

OIL SPILL PREPAREDNESS AND RESPONSE: THE ROLE OF INDUSTRY

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TABLE OF CONTENTS

SECTION	PAGE
1. INTRODUCTION	15
1.1 SCOPE	15
1.2 BACKGROUND	15
1.3 FRAMEWORK FOR INTERNATIONAL COOPERATION	17
2. OIL SPILL PREPAREDNESS	19
2.1 CONTINGENCY PLANNING AND COORDINATED RESPONSE PROCEDURES	19
2.2 ESTABLISHMENT OF EQUIPMENT STOCKS	19
2.3 RESEARCH AND DEVELOPMENT PROGRAMMES	21
2.4 TRAINING AND EXERCISE PROGRAMMES	21
2.5 SHIPBOARD OIL POLLUTION EMERGENCY PLANS	22
3. OIL SPILL RESPONSE	23
3.1 TECHNICAL COOPERATION	23
3.2 INTERNATIONAL COOPERATION IN OIL SPILL CONTROL	23
4. GENERAL PRINCIPLES FOR GOVERNMENT/INDUSTRY COOPERATION	25
5. STATUS OF THE GOVERNMENT/INDUSTRY PARTNERSHIP	27
6. SUMMARY AND CONCLUSIONS	29
REFERENCES	31

APPENDIX

SUMMARY OF THE INTERNATIONAL CONVENTION ON OIL POLLUTION PREPAREDNESS, RESPONSE AND COOPERATION, 1990	33
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LIST OF TABLES

1. OPRC Convention: Contracting states as of December 1, 1996	23
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LIST OF FIGURES

1. Tanker spills, 1976–1995	15
2. Locations of major oil spills from tankers (over 5,000 bbl), 1970–95, and locations of the main equipment stockpiles available for international use	20

SECTION 1

INTRODUCTION

1.1 SCOPE

Few would disagree with the notion that prevention is better than cure. However, oil spills are an inevitable consequence of the need to produce, store, and transport oil by sea. The occurrence of major oil spills with costly and far-reaching effects has created the need for cooperation between different countries, and between government and industry. Collaboration and pooled resources have fostered an integrated approach extending from contingency planning to spill response and compensation.

Historically, most medium and large spills (over 50 bbl or seven tonnes) have involved ships. The aim of this paper is to review, from a shipping perspective, the role of industry in dealing with oil pollution incidents arising from the transportation of oil. In this context, the shipping community is represented by the ship owners and operators, including some of the major oil companies. The wider oil industry also has separate involvement as owners of oil tanker cargoes and as oil importers. As a whole, the oil industry is composed of a disparate group of private and public organisations ranging from major oil companies to very small operators of individual tank farms, jetties, and other oil-handling facilities.

Oil spills also occur in connection with offshore exploration and production activities, but the relationship between

government and oil industry in this type of spill response is less complex. Moreover, the salient points of such spills are similar to those discussed in this paper.

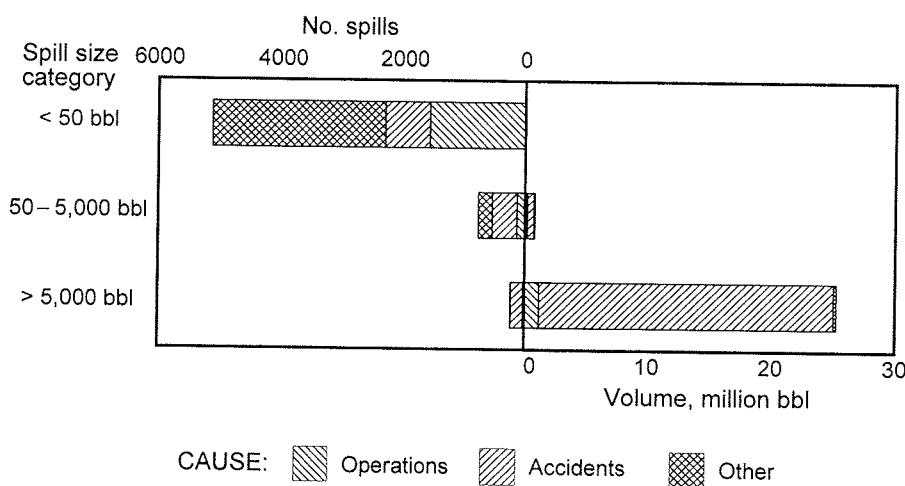
The title of the paper reflects the fact that oil spill preparedness and response are separate but inextricably linked issues. Conceptually, good preparation paves the way for an effective response; in an ideal world, both preparation and response aspects are given equal weight. In reality, however, preparedness activity often is compromised in countries with more pressing demands on finite funds and resources. Thus oil spill response alone must serve as the way of dealing with spills in countries that remain comparatively ill-prepared.

1.2 BACKGROUND

A few generic approaches to oil spills have evolved in the 30 years since the first major oil tanker spills. Response arrangements generally have been moulded by certain characteristics of spills, as well as by the culture and administrative fabric of different countries.

As shown in Figure 1, the overwhelming majority of marine incidents involve small spills during routine operations at terminals and other oil-handling facilities (ITOPF, 1996a).

FIGURE 1.
TANKER SPILLS, 1976-1995



Source: ITOPF, 1996a.

More than 80 percent of all recorded oil spills from tankers, barges, and combination carriers involved less than 50 barrels (seven tonnes). The responsibility for dealing with such small spills naturally has fallen to the operators of the oil-handling facilities. If ships are the source and/or the cause of the incidents, the costs involved are passed to the ship owners and their insurers.

