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# **The EU Directive on Port Reception Facilities for Ship-Generated Waste and Cargo Residues: current availability of facilities in the North Sea**

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## **Abstract**

The aim of this paper is to evaluate the current availability of port reception facilities within the North Sea area. The evaluation is based primarily on original survey data from the summer of 2001, supplemented by existing information from surveys conducted by the International Maritime Organization. The EU Directive on port reception facilities for ship-generated waste etc. (Directive 2000/59/EC) requires that all ports provide facilities to meet the needs of those vessels normally calling in at them. In order for the Directive to be implemented effectively, the physical availability of such facilities is vital. This paper audits the wide range of port types within the region and also outlines the wide range of vessel types using these ports, and their requirements for a range of facilities. On the basis of this analysis, conclusions are drawn about the extent to which the provision requirement of the Directive is already being met.

**Keywords: European Union, North Sea, port reception facilities, MARPOL 73/78, waste discharge.**

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## **1. Introduction**

A new EU Directive on port reception facilities for ship-generated waste and cargo residues has been developed with the aim of protecting “the marine environment from operational pollution by ships, regardless of flag, with a view to eliminating such pollution” (Commission of the European Communities, 1998). The European Commission (2000) sets out specific requirements for all EU ports to provide reception facilities for vessels normally making use of those ports. Depending on the size and business of the port, this can cover a range of ship-generated wastes and cargo residues including various types of oily waste, chemical waste and garbage. The Directive is due to be implemented by December 2002.

Article 1 of the Directive sets out its purpose, which is to “reduce the discharges of ship-generated waste and cargo residues into the sea, especially illegal discharges, from ships using ports in the Community, by improving the availability and use of port reception facilities .... thereby enhancing the protection of the marine environment” (page 83).

The Directive (Article 4, paragraph 1) requires that Member States “shall ensure the availability of port reception facilities adequate to meet the needs of ships normally using the port without causing undue delay to ships” (page 83). It stipulates (paragraph 2) that “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” (page 83).

The phrase “normally using that port” is important: it means that ports will not be required to provide facilities for vessels that are, for example, forced to tie up on their quayside because of bad weather.

The Directive focuses on the operation of ships in community ports, in particular by improving the provision and use of port reception facilities. Carpenter and Macgill (2001, page 93) outline the key requirements of the Directive:

- “all EU ports are to provide adequate reception facilities and to develop waste reception and handling plans;
- all wastes are to be delivered to reception facilities unless there is capacity on board for retention until next port of call;
- all ships are required to notify ports in advance of intention to use facilities and quantities of waste on board;
- a fee system will be introduced to encourage use of facilities; and
- 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”.

The aim of this paper is to examine this first requirement only, namely the extent to which North Sea ports are already meeting the first requirement of the Directive, that is to provide adequate reception facilities. This paper considers only the requirements placed on ports by the Directive: it does not consider requirements placed on ships making use of those ports, or the development of waste reception and handling plans.

Carpenter and Macgill (2000, page 181) observe that “A major stumbling block of MARPOL has been the lack of accurate data regarding the availability of facilities, and this issue may (also) undermine the ... EU Directive”. They also suggest that “In order for the EU to provide accurate information to vessels wishing to make use of facilities, it is recommended that a survey of all EU ports be undertaken in order to obtain the most up to date information possible”.

This paper arises from just such a survey, targeting North Sea ports in the United Kingdom, the Netherlands, Belgium, Denmark, Germany and Norway. The survey was sent out in June 2001 with follow up letters sent to ports, which had not responded in July/August of 2001. Norwegian ports have been included in the survey, although they are not subject to the requirements of the Directive, in order to provide a complete picture of current availability within the North Sea.

Of the 200 ports approached, returns covering 73 ports were received. Given that one return covered the 7 Medway Ports in the UK, the total number of returns declared in the analysis is 66. It should also be noted that some sections of the analysis refer to information from fewer ports as some failed to complete all sections of the survey. The number of surveys sent out, by country, and the resulting responses is summarized in Table 1.

Of the ports in the category “Other”: 2 are not classified as North Sea; 2 have a supervisory role for waterways only and do not operate any facilities; 3 no longer take vessels of any kind; 7 wrong addresses; 4 sent brochures, rather than completed surveys;

2 unable to complete as the ports cover a wide range of privately operated terminals using many different contractors to dispose of waste; and 1 survey included so little data that it could not be used

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## **2. North Sea Ports – General Background Information**

Contextual information for the activities of North Sea ports was obtained from questions about business activities, physical location, vessel numbers, vessel sizes and vessel origins. It emphasizes the broad variety of port types and size within the North Sea area, and the range of vessel types and sizes that they accommodate. It also illustrates the global nature of trade within North Sea ports, the importance of ports to trade within the EU and the very broad range of ports that the Directive seeks to cover.

### **Business Activities:**

Power (1995) emphasizes the importance of the North Sea as a major trade centre within the EU, and the great importance of shipping, both in terms of trade with the rest of the world and for other reasons. “It is no exaggeration to describe shipping ... as a pivotal industry for the EU” (page 45). He notes:

- “Over 90 per cent of the EU’s external trade is carried by sea.
- More than one-third of the EU’s internal trade is carried by sea.
- The EU’s ports are among the largest in the world.

- Millions of people are employed (directly or indirectly) in the EU's shipping industry and ancillary industries ...
- Billions of ECU are earned annually from shipping and related sectors.” (page 45).

Figures 1 and 2 further emphasize the importance of both shipping and the ports industry to trade within the EU, and the North Sea.

The majority of ports offer 5 or fewer different business activities (Figure 1). The port offering 15 activities is in the Netherlands. Those offering just one activity are all in the UK. The median number of activities is 5.

A very broad range of business activities takes place in the North Sea region (Figure 2), emphasizing the range and importance of the maritime ports industry to trade in the region. The majority of ports offer some form of general unloading and loading operation. In all but one case (a UK port), the ports offering this service have some other form of business activity.

