GLOBAL CHALLENGES TO PREPAREDNESS AND RESPONSE REGIMES

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ABSTRACT: *The International Oil Spill Conference sponsored a workshop entitled "Global Challenges to Preparedness and Response" held in London, England, November 12-14, 2002. The Workshop brought more than 25 government, industry, and non-governmental organizations representatives together to analyze the strengths, weaknesses, opportunities, and threats relative to government-led and industry-led response regimes around the world. Over the course of three days, a team of facilitators led participants through a series of response scenarios, alternating between small break out sessions followed by plenary sessions, to develop consensus on a framework for preparedness and response. Each scenario built on previous ones to further participant understanding and concurrence on the strengths, weaknesses, opportunities, and threats facing regimes around the world. Participants rapidly concluded that all responses to significant incidents are government-led, with varying degrees of industry involvement. The framework for successful regimes was identified. The Workshop conclusions encompass three broad areas: 1) similarities and differences among models and regimes; 2) benefits of international conventions; and 3) critical elements in the preparedness cycle. Participants put forth specific challenges (recommendations for action) to all nations.*

1.0 Introduction

Driven by periodic catastrophic oil spills from vessels and facilities, since the late 1960s, preparedness and response efforts took two divergent paths around the world. Some nations and regions adopted a centralized strategy, which relies on government-directed preparedness and in varying degrees, by industry equipment pools (e.g., international response center model). Other nations and regions placed the preparedness and response onus on industry with government oversight (e.g., US and Canadian models). How successful have these models been in improving mitigation of adverse spill impacts? What advantages does each offer in promoting further improvements? What obstacles to improvement do each pose? Are there other viable alternatives? What are recommended approaches for emerging and developing countries? How should we organize to ensure optimum response capabilities not only regionally in oil producing, consuming nations, but also in nations at risk because they are located in oil transport corridors? Is government control and direction of response to a major incident inevitable? If government control is inevitable, are existing national response systems optimally designed to accommodate that control?

To help steward limited resources for preparedness and response, the International Oil Spill Conference (IOSC) took the unprecedented step to bring international experts together to conduct a consensus assessment of the strengths and weaknesses of government-led and industry-led preparedness and response regimes. The intent was that the Workshop serve as a stimulus for government and industry enhancement of existing regimes and for development of new regimes. The IOSC Workshop was held in November 2002 at the International Maritime Organization in London.

Workshop participants were invited based on an individual's expertise, geographic origin, and responsibilities. Participants included representatives from the oil industry, government agencies, an environmental advocacy group, and oil spill response organizations. Geographic regions included Western Europe, North America, Caribbean and Latin America, Southeast Asia, Southern Africa, and Eastern Europe.

This manuscript is a summary record of this 2.5-day IOSC Workshop. First, a brief summary of the Workshop process is presented to document the technical approach. Because parameters of government-led and industry-led preparedness and response regimes had not been precisely defined previously, a

concerted effort was made by the Workshop Team to create working definitions of each. Definitions, empirical observations, and results from Workshop discussions are included. Participants reached consensus on the necessary framework for effective preparedness and response regimes. Lastly, based on their consensus, the Workshop participants identified challenges for the response community worldwide to achieve that framework. Appendix A provides a summary of major international preparedness and response conventions and protocols.

2.0 Workshop process

The Workshop initially focused on identifying the distinguishing parameters for industry-led and government-led regimes. This effort was intended to foster discussion of participants' assumptions and their expectations of government and industry responsibilities when preparing for and responding to oil spills. Industry-led regimes were labeled Model A and Government-led regimes were labeled Model B. The discussions on discriminators between models were integrated into each day's plenary sessions.

During breakout sessions, participants used scenarios to examine the strengths, weaknesses, opportunities, and threats (SWOT) presented by each Model. These scenarios addressed hypothetical spill events in developing nations, developed nations, and multiple nations within a region, to stimulate discussion. For each of three scenarios, participants in two breakout sessions were assigned to conduct an independent SWOT analysis. Following each breakout session period, participants reconvened in plenary session to brief others on their analysis findings and jointly discuss differences and similarities. The Workshop process was structured such that each succeeding scenario built upon previous discussions. A final plenary session was held to summarize and clarify participants' consensus on, and conclusions about, each of the Models, and on what comprised a framework for effective preparedness and response regimes worldwide.