Figure 1 also shows that major incidents are rare but involve considerably greater volumes of spilled oil. Past experience shows that most of the larger ship spills (more than 5,000 bbl or 700 tonnes) occur as a result of collisions, groundings, fires, explosions, and hull failures involving tankers. High-risk zones are characterised by high traffic density and the presence of navigational hazards (ITOPF, 1996b). Even so, the size, location, and circumstances of any major oil spill remain unpredictable.

Given this unpredictability, governments have largely accepted the need to take charge of the response to major shipping incidents. A review of oil spill response arrangements in 141 countries worldwide (ITOPF, 1996c) established that governments have accepted the primary role of dealing with ship-source oil pollution in well over 100 countries; the opposite approach, an active industry-led response, prevails in about 15 countries. There are good reasons that governments are best suited to take the lead in responding to oil spills from ships. Governments' acceptance of responsibility for oil spill response stems from a recognition of the complex nature of oil spills that affect coastal communities and the need to balance conflicting interests. Governments alone have the mandate to resolve contentious issues and implement an agreed policy for spill response.

Most governments have recognised that it is impractical and unsatisfactory to rely on ship/cargo owners to deal with pollution incidents because a large percentage of the ships adjacent to their coasts are in transit to a destination in another country. As with arrangements for emergency search-and-rescue, there is a clear advantage in developing solutions for such unpredictable events that do not depend primarily on the participation of the ship and/or cargo owner.

The opposite approach to a government-led response is one in which industry or the spiller plans and conducts all aspects of spill response. This approach has been adopted, with variations, by the USA, Canada, Australia, South Korea, and Japan; most ships in these countries' waters are approaching or leaving domestic ports.

Because these vessels are operating in territorial waters, it provides the opportunity for those governments to require more active participation from ship owners in both preparedness and response. In such countries, commercial cleanup contractors and industry cooperatives often are retained by the ship owners to provide equipment and personnel. Governments then focus primarily on monitoring and regulatory enforcement. Limited funding is less likely to impede effective spill response. On the other hand, there often is undesirable duplication of resources and high cost since the government must retain a spill response capability in case the primary

systems fail, such as if the spiller cannot or will not undertake the cleanup. Another consequence is a tendency toward polarisation between those perceived to be wholly responsible for providing resources and conducting the cleanup, and those solely exercising authority. This relationship can lead to a poor appreciation of the practicalities of spill response amongst those in charge, thereby breeding mistrust and detracting from the concept of an equal partnership between industry and government.

In the wake of the *Torrey Canyon* incident in 1969, governments largely accepted the need for their active participation in responding to major oil spills. It was recognised that an efficient mechanism was required for ensuring the reimbursement of reasonable costs incurred in the course of controlling oil spills. The International Convention on Civil Liability for Oil Pollution Damage (CLC) and the Convention on the Establishment of an International Fund for Compensation for Oil Pollution, 1971 (Fund Convention), as well as the interim voluntary schemes of Tanker Owners Voluntary Agreement Concerning Liability for Oil Pollution (TOVALOP) and Contract Regarding an Interim Supplement to Tanker Liability for Oil Pollution (CRISTAL) introduced by industry, have provided the means for compensation following incidents involving tankers. Given the wide acceptance of these Conventions, the two voluntary industry schemes have served their purpose and so expired in February 1997.

Compensation is provided by way of shipping insurance in the case of the CLC, and through oil importers' contributions under the terms of the Fund Convention. It is worth noting that these international arrangements for compensation for oil tanker spills also allow for the recovery of certain elements of spill preparedness costs that are attributable to specific tanker incidents. Thus, the "Polluter Pays Principle" continues to be upheld since the international compensation system is underwritten by the shipping community and the wider oil industry.

In the event of an incident threatening or leading to pollution, the primary financial responsibility in most jurisdictions lies with the ship owner. This responsibility extends to the liability for costs of response, cleanup, and damage caused by oil pollution. Ship owners normally meet their obligations with the help of their pollution liability insurers, called Pollution and Indemnity (P&I) Clubs, International Tanker Owners Pollution Federation Limited (ITOPF), and others. The oil cargo owner may have a secondary interest as charterer and as a contributor to supplementary compensation funds administered by the International Oil Pollution Compensation (IOPC) Fund under the terms of the Fund Convention. Although they do not usually face a direct liability from oil pollution incidents, cargo owners such as the major oil companies are exposed to indirect damage to their markets, and may seek to participate in spill response by contributing advice and resources. Attempts by cargo owners' response teams to take control can be viewed with unease by tanker owners and insurers, and such attempts usually are resisted by the government authority in charge of the spill response.

1.3 FRAMEWORK FOR INTERNATIONAL COOPERATION

The OPRC Convention was developed under the auspices of IMO and came into force in May 1995. The Convention draws attention to the special needs of developing countries, particularly small island states, and calls for cooperation between governments and the oil and shipping industries (IMO, 1991).

Section 2 of this paper focuses on one of the primary objectives of the OPRC Convention, which is to encourage government and industry cooperation in the following areas of spill preparedness:

- contingency planning and coordinated response procedures (Art. 6.2,d);
- establishment of equipment stocks sufficient to deal with oil pollution risks (Art. 6.2,a);
- research and development (R&D) programmes (Art. 8);
- training and exercise programmes to facilitate oil spill response (Art. 6.2,b); and
- Shipboard Oil Pollution Emergency Plans (SOPEPs), to be carried on board all vessels over a stipulated size (Art. 3.1).

For reasons of expediency, the specific requirements are set out in Regulation 26 in Annex 1 of the International Convention for the Prevention of Pollution from Ships, 1973, Protocol 1978 (MARPOL 73/78) (IMO, 1992), obliging ship owners to prepare SOPEPs.

Section 3 will address the OPRC Convention emphasis on government/industry collaboration in two areas related to spill response:

- technical cooperation (Art. 9); and
- international cooperation in oil spill control (Art. 7).

