.

8.2 The Process of Legislative Development

OXERA (2000), in examining the rationale for establishing a model process in policy making, sets out a number of advantages for such a process, together with one specific disadvantage. A similar situation will exist in a model process of legislative development and so the advantages and sole disadvantage have been adapted for the creation of new legislation, and are set out in Table 8.1.

The process of developing environmental legislation, and more specifically legislation for vessel-source pollution, can be disaggregated into a series of stages, and corresponding questions. Figure 8.1 has been compiled in order explicitly to identify the six stages involved, from the problem being identified to the legislating body through to the decision being taken to

legislate for the problem. These six stages are examined below, with reference to how their implementation would avoid the problems evident in the process of developing the EU Directive, and in light of the drivers of the behaviour of the various actors involved in the process.

Table 8.1 Advantages and Disadvantages of a Model Process

Advantages	• Once defined, it will be quicker and easier to follow a process when new legislation is required, than to define an ad hoc process each time • A codified process can be audited and public confidence in the process can confer confidence in the legislation • The definition of the process, and its audit and review, can be published to provide public accountability • A process reduces dependence on the judgement of individuals. Stakeholders may have confidence in a process, rather than having to place their trust in individuals • A defined process may help ensure that legislation is "fit for purpose", by helping to avoid ambiguity and uncertainty about the aims of the legislation and what is expected of those being legislated • If the same process is used for all legislative development, the outcomes are more likely to be consistent
Disadvantage	• May not be sufficiently flexible to cover every circumstance in which legislation needs to be developed, without adapting the process, particularly where the requirement for legislation is urgent

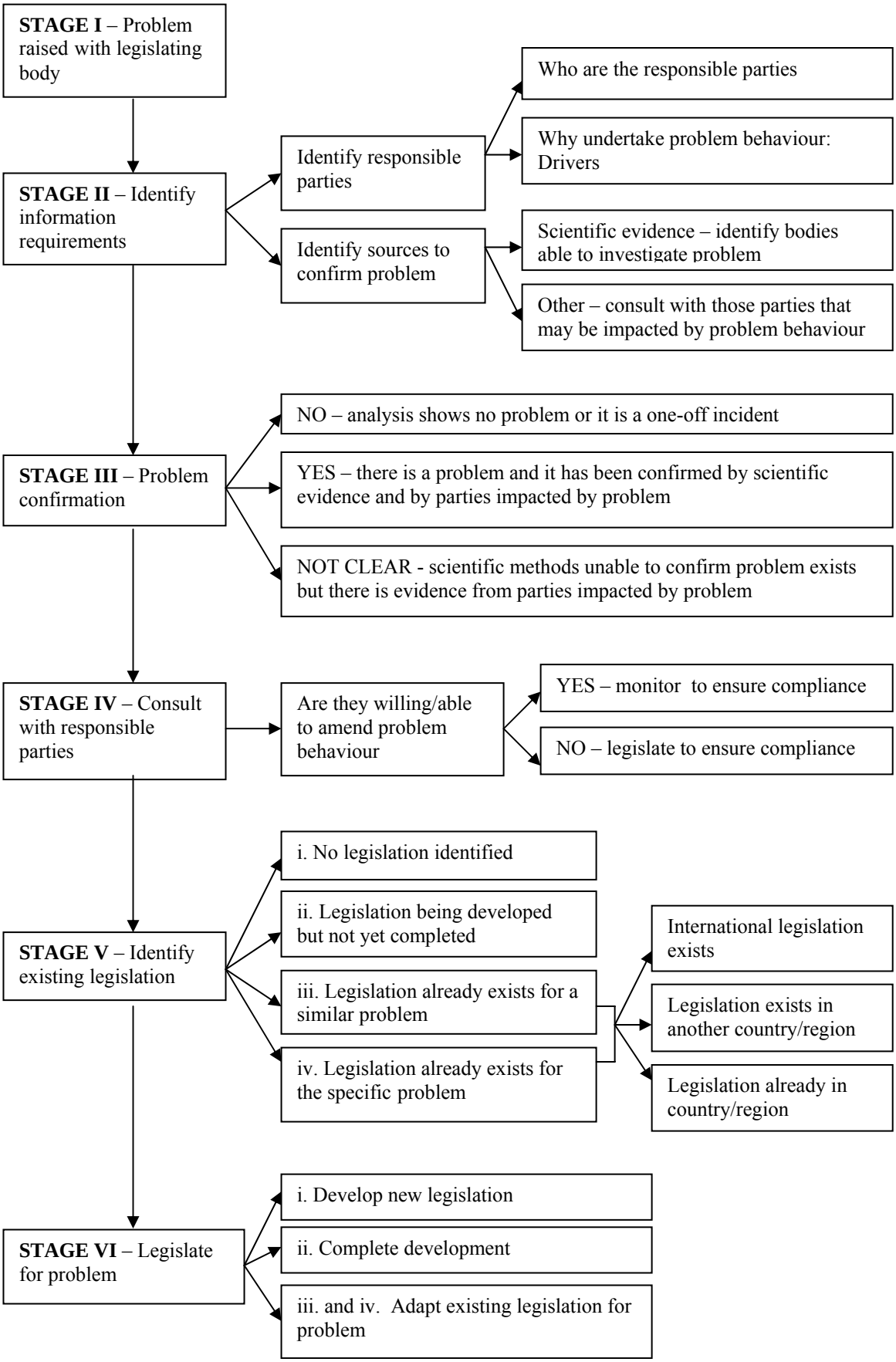
Source: Adapted from OXERA (2000, page 19)

8.2.1 Stage I - Identification of Problem

OXERA (2000) states that policy issues "may emerge from many sources, including parliamentary questions, departmental science staff, the media (including academic journals), and the general public or they may be triggered by accidents" (page 23). Similarly, environmental issues may also emerge from many sources and, in the case of the EU, Raworth (1993) notes that most ideas for legislation emerge "within the Commission itself from the highest level down to individual … officials" or through "contacts with national and European interest groups, officials from Member States, other Community bodies and even individuals" (page 27).

The drivers on the behaviour of the different actors in the example of North Sea pollution are examined in Chapter 3, and an example of the behaviour of legislators being driven by events – the sinking of the *Erika* - is set out in Section 3.5. This example illustrates how the media are able to influence the agenda on a particular issue and put pressure on the actors responsible for introducing legislation to take specific action. There may even be pressure from the media and

Figure 8.1 Model Process Flow Chart



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other interested parties for legislation following a one-off pollution incident, even if it is unlikely that such an event will occur again. Similarly, the election of a single issue political party, or a political party taking action to meet election promises and a national agenda (see Chapter 3.2, Tables 3.1 and 3.2), may result in action being taken to fulfil that agenda, irrespective of whether it is really necessary.

At each stage in Figure 8.1, information can be sought from interested parties about the problem that has been identified to the legislating body, and whether action is required to overcome it. At different stages, the decision can be taken that no legislation is required and the process can then be halted. However, even if evidence suggests that no action is needed, the decision may still be taken to legislate since taking no action may be detrimental for the chances of the legislators to retain power in a general election, for example.

As outlined in Chapter 2, Figure 2.1, interested parties may include the wide range of participants in a particular area of concern. In the case of North Sea pollution, this will include various national and regional Government bodies, industry and trade associations, various environmental organizations, and also other bodies that are responsible for the development of legislation in the region. In this latter case, a decision may be made that a problem falls outside the remit of a particular body, and that legislation would be more appropriate or more likely to be complied with if it originated within the EU, for example. An issue of concern may also have been raised by a particular environmental organization, whose remit is to put pressure on legislators to take action to minimise or eradicate a particular problem. The different interested parties will have their own agendas for action, and will seek to meet the aims of those agendas by putting pressure on elected representatives such as MPs or MEPs to take steps to counter a problem.

8.2.2 Stage II – Identify Information Requirements

Figure 8.1 sets out Stage II of the process of legislative development as identification of the information requirements of the legislating body. Once an issue such as an environmental problem has been identified to that body, two types of information are required – identification of responsible parties and identification of sources of information which can be used to confirm that the problem exists

It is important to identify the responsible parties, if at all possible, so that the source and reasons for a particular problem can be better understood. In the case of discharges of ship-generated waste, the responsible parties will include those shipping companies that choose to discharge wastes at sea. The reasons for this behaviour can include the fact that some discharges are legal, as in the case of sewage wastes outside specified limits, or because there are no facilities

available into which discharges can be made in ports. In a situation where no facilities are available, then the port companies could also be included as responsible parties because they have not taken action to provide facilities as required under existing legislation. However, in the North Sea region, a broad range of facilities, identified at Chapter 7, are available in ports, and so it is unlikely that the port companies will be considered as responsible parties.

In the model process flow chart, having identified the responsible parties, these parties would then be consulted with at Stage IV.

The second set of information, identification of sources of information which can be used to confirm that the problem exists, requires that the legislators approach a range of bodies to obtain evidence of the existence of the problem. The first information source is scientific bodies such as University Departments, specialist laboratories and specific agencies within Government that can be employed as consultants to investigate the problem and provide evidence back to the legislating body. In the case of marine pollution, one such body would be the Joint Monitoring Group, discussed in Chapter 4, Section 4.3.2, which provides scientific advice on polluting substances, for example, for the black and grey lists of the OSPAR Convention.

The second method of confirming that a problem exists is through consultations with those parties who have been, or may be, impacted upon by that problem. In the example of marine pollution incidents, where the pollutant is washed up on the beaches in a region, this may include local residents, local tourist boards, fish farming or commercial shellfish industries, environmental groups and local government in that area. If the pollutant is not coming ashore, the interested parties may include fishing vessel or other vessel owners where solid materials provided a hazard to safe navigation in an area. Although evidence obtained from interested parties may be anecdotal in nature, their opinions regarding a specific problem can make an important contribution towards any debate on the issue.

8.2.3 Stage III – Problem Confirmation

Based on the scientific and other consultations that have taken place, evidence will then be placed before the legislating body as to whether a problem is real or not. This caveat is introduced because scientific evidence may exist to show that a specific discharge into the sea, for example, will definitely not cause environmental harm. Alternatively, in some situations, the "problem" may have been the result of a one-off event, and a similar set of circumstances is very unlikely to occur again. In both these situations, the answer to the question of whether the problem requires legislation would be "NO". However, as previously noted, legislators may still choose to develop laws to govern this particular behaviour, if it is in their political interests to do so.

Where there has been specific confirmation of a problem, either in the form of scientific evidence or through consultations with those individuals or bodies impacted on by the particular problem, then further action will be required on the part of the legislators, following through the stages identified at Figure 8.1. However, Stage III also includes the answer "NOT CLEAR". This is because scientific methods may not be available to confirm that a problem exists at the current time.

In the example of vessel-source discharges, for example, it may not be possible to prove that the discharge of certain substances into the oceans actually causes damage, and so the decision may be taken not to legislate. However, if the precautionary principle were to be applied in this situation, as set out in Chapter 4, Box 4.4, where Principle 15 of the Rio Declaration 1992 states that the "lack of scientific certainty shall not be used as a reason for postponing … measures to prevent environmental degradation", then the decision may be taken to proceed with legislation, even where there is no scientific evidence that the discharge of a substance may result in harm to the environment.

Chapter 4, Section 4.3.2 (iii), notes that the precautionary principle was adopted into international legislation under the 1992 OSPAR Convention, under which the black and grey lists of prohibited substances that could not be discharged at sea were expanded to include substances for which there was no current scientific evidence of harm. There is, therefore, a precedent under this Convention for legislators to request the addition of new substances to the black or grey lists (see Chapter 4, Box 4.3), removing the need for specific and separate legislation. This would also help overcome the problem of companies claiming that they are unfairly targeted by legislators, and that they should not be prohibited from discharging substances without any evidence of harm. If, at a future date, new testing methods were developed which provided proof of harm, then early action to prohibit the substance will be fully justified, and there will have been no delay in taking action to combat that harm.

8.2.4 Stage IV – Consult with Responsible Parties

Where Stage III of the process has resulted in a decision to continue to develop legislation, even where the problem has not been confirmed or does not actually exist but the decision has been taken to proceed with legislation anyway, it will then be necessary to consult with those parties identified at Stage II as being responsible for the problem. These consultations should examine in detail the drivers that lead to the problem behaviour, and can be used to see whether it is possible to get the responsible parties to modify that behaviour. It may be that voluntary amendment can take place and, in this case, there would be no need to legislate, but there would be a requirement to monitor and ensure compliance. However, it may be that the parties are unable to modify the behaviour and legislation will be required.

As an example of the voluntary amendment of behaviour, one cultural driver on the behaviour of the responsible parties would be the level of education of those parties. The decision to discharge waste or other substances at sea may be taken as a result of a lack of awareness of laws in a particular region, if a vessel enters that region for the first time from an area where discharges are allowed. In addition, the crews of many vessels are multi-cultural and multi-lingual and the levels of education differ widely, so that the crewman that physically discharges the waste is unaware that it is not permitted, even if the officers in the crew are aware. In these examples, with the use of improved crew training and better dissemination of information about the specific legal requirements in a region, it may be possible to prevent the problem from being repeated without the need for legislation.

Where the responsible party is unable to amend the problem behaviour, drivers on behaviour may be financial or technological. Vessel owners may be operating to such tight financial margins that they are unable to pay to use port reception facilities without it becoming financially impossible to continue to trade, as outlined in Chapter 3, section 3.4.3. In this case they may choose to continue to discharge wastes at sea, particularly if any fine for being caught is less than the cost of facilities. Where technology is available to reduce waste generation to a more manageable level, this may also be too expensive for many vessels or, again, the fine for the behaviour is less than the cost of the technology. Available technology may also not be appropriate for a particular vessel type, as discussed in Chapter 3, section 3.3.2, and so the responsible party would not be able to introduce it on board, irrespective of whether they would voluntary do so if they could.

Where it proves impossible to get the responsible parties to either voluntarily amend their behaviour, or they are unable to do so, then it will be necessary to continue to develop legislation to overcome the problem and to ensure that all parties comply with it. Again, even were the parties willing to amend the behaviour, the decision to proceed with legislation may still be take.

8.2.5 Stages V and VI – Identify Existing Legislation/Legislate for Problem

In the development of EU legislation, Raworth (1993) states that the Commission is able to initiate preliminary studies prior to proposing new legislation, these studies being conducted by "a single academic, a group of academics, forms of consultants or other experts working in the field" (page 29), with studies being published as COM Documents requiring formal adoption by the Commission. Having identified the problem, together with its source, it is important to identify whether action has already been taken, either elsewhere or within regional or national legislation, to deal with either the problem itself or a similar or related problem.

The Commission's preliminary studies, or a similar study by other legislative bodies such as State Governments in the United States, provide the opportunity for identification of action required, and also for the identification of best practice and determination of the most effective method of dealing with the specific or a related problem. Once this has been done, the legislating body can then make the decision as to whether completely new legislation is required, or whether existing legislation can be applied to overcome the problem. Figure 8, Stage V identifies four outcomes of the process of identifying whether there is legislation already in existence. These are:

(i) No legislation identified;

(ii) Legislation being developed but not yet completed;

(iii) Legislation already exists for a similar problem; and

(iv) Legislation already exists for the specific problem.

Stage VI then identifies the action required for each of the four outcomes, and these are:

(i) develop new legislation;

(ii) complete development; and

(iii) and (iv) adapt existing legislation for the problem.

In the case of (i), where it has not been possible to identify legislation anywhere that is appropriate to the problem, it will be necessary to develop legislation that is specific to the problem.

In the case of (ii), where legislation is already being developed, this could either be within the region or elsewhere. If it is being developed in the area covered by the legislating body, then the most appropriate measure would be to complete its development, taking into account the information obtained in Stages II - IV to ensure that the legislation is appropriate to the problem, and targeted at those responsible for it. The legislation could, however, be under development in another country or region. In this example, it may be possible to act in conjunction with the appropriate legislating bodies and relevant agencies of those other nations or regions and to share information. In such a situation, bilateral or regional legislation may be more appropriate in dealing with a problem that has been identified by more than one country.

In the example of marine pollution, the most appropriate body to oversee multi-regional legislative development would be the IMO, and it may be that MARPOL 73/78 or another IMO Convention could be adapted to deal with the specific problem. This would, however, depend on the willingness of the legislating body to pass responsibility onto the IMO. Where responsibility was handed over, the legislating body might no longer be able to use introduction of the legislation as evidence that it has met a political promise or has resolved the original

problem to the satisfaction of those who originally raised it as an issue. The body may, therefore, choose to continue with legislative development itself.

In the case of (iii) and (iv), legislation for a similar problem or the specific problem may already exist at an international level, as in the case of MARPOL 73/78 for oil and other substances entering the marine environment from ships at sea. Legislation may also exist in another country or region, or even within the same region where the legislative process is taking place. In the EU and North Sea region, the examples of the OSPAR Convention, the Paris MOU and the Bonn Agreement have been identified and examined in Chapter 4. Legislation may also exist nationally for a broadly similar problem.

Where legislation already exists that is appropriate to deal with the problem, the legislating body will be required to decide whether it is possible to adapt the existing legislation (if it is national legislation) or to become signatories to the legislation (if it is regional or international). In the latter case, the legislating body may already be a signatory to the legislation and better monitoring of compliance by all the responsible parties may be all that is needed to ensure that the problem is resolved. However, it may not be possible to adapt the existing legislation or better implement it to overcome the problem, irrespective of whether it is national, regional or international. The decision may also be taken that the legislation should have a different emphasis to overcome the problem, and so the decision may still be taken to develop specific new legislation.

This change of emphasis is evident in the case of the Directive 2000/59/EC that has been developed even though all EU member states were parties to MARPOL 73/78. The EU took the decision that legislation was required which went further than the focus of MARPOL 73/78 which is the elimination of intentional pollution of the marine environment by regulating discharges from vessels at sea. The focus of the EU Directive is on the operation of ships while in community ports. It was determined that a reduction in vessel-source pollution could be achieved through adequate provision of reception facilities in all EU ports. All vessels would have access to facilities, and would be required to make use of them and so the excuse that facilities were not available could no longer be used by any vessel identified as having discharged wastes at sea.

8.3 Model Legislation

Having determined that legislation is required to combat a particular problem, there are a number of elements that should be included in any such legislation. The Basel Convention Secretariat (2004) identifies model national legislation to deal with the management of

hazardous wastes, including the transboundary movement and disposal of these wastes. This model national legislation, which was accepted by a meeting of the Parties to the Basel Convention in March 1994, contains a number of elements for inclusion in national legislation and these are outlined below:

- the aim of the law;
- the Authority responsible for regulating the law;
- definitions of what is being legislated for;
- obligations of the Authority; and
- control and monitoring systems.

These elements have been adapted to form the basis of a model of legislation which can be used in the development of new legislation in areas where there is a problem which can result in environmental damage. Each of the first three elements identified above will be considered separately. However, the final two elements will be considered in a single section as it is considered that the main obligation is to ensure that the aim of the legislation is fully met and the main method of doing this is through the use of control and monitoring systems.

8.3.1 Aim and Scope of Legislation

The aim of any new legislation should be to overcome a specific problem, having determined that new legislation is necessary using the model process identified in Figure 8.1 and Section 8.2. This process will have identified the source of the problem, including the actors involved, in order that the legislation can be targeted to best achieve that aim. Any new legislation needs to be clear and unambiguous in its aim. It should not be so broad as to be unachievable nor so narrow that it potentially excludes alternative sources (or actors) that may also be responsible for the problem. Above all, in the case of environmental legislation, its aim should be to protect the environment from the problem that has been identified.

The scope of the law is the specific method by which the aim of the law is to be met. It should set out the specific problem for which the legislation has been developed. It may be very narrow and target a single pollutant in a small area from a single source, or it may cover a much broader range of substances in a large geographical area and from a group of sources. The EU Directive is an example of this latter case, covering as it does ship-generated waste and cargo residues in all EU member state waters and from all but a few vessel types.

In identifying how to achieve the aim and scope of the legislation, the methods to be used should also be appropriate to the problem. Depending on the nature of the problem, all that might be required is a change in the behaviour of the actors involved. In this case, the methods

used would be very different compared with a situation requiring physical change to overcome the problem. These two situations are examined in more detail below.

Behaviour Change

If the problem is one where a change in actor behaviour is required then, in the shorter term, all that may be needed is clear communication that this change is necessary for the actor to be in compliance with the new legislation. This communication should also include identification of sanctions associated with non-compliance. In this situation, the aim of the legislation should be met very rapidly and so the timetable for action between going onto the statute books and entry into force may be very short. The legislation could, however, also include a longer-term clause resulting in the introduction of mandatory education of employees within the industry. Such a clause would mean that all new employees are actively made aware of the prohibited behaviour and are deterred from undertaking that behaviour from the outset of their employment. The evaluation date to assess the effectiveness of the legislation may also be fairly close to the entry into force date, and so the legislation can be responsive and change rapidly if any problems are identified with it.

In the case of behaviour change, the timescale taken to develop and implement legislation will differ between national legislation and regional legislation. In the case of national legislation, the new law may be placed on the statute books in a very short period of time. However, with regional legislation, a longer timescale may be required to allow member states to develop national legislation that transposes the regional legislation into national law, particularly if the legislation is developed at an EU level.

As an example of the difference in timescale, where a Directive has been developed and ratified by the EU, that Directive will still need to be transposed into law in all the separate member states. This will require a much longer timescale than is the case for national legislation. Although many states do adopt Directives very rapidly, the delays in entry into force of Directive 2000/59/EC, examined at Chapter 7, Section 7.4.1, highlights delays in the transposition of the Directive into national laws. Member states had two years between the publication (December 2000) and entry into force dates (December 2002) to bring the Directive onto the statute books. However, a number of states, including the Netherlands and the UK, failed to do so.

This Directive can be used as an example of behaviour change in that it requires vessels to make use of reception facilities provided in ports rather than discharge wastes at sea. However, despite adequate facilities being available in the majority of North Sea ports, the results of the

two surveys examined in Chapter 7 show that uptake of facilities remained very low in the run up to entry into force of the Directive and so the required behaviour change had not taken place.

In the example of the Directive, it may have been possible to have separate entry into force dates for the two main elements – mandatory discharge into facilities by vessels and the mandatory provision in ports. In the case of mandatory discharge, in order to achieve the required behaviour change over a short timescale, ships masters could have been required to comply and to discharge wastes into already available facilities by a fixed date set out in the Directive at the time of its publication. However, a more appropriate option may have been the development of a separate Regulation of the EU which, as indicated at Chapter 5, Section 5.4.1, is compulsory for all States and does not require adaptation by national legislation. The result of a separate Regulation would have been an earlier reduction in ship-generated waste entering the marine environment and so the aim of the EU to reduce marine pollution could have been met more much rapidly.

In the case of mandatory provision of port reception facilities, this element of the Directive may require some physical change in ports, in the form of new infrastructure, particularly in those North Sea ports which do not already offer adequate facilities. Legislating for physical change is examined below.

Physical Change

In a situation where physical change is required, the timetable for action will be much longer than that for behaviour change. Those actors at which the legislation is targeted will need a longer period, before entry into force to put in place any necessary physical changes such as the introduction of new technology or building new infrastructure. Any physical change may, in some cases, also require specific clauses in the legislation to set out the exact standards of equipment required, and the sanctions that will be imposed if these standards are not met, in order to ensure that actors do not introduce low cost, ineffective technologies.

In this situation, larger organizations may have an advantage since they are more likely to have the necessary infrastructure in place and also operate more advanced technology than smaller organizations. Larger organizations will also be in a much more advantageous position in which to raise funds to carry out infrastructure change. It will be important, therefore, to consider within the legislation the ability of the organizations to meet the requirements of legislation, when setting out the timetable for action. It may also be necessary to consider the possibility of including a source of funding, such as low interest/long repayment period loans to assist in the building of infrastructure for those smaller organizations.

Where physical change is needed, the entry into force date of the legislation will be at a later date than that for behaviour change, and any evaluation of effectiveness will also take place at a much later date. In the case of Directive 2000/59/EC, Article 17 sets out the evaluation method as being 3-yearly reports from Member States to Commission, which will then evaluate the impact of the Directive and report back to the European Parliament and the Council (see Chapter 5, Table 5.2). At this stage, any changes to the legislation that are required, as a result of technological developments or problems identified with the Directive for example, can then be initiated. Legislation requiring physical change will be much less responsive to adaptation than that associated with behaviour change and will, as a result, need to be much more detailed in outlining its requirements at the development stage. This will be the case for both national and regional legislation. It will also be vital to ensure that there is no conflict between the requirements and standards set under the new legislation and any existing legislation, including that at an international level.