For the 5 other UK ports operating under only one business activity heading, 3 are the oil terminals and 2 are fishing ports. In addition to the 9 categories explicitly identified, the Dutch port with 15 activities offers terminals for containers, cars, general cargo, gas tankers, chemical tankers and reefer vessels, and barge carriers.

## Physical Environment and Geographic location

The physical environment and geographic location of ports was considered to provide further important information for their operation. In terms of the physical environment, 42 of the 66 ports operated in one or more of the environments identified in Table 2.

24 of the 66 ports operated in other types of environment than those identified above (20 UK and 4 non-UK). Using the categories specified: 21 were located in one only (8 UK, 13 non-UK); 10 in 2 types (4 UK, 6 non-UK); 4 in 3 types (1 UK, 3 non-UK); and 7 in all 4 types (4 UK, 3 non-UK).

In terms of their geographic location (whether based in an Urban Area – City, Urban Area – Town, Rural Area or some other type of area), most are urban-based. The locations of ports are identified in Table 3.

From this table, it is apparent that a higher proportion of non-UK than UK ports are based in cities than in the UK. In contrast, a higher number of UK ports are based in a rural location. Of the 7 ports with an entry of “Other”, 4 UK ports provided additional information. Two are fishing ports only while one is a manmade structure built in the Forth Estuary and one is a floating buoy, situated in the mouth of the River Humber which uses a pipe to transport oil to shore, 3 miles away. In the case of the 1 non-UK port, this is a recreation beach. For the category “mixed”, 1 port operated in a city/rural



area, 8 in town/rural, 1 in city/town/rural, 2 in city/rural and 1 in all areas, this latter being the port which operated by a recreation beach.

The locales within which 65 ports operate, combining information on both physical and geographic location, are summarized in Figure 3. One port did not provide this information.

### Volumes/Types of Vessel Traffic and Origins

Data on the average number of vessels calling in at a port each year was received from 61 ports, showing that there are around 277,000 vessel movements per annum through these ports. Vessel numbers ranged from 20 bulk carriers per annum in one UK port to 33,680 vessels per annum, from 7 different categories of vessel in one Norwegian port. One UK port receives an of average 5,736 vessels per annum from all 10 non-passenger categories shown in Figure 4 below. Interestingly, there is no one example of a typical North Sea port. The Directive needs to be broad enough in its requirements to cover a range of very different port types and sizes.

#### i. Non-passenger vessels

Vessel numbers per annum within the 61 ports, for 10 specific categories of non-passenger vessels calling in at 61 ports is summarized in Figure 4. By far the largest category here are General Cargo vessels. The 11<sup>th</sup> and final category is “Other”. This is the second largest category, and represents 21,271 vessels from 62 non-passenger and one passenger category of vessels calling in at ports. These include fishing boats,

offshore supply vessels, navy vessels, barges etc., and were identified by ports when asked to provide information on other types of vessels calling in at them.

ii. Passenger Vessels

32 ports receive some form of passenger vessel, of which 27 were used by approximately 32.6 million passengers each year. The remaining 5 ports did not provide passenger numbers. One UK port receives the largest number of passengers per annum: 16,315,000 passengers each year, using 2 categories of vessels, Cruise Ships and Ro-Ro Passenger Ships (150 and 2,500 ship movements respectively). However, this port is only fifth in terms of vessel numbers. By contrast, 2 ports in Norway jointly have the lowest passenger numbers per annum: 1,500 passengers each (5 and 3 cruise ships respectively). However, another Norwegian port has the highest number, with 28,550 vessels per annum, of which all but 500 are passenger ferries.

Vessel numbers (actual) and passenger numbers (000s) per annum for the 27 ports providing both types of information are summarized in Figure 5.

A country-specific disaggregation of this information (Table 4) emphasizes the importance of this transport mode for Norway: 14 ports receive nearly 66,000 vessels per annum, with one port responsible for over one third of all vessel numbers.

iii. Other Vessels – non-passenger and passenger

63 different “other” vessel types have been listed including dredgers, pleasure craft, offshore supply vessels and fishing vessels. Of these 63 types, 62 are non-passenger vessel types, accounted for 21,571 vessel movements. Specific information is not

provided on these vessels as there is a very wide variation in the types and number of “other vessels” visiting ports each year. The range extends from one port in the Netherlands which received an additional 11 vessel types under the “other” heading, accounting for 1639 vessel movements, to one UK port which lists 1 vessel type, with only 7 vessel movements. Although the category “catamaran passenger ship” appears in Figure 5, this was the only passenger type vessel that was listed under the “other” category. These vessels provide a passenger service in one Norwegian port, with 13,000 vessels calling in at the port each year, carrying around 200,000 passengers.

#### Vessel Size

Information about the maximum and minimum sizes of vessels using different ports facilitates comparisons between ports based on size of vessels. The gross tonnage (GT) of a ship is based on its measurements, i.e. height, length and breadth, and its capacity is ascertained by measuring all covered spaces in cubic feet.

Of the 66 ports, 50 gave details of the maximum vessel size that could be accommodated, and 44 gave details of minimum vessel size, which has been considered regardless of vessel type. The largest in the “maximum size” category, the largest indicated was an oil tankship of 300,000 GT accepted by a UK Marine Terminal while the smallest in that category was a 180 GT general cargo – multipurpose vessel, again in a UK port. In the “minimum size” category, the largest was for the same UK Marine Terminal and vessel type at 70,000 GT, while the smallest was a 50 GT passenger ferry

in a Norwegian port. 22 of the 50 ports can accept vessels up to a maximum size of 15,000 GT; 8 accepting vessels from 15,000-30,000 GT; and 7 from 30,000-45,000 GT. The vast majority of ports, therefore, have a relatively small upper limit on vessel size when compared to the one, which accepts the largest vessel size of 300,000 GT.

Of the 44 ports responding with details of the minimum size of vessel that can be accepted, 40 are of 5,000 GT or less and only one is above 20,000 GT. In fact, 34 of the 40 ports of less than 5,000 GT are actually 1,000 GT or smaller in terms of minimum acceptable vessel size.

