

International Co-operation to Prevent Oil Spills at Sea: Not Quite the Success It Should Be

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Introduction

Of all the pollutants entering the sea, oil very often appears to be the substance that attracts most attention. Similarly, of all sources of marine pollution, oil-tanker accidents very often appear to be the single most important source of marine pollution. This as such is a major problem. Oil may not be the most hazardous pollutant to be introduced into the marine environment, oil-tanker accidents definitely are not the most important source of marine pollution in general nor for oil pollution in particular. The problem associated with the high profile of oil in the league of pollutants could well be that far too much attention is given to oil pollution at the cost of the attention that should also be given to other substances seriously polluting the marine environment.

This article will nevertheless focus its attention on marine oil pollution; it is, after all, a serious problem in its own right. As a result of the attention oil pollution has had over the past decades, in particular in reaction to a long list of serious oil-tanker accidents, many measures have been taken against it. Consequently, this is an area where it is possible to assess how far the international community has come in solving specific environmental problems, what the main obstacles are to effective international solutions, and what should be done to overcome these problems.

The Nature of the Problem: The Amounts of Oil Spilled into the Marine Environment

Every year over 1,500 million tonnes of oil are transported over the world's seas by ships as cargo (some 1,480 million tonnes in 1989), as fuel oil (an estimated 110,000 tonnes in 1989), or for other uses.¹ A relatively small but in absolute numbers substantial amount of oil never reaches its destination as cargo or is effectively used in the ships' engines: it ends up in the marine environment either as a result of operational discharges or as a result of accidents with ships.

Various estimates have been made to assess the total amount of oil entering the world's seas and oceans. Table 1 summarizes some of these estimates from different years; the estimates included are for the years 1973, 1981, 1990, and 1992. The estimate for the year 1981 provides an indication of the importance of shipping as a source of marine oil pollution. From an estimated total of 3.28 million tonnes of oil entering the marine environment, some 1.5 million tonnes (46 per cent) were generated by shipping, from which some 410,000 tonnes (13 per cent) were the result of (tanker)-accidents.

Table 1. Estimates of the quantities of oil annually entering the marine environment (millions of tonnes)

	Year of the estimate/publication			
	1973/1975	1981/1985	1990/1990	1992/1993
Natural sources	na	0.25	na	0.25
Oil exploration	na	0.05	na	0.05
Shipping				
Discharge of bilge and fuel oil plus operational losses from oil tankers	1.08	1.02	0.41	0.41
Tanker-accidents	0.20	0.41	0.11	0.11
Accidents with other types of ships	0.10	—	0.01	0.01
Other (ports, shipyards, scrapping, etc.)	0.75	0.07	0.04	0.04
Atmospheric deposition	na	0.30	na	0.30
Land-based sources	na	1.18	na	1.18
Total amount per year	—	3.28	—	2.35

Note: na = not available.

Sources: National Research Council (1991), *Tanker Spills, Prevention by Design* (National Academy Press, Washington, DC); GESAMP (1993), *Impact of Oil and Related Chemicals and Wastes on the Marine Environment* (IMO, London).

The most recent (albeit not quite new) estimate was given in a report by GESAMP (the IMO/FAO/UNESCO/WMO/WHO/IAEA/UN/UNDP Joint Group of Experts on the Scientific Aspects of Marine Pollution) and was put at an annual introduction of 2.35 million tonnes of oil into the marine environment.² GESAMP did not develop new estimates; its report merely uses the most recent estimates available from previous studies (in Table 1 the figures given in either column 2 or 3).

The GESAMP report then continues to provide data (taken from other publications) regarding regional sea areas (see Table 2). When the estimates for these regional sea areas are added, a different picture emerges: at least 7.3 million tonnes of oil are entering the world's seas and oceans annually if those estimates are correct.

Table 2. Estimates of the quantities of oil annually entering the marine environment in various regional sea areas (millions of tonnes)

North Sea	260,000	
Baltic Sea	21,000-60,000	
Mediterranean Sea	500,000	
North-West Atlantic	*	
Wider Caribbean	950,000	
West and Central Africa	*	
South Africa	*	
East African region	*	
Red Sea, Gulf of Aden	*	
Arabian/Persian Gulf	160,000	(pre Iran-Iraq and Gulf wars)
Indian Ocean, Arabian Sea	5,000,000	
Indian Sea, Bay of Bengal	400,000	
South-East Asia	*	
South-East Pacific	*	
North-East Pacific	*	
Arctic Ocean	*	
Antarctic Ocean	*	
TOTAL	approx. 7,300,000	

Note: * = no overall estimate.

Source: GESAMP (1993), *Impact of Oil and Related Chemicals and Wastes on the Marine Environment* (IMO, London).

More detailed estimates, providing information about the contribution of shipping, are also available from other sources, for example, for the North Sea (see Table 3). The fact that the North Sea states could not jointly agree on the amounts of oil 'produced' by illegal discharges and tanker accidents does not mean that there have been no estimates for, in particular, the amounts of oil discharged illegally. These estimates range from some 15,000 tonnes per year to as much as 60,000 tonnes per year for the whole North Sea. This, of course, adds considerably to the total input given in the above list.

Table 3. Estimates of the quantities of oil annually entering the marine environment in the North Sea (millions of tonnes)

Transportation	0.001-0.002
Legal discharges	0.001-0.002
Illegal discharges	*
Tanker accidents	*
Production platforms	0.029
Atmospheric deposition	0.007-0.015
Land-based sources	0.029-0.081
Dumping operations	0.004-0.022
Sewage sludge	0.001-0.010
Industrial wastes	0.001-0.002
Dredge spoils	0.002-0.010
Natural seeps	0.001
TOTAL	0.071-0.150

Note: * = no agreed estimate

Source: Scientific and Technical Working Group, Second International Conference on the Protection of the North Sea (1987), *Quality Status of the North Sea, Summary Report* (London).

From all these figures it is clear that shipping is only one (albeit not an unimportant) source of marine oil pollution and that (tanker) accidents are not the most important source of oil entering the sea from ships. It is important, however, to keep in mind that these figures are nothing but an indication, and that if these figures were to be prepared on the basis of information available now, the situation might be different. The recent accident with the oil-tanker *Braer* in the Shetland Islands introduced some 85,000 tonnes of oil into the north-eastern Atlantic (and North Sea). Had this accident happened in the North Sea, it would have more than doubled the total amount of oil in the lowest estimate, and would have added more than half of the amount of oil to the highest estimate given in Table 3.