Chapter 5, Figures 5.2 and 5.3, identify existing EU legislation on Waste and on Marine Transport. The EU Directive has been developed taking into account what already exists in those areas. It will also have taken into account international marine environmental law, as identified at Chapter 4, Table 4.1 that has previously been ratified by the EU. The EU Directive will then have to be taken into consideration when developing any new legislation which may have some impact upon it. Chapter 5, Section 5.5.2 examines proposals for two new Directives on the protection of the environment through criminal law and on ship-source pollution and the introduction of sanctions. In these two cases, the proposed Directives will have a direct impact on the EU Directive in terms of stricter controls on compliance and the availability of more stringent penalties for non-compliance.

It is important, therefore, to ensure that the aim and scope of any new legislation is clearly outlined and is not in any way contradictory with existing legislation, irrespective of whether it requires behavioural or physical change.

8.3.2 Authority

A problem that often occurs with legislation is what body has the authority to implement that legislation. This authority will also include a number of other aspects to ensure the successful implementation of the legislation including:

- the determination of any exemptions from the terms of the legislation;
- the establishment of an administration able to collate information on the impact of the legislation – this information will include data on compliance and also any reports of inadequacy of implementation; and

- the imposition of a system of penalties and sanctions for non-compliance – which could include a scale of fines for first offences through to the threat of confiscation of property or imprisonment of actors at various levels within the organization responsible for non-compliance.

The new legislation must, for the purposes of that specific legislation, establish clear authority for the legislating state or regional government to take any action necessary to ensure compliance with the law. However, even though authority may be set out explicitly within the legislation, existing international law may at times take priority over it, with authority being held by another country. The example of jurisdiction over vessels flying flags of convenience has been examined in Chapter 4, Box 4.2. In this example, there can be conflict between coastal states, port states and flag states as to which one has the authority to take action against vessels for non-compliance with marine pollution legislation.

Although the EU does not specify its authority in the example of the Directive, where the originating legislation has come from the EU, then it will be the ultimate authority. Member states will also have authority over specific activities of the legislation. Examples of this authority may include the power to determine whether there should be a common charging system used by all the ports in that country, who will be responsible for collecting information on facilities and their uptake for transmission up to an EU level administration, and who will undertake vessel inspections. These elements may require specific additional clauses in the national legislation used to transpose the Directive into national law. However, in the example of the Directive, as the definitions of what is ship-generated waste arise from various Annexes of MARPOL 73/78, the nature of what is deemed waste under these Articles may be changed at any time by the IMO. The consequence of this may be that the IMO would have some over-riding authority on the nature of what constitutes those wastes and the substances to be included under the MARPOL 73/78 Annexes. This could directly impact on the EU Directive, without the IMO first referring any such change to the EU.

8.3.3 Definitions

Definitions should be specific to the legislation within which they are contained and, in general terms, must set out explicitly what is meant by various terms in that legislation, so that they are clear and not open to interpretation. In outlining definitions within legislation, these will include a number of specific items directly related to that legislation, but may also include additional definitions in the case where regional legislation is transposed into national legislation. For example, the Official Journal (2000, page 83) sets out the definitions of the EU Directive at Article 2 as follows:

"(a) 'ship' shall mean a seagoing vessel of any type whatsoever operating in the marine environment and shall include hydrofoil boats, air-cushion vehicles, submersibles and floating craft;
(b) 'Marpol 73/78' shall mean the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as in force at the date of adoption of this Directive;
(c) 'ship-generated waste' shall mean all waste, including sewage, and residues other than cargo residues, which are generated during the service of a ship and fall under the scope of Annexes I, IV and V to Marpol 73/78 and cargo associated waste as defined in the Guidelines for the implementation of Annex V to Marpol 73/78;
(d) 'cargo residues' shall mean the remnants of any cargo material on board in cargo holds or tanks which remain after unloading procedures and cleaning operations are
completed and shall include loading/unloading excesses and spillage;
(e) 'port reception facilities' shall mean any facility, which is fixed, floating or mobile and capable of receiving ship generated waste or cargo residues;
(f) 'fishing vessel' shall mean any ship equipped or used commercially for catching fish or other living resources of the sea;
(g) 'recreational craft' shall mean a ship of any type, regardless of the means of propulsion, intended for sports or leisure purposes;
(h) 'port' shall mean a place or a geographical area made up of such improvement works and equipment as to permit, principally, the reception of ships, including fishing vessels and recreational craft.
Without prejudice to the definitions in points (c) and (d), 'ship-generated waste' and 'cargo residues' shall be considered to be waste within the meaning of Article 1(a) of Council Directive 75/442/EEC of 15 July 1975 on waste."

The definitions set out in this Directive identify precisely which groups are covered by the legislation - point (a), what substances are being legislated for – points (c) and (d), and will also include any physical requirements of that legislation – point (e). The definitions may also contain information on other legislation referred to specifically within its text, as is the case with MARPOL 73/78 at point (b). In the example of the EU Directive, the categories of waste identified at point (c) are those set out under the various Annexes of MARPOL 73/78. The final three categories of definitions for the EU Directive cover vessel types which are exempt from that Directive - points (f) and (g), and the geographical area that it covers - point (h).

It should be noted that, at (c), noxious liquid substances under MARPOL 73/78 Annex II have not been specified, but facilities for cargo residues are provided in all ports in the North Sea region where vessels regularly call in.

Where the transposed legislation is adapted to meet national requirements, additional definitions may include identification of the responsible persons to undertake vessel inspections, carry out administrative duties, or collect data on provision and uptake of facilities.

In terms of responsible persons, the Basel Convention Secretariat (2004), in its definitions, includes the category "persons" who are identified as any natural or legal person. For the purposes of that Convention, this should mean any person who is employed by any of the actors involved at any stage in handling the substances or involved in the behaviour being legislated for. In the case of ship-generated waste, "persons" would include ship and port employees, employees of waste recovery, transport and disposal firms, those and responsible for inspections to ensure compliance, for example. In a case where a specific behaviour is being targeted, "persons" may include those who give the order to undertake that behaviour, not just those who physically do it, and all those responsible for dealing with the consequences of that behaviour.

Two further definitions that may be used in legislation specifically relating to the provision of port reception facilities for the categories of waste set out in the MARPOL 73/78 Appendices are those outlined in Chapter 5, Section 5.3.1 on what constitutes adequate provision of facilities, and also what constitutes undue delay to the vessels which use them.

8.3.4 Obligations of the Authority

Obligations of the Authority, as set out by the Basel Convention Secretariat (2004), will normally include: monitoring the effects of the legislation on human health and the environment; promoting the introduction of new technologies to further reduce the problem; ensuring the adequacy of the methods used to deal with the problem; making available funding to assist in the event of emergencies; and the use of preventative measures.

The obligations of the authority do not stop once legislation is in place. A key obligation is to monitor the effectiveness of the legislation to ensure that its aims are being met. This monitoring can, by identifying any direct impacts of the legislation such as improved human health or a cleaner environment, provide evidence of a link between the actors covered by the legislation and the problem. However, if the problem persists, the authority may then have to look beyond the original actors and take additional action to meet the aim of the legislation. Where the problem continues to persist, but at a much lower level, the scope of the legislation may need to be changed to cover additional actors as sources of the problem. Where the problem continues at the same level, however, additional investigation will be required to identify its source and completely new legislation may be required. In this latter example, if it is proved that the actors at whom the original legislation was targeted were not responsible for the problem then those actors may take action to claim compensation for any losses resulting

from it. This emphasizes the importance of correctly identifying the source of a problem prior to taking action to combat it.

Under the obligation to encourage the adoption of new technologies, the authority may, by establishing a system of exemptions or reductions in fees, promote the introduction of new technology since there will be a financial incentive for actors to do so. Chapter 5, Section 5.3.4, indicates that vessels using clean technologies or waste minimisation schemes on board which result in smaller volumes of waste may be charged lower fees or receive rebates when discharging waste into port reception facilities, and will be required to use those facilities less frequently. This will result in a direct financial benefit to those vessels using such technology, and may also result in those vessels spending less time in port. Evidence of such financial and time savings can be used by the authority as a means of promoting these technologies.

Encouragement of adoption of new technology may also come in the form of funding to academic or business organizations involved in the development of new technologies, so that these bodies are able to continue their research. The introduction of a system of low cost loans to those actors willing to introduce new technology may also be undertaken, or promoted, by the authority. As previously noted, smaller organizations may not be able to obtain funding to introduce technology from financial institutions at an affordable cost. The availability of low cost finance, together with savings made once technology has been introduced, will make smaller organizations much more likely to adopt these technologies, and will further reduce the scale of the problem.

Where the legislated problem requires waste recovery companies to handle specific types of waste, for example, the Basel Convention Secretarial (1994) indicate that the control and management of such wastes places a number of requirements on the authority. The authority will need to licence such companies to ensure that they meet appropriate standards in the transport, storage or disposal of those wastes. It will also be necessary to ensure that these companies meet specific health and safety requirements to ensure that there are no risks to public health, or the health of their employees. Where the transport of the waste is hazardous, the authority may also be required to ensure that facilities for the recovery and disposal of the waste are built close to where it is either generated or discharged. It will also need to put in place arrangements to ensure that the waste is not mixed with other substances unless this results in a lower environmental risk.

With regard to funding in the event of an emergency, the authority may choose to put in place a system where a specific proportion of the fee charged for handling waste is set aside so that emergency funding is available. The authority might also put in place an insurance system

where, following the introduction of new technology or certification from the authority's inspectors, those actors with technology that reduces the risk of an emergency pay a lower premium than those without the technology. In this way, the authority will be further able to encourage the use of new technology as a preventative measure.

Finally, the authority must put in place appropriate systems for the collection of data on the effectiveness of the legislation. It will, therefore, need an appropriate administrative body, with associated funding put in place, to both collate any data provided to it, and also to initiate research when problems are identified. In the case of inadequacy of port waste reception facilities, a reporting system was put in place by the IMO so that ships masters and other interested parties could report inadequate provision.

There will also be a requirement to collect data on the inspection of waste producers and the companies that are licensed to handle that waste. These inspections may already be undertaken as a result of existing legislation, as in the example of vessel inspections undertaken by the Paris MOU and other MOUs to ensure that vessels meet the requirements of a number of international conventions. Where such systems are already in place, it should be an obligation of the authority that it opens communications with the bodies responsible for those systems, to ensure that conflict does not arise between them. It may be that the current system can be adapted to collect the information required by the authority and so the authority could make a contribution to the costs of expanding the existing system, which may include providing funds for additional inspectors to be employed by those existing bodies, or additional administrative staff.

From the obligations set out above, it is clear that a major role of the authority is to ensure that the aims of the legislation are achieved. Where the aim is to overcome a problem that has not previously been legislated for, then the authority will be free to put in place any system that it deems appropriate to meet this aim. However, where legislation exists to deal with a similar (or the same) problem, then the authority must ensure that any system it introduces does not conflict with existing systems, and that it co-operates, where possible, with the authorities responsible for those existing systems.

8.4 Conclusions

Chapter 5, Section 5.5.2, examines the process of development of the EU Directive on port reception facilities, while Table 5.2 outlines the Timetable of that process. The Directive took over two years, from its original proposal in July 1998 to its signature by the European Parliament and Council in November 2000, to be developed, and work had been undertaken on drafting a Directive for some time before the original proposal. Even after the signature stage,

the Directive was not due to enter into force until two years later in December 2002 and a number of countries failed to meet that deadline by several months or even more than one year in the case of the Netherlands.

The EU Directive has a number of requirements which mirror existing international legislation on vessel-source pollution, vessel inspections, monitoring and surveillance requirements, and the development of port waste management plans. However, it also has requirements that may be contradictory to existing legislation. Chapter 3, Section 3.2.1, identifies the requirement of the Helsinki Convention, covering Baltic States, for a harmonised fee system common to all signatory states. The "no special fee" system is the one defined by HELCOM (2001) in Recommendation 22/3 and its earlier iterations, and this system is very different from the charging system set out in the development stages of the Directive which called for all vessels to contribute significantly towards the cost of facilities.

When developing environmental legislation, whether for the marine or wider environment, the model process identified in Section 8.2 and in Figure 8.1 will provide a number of advantages for the legislating body in taking decisions about that legislation. These advantages are summarised below:

- The decision not to legislate can be taken at any stage in the process. Legislators are not bound, having set the process in motion, to produce new legislation at the end of it. Where such a process is not used, once the decision has been taken to proceed with legislation, it may not be possible to halt its development, even if it is later found that the legislation is not required.
- Identification of responsible parties means they can be approached at an early stage and asked to modify problem behaviour. If a voluntary code of conduct can be introduced to reduce or halt that behaviour, then there will be no need for legislation at that stage. Only if such a system cannot be established, or if responsible parties fail to adhere to the voluntary code, will legislation be required.
- Scientific advice is sought at an early stage, so that decision to proceed can be based on concrete evidence of need. This evidence can also be used to justify introduction of the legislation in the face of opposition from responsible parties, claims that the problem does not exist, or that it is not really a problem.
- Consultations with interested parties at an early stage means they can contribute to the decision making process through identification of the first hand the effects of the problem. As potential voters for the Government(s) considering legislation, this can result in voter satisfaction as these parties feel that their views are important.

- Where evidence does not support the existence of a problem, the decision to not proceed can be taken and will result in a reduction in workload for the legislators. The problem confirmation process also provides evidence for the legislators to justify this decision, in the face of continued public or media demands for action.
- The identification of existing legislation can prevent duplication. Existing legislation may already provide the solution to the problem. State or regional Government can seek to ratify that legislation or to transpose it into its own laws, and this will require a much shorter timescale than the development of entirely new legislation. Government(s) can then use this as an example of prompt action to overcome a problem, and again this may result in voter satisfaction and an improved perception by the media and general public.
- Making use of existing legislation reduces the need to educate those at whom the legislation is targeted, as they should be aware of its requirements through their activities in other countries or regions.
- The legislation should be effective over a shorter timescale as responsible parties may already have necessary equipment or knowledge in place to cease the problem behaviour, as they are already required to do so elsewhere.
- Existing legislation will have a Secretariat or equivalent body to regulate its activities. It will also have an administrative system including data collection, and the monitoring of compliance through inspections, for example. It may be possible to adapt or expand these into a new country or region, and the financial costs of this will be much less than they would be when establishing a completely new system.
- Identification of existing legislation, particularly where it is already in place in the country or region, will overcome the potential for duplication of workload and also the possibility of conflicting requirements.

If, at the end of the decision making process, the legislating body still proceeds with the development of completely new legislation, the model legislation set out at Section 8.3 will provide a framework from which that new legislation can be developed. This will particularly be the case when no legislation exists to deal with the problem or if it is a completely new problem. A model of legislation under the Basel Convention relating to the transboundary movement and disposal of hazardous wastes has been examined and adapted in Section 8.3. The key elements identified in that section – Aim and Scope, Authority, Definitions, and Obligations of the Authority, provide a general framework which can be adapted to suit a range of environmental problems requiring legislation, and not just marine pollution.

CHAPTER 9

CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

The aim of this thesis has been to examine and to critically evaluate the development of the EU Directive on Port Reception Facilities (Directive 2000/59/EC) and its potential to reduce intentional discharges of wastes into the marine environment, with particular reference to the North Sea and North East Atlantic Region. Its main focus is the operation of ships in ports as distinct from the regulation of discharges at sea, the focus of MARPOL 73/78, for example.

In order to achieve the aim of this thesis, an examination has been made of the nature of ship-generated wastes, including their sources in Chapter 1. The various actors involved in the process of developing legislation have then been identified in Chapter 2, together with the drivers which influence the behaviour of those actors in Chapter 3. A detailed examination of existing legislation has been undertaken in Chapter 4, and the development process of the Directive has been set out in detail in Chapter 5. Data collected from a number of sources has been analysed in Chapter 6 to establish both the availability of facilities and some measure of the scale of the problem of ship-generated waste in the region, prior to the introduction of the Directive. Also prior to its introduction, two surveys of ports in the North Sea region were conducted to determine their readiness to undertake the requirements of the Directive, and assess levels of availability of facilities and vessel uptake, prior to its entry into force. The results of these surveys are set out in Chapter 7. A model process has then been developed in Chapter 8 to assist legislators in deciding whether to proceed with new legislation when a problem has been identified. If, at the end of this process, the decision is taken to continue to introduce new legislation, the main elements of such legislation are set out.

Section 9.2 will evaluate the strengths and weaknesses of the Directive as a means to reduce intentional discharges of waste into the marine environment, beyond what can be done using other international legislation. Section 9.3 will examine the significant contributions made in this thesis and how these can be used for future research. Finally, Section 9.4 will offer some concluding thoughts on the most significant strengths and weaknesses of the Directive, both in terms of what elements are most amenable to remedial action to achieve a rapid result from the Directive and what are the factors most likely to result in problems arising from it.

9.2 Directive 2000/59/EC as a means of reducing intentional discharges of waste into the marine environment

Section 5.4 of Chapter 5 emphasises the complexity of the legislative framework within which the Directive sits at an EU level. In conjunction with Chapter 4, it illustrates the wide range of legislation available to control marine pollution. However, despite this legislative framework, the problem of illegal discharges of vessel-source waste continues and Directive 2000/59/EC seeks to overcome this problem. The key requirements of the Directive are analysed below in terms of their potential effectiveness to reduce intentional discharges of wastes at sea.

9.2.1 Mandatory Provision of Port Reception Facilities

Key requirements:

Article 4: (1) Member States shall ensure the availability of port reception facilities adequate to meet the needs of the ships normally using the port without causing undue delay to ships; (2) To achieve adequacy, the reception facilities shall be capable of receiving the types and quantities of ship-generated waste and cargo residues from ships normally using that port, etc.; and (3) Member States shall establish procedures … for reporting to the port state alleged inadequacies of port reception facilities (Official Journal, 2000, page 83).

Article 5: (1) An appropriate waste reception and handling plan shall be developed and implemented for each port, etc. having regard to the requirements of [a number of] *Articles, (2) the plans … may, when required for reasons of efficiency, be developed in a regional context ... provided that the need for, and availability of, reception facilities are specified for each individual port; and (3) Member States shall evaluate and approve the plan, monitor its implementation, and ensure its re-approval at least every three years and after significant changes in the operation of the port* (Official Journal, 2000, pp 83-84).

Strengths:

- Expansion of availability of facilities will remove the excuse that there was no choice but to discharge illegally since facilities were not available in which to discharge waste legally.
- Reporting of inadequacy of facilities will allow measures to be taken against ports failing to provide facilities at an early stage, and should promote the expansion of provision.
- Port Waste Management Plans will provide clear information to port users, including type and location of facilities, capacity of the equipment to receive waste discharges, costs of facilities, details of providers and how to make arrangements to use the facilities.
- Port Waste Management Plans should contribute to improved uptake as a ship's master will be able to call in at a port within a region where suitable facilities are available when required, removing the possibility of undue delay.
- Regular updating of plans will ensure that information is accurate and up to date at all times.

Weaknesses:

- Where facilities are not suitable for a vessel in terms of size, accessibility and where any delay in waiting to use facilities would result in a financial loss to the vessel's master, then the decision to discharge illegally may still be taken.

Recommendations:

- The agency responsible for the implementation of the Directive must ensure that Articles 4 and 5 are implemented as rapidly as possible, to remove inadequacy of provision as an excuse for continued illegal discharge
- A comprehensive data collection system, possibly in conjunction with the Paris MOU SIRENAC system, is required to ensure that information on availability and waste management plans is available and accessible to all interested parties, and this system should be updated regularly to show the direct impact of the Directive on improved provision of facilities based on information provided in waste management plans.

9.2.2 Mandatory Discharge Principle

Key requirements:

Article 3 - Scope: The Directive shall apply to (a) all ships, including fishing vessels and recreational craft, irrespective of their flag, calling at, or operating within, a port of a Member State [with certain exceptions]*; and (b) all ports of the Member States normally visited by* [these] *ships.* (Official Journal, 2000, page 83).

Article 7 – Delivery of ship-generated waste: (1) The master of a ship calling at a community port shall, before leaving the port, deliver all ship generated waste to a reception facility. (2) Notwithstanding paragraph 1, a ship may proceed to the next port of call without delivering the ship-generated waste if … there is sufficient dedicated storage capacity for all ship-generated waste that has been accumulated and will be accumulated during the intended voyage of the ship until the port of delivery. If there are good reasons to believe that adequate facilities are not available at the intended port of delivery, or if this port is unknown, and that there is therefore a risk that waste will be discharged at sea, the Member State shall take all necessary measures to prevent marine pollution, if necessary by requiring the ship to deliver its waste before departure from the port. (3) Paragraph 1 shall apply without prejudice to more stringent delivery requirements for ships adopted in accordance with international law. (Official Journal, 2000, page 84).

Article 10 – Delivery of cargo residues: The master of a ship calling at a Community port shall ensure that cargo residues are delivered to a port reception facility in accordance with the provisions of MARPOL 73/78. Any fee for delivery of cargo residues shall be paid by the user of the reception facilities. (Official Journal, 2000, page 85).

Strengths:

- All ships' masters are aware of the need to use facilities, unless they are specifically exempted under the Directive

- Smaller vessels that have not previously been required to use facilities are now included under legislation and the range of number of vessels covered by legislation is greatly increased
- Article 7 should promote waste reduction methods on board so that vessels are able to store the smaller volumes of waste generated and therefore make use of facilities less frequently
- Article 7 should also promote effective record keeping, and transmission of information between ports, so that vessels can prove they have not discharged illegally during a voyage if they do not have capacity on board for all the waste they should have accumulated.
- Vessels may be detained in port and forced to discharge wastes before being able to undertake its next voyage
- Stricter requirements under existing or future international law will still take precedence over the delivery requirements under the Directive.

Weaknesses:

- While vessels will be required to prove that they have not discharged illegally if they do not have sufficient storage on board, leading to increased record keeping on vessels – some vessels may be unable to provide information because they travel into the region for the first time and have not been required to maintain records elsewhere.
- Any additional costs to vessels arising from the requirement for strict record keeping may well result in some vessels choosing to transfer their trade away from EU ports, or could lead to increased use of other modes of transport where shipping is not the sole method available.

Recommendations:

- Introduction of a system of vessel logbooks and record keeping to enable vessels to provide information to ports on volumes of waste accumulated and evidence of capacity on board. Logbooks may be used in conjunction with port waste management plans to show that there is capacity on board to travel to next port of call without first discharging waste. This will help minimise the number of vessels detained in ports.
- An assessment should be made at the three year review stage of the numbers and types of vessels detained in port to see if there are any specific categories of vessels which are unable to satisfy port authorities that they have the capacity to travel to the next port of call; where specific categories are identified, measures to be taken to assist these specific vessels in meeting that requirement.
- Monitoring of transport modes is required to assess whether the Directive has had any impact on external and internal trade using shipping through EU ports; if there is any decline in trade, or there has been a transfer to more costly or polluting modes of transport, measures may be required to address such changes.

9.2.3 Notification

Key requirement:

Article 6 - Notification: (1) The master of a ship, other than a fishing vessel or recreational craft authorised to carry no more than 12 passengers, bound for a port located in the Community shall complete truly and accurately the form in Annex II to notify that information to the authority or body designated for this purpose by the Member State in which that port is located; and (2) The information … shall be kept on board at least until the next port of call and shall upon request to made available to the Member States/ authorities. (Official Journal, 2000, page 84).

Strengths:

- Ports will be provided with information on IMO identification number; vessel name and call sign, estimated time of arrival/departure; previous/next port of call. With specific reference to the discharge requirement of the Directive, vessels will also provide information on the last port and date when ship generated waste was delivered; whether all/some/none of the vessel's waste is to be delivered; and type and amount of waste to be delivered/stored on board.
- This information can be used in the monitoring of the Directive, and should be forwarded to the responsible agencies at national and EU level. The information can also be used to assist in vessel inspections under Port State Control

Weakness:

- The lack of a notification system for smaller vessels could mean that the Directive is less effective in reducing waste from these vessel types, since they will not be required to keep accurate records. Lack of information where the vessel is chosen for inspection may result in the detention of such vessels under the mandatory discharge requirement.