States are urged to adopt the Convention and its concept of collaboration. The IMO is encouraged to provide and maintain an institutional framework for international cooperation. A summary of the articles of the OPRC Convention is provided in the Appendix.

It is appropriate at this point to review the extent to which the spirit of cooperation embodied in the OPRC Convention has been realised in practice. Using the key points listed above as headings, we focus on the record of the shipping and oil industries in the partnership between government and industry. The implications of this review of OPRC Convention issues are discussed in the concluding section.

SECTION 2

OIL SPILL PREPAREDNESS

2.1 CONTINGENCY PLANNING AND COORDINATED RESPONSE PROCEDURES

Industry has embraced an integrated approach to oil spill preparedness and response. The idea is reflected in the "tiered response" concept, which makes it possible to escalate a response by calling on supplementary resources. Basic spill response capabilities at different oil-handling installations complement each other, as well as those of government. These individual resources can be combined for dealing with even the largest oil spills. Contingency planning is approached in the same vein (IPIECA, 1991).

Tier 1 spills are minor but comparatively frequent events. They occur primarily at fixed installations such as ports, harbours, terminals, and oil-handling facilities where the spill size and potential impact are generally small. Responsibility falls to the facility operators to prepare contingency plans identifying the risks and threats posed by spills, the most likely spill scenarios, and the range and level of resources needed to deal with them. Indeed, the OPRC Convention calls for governments to require the operators of oil-handling facilities to prepare and maintain oil pollution emergency plans (IMO, 1991).

Trained members of the regular work force should be familiar with the procedures for initiating a response and activating the facility's emergency plan at any time. Assuming the response is mounted quickly and effectively, any continuing leakage will be stopped, and the spilled oil will be contained and possibly recovered. In the event of a larger incident, the Tier 1 response capability should serve as a first-aid measure and readily form part of an escalated response.

The quality of Tier 1 response capabilities varies, reflecting the disparate organisations operating oil-handling facilities. Some installations are operated without proper emergency plans, others without suitable response equipment or trained spill control personnel. Deficiencies at this basic level have repercussions on the effectiveness with which Tier 1 resources can be integrated into higher tiers.

Tier 2 spills are those which, by virtue of their size and potential impact, call for a response greater than that available at an individual site maintaining preparedness for a Tier 1 spill. A local government agency often will manage and direct the response to a Tier 2 spill, calling on resources of its own and those of neighbouring authorities and local industry. Regardless of the nature of any government/industry partnership in any part of the world, the basic premise is that

available resources are pooled to create the necessary response capability.

Tier 3 spills are of national significance and call for the mobilisation of resources and a response greater than that possible through the pooling of Tier 2 capabilities. To augment the pooled Tier 2 resources available from local government and industry, stockpiles of equipment and cooperatives intended to deal with Tier 3 spills have been created in a number of countries, mostly by the oil industry. Tier 3 stockpiles may be primarily intended for use within one large country, for a region, or globally.

Tier 3 spills inevitably result in governments' becoming directly involved in coordinating the escalation of cleanup resources and managing the spill response. A national contingency plan is essential to establish the government's policy toward oil pollution, the capabilities developed in preparation for such events, and the strategies intended to be used. The national contingency plan also should provide for the pooling of local government and industry equipment resources.