Whilst on a global scale the amount of oil entering the marine environment as a result of accidents may be relatively low, on a regional or local scale the relative importance of such an accident may be substantially higher. In certain areas an accidental spill might even account for almost 100 per cent of the total input of oil in that area. That is why the *Exxon Valdez* was an ecological disaster where it happened. That is how even a relatively small spill, such as the approximately 750 tonnes of the December 1988 accidental spill off Grays Harbour on the Washington State coast, could develop into a major environmental problem at the time it happened.

From these figures it is also clear that there are no reliable data regarding the input of oil into the marine environment. The various estimates are too far apart. If it is possible to extract two completely different totals from just one publication (that is, the 2.35 million tonnes estimate in the GESAMP report and the 7.3 million tonnes total that can be

extracted from that same report), the only valid conclusion seems to be that we do not really know how much oil enters the marine environment, due to a lack of reliable data.

The Nature of the Problem: Effects and Damage

The problem at hand is of course not the introduction of oil into the marine environment as such. The real problem is the ecological and economic damage caused by such discharges. Oiled birds are the most potent symbol of ecological damage caused by oil spills, but damage is, of course, not confined to birds alone.

The 1993 GESAMP report provides one of the most recent assessments of the effects of oil in the marine environment. This report concludes, among other things, that (a) reproductive, developmental, and behavioural processes are very sensitive to exposure to hydrocarbons; (b) generally, young life stages are more sensitive than adults, and many juvenile and adult crustaceans and echinoderms are more sensitive than juvenile and adult fish; (c) chronic sub-lethal effects caused by petroleum hydrocarbons spilled or discharged in low-energy, shallow coastal waters remain a valid concern; (d) diving and surface-dwelling populations of seabirds, and sea otters and polar bears in particular, are known to be sensitive to oiling; (e) there is some evidence that petroleum causes long-term effects on populations and communities at spill sites; (f) some habitats (for example, low-energy marshes and mangroves) can require decades to return to their pre-spill condition of population, species diversity, and habitat quality; (g) oil spills have low or negligible impacts on fish populations, whilst significant impacts on local populations generally occur only in shallow waters with poor circulation; and (h) tropical ecosystems, such as mangroves and coral reefs, as well as sea-grasses in all locations are particularly vulnerable and sensitive, due to greater retention of oil and the exposure of many species and life stages year-round.³

In some respects ecological damage translates directly into economic damage, in particular for those industries depending on a clean and healthy environment: particularly fisheries, recreation, and tourism

The Nature of the Problem: Why Does Oil Enter the Marine Environment?

One could think of many reasons why ships discharge oil into the marine environment. Ignorance of the problems caused by doing that could be among these, although it is hard to understand how at present any seafarer could be unaware of the ecological and economic damage caused by oil. A false sense of economy is more likely to be a major factor in deciding to discharge oil at sea, or in creating the circumstances

in which serious accidents resulting in (major) oil spills can occur. This false sense of economy translates into the illusion that it is cheaper to discharge oil at sea than to dispose of it properly; it translates into the illusion that it is more profitable to run a ship at the lowest possible cost of maintenance and crew.

What Needs to be Done?

The simplest answer to the question of what needs to be done is that the amount of oil introduced into the marine environment from any source must be reduced substantially. The next question to be answered then is how to do that. With respect to shipping the questions are how to reduce operational discharges from ships and how to reduce the number of shipping accidents (from which not only the marine environment will benefit but, possibly even more importantly, the safety of human life for those on board ships). And the last question to be answered is, who should take such actions.

As shipping is almost by definition an international activity, measures to reduce the amount of oil entering the marine environment need to be taken at an international level. For any country it is important that all ships of whatever flag passing through its waters have to abide by the same rules. Similarly, it will be important for any ship to know that the same rules will apply in whatever area of the world this ship is operating, and for all ships competing in the same (global) market. And last but not least, for the effectiveness of any measures it is important that they should be the same everywhere and that seafarers should not be confused by different sets of rules in different regions.

Measures to reduce the amount of oil entering the marine environment therefore need to be developed at an international (global) level. And it is true that after every accident causing a serious oil spill many will call for international action in response to that accident. Is there then no rationale for action to be taken at a national level? There is. No measure taken at an international level can ever be effective if it is not implemented effectively at a national level.

Actions taken at the international and national levels are therefore complementary, and action taken at one of these levels cannot be effective without simultaneous action at the other level.

The International Response to the Problem

In 1992 the issue of oil spills at sea was, of course, one of the many issues discussed by the United Nations Conference on Environment and Development (UNCED). Agenda 21 addressed the issue in several paragraphs of its Chapter 17, and included recommendations regarding the support of

wider ratification and implementation of relevant shipping conventions and protocols (paragraph 17.30-a-i), the co-operation in monitoring marine pollution from ships (paragraph 17.30-a-iii), the protection of particularly sensitive areas (paragraph 17.30-a-iv), and others.⁴ Most of UNCED's recommendations in this field, however, refer back to international efforts already under way.

The prevention of oil spills has been on the international diplomatic agenda for a long time, since the early decades of this century. Serious tanker accidents in the last decades have prompted the development of many international instruments aimed at preventing accidents (for example, the International Convention for the Safety of Life at Sea, SOLAS 1974, and subsequent Protocols; the Convention on the International Regulations for Preventing Collisions at Sea, COLREG 1972); at limiting the damage once accidents have occurred (for example, the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, INTERVENTION 1969, and subsequent Protocols; the 1989 International Convention on Salvage; the International Convention on Oil Pollution Preparedness, Response and Co-operation, OPRC 1990; and some aspects of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, MARPOL 1973/78); at compensating damages resulting from these accidents (for example, the International Convention on Civil Liability for Oil Pollution, CLC 1969; the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, FUND 1971, and the subsequent Protocols to these Conventions); and at the prevention of marine pollution as a result of operational discharges from ships (the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, MARPOL 1973/78, which covers oil as well as discharges of other substances such as noxious substances and garbage).