Recommendations:

- Introduction of a system of vessel logbooks as an appropriate method of collecting the data required for notification under Article 6.
- Expansion of the notification requirement to cover smaller vessels, with the information requirement tailored for different vessel types, based on size, business activity and the types and quantities of waste likely to be generated by them.
- Collection of baseline data on volumes and types of wastes discharged, and the proportion of vessels making use of facilities, to provide a means by which it can be shown whether the Directive has resulted in higher volumes of waste being discharged legally in ports with the consequent reduction in volumes available to be discharged illegally at sea.

9.2.4 Common Charging System

Key requirement:

Article 8 – Fees for ship-generated waste: (1) Member States shall ensure that the costs of port reception facilities for ship-generated waste, including the treatment and disposal of the waste, shall be covered through the collection of a fee from ships; (2) The cost recovery system … shall provide no incentive for ships to discharge their waste into the sea; (3) fees [should be] fair, transparent, non-discriminatory and reflect the costs of the facilities and services made available; (4) The Commission shall, within three years …, submit a report to the European Parliament and to the Council, evaluating the impact of the variety of cost recovery systems adopted … [and] The Commission shall, if necessary in the light of this evaluation, submit a proposal to amend this Directive by the introduction of a system involving the payment of an appropriate percentage, of no less than one third, of the costs referred to in paragraph 1 by all ships calling in at a port of a Member State irrespective of actual use of the facilities, or an alternative system with equivalent effects. (Official Journal, 2000, page 84)

Strengths:

- The three year review of the impact of the cost recovery systems provides the EU with an opportunity to amend the Directive, without the requirement for new legislation, to overcome any problems arising from the system as set out above.
- This Directive contradicts Article 130(r) of the Single European Act as it does not apply the polluter pays principle under which the owner of a vessel discharging wastes would be responsible for the entire costs associated with those wastes. However, strict application of that principle would make it more likely that vessels would continue to discharge illegally, since the costs of disposal could be very high, and so the decision not to apply the principle should increase the likelihood of vessels using reception facilities in ports.

Weaknesses:

- This Article is very vague as the system to be used is not specified and nor is the actual fee to be charged.
- May be viewed as unfair since those vessels paying the charge in the harbour dues but not using facilities are actually subsidizing the waste disposal costs of those that are.
- The Directive allows Member States to select their own charging system, based on national laws and current practice and, as a result, it fails to overcome the possibility of unfair competition between ports, if they choose to manipulate the charging system to gain an economic advantage.
- There is the potential for conflict between the charging system under the Directive and the "no special fee" requirement of the HELCOM Baltic Strategy, if a system requiring the payment of a large proportion of the actual costs of wastes discharged is introduced after the three year review.

Recommendations:

- In order to achieve consistency in charging between all ports, and to prevent ports deliberately charging to prevent waste disposal, it is recommended that a common charging system be implemented across the whole EU. Such a system, which would include guidelines on how much to charge for vessel types, engine sizes, distances travelled, crew and passenger numbers, and the types and volumes of waste being disposed of.
- Despite the potential conflict with the HELCOM charging system, a combined system where all vessels contribute towards a proportion of the costs and where those disposing of waste pay an additional fee for disposal, would appear to be the best method of achieving the aim of the Directive. In this case, the fee for the actual volume of waste disposed of will be reduced because vessels not using facilities are effectively subsidizing those that are, and vessels with waste are more likely to discharge them legally in the facilities provided in ports.
- Incentives for waste minimization and clean technology, through a system of rebates on fees, will result in a reduction in the volumes of waste generated and, therefore, in the volumes of waste available to be discharged illegally.

9.2.5 Compliance and Monitoring

Key requirements:

Article 11 – Enforcement: (1) Member States shall ensure that any ship may be subject to an inspection in order to verify that it complies with Articles 7 and 10 and that a sufficient number of such inspections is carried out. (2) For inspections … (a) particular attention paid to ships which have not complied with Article 6 there are grounds to believe that the ship does not comply with the Directive; (b) inspections are to be undertaken within the framework of Directive 95/21/EC [Port State Control Directive] and … the 25% inspection requirement set out in that Directive shall apply; (c) vessels can be detained until all wastes are delivered in accordance with Articles 7 and 10; (d)where a vessel has proceeded to sea without complying with Articles 7 and 10, it can be detained at its next port of call. (3) Member States shall establish control procedures … for fishing vessels and recreational craft … carry[ing] no more than 12 passengers to ensure compliance with the applicable requirements of this Directive.

Strengths:

- Member States are able to designate the appropriate bodies or authorities to undertake the requirements of the Directive and it is assumed that inspections will be conducted by the same agencies that carry out Paris MOU inspections, since inspections are to be undertaken in line with Directive 95/21/EC on Port State Control.
- Allows the application of some procedures to smaller vessels, at the discretion of the Member State.

Weaknesses:

- It is unclear how the costs of inspections are to be financed, including the salaries and associated costs of additional inspection and administrative staff for the relevant body.
- It is unclear how inspections will be undertaken in smaller, more isolated ports, where very few vessels call in and these vessels are not required to provide the notification details set out in Article 6.

Recommendations:

- The costs of inspections and the associated administration should be specifically identified and monies to meet these costs should be included within the fees for ship generated waste.

9.3 Recommendations for Future Research

This thesis provides a comprehensive examination of the complex nature of legislation for a single issue, and consists of a wide-ranging examination of many different factors relevant to legislating for such an issue. A number of contributions have been made in this thesis and, resulting from these, future research can be undertaken under four main headings: Data Provision, Modelling of Actors and their Behaviour, Application of the Directive to other regions; and Modelling of the Legislative Process. These four headings, together with associated recommendations for future research, are examined below:

9.3.1 Data Provision

Existing sources of information have been identified in Chapter 6 with regard to the provision of port reception facilities in the North Sea region, levels of oil slicks identified using aerial surveillance methods, and also on inadequacy of vessels identified during port state control inspections. The use of surveys of North Sea ports that form the basis of Chapter 7 has provided a means by which identified gaps in the data, particularly in terms of provision of facilities, can be filled.

Additional surveys of ports in the North Sea region are required to assess the impact of the Directive, on an annual or bi-annual basis, and these should be conducted to obtain definitive evidence of the impact of the Directive on the provision of facilities in ports and on the levels of vessel uptake and volumes of waste discharged. The continued analysis and interpretation of existing data on levels of identified oil slicks and on the reasons why vessels are deemed to be inadequate during the inspection process can further offer supporting evidence as to the impact of the Directive.

9.3.2 Modelling of Actors and their Behaviour

In order to better understand the behaviour of the range of actors identified in Figure 2.1 and their responses to change, a working definition on the behaviour of actors has been developed for use in Chapter 3 which sets out the key drivers on the behaviour of the main actors under the broad headings of Legislative, Technological, Financial, and Cultural and Social Drivers.

As a result of the implementation of the Directive, changes in the behaviour of some of the actors are anticipated, particularly in the case the port and shipping industries. Additional actors may also become involved in the implementation of the Directive, for example where local port user groups are faced with using facilities for the first time, and an examination of the drivers on the behaviour of both current and any new actors should be undertaken, after the initial period of implementation of the Directive. This will enable an analysis to be made of whether the drivers identified within Chapter 3 continue to be the most significant influence on behaviour or whether there are new drivers, resulting from the introduction of the Directive, that have a greater impact on behaviour in the future.

9.3.3 Application of Directive to other regions

A synthesis of existing legislation has been set out in Chapter 4 to provide a context for the EU Directive, and an analysis of the process of development of the Directive has been undertaken in Chapter 5, setting it within the context of the broader decision-making system of the European Union and examining the expected impact of new legislation being developed by the EU. The potential strengths and weaknesses of the key requirements of the Directive have also been examined and recommendations made to overcome those weaknesses.

The Thesis provides a case study on a specific EU Directive within the context of an enclosed sea area – the North Sea – using Norway, as a non-EU state, for comparison. However, what is appropriate to a region where all, or most, states are part of a regional body may not be applicable in a region where there are a large number of states which traditionally have seen little or no co-operation, or where factors such as poverty and lack of resources means that little value is placed on the environment.

In order to assess the effectiveness of the Directive in other regions of the EU, an examination of the impact of the Directive in the Mediterranean Sea – an enclosed sea area with a mix of EU and non-EU states - would provide the opportunity to examine the effectiveness of the Directive in a region where only some states are required to adhere to its requirements. The region comprises a combination of EU states to the north including the islands of Malta and Cyprus, and also includes Turkey which is seeking future admission into the EU, while to the south there

are a range of North African states In the case of Malta and Cyprus, both of which are heavily dependent on shipping for trade, tourism and economic prosperity, how able those states are to meet the costs of provision of facilities associated with the Directive will be an important one. Within the region, the options for vessels to transfer trade elsewhere, or to discharge wastes outside the territorial waters of EU states, may result in very specific problems. An analysis of the implementation and impact of the Directive in the Mediterranean may, therefore, result in the identification of very different problems, specific to that region, than those identified in the North Sea region and may require different adaptations to the Directive to overcome those specific problems.

A number of North Sea ports in Germany and Denmark have already made contributions to this thesis. However, many more ports in those countries lie within the Baltic Sea region. There are also many ports in the EU states of Sweden and Finland, together with the new member states of Estonia, Latvia, Lithuania and Poland. An examination of the impact of the Directive in the Baltic Sea region – also an enclosed sea area – would provide an opportunity to assess the rapidity with which new EU member states are able to integrate EU legislation into their national laws, and will also allow an examination of the impact of having conflicting legislative requirements in a region where states are both members of the EU and are also signatories to the Helsinki Convention.

In the case of a non-enclosed sea area, an examination of the legislative requirements of the Directive compared to the requirements in an enclosed sea area would allow an analysis to be made of the relevance of the Directive's requirements to such an area. Research could be undertaken on the provision and uptake of facilities in France, Ireland, Portugal and Spain, or covering the West Coast of Scotland and West and Southern England, for example, where many ports are situated on the Atlantic coast. A comparison of provision and uptake between North Sea ports and Atlantic coast ports can be used to identify any problems or weaknesses of the Directive in terms of a non-enclosed sea area.

Research on the provision of port reception facilities in a semi-enclosed area such as the Wider Caribbean, where there are many islands and coastal regions with open access from the western Atlantic but very limited access from the east of the region, would provide the opportunity to identify problems specific to such a region and also to assess the applicability of the key elements of the Directive and identify other key elements that are relevant to the specific needs of such a region.

It is not just the impact on the physical infrastructure and provision of facilities that is important, however. Additional research could be carried out on the impacts of the Directive on, for

example, the uptake of facilities by particular vessel types in the North Sea as compared with similar vessels in another region where different legislation exists. This research would allow an analysis to be made of the effectiveness of the Directive for that vessel type when compared with other legislation. For example, the introduction of new legislation in the waters of the State of California for the regulation of large passenger vessels would provide a comparator, allowing for the assessment of the impact of that legislation compared with the impact of the Directive on large passenger vessels – passenger ferries and cruise ships, for example – operating in European or North Sea waters.

9.3.4 Modelling of the Legislative Process

A model process for the introduction of new legislation has been developed in Chapter 8 to assist legislators in determining the need for legislation by setting out a series of stages which should be undertaken prior to the development of legislation, and providing the opportunity to decide whether or not to proceed with legislation. Where it is determined that legislation is required, model legislation has been set out (adapted from an existing model) and this can be used in conjunction with the model process.

Research into the applicability of the model process as a tool when deciding whether to proceed with new legislation may be difficult to undertake. The model process provides the opportunity for an analysis of the development of new environmental legislation to deal with a specific problem from an early stage, using the model as a tool to assess at each stage whether the decision to proceed with legislation is appropriate. It can also be used to identify whether other measures such as voluntary codes to change the behaviour of actors, or the adaptation of existing legislation, would be more appropriate to deal with that particular problem.

However, there a number of problems apparent when seeking to undertake research in this area. Because the model is new and unique, it would first be necessary to make legislative bodies aware of its availability as a tool to assist in the decision making process, and to then persuade them to make use of it. In order to do this, legislative bodies could be approached directly to raise awareness of the existence of the model, in conjunction with the publication of articles on the model in journals. In order to then assess the impact of the model on a specific problem, it would be necessary to proactively identify problems where the model can be used and, again, to approach the appropriate legislative body to set out the model and seek co-operation in assessing its effectiveness as a tool to assist in the decision making process regarding that specific problem.

9.4 Concluding Thoughts

The European Union has, since the publication of "A Common Policy on Safe Seas" in 1993, developed a broad range of legislation in an effort to improve both the quality of the marine environment and to reduce the levels of pollution entering that environment. While the EU is signatory to a wide range of maritime legislation, in particular MARPOL 73/78, it has identified that there is still a problem of illegal discharges of wastes from vessels into European waters and it has, therefore, set out the Directive as a means of helping to reduce that problem. Further legislative developments by the EU such as the proposed Directives on the protection of the environment through criminal law and on ship-source pollution, including the introduction of sanctions, will further strengthen Directive 2000/59/EC.

Based on the assessment of the Directive summarised at Section 9.3, its main strength is that it reinforces the requirements of MARPOL 73/78 by ensuring that any vessel which normally calls into an EU port has appropriate facilities provided for it. A vessel's master will no longer be able to use inadequacy of facilities as an excuse to discharge waste at sea. The Directive also promotes "green" technology as it allows vessels with waste minimisation equipment to use facilities less frequently and the smaller volumes of waste generated will cost less to dispose of.

The main weakness of the Directive is the lack of a comprehensive charging system that can be used by all ports. Allowing differential charging, where vessels with waste are faced with very high charges, means that some ports or countries can drive waste elsewhere and avoid the burden of having to deal with it. They can also charge very low rates to other vessels without waste, since waste costs are minimised, and so can gain a competitive advantage. Small ports, faced with potentially high costs of handling very small volumes of waste, may be driven out of business, or only receive vessels specifically exempted from the Directive.

The introduction of logbooks for vessels using EU ports, where vessels masters have no choice but to record information on where they last discharged waste, together with the volumes of waste generated during the voyage to those ports, would provide a very rapid and verifiable system of data collection to identify the effectiveness of the Directive. It would also provide a tool for the monitoring of vessel compliance under port state control inspections, and information already collected through these inspections and held in the Paris MOUs SIRENAC information system could also be used in any such monitoring.

The key constraints to implementation of the Directive are financial and political. Governments can obtain an economic advantage where volumes of waste are minimised but volumes of trade are maximised through differential charging. As the "no special fee" system is used by some

EU states under the Helsinki Convention, it would be difficult for them to operate two systems in different ports. This would either require the rest of the EU to agree to the "no special fee" system or renegotiation of the Helsinki Convention.

I believe that the EU Directive has a major role to play in the prevention of dumping of waste at sea and that it could, in the future, form the basis of a model for legislation in other regions of the world. It is very important that a comprehensive data collection system is put in place at the earliest possible stage to provide evidence of its success, over and above existing legislation. This will provide the IMO with evidence to promote the requirement for facilities under MARPOL 73/78.

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APPENDIX 1

MARPOL ANNEX I FACILITIES - DATA FOR NORTH SEA PORTS FROM IMO MEPC CIRCULARS

NOTE: Prior to MEPC3/Circ.3 of 1998, Circulars are available in paper format only from the IMO. Circulars are available online from MEPC3/Circ.3 onwards at http://www.imo.org/

Key: Column A - 18/03/1985 - MEPC/Circ. 135
Column B - 22/03/1988 - MEPC/Circ. 135/Add. 1
Column C - 15/08/1990 - MEPC/Circ. 234
Column D - 02/06/1994 - MEPC/Circ. 278 (Norway Only)
Column E - 03/07/1995 - MEPC3/Circ. 1
Column F - 14/05/1996 - MEPC3/Circ. 2
Column G - 06/10/1998 - MEPC3/Circ. 3
No./Total No. = Number of companies listed as providing facilities for that port, where more than 1 listed

	Categories, including Norway pre-02/06/1994	**Categories for Norway only from 02/06/1994**
1.	Dirty Ballast Water	Ballast water
2.	Tank Washing (Slops)	No longer appears
3.	Oily Mixtures containing chemicals	Waste oil only
4.	Scale and sludge from tank cleaning	Solid Waste
5.	Oily bilge water	Bilge water (oil not mentioned)
6.	Sludge from fuel oil purifier	Sludge (not specified for source)

Notes:

Belgium:
Does not specify categories of Annex I facilities. Facilities provided on a regional basis in most cases.

Germany:

*all figures from MEPC/Circ.135/Add.3 of 11/12/89
**all figures from MEPC/Circ.135/Add.2 of 08/08/88

Netherlands:

2 entries for NE3 (a and b) as these are shown as separate entities under MEPC Circulars

All facilities provided by private companies/bunkering services, contacted via local shipping agents

Norway:

Column D covers Norway only, at which time reporting format is changed. Results given as "all", but category 2 no longer appears

UK:

(~) figures in Column B taken from MEPC/Circ.135/Add.2 of 08/08/88

UK31(a) and (b) - 31(b) is an additional provider of facilities within the area covered by 31(a)

UK24 &32 figures are for facilities provided in combination for the two ports - UK24 and UK32 also have separate returns under MEPC.

UK47(a), (b) and (c), UK53(a) and (b) and UK68(a) and (b) are separate ports under MEPC but grouped together in survey

Appendix 1 (continued) MARPOL Annex I Facilities – Data for North Sea Ports from IMO MEPC Circulars

Port No.	A	No.	B	No.	C	No.	D (Norway)	No.	E	No.	F	No.	G	No.	Total No.
B1									annex 1	3	annex 1	2	annex 1	2	3
B3									annex 1						1
B8									annex 1						1
B1/B3/B8									annex 1	38	annex 1	38	annex 1	38	38
B - other									annex 1	27	annex 1	27	annex 1	27	27
D1			all		all				all		all		all		1
D2			all		all				all		all		1,2,4,5,6		1
D3			all		all				all		all		all		1
D4			all		all				all		all		all		1
D5			3,5,6		3,5,6				3,5,6		3,5,6		3,5,6		1
D6			all		all				all		all		all		1
G1	all		all		all				all		all		all		1
G2	1,2,4,5,6		all		all				5,6		5,6		5,6		1
G3	1,2,4,5,6								all		all		all		2
G4	5	2							1,2,4,5,6		1,2,4,5,6		1,2,4,5,6		2
G5	all		all	5	all	5			all		all		all		6
G6	5								1,2,5,6		1,2,5,6		1,2,5,6		1
G7	5														1
G9	all		all	3	all	3			all		all		all		3
G10	1,2,3,5		1,2,4,5,6		1,2,4,5,6				1,2,3,5		1,2,3,5		1,2,3,5		1
G11	5								1,2,5,6		1,2,5,6		1,2,5,6		1
G12									5.6		5.6		5,6		1
G13	2,5								all		all		all		1
NE3(a)	1,2,4,5,6				1,2,4,5,6				1,2,4,5,6		1,2,4,5,6		1,2,4,5,6		1
NE3(b)	1,2,4,5,6				1,2,4,5,6				1,2,4,5,6		1,2,4,5,6		1,2,4,5,6		1
NE5	5,6				5,6				5,6		5,6		5,6		1
NE6	1,2,5,6				1,2,5,6				1,2,5,6		1,2,5,6,		1,2,5,6		1
NE7	all				all				all		all		all		1

Appendix 1 (continued)

Port No.	A	No.	B	No.	C	No.	D (Norway)	No.	E	No.	F	No.	G	No.	Total No.
NE8	5,6				5,6				5,6		5,6		5,6		1
NE12	6				6				6		6		6		1
NE17	1,2,4,5,6				1,2,4,5,6				1,2,4,5,6		all		all		1
NE19	5,6				5,6				5,6		5,6		5,6		1
NO2	1,2,3,4,6	3			1,2,3,4,6	3	all	2	all	2	all	2	all	2	3
NO6	3,4,6				3,4,6		all		all		all		all		1
NO7							3,4		3,4		3,4		3,4		1
NO8	1,2,3,5,6				1,2,3,5,6		all	4	all	4	all	4	all	4	4
NO9	1,2,3,5				1,2,3,5		1,3,5		3,4		3,4		3,4		1
NO10	all	3			all	3	3,4,6		3,4,6		3,4,6		3,4,6		3
NO12	2,3,4,5,6				2,3,4,5,6	2									2
NO13	all	3			all	3	3,4,6	2	3,4,6	2	3,4,6	2	3,4,6	2	3
NO21	all	4			all	4	1,3,4,5,6	4	all	4	all	4	all	4	5
NO22	3,4,6	3			3,4,6	3	3,4,5,6	3	3,4,5,6	3	3,4,5,6	3	3,4,5,6	3	5
NO24	all				all										1
NO30	all	3			all	3	all	3	all	3	all	3	all	3	4
NO31	3,4,6	2			3,4,6	3	3,4,6	2	3,4,6	2	3,4,6	2	3,4,6	2	3
NO35	3,4,6				3,4,6		3,6		3,6		3,6		3,6		2
NP39	3,4,6	2			3,4,6	2									2
NO41	all				all										1
NO43	3,4,6				3,4,6										1
NO45	all	3			all	3	3,6		3,6		3,6		3,6		4
NO47	all				all										1
NO48	3,4,5,6				3,4,5,6										1
NO51	3,4,5,6	3			3,4,5,6	3	all		all		all		all		3
NO56	all	4			all	4	1,3,4,6	3	1,3,4,6	3	1,3,4,6	3	1,3,4,6	3	5
NO57	all	4			all	4	all	3	all	3	all	3	all	3	5
NO59	3,4,6				3,4,6										1

Appendix 1 (continued)

Port No.	A	No.	B	No.	C	No.	D (Norway)	No.	E	No.	F	No.	G	No.	Total No.
NO60	3,4,6				3,4,6										1
UK1	3,4,5,6		3,4,5,6		3,4,5,6				3,4,5,6		5		all		1
UK2											all		5		1
UK3													5		1
UK4											all		all		1
UK5											5				1
UK8											all		all		1
UK10, 21, 22, 29 & 41	1,2,3,5,6	4	1,2,3,5,6	4	1,2,3,5,6	4			1,2,3,5,6		1,2,5				5
UK12									all				1,3,5,6		1
UK13(a)	1,2,5		1,2,5		all				all	3					3
UK13(b)											1,2,4,5	2			2
UK14	all		all		all				all	2	1,2,3,5,6		1,3,5,6		2
UK16	1,2,3,5,6		1,2,3,5,6		1,2,3,5,6				1,2,3,5,6		all		all		1
UK18			all (~)	2							2,3,5,6		1,2,3,5		1
UK20	all	2	all	2	all	2			all	3	5,6		5,6		3
UK22											all		all		1
UK23			all(~)						all		all		all	6	6
UK24											1,2,3,5,6	2	all	2	3
UK 24 & 32	1,2,5,6,		1,2,5,6		1,2,5,6,				1,2,5,6						1
UK27	1,2,3,5,6	2	1,2,3,5,6	2	1,2,3,5,6	2			all	2	1,2		1,2	2	3
UK30													1,2,5		1
UK31(a)	all		all		all				all		all		all		1
UK31(b)													all		1
UK32									all	2					2
UK35	all		all		all				all	2	3,4,5,6		all		2
UK36													all		1
UK37											all		all		1
UK39											1,2,3,5		1,2,3,5		1

Appendix 1 (continued)

Port No.	A	No.	B	No.	C	No.	D (Norway)	No.	E	No.	F	No.	G	No.	Total No.
UK40											all		3,5,6		1
UK41													1,2,3,5		1
UK42	all	2	all	2	all	2			all	2	all				3
UK43	all	5	all	5	all	5			all	11	all	5	1,2,3,5	2	16
UK44			all (~)						all		all		all		1
UK45													1		1
UK47(a)	1,2,5		1,2,5		1,2,5				1,2,5						1
UK47(b)	1,2,4,5,6	2	1,2,4,5,6	2	1,2,4,5,6	2			1,2,4,5,6	2					2
UK47(c)											5		all		1
UK48									1,6		4,5,6				1
UK49											1,5		1,2,5		1
UK51	4								4		1,2,3,5		2,3,5	2	2
UK53(a)	1,5		1,5		1,5				1,5	2	3,5				2
UK53(b)											1,2,3,5		1,2,3,5		1
UK54			1,3,4,5 (~)						1,3,4,5						1
UK55									all						1
UK56	1,2,4,5,6		1,2,4,5,6		1,2,4,5,6				all				2,3,4,5,6		1
UK59	1,2,5		1,2,5		1,2,5				1,2,5		2,3,5	2	all	3	4
UK63	all		all		all				all		all		all		1
UK64													all		1
UK65													1,2,5		1
UK66	1,2,5,6		1,2,5,6		1,2,5,6				1,2,5,6,		all		1,2,4,5,6		1
UK67	1,2,3,5		1,2,3,5		1,2,3,5				1,2,4,5		2,5,6		1,2,5		1
UK68(a)	1,2,3,5	6	1,2,3,5	6	1,2,3,5	6			1,2,3,5	6	1,2,5	2	1,2,3,5,6	2	10
UK68(b)											all		5		1
UK70													1,5		1
UK71													1,3,5,6		1
UK73	all	8	all	8	all	8			all	8			all	3	9
UK77													5		1

APPENDIX 2

COMPLIANCE AND MONITORING - BONN AGREEMENT AERIAL SURVEILLANCE DATA

Tables for Chapter 6, Section 6.4.1

NOTES:

Tables 1 and 8 - SOURCE: Bonn Aerial Surveillance Programme Annual Reports.