3.0 Comparison between response models

The original concept of the Workshop was to contrast the strengths and weaknesses of government-led versus industry-led response models and then to create a framework for a new, more flexible model. Model A is characterized by government oversight of industry in preparing for, and responding to, maximum worst-case spills. Industry is tasked with acquiring and maintaining response equipment and personnel to address that maximum case, and with leading response efforts in most cases. Model B is characterized by government cooperation with industry in establishing preparedness and response standards for response to incidents up to the practical, operational limits of equipment and personnel. Both government and industry share responsibility for establishing and maintaining equipment stockpiles. Workshop participants quickly concluded that neither the industry-led Model nor the government-led Model exist in pure form. Participants recognized that in either model, the government is the entity that has the authority, responsibility, and accountability to its citizens to preserve their environment. Consequently, discussions turned to the concepts of "government led / government run" versus the alternative of "government led / industry run" models. The difference between these two models was still found to be very small. The key distinction lay in how models were implemented and resourced (they use different criteria for determining preparedness and response strategies, personnel, and equipment).

Participants agreed that, fundamentally, a successful model would have the six major components described within the International Convention on the Oil Pollution Preparedness, Response, and Cooperation (OPRC, 1990). They are:

- A competent national authority,
- A national oil spill contingency plan,
- A spill notification procedure,
- A minimum level of response resources relevant to the background risk,
- Regional agreements to enhance sharing of limited response resources, and
- An oil spill response feedback reporting procedure.

Workshop participants felt other elements of the OPRC were important, but that those elements would occur as a consequence of the above components. These *other* elements include establishing:

- A minimum level of equipment to meet immediate needs;
- A defined program of training and exercises; and
- A communication and coordination system.

Both "government-led/government-run" and "government-led/ industry-run" preparedness and response regime models have the above six components. Where and how they differ is, in large part, a function of their implementing legislation, which prescribes a level of response plus how and when it will be delivered. This implementing legislation is influenced by social, political, and economic considerations of individual nations.

One important aspect that must be considered is that capital investment in personnel and equipment can be significant and must be sustained. Nations that are developing their economies understand the need to protect their natural environment, but other social or political priorities may take precedence. In such cases, alternatives for providing effective preparedness and response capabilities for protection of the environment will need to be formulated. Developed nations face a different challenge, which is whether to assign the responsibility for establishment and maintenance of capabilities to government or to industry.

Regardless of whether either the "government-led/government-run" or "government-led/industry-run" model is applied, the key to effective response is being prepared. Use of comprehensive risk assessment to predict spill sources, their frequency, type and thence to determine appropriate resource needs are fundamental for preparedness. Historically, such assessments tended to focus on the oil production, transportation, and storage industry, in reaction to a trigger event. From Workshop discussions, it became clear that assessment of spill risk should account for a broader array of potential sources and causes, e.g., land-based facilities, pipelines, and non-tank vessels.

3.1 Perceptions and realities. One Workshop goal was to explore, in detail, a widely held perception that there are at least two distinct models used by various nations in preparing for and responding to oil spills. As a starting position for analysis, two response models were used in the Workshop: Industry-led (Model A) and government-led (Model B). This position shifted to recognise that implementation actually involved hybrids of those two. There are differing degrees of industry participation and differing ways for setting performance expectations, which are both driven by a nation's approach to response. Some nations determine worse case (maximum) scenarios and establish capabilities to meet those conditions, while others determine a minimum case and establish capabilities to meet those conditions

(Figure 1). For both, response to large spills will test those planning assumptions. In Model A, performance expectations may be unachievable and should be adjusted downwards to reflect operational realities. In Model B, operational capabilities may be overwhelmed and should be adjusted upwards to accommodate larger response efforts.

The approach taken by a nation can be viewed from either end of the industry - government spectrum (Figure 1). The reality is that oil spilled into the environment is subject to complex natural forces outside of human control (e.g., weather processes of spreading, evaporation, emulsification, and dispersion). While mathematical assumptions provide a good starting point, relying solely on mathematical assumptions to determine response requirements (e.g., equipment types, quantities, and performance expectations) may lead to inaccurate assumptions. An undue reliance on mathematical models to derive the performance of system can lead to equipment selection being biased to satisfy the model rather than effectively respond to the spill.