It is often claimed that these instruments have been highly successful. The number of serious tanker accidents has gone down, and many consider the MARPOL 73/78 Convention to have been extremely successful in reducing the amount of oil discharged into the marine environment by ships.

There is, however, certainly reason to cast at least some doubt on these claims. It is therefore useful to assess how successful these instruments have been in reality. The first question to ask is whether the instruments really have achieved their primary purpose, that is, limiting the amount of oil entering the marine environment as a result of either accidents or operational discharges. A second question to ask is whether national governments are effectively implementing these international instruments. In other words, are these international instruments a success in terms of application and compliance by national governments?

In trying to answer these questions, this article will primarily focus its attention on a number of aspects of the MARPOL 73/78 Convention.

Less Oil in the Marine Environment?

If one takes the figures from Table 1 it would seem that the total amount of oil introduced into the marine environment by shipping has dropped from an estimated 2.13 million tonnes in 1973, to 1.50 million tonnes in 1981, to 0.57 million tonnes in 1990; a substantial drop indeed, and if these figures are correct the claim for success would be more than justified. The question is, of course, whether these figures are correct. It is likely that they are not.

An analysis of the method by which the figures for 1990 were determined shows that they are based on a large number of assumptions.⁵ The estimate for operational discharges from oil tankers, for instance, is based on the amount of oil which tankers can discharge legitimately under the MARPOL 73/78 Convention, plus an estimate of the amount of oil that would be discharged unlawfully. The assumptions on which this estimate is based include the degree of compliance (estimated to range from 80 per cent for oil tankers smaller than 20,000 dead weight tonnage (DWT) to 99 per cent for oil tankers larger than 150,000 DWT) and on estimates of how much a non-complying ship would discharge unlawfully. Both estimates may be correct, but they may also be too optimistic.

It is important to note that it is not possible to conclude that less oil is being discharged into the marine environment if the figures used for that conclusion are based only on assumptions regarding the amounts of oil discharged. Or, to put it more clearly: one cannot conclude that MARPOL 73/78 is successful if that conclusion is based on the assumption that MARPOL 73/78 is successful.

Is there any other basis for an assessment of the trends in the amounts of oil being discharged at sea? From an analysis of reports on the application of the MARPOL 73/78 Convention to the International Maritime Organization it is clear that there are only a few areas in the world where adequate efforts are made to detect (unlawful) discharges of oil from ships (see Table 4). Most discharges are detected in waters off industrialized countries. It would be wrong to conclude from this that there are hardly any discharges of oil on the southern hemisphere or in waters off developing countries. It is more than likely that the numbers of detected discharges are an indication of the effort made to detect discharges. These data therefore cannot provide any basis for conclusions regarding the amount of oil discharged at sea.

Table 4. Number of reported spills in specific sea areas (approximate figures)

Atlantic Ocean (European waters)	120
Baltic Sea	25
North Sea and Channel	290
Mediterranean Sea (European, Asian, and African waters)	300
Atlantic Ocean (Canadian and US waters)	120
Gulf of Mexico	20
Pacific Ocean (Canadian and USA waters)	40
Pacific Ocean (Japanese waters), Sea of Japan, and East China Sea	140
South China Sea	20
<u>Waters of the southern hemisphere (Atlantic, Indian, Pacific Oceans)</u>	<u>40</u>

Source: Gerard Peet (1992), *Operational Discharges from Ships: An Evaluation of the Application of the Discharge Provisions of the MARPOL Convention by its Contracting Parties* (AIDEnvironment, Amsterdam).

If one looks at figures for one of the regions where a real effort has been made to detect unlawful discharges of oil at sea over a number of years, for example, in the Netherlands' sector of the North Sea (see Table 5), it would seem that there is no clear trend of a reduction in the number of spills detected, especially not if the detection effort (flying hours for aerial surveillance) is included in the comparison of the number of detected spills over the years.

In addition to the detection of spills, trends in the amount of oil discharged may also be deducted from the number of oiled seabirds washed ashore. In 1989 environmental organizations in the Netherlands published a report about seabird mortality.⁶ This report reviewed the available information regarding seabird mortality in relation to oil pollution along the Netherlands' coast over a period of several decades. One of the most significant conclusions from the report was that the percentage of seabirds contaminated with oil, as well as the total number of oil victims, has not changed much over the last few decades and that there appears to have been a shift from mortality as a result of occasional large-scale incidents to a continuous stream of victims caused by chronic oil pollution.

Relatively large numbers of birds contaminated with oil are washing ashore during the winter months when there is poor

visibility and when the seas are rough as a result of storms. During a period of storms the immediate effect was an increase in the number of oil victims. This too could indicate that the role of operational discharges by ships is considerable; these are times when it is relatively safe for a ship to discharge its oily wastes. Poor visibility will prevent these discharges from being noticed and waves will disturb spills quickly, as a result of which it is almost impossible to connect an oil spill to a ship when such a spill is noticed in spite of the poor visibility.

This is not something happening in the North Sea only. In March 1990 the Canadian newspaper *Globe and Mail* reported similar events off Newfoundland: 'New discoveries of oil-covered seabirds off Newfoundland's coast have increased estimates to about 25,000 so far this year, and have dashed hopes of an end to the deaths from ocean oil pollution.' The source, again, was illegal discharges by ships.

In summary, the MARPOL 73/78 Convention may not have been quite as successful in reducing the amounts of oil entering the sea as a result of operational discharges as many would like to believe. However, it is also difficult to claim the opposite, because of the lack of reliable data.

What is the situation regarding spills from serious (tanker) accidents? The estimates for the amount of oil entering the marine environment as a result of accidents given in Table 1 ranged from 300,000 tonnes in 1973 to 410,000 tonnes in 1981, to 120,000 tonnes in 1990. The 1990 figures therefore indicated (again) a substantial decrease. Figures are now also available for the years 1991 and 1992 as summarized by Greenpeace International from data compiled by the Oil Spill Intelligence Report in a document presented to the 34th session of the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO): some 88,000 tonnes (27.1 million gallons) in 1991 and some 140,000 tonnes (42.7 million gallons) in 1992. As of March 1993, some 105,000 tonnes (32.5 million gallons) have already been spilled in 1993 as a result of serious accidents.⁷

Whilst the total number of (tanker) accidents may be going down, there is definitely no downward trend (if there is any trend) in the total amount of oil being lost as a result of accidents. Again, the global instruments may not be as

Table 5. Number of detected spills (oil as well as other substances) in the Netherlands sector of the North Sea

	1983	1984	1985	1986	1987	1988	1989	1990	1991
Total number of spills	1,024	649	571	378	535	429	577	721	712
reports based on aerial surveillance	887	528	459	282	413	316	350	449	448
flying hours	760	1,119	1,134	911	1,207	901	884	919	878

Source: Directoraat-Generaal Rijkswaterstaat, Directie Noordzee (1992), *Verontreinigingsrapportage 1991* (Rijswijk).

successful in preventing accidental oil pollution as is often claimed.