#### Vessel Origins

64 ports provided information on the origins of vessels calling in at them and, of these, only 2 ports received vessels solely from EU countries, and a further 5 from only within the North Sea. Of the remaining 57 ports, 7 (2 Dutch and 5 UK) indicate that they trade globally without indicating ship origins.

35 ports provided specific details of 2 or more countries of origin. They identify a wide range of countries and regions including the Americas and the Middle and Far East, as well as more local traffic including the Baltic States and the Mediterranean. Ships visited one port from 14 countries ranging from within the EU and Baltic to various locations in the Caribbean and Mediterranean. A further 5 ports list 12 different vessel origins, again including the EU, Baltic and Caribbean, but also the Middle and Far East.

## Summary

Ports operate in a very wide range of physical environments and geographic locations, offering many different business activities for vessels of a wide variety of sizes and from many different countries. The EU Directive will consequently be required to cover an extremely broad range of ports, ranging from large industrial ports with a massive throughput of vessels to very small fishing ports or those based in a small rural community, with very few vessels calling in at them.

### **3. Port Reception Facilities available in North Sea Ports – Summer 2001**

#### Awareness of Directive

Of the 48 EU ports which responded, only 2 (1 Dutch and 1 UK) indicated that they had not previously been aware of the Directive. Of the remainder, 36 indicated sources of information including Government agencies, professional organisations and the European Sea Ports Organisation.

Of the 17 Norwegian ports responded, 11 were already aware of the Directive, 8 indicating that they had obtained information from Norwegian Government Circulars, the Norwegian Harbour Association and the European Sea Ports Organisation. A further 6 ports had not been aware of the Directive until they received the Survey.

## Physical Type and Ownership of facilities

64 ports indicated that they currently had facilities available. Only 2 ports, one in Norway and a Dutch Port Authority did not answer this question. However, in the case of the latter, the Port Authority does not deal directly with vessels and so this section of the survey was not relevant. Physical type of facilities available, i.e. fixed (physically attached to the quayside), floating (such as a barge which can be tied up alongside vessels on request), or mobile (for example, road tankers or skips), is summarized in Table 5 (49 responses). Numbers of ports offering one, two or all three categories are identified, and from this it can be seen that physical type of facilities vary widely, 38 ports making use of mobile facilities, 17 with some form of fixed facility and only 12 make use of floating facilities

Ownership of facilities is also quite varied and this is illustrated in Table 6 (61 responses). This table identified whether ports/terminals (P/T) own the facilities, operate them on behalf of another owner, or contract facilities into the port. Again, it identifies whether one, two or all three categories apply and in how many ports and, as can be seen, contractors are used to run reception facilities in more than two thirds of ports, while in nearly half of the ports, contractors are the sole operators and providers.

## Facilities available

### i. Annex 1 – Oily Waste

MARPOL Annex I covers 5 categories of oily waste. The number of ports providing each category is shown in Table 7. 54 ports provided details of facilities, while 1 UK port specifically stated that it does not handle this type of waste and 10 ports did not complete this question.

By combining the figures from the current survey with the IMO's 1998 MEPC Survey on availability of facilities for Annex I wastes, information is available from 104 ports. Figure 6 illustrates availability in these ports and, from the figures available, it is clear that a wide range of facilities for Annex I wastes is currently available throughout the North Sea region.

Overall, a wide range of facilities is available throughout the North Sea region, with most ports providing facilities for Oily Bilge Water, Oil Sludge and Used Lubricating Oils. In the majority of cases, roadside tankers are used to remove these oily wastes; there are many fewer quayside tanks and terminal facilities.

### ii. Annex II – Noxious Liquid Substances

Annex II wastes are divided into 5 categories, A to D plus Other Liquid Substances, which refer to the different levels of hazard from the wastes. Category A is the most hazardous, both to aquatic life and human health, while Category D is practically non-

toxic to aquatic life. Other liquid substances are those which do not fall into categories A to D.

27 ports responded as accepting some form of chemical or noxious wastes, while a further 38 indicated that no chemical tankers could be accepted by the port. Availability and type of facility by category is summarized in Table 8.

The main type of facility in use within North Sea ports which offer Annex II facilities are roadside tankers. Many fewer ports offer this type of facility than in the case of Annex I. It would appear that few vessels need to make use of this type of facility and, when again considering the physical locations of ports, only 11 operate within a chemical plant and 24 within an area offering storage for oil and chemicals. It can be assumed that vessels carrying chemicals and noxious liquid cargoes will make use of specialist port facilities, rather than requesting such facilities from a general cargo port, for example.

### iii. Annex IV - Sewage

This Annex has yet to enter into force and, until such time as it does, there is no mandatory requirement on ports to offer any facilities. The IMO (2002, page vi) indicates that “As of 21 September 2001”, despite being ratified by 81 States, “ratification by States covering an additional 4% of the gross tonnage of the world’s merchant fleet was required before the entry-into-force requirements ... were satisfied”.

Even upon entry into force, additional complications regarding Annex IV are also apparent. The first of these is that ships are allowed to discharge sewage waste outside



the 12 mile limit, and thus may not choose to make use of facilities, whether they are provided or not. More specific to the EU Directive is that, under the terms of Article 16, provision is made for the ongoing delay in ratification of Annex IV, with the statement that “as far as sewage ... is concerned, the implementation of this Directive shall be suspended until 12 months after the entry into force of Annex IV to MARPOL 73/78”.

The situation with regard to Annex IV is thus a complicated one, and it is not clear how long it will be before (if at all) facilities for sewage waste become a mandatory requirement, and whether the 12 mile limit issue will have any effect or require further legislation.

20 ports declared that they already made available facilities for the disposal of ship-generated sewage wastes; 35 declared that they did not. Of the 20 respondents offering some form of facilities, these range from pump stations, road tankers, barges, vacuum trucks, quay connection to the sewers etc.

#### iv. Annex V - Garbage

Under MARPOL 73/78, Annex V wastes are divided into 6 categories and these are:

(1) Plastic; (2) Floating dunnage, lining or packaging material; (3) Ground paper products, rags, glass, metal, bottles, crockery etc.; (4) Paper products, rags, glass, metal, bottles, crockery etc.; (5) Food waste; and (6) Incinerator ash.