- 1992 to 1997 figures from printed annual reports available from Bonn Agreement Secretariat, London.
- 1998 to 2001 figures available online from Bonn Agreement Secretariat at http://www.bonnagreement.org

Tables 3 and 8 have been compiled to provide country-specific data, and for the basis of Figures 6.3 to 6.5 in Chapter 6

Table A2.1 - All Countries data, including France and Sweden

Year	No. of flights	No. of Flight Hours			No of Slicks			Ratio of slicks per flight hour
		Daylight	Darkness	Total	Daylight	Darkness	Total	
1986				977			425	0.44
1987				1122			635	0.57
1988				1599			532	0.33
1989				2270			1104	0.49
1990				2748			843	0.31
1991				2601			647	0.25
1992		2811	80	2891	694	26	720	0.25
1993		3275	50	3325	726	15	741	0.22
1994		3637	112	3749	679	57	736	0.20
1995		3435	41	3476	672	9	681	0.20
1996				3681			650	0.18
1997		3245	765	4010	885	296	1181	0.29
1998	1545	3533.3	292.55	4126	767	155	922	0.22
1999	1697	3282	560.3	3842.2	778	106	884	0.23
2000	1830	3334.1	417	3751.6	506	42	548	0.15
2001	1173	3132.78	428.37	3561.15	579	97	666	0.19

Note: For the 1992 figures – the total no. of flights appearing in annual reports after 1992 is given as 3219, and the total no. of slicks is given as 805.

Table A2.2 - All Countries data, excluding France and Sweden

Year	No. of flights	No. of Flight Hours			No of Slicks			Ratio of slicks per flight hour
		Daylight	Darkness	Total	Daylight	Darkness	Total	
1990				2663			817	0.31
1991				2524			632	0.25
1992		2694	80	2774	688	26	714	0.26
1993		3159	50	3209	720	15	735	0.23
1994		3306	112	3418	667	57	724	0.21
1995		3053	41	3094	649	9	658	0.21
1996				3355			624	0.19
1997		2657	765	3422	743	296	1039	0.30
1998	1545	3533.3	292.55	3451.1	767	155	846	0.25
1999	1697	3282	560.3	3378.4	778	106	826	0.24
2000	1830	3334.1	417	3165	506	42	515	0.16
2001	1173	3132.78	428.37	2559.21	579	97	635	0.25

Table A2.3 - Belgium

Year	No. of flights	No. of Flight Hours			No of Slicks			Ratio of slicks per flight hour
		Daylight	Darkness	Total	Daylight	Darkness	Total	
1991				75			16	0.21
1992		189	0	189	63	0	60	0.32
1993		210	4	214	58	2	60	0.28
1994		207	0	207	82	0	82	0.40
1995		206	0	206	57	0	57	0.28
1996				223			42	0.19
1997		210	10	220	56	2	58	0.26
1998	183	235.9	12.75	248.8	69	1	70	0.28
1999	220	237.3	4.25	241.6	59	2	61	0.25
2000	203	132	6.3	138.3	53	1	54	0.39
2001	176	148.62	12.43	161.05	49	5	54	0.34

Table A2.4 - Denmark

Year	No. of flights	No. of Flight Hours			No of Slicks			Ratio of slicks per flight hour
		Daylight	Darkness	Total	Daylight	Darkness	Total	
1990				292			65	0.22
1991				95			91	0.96
1992		122	0	122	27	0	27	0.22
1993		141	0	141	4	0	4	0.03
1994		51	0	51	10	0	10	0.20
1995		71	0	71	17	0	17	0.24
1996				86			13	0.15
1997		102	0	102	36	0	36	0.35
1998	108	232.2	0	232.2	57	0	57	0.25
1999	93	179.5	1	180.5	74	0	74	0.41
2000	84	231	0	231	33	0	33	0.14
2001	93	226	30	256	110	4	114	0.45

Table A2.5 - Germany

Year	No. of flights	No. of Flight Hours			No of Slicks			Ratio of slicks per flight hour
		Daylight	Darkness	Total	Daylight	Darkness	Total	
1990				432			130	0.30
1991				392			51	0.13
1992		616	38	654	123	12	135	0.21
1993		488	0	488	99	0	99	0.20
1994		626	3	629	121	1	122	0.19
1995		693	14	707	94	4	98	0.14
1996				781			121	0.15
1997		546	239	785	122	3	125	0.16
1998	278	699.4	150.8	850.2	118	2	120	0.14
1999	364	803.4	197.4	1000.8	115	3	118	0.12
2000	377	887	104	991	91	29	120	0.12
2001	349	752.6	152.4	905	79	14	93	0.10

Table A2.6 - The Netherlands

Year	No. of flights	No. of Flight Hours			No of Slicks			Ratio of slicks per flight hour
		Daylight	Darkness	Total	Daylight	Darkness	Total	
1990				648			362	0.56
1991				703			273	0.39
1992		470	22	492	194	8	202	0.41
1993		691	30	721	269	10	279	0.39
1994		858	91	949	241	42	283	0.30
1995		819	0	819	238	0	238	0.29
1996				897			247	0.28
1997		685	285	970	486	285	771	0.79
1998	291	501.1	233	734.1	312	146	458	0.62
1999	344	456.1	193.9	650	359	91	450	0.69
2000	397	545.5	219	764.5	179	8	187	0.24
2001	295	40373	160.94	564.67	195	71	266	0.47

Table A2.7 - Norway

Year	No. of flights	No. of Flight Hours			No of Slicks			Ratio of slicks per flight hour
		Daylight	Darkness	Total	Daylight	Darkness	Total	
1991				711			66	0.09
1992		634	47	681	94	4	98	0.14
1993		959	9	968	112	1	113	0.12
1994		902	5	907	79	1	80	0.09
1995		423	0	423	72	0	72	0.17
1996				387			93	0.24
1997		450	37	487	60	0	60	0.12
1998	205	544.8	0	544.8	72	0	72	0.13
1999	239	554.5	3	557.5	64	1	65	0.12
2000	250	392.2	1	393.2	46	0	46	0.12
2001	226	406.16	0	408.16	64	0	64	0.16

Table A2.8 - United Kingdom

Year	No. of flights	No. of Flight Hours			No of Slicks			Ratio of slicks per flight hour
		Daylight	Darkness	Total	Daylight	Darkness	Total	
1990				554			180	0.32
1991				548			135	0.25
1992		627	9	636	188	3	191	0.30
1993		670	7	677	178	2	180	0.27
1994		668	7	675	143	4	147	0.22
1995		855	13	868	172	4	176	0.20
1996				981			108	0.11
1997		711	147	858	87	2	89	0.10
1998	162	681	160	841	68	1	69	0.08
1999	132	631	117	748	55	3	58	0.08
2000	227	583	64	647	73	2	75	0.12
2001	169	585	49	634	52	2	54	0.09

APPENDIX 3

COMPLIANCE AND MONITORING - PARIS MOU DATA

Tables for Chapter 6, Section 6.4.2

NOTES:

Table 1 - SOURCE: Paris MOU (2001 and 2003). *"Paris MOU Blue Book 2000"*, and *"Paris MOU Blue Book 2002"*, pub. Paris MOU Secretariat, The Hague, Netherlands, July 2001, pp 11-20 and August 2003, pp 13-22

Tables 2 to 7 - SOURCE: Paris MOU Annual Reports 1985 to 2002. Pub. Paris MOU Secretariat, The Hague, Netherlands

Tables 6 and 7 do not have comparable Figures in Chapter 6, Section 6.4.2

Table A3.1 - Paris MOU Inspection rates for North Sea states and All Countries - Paris MOU Inspections by Member State 1991-2002 - % of Ships

Year	All*	Belgium	Denmark	Germany	Netherlands	Norway	United Kingdom
1991	23.72	5.9	23.0	24.1	27.4	36.5	40.7
1992	23.76	4.8	21.1	24.9	30.4	35.9	33.4
1993	26.09	3.3	22.1	24.5	27.5	39.3	37.6
1994	26.80	2.8	22.6	26.5	29.0	44.4	32.4
1995	25.88	6.3	23.0	26.6	25.9	37.1	25.9
1996	24.48	4.6	19.5	25.5	25.7	34.8	33.2
1997	25.25	6.1	21.3	25.8	26.2	26.1	26.2
1998	26.49	10.5	24.6	25.9	24.4	24.6	30.4
1999	27.79	24.3	22.7	25.0	32.3	19.6	28.4
2000	28.80	25.6	23.8	25.9	28.9	22.4	27.7
2001	28.84	29.0	25.5	21.7	23.5	25.8	27.9
2002	28.93	26.0	25.1	26.1	24.7	25.5	27.3

NOTE: All States = 19 states including 6 North Sea states, together with Canada, Russian Federation, Poland, Finland, etc.

Table A3.2 - Basic Port State Control Figures 1985-2002

Year	Number of individual ships inspected	Number of inspections	Detentions as % of inspections	Delays/ Detentions as % of individual ships	Number of deficiencies observed	Number of Delays/ Detentions
1985	7879	10417	*3.42*	4.52	13342	356
1986	8721	15709	*1.95*	3.52	15709	307
1987	10337	11451	*2.45*	2.71	16566	280
1988	8382	11224	*2.63*	3.52	15110	295
1989	9164	12459	*2.76*	3.75	18608	344
1990	9842	13955	*3.16*	4.48	22623	441
1991	10101	14379	3.65	5.20	25930	525
1992	10455	14783	3.98	5.62	27136	588
1993	11252	17294	6.39	8.23	43071	926
1994	10694	16964	9.41	14.93	53210	1597
1995	10563	16381	11.21	17.39	54451	1837
1996	10256	16070	10.70	16.76	53967	1719
1997	10719	16813	9.66	15.15	53311	1624
1998	11168	17643	9.06	14.31	57831	1598
1999	11248	18399	9.15	14.97	60670	1684
2000	11358	18559	9.50	*15.53*	67735	1764
2001	11658	18681	9.09	*14.57*	68756	1699
2002	11823	19766	7.98	*13.34*	69076	1577

NOTE: figures in italics have been calculated based on the data provided and did not appear in the Blue Book data

Table A3.3 - MARPOL deficiencies as % of total deficiencies 1985-2002

Year	MARPOL Annex 1	Deficiencies specific for tankers	MARPOL - Annex II	MARPOL related operational deficiencies	MARPOL - Annex III	MARPOL - Annex V
1985	3.20	0.64				
1986	3.68	0.46				
1987	3.36	0.55	0.86			
1988	3.78	0.69	0.94			
1989	4.26	1.11	0.50			
1990	4.36	0.86	0.37			
1991	4.32	0.67	0.25			
1992	5.05	0.81	0.29	0.04	0.00	
1993	4.13	0.47	0.19	0.30	0.03	
1994	5.26	0.48	0.27	0.50	0.02	
1995	5.42	0.22	0.21	0.37	0.03	
1996	7.29	0.23	0.18	0.43	0.02	
1997	7.54	0.27	0.15	0.49	0.03	
1998	7.11	0.33	0.14	0.94	0.08	0.12
1999	7.05	0.25	0.11	0.92	0.06	1.04
2000	7.20	0.30	0.10	0.90	0.00	1.10
2001	7.40	0.20	0.10	0.70	0.00	1.10
2002	6.40	0.29	0.09	0.49	0.03	1.01

Table A3.4 - MARPOL deficiencies as % of number of inspections 1985-2002

Year	MARPOL Annex 1	Deficiencies specific for tankers	MARPOL - Annex II	MARPOL related operational deficiencies	MARPOL - Annex III	MARPOL - Annex V
1985	4.10	0.82				
1986	4.92	0.61				
1987	4.83	0.79	1.23			
1988	5.09	0.93	1.27			
1989	6.37	1.66	0.75			
1990	7.07	1.39	0.61			
1991	7.79	1.20	0.46			
1992	9.25	1.48	0.53	0.07	0.00	
1993	10.30	1.19	0.49	0.75	0.08	
1994	16.51	1.44	0.84	1.58	0.06	
1995	18.01	0.74	0.68	1.23	0.12	
1996	24.48	0.78	0.60	1.44	0.07	
1997	23.89	0.85	0.49	1.56	0.09	
1998	23.31	1.08	0.45	3.09	0.26	0.40
1999	23.24	0.82	0.36	3.03	0.20	3.43
2000	26.50	1.20	0.40	3.40	0.20	4.00
2001	27.40	0.80	0.20	2.45	0.10	4.10
2002	22.37	1.02	0.32	1.73	0.11	3.55

Table A3.5 - MARPOL deficiencies as % of individual ships 1985-2002

Year	MARPOL Annex 1	Deficiencies specific for tankers	MARPOL - Annex II	MARPOL related operational deficiencies	MARPOL - Annex III	MARPOL - Annex V
1985	5.42	1.08				
1986	6.63	0.83				
1987	5.35	0.88	1.36			
1988	6.81	1.24	1.69			
1989	8.66	2.26	1.02			
1990	10.02	1.97	0.86			
1991	11.09	1.72	0.65			
1992	13.08	2.09	0.76	0.10	0.00	
1993	15.83	1.82	0.76	0.16	0.12	
1994	26.19	2.28	1.33	2.51	0.10	
1995	27.93	1.15	1.06	1.90	0.18	
1996	38.36	1.22	0.95	2.26	0.11	
1997	37.48	1.33	0.76	2.44	0.14	
1998	36.82	1.70	0.71	4.89	0.41	0.63
1999	38.02	1.34	0.60	4.96	0.32	5.62
2000	43.30	1.90	0.60	5.50	0.30	6.60
2001	43.90	1.30	0.40	3.90	0.10	6.50
2002	37.39	1.71	0.54	2.88	0.18	5.93

Table A3.6 - Breakdown and % breakdown of most common deficiencies for MARPOL Annex I – 1986-1999

ANNEX I																				
Year	MARPOL SOPEP		Oil Record Book		Retention of Oil on Board		Oily Water Separator Equipment		Oil discharge monitoring and control systems		15 ppm alarm arrangements		Standard discharge connection		Pollution Report		Other		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1986		0.00	249	43.08	29	5.02	148	25.61	17	2.94	8	1.38	17	2.94	4	0.69	106	18.34	578	100.00
1987		0.00	267	48.28	34	6.15	112	20.25	17	3.07	17	3.07	13	2.35	6	1.08	87	15.73	553	100.00
1988		0.00	257	45.01	39	6.83	101	17.69	25	4.38	16	2.80	10	1.75	2	0.35	121	21.19	571	100.00
1989		0.00	303	38.16	65	8.19	135	17.00	47	5.92	49	6.17	9	1.13	22	2.77	164	20.65	794	100.00
1990		0.00	367	37.22	107	10.85	153	15.52	90	9.13	48	4.87	11	1.12	22	2.23	188	19.07	986	100.00
1991		0.00	364	32.50	122	10.89	218	19.46	137	12.23	53	4.73	9	0.80	13	1.16	204	18.21	1120	100.00
1992		0.00	438	32.02	124	9.06	310	22.66	161	11.77	81	5.92	11	0.80	11	0.80	232	16.96	1368	100.00
1993		0.00	520	29.20	267	14.99	402	22.57	190	10.67	128	7.19	31	1.74	45	2.53	198	11.12	1781	100.00
1994		0.00	963	34.38	258	9.21	486	17.35	205	7.32	252	9.00	51	1.82	185	6.60	401	14.32	2801	100.00
1995	17	0.58	925	31.36	407	13.80	456	15.46	248	8.41	247	8.37	38	1.29	32	1.08	580	19.66	2950	100.00
1996	161	4.09	1865	47.41	436	11.08	489	12.43	311	7.91	224	5.69	38	0.97	27	0.69	383	9.74	3934	100.00
1997	206	5.13	1774	44.16	545	13.57	534	13.29	236	5.88	218	5.43	44	1.10	19	0.47	441	10.98	4017	100.00
1998	467	11.36	1530	37.21	466	11.33	619	15.05	240	5.84	249	6.06	35	0.85	25	0.61	481	11.70	4112	100.00
1999	666	15.58	1506	35.22	385	9.00	729	17.05	222	5.19	275	6.43	39	0.91	21	0.49	433	10.13	4276	100.00

Table A3.7 - Breakdown and % breakdown of most common deficiencies for MARPOL Annex II – 1987-1999

ANNEX II																		
Year	Cargo Record Book		P&A Manual		Efficiency Stripping		Residue Discharge Systems		Ventilation Procedures/ Equipment		Pollution Report - Annex II		Ship Type Designation - Annex II		Other		TOTAL	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1987	30	21.28	54	38.30	7	4.96	5	3.55	2	1.42	3	2.13	7	4.96	33	23.40	141	100.00
1988	30	21.13	61	42.96	6	4.23	7	4.93	0	0.00	0	0.00	4	2.82	37	26.06	142	100.00
1989	26	27.66	31	32.98	5	5.32	8	8.51	4	4.26	1	1.06	1	1.06	18	19.15	94	100.00
1990	28	32.94	21	24.71	0	0.00	4	4.71	3	3.53	3	3.53	1	1.18	25	29.41	85	100.00
1991	25	37.88	13	19.70	4	6.06	0	0.00	0	0.00	1	1.52	1	1.52	22	33.33	66	100.00
1992	44	55.70	13	16.46	0	0.00	1	1.27	2	2.53	1	1.27	0	0.00	18	22.78	79	100.00
1993	35	41.18	5	5.88	3	3.53	12	14.12	5	5.88	3	3.53	2	2.35	20	23.53	85	100.00
1994	45	31.69	33	23.24	1	0.70	10	7.04	3	2.11	1	0.70	4	2.82	45	31.69	142	100.00
1995	40	35.71	16	14.29	0	0.00	7	6.25	2	1.79	4	3.57	0	0.00	43	38.39	112	100.00
1996	37	38.14	20	20.62	1	1.03	7	7.22	5	5.15	4	4.12	4	4.12	19	19.59	97	100.00
1997	28	34.15	19	23.17	2	2.44	3	3.66	4	4.88	0	0.00	3	3.66	23	28.05	82	100.00
1998	22	27.85	18	22.78	1	1.27	5	6.33	1	1.27	1	1.27	0	0.00	31	39.24	79	100.00
1999	20	29.85	7	10.45	5	7.46	1	1.49	6	8.96	2	2.99	0	0.00	26	38.81	67	100.00

APPENDIX 4

PORT SURVEYS

SECTION (A) Surveys issued to ports: Summer 2000 – all ports, and Autumn 2002 – previous non-respondents

SURVEY OF AVAILABILITY OF PORT RECEPTION FACILITIES IN NORTH SEA PORTS – AUTUMN 2002

EU DIRECTIVE 2000/59/EC ON PORT RECEPTION FACILITIES FOR SHIP-GENERATED WASTE AND CARGO RESIDUES

SECTION TWO - QUESTIONNAIRE

PLEASE COMPLETE IN AS MUCH DETAIL AS POSSIBLE. For questions marked with an asterisk (*), please delete as appropriate.

Part 1 – General details of Port/Terminal

NAME OF
PORT/TERMINAL:……

FULL POSTAL
ADDRESS:……

……

CONTACT NAME: …….

POSITION: ……..

BUSINESS ACTIVITY/IES:

Please tick all categories that apply:

Unloading/Loading Port		Shipyard	
Oil Terminal		Fishing Port	
Ferry Terminal		Pleasure Craft Marina	
Bulk Cargo Terminal		Bunkering Terminal	
Cruise Liner Terminal		Other[§]	

[§] Please give details:…….
PHYSICAL AND GEOGRAPHICAL LOCATION:

Please indicate the type of physical location within which your port/terminal operates
- tick all categories that apply:

Industrial Area		Urban area – city	
Oil Refinery		Urban area – town	
Chemical Plant		Rural area	
Storage for oil and chemicals		Other[§]	

[§] Please give details:…….

Part 2 – Volumes of traffic

AVERAGE NUMBER OF VESSELS PER ANNUM (all types) …….

Please indicate all types of vessels using your port/terminal in the table below. For vessel types not included in this table, please continue overleaf.

Note: GT refers to Gross Tonnes and, together with Maximum and Minimum Size, is intended to aid in comparisons between ports based on vessels making use of them.

Vessel Type	Average No. per annum	Typical Size (GT)	Maximum Size (GT)	Minimum Size (GT)
Bulk Carrier				
Chemical Tankship				
Containership				
Factoryship				
Gas Carrier				
General Cargo – Multipurpose				
Oil Tankship				
Ore/Bulk/Oil Carrier				
Refrigerated Cargo Ship				
Ro-Ro Cargo Ship				

For the following categories of vessels, the average number of passengers should also be given, if this information is available.

Vessel Type	Average No. per annum	Typical Size (GT)	Maximum Size (GT)	Minimum Size (GT)	Average No. of Passengers
Passenger Ferry					
Cruise Ship					
Ro-Ro Passenger Ship					

Please indicate any other vessel types and numbers, size etc. not included in the above table.

……

……

……

VESSEL ORIGIN:

Please give details of the origin of vessels travelling to your port/terminal (please tick one box from each column)

Regional (all Europe)	□	EU	□
National	□	Non-EU	□
North Sea area	□	Combination of EU and non-EU	□
Global	□		

Please list main countries of origin: ……..

……

……

..……..…

Part 3 – Port Reception Facilities available

Are you already aware of the new EU Directive 2000/59/EC on Port Reception Facilities for Ship-Generated Waste and Cargo Residues? YES/NO*

If YES, please outline how/where/when this information was obtained (if possible) ….

……

…… (continue overleaf if required)

Are there any waste reception facilities available within your port/terminal?

Provided "in house"	YES/NO*
External contractor	YES/NO*
Other	YES/NO*

If NO to all categories, please complete Part 3.1.
If YES to any category, please move on to Part 3.2.

<u>Part 3.1 – No Facilities currently available</u>:

Please give details of how soon your port/terminal plans to make reception facilities available (e.g. within 3 months, 6 months etc.):

……..

Will these facilities be PORT/TERMINAL OWNED OR OPERATED/CONTRACTED IN*

If <u>PORT/TERMINAL OWNED or OPERATED</u>, have plans been made for their introduction? YES/NO*

Has a date been set by which facilities should be available? YES/NO*

Please give date, if this is available ……

If <u>CONTRACTED IN</u>, have arrangements been made with Contractors for their introduction? YES/NO*

Has a date been set by which contract negotiations should have commenced? YES/NO*

Please give date, if this is available ……

Part 3.2 – Facilities currently available

Are the facilities available currently: FIXED/FLOATING/MOBILE*

Are the facilities: Port/Terminal Owned? YES/NO*

Port/Terminal Operated? YES/NO*

Contracted in? YES/NO*

The categories of port reception facilities in the Directive are those specified in the International Maritime Organization's MARPOL 73/78 Convention.

In the relevant sections below, please indicate those facilities that are CURRENTLY available in your port/terminal - *please tick all relevant boxes*. If plans are in hand to introduce further facilities, please indicate on the reverse of each sheet).