3.2 Tiered response philosophy. In either Model A or B, the more control that exists over various factors, and the more realistic the assumptions, the greater the likelihood of success (Figure 2). It is, therefore, perhaps no surprise that for smaller Tier 1 and Tier 2 spills, expectations and the capabilities to meet them, regardless of model type, closely mirror the reality of a response. Conversely, in a Tier 3 spill, many factors are loosely controlled or uncontrolled, making it much more difficult for performance expectations to meet reality.

Recognizing the relative infrequency of large marine oil spills on a global basis, governments and oil industry adopted a tiered spill response philosophy based on complexity (Figure 2). This philosophy recognizes that it is not cost effective for either government or industry to establish equipment stockpiles in every potential spill location around the world. History has shown that these resources may rapidly become obsolete, fail through lack of maintenance, or be ineffective through a lack of trained operators. The oil industry has in the main accepted the responsibility to ensure that it can provide the Tier 1 response equipment to deal with minor operational spills. For larger, Tier 2 incidents a combination of local industry operators often provide initial assistance in conjunction with resources taken from a nation's stockpiles. In the event of a low-probability, high-consequence Tier 3 incident, resources can be provided via multilateral agreements at an international or regional level or via industry co-

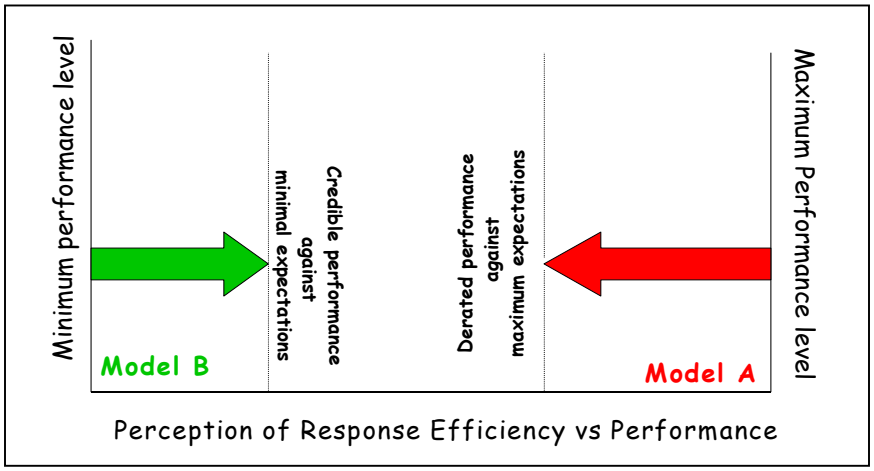

Figure 1. Comparison of preparedness and response models.

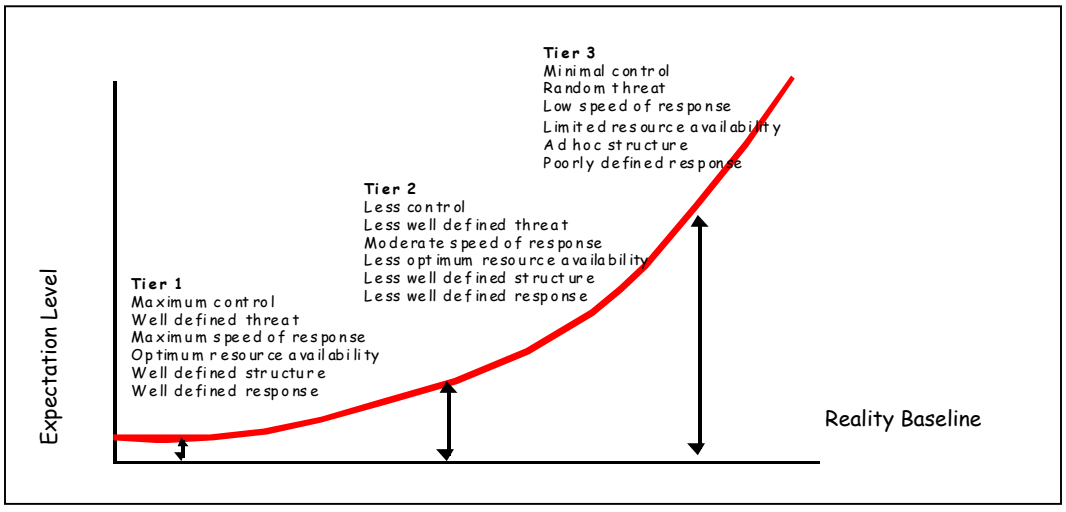

Figure 2. Gap between reality and expectation with changes in spill complexity.