MARPOL 73/78's Application by National Governments: Ratification

The first step towards the application of the MARPOL 73/78 Convention by a national government is ratification. At 31 May 1993, seventy-nine states had ratified the Convention and its Annexes I (oil) and II (noxious liquid substances in bulk). The ships flying the flags of these states represent 90.26 per cent of the world's commercial tonnage.⁸

A large number of states have not ratified the MARPOL 73/78 Convention. Only some 10 per cent of the world's tonnage is not flying a MARPOL 73/78 flag, but whilst this may be a relatively small part in terms of tonnage, it may still be a considerable number of possibly relatively small vessels. In addition, many of the states that have not ratified the MARPOL 73/78 also not be providing the facilities required under the Convention such as reception facilities for (oily) wastes from ships.

Ratification Obstacles

It is now widely recognized that the costs involved in ratifying the MARPOL 73/78 Convention represent the main obstacle to ratification for many countries. From Table 6 it will be clear that the rate of ratification is particularly low in the developing nations. During the first meeting of the new subcommittee on Flag State Implementation of the International Maritime Organization several observations were made in this respect.⁹ The Indonesian delegation noted that many flag administrations, particularly those from developing countries in the Asia-Pacific region, found it very difficult to keep pace with the rapid development of IMO instruments, and felt that technical assistance would be needed by these countries in order to fulfil their obligations under IMO conventions. The subcommittee even agreed that the lack of resources suffered by some developing countries which were also flag states hindered the full implementation of IMO instruments and that technical assistance would be necessary to alleviate the problem.

Technical or, more importantly, financial problems may not always be the main reason for not ratifying IMO conventions or, in particular, the MARPOL 73/78 Convention. One would expect that the major oil-exporting countries (OPEC countries) would be able to ratify the MARPOL 73/78 and more specifically its regulations regarding the transport of oil. In practice, this is not the situation: only four out of thirteen OPEC countries (including Ecuador) have ratified

Table 6. Percentage of states from various economic groupings that have ratified the MARPOL 73/78 Convention (situation as at 31 May 1993)

Country groups	MARPOL 73/78 Annexes				
	I	II	III	IV	V
Developed market economy countries	80	80	67	43	73
Developed market economy countries, adjusted % (Andorra, Holy See, Liechtenstein, San Marino not included)	92	92	77	50	85
Socialist and former socialist countries	48	48	39	39	42
Developing countries with a 1986 per-capita GDP above \$1,500	53	53	25	22	28
Developing countries with a 1986 per-capita GDP between \$500 and \$1,500	24	26	26	21	21
Developing countries with a 1986 per-capita GDP below \$500 or about which there is no information about the 1986 per-capita GDP	20	20	12	10	12

Source: IMO (1993), *Status of International Conventions Relating to Marine Pollution of Which IMO is Depository or Responsible for Secretariat Duties* (Document MEPC 34/2) (IMO, London).

the MARPOL 73/78, including none of the oil-rich Gulf States. It is unclear what obstacles deter these countries from ratifying.

MARPOL 73/78's Application by National Governments: Living by MARPOL's Rules?

Several articles in the MARPOL 73/78 Convention spell out the duties and responsibilities states accept when ratifying the MARPOL 73/78. For some of these it is relatively easy (albeit time-consuming) to assess whether the Contracting Parties to the Convention are actually doing in practice what they promised to do by ratification. The following paragraphs will assess the level of compliance by Contracting Parties with several of the MARPOL 73/78 regulations:

- Articles 11(1)(e) and (f) with requirements for Contracting Parties to send reports about the application of the MARPOL 73/78 to the IMO;
- Article 6(1) calling on Contracting Parties to use all appropriate and practicable measures to detect unlawful discharges;
- Articles 4(1), (2), (3), and (4) spelling out the duties of Contracting Parties with respect to the enforcement of the discharge provisions; and
- Annex I, Regulation 12(1) outlining the responsibility of Contracting Parties to ensure the availability in ports of reception facilities for wastes from ships.

Articles 11(1)(e) and (f): Reporting Requirements for Contracting Parties

Article 11(1)(e) requires Contracting Parties to submit reports about the application of the Convention to the IMO; Article 11(1)(f) requires Contracting Parties to submit annual statistical reports of penalties imposed for infringements of the present Convention. In a special circular letter (MEPC/Circ.138), the IMO has developed a special format for these reports consisting of eight different sections of information.

On 31 December 1991 only six Contracting Parties had submitted reports for each year since the entry into force of the MARPOL 73/78 Convention (see Table 7). These reports did not always comply with the reporting format given by the IMO in MEPC/Circ.138. Only one country (Australia) had submitted statistical reports for each year since MARPOL 73/78 entered into force; seven countries had done so for every year minus one.

Denmark, the Netherlands, and the United Kingdom deserve special attention in this respect. On 31 December 1991 Denmark and the Netherlands had submitted reports for every year minus one since the entry into force of the Convention for these countries, and the United Kingdom for every year. However, the ratification of the MARPOL 73/78 by these countries was also made effective for the Faroe Islands (Denmark), the Netherlands Antilles and Aruba (the Netherlands), and Bermuda, the Cayman Islands, Gibraltar, Hong Kong, and the Isle of Man (United Kingdom). Reporting for these areas has not been complete.

More than thirty Contracting Parties have never submitted a report to the IMO. The other Contracting Parties have submitted (often incomplete) reports for one or a few years only.