NOTE: For each category, please specify the types of facilities available e.g. Quayside Tank, Road Tanker, Terminal Facility, Other (please specify), and the approximate annual usage.

a. Annex I - Oily Waste:

Please tick for all categories where facilities are currently available and indicate type:

Waste Category	Available	Quayside Tank	Roadside Tanker	Terminal Facility	Other
Oily Tank Washing					
Dirty ballast water					
Oily bilge water					
Oil sludge					
Used lubricating oil					

Approximate No. of vessels per annum: …….

b. Annex II - Noxious Liquid Substances:

Please see Appendix 1 to this questionnaire* – Guidelines for the categorization of noxious liquid substances.

Please tick for all categories where facilities are currently available and indicate type:

Waste Category	Available	Quayside Tank	Roadside Tanker	Terminal Facility	Other
Category A					
Category B					
Category C					
Category D					
Other Liquid Substances					

Approximate No. of vessels per annum: …….

c. Annex IV - Sewage:

Although MARPOL 73/78 Annex IV is not yet in force, it has now been ratified by countries representing more than 50% of the world's fleet by tonnage and is due

* NOTE: Appendix 1 omitted

to enter into force in September 2003. At this time, has your port introduced facilities for the disposal of ship-generated sewage wastes? YES/NO*

Types of facilities: ……..

Approximate No. of vessels per annum: …….

d. Annex V - Garbage:

Please tick for all categories where facilities are currently available and indicate type:

Waste Category	Available	Segregation/ Recycling	Contractor Disposes	Other
Category 1 (Plastic)				
Category 2 (floating dunnage, lining or packing material)				
Category 3 (ground paper products, rags, glass, metal, bottles, crockery, etc.				
Category 4 (paper products, rags, glass, metal, bottles, crockery, etc.				
Category 5 (food waste)				
Category 6 (incinerator ash)				

Approximate No. of vessels per annum: …….

Part 3.3 - Facilities available by vessel type

For the same categories of vessels outlined in Part 2, Volumes of Traffic, please indicate for which vessels reception facilities are currently available shoreside.

Vessel Type	Facilities Available YES/NO	Vessel Type	Facilities Available YES/NO
Bulk Carrier		Ore/Bulk/Oil Carrier	
Chemical Tankship		Refrigerated Cargo Ship	
Containership		Ro-Ro Passenger Ferry	
Factoryship		Passenger Ferry	
Gas Carrier		Cruise Ship	
General Cargo – Multipurpose		Ro-Ro Passenger Ship	
Oil Tankship		Other[§]	

[§]For other, please give details: …….

Part 4 – Waste Reception and Handling Plan

This is a requirement of Article 5 of the EU Directive on Port Reception Facilities.

Does your port currently have a Waste Reception and Handling Plan? YES/NO*

If NO, complete Part 4.1. If YES, complete Part 4.2.

Part 4.1 – No Waste Reception Plan available

Does the port/terminal intend to develop a Waste Reception plan to meet the requirements of the EU Directive

In its own right? YES/NO*

As part of a regional plan? YES/NO*

Please give details of whether a Waste Reception plan is currently under development, and its anticipated completion date.

……..

…… (continue on separate sheet if required)

If a Waste Reception plan is not currently under development, do you see any problems implementing the EU deadline of 28 December 2002 for the full implementation of the new Directive? YES/NO*

If YES, please give details: ……..….

…… (continue on separate sheet if required)

Part 4.2 – Waste Reception Plan available

Please indicate the date when the plan was first produced: ……..

Please indicate when the plan was last updated: ……...

Does this plan contain information about available Waste Reception Facilities? YES/NO*

Please indicate which of the following groups currently have access To the Waste Reception Plan:

Port users, i.e. ships and/or shipping agents YES/NO*

Waste contractors YES/NO*

Terminal operators YES/NO*

Local Government Agencies YES/NO*

Please indicate other groups to whom the Plan is made available, e.g. local residents:

APPENDIX 4, SECTION (B)

ADDITIONAL QUESTIONS TO SURVEY 1 RESPONDENTS

SURVEY OF AVAILABILITY OF PORT RECEPTION FACILITIES IN NORTH SEA PORTS – AUTUMN 2002 etc.

SECTION THREE - ADDITIONAL QUESTIONS

FOR THE FOLLOWING QUESTIONS, PLEASE PROVIDE AS MUCH DETAIL AS POSSIBLE. INFORMATION ON ACTUAL CHARGES FOR FACILITIES NEED NOT BE INCLUDED, AND ANY INFORMATION WILL BE COMPLETELY ANONYMISED.

*Please delete as appropriate.
Please use extra sheets where appropriate.

1. Transposition of EU Directive into National Law:

1.1 Through what means have you been made aware of how the UK Government is transposing the EU Directive into national law?

Government Documentation YES/NO*

Trade Organization (If YES, please specify the Organization) YES/NO*

Own initiative YES/NO*

Other (If YES, please specify) YES/NO*

…….

1.2 Did your port participate in the DTLR consultation process of May 2002 – "Port Waste Reception Facilities: A Consultation Document"? YES/NO*

1.3 If NO, were you aware that the consultation was taking place? YES/NO*

1.4 Are you now aware of whether the Directive has been brought into national law? If yes, please indicate:

When this took place: ……

Title or Reference Number of Legislation: ……..

Government Department responsible: …….

……..

1.5 If it has not been brought into national law, do you have any information regarding when this will take place, the Department responsible or any other information that you feel is relevant?

…… (continue on separate sheet)

2. Charging for Waste Reception Facilities:

2.1 Please tick the box describing which system of charging for facilities your port currently uses:

Direct Charge	☐	where the vessel is charged for the full cost of disposal of all wastes and cargo residues – vessels that do not use facilities bear no costs
Indirect Charge (No-Special Fee)	☐	where all vessels pay an amount (for example in harbour dues) which contributes to the cost of facilities – vessels do not pay additional fees for actual use of facilities in most cases.
Combined System	☐	where all vessels pay an amount towards the cost of facilities, but in addition pay amount towards the cost of actual waste disposed of.
Other	☐	Please specify below, if your port uses another system of charging for facilities.

……..……

……..…. (continue on separate sheet).

2.2 Has the UK Government imposed a specific charging system on all UK ports? YES/NO*

2.3 If YES, what system has been specified?……

2.4 If NO, do you currently have any plans to change the system in use in your port?

……..…….. (continue on separate sheet)

2.5 Has the Government provided information on how much should be charged per vessel, dependent on factors such as: vessel type, size, engine size, passenger numbers, crew numbers, distance travelled since last port of call, volume of waste, for example? Please provide details below:

……..……..……

……..… (continue on separate sheet).

3. Other Information

3.1. Has any arrangement been made for extra vessel inspections required under the Directive? YES/NO*

3.2 Who currently carries out vessel inspections (e.g. for Port State Control)? …..

….……..

3.3 Will the same Organization conduct inspections under the Directive? YES/NO*

3.4 If NO, please specify the Organization that will do them: ……..……

3.5 Have any arrangements been made for the additional administrative personnel and costs associated with introduction of the Directive? YES/NO*

3.6 If YES, please give details: ……

…… (continue on separate sheet)

3.7 Who will carry out these administrative duties?

- (a) from within current staffing of port*
- (b) additional staff*
- (c) other* (please specify)

……..……

…… (continue on separate sheet)

If you wish to provide any further comments on any aspect of the Directive and its impact on your Port, please feel free to do so.

APPENDIX 4, SECTION (C)

EXAMPLE OF RESPONSE TO SURVEY 1 – RETURNED TO RESPONDENT AT SURVEY 2 FOR UPDATE

SURVEY OF AVAILABILITY OF PORT RECEPTION FACILITIES IN NORTH SEA PORTS – AUTUMN 2002 etc.

SECTION TWO - QUESTIONNAIRE

PREVIOUS ANSWERS ARE SHOWN BELOW FROM THE SURVEY OF SUMMER 2001. PLEASE INDICATE WHETHER THERE HAVE BEEN ANY CHANGES TO THESE ANSWERS.

**Please delete as applicable*

Part 1 – General details of Port/Terminal

NAME OF PORT/
TERMINAL:……xxxxxxxxxxxxx……

CONTACT NAME: …xxxxxxxxxxxxxxxxxxxxxx …….
POSITION: ……xxxxxxxxxxxxxxxxxxxxxxxxxxxx ……...

BUSINESS ACTIVITY/IES SPECIFIED:

Unloading/Loading Port, Oil Terminal, Bulk Cargo Terminal, Pleasure Craft Marina and Car Terminal.

Please give details of any changes:…….

Part 2 – Volumes of traffic

AVERAGE NUMBER OF VESSELS PER ANNUM (all types): …2721….

Vessel Type(s) Average	Average No. per annum	Typical Size (GT)	Maximum Size (GT)	Minimum Size (GT)	No. of Passengers
Bulk Carrier	340	21850	37821	3658	
Containership	28	24500	25345	2791	
General Cargo-Multipurpose	1847	5800	30928	328	
Oil Tankship	337	8200	23884	672	
Ro-Ro Cargo Ship	124	7800	15270	1628	
Passenger Ferry	13	3000	3464	450	?
Cruise Ship	2	15000	20606	14903	?
Cement Carrier	20	1800	1850	1181	
Car Carrier	4	46000	58684	45365	

Please indicate any additional vessel types and numbers, size etc. not included in the above list. ……

Part 3 – Port Reception Facilities available

Are the waste reception facilities available within your port/terminal:

Provided "in house"?		NO
External contractor?	(MARPOL V)	YES
Other?	MARPOL I – contract between vessel and reception facility	YES

Part 3.1 – Facilities currently available

Are the facilities available currently: MOBILE

Are the facilities:

Port/Terminal Owned?	NO
Port/Terminal Operated?	NO
Contracted in?	YES

Part 3.2 – Facilities available by MARPOL Annex – Summer 2001:

For each of the following categories, please indicate if there has been any change since last year.

a. Annex I - Oily Waste:

Waste Category	Available	Quayside Tank	Roadside Tanker	Terminal Facility	Other
Oily Tank Washing	X		X		
Dirty ballast water	X		X		BARGE
Oily bilge water	X		X		BARGE
Oil sludge	X		X		BARGE
Used lubricating oil	X		X		

Approximate No. of vessels per annum: ……XXX of XXX…….

b. Annex II - Noxious Liquid Substances:

NONE – NO CHEMICAL TANKERS CALL IN

c. Annex IV - Sewage:

Although MARPOL 73/78 Annex IV is not yet in force, it has now been ratified (at September 2002) and will enter into force in September 2003 for MARPOL and September 2004 for the EU Directive). Does your port already have facilities for the disposal of ship-generated sewage wastes? NO at 2001

Have any facilities been provided since the last survey? YES/NO*

If YES, please specify ……..

d. Annex V - Garbage:

Waste Category	Available	Segregation/ Recycling	Contractor Disposes	Other (1)
Category 1 (Plastic)	X			
Category 2 (floating dunnage, Lining or packing material)	X			X
Category 3 (ground paper products, Rags, glass, metal, bottles, crockery, etc.	X		X	
Category 4 (paper products, rags, Glass, metal, bottles, crockery, etc.	X			
Category 5 (food waste)	X		X	
Category 6 (incinerator ash)	X			X

(1) INDIVIDUAL CONTRACT BETWEEN SHIP AND RECEPTION FACILITY

Approximate No. of vessels per annum: ……XXXX OF XXXX…….

Part 3.3 - Facilities available by vessel type

In the Summer of 2001, you indicated that facilities were available for the following vessel types: Bulk Carrier, Containership, General Cargo-Multipurpose, Oil Tankship, Ro-Ro Cargo Ship, Passenger Ferry, Cruise Ship, Cement Carrier, and Car Carrier.

Part 4 – Waste Reception and Handling Plan

Does your port currently have a waste reception and handling plan? NO

Does the port/terminal intend to develop a Waste Reception plan to meet the requirements of the EU Directive

In its own right? YES

As part of a regional plan? NO

Please indicate whether the plan has now been completed YES/NO*

If NO, please indicate anticipated completing date:……...

If YES, please complete the following questions:

Please specify actual completion date: ……

Does this plan contain information about available Waste Reception Facilities? YES/NO*

Please indicate which of the following groups currently have access To the Waste Reception Plan:

Port users, i.e. ships and/or shipping agents YES/NO*

Waste contractors YES/NO*

Terminal operators YES/NO*

Local Government Agencies YES/NO*

Please indicate any other groups to whom the Plan is now available:

……

APPENDIX 5

SURVEY RESPONSES/REASONS FOR NON-RESPONSE - BOTH SURVEYS

Port Numbers are allocated on the basis of all ports identified for surveys, making use of port identities under MEPC Circulars and other sources e.g. Fairplay Ports Guide

NOTE: Reasons for "Other" appear in "Comments" column

Port No.	Comments	Comp-leted	nil return	Other
B1	Completed surveys received	1 and 2		
B2	Nil return		1 and 2	
B3	Survey 1 incomplete - unable to use as missing too much data. Nil return for survey 2			1
B4	Not considered North Sea - inland port therefore not appropriate for survey			1
B5	Nil return		1 and 2	
B6	Nil return		1 and 2	
B7	Nil return		1 and 2	
B8	Unable to complete as many private terminals at port with different contractors			1
Belgium		**1xboth**	**4xboth**	**3**
D1	Nil return		1 and 2	
D2	Nil return		1 and 2	
D3	Completed surveys received	1 and 2		
D4	Completed survey 1 received. Nil for 2	1	2	
D5	Nil return		1 and 2	
D6	Nil return		1 and 2	
D7	Completed surveys received	1 and 2		
Denmark		**2xboth and 1x1**	**4xboth and 1x2**	**0**
G1	Completed surveys received	1 and 2		
G2	Completed surveys received	1 and 2		
G3	Nil return		1 and 2	
G4	Nil return for 1. Completed survey 2	2	1	
G5	Completed surveys received	1 and 2		
G6	Nil return		1 and 2	
G7	Nil return		1 and 2	
G8	Not a North Sea port, although connects N Sea and Baltic			1
G9	Nil return		1 and 2	
G10	Nil return for 1. Completed survey 2.	2	1	
G11	Nil return		1 and 2	
G12	Nil return for 1. Completed survey 2.	2	1	
G13	Survey 1 not completed (sent brochure - not usable). Survey 2 completed	2	1	
Germany		**3xboth, 4x2**	**5xboth, 4x1**	**1**
NE1	Nil return		1 and 2	
NE2	Completed survey 1 received but not responsible for vessels therefore excluded			1
NE3(a)	Completed surveys received - inc. 4 other regional ports	1 and 2		

APPENDIX 5 (continued)

Port No.	Comments	Comp-leted	nil return	Other
NE3(b)	No contact details available for port under MEPC - not included in surveys			1
NE4	Incorrect address			1
NE5	Nil return		1 and 2	
NE6	Nil return		1 and 2	
NE7	Nil return for 1. Completed survey 2.	2	1	
NE8	Nil return		1 and 2	
NE9	Brochure received for survey 1 - not able to use data. Nil return for 2		1 and 2	
NE10	Completed surveys received	1 and 2		
NE11	Waterway supervision only - not a port			1
NE12	Nil return		1 and 2	
NE13	Nil return		1 and 2	
NE14	Completed surveys received	1 and 2		
NE15	Nil return		1 and 2	
NE16	Nil return		1 and 2	
NE17	Completed survey received	1 and 2		
NE18	Nil return		1 and 2	
NE19	Completed survey 1 received. Nil return for 2.	1	2	
NE20	Nil return - returned address unknown			1
NE 21	Nil return - returned address unknown			1
NE22	Nil return		1 and 2	
Netherlands		**4xboth, 1x1 and 1x2**	**11xboth, 1x1 and 1x2**	**6**
NO1	Nil return		1 and 2	
NO2	Completed survey received	1	2	
NO3	Nil return		1 and 2	
NO4	Nil return		1 and 2	
NO5	Nil return		1 and 2	
NO6	Nil return for 1. Completed survey 2.	2	1	
N07	Completed survey 1 received. Nil return for 2.	1	2	
NO8	Not able to complete survey			1
NO9	Completed survey 1 received. Nil return for 2.	1	2	
NO10	Completed survey received	1 and 2		
NO11	Nil return		1 and 2	
NO12	Completed survey 1 received. Nil return for 2.	1	2	
NO13	Nil return for 1. Completed survey 2.	2	1	
NO14	Not completed as private co (10-14 vessels) with no external users			1
NO15	Nil return		1 and 2	
NO16	Completed survey received	1 and 2		
NO17	Completed survey received	1 and 2		
NO18	Nil return		1 and 2	
NO19	Completed survey received	1 and 2		
NO20	Completed survey received	1 and 2		
NO21	Nil return		1 and 2	
NO22	Nil return		1 and 2	
NO23	Nil return		1 and 2	

APPENDIX 5 (continued)

Port No.	Comments	Comp-leted	nil return	Other
NO24	Completed survey 1 received. Nil return for 2.	1	2	
NO25	Nil return		1 and 2	
NO26	Nil return		1 and 2	
NO27	Nil return		1 and 2	
NO28	Nil return		1 and 2	
NO29	Nil return for 1. Completed survey 2.	2	1	
NO30	Nil return for 1. Completed survey 2.	2	1	
N031	Nil return - includes 1 other regional port		1 and 2	
NO32	Nil return		1 and 2	
NO33	Completed surveys received	1 and 2		
NO34	Nil return		1 and 2	
NO35	Nil return		1 and 2	
NO36	Nil return - returned address unknown			1
NO37	Nil return		1 and 2	
NO38	Nil return		1 and 2	
NO40	Nil return		1 and 2	
NO41	Nil return		1 and 2	
NO42	Nil return		1 and 2	
NO43	Sent brochure for survey 1 - unable to use. Completed survey 2	2	1	
NO44	Completed surveys received	1 and 2		
NO45	Completed surveys received	1 and 2		
NO46	Nil return		1 and 2	
NO47	Nil return for 1. Unable to complete 2 as minimal facilities brought in by vessels		1 and 2	
NO48	Nil return		1 and 2	
NO49	Nil return		1 and 2	
NO51	Refinery jetties permanently closed down therefore no port operations			1
NO51	Completed survey 1 received. Nil return for 2.	1	2	
NO52	Nil return		1 and 2	
NO53	Nil return for 1. Completed survey 2.	2	1	
NO54	Nil return		1 and 2	
NO55	Nil return		1 and 2	
NO56	Nil return		1 and 2	
NO57	Completed survey 1 received. Nil return for 2	1	2	
NO58	Nil return		1 and 2	
NO59	Completed surveys received	1 and 2		
NO60	Completed survey1 received. Nil return for 2	1	2	
NO61	Nil return		1 and 2	
Norway		**9xboth, 8x1 and 6x2**	**34xboth, 6x1 and 8x2**	**4**
UK1	Completed survey 1 received. Nil return for 2	1	2	
UK2	Completed survey 1 received. Nil return for 2	1	2	
UK3	Completed surveys received	1 and 2		
UK4	Nil return for 1. Completed survey 2	2	1	
UK5	Completed surveys received	1 and 2		
UK6	Completed surveys received	1 and 2		

APPENDIX 5 (continued)

Port No.	Comments	Comp-leted	nil return	Other
UK7	Completed surveys received	1 and 2		
UK8	Completed surveys received	1 and 2		
UK9	Does not handle ships any longer			1
UK10, 21, 22, 29 & 41	Nil return		1 and 2	
UK11	Completed surveys received	1 and 2		
UK12	Nil return		1 and 2	
UK13(a)	Nil return for 1. Completed survey 2.	2	1	
UK13(b)	No contact details available for port under MEPC - not included in surveys			1
UK14	Completed surveys received	1 and 2		
UK15	Completed survey 1 received. Nil return for 2	1	2	
UK16	Nil return		1 and 2	
UK17	Nil return		1 and 2	
UK18	Completed surveys received	1 and 2		
UK19	Completed survey 1 received. Nil return for 2	1	2	
UK20	Nil return		1 and 2	
UK21	Closed to commercial shipping and is now part of UK10, 21 etc grouping			1
UK22	Completed surveys received	1 and 2		
UK23	Nil return		1 and 2	
UK24	Completed survey 1 received. Unable to complete 2	1	2	
UK24 & 32	No contact details available for combined ports under MEPC therefore not included in surveys			1
UK25	Nil return		1 and 2	
UK26	Completed surveys received	1 and 2		
UK27	This is a conservation authority and does not manage any port operations			1
UK28	Returned address not known			1
UK29	Completed surveys received	1 and 2		
UK30	Nil return		1 and 2	
UK31(a)	Nil return		1 and 2	
UK31(b)	No contact details available for port under MEPC - not included in surveys			1
UK32	Completed survey 1 received. Unable to complete 2	1	2	
UK33	Completed surveys received	1 and 2		
UK34	Nil return		1 and 2	
UK35	Nil return		1 and 2	
UK36	Nil return		1 and 2	
UK37	Nil return		1 and 2	
UK38	Nil return		1 and 2	
UK39	Completed surveys received	1 and 2		
UK40	Nil returns		1 and 2	
UK41	Completed survey received	1 and 2		
UK42	Completed survey 1 received. Nil return for 2	1	2	
UK43	Completed surveys received	1 and 2		
UK44	Nil return for 1. Completed survey 2	2	1	
UK45	Completed survey 1 received. Nil return for 2	1	2	
UK46	Completed surveys received	1 and 2		

APPENDIX 5 (continued)

Port No.	Comments	Comp-leted	nil return	Other
UK47(a), (b) and (c)	7 ports covered by both completed surveys	1 and 2		
UK48	Nil return		1 and 2	
UK49	Completed surveys received	1 and 2		
UK50	Nil return		1 and 2	
UK51	Nil return for 1. Completed survey 2.	2	1	
UK52	No commercial traffic and has exemption from requirements of Directive			1
UK53, (a) and (b)	Completed surveys received covering all three port identities under MEPC	1 and 2		
UK54	Returned addressee gone away			1
UK55	Nil return		1 and 2	
UK56	Nil return		1 and 2	
UK57	Returned addressee gone away			1
UK58	Nil return for 1. Completed survey 2.	2	1	
UK59	Completed surveys received	1 and 2		
UK60	Military vessels only - exempt from requirements of Directive		1 and 2	
UK61	Nil return		1 and 2	
UK62	Nil return		1 and 2	
UK63	Nil return for 1. Unable to complete 2 until receive guidance from Dft or MCA on Directive		1 and 2	
UK64	Nil return		1 and 2	
UK65	Completed surveys received	1 and 2		
UK66	Completed surveys received	1 and 2		
UK67	Completed survey 1 received. Nil return for 2	1	2	
UK68(a)	Nil return for 1. Completed survey 2.	2	1	
UK68(b)	No contact details available for port under MEPC - not included in surveys			1
UK69	Nil return		1 and 2	
UK70	Completed surveys received	1 and 2		
UK71	Sent port waste management plan - no survey completed			1
UK72	Completed surveys received	1 and 2		
UK73	Nil return		1 and 2	
UK74	Returned addressee gone away			1
UK75	Nil return		1 and 2	
UK76	Completed survey 1 received. Unable to complete 2.	1	2	
UK77	Completed survey1 received. Nil return for 2	1	2	
UK78	Nil return for 1. Completed survey 2	2	1	
UK79	Nil return		1 and 2	
UK		**24xboth, 11x1 and 7x2**	**28xboth, 7x1 and 12x2**	**13**

APPENDIX 6

BUSINESS ACTIVITIES IN 78 PORTS

KEY:

1. Unloading/Loading
2. Oil Terminal
3. Ferry Terminal
4. Bulk Cargo
5. Cruise Liner Terminal
6. Shipyard
7. Fishing Port
8. Pleasure Craft Marina
9. Bunkering Terminal
10. Other