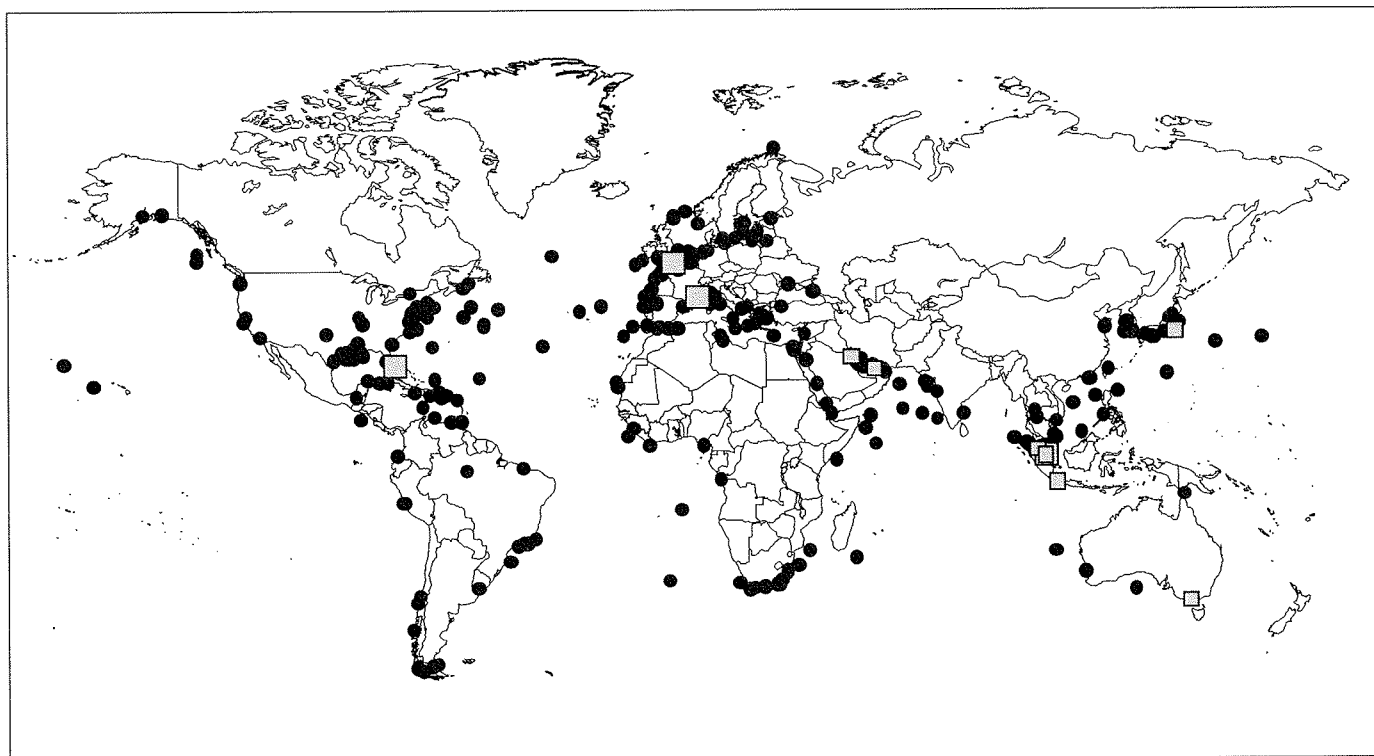
2.2 ESTABLISHMENT OF EQUIPMENT STOCKS

Next to the obligation of underwriting the costs of oil spills, the main role of industry in spill response is to provide expertise and equipment. This role is also noted in Resolution 5 of the OPRC Convention (IMO, 1991). It is logical that the development of oil spill response capabilities will be related to the likelihood of spills occurring, as well as to the damage that might ensue. A risk analysis usually is the first step in the process of selecting resources and deciding where personnel, equipment, and materials should be based. Records of past spills have proved useful in identifying high-risk areas.

The bias toward locating several Tier 3 regional stockpiles in consumer countries exists for good reason. Oil spill statistics reveal that significantly more major oil spills occur close to the voyage destination than occur at the origin or in transit (ITOPF, 1996a, 1996b). From 1970 to 1995, about 380 oil spills of more than 5,000 bbl (700 tonnes) from tankers were recorded worldwide. More than half of these occurred in European and North American waters. Figure 2 shows the locations of the major spills and the main stockpiles of equipment available for international use. Figure 2 also shows that

FIGURE 2.

LOCATIONS OF MAJOR OIL SPILLS FROM TANKERS (OVER 5,000 BBL), 1970-95 (●), AND LOCATIONS OF THE MAIN EQUIPMENT STOCKPILES AVAILABLE FOR INTERNATIONAL USE (■) FROM CCC IN FORT LAUDERDALE, USA; OSRL IN SOUTHAMPTON, UK; FOST IN MARSEILLE, FRANCE; EARL IN SINGAPORE; PAJ IN SAUDI ARABIA, ABU DHABI, MALAYSIA, SINGAPORE, INDONESIA, JAPAN (6 DEPOTS); AMOSC IN GEELONG, AUSTRALIA



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comparatively few developing countries are situated in high-risk areas.

A more detailed analysis has been made of the 13 different Regional Seas Areas designated by the United Nations Environment Programme (UNEP) (ITOPF, 1996b). High-risk areas are found where a high oil transportation volume coincides with dense traffic and/or other navigational hazards such as shallow water, bad weather, and severe sea conditions. Notable high-risk areas include the Bosphorus and Malacca/Singapore Straits, Mediterranean and Caribbean Seas, South Africa, and South Korea/Japan. In the Mediterranean and Caribbean Seas, many of the countries exposed to a high risk have limited spill response capabilities.

Industry arrangements for supplementing local and national response capabilities are referred to as cooperatives or stockpiles. The terms are synonymous to the extent that both cooperatives and stockpiles involve the pooled resources of member companies, stored and maintained ready to be called out to a major spill.

Cooperatives usually cover relatively small geographical areas, such as an estuary, where a number of oil industry facilities forming the cooperative are located. The Gulf Area Oil Companies Mutual Aid Organisation (GAOCMAO) is an oil industry cooperative covering a larger water body and several countries, but the concept of pooling resources to deal with a

spill remains the same. National oil industry cooperatives, such as the Petroleum Industry of Malaysia Mutual Aid Group and Norsk Oljevernforening for Operatørselskaper, generally do not provide equipment operators. Some have sufficient numbers of trained personnel amongst member companies to create an operator pool in case of need, while others rely on contractor networks.

Large stockpiles usually are intended for use within groups of countries or particular regions, such as the Clean Caribbean Cooperative (CCC) and East Asia Response Limited (EARL). There are variations; for example, the Oil Spill Response Limited (OSRL) is available to operate globally, while the Australian Marine Oil Spill Centre (AMOSC) is an industry stockpile primarily intended for national use. The members of major stockpiles have favoured establishing teams of trained personnel to maintain and operate the equipment. In the case of the Petroleum Association of Japan (PAJ), stockpiled equipment is maintained by contractors, but users of the equipment have to provide their own operators. The PAJ arrangement also involves the maintenance of five identical equipment depots located along the Gulf-Japan tanker routes, in addition to six stockpiles located within Japan.

Oil spill cooperatives and major stockpiles are expensive to establish and maintain. To provide a financial return partially offsetting the cost to members, most operators have made their

equipment and materials available for use at commercial rates. The rates charged to non-members are typically twice the member rates. In this way, the shipping community makes a substantial, indirect contribution to maintenance costs. Outside the USA and Japan, full membership has not been open to shipowners, but some stockpiles and cooperatives have accepted shipping companies as associate members with partial access to the pooled resources.

Countries with industry cooperatives or stockpiles located nearby have tended to rely on those services in preference to their own governments' Tier 2 and 3 capabilities. This may result in reducing some of the duplicative investment through the scaling down of existing government stockpiles and more reliance being placed on industry. Whether such a trend is healthy depends on local circumstances and to what extent available industry equipment is adequate, well-located, and maintained. More importantly, governments taking this route will have less control over the choice of equipment and its availability in the event of a spill.