55 Ports responded to the question on whether facilities were available and details of the responses appear in Table 9. Of the 55 respondents, 29 provide facilities for all of Categories 1 to 6 while only one port (in the UK) provides for only a single category.

Most ports provide some form of facilities and, in the majority of cases, are able to take all categories of garbage waste. The main service provided appears to be where a contractor comes to the vessel and both removes and disposes of the waste generated.

### Facilities by Vessel Type

Information on the availability of facilities by vessel type was provided by 63 ports and is summarized in Table 10. The category “Other” refers to a range of vessel types including gravel carriers, fishing vessels, cement carriers, car carriers, barges, yachts, pleasure cruisers and several other types of vessels.

By comparing the availability of facilities for each vessel type with actual vessels calling in at ports, it is possible to assess the completeness of current provision within the North Sea. This is a major aspect of the Directive, which states at Article 4 that “Member States shall ensure the availability of port reception facilities adequate to meet the needs of the ships normally using the port”.

Ports were asked to provide information on whether facilities were available for all of the vessel types normally calling in at them. Of the 63 ports responding to this section of the survey, 10 did not provide information on whether facilities were available by

specific vessel category, although they did specify numbers of vessels and type calling in each year. These ports account for the “did not provide information” section of Figure 7 which summarizes all responses.

Of the remaining 53 ports, 34 indicated that they were able to provide facilities for all the vessel types that would normally call in at them, ranging from one small, rural port that is visited by 40 general cargo vessels in one year, to a large mixed port with both non-passenger and passenger traffic, which can provide facilities for all 14 different categories of vessel, and is visited by over 30,000 vessels each year from 8 vessel categories. In this latter case, the port would be able to provide facilities for the remaining 6 categories of vessels, should they call in at it. This is one of 21 ports that have indicated that they provide facilities for one or more types of vessels that do not normally call in at them.

10 ports indicated that they could provide facilities for all vessel types except those falling into the category “other”. For these ports, if we consider “other” vessels as a percentage of the total number calling in at that port, as shown in Table 11, the results differ widely between ports, ranging from less than half a percent for port 53 to over 84 percent in port 59. However, in all but one port, these vessels are all small craft such as yachts and pleasure craft, fishing vessels, and supply vessels, for example. Only port number 28 receives larger vessels including 50 naval vessels and 1,300 catamaran ferries.

Table 12 examines the ports represented by the final category appearing in Figure 5, the 9 “Remaining Ports”. It considers the proportion of vessels calling in for which facilities are not provided. Only in the cases of ports 17 and 57 do such vessels account for more than 4 percent of the total number of vessels. In the other 7 ports, the vessels for which specific provision is not made all fall outside the normal core business of these ports.

Port number 57 is an oil terminal and the category of vessel apparently not provided for is oil tankships. However, it can be assumed that facilities for these vessels are provided for as part of the port’s core business. The case of port number 17 is unclear, since vessels not provided for range from small barges to gas carriers and general cargo vessels, and so it might be assumed that there is some error in the information provided in this case.

Ports were further asked to identify facilities specifically available under each of the four MARPOL 73/78 Annexes covered by the survey, together with the number of vessels which actually make use of them. Table 13 provides a summary of the number of categories of facilities provided by ports for each MARPOL Annex. For example, in the case of Annex II, 20 ports provide all categories set out by MARPOL 73/78, 2 ports provide 4 of the categories (in both cases A-D), 2 ports only provide 1 category (A) and 31 ports provide no facilities. In this case 8 ports did not provide specific information. In the case of Annex IV – Sewage, from the information provided in this section of the survey, 25 ports do already provide facilities, 33 do not and 5 did not provide information.

Finally, in order to examine actual levels of uptake of facilities, ports were asked to indicate the annual total number of vessels calling in at them, together with the number making use of facilities under each Annex. This information is set out in Table 14 which outlines the number of vessels using facilities compared to the total number of vessels using the port. In each case, only the totals for ports that provided specific numbers of vessels using facilities have been combined to provide the figures in the column “Out of”. Additional information has been provided in this table of the numbers of ports which specified that no vessels used the facilities, and those where all vessels have used them.

Using the data from ports which indicated both availability of facilities and their actual uptake (30 in the case of Annex I), it is apparent that only in the case of Annex V do more than 10 percent of vessels actually make use of reception facilities. Although clearly such a small number of ports does not provide a very accurate picture of levels of uptake, if similar levels were the norm in the majority of North Sea ports, then a major solution in reducing levels of ship-generated waste will be to make it mandatory for vessels to use the facilities already being provided. This is one of the key aspects of the Directive outlined in the introduction to this paper, i.e. that ships will be required to deliver all wastes in port, unless there is sufficient capacity of board to travel to the next port of call.

#### **4. Conclusions**

The survey findings overall show that a very broad range of port reception facilities for ship-generated waste and cargo residues for vessels visiting the North Sea region is already available, broadly meeting the requirement of Directive 2000/59/EC. Where specific facilities are not available in a particular port, there will normally be facilities available in another port locally. At the same time, a very broad range of port types, with different business activities and vessel requirements is apparent. It is clear, therefore, that the requirements for facilities in ports will vary widely, with some ports only receiving a very few vessels that will need to make use of reception facilities on a very occasional basis. By contrast, large ports with many vessel movements will have a much greater requirement to provide facilities.

The information provided by the ports that responded to the 2001 Survey – together with additional information obtained from a 1998 IMO survey for oily wastes – has given the first clear picture of levels of provision for reception facilities. In particular, it has shed light on what is available in smaller ports. The results of the survey indicate that many ports are already meeting the provision requirement of the Directive in that they provide facilities for the vessels normally calling in at them. However, as many as 106 ports did not respond at all to the survey.

At the same time, it is apparent from the survey results, particularly those outlined in Tables 11 to 13, that the picture of actual availability does not appear to match need.