Country	Port No.	Surveys	Business Activities		
			Type(s)	Comments	No. of Activities
Belgium	B1	1 and 2	1,2,4,5,6,8		6
Denmark	D3	1 and 2	1,3,6,7		4
	D4	1	1,2,6,7,8		5
	D7	1 and 2	1,6-10	10 = gravel terminal	6
Germany	G1	1 and 2	1,2,4,8,10	10 = car terminal	5
	G2	1	1,5-9		6
	G4	2	1,3-10	10 = Ro-Ro Terminal	9
	G5	1 and 2	1,3,4,6,8,9		6
	G10	2	1		1
	G13	2	1,2,4		3
Netherlands	NE3(a)	1 and 2	1-6,8,9		8
	NE10	1 and 2	1,2,5,6,8	5 = small cruise liners, 6 = small dock	5
	NE14	1 and 2	1,3		2
	NE17	1 and 2	1-6,8-10	10 - See Note A below	16
	NE19	1	1-4,6-8		7
Norway	NO2	1	1,6-9		5
	NO6	2	1,2,4,7-9		6
	NO7	1	1,6-9		5
	NO9	1	1,3-8	6 = small ships	7
	NO10	1 and 2	1-4,6,8,9		7
	NO12	1	1,2,4,6,8,10	10 = special car carriers	6
	NO13	2	1,3,4,7-9		6
	NO16	1 and 2	1,6,7		3
	NO17	1 and 2	1,3,4,6-9		7
	NO19	1 and 2	1,4,6,7		4
	NO20	1 and 2	1,4,8		3
	NO29	2	1,6-8		4
	NO30	1 and 2	2,4,5,7,8,10	10 = container terminal	6
	NO33	1 and 2	4,5,7,8		4
	NO43	2	1,4,8		3
	NO44	1 and 2	1,4		2
	NO45	1	1-5		5
	NO51	1	1,3-6,8,9		7
	NO53	2	2		1
	NO57	1	1-9		9
	NO59	1 and 2	1,3,5-9		7
	NO60	1	1,5,7-9		5

APPENDIX 6 (continued)

Country	Port No.	Surveys	Business Activities		
			Type(s)	Comments	No. of Activities
UK	UK1	1	1-10	10 = North Sea logistics	10
	UK2	1	7		1
	UK3	1 and 2	1		1
	UK4	2	1,4,7,8		4
	UK5	1 and 2	1,4		2
	UK6	1 and 2	2		1
	UK7	1 and 2	7		1
	UK8	1 and 2	1,4,6,7		4
	UK11	1 and 2	1,8		2
	UK13(a)	2	1,2,5,6		4
	UK14	1 and 2	1,3,5,8		4
	UK15	1	7,8		2
	UK18	1 and 2	1-3,9		4
	UK19	1	1,4		2
	UK22	1 and 2	1,2		2
	UK24	1	1,3,4,7,8		5
	UK26	1 and 2	1-5		5
	UK29	1 and 2	1,2		2
	UK32	1	1-4,9,10	10 = offshore supply base	6
	UK33	1 and 2	1,2,4,8		4
	UK39	1 and 2	1,3,5,7,9		5
	UK41	1 and 2	1,2,4,5,9		5
	UK42	1	1,3-9	4 & 5 = not terminals	8
	UK43	1 and 2	1,2,4,5,7		5
	UK44	2	1,2,4-9		8
	UK45	1	1,5,6		3
	UK46	1 and 2	1,5-7		4
	UK47(a)	1 and 2	1-4,6-10	10 = leisure craft marinas, boatyards and moorings (see Note B)	9
	UK51	2	1,4		2
	UK53	1 and 2	1-3,5,7,8,10	10 = ship to ship oil transfer facilities	7
	UK58	2	7,8		2
	UK59	1 and 2	1,10	10 = Ro-Ro Vessels	2
	UK65	1 and 2	1,2		2
	UK66	1 and 2	2		1
	UK67	1	1,2,4,7,8		5
	UK68(a)	2	2		1
	UK70	1 and 2	1,2	See Note C	2
	UK72	1 and 2	1,2		2
	UK76	1	2		1
	UK77	1	1,6-8		4
	UK78	2	7,10	10 = yachts and general cargo	2

PORT NOTES:

A. NE17 includes: Container Terminal, Car Terminal, General Cargo Terminal, Gas Tanker Terminal, Chemical Tanker Terminal, Reefer Terminal, Barge Carrier (Lash) Mooring Buoys/Dolphins

B. UK47(a) also covers 47(b) and 47(c) and comprises 7 separate port/harbour identities combined as one group for the purposes of this survey

C. UK70 refers to a sea island concrete and steel structure in the mouth of an estuary

APPENDIX 7

GEOGRAPHICAL LOCATION AND PHYSICAL ENVIRONMENT OF PORTS

KEY: Geographical Location

A. Urban Area – City
B. Urban Area – Town
C. Rural Area
D. Other

Physical Environment

I. Industrial Area
II. Oil Refinery
III. Chemical Plant
IV. Storage for Oil and Chemicals

Country	Port No.	Surveys	Geographical Location	Physical Environment
Belgium	B1	1 and 2	A	I-IV
Denmark	D3	1 and 2	B	I-IV
	D4	1	B	I-IV
	D7	1 and 2	B+C	I, III & IV
Germany	G1	1 and 2	B	I + IV
	G2	1	A	I
	G4	2	B+C	I
	G5	1 and 2	B+C	
	G10	2	B	I
	G13	2	B	I, II & IV
Netherlands	NE3(a)	1 and 2	A	I, II & IV
	NE10	1 and 2	A+B	
	NE14	1 and 2	B	I
	NE17	1 and 2	A-D	I-IV
	NE19	1	A	I-IV
Norway	NO2	1	A	I
	NO6	2	A+B	IV
	NO7	1	C	I & IV
	NO9	1	A+C	I & IV
	NO10	1 and 2	A+B	I, III & IV
	NO12	1	A	I
	NO13	2	B+C	I & IV
	NO16	1 and 2	B	
	NO17	1 and 2	B	I
	NO19	1 and 2	B	I
	NO20	1 and 2	B	
	NO29	2	B+C	
	NO30	1 and 2		
	NO33	1 and 2	B	I
	NO43	2	B	
	NO44	1 and 2	B	I
	NO45	1	A	IV
	NO51	1	A+B+C	I & IV
	NO53	2	C	I & IV
	NO57	1	A	I & IV
	NO59	1 and 2	B	I
	NO60	1	A	I & IV

APPENDIX 7 (continued)

Country	Port No.	Surveys	Geographical Location	Physical Environment
UK	UK1	1	A	
	UK2	1	B	
	UK3	1 and 2	B	
	UK4	2	B	I
	UK5	1 and 2	B	
	UK6	1 and 2	C	
	UK7	1 and 2	B	
	UK8	1 and 2	B	
	UK11	1 and 2	A	
	UK13(a)	2	C	
	UK14	1 and 2	B	
	UK15	1	B	
	UK18	1 and 2	B+C	IV
	UK19	1	C	
	UK22	1 and 2	B	I-IV
	UK24	1	B	I & III
	UK26	1 and 2	B	II
	UK29	1 and 2	D	
	UK32	1	B+C	I-IV
	UK33	1 and 2	A	
	UK39	1 and 2	B+C	
	UK41	1 and 2	A	I & IV
	UK42	1	B	
	UK43	1 and 2	A	I, II & IV
	UK44	2	B	
	UK45	1	D	
	UK46	1 and 2	B	
	UK47(a)	1 and 2	A-D	I-IV
	UK51	2	I	I
	UK53	1 and 2	B+C	
	UK58	2	D	
	UK59	1 and 2	D	I
	UK65	1 and 2	C	IV
	UK66	1 and 2	C	IV
	UK67	1	A	III & IV
	UK68(a)	2		I + IV
	UK70	1 and 2	D	
	UK72	1 and 2	D I	I
	UK76	1	B	I & IV
	UK77	1	B+C	I-IV
	UK78	2	C	

APPENDIX 8

VESSEL NUMBERS, TYPES AND SIZES

Section (A) - Cargo Vessel Data (only ports specifically providing information are shown here)

KEY:

A.	Bulk Carrier	G.	Oil Tankship
B.	Chemical Tankship	H.	Ore/Bulk/Oil Carrier
C.	Containership	I.	Refrigerated Cargo Ship
D.	Factoryship	J.	Ro-Ro Cargo Ship
E.	Gas Carrier	N.	Other e.g. 1(45) – 1 vessel type (457 actual vessels)
F.	General Cargo – Multipurpose		

NOTES: Figures in red – port does not specify that facilities are provided for these vessels

Where a 0 appears for A-N, facilities are available but no vessels call in of this type

Where figures appear in italics, this indicates where there has been change between Surveys 1 and 2 in one or more categories of vessel

CATEGORIES A – F

Port No.	Ave. No of vessels p.a. - all types		Vessel Types - numbers by category/facilities available y/n									
			A		B		C		D		E	
	Survey 1	Survey 2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
B1	16599	16599	852	852	0	0	2463	2463	0	0	808	808
Belgium Total	**16599**	**16599**	**852**	**852**	**0**	**0**	**2463**	**2463**	**0**	**0**	**808**	**808**
D3	650	650					0	0				
D4	25		0									
D7	8870	8870			20	20						
Denmark Total	**9545**	**9520**	**0**		**20**	**20**	**0**	**0**				
G1	2700	2700	340	340			28	28				
G2	6610	6610					1401	1401				
G4		969		203				0		2		
G5	1130	1090	40	40	0	0	180	180			30	30
G10		130										
G12		1040										
G13		1557		301				330				56
Germany Total	**10440**	**14136**	**380**	**884**	**0**	**0**	**1609**	**1939**		**2**	**30**	**86**
NE3(a)	*5150*	*5170*	490	490	500	500	100	100			65	65
NE10	*2610*	*2580*					*70*	*40*				
NE17	*25155*	*24818*	1212	1212	0		4982	4982	0	0	0	0
NE19	5800		291		467		13		8		585	
N'lands Total	***38715***	***32568***	**1993**	**1702**	**967**	**500**	***5165***	***5122***	**8**	**0**	**650**	**65**

APPENDIX 8 (a) (continued)

Port No.	Ave. No of vessels p.a. - all types		Vessel Types - numbers by category/facilities available y/n									
			A		B		C		D		E	
	Survey 1	Survey 2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
NO2	3610		140		0		250		300		0	
NO6		250		0		6		0				
NO7	370		120		0		0		100		0	
NO9	1112		986									
NO10	653	653	223	223	135	135	111	111				
NO12	1580		17				85				40	
NO13		4910		300				200				
NO16	30	30										
NO17	*5670*	*5770*	1400	1400	120	120	300	300				
NO19	148	148	8	8								
NO20	*421*	*493*	121	121			*178*	*250*				
NO24	350											
NO29		680		350								
NO33	140	140	140	140								
NO43		600		200				100				
NO44	400	400	300	300			0	0				
NO45	4745	4745	242	242			498	498				
NO51	3131		428									
NO53		211										15
NO57	2110		220				0		0			
NO59	212	212	20	20								
NO60	650		10									
Norway Total	**25332**	**19030**	**4375**	**3304**	**255**	**261**	**1422**	**1459**	**400**		**40**	**15**
UK1	7089		13		87		48		2			
UK3	110	110										
UK4		350		110				140				
UK5	500	500	200	200			100	100	0	0		
UK6	303	303			3	3					270	270
UK7	50	50										
UK8	90	90										
UK13(a)		449		3		19		0		0		0
UK14	150	150										
UK15	36											
UK18	7630	7630			10	10	4400	4400			10	10
UK19	35		35									
UK22	2500	2500			450	450	550	550			140	140
UK24	1067		6						14			
UK26	799	799	19	19	0	0	332	332				
UK29	330	330										
UK32	5916		200		577		147		4		172	

APPENDIX 8 (a) (continued)

Port No.	Ave. No of vessels p.a. - all types		Vessel Types - numbers by category/facilities available y/n									
			A		B		C		D		E	
	Survey 1	Survey 2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
UK33	381	381	95	95								
UK39	172	172	10	10			110	110				
UK41	1420	1420	750	750	20	20						
UK42	5436		0				0		0			
UK43	11767	11767	1588	1588	1857	1857	494	494	0	0	369	369
UK44		706		115		8		53				
UK45	20		20									
UK46	42	42										
UK49	*672*	*527*	112	112	3	3						
UK51		823		410								413
UK53	1335	1335					98	98			29	29
UK59	1150	1150										
UK65	*399*	*261*									*35*	*20*
UK66	*415*	*245*									*25*	*20*
UK67	2662		50		12							
UK68(a)		673										400
UK70	100	100										
UK72	*163*	*170*	105	105								
UK76	610				92						94	
UK77	40											
UK78		142										
UK Total	**53389**	**33175**	**3203**	**3517**	**3111**	**2370**	**6279**	**6277**	**20**	**0**	**1144**	**1671**
Grand Total	**254651**	**217053**	**10803**	**10259**	**4353**	**3151**	**16938**	**17260**	**428**	**2**	**2672**	**2645**

APPENDIX 8 (a) (continued)

CATEGORIES F – J AND N

Port No.	Vessel Types - numbers by category/facilities available y/n											
	F		G		H		I		J		N	
	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
B1	6711	6711	2666	2666	57	57	682	682	1903	1903	457	457
Belgium Total	**6711**	**6711**	**2666**	**2666**	**57**	**57**	**682**	**682**	**1903**	**1903**	**457**	**457**
D3	650	650					0	0	0	0		
D4											25	
D7	10	10	25	25			15	15			8800	8800
Denmark Total	**660**	**660**	**25**	**25**			**15**	**15**	**0**	**0**	**8825**	**8800**

APPENDIX 8(a) (continued)

	Vessel Types - numbers by category/facilities available y/n											
	F		G		H		I		J		N	
Port No.	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
G1	1847	1847	337	337					124	124	24	24
G2	178	178	213	213			71	71	103	103	4644	4644
G4		60		84				70		550		
G5	180	180							650	650	50	50
G10		130										
G12												1040
G13				870								
Germany Total	**2205**	**2395**	**550**	**1504**			**71**	**141**	**877**	**1427**	**4718**	**5758**
NE3(a)	2300	2300	700	700	10	10	5	5	*680*	*650*	*300*	*350*
NE10	40	40									2500	2500
NE17	10768	10768	*6498*	*6171*	*149*	*146*	0	0	0	0	*1546*	*1539*
NE19	2800		200		31		632		773			
N'lands Total	**15908**	**13108**	**7398**	**6871**	**190**	**156**	**637**	**5**	**1453**	**650**	**4346**	**4389**
NO2	2000		500				0		20		400	
NO6		240		2						2		0
NO7	0		30		0		120		0		0	
NO9	123										3	
NO10	0	0	50	50					134	134		
NO12	361		37		0		10		260		770	
NO13		260		120				200		30		3800
NO16	30	30										
NO17	3400	3400	160	160			*240*	*340*	50	50		
NO19	100	100									40	40
NO20	0	0							122	122		
NO24	350											
NO29												330
NO33												
NO43		300				0						
NO44	100	100			0	0						
NO45	996	996	315	315					481	481	2213	2213
NO51	1693		432						578			
NO53				194		2						
NO57	1700		150				0		40			
UK4		50						50				
UK5	200	200							0	0		
UK6			30	30								
UK7											50	50
UK8	90	90									0	0
UK13(a)		135		30		2		0		14		246
UK14							150	150	0	0		

APPENDIX 8 (a) (continued)

	Vessel Types - numbers by category/facilities available y/n											
	F		G		H		I		J		N	
Port No.	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
UK15											36	
UK18	40	40	30	30					3140	3140		
UK19												
UK22	360	360	1000	1000								
UK24	484		1				77		485			
UK26	11	11	137	137	0	0	0	0	300	300		
UK29			320	320	10	10						
UK32	1694		1294		52		3		1773			
UK33	95	95	180	180			1	1			10	10
UK39	0	0							52	52		
UK41	150	150	100	100					10	10	390	390
UK42	232		100		0		104		0		5000	
UK43	3542	3542	0	0	393	393	27	27	3497	3497		
UK44												530
UK45												
UK46	35	35									7	7
UK49	*225*	*340*					12	12			*320*	*60*
UK51												
UK53	85	85	262	262					861	861		
UK59									1150	1150		
UK65	4	4	*350*	*215*	10	10					*0*	*12*
UK66	0	0	*365*	*200*	25	25						
UK67	100		200								2300	
UK68(a)				270		3						
UK70			100	100								
UK72			8	8	50	57						
UK76			424									
UK77	40											
UK78		31										111
UK Total	**8088**	**5458**	**5301**	**2882**	**540**	**500**	**410**	**252**	**11894**	**9024**	**14231**	**1416**
Grand Total	**58173**	**33758**	**17614**	**14789**	**787**	**715**	**2185**	**1635**	**17812**	**13823**	**36003**	**27203**

APPENDIX 8

Section (b) **Passenger Vessel Data** (only ports specifically providing information are shown here)

KEY: K. Passenger Ferry L. Cruise Ship
M. Ro-Ro Passenger Ferry N. Other – as 8(a) but now including passenger numbers

APPENDIX 8 (b) (continued)

	Passenger Vessel/Passenger Numbers															
	K				L				M				N			
	Vessel No.		Passenger No.		Vessel No.		Passenger No.		Vessel No.		Passenger No.		Vessel No.		Passenger No.	
Port No.	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
B1	0	0	0	0	40	40	40000	40000	0	0	0	0				
Belgium Total	0	0	0	0	40	40	40000	40000	0	0	0	0				
D3	0	0	0	0					1650	1650	1980000	1980000				
Denmark Total	0	0	0	0					1650	1650	1980000	1980000				
G1	13	13			2	2			0	0						
G2					58	58	53418	53418								
G4		1534		686603		15										
G5	1200	1200	60000	60000												
G12		150		8000												
Germany Total	1213	2897	60000	754603	60	75	53418	53418								
NE3(a)					100	100	150000	150000								
NE10					25	25	2500	2500								
NE14									1750	1750	1059000	1059000				
NE17	0	0	0	0	1	1			5053	5053						
N'lands Total	0	0	0	0	126	126	152500	152500	6803	6803	1059000	1059000				

APPENDIX 8 (b) (continued)

	Passenger Vessel/Passenger Numbers															
	K				L				M				N			
	Vessel No.		Passenger No.		Vessel No.		Passenger No.		Vessel No.		Passenger No.		Vessel No.		Passenger No.	
Port No.	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
NO2	800				50											
NO6						4		2000		2						
NO7	730		109500		0		0		0		0		0		0	
NO17	28000	28000	290000	290000	10	10	8000	8000								
NO20	156	156	21060	21060												
NO24									900		2000000					
NO33					3	3	1500	1500								
NO43		300		20000		5		2000								
NO45	1313	1313	254600	254600	110	110	108836	108836								
NO51	28500		3250000		50		4000									
NO57	750				45		25000						1300		200000	
NO59	1750	1750	315000	315000	11	11	2750	2750								
NO60	360		72000													
Norway Total	62359	31519	4312160	900660	279	143	150086	125086	900	2	2000000		1300		200000	
UK1	626		58065		11		1001		0		0		0		0	
UK13(a)		0		0		22		620		0		0				
UK14					120	120	150000	150000	25000	25000	16300000	16300000				
UK26	999	999	1335570	1335570	31	31	54681	54681	905	905						
UK33					1	1	120	120								
UK39	3285	3885	328500	328500	*55*	*70*	*1375*	*4250*	52	52	3120	3120				
UK41	0	0	0	0	35	35	15000	15000	0	0	0	0				
UK42	0		0		40		9920		467		61644					
UK43	53	53														
UK53	0	0	0	0	55	55	14096	14096	861	861	204617	204617				

APPENDIX 8 (b) (continued)

	Passenger Vessel/Passenger Numbers															
	K				L				M				N			
	Vessel No.		Passenger No.		Vessel No.		Passenger No.		Vessel No.		Passenger No.		Vessel No.		Passenger No.	
Port No.	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
UK Total	4963	4937	1722135	1664070	348	334	246193	238767	27285	26818	16569381	16507737	0		0	
Grand Total	68535	39353	6094295	3319333	853	718	642197	609771	36638	35273	21608381	19546737	1300		200000	

PORT NOTES:

NE17 Received 30000+ seagoing vessels, together with 130000 inland waterway vessels - seagoing vessels only considered above

NO16 – All facilities brought in on demand from other ports

NO20 – Annex V Facilities only in this port

NO24 – Annex IV and V Facilities only in this port

NO33 – Ceased taking cruise ships after Survey 2

NO46 – Annex IV facilities for ferries only; everything else arranged directly with private contractors

NO51 – Facilities are only available for passenger ferries

NO57 – 1300 of category N (Others) = catamaran passenger vessels covered under Column K

UK14 – all wastes are handled in quayside disposal bins

UK26 – 1,335,570 passengers for Category K vessels are shared with Category M vessels

UK53 – 861 in Category M represents Ro-Ro vessels taking both cargo and passengers

APPENDIX 9

MAXIMUM AND MINIMUM VESSEL SIZES THAT CAN BE HANDLED IN PORTS

NOTE: Vessel sizes are given in GT (Gross Tonnage) unless otherwise stated.

Port No.	Vessel Size	
	Max	Min
B1	135000	6000
D3	35000	600
D4	1900	500
D7	3200	684
G1	58684	328
G2	91500	500
G4	18200	500
G5	50000	435
G10	3000	1000
G13	89000	
NE3(a)	89000	1000
NE10	2000	1000
NE14	40000	
NE19	100000	250
NO2	20000	200
NO6	16000	2500
NO7	6000	500
NO9	25000	
NO12	40000	900
NO16	4000	1500
NO17	20000	50
NO24	3000	500
NO29	3500	2000
NO33	10000	2000
NO43	100000	2000
NO44	40000	500
NO53	160214	65800
NO57	77000	300
NO59	12000	304
NO60	5000	1000

Port No.	Vessel Size	
	Max	Min
UK3	3800	150
UK4	15000	2000
UK5	4500	500
UK6	35000	3000
UK8	2000	600
UK13(a)	80000	460
UK14	70000	4000
UK18	1500	600
UK22	23235	664
UK24	12189	
UK26	69130	9563
UK29	300000	70000
UK32	180000	
UK33	3400	800
UK39	20000	721
UK41	45000	750
UK42	59652	412
UK45	858	320
UK46	180	110
UK49	12000	800
UK51	92000	1000
UK53	164373	469
UK59	23986	5880
UK65	155000	1000
UK66	200000	20000
UK67	7000	
UK68(a)	150000 dwt	16000 dwt
UK72	14201	800
UK76	28628	136
UK77	2000	800
UK78		

APPENDIX 10

AVAILABILITY OF ANNEX I FACILITIES – OILY WASTE

KEY: A = Available R = Roadside Tanker O = Other
Q = Quayside Tanker T = Terminal Facility

	Oily Tank Washing					Dirty Ballast Water					Oily Bilge Water					Oil Sludge					Used Lubricating Oil				
Port No.	**A**	**Q**	**R**	**T**	**O**	**A**	**Q**	**R**	**T**	**O**	**A**	**Q**	**R**	**T**	**O**	**A**	**Q**	**R**	**T**	**O**	**A**	**Q**	**R**	**T**	**O**
B1	✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓		
Belgium Total	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**0**
D3											✓		✓			✓		✓			✓		✓		
D4	✓					✓					✓					✓									
D7	✓		✓	✓		✓				✓	✓		✓	✓		✓		✓	✓		✓		✓	✓	
Denmark Total	**2**	**0**	**1**	**1**	**0**	**2**	**0**	**0**	**0**	**1**	**3**	**0**	**2**	**1**	**0**	**3**	**0**	**2**	**1**	**0**	**2**	**0**	**2**	**1**	**0**
G1	✓		✓			✓		✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		
G2	✓	✓	✓		✓	✓	✓	✓		✓	✓		✓		✓	✓	✓	✓		✓			✓		✓
G4	✓					✓					✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓
G5											✓		✓			✓		✓			✓		✓		
G10	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
G12											✓										✓				
G13	✓			✓			✓			✓	✓		✓			✓		✓			✓		✓		
Germany Total	**5**	**1**	**3**	**1**	**1**	**4**	**2**	**3**	**0**	**3**	**7**	**1**	**6**	**0**	**3**	**6**	**2**	**6**	**0**	**3**	**6**	**1**	**6**	**0**	**2**
NE3(a)	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NE7	✓				✓	✓				✓	✓				✓	✓				✓	✓				✓
NE10											✓					✓					✓				
NE14											✓		✓			✓		✓			✓		✓		
NE17	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	
NE19	✓	✓	✓			✓	✓	✓	✓		✓	✓	✓			✓	✓	✓			✓	✓	✓		
Netherlands Total	**4**	**3**	**3**	**2**	**1**	**4**	**3**	**3**	**3**	**1**	**6**	**3**	**4**	**2**	**1**	**6**	**3**	**4**	**2**	**2**	**6**	**3**	**4**	**2**	**2**

APPENDIX 10 (continued)