In some parts of the world there may be few or no specialised resources available nationally beyond what is held at individual facilities; and these, even when combined, may not constitute a credible Tier 2 response capability. For these countries, a Tier 2 spill effectively calls for a Tier 3 response involving resources from other countries and regions. However, it rarely is feasible to airlift Tier 3 resources to a country lacking the logistic infrastructure. In such circumstances, the best remedy lies in mounting a response using available non-specialised local resources.

Industry Tier 3 capabilities rarely are used, which makes it all the more important for the necessary arrangements to be in place for adequate response. There is little point in having these resources if the movement of trained operators and their equipment is hindered or prevented. Obstacles encountered include customs restrictions and a reluctance on the part of recipient countries to allow the return of equipment to base. Commercial incentives encourage stockpile managers to try to overcome such obstacles in advance, but facilitating the cross-border transfer of personnel and equipment is a task that only the government of the recipient country can perform. Article 7 of OPRC Convention establishes that contracting states should facilitate the movement of foreign spill response personnel and equipment to, in, and from their territory (Appendix; IMO, 1991).

2.3 RESEARCH AND DEVELOPMENT PROGRAMMES

Several ambitious research and development (R&D) programmes have been sponsored separately by industry and government in the wake of the *Exxon Valdez* incident, but in almost all cases the financial commitment has dwindled in recent years. In the United States, a five-year \$30 million programme funded by the Marine Spill Response Corporation (MSRC) ended in 1995. The support from the American Petroleum Institute (API) and most individual oil companies

is also at a low level. This trend is reflected by similar cuts in government funding in the last two years.

Attempts to avoid supporting duplicative work under different programmes in the USA and elsewhere have not been entirely successful. To some extent, this is a natural consequence of governments' tendency to channel funds to national research institutions. Specific projects have been better focused and sustained, and ultimately more successful, although in the case of the Newfoundland Offshore Burn Experiment, the attendant cost was enormous. This \$60 million experiment conducted in 1993 was facilitated by Canadian government authorities and jointly funded by government agencies and industry in the United States and Canada.

To bring a wider and more international approach, IMO hosted meetings sponsored by governments and industry at which projects were reviewed and priority assigned to those which would contribute most to an improvement in effective response to spills (IMO, 1995). However, no funds were committed, and it is not yet clear whether sufficient impetus has been given to the promotion of international cooperation in coordinated, focused, and effective R&D, despite the importance attached to this subject in Resolution 7 of OPRC Convention (IMO, 1991).

2.4 TRAINING AND EXERCISE PROGRAMMES

In this decade, the number and scope of oil spill exercises have greatly increased in the United States and elsewhere. This increase is partly a result of mandatory requirements under the Oil Pollution Act 1990 (OPA 90), but the trend for more and better exercises is worldwide. The shipping and oil industries are organising joint exercises with national governments.

Through the industry stockpiles and cooperatives, spill experience may be retained in a central and focused organisation, from which knowledge and information can be disseminated to the wider industry. The teams maintaining most of the largest stockpiles — for example OSRL, EARL, CCC, and AMOSC — run extensive training programmes designed for different operator and management levels. The managers of Tier 3 stockpiles are participating in mobilisation exercises whereby equipment is airlifted to the site in order to test response times, customs clearance procedures, logistics support, and other practical arrangements. Training activities such as these occupy maintenance staff between responses, and the revenue gained helps offset members' costs of purchasing and maintaining specialised equipment.

Governments, working singly or jointly, run training courses within the framework of the UNEP Regional Seas Programme. Several industry organisations, including OSRL and ITOFF, have contributed to the development of training modules in the IMO Model Course Programme on Oil Pollution Preparedness and Response. Collaboration between industry and government in the field of training is continuing to develop through the wider availability of such training courses to government personnel involved in oil spill response.

Training and exercise programmes have even more relevance in the 1990s with the increase in turnover of spill

response personnel. The trend is particularly noticeable in government circles with the establishment or expansion of environmental conservation departments and agencies in many countries.

Amongst oil companies, the management implications of handling major oil spill incidents are the focus for most training activity. The importance of developing a "comprehensive training programme in the field of oil pollution preparedness and response" is stressed in Resolution 7 of OPRC Convention (IMO, 1991). A realistic appreciation of oil spill cleanup options and their limitations in relation to the characteristics and fate of spilled oil must remain an objective of fundamental importance for training courses at all levels.

2.5 SHIPBOARD OIL POLLUTION EMERGENCY PLANS

In an emergency, the priorities of a ship's crew are to save lives, then the ship and its cargo. It generally is unrealistic to expect crew members to carry out spill response measures. Since spilled oil quickly spreads and drifts away from the ship, crew members realistically cannot perform response measures on a spill some distance from the ship. Ship owners, however, often carry some equipment and/or materials on board, such

as sorbents, in order to provide a self-help capability for small spills on deck.

Notification is a key responsibility of ship owners in the event of an oil spill incident, as envisaged under Article 3 of the OPRC Convention. Although the OPRC Convention has been ratified by relatively few countries so far, the pertinent regulation is incorporated in the widely accepted and readily enforceable MARPOL 73/78. Under MARPOL Regulation 26, SOPEPs include provisions for notifying coastal states and other interested parties of actual spills and conditions that might lead to oil pollution. The plans specify practical measures to be taken by the crew in order to minimise pollution damage. The role of crew members in controlling and minimising an oil spill are outlined under different scenarios, e.g., operational spills, groundings, collisions, hull failure, fires, and explosions.

Arrangements must be made on board to facilitate communication between the ship and the appropriate authorities ashore so that information relevant to the spill response is exchanged freely. Subject to his other priorities, the master of the ship has a vested interest, on behalf of ship and cargo owners, in cooperating with the authorities of the coastal state in order to minimise potential liabilities. In a few countries, such as Canada and the USA, the SOPEP requirements are more extensive and include provisions to be made for a shore-based response capability using cleanup contractors.