Is it important that Contracting Parties comply with reporting requirements? Or, in other words, why should one be concerned with the lack of what is essentially a lot of paper-work? There are various reasons why the reporting requirements are to be taken seriously. First, a reliable

assessment of MARPOL 73/78's effectiveness can only be made on the basis of sufficient data regarding its implementation. The required reports are intended to obtain such data. Secondly, if a Contracting Party is not complying with such simple requirements as reporting, there might be cause for concern with respect to the compliance with other more substantial requirements.

In general, the conclusion has to be that most Contracting Parties to the MARPOL 73/78 Convention are not complying with Articles 11(1)(e) and (f) of the Convention. This raises some doubts with respect to the implementation of the other MARPOL 73/78 requirements by these Contracting Parties.

Obstacles in Complying with Articles 11(1)(e) and (f)

There may be various reasons for the lack of compliance with the reporting requirements:

- it is possible that there was no information to be reported when no discharges were detected and no ships flying the flag of these countries have been involved in (alleged) discharges. It may seem logical to send no reports when no (alleged) discharges have been detected, but for an assessment of the effectiveness of the MARPOL 73/78 Convention it is nevertheless extremely important that reports stating that no (alleged) discharges have been detected are submitted to the IMO;
- it is also possible that Contracting Parties have been active with respect to the implementation and enforcement of the MARPOL 73/78, but have not submitted any reports to the IMO. That this is true for some cases follows from a number of reports where a flag state reacts to a report from a port or coastal state, reports which apparently have been submitted to the flag state but not to the IMO. It is obvious that it is important that the port or coastal state should submit these reports to the IMO.

Article 6(1): Detection Efforts

Article 6(1) of the MARPOL 73/78 Conventions requires Contracting Parties (among others) to use all appropriate and practicable measures of detection of unlawful discharges. The reports of seventeen Contracting Parties provide information about the methods used for the detection of (alleged) discharges at sea. Table 8 gives a summary of the methods used by thirteen Contracting Parties in the years 1988–90, as indicated in their reports to the IMO.

The information for the years 1988–90 (in spite of being incomplete because the annual reports of the Paris Memorandum of Understanding on Port State Control were not included

Table 7. Contracting parties which have submitted reports for every year since the entry into force of the MARPOL 73/78 Convention (situation as at 31 December 1991)

Country (year of entry into force)	Completeness of reports (%)	
Australia (1988)	100.00	(3 years)
USA (1983)	95.83	(8 years)
FDR (1983)	87.50	(8 years)
Norway (1983)	66.67	(8 years)
Greece (1983)	64.58	(8 years)
Cyprus (1989)	12.50	(2 years)

Source: Gerard Peet (1992), *Operational Discharges from Ships: An Evaluation of the Application of the Discharge Provisions of the MARPOL Convention by its Contracting Parties* (AIDEnvironment, Amsterdam).

in the analysis) indicates that port inspection (inspection of entries in oil record books, adequacy of MARPOL 73/78 equipment such as oil water separators, automatic alarms) is almost as important as surveillance at sea for the detection of discharges at sea.

Eight Contracting Parties have reported the detection of (alleged) discharges by government aircraft and vessels (police, coastguard, navy, air force, and so on; see Table 9). The reports of three additional Contracting Parties gave no

Table 8. Methods used for the detection of discharges at sea in 1988, 1989, and 1990

	1988	1989	1990
Port inspection	56	64	41
Sightings at sea			
By government vessels	3	1	—
By government aircraft	27	32	10
By others or by unidentified observers	36	42	15
Method unknown	23	28	100

Source: Gerard Peet (1992), *Operational Discharges from Ships: An Evaluation of the Application of the Discharge Provisions of the MARPOL Convention by its Contracting Parties* (AIDEnvironment, Amsterdam).

exact details about the method of detection, but it is likely that government vessels and aircraft from these states have been deployed for the detection of (alleged) discharges at sea: the Federal Republic of Germany, Japan, and the United States of America. It is possible that other Contracting Parties have also used aerial surveillance but have not indicated the method of detection in their reports. Nevertheless, it would appear that only a limited number of Contracting Parties are using surveillance, by vessels and/or aircraft to detect (alleged) discharges at sea.

It is likely that many Contracting Parties are not using all appropriate and practicable measures of detection with respect to the discharge provisions of the MARPOL 73/78 and,

Table 9. The use of government aircraft for the detection of (alleged) discharges at sea

	1983	1984	1985	1986	1987	1988	1989	1990
Australia	0	0	0	0	0	0	0	5
Denmark	0	0	0	0	0	0	0	1
France	2	0	0	0	0	0	0	0
Greece	0	0	0	0	0	0	4	3
Netherlands	4	19	12	13	7	16	24	0
Norway	1	0	0	0	1	0	0	0
South Africa	0	0	0	0	0	1	1	0
UK	1	5	5	9	1	10	3	1

Source: Gerard Peet (1992), *Operational Discharges from Ships: An Evaluation of the Application of the Discharge Provisions of the MARPOL Convention by its Contracting Parties* (AIDEnvironment, Amsterdam).

therefore, are not complying with Article 6(1) of the Convention.

Obstacles in Complying with Article 6(1)

The detection of violations of the discharge provisions requires well-trained inspectors as well as substantial financial resources for effective port inspection and inspections at sea. For many countries these would seem to be the main reasons for not complying with Article 6(1). In addition, it is possible that Contracting Parties have other reasons, for example, not wanting to deter ships from trading through their ports or a simple lack of political will to comply with Article 6(1).

Articles 4(1), (2), and (3): Reaction of Contracting Parties to Violations

Articles 4(1), (2), and (3) require Contracting Parties to act upon violations of the requirements of the MARPOL 73/78 Convention and describe various steps to be taken by Contracting Parties either as port or coastal state, or as flag state.

From the reports available at 31 December 1991, it is clear that in most cases (1,077 out of 1,335) the action to be taken is left to the flag state.

Action Taken by Contracting Parties as Port and Coastal States

Most of the reported actions taken by port and coastal states were with respect to alleged discharges in ports. Especially Italy, the United Kingdom (Hong Kong), and the former Yugoslavia have reported action taken as port states, in many cases fines.

Table 10 reviews the action taken by port and coastal states in the remaining 258 cases (47 in 1983, 35 in 1984, 68 in 1985, 21 in 1986, 16 in 1987, 19 in 1988, 25 in 1989, and 27 in 1990).