While most ports indicate that they already provide facilities for the majority of vessels that call in at them, relatively few provide the full spectrum of facilities. In the case of Annex II – Noxious Liquid – this may be because facilities are limited mainly to ports which specifically operate within a chemical plant environment or provide storage for oil and chemicals. In the case of Annex IV – Sewage – by contrast, although facilities are not yet mandatory under MARPOL 73/78, 23 ports do already offer facilities for some kind, although with very limited uptake.

In terms of Annex 1 – Oily Waste – 4 ports indicate specifically that they do not receive this type of waste, while for Annex V – Garbage – all ports which provided information do offer these facilities. However, in both cases, the actual categories offered within each Annex may be limited to only one or two of the full range specified in the relevant MARPOL Annex.

Also apparent from the survey results is that, although ports may provide facilities for specific vessel types, many vessels do not make use of them. Where figures for actual uptake have been provided (Table 14) levels of uptake are extremely low, less than 3 percent for Annex II and IV, and less than 8 percent for Annex I. Only in the case of Annex VI does the level of uptake approach 40 percent.

Lack of uptake of facilities by vessels is problematical because, if very few vessels choose to use facilities, it may be uneconomical for ports to offer them. Nevertheless, ports are still faced with the requirement to provide facilities under the EU Directive.

However, with the additional requirements of the Directive discussed in the introduction, i.e. mandatory delivery of waste unless vessels have adequate capacity for retention on board, together with a fee system to encourage the use of facilities, it is anticipated that the Directive will result in much higher levels of uptake. It may, accordingly, become more economically viable for ports to offer a range of facilities.

The intention of this survey has been to provide a clearer picture of availability of facilities than has previously been available. In this respect, the result has been a much more comprehensive overview of current availability. However, it is clear that there is still scope for further information to be sought to improve further the picture of provision within the North Sea area, through the use of a follow-up survey. There are two reasons for this: the first is the lack of response from many ports, for whatever reason; the second is that, with the introduction of the Directive due to take place in December 2002, ports lacking in facilities at the time of the 2001 Survey may now be making efforts to arrange for such facilities to be in place, whether by contracting-in such facilities or by developing them on-site. The use of a follow-up survey, which would generate a longitudinal analysis of those ports that completed the 2001 Survey, would provide some direct evidence of whether the Directive is already having a positive impact on availability of facilities within the North Sea area.

It is therefore the intention of the authors to conduct a further survey in the Autumn of 2002, with the express purpose of expanding on the results discussed in this paper, and to examine whether any positive impact of the Directive is apparent.



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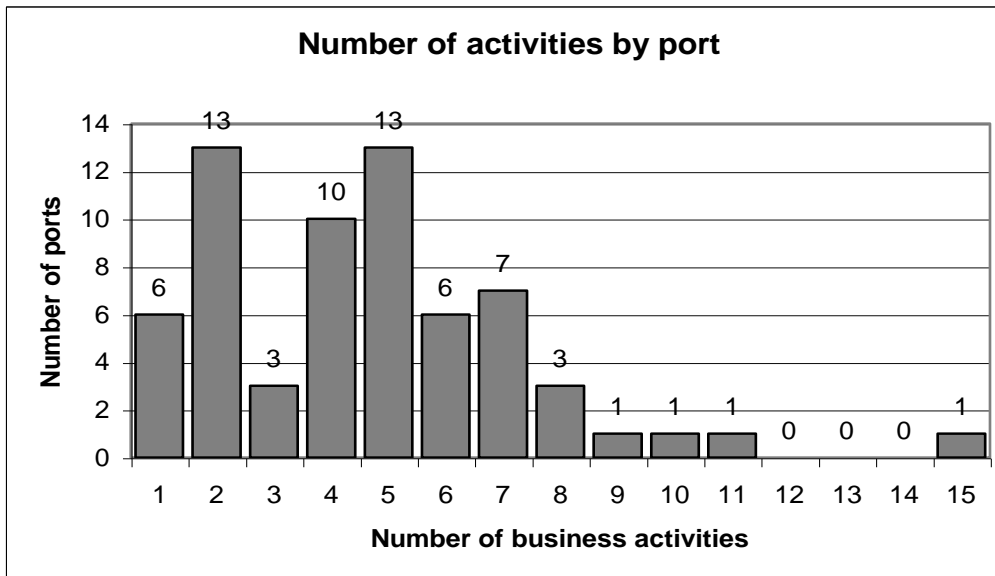
Power, V. (1995) European shipping law. In Shipping Law faces Europe: European Policy, Competition and Environment. pp 43-75. European Institute of Maritime and Transport Law, MAKLU Uitgevers, Antwerp, The Netherlands.

## TABLES AND FIGURES

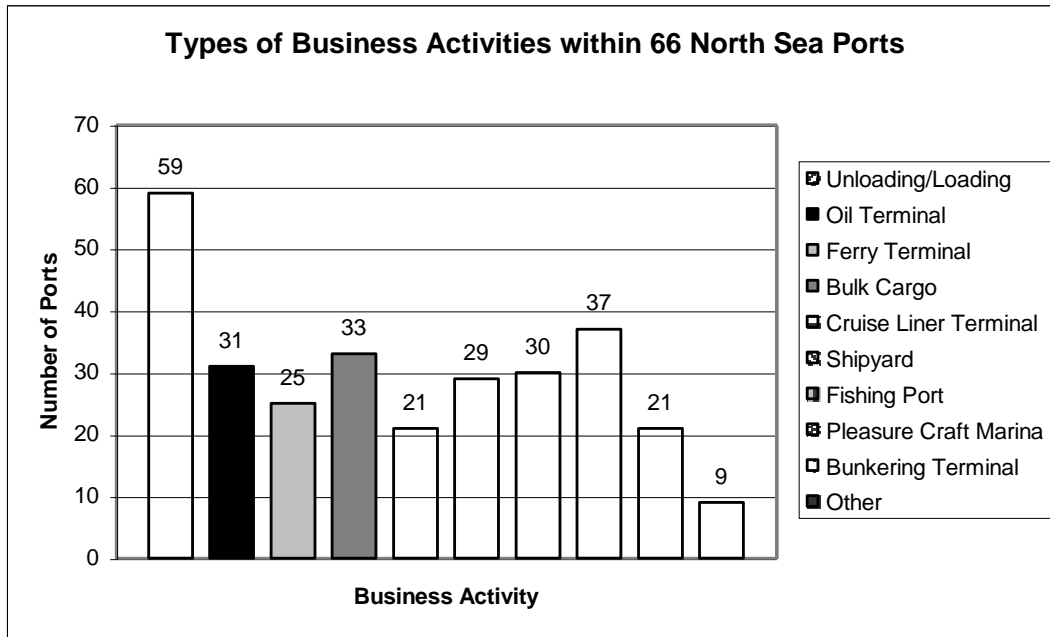
**Table 1 Survey Responses, Summer 2001**