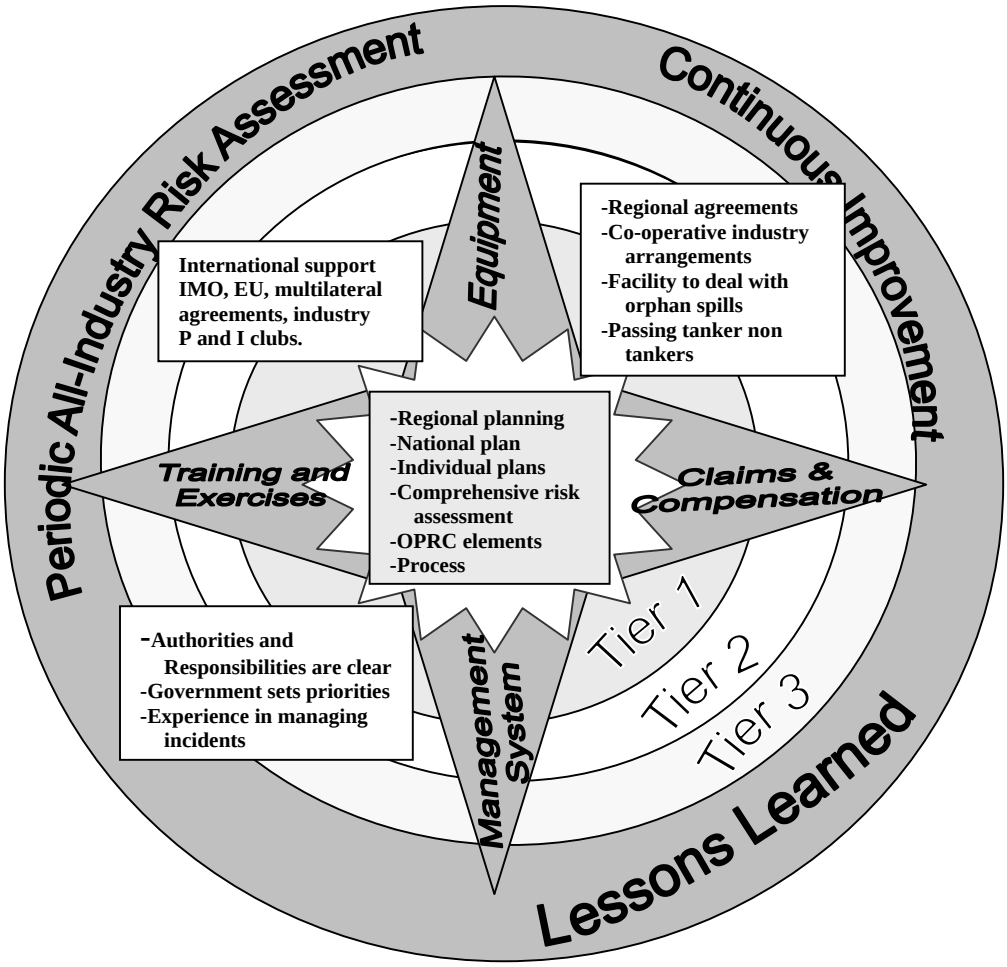

Figure 3. The effective response model wind rose.

operatives established for just such an event. It must be recognised that the benefits of co-operative approach, in terms of capital expenditure, operating budgets and training come at a cost.

3.3 Summary of the components of a response model. The Workshop participants concluded that any response model, regardless of the level of government or industry involvement, must address the same elements to be effective. Figure 3 depicts the relationships and interactions between these elements:

- Continuous planning process for all tiers that includes feedback; and
- Planning targets for management, training, exercises equipment, and financing.

By its very nature, an effective response model will support decision making and stakeholder accountability.

4.0 Conclusions

The five major conclusions are presented below and encompass three broad areas: 1) similarities and differences among models and regimes; 2) benefits of international conventions; and 3) critical elements in the preparedness cycle. Each represents consensus among participants.