In sixty-eight cases the reports indicated that action is pending. In many of these cases follow-up action or the outcome of action which was reported to be pending has not been reported to the IMO.

In ninety-three cases the reports indicated that there was insufficient evidence even to submit a report to the flag state. There is no information as to why the evidence was considered insufficient.

Action Taken by Contracting Parties as Flag States

Since 1983 over 1,000 (alleged) discharges from ships flying the flag of Contracting Parties to the MARPOL 73/78 Convention have been reported to the IMO. Table 11 gives a summary of the states with the highest number of reported

Table 10. Action taken by contracting parties as port or coastal states over the period 1983–1990 (cumulative)

	Total number of cases, 1983–90	%
Action pending	68	26
No action		
Vessel not guilty	10	4
Insufficient evidence	93	36
Other reasons	3	1
Action taken		
Fine	72	28
Other action (including denial of entry and warning)	12	5
TOTAL	258	100

Source: Gerard Peet (1992), *Operational Discharges from Ships: An Evaluation of the Application of the Discharge Provisions of the MARPOL Convention by its Contracting Parties* (AIDEnvironment, Amsterdam).

(alleged) discharges from ships flying the flag of that state. In addition, Table 12 gives an overview of the action taken by flag states upon these reported discharges.

In 52.8 per cent of the cases (534 out of 1,012), flag states have not submitted reports about the action taken against ships involved in (alleged) discharges. If cases which are still pending are also taken into account, 60.7 per cent of the cases (615 out of 1,012) are without a report about the action taken by the flag state.

In only 206 cases have flag states reported that they have taken some type of action (that is, vessel found not guilty, no action because of insufficient evidence, no action for other and unspecified reasons, warning given, fines, and other unspecified action). From these 206 cases, sixty cases resulted in no action because of insufficient evidence. It would be useful to learn from the flag states involved why the evidence was considered insufficient.

From these 206 cases, seventy-seven cases resulted in fines being imposed on the owners of vessels and/or members of the crew. This is less than 8 per cent of the total number (1,012) of (alleged) discharges reported to the IMO.

Some flag states have a relatively high level of reporting actions taken: the Federal Republic of Germany, Greece, and Norway. Many flag states have never, or only in very few cases, submitted reports about action taken.

Table 10 provided some information as to the types of action taken by port and coastal states in those cases where action with regard to reported discharges was not left to the flag states. If these percentages are used for the number of cases in Table 12 where action was taken by the port or coastal state, it is possible to develop a table which gives percentages for the various types of action taken after the detection of an (alleged) discharge by port, coastal, and flag states over the period 1983–90 (see Table 13).

Table 11. Reported (alleged) discharges from ships flying the flag of contracting parties to the MARPOL 73/78 Convention (more than 3 reports per year; situation as at 31 December 1991)

	Total number of reported discharges	Average per year	Number of years
Panama	160	26.667	6
Liberia	137	17.125	8
Norway	114	14.250	8
Cyprus	23	11.500	2
Greece	80	10.000	8
UK	53	6.625	8
FDR	46	5.750	8
USA	38	4.750	8
Denmark	33	4.125	8
Netherlands	32	4.000	8
Italy	31	3.875	8
USSR	27	3.857	7

Source: Gerard Peet (1992), *Operational Discharges from Ships: An Evaluation of the Application of the Discharge Provisions of the MARPOL Convention by its Contracting Parties* (AIDEnvironment, Amsterdam).

Article 4(4): Severity of Penalties

Article 4(4) of the MARPOL 73/78 Convention stipulates that penalties for violations of the Convention should be adequate in severity to discourage such violations. Within the framework of this article it is not possible to assess whether the level of fines given is adequate. Table 14 provides a comparison of the average level of fines (by all Contracting Parties where reports are available) since 1983.

Conclusion with Respect to Articles 4(1), 4(2), 4(3), and 4(4)

From the information available in the reports to the IMO it would seem that most Contracting Parties to the MARPOL 73/78 Convention do not fully comply with Articles 4(1), 4(2), 4(3), and 4(4) of the Convention. As regards its discharge provisions, the MARPOL 73/78 Convention is most likely not as effective as it could be.

A study conducted in 1989 by the Netherlands' environmental organization Werkgroep Noordzee study concluded that:

- there was little chance that ships would be detected when making unlawful discharges at sea;
- when ships were seen while illegally discharging at sea, there was little chance that they would be brought before justice;
- when ships involved in unlawful discharges were brought before justice, chances were small that penalties would be given; and

Table 12. Action taken by contracting parties as flag state (1983–1990)

	?	1983	1984	1985	1986	1987	1988	1989	1990	Total
No report available	1	4	32	68	104	44	74	89	118	534
Action pending	2	2	5	13	6	6	4	26	17	81
No action										
Vessel left registry	—	—	—	—	2	—	—	—	2	4
Vessel not guilty	—	4	10	2	3	3	3	—	1	26
Insufficient evidence	3	5	17	10	6	1	9	5	4	60
Other reasons	—	1	3	5	4	3	3	2	—	21
Action taken										
Warning given	—	1	1	1	2	1	1	1	—	8
Fine	—	12	22	2	4	3	11	13	10	77
Other/unspecified	—	1	1	4	1	—	—	1	2	10
Action taken by										
Port or coastal state	—	18	24	34	29	22	18	27	19	191
TOTAL	6	48	115	139	161	83	123	164	173	1012

Source: Gerard Peet (1992), *Operational Discharges from Ships: An Evaluation of the Application of the Discharge Provisions of the MARPOL Convention by its Contracting Parties* (AIDEnvironment, Amsterdam).

- when penalties were given, these would generally be very low and definitely not adequate in severity to discourage MARPOL 73/78 violations.¹⁰

These conclusions are, unfortunately, still valid.

Obstacles in Complying with Articles 4(1), 4(2), 4(3), and 4(4)

It is possible that Contracting Parties have been more active with respect to their Article 4 duties than is reflected in the reports available. This is, however, not likely. Why then are so many Contracting Parties not complying with these regulations? A lack of expertise, resources, or even political will could explain much. It is also possible that the interests related to maintaining a substantial fleet under its flag tempts certain flag states to be quite forgiving with respect to MARPOL 73/78 violations by ships flying its flag.