SECTION 3

OIL SPILL RESPONSE

3.1 TECHNICAL COOPERATION

Resolution 9 of the OPRC Convention calls for cooperation between countries and the technical advisers to the ship owners' insurers, in order to promote exchange of information and effective oil spill response (IMO, 1991). The shipping industry continues to provide the services of ITOPF, which offers on-site technical advice in the context of the oil spill scenario and whatever national arrangements are in place in the country concerned.

Given the widespread preoccupation with specialised equipment, it often is forgotten that successful oil spill response is primarily dependent on a realistic attitude and basic organisation. Such commodities are not necessarily in short supply in developing countries, and much can be achieved using non-specialised local resources. Numerous oil spills in South Korea and occasional incidents in remote locations elsewhere have clearly demonstrated the effectiveness of manual cleanup of polluted shorelines without the use of specialised equipment. A large capacity for self-help and for making effective use of available resources also is especially prevalent in isolated communities, such as those of small islands.

A good example illustrating these points is provided by an incident in Mozambique attended by ITOPF staff in April 1992. A substantial spill of heavy fuel oil from the tanker *Katina P* contaminated sandy beaches and mangroves near the capital, Maputo. A team of operators with equipment from a major international stockpile was flown out to Maputo before an evaluation of local conditions was made. The selected equipment proved to be of little use because of a lack of logistical support and other local circumstances, including extremely shallow water in Maputo Bay. No offshore response was feasible and most of the equipment was therefore returned, although some boom and a number of operators were retained to assist with shoreline cleanup. Despite a complete lack of specialised local resources, such as cleanup equipment, trained personnel, and contingency plans, it proved possible to organise an effective response using a labour force of 500 casual workers and standard road maintenance machinery.

Considering the different levels of commitment to oil spill preparedness by governments and some parts of industry, the importance of effective response procedures becomes paramount. The presence of ITOPF on site ensures that essential equipment can be made available through the participation of P&I Clubs and in some cases also the IOPC Fund. More

importantly, it allows for a respectable spill response to be organised even if prior experience, contingency plans, or equipment stocks in the country involved are rudimentary or non-existent.

3.2 INTERNATIONAL COOPERATION IN OIL SPILL CONTROL

The benefits of the universal procedures created by international conventions are well-appreciated by the international shipping and oil industries. The industry actively supports their wider adoption, but other priorities in many countries result in a slow ratification process. In the case of OPRC Convention, which was conceived primarily for the assistance of developing nations, only 30 countries adopted the Convention as of December 1996, and fewer than half of these are developing countries. Table 1 shows the countries that have adopted OPRC Convention (Edwards, 1995).

TABLE 1.
OPRC CONVENTION: CONTRACTING STATES AS OF
DECEMBER 1, 1996

Argentina	Greece	Senegal
Australia	Iceland	Seychelles
Canada	Japan	Spain
Denmark	Liberia	Sweden
Egypt	Marshall Islands	Switzerland
El Salvador	Mexico	Tonga
Finland	Netherlands	Tunisia
France	Nigeria	United States
Germany	Norway	Uruguay
Georgia	Pakistan	Venezuela

Nevertheless, in response to the OPRC Convention requirements set out in Resolution 6, the oil industry has collaborated with IMO to promote multilateral contingency planning and the exchange of technical information, with particular emphasis on developing countries. The International Petroleum Industry Environmental Conservation Association (IPIECA) is the specific conduit for oil industry assistance in this area.

IMO and IPIECA have co-sponsored a series of seminars advocating the tiered response concept for combating oil

spills. The aim has been to bring together senior government officials and oil industry executives to stimulate cooperation and create sufficient momentum to lead to improvements at the national level. The initiative began in 1991 and has been funded jointly by industry, donor countries, and funding agencies through IMO. The programme has reached about 1,000 seminar participants from more than 80 countries. The seminars have emphasised the need for follow-up action to develop national response systems and training programmes.

The industry groups and IMO recently created what is known as the Global Initiative, whereby mechanisms are sought for cooperation to support national implementation of the OPRC Convention, with funding from the World Bank Global Environmental Facility (GEF), and other national aid agencies. The Global Initiative's next phase initially focuses on the development of oil spill preparedness in Sub-Saharan African countries.

This activity is designed to provide sufficient assistance to developing countries with significant oil spill risks to enable the establishment of a fully tested national contingency plan through national industry/government cooperation. However, the risk of oil spills occurring in the target African countries is comparatively low and the idea of oil spill preparedness has not taken firm root. It is justifiable to argue that a better return could be expected from investing effort in countries in North Africa, the Caribbean, Eastern Europe, and Turkey where the risks — and the likely commitment to tackling them — generally are greater.

A number of regional initiatives for cooperation between countries in the field of pollution control have been implemented by IMO and UNEP in designated regions such as the Mediterranean Sea, Gulf Area, Caribbean, and Latin America. Reciprocal industry agreements in these areas have been established as a means of optimising government/industry cooperation within the regions (MOIG, GAOCMAO, ARPEL). The Regional Marine Pollution Emergency Response Centre (REMPEC) in the Mediterranean region is a well-established inter-governmental centre promoting the development of national contingency plans, encouraging international cooperation, and conducting training courses with the participation of industry expertise. ITOPF actively participates in initiatives by REMPEC to promote multilateral cooperation in the Mediterranean region, such as that between Cyprus, Egypt, and Israel. REMPEC's counterpart in the Caribbean region is the Regional Marine Pollution Emergency Information and Training Centre Caribbean (REMPEITC) established in 1995.