4.1 Similarities and differences among models and regimes. *There are not two competing models (government-led versus industry-led) in preparedness and response. Rather there are hybrids that are government-led with varying degrees of industry involvement. The characteristics of a hybrid regime should be selected to meet the expectations of a nation and be appropriate to the predicted risks.*

Workshop participants recognized that the framework for implementation of an effective preparedness and response regime, by any nation, had to take into account the following items:

- Expectations of the people and government;
- Social customs and practices;
- Government capability and preparedness at the local and national level;
- Environmental sensitivities;
- Geography for the region;
- Level of risk of a spill;
- Sources of possible spills;
- Level of development of the economy and availability of funding;
- Local climate and weather; and
- Predicted economic impacts on tourism, fisheries, etc.

4.2 Benefits of international conventions[1].

Developing economies should quickly implement the five most significant sections of the International Convention on Oil Pollution Preparedness, Response, and Cooperation (OPRC), and utilize extra-governmental resources to implement programs.

Using the OPRC as a guideline for regime development and implementation, developing nations can make great progress in preparedness and response. Existing extra-governmental resources available to assist with the development and implementation of these programs, include:

- International Maritime Organization (IMO),
- United Nations Environment Program (UNEP),
- United Nations Industrial Development Organization (UNIDO),
- International Petroleum Industry Environmental Conservation Association (IPIECA), and
- International Tanker Owners Pollution Federation (ITOPF); etc.

Effective regional oil spill preparedness and response is dependent upon multilateral cooperative frameworks that include government-to-government, government-to-industry agreements, and possibly industry-to-industry agreements. These agreements should cover liability issues and cost recovery.

The Workshop participants agreed that successful multilateral agreements assure rapid sharing of limited resources. Further, they identified several impediments (liability concerns, cost allocation, and other issues) that have been worsening over the recent years. With these issues unresolved, nations and industries must increase funding of response resources to assure adequate capabilities.

4.3 Critical elements in the preparedness cycle.

The assessment of spill threats should be broad and include all potential sources. Results from that assessment will be used in building a nation's preparedness and response capability to meet their expectations.

Workshop participants concluded that inappropriate preparedness and response regimes were often the result of inadequate risk assessments, which did not address all potential threats. The risks of spills comes not only from the oil production, storage, and transportation industries, but also from non-tank vessels, power generating industry, manufacturing, and government facilities, etc. In addition, the threat from passing tankers as well as bunker spills from all passing ship types, while often overlooked and difficult to address, must also be taken into account and addressed.

Critical management tasks are 1) to make timely decisions, 2) communicate clearly, and 3) use equipment and personnel well. Preparedness and response equipment must be properly maintained, personnel must be properly trained, and both must be adequate to meet domestic and regional obligations.

In practical terms, oil spill equipment that is procured, but not maintained, becomes useless. Equipment that is operated by unskilled and/or untrained personnel is ineffective and potentially dangerous. Thus, effective regimes will incorporate the necessary maintenance and training protocols to ensure their ability to respond. Threats to readiness include:

- Infrequency of large oil spills globally combined with personnel turnover reduces response experience;
- Aging equipment inventories yields increased maintenance costs with decreased effectiveness; and
- Changes in risks of spills without commensurate adjustments in equipment and personnel resources.

5.0 Workshop consensus challenges

Over the 2.5 days, Workshop participants jointly built their understanding of preparedness and response regimes and identified factors that influence successful regime design and use around the globe. The SWOT analysis proved to be a valuable tool for identifying such factors. As a consequence of the model review and scenario analysis, several major impediments to improved performance were repeatedly identified:

- Even in developed nations, assessments for determining appropriate preparedness and response capabilities are, at times, poorly done or not done at all;
- There are many nations and regions where spill risk is high, yet response capabilities are absent or unmatched to the real spill threat;
- Existing technical and administrative assistance programs, offered by international governmental and industry organizations for planning and response, are underutilized by developing nations.

Agreement on a common framework, as promoted by this Workshop, will foster improved assessment and promote support for overcoming national and regional capability shortfalls. During the last plenary session, participants endorsed the concept of a single framework for preparedness and response. In so doing, they also considered strategies for overcoming obstacles to effective preparedness and response worldwide. In the end, participants endorsed three priority challenges to the individual nations and the international response community. No timeline was offered for addressing any of these challenges, but the sense of the group was that all deserve expeditious attention.

Summary of international relevant international preparedness and response conventions

Throughout the Workshop, participants relied on and shared their knowledge of 1) major international maritime pollution prevention and response conventions; 2) conventions related to liability for response and funding of response costs; and 3) conventions which promote regional cooperation for preparedness and response. Summaries of the major conventions discussed are included in the appendix at this end of this report, along with a matrix including nations signatory to those conventions.