There is, however, also a very real and practical problem: the burden of proof. Table 13 indicates that in 13 per cent of all cases insufficient evidence was the cause of no action being taken; if only those cases for which reports are available are taken, in 129 out of 347 (37 per cent) insufficient evidence was the cause of no action being taken.

It is sometimes extremely difficult to satisfy the requirements of the legal systems in many countries with regard to the proof that a specific vessel is responsible for a specific oil spill.

Annex I, Regulation 12(1): Provision of Reception Facilities

Regulation 12(1) of MARPOL 73/78's Annex I requires that the government of a Contracting Party undertakes to ensure the provision at oil-loading terminals, repair ports, and in other ports in which ships have oily residues to discharge, of facilities for the reception of such residues.

It is, at present, extremely difficult to assess the current situation as to the availability of such reception facilities for oily residues in ports. Complaints from the shipping industry as to the lack of such facilities in many ports have been voiced on many occasions, including during meetings of the International Maritime Organization. The overall complaint of the shipping industry is that, whilst the industry has made significant steps (at, in the industry's words, high costs) towards complying with the requirements of the MARPOL 73/78 Convention, the governments of Contracting Parties have not made equal efforts to comply with the requirements the Convention places on them. This is especially true for the provision of reception facilities.

At a conference in 1986, the International Chamber of Shipping (ICS) noted the following:

What the industry finds hard to stomach is the fact that little has been done in some parts of the world to provide the reception facilities in ports which the Convention demands. ICS has conducted two enquiries, asking masters to complete a form about the adequacy or otherwise of the reception facilities for oil residues from their own first hand experience. While these surveys cannot be regarded as comprehensive, they reveal all too clearly that ships are sometimes put in a quite impossible position: rightly prohibited by the Convention from discharging everything but virtually oilfree ballast water and engine room bilge water at sea, they are not provided with the required alternative means of disposal ashore.¹¹

Table 13. Action taken by contracting parties as port, coastal and flag states over the period from 1983–1990 (cumulative)

	total number of cases, 1983–1990	%
No report available		
Flag state	534	
Action pending		
Flag state	81	
port or coastal state (26% of 191)	50	
Sum: No report or action pending	665	65
No action, vessel not guilty		
Flag state	26	
Port or coastal state (4% of 191)	8	
Sum: No action, vessel not guilty	34	3
No action, insufficient evidence		
Flag state	60	
Port or coastal state (36% of 191)	69	
Sum: No action, insufficient evidence	129	13
No action, other reasons		
Flag state	25	
Port or coastal state (1% of 191)	2	
Sum: No action, other reasons	27	3
Action taken, fined		
Flag state	77	
Port or coastal state (28% of 191)	53	
Sum: Action taken, fined	130	13
Action taken, other and unspecified		
Flag state	18	
Port or coastal state (5% of 191)	9	
Sum: Action taken, other and unspecified	27	
TOTAL	1,012	100

Source: Gerard Peet (1992), *Operational Discharges from Ships: An Evaluation of the Application of the Discharge Provisions of the MARPOL Convention by its Contracting Parties* (AIDEnvironment, Amsterdam).

The situation apparently has not changed much since. Recently, INTERTANKO (International Association of Independent Tanker Owners) presented a document to the 34th session of the Marine Environment Protection Committee in which it notes that over the last ten years INTERTANKO received many reports from its members which showed a significant lack of reception facilities which turns out to be a serious matter in ports, not least those being located within special areas. In this document INTERTANKO also points

Table 14. Average level of fines for unlawful discharges (\$US)

1983	876
1984	2,358
1985	737
1986	607
1987	840
1988	664
1989	937
1990	6,158

Source: Gerard Peet (1992), *Operational Discharges from Ships: An Evaluation of the Application of the Discharge Provisions of the MARPOL Convention by its Contracting Parties* (AIDEnvironment, Amsterdam).

to the lack of a sufficiently strong political will to deal individually and jointly with this common problem.¹²

Obstacles in Complying with Annex I, Regulation 12(1)

There are financial, technical, and political reasons for the lack of reception facilities. In a review of the situation concerning reception facilities in the Mediterranean (a review that confirms the lack of such facilities in that Region) these problems are summarized as follows. Financial problems include relatively high initial investment and operating costs. Technical reasons comprise problems related to the operation of reception facilities and their maintenance. Political reasons are related mainly to willingness of coastal states to improve the present situation.¹³

Future Prospects

From the previous analysis it will be clear that:

- there are insufficient reliable data to support any conclusion regarding trends in the amount of oil entering the world's seas and oceans, or regarding the contribution of shipping therein;
- the most serious problem at present is implementation and enforcement of international agreements such as MARPOL 73/78 by national governments rather than the need to develop new international regulations.

UNCED did not do much to resolve these problems. With an agenda as saturated as UNCED's, it should be no surprise that the activities of a United Nations agency (the IMO) that is generally considered to be quite effective and the instruments of which (such as the MARPOL 73/78 Convention) are generally considered to be quite successful have received relatively little attention. With regard to marine oil pollution,

UNCED's recommendations have basically done nothing more than confirm the efforts already under way within the IMO. In doing this, UNCED has failed to recognize the problem of inadequate implementation of international instruments (such as the MARPOL 73/78 Convention) by their Contracting Parties. Consequently, UNCED has failed to develop mechanisms by which Contracting Parties to international conventions and agreements can be forced to implement what they have ratified. This, unfortunately, will not improve the future prospects of implementing such conventions as the MARPOL 73/78 Convention.

How to Improve Implementation and Enforcement by National Governments?

In the wake of serious accidents many will normally call for more-effective action at an international level, or may even blame the International Maritime Organization for failing to develop effective measures.

It is extremely important to note that reality shows a different picture. In the necessary balance between efforts at an international level (in this case by the IMO) and complementary activities at a national level, it is evident that the problems occur almost exclusively at a national level in many if not most of the nations party to the relevant international conventions.