Country	Survey Response Details			
	Surveys Issued	Returns Details		Nil Returns
		Completed Survey Returned	Other	
Belgium	8	1	3	4
Denmark	7	3	0	4
Germany	13	3	2	8
The Netherlands	23	6	4	13
Norway	61	17	4	40
United Kingdom	88	43	8	37
<b>TOTALS</b>	<b>200</b>	<b>73</b>	<b>21</b>	<b>106</b>

**Figure 1 Survey responses to question on business activities (66 ports)**



**Figure 2 Business activities by type**



**Table 2 Physical Environment of Ports**

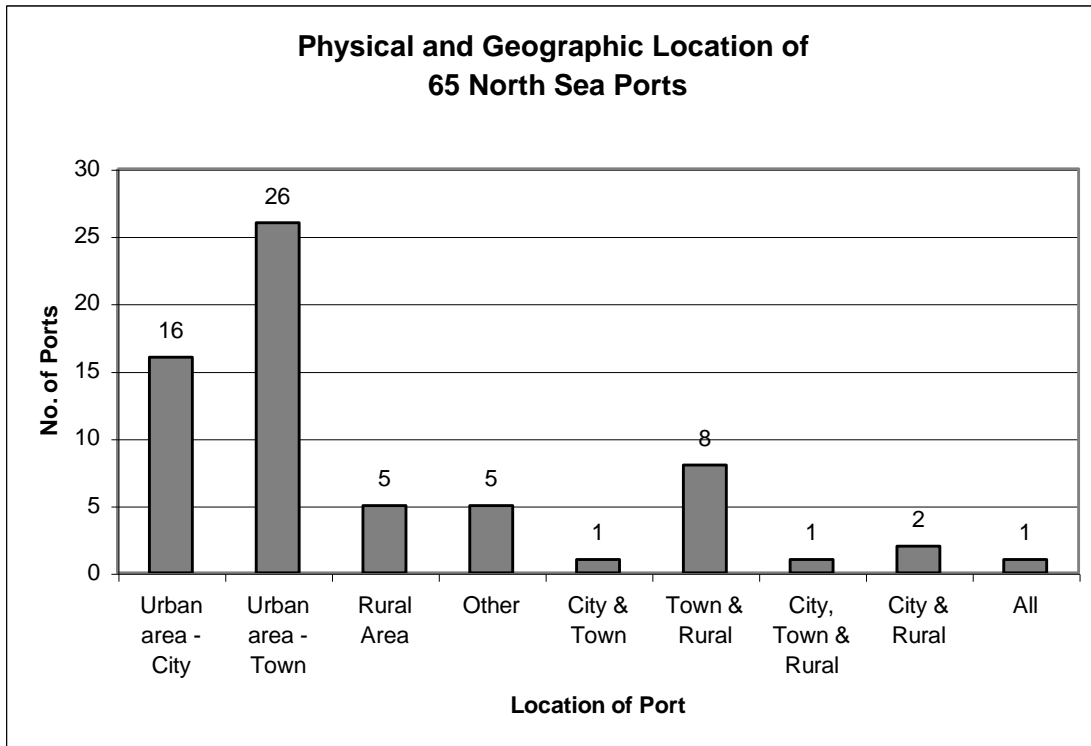
Physical Environment	No. of Ports	No. of UK Ports	No. of Non-UK Ports
Industrial Area	36	11	25
Oil Refinery	10	5	5
Chemical Plant	11	5	6
Storage for Oil and Chemicals	24	10	14

**Table 3 Geographical Location of Ports**

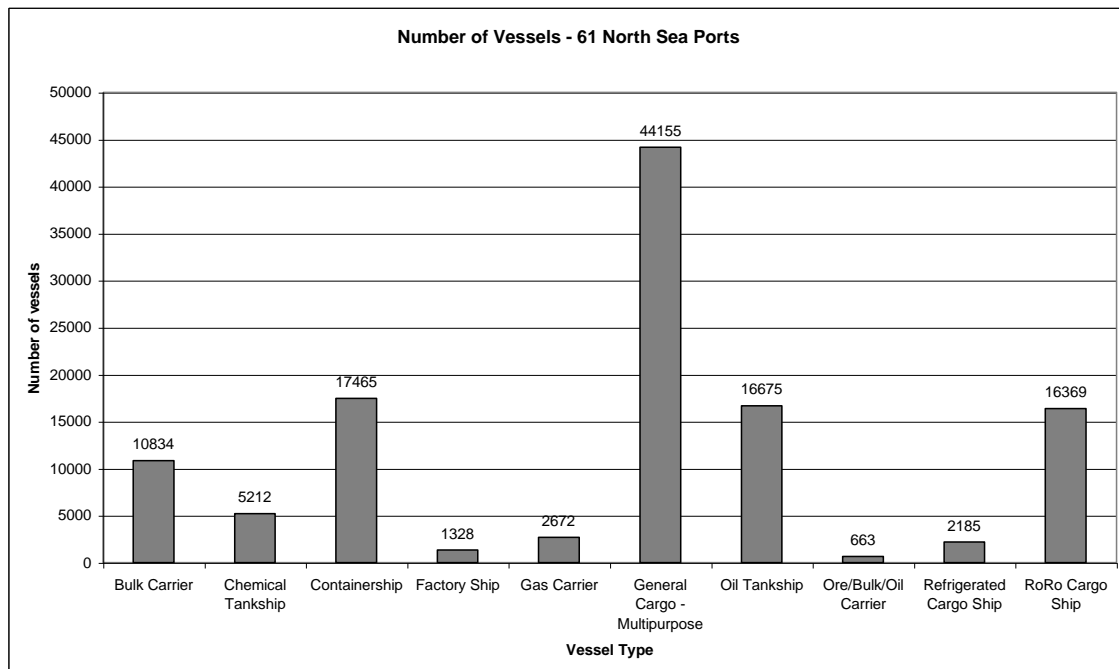
Geographical Location	No. of Ports	No. of UK Ports	No. of Non-UK Ports
Urban Area - City	23	9	14
Urban Area - Town	35	17	18
Rural Area	17	10	7
Other	7	6	1
Mixed*	13	..	..