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Table 1. Challenges to the spill preparedness and response community for improved capabilities worldwide.

Challenge	To Who	Why	Where	How
1. Assess preparedness & response capabilities	Governments and/or businesses (e.g., oil production, storage, and transportation industries, but also from non-tank vessels, power generating industry, manufacturing, and government facilities, etc.	To match local vulnerability and degree of risk to the ability to realistically limit adverse effects from a spill	In developed nations	Spill risk assessments should be unconstrained by • existing plans, • capabilities, and • past assumptions. Assessments should be subject to independent review. Findings may validate existing preparedness & response plans and capabilities or, instead, identify opportunities for enhancement/downgrading/ re-allocation).
2. Achieve worldwide coverage and consistency in understanding spill risks and build a framework for establishing national and regional capabilities to address those risks	IMO/IPIECA for marine environments and IPIECA/UNEP for non-marine environments	To assist in acquiring reasonable and achievable preparedness and response capability	In developing nations, and in regions at high risk worldwide	• Re-invigorate the Global Initiative for marine environments. • Extend the Global Initiative concept to address needs of non-marine areas (e.g., inshore, riverine, and land-based).
3. Promote technical co-operation (i.e., training, instruction, direct support) for contingency planning and the establishment and maintenance of preparedness & response capabilities	Governments and/or businesses, their international coordinating organizations or aid programs (e.g., IMO, UNEP, ITOPF, IPIECA, etc.)	To enable effective protection of resources at risk	In developing nations and in regions at high risk worldwide	Use existing intergovernmental and international cooperative programs to provide technical support.

Appendix A. International and regional conventions consistent with OPRC elements for preparedness and response

The workshop conclusions emphasize the importance of international cooperation in constructing effective preparedness and response regimes both nationally and with bordering nations worldwide. Many nations with common boundaries have worked regionally and under the auspices of both IMO and the United Nations Environment Program towards this end. This appendix summarizes some of those key international conventions and cooperative agreements. Table A-3 summarizes status of accession to the major Conventions and Protocols discussed in this appendix.

International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)

The MARPOL Convention is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. It is a combination of two treaties adopted in 1973 and 1978 respectively and updated by amendments through the years.

The International Convention for the Prevention of Pollution from Ships (MARPOL) was adopted on 2 November 1973 at IMO and covered pollution by oil, chemicals, harmful substances in packaged form, sewage and garbage. The Protocol of 1978 relating to the 1973 International Convention for the Prevention of Pollution from Ships (1978 MARPOL Protocol) was adopted at a Conference on Tanker Safety and Pollution Prevention in February 1978 held in response to a spate of tanker accidents in 1976-1977. (Measures relating to tanker design and operation were also incorporated into a Protocol of 1978 relating to the 1974 Convention on the Safety of Life at Sea, 1974).

As the 1973 MARPOL Convention had not yet entered into force, the 1978 MARPOL Protocol absorbed the parent Convention. The combined instrument is referred to as the International Convention for the Prevention of Marine Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), and it entered into force on 2 October 1983 (Annexes I and II). The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes:

- Annex I - Regulations for the Prevention of Pollution by Oil
- Annex II - Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk
- Annex III - Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form
- Annex IV - Prevention of Pollution by Sewage from Ships
- Annex V - Prevention of Pollution by Garbage from Ships
- Annex VI - Prevention of Air Pollution from Ships (adopted September 1997 - not yet in force)

States Parties must accept Annexes I and II, but the other Annexes are voluntary.

International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties, 1969

Adoption: 29 November 1969
Entry into force: 6 May 1975

The Convention affirms the right of a coastal State to take such measures on the high seas as may be necessary to prevent, mitigate or eliminate danger to its coastline or related interests from pollution by oil or the threat thereof, following upon a maritime casualty. The 1973 Protocol extended the Convention to cover substances other than oil.

The *Torrey Canyon* disaster of 1967 revealed certain doubts with regard to the powers of States, under public international law, in respect of incidents on the high seas. In particular, questions were raised as to the extent to which a coastal State could take measures to protect its territory from pollution where a casualty threatened that State with oil pollution, especially if the measures necessary were likely to affect the interests of foreign shipowners, cargo owners, and even flag States. The general consensus was that there was need for a new regime which, while recognizing the need for some State intervention on the high seas in cases of grave emergency, clearly restricted that right to protect other legitimate interests. A conference to consider such a regime was held in Brussels in 1969.