To further facilitate dialogue and international cooperation, an IMO/Industry Consultative Forum has been formed with the IMO, IPIECA, ITOPF, ICS, INTERTANKO, OCIMF, and E&P Forum. Most of these organisations actively participate in the work of the OPRC Working Group under the Marine Environment Protection Committee of IMO. IPIECA and IMO also have co-sponsored the International Oil Spill Conference to promote greater participation from developing countries and increase awareness of oil spill response issues.

SECTION 4

GENERAL PRINCIPLES FOR GOVERNMENT/INDUSTRY COOPERATION

Previous sections discussed progress in implementing the OPRC Convention and identified certain trends in the relationship between government and industry. OPRC contains the essence of sound preparedness and effective response activity and reflects the consensus of the 90 countries attending the diplomatic conference at which the Convention was adopted. However, since the conference was held in 1990, only one-third of the countries represented have ratified the Convention (Table 1, page 23), including little more than a dozen developing nations, for a variety of reasons. For some countries, the risk of a major oil spill is low, so allocating effort and scarce resources for this purpose is a low priority. The analysis of oil spill risks for different regions of the world confirms that many developing countries face minimal risks of major oil spills. Cultural differences and local conditions also contribute to shaping attitudes. These facts dictate a flexible approach to improving oil spill preparedness and response.

Similarly, there are no universal solutions to the problem of funding. A funding system based on a levy on imports or port calls cannot equitably distribute preparedness costs amongst potential polluters because many oil spills originate from passing ships that may not be subject to the levy.

Oil spills are an inevitable consequence of maritime trade, and not just from oil transportation. In the same way that oil cargo owners have an indirect responsibility for the consequences of transporting oil by sea, it can be argued that in the wider perspective, oil spills in general arise as a result of the need to carry goods by sea. Since everyone benefits from maritime trade, it is fair that taxpayers share the general costs for oil spill preparedness. The basic elements of oil spill preparedness should be part of the essential infrastructure governments provide to facilitate maritime trade. If this viewpoint were adopted, the proposal for an international fund to pay for preparedness costs (Holt, 1994) would be superfluous. In the case of spills from tankers (including passing tankers), the specific preparedness costs that can be attributed to the incident and the cleanup period are reimbursable under the terms of the compensation conventions.

The approach to successfully combating oil spills is determined by the characteristics, behaviour, and fate of the spilled oil. Equipment and materials work in some conditions and not in others, yet the attitude of "more is better" often prevails —

and results in excess and waste. Rarely does one see an honest appraisal of what spill response resources are appropriate and likely to be effective. Successful oil spill response primarily depends on a realistic attitude and a good basic organisation.

Experience has proved that it is possible to respond effectively to oil spills in any country, prepared or not, particularly when the government authorities are willing to accept advice and assistance from outside the country. A developing country may use existing non-specialised resources, and the assistance may simply take the form of advice on-site at the time of the incident. Occasionally it is appropriate to arrange for the provision of specialised equipment for oil spill control from abroad. Assistance must be tailored to local conditions and needs; automatically importing foreign response teams and specialised equipment often is the wrong remedy and generates more problems than solutions.

The best opportunity to improve oil spill response capabilities is in countries that face significant risk and are committed to developing the basic elements of spill management and control envisaged in Article 6.1 of OPRC (Appendix; IMO, 1991). The essential steps are the designation of a competent authority and the development of a national contingency plan and response arrangements. Once these are completed, industry may have a broader role to play as provider of equipment and other services. Exactly what form the industry contribution should take varies from one country to another, and no universal prescriptive formula can be applied.

The tiered response concept helps ensure that adequate supplies of equipment will be available. The focus for improvement should lie in creating a framework for spill response, making use of available resources, and where appropriate, facilitating imports of appropriate supplementary expertise and equipment. The costs of establishing Tier 1 capabilities have been, and should continue to be, borne by the industry operators of oil handling facilities. Whilst industry also has a role in establishing and maintaining equipment and materials for larger oil spills, there is no indication that existing resources are deficient or ill-placed. Experience has shown that a lack of specialised resources is not usually the limiting factor in effective spill response.

SECTION 5

STATUS OF THE GOVERNMENT/INDUSTRY PARTNERSHIP

Equipment stockpiles and response cooperatives represent a substantial commitment on the part of the oil industry and enhance the response capabilities and overall level of preparedness in any given region. Given the relative infrequency of intermediate and major oil spills, there should be a realistic limit on the amount of resources kept ready. In recent years, the incidence of such spills has dropped (ITOPF, 1996a), thereby eroding the justification for greater investment in equipment stockpiles.

Although much has been achieved with the establishment of equipment stocks, the overall tiered response structure is weakened by deficiencies at the Tier 1 level. Those installations operated by the major oil companies generally are adequately provided with spill response resources. Unfortunately, many other waterfront oil-handling facilities lack emergency plans, equipment, or trained personnel for dealing with oil spills on their doorsteps. It is a task for governments to define and enforce minimum standards for preventing and controlling oil spills at Tier 1 facilities. A mechanism for introducing minimum standards of oil spill preparedness and response exists within the framework created by OPRC, but since few countries have chosen to adopt the Convention, a remedy must be sought elsewhere. Although not strictly their responsibility, the local subsidiaries of the major oil companies generally are well-placed to disseminate valuable experience and encourage a cooperative approach to comprehensive improvement of Tier 1 capabilities.

In most countries, governments accept the lead in dealing with ship-source spills of significant magnitude. However, in some countries, including the USA, Canada, Australia, and Japan, governments have contemplated or implemented systems shifting the responsibility for oil spill response to the oil and shipping industries. In the case of Canada, an investigative panel appointed by the government concluded that ensuring a national response capability is a government responsibility that cannot be delegated. The panel recommended the establishment of a national spill response agency which, as a true government-industry partnership, would become the main national centre in charge of oil spill response (Gold *et al.*, 1996). This concept is embraced in Australia where the government's lead agency, the Australian Maritime Safety Authority (AMSA), has succeeded in creating a working

partnership with industry. By striking the right balance between exercising authority and accepting public responsibility, AMSA has retained a lead role and avoided a confrontational relationship with industry.