Port No.	Oily Tank Washing					Dirty Ballast Water					Oily Bilge Water					Oil Sludge					Used Lubricating Oil				
	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O
NO2	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
NO6	✓		✓			✓		✓			✓		✓			✓		✓							
NO7																✓	✓				✓	✓			
NO9	✓					✓					✓					✓									
NO10	✓		✓								✓		✓			✓		✓			✓		✓		
NO12											✓		✓			✓		✓			✓		✓		
NO13	None provided																								
NO16	No facilities provided in port - ordered in from other ports in the region																								
NO17	✓	✓	✓	✓							✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	
NO19	✓		✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		✓
NO20	None provided																								
NO24	None provided																								
NO29	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
NO33	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
NO43											✓				✓	✓				✓	✓				✓
NO44	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
NO45											✓		✓			✓		✓			✓		✓		
NO51	✓	✓	✓								under construction										✓	✓	✓		
NO53	✓			✓		✓			✓																
NO57	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
NO59	✓			✓		✓					✓					✓			✓		✓			✓	
NO60																					✓	✓			
Norway Total	**13**	**2**	**10**	**3**	**1**	**10**	**0**	**7**	**1**	**1**	**14**	**1**	**11**	**1**	**2**	**15**	**2**	**11**	**2**	**2**	**15**	**4**	**11**	**2**	**2**
UK1	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK2											✓	✓				✓	✓				✓	✓			
UK3											✓			✓							✓			✓	
UK4	✓		✓			✓		✓			✓		✓			✓		✓			✓				
UK5	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		

APPENDIX 10 (continued)

Port No.	Oily Tank Washing					Dirty Ballast Water					Oily Bilge Water					Oil Sludge					Used Lubricating Oil				
	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O
UK6	not handled																								
UK7																					✓	✓			
UK8											✓		✓			✓		✓			✓	✓			
UK11																					✓	✓			
UK13(a)	✓	✓		✓		✓	✓		✓		✓		✓			✓		✓			✓		✓		
UK14	✓		✓								✓		✓			✓		✓			✓		✓		
UK15	✓	✓																			✓				✓
UK18	✓	✓				✓	✓				✓		✓			✓		✓			✓		✓		
UK19	None provided																								
UK22	✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		✓			✓		✓		
UK26	✓			✓	✓						✓		✓		✓	✓		✓		✓	✓		✓		✓
UK29	✓			✓		✓			✓																
UK33	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK39											✓	✓				✓	✓				✓	✓			
UK41	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK42	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK43	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK44	✓		✓			✓		✓			✓		✓			✓		✓			✓	✓	✓		
UK45																					✓	✓			
UK46																					✓				
UK47 etc	✓		✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		✓
UK49											✓		✓								✓		✓		
UK51	✓	✓				✓	✓				✓	✓				✓	✓				✓		✓		
UK53 etc						✓			✓		✓	✓			✓	✓	✓			✓	✓	✓			✓
UK58	None provided																								
UK59																✓		✓							
UK65	✓			✓		✓			✓		✓			✓	✓										
UK66	✓			✓		✓			✓		✓			✓		✓			✓		✓			✓	
UK67	✓		✓								✓		✓			✓		✓			✓		✓		

APPENDIX 10 (continued)

Port No.	Oily Tank Washing					Dirty Ballast Water					Oily Bilge Water					Oil Sludge					Used Lubricating Oil				
	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O
UK68(a)	✓			✓		✓			✓		✓			✓		✓			✓		✓			✓	
UK70	✓				✓	not applicable					✓			✓		✓				✓	✓				✓
UK72	None provided - see port notes																								
UK73	None provided																								
UK76	✓			✓		✓			✓																
UK77											✓		✓			✓		✓			✓			✓	
UK78	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK79	None provided																								
UK Total	**24**	**4**	**13**	**8**	**3**	**20**	**3**	**11**	**8**	**1**	**28**	**4**	**19**	**6**	**4**	**26**	**4**	**19**	**2**	**4**	**32**	**8**	**17**	**4**	**5**
Grand Total	**49**	**11**	**31**	**15**	**6**	**41**	**9**	**25**	**12**	**7**	**59**	**10**	**43**	**10**	**10**	**57**	**12**	**43**	**7**	**11**	**62**	**17**	**41**	**9**	**11**

NOTES:

Different categories have been used than for the MEPC Circular data appearing in Appendix 1.
The data from the MEPC Circular is from a period 3-4 years before the surveys.

PORT NOTES:

NE3(a) – Tank vessels can berth at shore reception facilities or a barge can be ordered
NO43 – All facilities are by barge only
UK4 –No requests have ever been received for facilities
UK6 – Specifically does not provide Annex I facilities – does not handle oily wastes
UK18 – Uptake levels are not known as arranged direct with external contractors
UK44 – 150 vessels using quayside tanks are inshore fishing vessels only
UK47 etc – "Other" facilities are available on request throughout the 7 ports making up this group
UK58 – "Other" = bunkers for drums
UK59 – 1000 vessels using this port are ferries between the UK and Belgium – vessels use UK facilities as these are cheapest
UK72 – None specifically provided but oily waste is placed in skips

APPENDIX 11

LEVELS OF UPTAKE OF MARPOL 73/78 ANNEX 1, II, IV AND V FACILITIES

Section (A) – Annex I uptake levels

Port	Approx no of vessels using facilities under survey 1	Approx no of vessels using facilities under Survey 2	No. of vessels using port - Survey 1	No. of Vessels using port - Survey 2	% uptake under Survey 1	% uptake under Survey 2
B1	1200	1200	16105	16105	7.45	7.45
D3	200	200	2300	2300	8.70	8.70
D4	1		23		4.35	
G1	144	179	2721	2588	5.29	6.92
G2	673	673	6674	6674	10.08	10.08
G4	200	200	2330	2030	8.58	9.85
NE3(a)	220	220	5500	5500	4.00	4.00
NE14	6	6	1750	1750	0.34	0.34
NE17	2000	2000	30200	30200	6.62	6.62
NO6		12		260		4.62
NO7	200		1000		20.00	
NO9	50		8900		0.56	
NO17	3000	3000	33680	33680	8.91	8.91
NO43		5	1000		0.00	
NO57	10		4578		0.22	
UK3	6	6	110	110	5.45	5.45
UK7	50	50	50	50	100.00	100.00
UK8	90	90	90	90	100.00	100.00
UK26	137	137	2734	2734	5.01	5.01
UK29	2	3	330	330	0.61	0.91
UK33	2	2	380	380	0.53	0.53
UK39	20	60	3500	4179	0.57	1.44
UK41	65	15	1500	1500	4.33	1.00
UK44		150		700		21.43
UK47		2		9000		0.02
UK49	350	350	700	700	50.00	50.00
UK51		7		823		0.85
UK59	1000	1000	1150	1150	86.96	86.96
UK65	400	300	400	300	100.00	100.00
UK68		10		673		1.49
UK77	40		40		100.00	
Totals - all ports	**10066**	**9877**	**127745**	**123806**	**7.88**	**7.98**
Totals - Both survey respondents only	**9765**	**9691**	**112204**	**112350**	**8.70**	**8.63**

APPENDIX 11 (continued)

Chi Square Table – All Respondents (26 ports for Survey 1; 24 for Survey 2)

	Survey 1	Survey 2	Total
Using facilities	10066	9877	19943
Not using facilities	117679	113929	231608
Totals	127745	123806	251551
Percentage uptake	7.88%	7.98%	

$\chi 2 = 0.83$ p (1 deg freedom) = 0.36

Chi Square Table – Survey 1 and 2 Respondents only (20 ports)

	Survey 1	Survey 2	Total
Using facilities	9765	9691	19456
Not using facilities	102439	102659	205098
Totals	112204	112350	224554
Percentage uptake	8.70%	8.63%	

$\chi 2 = 0.42$ p (1 deg freedom) = 0.52

Section (B) – Annex II Uptake Levels

Port	Approx no of vessels using facilities under survey 1	Approx no of vessels using facilities under Survey 2	No. of vessels using port - Survey 1	No. of Vessels using port - Survey 2	% uptake under Survey 1	% uptake under Survey 2
B1	2	2	16105	16105	0.01	0.01
D4	1		23		4.35	
NE3(a)	10	10	220	220	4.55	4.55
NE17	400	400	2000	2000	20.00	20.00
NE19	400		5800		6.90	
NO6		12		260		4.62
NO17	100	100	33680	33680	0.30	0.30
NO19	100	100	130	150	76.92	66.67
UK18	60	60	7900	7900	0.76	0.76
UK44		2		700		0.29
UK51		2		823		0.24
UK53	1146	1146	1398	1398	81.97	81.97
UK77	12		40		30.00	
Totals - all ports	**2231**	**1834**	**67296**	**63236**	**3.32**	**2.73**
Totals - Both survey respondents only	**1818**	**1818**	**61433**	**61453**	**2.96**	**2.96**

APPENDIX 11 (continued)

Chi Square Table – All Respondents (10 ports each for Surveys 1 and 2)

	Survey 1	Survey 2	Total
Using facilities	2231	1834	4065
Not using facilities	65065	61402	126467
Totals	67296	63236	130532
Percentage uptake	3.32%	2.90%	

$\chi 2 = 18.61$ p (1 deg freedom) = 0.000016

Section (C) – Annex IV Uptake Levels

Port	Approx no of vessels using facilities under survey 1	Approx no of vessels using facilities under Survey 2	No. of vessels using port - Survey 1	No. of Vessels using port - Survey 2	% uptake under Survey 1	% uptake under Survey 2
B1	2	2	16105	16105	0.01	0.01
D4	2		25		8.00	
G5	150	150	2330	2330	6.44	6.44
NE3(a)	50	50	5500	5500	0.91	0.91
NE7		1		1146		0.09
NE14	6		1750		0.34	
NO57	20		4578		0.44	
UK41	5	5	1500	1500	0.33	0.33
UK44		2		200		1.00
Totals - all ports	**235**	**210**	**31788**	**26781**	**0.74**	**0.78**
Totals - Both survey respondents only	**207**	**207**	**25435**	**25435**	**0.81**	**0.81**

Chi Square Table – Survey All Respondents (7 ports for Survey 1; 6 for Survey 2)

	Survey 1	Survey 2	Total
Using facilities	235	210	445
Not using facilities	31553	26571	58124
Totals	31788	26781	58569
Percentage uptake	0.74%	0.78%	

$\chi 2 = 0.39$ p (1 deg freedom) = 0.53

APPENDIX 11 (continued)

Section (D) – Annex V Uptake Levels

Port	Approx no of vessels using facilities under S1	Approx no of vessels using facilities under S2	No. of vessels using port - Survey 1	No. of Vessels using port - Survey 2	% uptake under Survey 1	% uptake under Survey 2
B1	500	1000	16105	16105	3.10	6.21
D3		1000		2300		43.48
G1	2721	2588	2721	2588	100.00	100.00
G2	6674	6674	6674	6674	100.00	100.00
G10		300		300		100.00
NE3(a)	600	600	5500	5500	10.91	10.91
NE7		5		1146		0.44
NE14	6	6	1750	1750	0.34	0.34
NE17	2000	3000	30200	30000	6.62	10.00
NO6		250		250		100.00
NO7	700		10000		7.00	
NO9	6000		8900		67.42	
NO10		1200		2592		46.30
NO12	950		1590		59.75	
NO13		500		5500		9.09
NO58	2000		4578		43.69	
NO61	500		1100		45.45	
UK3	50	50	110	110	45.45	45.45
UK6	300	300	300	300	100.00	100.00
UK7	30	50	30	50	100.00	100.00
UK8	90	90	90	90	100.00	100.00
UK11	500	500	500	500	100.00	100.00
UK13 (a)		25		520		4.81
UK18	6300	6300	7900	7900	79.75	79.75
UK26	447	447	2734	2734	16.35	16.35
UK29	165		330		50.00	
UK33	380	380	380	380	100.00	100.00
UK41	1500	1500	1500	1500	100.00	100.00
UK44		400		400		100.00
UK46	7	7	35	42	20.00	16.67
UK49	650		700		92.86	
UK51		800		800		100.00
UK59	1146	1146	1150	1150	99.65	99.65
UK65	400	300	400	300	100.00	100.00
UK66	415	245	415	415	100.00	59.04
UK67	350		4000		8.75	
UK70	20	20	100	100	20.00	20.00
UK72	113	170	113	170	100.00	100.00
UK77	4		40		10.00	
Totals - all ports	**35518**	**29853**	**109945**	**92166**	**32.31**	**32.39**
Totals - Both survey respondents only	**24199**	**25373**	**78707**	**78358**	**30.75**	**32.38**

APPENDIX 11 – Section 4 (continued)

Chi Square Table – All Respondents (26 ports for Survey 1; 24 for Survey 2)

	Survey 1	**Survey 2**	**Total**
Using facilities	35518	29853	65371
Not using facilities	74427	62313	136740
Totals	109945	92166	202111
Percentage uptake	32.31%	32.39%	

$\chi 2 = 0.17$ p (1 deg freedom) = 0.68

Chi Square Table – Survey 1 and 2 Respondents only (21 ports)

	Survey 1	**Survey 2**	**Total**
Using facilities	24199	25373	49572
Not using facilities	54508	52985	107493
Totals	78707	78358	157065
Percentage uptake	30.75%	32.38%	

$\chi 2 = 48.61$ p (1 deg freedom) = 3.12799459139497E-12 (3.1*10-12)

APPENDIX 12

AVAILABILITY OF ANNEX II FACILITIES – NOXIOUS LIQUID SUBSTANCES

KEY: A = Available R = Roadside Tanker O = Other
Q = Quayside Tanker T = Terminal Facility

Port No.	Category A					Category B					Category C					Category D					Other Liquid Substances				
	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O
B1	✓	✓	✓			✓	✓	✓			✓	✓	✓			✓	✓	✓							
Belgium Total	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
D3	None provided																								
D4	✓																								
D7	None provided																								
Denmark Total	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
G1	None provided																								
G2	None provided																								
G4	None provided																								
G5	✓		✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		✓
G10	None provided																								
G12	None provided																								
G13	None provided																								
Germany Total	**1**	**0**	**1**	**0**	**1**	**1**	**0**	**1**	**0**	**1**	**1**	**0**	**1**	**0**	**1**	**1**	**0**	**1**	**0**	**1**	**1**	**0**	**1**	**0**	**1**
NE3(a)	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
NE7	✓					✓					✓					✓					✓				
NE10	None provided																								
NE14	None provided																								
NE17	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	
NE19	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	
N'lands Total	**4**	**2**	**3**	**2**	**0**	**4**	**2**	**3**	**2**	**0**	**4**	**2**	**3**	**2**	**0**	**4**	**2**	**3**	**2**	**0**	**4**	**2**	**3**	**2**	**3**
NO2	✓		✓			✓		✓			✓		✓			✓		✓							
NO6	✓		✓			✓		✓			✓		✓			✓		✓							
NO7	✓					✓					✓					✓					✓				
NO9	✓					✓					✓					✓					✓				
NO10	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
NO12	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
NO13	None provided																								
NO16	no facilities provided in port - ordered in from other ports in region																								
NO17	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	
NO19	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	
NO20	✓				✓	✓				✓	✓				✓	✓				✓	✓				✓
NO24	None provided																								
NO29	✓		✓			✓		✓			✓		✓			✓		✓							
NO33	None provided																								
NO43	None provided																								
NO44	None provided																								

APPENDIX 12 (continued)

Port No.	Category A					Category B					Category C					Category D					Other Liquid Substances				
	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O
NO45	✓				✓	✓				✓	✓				✓	✓				✓	✓				✓
NO51	None provided																								
NO53	✓				✓	✓				✓	✓				✓	✓				✓	✓				✓
NO57	✓					✓					✓					✓					✓				
NO59	✓					✓					✓					✓					✓				
NO60	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
Norway Total	**15**	**2**	**8**	**2**	**3**	**15**	**2**	**8**	**2**	**3**	**15**	**2**	**8**	**2**	**3**	**15**	**2**	**8**	**2**	**3**	**12**	**2**	**5**	**2**	**1**
UK1	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK2	None provided																								
UK3	None provided																								
UK4	✓		✓			✓		✓			✓		✓								✓		✓		
UK5	No vessels carry chemicals to this port																								
UK6	None provided																								
UK7	None provided																								
UK8	None provided																								
UK11	✓				✓	✓				✓	✓				✓	✓				✓	✓				✓
UK13(a)	None provided																								
UK14	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK15	✓		✓			✓		✓		✓	✓		✓			✓		✓			✓		✓		
UK18	✓					✓					✓					✓					✓				
UK19	✓					✓					✓					✓					✓				
UK22	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK24	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK26	None provided																								
UK29	None provided																								
UK32	None provided																								
UK33	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK39	*see notes section below - no longer provides facilities*																								
UK41	None provided																								
UK42	None provided																								
UK43	✓		✓			✓		✓			✓		✓			✓		✓							
UK44	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK45	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK46	None provided																								
UK47 etc	None provided - not carried as cargo in any port																								
UK49	None provided																								
UK51	✓		✓			✓		✓			✓		✓			✓		✓			✓		✓		
UK53 etc	✓		✓			✓		✓			✓		✓			✓		✓			✓			✓	
UK58	None provided																								
UK59	✓		✓			✓		✓			✓		✓			✓		✓			✓			✓	
UK65	None provided																								
UK66	None provided																								
UK67	None provided																								
UK68(a)	None provided																								

APPENDIX 12 (continued)

Port No.	Category A					Category B					Category C					Category D					Other Liquid Substances				
	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O	A	Q	R	T	O
UK70	see notes section below																								
UK72	None provided																								
UK73	None provided																								
UK76	None provided																								
UK77	✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		✓	✓		✓		✓	✓	
UK78	None provided																								
UK79	None provided																								
UK Total	**17**	**0**	**14**	**1**	**1**	**17**	**0**	**14**	**1**	**2**	**17**	**0**	**14**	**1**	**1**	**16**	**0**	**13**	**1**	**1**	**16**	**0**	**13**	**3**	**1**
Grand Total	**39**	**5**	**27**	**5**	**5**	**38**	**5**	**27**	**5**	**6**	**38**	**5**	**27**	**5**	**5**	**37**	**5**	**26**	**5**	**5**	**33**	**4**	**22**	**7**	**6**

PORT NOTES:

G5 – facilities available on order via special waste management company

NE3(a) – Annex I and II – tank vessels can berth at shore facilities or a barge can be arranged

NO20, NO45, NO53 and UK11 – "Other" category of facilities is provided direct with private contractors

UK18 – direct contact between ship and waste contractor – no port involvement

UK39 – shows change between Surveys 1 and 2 – no longer provides facilities where previously all categories were provided by roadside tanker but no vessel requests

UK70 – No requests between 1970 and 2001 but can be arranged between shipping agent and waste contractor direct – no port involvement

APPENDIX 13

AVAILABILITY OF ANNEX IV FACILITIES – SEWAGE

NOTES: Boxes with information in italics indicate where there has been change between Surveys 1 and 2

Where figures for No. of Vessels using facilities were provided for both Surveys, all ports indicated that they were unchanged

	Survey 1 responses			Survey 2 responses		
Port No.	**Are facilities available (yes/no)**	**Types of facilities**	**Approx. No. of vessels**	**Are facilities available (yes/no)**	**Types of facilities**	**Approx. No. of vessels**
B1	yes	chemical & biological treatment	2	yes	<10 vessels, 2 cruise ships	2
D3	no			no		
D4	yes	pump-station	2			
D7	yes	pipeline from jetty to county facilities 10 km away	0	yes	by pipeline at certain berths	0
G1	no			no		
G2	yes	road tanker		yes	road tanker	
G4				yes		
G5	yes	one fixed system, mainly for regional authority ships	150	yes	fixed system. Mostly regional authority ships	150
G10				no		
G12				no		
G13				yes	partly fixed facilities by pipe, rest by tank car	
NE3(a)	yes	barges for most navy vessels and cruise ships	50	yes	most naval vessels and cruise ships	50
NE7				yes	1 small inland barge	1
NE10				no		
NE14	no		6	no		
NE17	yes	vacuum trucks - but hardly any/no demand	0	yes	vacuum trucks	almost 0
NE19	no					
NO2	no					
NO7	no					
NO9	no					
NO10	no			no		
NO12	yes	tank container	0			
NO17	no			no		
NO19	yes	private contractor can provide road tanker on request		yes	private contractor can provide road truck on request	
NO24	no					
NO29				yes	by road to town purification facilities	
NO43				no		
NO44	no			no		
NO45	*no*	*these will be provided to international ferries etc in 2001*		*yes*	*Limited. International ferries, charter boats and local ferries have one reception point since 2001*	
NO51	no					
NO53				no		

APPENDIX 13 (continued)

Port No.	Survey 1 responses			Survey 2 responses		
	Are facilities available (yes/no)	Types of facilities	Approx. No. of vessels	Are facilities available (yes/no)	Types of facilities	Approx. No. of vessels
NO57	yes	roadside tankers	20			
NO59				yes		
NO60	no					
UK1	yes	quay connection to foul sewer or road tanker				
UK3	no			no		
UK4				yes	road tanker by prior arrangement, but no requests	0
UK5	no			no	would use commercial septic tank contractors if required	
UK6	no			no		
UK7	no			no		
UK8	no			no		
UK11	yes	sewage tank pump-outs available at 3 locations on canal, although not at ports	150	yes	sewage tank pump outs at 3 locations on canal but not in ports	
UK13 (a)				no		
UK14	no	but - pump-out facility for yachts in marina		no	but - pump out facility for yachts in marina	
UK15	yes	waste bins on quayside	60			
UK18	no			no		
UK22	no			no		
UK26	no			no		
UK29	no	ships visiting are fitted with sewage plants		no	Annex IV covers new tonnage from 2003. Existing tonnage exempt until 2013	
UK33	no			no		
UK39	yes	on request		yes	on request	
UK41	yes	portable road tankers	5	yes	portable road tankers	5
UK42	yes	2 contractors available to take sewage waste via road tanker	0			
UK43	yes	road tankers operated by contractors if required		yes	road tankers operated by contractors	
UK44				yes	road tanker - pump out at yacht marina	2
UK45	yes	pump out	0			
UK46	yes	only in marinas and in extreme cases for others, provided by roadside tankers		yes		
UK47 etc	no			yes	only in marinas and in extreme cases where vessel requires this service, provided by roadside tankers	
UK49				no		
UK51				no		
UK53 (a)	no			no		

APPENDIX 13 (continued)

Port No.	Survey 1 responses			Survey 2 responses		
	Are facilities available (yes/no)	Types of facilities	Approx. No. of vessels	Are facilities available (yes/no)	Types of facilities	Approx. No. of vessels
UK58				no		
UK59	no			no		
UK65	no			no		
UK66	no			no		
UK67	no					
UK68 etc				no		
UK72	no			no		
UK76	no					
UK77	no					
UK78				no		

APPENDIX 14

AVAILABILITY OF ANNEX V FACILITIES – GARBAGE

NOTES: No port completing both Surveys indicated any change in provision between them

Totals refer to the number of ports by country which provided Annex V facilities, combining all survey returns

KEY: A = facilities available
B = segregation/recycling used
C = contractor disposes
D = other

	Annex V - Garbage																							
	Category 1				Category 2				Category 3				Category 4				Category 5				Category 6			
Port No.	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
B1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Belgium totals	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**			
D3	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
D4	✓				✓				✓				✓				✓				✓			
D7	✓	✓			✓	✓			✓	✓			✓	✓			✓	✓						
Denmark totals	**3**	**1**	**1**		**3**	**1**	**1**		**3**	**1**	**1**		**3**	**1**	**1**		**3**	**1**	**1**		**2**		**1**	
G1	✓		✓		✓		✓	✓	✓		✓		✓		✓		✓		✓		✓			✓
G2	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
G4	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓					
G5	✓				✓				✓				✓				✓				✓			
G10	✓		✓						✓		✓		✓		✓		✓		✓					
G12	✓				✓				✓				✓				✓							
G13	✓		✓		✓		✓		✓		✓						✓		✓					
Germany totals	**7**		**5**		**6**		**3**	**1**	**7**		**5**		**6**		**4**		**7**		**5**		**3**		**1**	**1**
NE3(a)	✓				✓				✓				✓				✓				✓			
NE7	✓				✓				✓				✓				✓							
NE10	✓				✓				✓				✓				✓							
NE14	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
NE17	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓
NE19	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
Netherlands totals	**6**	**1**	**2**	**1**	**6**	**1**	**2**	**1**	**6**	**1**	**2**	**1**	**6**	**1**	**2**	**1**	**6**	**1**	**2**	**1**	**4**	**1**	**2**	**1**
NO2	✓				✓				✓				✓				✓				✓			
NO6	✓		✓		✓		✓		✓		✓		✓		✓		✓	✓			✓		✓	
NO7	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
NO9	✓				✓				✓															
NO10	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
NO12	✓	✓			✓	✓			✓	✓			✓	✓			✓	✓			✓		✓	
NO13	✓				✓				✓				✓				✓				✓			
NO17	✓	✓	✓		✓	✓		✓	✓	✓			✓	✓			✓	✓		✓	✓		✓	
NO19	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
NO20					✓	✓	✓		✓	✓			✓	✓			✓	✓						
NO29	✓		✓		✓		✓		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓		✓	
NO33	✓				✓				✓				✓				✓				✓			
NO43	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
NO44	✓				✓				✓				✓				✓				✓			