The Convention which resulted affirms the right of a coastal State to take such measures on the high seas as may be necessary to prevent, mitigate or eliminate danger to its coastline or related interests from pollution by oil or the threat thereof, following upon a maritime casualty.

The coastal State is, however, empowered to take only such action as is necessary, and after due consultations with appropriate interests including, in particular, the flag State or States of the ship or ships involved, the owners of the ships or cargoes in question and, where circumstances permit, independent experts appointed for this purpose.

The Convention applies to all seagoing vessels except warships or other vessels owned or operated by a State and used on Government non-commercial service. A coastal State, which takes measures beyond those permitted under the Convention, is liable to pay compensation for any damage caused by such measures. Provision is made for the settlement of disputes arising in connection with the application of the Convention.

International Convention on Salvage, 1989

Adoption: 28 April 1989
Entry into force: 14 July 1996

The Convention replaced a convention on the law of salvage adopted in Brussels in 1910 which incorporated the "'no cure, no pay" principle under which a salvor is only rewarded for services if the operation is successful.

Although this basic philosophy worked well in most cases, it did not take pollution into account. A salvor who prevented a major pollution incident (for example, by towing a damaged tanker away from an environmentally sensitive area) but did not manage to save the ship or the cargo got nothing. There was therefore little incentive to a salvor to undertake an operation that has only a slim chance of success.

The 1989 Convention seeks to remedy this deficiency by making provision for an enhanced salvage award taking into

account the skill and efforts of the salvors in preventing or minimizing damage to the environment.

Special compensation. The 1989 Convention introduced a "special compensation" to be paid to salvors who have failed to earn a reward in the normal way (i.e. by salving the ship and cargo). The compensation consists of the salvor's expenses, plus up to 30% of these expenses if, thanks to the efforts of the salvor, environmental damage has been minimized or prevented. The salvor's expenses are defined as "out-of-pocket expenses reasonably incurred by the salvor in the salvage operation and a fair rate for equipment and personnel actually and reasonably used".Damage to the environment is defined as "substantial physical damage to human health or to marine life or resources in coastal or inland waters or areas adjacent thereto, caused by pollution, contamination, fire, explosion or similar major incidents." The tribunal or arbitrator assessing the reward may increase the amount of compensation to a maximum of 100% of the salvor's expenses, "if it deems it fair and just to do so". If, on the other hand, the salvor is negligent and has consequently failed to prevent or minimize environmental damage, special compensation may be denied or reduced. Payment of the reward is to be made by the vessel and other property interests in proportion to their respective salved values.

International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990

Adoption: 30 November 1990
Entry into force: 13 May 1995

Parties to the OPRC convention are required to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries.

In July 1989, a conference of leading industrial nations in Paris called upon IMO to develop further measures to prevent pollution from ships. This call was endorsed by the IMO Assembly in November of the same year and work began on a draft convention aimed at providing a global framework for international co-operation in combating major incidents or threats of marine pollution.

Parties to the OPRC convention are required to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries. Ships are required to carry a shipboard oil pollution emergency plan, the to be developed by IMO. Operators of offshore units under the jurisdiction of Parties are also required to have oil pollution emergency plans or similar arrangements which must be co-ordinated with national systems for responding promptly and effectively to oil pollution incidents.

Ships are required to report incidents of pollution to coastal authorities and the convention details the actions that are then to be taken. The convention calls for the establishment of stockpiles of oil spill combating equipment, the holding of oil spill combating exercises and the development of detailed plans for dealing with pollution incidents.

Parties to the convention are required to provide assistance to others in the event of a pollution emergency and provision is made for the reimbursement of any assistance provided. The Convention provides for IMO to play an important co-ordinating role.

Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000 (HNS Protocol)

Adoption: 15 March 2000
Entry into force: Twelve months after ratification by not less than fifteen States, which are States Party to the OPRC Convention.
Status: see status of conventions

The Protocol on Preparedness, Response and Co-operation to pollution Incidents by Hazardous and Noxious Substances, 2000 (HNS Protocol) follows the principles of the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC) and was formally adopted by States already Party to the OPRC Convention at a Diplomatic Conference held at IMO headquarters in London in March 2000.