\*NOTE: In this category, ports operate in more than one of the specified locations. See text for details.

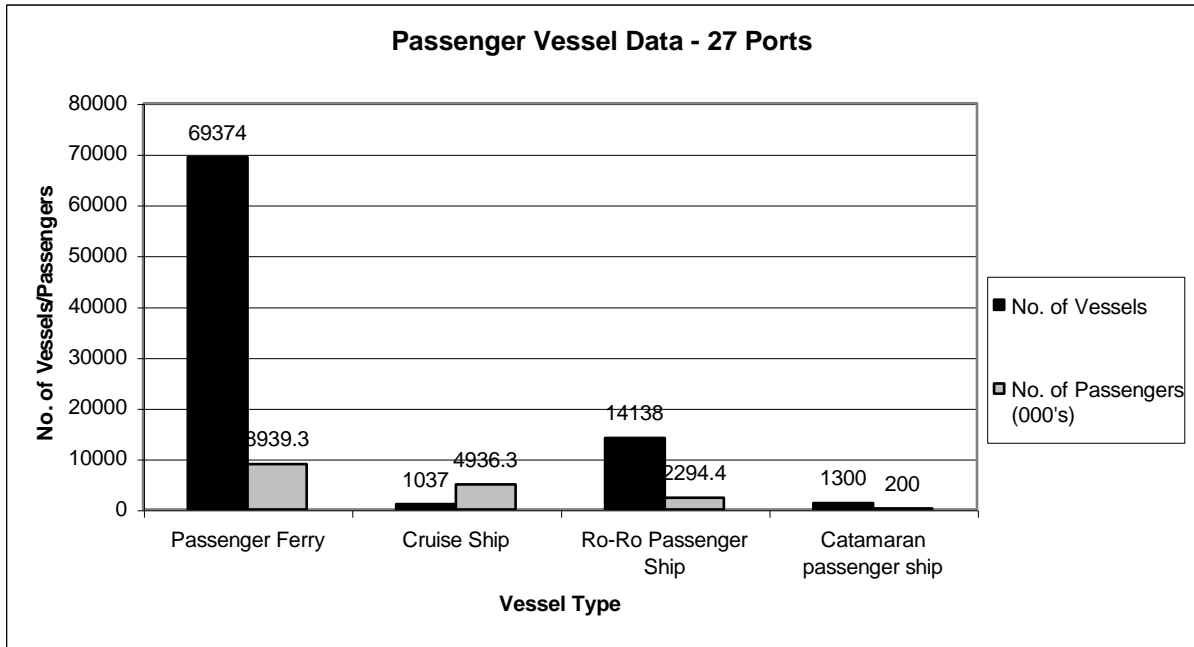
**Figure 3** Locales of 65 North Sea Ports



**Figure 4** Vessels calling in at 61 North Sea ports per annum



**Figure 5 Vessel and Passenger Numbers by Vessel Type**



**Table 4 Country-specific information on passenger vessels**

Country	No. of Ports	No. of Ships	No. of Passengers
Belgium	1	40	40,000
Denmark	1	1,650	198,000
Germany	3	1,273	626,100
The Netherlands	4	6,929	1,211,500
Norway	14	65,861	8,968,796
United Kingdom	9	10,096	19,750,534

**Table 5 Physical Type of Facilities**

Physical Type	No. of Ports
Fixed only	10
Floating only	1
Mobile only	20
Fixed and Floating	0
Fixed and Mobile	7
Floating and Mobile	2
Fixed, Floating and Mobile	9

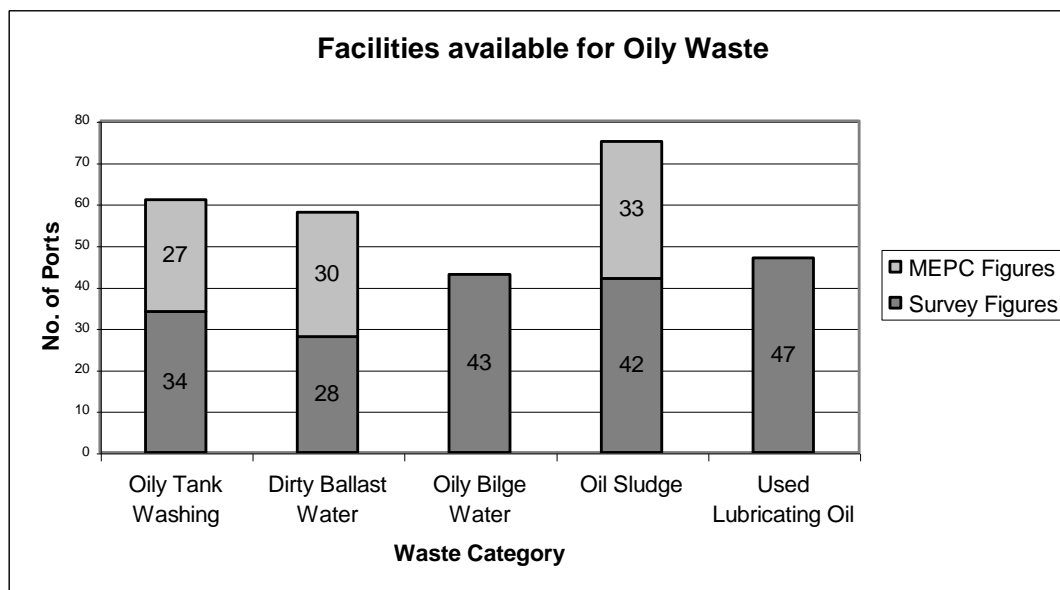
**Table 6 Ownership of Facilities**

Ownership Type	No. of Ports
P/T owned only	3
P/T operated only	0
Contracted in only	27
P/T owned and operated	10
P/T owned and contracted in	2
P/T operated and contracted in	8
P/T owned, operated and contracted in	11