Some developing countries rely heavily on the domestic oil industry to shoulder most aspects of oil spill preparedness and response. This tendency is particularly noticeable in oil producing countries. However, over-reliance on industry can undermine prospects for developing a sensible and effective joint government/industry response capability. Venezuela, which has ratified the OPRC Convention, is probably the country with the closest collaboration between industry and government in spill response arrangements. The responsibility for combating all oil spills on water in designated zones is allocated to one of three different oil companies. Such close integration was facilitated by the circumstance that, until recently, the oil industry was state-owned. However, as several foreign oil companies recently were invited to participate in oil exploration and production in new areas, the system is under review and may change. It remains to be seen whether the current industry-led response would persist during a major incident for which the state-owned industry has no liability, or whether government would take the lead.

Advances in oil spill response usually are stimulated by major incidents. A cyclic progression has been triggered by a landmark spill, occurring coincidentally at 11-year intervals: the *Torrey Canyon* in March 1967, *Amoco Cadiz* in March 1978, and *Exxon Valdez* in March 1989. Each spawned IMO Conventions and stimulated financial and intellectual investment in more effective ways of controlling oil spills. Eight years have passed since the last landmark spill, and signs of waning interest and investment are apparent.

The relative infrequency of galvanising events carries the danger of a wavering commitment to improvements in preparedness activities. For example, the creation of the colossal MSRC in 1989, followed by attempts at diversification are symptomatic of a "boom-and-bust" process that can be counterproductive. This is particularly applicable to contingency planning and R&D, for which a sustained effort is required. Industry should continue its commitment to collaboration with IMO in programmes such as the Global Initiative. This commitment is vital to create a climate favourable for developing

and improving oil spill response capabilities in countries that are ill-prepared for the significant oil spill risks they face.

IMO plays a crucial role in promoting the ideas contained in the OPRC Convention. Indeed, in Article 12, IMO is designated to establish and maintain information, education, training, and technical services subject to the availability of adequate funds (Appendix; IMO, 1991). However, recent budgetary controls have severely curtailed IMO's ability to perform the required functions. In the interest of the IMO-industry partnership, industry could consider making a long-term finan-

cial contribution or funding secondment postings at IMO to help sustain essential services for developing countries identified in the OPRC Convention.

The risk of major oil spills resulting from the transportation of oil by sea has been a reality for more than three decades. The world community has responded in a concerted manner and the systems in place basically are sound and have stood the test of time. By and large, polluters honour their obligations, and governments do not abuse their authority when they are accountable for their actions. It is an equitable balance.

SECTION 6

SUMMARY AND CONCLUSIONS

The development of spill response capabilities should reflect the degree of oil pollution risk and the threat posed to sensitive areas. Risk analysis shows that most major incidents occur close to tankers' destinations and that comparatively few developing countries are situated in high-risk areas. Many believe that the risk of spills from passing tankers creates severe spill response problems in developing countries, but experience does not bear this out. The system in force on behalf of the shipping community, coupled with a government-led response, has proved effective. In countries where the concepts of the OPRC Convention have not been embraced, the focus for improvement should lie in creating a framework for spill response, in making use of available resources, and in facilitating imports of supplementary expertise and equipment.

The OPRC Convention contains the essence of sound preparedness and response activity and calls for cooperation between government and industry in generating sustainable improvements in developing countries. The Convention emphasizes development of contingency plans, equipment stocks, R&D initiatives, training and exercise programmes, and appropriate spill notification procedures for shipping.

Government and industry have invested heavily in creating and maintaining expensive oil spill response systems against a background of decreasing numbers of intermediate and major oil spills worldwide. This situation has stimulated a reappraisal of the optimum level of oil spill preparedness and response capability — and how these should be funded — particularly for those countries that are thought still to be less than adequately prepared.

The basic elements of oil spill preparedness are the designation of a competent authority and the development of a national contingency plan and response arrangements. These tasks should be considered part of the essential infrastructure provided by governments to facilitate maritime trade. Governments have accepted the primary role of dealing with ship-source oil pollution in well over 100 countries, whereas the

opposite approach of an active industry-led response prevails in about 15 countries.

Industry has a contributory role to play in all countries, as provider of equipment and specialist services. The nature and extent of the industry contribution depends on national policies and other local conditions. An integrated approach to oil spill preparedness and response in support of governments' commitment is widely embraced within industry through the "tiered response" concept. In this manner, equipment stocks for dealing with small and moderate incidents are combined to create a joint capability for dealing with large oil spills. Industry has borne — and should continue to bear — responsibility for establishing Tier 1 capabilities. The quality of existing capabilities varies, reflecting the disparate organisations operating oil-handling facilities. The overall tiered response structure is weakened as a result. The local subsidiaries of the major oil companies generally are well-placed to disseminate valuable experience and encourage a comprehensive improvement of Tier 1 capabilities.

A "boom-and-bust" cycle of funding for spill preparedness and response can be counterproductive, particularly in areas such as contingency planning and R&D, for which a sustained effort is required. Ongoing support is needed from industry and IMO to promote improvements in developing countries in the spirit of the OPRC Convention. Budgetary restrictions imposed on IMO have curtailed these essential functions, and industry has an opportunity to make a long-term contribution toward safeguarding them.

The risk of major oil spills resulting from the transportation of oil by sea has been a reality for more than three decades. The world community has responded in a concerted manner and the systems now in place basically are sound and have stood the test of time. By and large, polluters honour their obligations, and governments do not abuse their authority when they are accountable for their actions. It is an equitable balance.

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