It is not possible to single out certain nations as the most important causes of the continuing problems. It would be too easy and inappropriate to single out developing nations; the record of several nations from the industrialized world is also far from positive. It would be too easy automatically to single out the open registry flags (often referred to as flags of convenience); some of the most important accidents of the last years (*Exxon Valdez* and *Herald of Free Enterprise*) were caused by ships flying the flag of rich industrialized nations. It would be too easy and again inappropriate to generalize about the poor quality of crews from developing countries; again, the crews involved in some of the most important accidents of the last few years came from developed industrialized countries. This is not to say that there are no problems associated with (certain) ships flying flags of convenience and that there are no problems associated with (certain) crews from developing countries, but the problems are not exclusively theirs.

Within this situation of non-compliance, the most important problems would seem to be:

- the non-compliance of port and coastal states with certain MARPOL 73/78 requirements, in particular those calling for the availability of reception facilities for wastes in ports; and

- the ineffective enforcement of international regulations.

The major obstacles towards solving these problems are financial, technical, and political.

This article has, so far, concentrated on the MARPOL 73/78 Convention, but inadequate enforcement especially is a problem associated with other international agreements in this field as well. Many of the recent serious (tanker) accidents have also highlighted the problems associated with ineffective enforcement and control by flag and port states of regulations with respect to the safety of ships (substandard ships and crews).

There appears to be general agreement among national governments represented at the IMO that more effective implementation and enforcement is indeed the key to future improvement of the current situation. Several important initiatives have now been taken and work has started to further develop these.

Within the IMO, a new subcommittee on Flag State Implementation (that will also address port and coastal state implementation issues) has been created with a view to improving the present situation. One of its first priorities is the development of guide-lines for flag state implementation with the aim of encouraging nations to ratify the Convention and to help contracting (flag state) Parties better to implement the Convention.¹⁴ These efforts complement IMO's programme of technical assistance consequential to Article 17 of the MARPOL 73/78 Convention, where Contracting Parties are required to promote support for those Parties which request technical assistance for the implementation of certain provisions of the Convention. This article has not assessed the compliance of Contracting Parties with this specific requirement of the MARPOL 73/78 Convention; such an assessment deserves (and requires) an article in its own right.

The Marine Environment Protection Committee of the International Maritime Organization has also developed some measures to solve some of the more practical problems of the enforcement of the discharge provisions of the MARPOL 73/78 Convention. At its 34th session in July 1993 this Committee discussed a resolution that would establish that, if oil is seen in the water, this automatically implies that the oil content of the associated discharge has been higher than 15 parts per million and is thus in violation of the relevant MARPOL 73/78 discharge provisions.¹⁵

The same Committee is also developing a Manual on Port Reception Facilities to assist port states in developing and constructing such facilities. In addition, an action plan has been developed by IMO and UNEP for the Mediterranean region, and initiatives are being developed by IMO and the World Bank within the framework of the Global Environment Facility for the Wider Caribbean Region.

The Commission of the European Communities has developed a wide range of initiatives in response to the *Aegean Sea* and *Braer* tanker accidents on European coasts. The action programme includes, among other things, measures to establish a convergent implementation of existing international rules in the Community and measures towards a tighter and more effective control of ships by the State of the ports.¹⁶

In conclusion, it would seem that there are now substantial efforts under way to improve the implementation and enforcement of international regulations aimed at reducing marine oil pollution. It remains to be seen, however, whether there is a real political will to tackle the fundamental financial problems of developing countries.

The Scope For New Initiatives by National Governments

Whilst there is sufficient reason to concentrate efforts on implementation, the question is valid whether there is no room at all for new regulations or changes to existing regulations. Relatedly, one might ask what role national governments could (or should) play in this respect.

In the wake of the *Exxon Valdez* accident, the United States developed a range of new initiatives, all amounting to developing new regulations, first at the national level, later at the international level of the IMO.

These efforts have, in some respects, been highly successful: within a few years the IMO developed and adopted a new international convention on oil-pollution preparedness and response (OPRC, on 30 September, ratified by ten Nations)¹⁷ as well as new international rules within the MARPOL 73/78 Convention with respect to new design criteria for oil tankers (the double-hull and mid-deck tanker design are now the new standards; these new requirements entered into force on 6 July 1993). In other respects these national initiatives have been counterproductive. The new national legislation in the USA regarding liability and compensation has effectively crippled (or killed) an international agreement in this field: the 1984 Protocols to the 1969 Civil Liability and 1971 Fund Conventions. A new Protocol had to be adopted in 1992 to allow higher compensation levels to enter into force without ratification of the Protocols by the United States.

In the wake of the *Maersk Navigator*, *Aegean Sea*, and *Braer* accidents, efforts are now under way (at the initiative of Germany and the Netherlands) to create the option of establishing mandatory ships' routing measures and reporting systems.

Whilst there is certainly room for new initiatives by national governments, there are also risks in such initiatives:

- national action could lead to different rules and regulations in different sea areas;
- national action could jeopardize the effectiveness of existing international regulations (as has been the case with the USA initiatives in the field of liability and compensation); and
- new national initiatives might focus attention away from the need effectively to implement and enforce existing national and international regulations.

Some Fundamental Questions That Will Need To Be Resolved

Most of the current efforts to improve the present situation are aimed at the technical problems, some will be aimed at the financial problems. It is unclear what is and can be done about the political problem, the lack of political will truly to resolve the present problems, especially with respect to enforcement.

The opportunities of (in particular) flag states effectively to enforce important international conventions such as those of MARPOL 73/78 and SOLAS are limited. Many ships may never see the ports of their flag state. There is therefore an urgent need to shift (certain) enforcement powers from flag states to port and coastal states.

This, as well as the proposed option of designating mandatory ships' routing measures, will also require a rethink of the concept of the right of innocent passage: how to define innocent passage in relation to the environmental security of a nation?

Last, but not least, it will be necessary to find ways to 'encourage' national governments that have ratified international conventions to live by the international rules they have thus accepted. The basic question here is: what sanctions could be available for states not complying with international conventions to which they are Contracting Parties?

Is There any Reason for Optimism?

The present situation with respect to marine oil pollution is not as positive as is often claimed. International co-operation in this field has, so far, not been quite the success it should have been. But international co-operation as such is not the main problem; the adequate application of its results by national governments is. Initiatives are now being taken to improve the situation and it is too early to tell how effective these will prove to be in five to ten years. The realist might say that there is no real reason to expect that the fundamental underlying problems (such as a lack of political will) will now be resolved. The optimist, however, will say that they simply have to be resolved and that the seeds to do so have been planted.

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