**Table 7 Facilities available for Oily Waste**

Waste Category	No. of Respondents	Type of Facility			
		Quayside Tank	Roadside Tanker	Terminal Facility	Other
Oily Tank Washing	34	9	24	10	4
Dirty Ballast Water	28	6	18	9	4
Oily Bilge Water	42	8	33	8	6
Oil Sludge	42	10	33	6	7
Used Lubricating Oil	47	15	32	8	7

**Figure 6 Annex I Facilities - 2001 Survey and 1998 MEPC Survey Data**



**Table 8 Facilities available for Noxious Liquid Substances**

Waste Category	No. of Respondents	Type of Facility			
		Quayside Tank	Roadside Tanker	Terminal Facility	Other
A	24	3	17	3	0
B	22	3	17	3	1
C	22	3	17	3	0
D	22	3	17	3	0
Other Liquid Substances	19	2	13	4	0

**Table 9 Facilities available for Garbage**

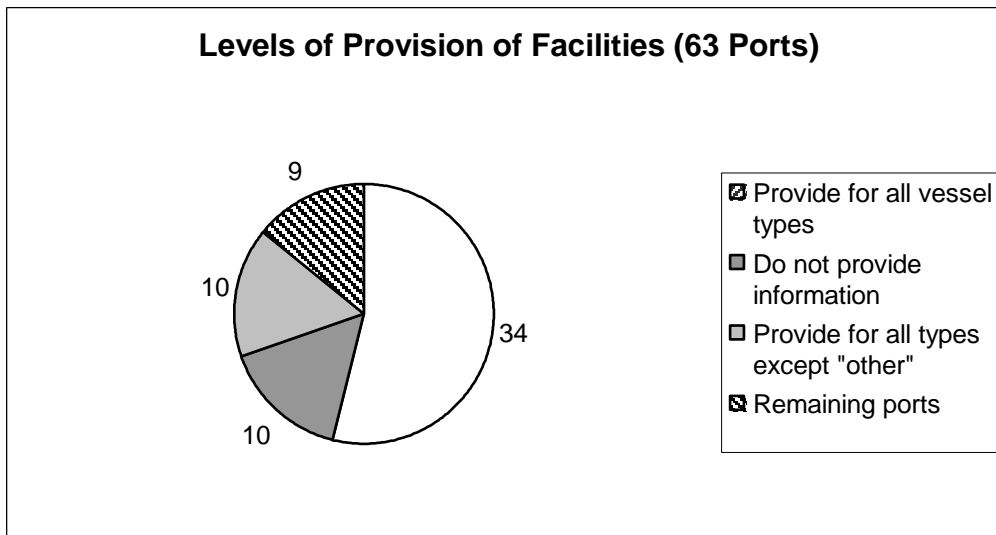
Waste Category	No. of Respondents	Type of Facility		
		Segregation / Recycling	Contractor Disposes	Other
Category 1	52	9	38	5
Category 2	49	11	30	7
Category 3	53	11	38	4
Category 4	53	11	39	5
Category 5	53	9	35	7
Category 6	29	4	21	4

**Table 10 Facilities available by Vessel Type**

Vessel Type	Ports with Facilities
Bulk Carrier	36
Chemical Tankship	17
Containership	21
Factoryship	10
Gas Carrier	13
General Cargo – Multipurpose	32
Oil Tankship	26
Ore/Bulk/Oil Carrier	11
Ro-Ro Cargo Ship	22
Refrigerated Cargo Ship	20
Passenger Ferry	18
Cruise Ship	19
Ro-Ro Passenger Ship	12
Other	10



**Figure 7 Provision of Facilities in for vessels normally calling in at port**



**Table 11 Ports providing for all vessel types except “other”**

Port No. from Survey	Total No. of Vessels	Number of "Other" Vessels	"Other" as % of total
1	16139	457	2.8
4	8870	1100	12.4
13	8060	4000	49.6
28	4295	1390	32.4
30	7734	5518	71.3
49	5943	5000	84.1
52	42	7	16.7
53	254	1	0.4
56	429	30	7.0
58	1662	1300	78.2

**Table 12 Remaining Ports not providing facilities for all categories**

Port No. from Survey	Total No. of Vessels	Number of vessels without facilities	Vessels without facilities as % of total
17	1590	1218	76.6
24	6222	242	3.9
26	288181	3131	1.1
27	1973	20	1.0
29	1010	30	3.0
33	403	3	0.7
48	1628	10	0.6
50	11820	53	0.4
57	415	365	88.0

**Table 13 Facilities provided in ports by MARPOL Annex**

Number of categories provided	Annex I – Oily Waste	Annex II - Noxious Liquid Substances	Annex IV - Sewage	Annex V - Garbage
6	N/A	N/A	N/A	28
5	22	20	N/A	18
4	9	2	N/A	5
3	10	0	N/A	2
2	4	0	N/A	3
1	9	2	25	1
0	4	31	33	0
No details	5	8	5	6

**Table 14 Levels of uptake of facilities by MARPOL Annex**

MARPOL 73/78 Annex	Number of vessels using facilities	Out of total number using ports	% using facilities	No. of ports where facilities were used	No. of ports where facilities not used	No. of ports where all vessels use facilities
Annex I	10908	139017	7.85	30	4	5
Annex II	1969	81174	2.43	7	5	1
Annex IV	380	30788	1.23	7	8	0
Annex V	28453	72842	39.06	31	2	12