APPENDIX 14 (continued)

Port No.	Annex V - Garbage																							
	Category 1				Category 2				Category 3				Category 4				Category 5				Category 6			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
NO45	✓			✓	✓			✓	✓			✓	✓			✓	✓			✓	✓			✓
NO51	✓		✓						✓		✓		✓	✓	✓		✓	✓	✓					
NO53	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓			✓
NO54	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
NO58	✓	✓	✓		✓		✓		✓	✓	✓		✓	✓	✓		✓		✓	✓				
NO60	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
NO61	✓			✓	✓			✓	✓			x	✓			✓	✓			✓				
Norway totals	**20**	**3**	**12**	**2**	**20**	**3**	**11**	**2**	**21**	**5**	**11**	**2**	**20**	**6**	**11**	**2**	**20**	**6**	**10**	**4**	**16**		**10**	**2**
UK1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK2	✓				✓				✓				✓				✓				✓			
UK3													✓		✓		✓		✓					
UK4	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK5	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK6	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓					
UK7					✓		✓		✓		✓													
UK8	✓				✓				✓				✓				✓							
UK11	✓		✓						✓		✓		✓		✓		✓		✓					
UK13(a)	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK14	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK15	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓					
UK18	✓				✓				✓				✓				✓				✓			
UK22	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓					
UK26	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓					
UK29	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK33	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK39	✓		✓		✓		✓		✓		✓		✓		✓		✓	✓						
UK41	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK42	✓		✓		✓	✓			✓		✓		✓		✓		✓		✓					
UK43	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK44	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK45									✓		✓													
UK46	✓		✓		✓		✓		✓	✓	✓		✓	✓	✓		✓		✓					
UK47 etc	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓					
UK49	✓		✓		✓		✓		✓	✓	✓		✓		✓		✓		✓					
UK51	✓		✓										✓		✓									
UK56	✓				✓				✓				✓				✓							
UK59	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓		✓	
UK53(a)	✓		✓						✓		✓		✓		✓		✓		✓					
UK65	✓		✓										✓		✓		✓		✓					
UK66	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓					
UK67	✓		✓		✓	✓			✓		✓		✓		✓		✓		✓					
UK68etc	✓			✓	✓			✓	✓			✓	✓			✓	✓			✓	✓			✓
UK70	✓	✓			✓	✓			✓	✓			✓	✓			✓				✓			

APPENDIX 14 (continued)

Port No.	Annex V - Garbage																							
	Category 1				Category 2				Category 3				Category 4				Category 5				Category 6			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
UK72	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓	
UK76	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓					
UK77	✓		✓		✓		✓		✓		✓		✓		✓		✓		✓					
UK totals	**35**	**4**	**29**	**2**	**32**	**6**	**23**	**2**	**35**	**5**	**29**	**2**	**36**	**4**	**30**	**2**	**35**	**3**	**28**	**2**	**16**	**2**	**12**	**2**
Grand Total	**72**	**10**	**50**	**6**	**68**	**12**	**41**	**7**	**73**	**13**	**49**	**6**	**72**	**13**	**49**	**6**	**72**	**12**	**47**	**8**	**42**	**3**	**26**	**6**

APPENDIX 15

WASTE RECEPTION AND HANDLING PLAN DATA

NOTE: Data outlined in boxes indicates changes between surveys

KEY: A = Port Users C = Terminal Operators
B = Waste Contractors D = Local Government Agencies

			x - no plan				✓ - has plan										
	Does port have waste handling and reception plan yes/no		Devel plan in own right		Devel plan as part of regional plan		Contains info on waste reception facilities		Groups with access to plan								Other
									A		B		C		D		
Port No.	S1	S2	S1	S2	S1	S1	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	
B1	x	✓	✓		✓			✓		✓		✓		✓		✓	
Belgium Total	**0**	**1**	**1**	**0**	**1**	**0**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**	**1**	**0**
D3	x	✓	✓		x			✓		✓		✓		✓		✓	
D4	✓						✓		✓		✓		✓		✓		
D7	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Denmark Total	**2**	**2**	**1**	**0**	**0**	**0**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**0**
G1	x	x	✓	✓	x	✓											
G2	x	x	✓	✓	x	x											
G4		x		✓		✓											
G5	x	x	x	x	✓	✓											
G10		x		✓		✓											
G12		x		✓		✓											
G13		x		x		✓											
Germany Total	**0**	**0**	**2**	**5**	**1**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
NE3	x	x	✓	✓	Possibly												
NE7		x		✓		x											
NE10	x	x	x	x	x	x											
NE14	✓	✓					✓	✓	✓	✓	x	x	✓	✓	✓	✓	
NE17	x	✓	✓		✓			✓		x		x		x		✓	✓
NE19	x		✓		✓												
N'lands Total	**1**	**2**	**3**	**2**	**2**	**0**	**1**	**2**	**1**	**1**	**0**	**0**	**1**	**1**	**1**	**2**	**1**
NO2	x																
NO6		✓								x		✓		✓		x	
NO7	x		✓		x												
NO9	✓																
NO10	x	x	✓	✓	✓	✓											
NO12	✓						x		✓		✓		x		✓		
NO13		x		x		x											
NO17	x	x	✓	✓	x	x											
NO19	x	x	x	✓	✓	x											

APPENDIX 15 (continued)

	Does port have waste handling and reception plan yes/no		x - no plan				✓ - has plan										
			Devel plan in own right		Devel plan as part of regional plan		Contains info on waste reception facilities		Groups with access to plan								
									A		B		C		D		Other
Port No.	S1	S2	S1	S2	S1	S1	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	
NO20	✓	✓					x	x	✓	✓	✓	✓	✓	✓	✓	✓	
NO29		✓						✓		✓		✓		✓		✓	✓
NO30		x		✓		✓											
NO33	x	x	x	x	x	✓											
NO43		x		✓		x											
NO44	x	x	✓	✓	✓	✓											
NO45	x	x	✓	✓	x	x											
NO51	✓						✓		✓		✓		✓		✓		
NO53		✓						✓		✓		✓		✓		x	
NO57	x		✓		x												
NO59	✓	✓					x	✓	✓	✓	✓	✓	✓	✓	✓	✓	
NO60	x		✓		x												
Norway Total	**5**	**5**	**7**	**7**	**3**	**4**	**1**	**3**	**4**	**4**	**4**	**5**	**3**	**5**	**4**	**3**	**1**
UK1	✓						✓		✓		✓		✓		✓		✓
UK2	x		✓		x												
UK3	✓	✓						✓		✓		x		x		x	✓
UK4		✓						✓		✓		✓		✓		✓	✓
UK5	✓	✓						✓	✓	✓	✓	✓	x	✓	x	✓	
UK6	✓	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	
UK7	✓	✓						x	✓	✓	✓	✓	x	x	✓	✓	
UK8	✓	✓						✓	✓	✓	✓	✓	N/A	N/A	✓	✓	
UK11	✓	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	
UK13		✓						✓		✓		✓		✓		✓	
UK14	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK15	✓						✓		✓		N/A		✓		N/A		✓
UK18	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
UK19	✓						✓		✓		✓		N/A		✓		
UK22	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
UK24	✓						✓		✓		✓		✓		✓		
UK26	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
UK29	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK32	✓						✓		✓		✓		✓		✓		
UK33	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK39	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
UK41	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK42	✓						✓		✓		✓		✓		✓		✓
UK43	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK44		✓						✓		✓		✓		✓		✓	
UK45	✓						x		✓								
UK46	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

APPENDIX 15 (continued)

	Does port have waste handling and reception plan yes/no		x - no plan				✓ - has plan										
			Devel plan in own right		Devel plan as part of regional plan		Contains info on waste reception facilities		Groups with access to plan								
									A		B		C		D		Other
Port No.	S1	S2	S1	S2	S1	S1	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	
UK47	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK49	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK51		✓						✓		✓		✓		x		✓	✓
UK53	✓	✓					✓	✓	✓	✓	✓	x	✓	x	✓	✓	
UK58		✓						✓		✓		x		x		x	
UK59	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
UK65	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
UK66	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
UK67	✓						✓		✓		✓		✓		✓		
UK68		✓						✓		✓		x		✓		x	✓
UK70	✓	✓					✓	✓	✓	✓	x	x	✓	✓	✓	✓	
UK72	x	✓						✓		✓		x		x		✓	✓
UK76	✓						✓		✓		✓		✓		✓		
UK77	✓						✓		✓		✓		✓		✓		
UK78		✓						✓		✓		✓		N/A		✓	
UK Total	**33**	**31**	**1**	**0**	**0**	**0**	**26**	**30**	**32**	**31**	**29**	**25**	**27**	**23**	**29**	**28**	**16**
Grand Total	**41**	**41**	**15**	**14**	**7**	**10**	**30**	**38**	**39**	**39**	**35**	**33**	**33**	**32**	**36**	**36**	**18**

APPENDIX 16

CHARGING FOR WASTE RECEPTION FACILITIES

Port No.	Current System (plus comments)	Has Government specified system? YES/NO (plus comments)
B1	Other. Shipping line has to pay a warranty to port authority according to characteristics of vessel. If vessel uses another facility, and has proof of use, the warranty is paid back	NO. No change as the warranty system has been worked out between all ports and approved by the Ministry of the Environment.
D3	Indirect Charge (no special fee)	NO
D7	Indirect Charge (no special fee)	NO
G1	Combined	NO – however increasing the percentage of the direct charge is being discussed but no decision made at December 2002
G2	Indirect – except liners which enter port of the state 24 times per year – no charge for these	YES. No special fee
G5	Indirect – except when exceeding a maximum quantity. Then a combined system is used	YES. Ships divided into 5 groups by gross tonnage – fixed price for each size.
NE10	Indirect	NO
NE14	Combined. However, port is for passenger ferries which will normally use UK facilities as these are cheaper and therefore do not use facilities in the Netherlands	NO
NE17	Direct.	Not yet decided. Notes that at the end of 2002 there were 2 systems under discussion by the Government but no decision had been made.
NO10	Other – this is a terminal so operators provide service to all vessels within normal operations	NO
NO19	Direct	NO
NO20	Combined	NO
NO44	Direct	NO
UK3	Indirect	NO
UK5	Indirect	NO
UK6	Direct	NO
UK7	Indirect	NO
UK8	Indirect	NO
UK11	Other. Licence fee includes disposal of normal domestic waste but chemical disposal is charged at contractors' prices.	Don't know
UK14	Direct. Will include charges in port dues with effect from October 2003 (or when UK legislation requires this)	NO. However, believes the UK Government will specify a system at some point.
UK18	Combined. Garbage within port dues; oily and cargo wastes, dunnage etc. direct via contractor. Port will increase charges to cover additional administration costs	NO
UK22	Other. No specific charges above port dues	NO
UK26	Direct. In addition to direct charge, some shipping companies use their own contractors to dispose of certain wastes.	NO

APPENDIX 16 (continued)

Port No.	Current System (plus comments)	Has Government specified system? YES/NO (plus comments)
UK29	Direct. Only charge for disposal of solid waste. Residues are received by company and processed	NO
UK33	Other. Cost of garbage skips are borne by a stevedoring company operating at the harbour. Vessels which use a road tanker (very infrequent) deal with cost direct through their shipping agent	NO
UK39	Indirect	NO
UK43	Other. For garbage, no direct charge at most terminals. For all other wastes, pay a direct charge. Port Authority fees do not include a garbage disposal fee	NO
UK46	Combined. Changed from Indirect charge to combined system in January 2003	NO
UK49	Other. At present, only vessels with special wastes are charged	NO
UK53	Combined. Costs are supposedly covered through harbour dues, though no increases have been made to allow for this expense. Make no charge for small amounts landed in barrels or drums or put into 1 tonne reception tank. Do charge for collection and disposal of quantities larger than 2000 litres.	NO
UK59	Indirect	NO
UK65	Indirect	NO
UK66	Indirect	NO

PORT NOTES:

NE17 Port wants no more than 2.5% increase in port dues but, at the time of the survey, this looked like being 3.5%. The port was negotiation and needed a guarantee from the Ministry that it would not have to pay the difference, or that the Government would make the difference up. Port also in negotiation over waste inspection costs for waste disposed of in UK

UK14 Harbourmaster believes that it will be difficult to charge ships fairly under a system based on engine size, passenger and crew numbers, distance travelled etc. because the quantity of waste to be landed does not necessarily increase with ship size.

UK18 Harbourmaster indicates that the least modifications to the current system, the better. Even a small change will cause considerable expense with more paperwork for both ports and ships. Also considers it will probably take several years to achieve an almost effective working system.

APPENDIX 17

INSPECTION AND ADMINISTRATION UNDER EU DIRECTIVE

(NOTE: This section is not applicable to Norwegian ports)

Responses from ports to the following questions:

3.1 Has any arrangement been made for extra vessel inspections required under the Directive? Y/N
3.2 Who currently carries out vessel inspections (e.g. for Port State Control)?
3.3 Will the same Organization conduct inspections under the Directive? Y/N
3.4 If NO, please specify the Organization that will do them
3.5 Have any arrangements been made for the additional administrative personnel and costs associated with introduction of the Directive? Y/N
3.6 If YES, please give details
3.7 Who will carry out these administrative duties? (a) from within current staffing of port; (b) additional staff of (c) other

Port No.	3.1	3.2	3.3	3.4	3.5	3.6	3.7
B1	YES	Port State Control	YES		YES	Federal Ministry of Mobility sent round administrative instructions to PSC officers in order to start enforcement by 1 January 2003	(a)
D3	NO	Maritime Authority			NO		(a)
D7	This is a fishing port used by Danish fisherman and does not have additional arrangements or control at the moment in this port						
G1	YES	Water police	YES	Administrative responsibility is imposed on port authority	YES	Surcharge on harbour dues of about €0.15 per 100 GT	(a)
G2	YES	Harbour police and harbour administrative personnel	YES		YES	3 additional staff; €170,000 per year	(b)
G5	NO	Marine Police	NO	Port Authority	NO		(a)
NE14	NO	NSI and MCA	YES		NO		(a)
NE17	NO	PSC Inspectors	YES		YES	In negotiation with Government over level of increase in port dues. Port seeks 2.5% but Govt wants 3.5%. Port requesting Govt cover difference.	(c)
UK3	NO	MCA	YES		NO		(a)
UK5	NO	MCA	YES		NO		
UK6	NO	Own marine staff	YES		NO		(a)
UK7	NO	MCA	YES		NO		(a)
UK8	NO	MCA	YES		NO		(a)
UK14	NO	MCA	YES		NO		(a)
UK18	NO	MCA	YES		YES	Charges will increase	(a)
UK22	NO	MCA	YES		NO		
UK26	NO	MCA	YES		NO		(a)
UK29	NO	MCA	YES		NO		(a)
UK33	NO	MCA	YES		NO		
UK46	NO	MHIC	YES		NO		(a)
UK49	NO	MCA	YES		NO		
UK59	NO	MCA	YES		NO		(a)
UK65	NO	MCA	YES		NO		(a)

APPENDIX 18

VALIDATION OF SURVEY DATA

Section (A) – Validation of data on the provision of MARPOL Annex I Facilities in Appendix 10 with IMO MEPC Circular Data

Notes:

No contemporaneous data is available from the time of the Surveys therefore comparisons have been made with MEPC Circular data as follows:

1. Comparison with MEPC Circular Data in Appendix 1 – uses the most recent circular available prior to the surveys (no later than October 1998)
2. Comparison with MEPC.3/Circ3/Add.4 of 6 September 2002 (IMO Ref. T5/1.01) - UK data only.
3. Comparison with MEPC.3/Circ.4 of 18 November 2003 (IMO Ref. T5/101)

Where "Partial" is indicated in the column "Agree", the survey data is duplicated by at least one of 1-3 above.

Where "N/A" is indicated in the column "Agree", no data has been provided by ports to the IMO for MEPC Circulars

Port No.	Agree	Comments
B1	Yes	MEPC Circulars all state that all facilities are available for Annex I
D3	Yes	Data confirmed using http://www.mst.dk/Portwaste website identified as data source in 2. and 3. for Danish ports
D4	Yes	
D7	Yes	
G1	Yes	1 and 3 both match
G2	Partial	No match with 1 - data varies between Circs.; match with 3.
G4	Partial	No match with 1, match with 3 - shows additional facilities available post surveys
G5	No	1 and 3 both indicate all facilities, survey indicates only some
G10	Partial	No match with 1, match with 3 - shows additional facilities available post surveys
G12	Yes	1 matches; 3 shows additional facilities available post surveys
G13	Yes	1 and 3 both match
NE3(a)	Yes	1 and 3 both match
NE7	Yes	1 and 3 both match
NE10	N/A	Unable to verify as data not provided to IMO MEPC Circulars
NE14	N/A	Unable to verify as data not provided to IMO MEPC Circulars
NE17	Yes	1 and 3 both match
NE19	Partial	No match with 1, match with 3 - shows additional facilities available post surveys
NO2	Yes	1 and 3 both match
NO6	Partial	No match with 1, match with 3 - shows less facilities available post surveys
NO7	Yes	1 and 3 both match
NO9	Yes	1 and 3 both match
NO10	Yes	1 and 3 both match
NO12	N/A	Unable to verify as data not provided to IMO MEPC Circulars since 1990
NO29	N/A	Unable to verify as data not provided to IMO MEPC Circulars
NO33	N/A	Unable to verify as data not provided to IMO MEPC Circulars
NO43	Yes	1 matches; no data to IMO for 3
NO44	N/A	Unable to verify as data not provided to IMO MEPC Circulars
NO45	Yes	1 and 3 both match
NO51	No	1 and 3 both indicate all facilities, survey indicates only some
NO53	N/A	Unable to verify as data not provided to IMO MEPC Circulars
NO57	Yes	1 and 3 both match

APPENDIX 18 (A) (continued)

Port No.	Agree	Comments
NO59	No	1 shows more facilities than surveys; no data provided for 3
NO60	N/A	Unable to verity as data not provided to IMO MEPC Circulars
UK1	Yes	1, 2 and 3 all match
UK2	No	Reduction from 1 (all categories) to 3 (single category only) - survey shows only some facilities provided
UK3	Partial	No match with 1 or 2, but does match with 3
UK4	Yes	1, 2 and 3 all match
UK5	No	1 does not match; data not provided for 2 and 3
UK7	Yes	No IMO return for 1; 2 and 3 match
UK8	Partial	No match with 1; match with 2; no match with 3 - reduction from all facilities at 1 to only 2 categories at 3
UK11	N/A	Unable to verity as data not provided to IMO MEPC Circulars
UK13(a)	Yes	1, 2 and 3 all match
UK14	Yes	1, 2 and 3 all match
UK15	N/A	Unable to verity as data not provided to IMO MEPC Circulars
UK18	Yes	1, 2 and 3 all match
UK22	Yes	1, 2 and 3 all match
UK26	Yes	No IMO return for 1; 2 and 3 match
UK29	Yes	No IMO return for 1; 2 and 3 match
UK33	Yes	1, 2 and 3 all match
UK39	Yes	1, 2 and 3 all match
UK41	No	Survey return shows more facilities available than for 1,2 and 3
UK42	Partial	1 matches; 2 and 3 show reduced provision
UK43	Yes	1, 2 and 3 all match
UK44	Partial	1 matches; 2 and 3 show reduced provision
UK45	Yes	1, 2 and 3 all match
UK46	N/A	Unable to verity as data not provided to IMO MEPC Circulars
UK47(a) etc.	Yes	1, 2 and 3 all match
UK49	Partial	1 matches; 2 and 3 show increased provision
UK51	N/A	Unable to verity as data not provided to IMO MEPC Circulars
UK53 etc.	Yes	1, 2 and 3 all match
UK59	No	Different number and types of categories identified in each MEPC Circular - no consistency
UK65	Yes	1, 2 and 3 all match
UK66	Yes	1 and 3 match; no data provided for 2
UK67	Yes	1, 2 and 3 all match
UK68	Yes	1, 2 and 3 all match
UK70	Partial	1 shows less facilities than survey; 2 and 3 match
UK76	N/A	Unable to verity as data not provided to IMO MEPC Circulars
UK77	Partial	1 shows less facilities than survey; 2 and 3 match
UK78	N/A	Unable to verity as data not provided to IMO MEPC Circulars

No. of ports: 70
No. of "Yes" 36)
No. of "Partial" 12) = 70% of total
No. of "N/A" 14 = 20% of total
No. of "No" 7 = 10% of total

APPENDIX 18 (continued)

Section (B) Validation of Survey Data for Specified Appendices

Notes:

Unless stated otherwise, data has been validated using a Port's own website and these have not been identified in order to maintain the confidentiality guaranteed to ports at the time of the Surveys.

For UK ports indicating MCA, data validated using MCA Report (MCA, 2000)

Key:
A6 Business Activities
A7 Geographical Location and Physical Environment
A8 Vessel Numbers, Types and Sizes
A9 Maximum and Minimum Vessel Sizes (GT)
A10 Availability of Annex I facilities – Oily Wastes
A12 Availability of Annex II facilities – Noxious Liquid Substances
A13 Availability of Annex IV facilities – Sewage
A14 Availability of Annex V facilities – Garbage
A15 Waste Reception and Handling Plan data

Port No.	Appendices where data is confirmed non-IMO sources
B1	A6, A7 and A8 No. of vessels per annum
D3	A10 by http://www.mst.dk/Portwaste
D4	A10, A13 and A14 by http://www.mst.dk.Portwaste
D7	A10, A12, A13 and A14 by http://www.mst.dk.Portwaste
G1	A7 and A8 No. of vessels per annum by http://www.keyports.de
G2	A7 and A8 No. of vessels per annum by http://www.keyports.de
G4	A6 and A7 by Town Council website
G13	A6 and A7 by website http://www.seaports.de
NE3(a)	A6, A7 and A8 Vessel Nos and Types, A15 including facility types
NE7	A7 by Town Council website
NE14	A6, A7 and A8 Vessel Nos and Types, A15
NE17	A6, A7, A8 and A15
NE19	A6, A7 and A15
UK1	A6, A8 vessel Nos, A10, A12, A14 and A15 by MCA
UK5	A6, A7, A8 vessel Nos, A9 max size, A10, A15
UK6	A6, A8 vessel Nos, A10, A14 and A15 by MCA
UK13(a)	A6, A7, A10 and A15
UK14	A6, A8 vessel Nos, A15 by MCA.
UK18	A6, A8 vessel Nos, A10, A12, A14 and A15 by MCA
UK22	A6, A8 vessel Nos, A9 max size, A10, A14 and A15 by MCA
UK24	A6, A8 vessel Nos, A9 max size, A15
UK29	A6, A8 vessel Nos, A9 min and max size, A10, A14 and A15 by MCA
UK32	A6, A8 vessel Nos, A9 max size, A15. A10 and A12 by MCA
UK33	A6, A10, A14and A15 by MCA
UK41	A6, A8 vessel Nos, A9 max size, A10 and A15 by MCA
UK44	A6, A8 vessel Nos and types, A10, A13, A14 and A15 by MCA
UK47(a) etc.	A6, A8 vessel Nos and Types, A10, A14 and A15 by MCA
UK58	A6, A7 and A15
UK73	A6, A8 vessel Nos, A10, A12, A14 and A15 by MCA
UK78	A6, A7 and A15