Like the OPRC Convention, the HNS Protocol aims to provide a global framework for international co-operation in combating major incidents or threats of marine pollution. Parties to the HNS Protocol will be required to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries. Ships will be required to carry a shipboard pollution emergency plan to deal specifically with incidents involving HNS.

HNS definition. HNS are defined by reference to lists of substances included in various IMO Conventions and Codes. These include oils; other liquid substances defined as noxious or dangerous; liquefied gases; liquid substances with a flashpoint not exceeding 60°C; dangerous, hazardous and harmful materials and substances carried in packaged form; and solid bulk materials defined as possessing chemical hazards.

The HNS Protocol, when it comes into force, will ensure that ships carrying hazardous and noxious liquid substances are covered, or will be covered, by regimes similar to those already in existence for oil incidents. In 1996, IMO adopted the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances (HNS) by sea, which provides for a compensation and liability regime for incidents involving these substances (it has not yet entered into force).

Liability and compensation regimes for oil pollution incidents are covered by the 1992 Protocols to the International Convention on Civil Liability for Oil Pollution Damage, 1969 and the International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1971.

The Civil Liability and Fund Conventions

(Source: ITOPF)

The international compensation regime for damage caused by spills of persistent oil from laden tankers was based initially on two IMO conventions: 1) the 1969 International Convention on Civil Liability for Oil Pollution Damage (1969 CLC), and 2) the 1971 International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (1971 Fund Convention). This 'old' regime was amended in 1992 by two Protocols, which increased the compensation limits and broadened the scope of the original Conventions.

The 1969 CLC entered into force in 1975 and lays down the principle of strict liability (i.e. liability even in the absence of fault) for tanker owners and creates a system of compulsory

liability insurance. Claims for compensation for oil pollution damage (including clean-up costs) may be brought against the owner of the tanker which caused the damage or directly against the owner's P&I insurer. The tanker owner is normally entitled to limit his liability to an amount, which is linked to the tonnage of the tanker causing the pollution.

The 1971 Fund Convention provided for the payment of supplementary compensation to those who could not obtain full compensation for oil pollution damage under the 1969 CLC. The International Oil Pollution Compensation Fund (1971 IOPC Fund) was set up for the purpose of administering the regime of compensation created by the Fund Convention when it entered into force in 1978. By becoming Party to the 1971 Fund Convention, a country became a Member of the 1971 IOPC Fund. Payments of compensation and administrative expenses of the 1971 IOPC Fund were financed by contributions levied on companies in Fund Convention countries that received crude oil and heavy fuel oil after sea transport.

In 1992, a Diplomatic Conference adopted two Protocols amending the 1969 CLC and 1971 Fund Convention, which became the 1992 CLC and 1992 Fund Conventions. These 1992 Conventions, which provide higher limits of compensation and a wider scope of application than the original Conventions, entered into force on 30 May 1996. As in the case of the original Conventions, the tanker owner and P&I insurer are liable for payment of compensation under the 1992 CLC and oil receivers in countries, that are party to the 1992 Fund Convention, are liable for the payment of supplementary compensation through the 1992 IOPC Fund. 1992 Fund Convention countries were required to denounce the 1969 CLC and 1971 Fund Convention, at midnight on 15th May 1998. As more States ratify or accede to the 1992 Conventions, the original Conventions have rapidly lost significance and the 1971 Fund Convention was terminated altogether on 24 May 2002.

In October 2000 the Contracting States to the 1992 CLC and 1992 Fund Convention approved a proposal to increase by about 50% (to about US$260 million) the amount of compensation available under the terms of the Conventions. This will come into effect on 1 November 2003.

Oil spill compensation in countries, which have not ratified the international conventions. Some countries, which have not ratified the international compensation Conventions, will have their own domestic legislation for compensating those affected by oil spills from tankers. Some of these may be highly specific, such as the Oil Pollution Act of 1990 in the USA, whereas other countries may rely on broader laws originally developed for other purposes.

International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (HNS), 1996

Adoption: 3 May 1996
Entry into force: 18 months after the following conditions have been fulfilled:
12 States have accepted the Convention, four of which have not less than two million units of gross tonnage
Provided that persons in these States who would be responsible to pay contributions to the general account have received a total quantity of at least 40 million tonnes of contributing cargo in the preceding calendar year.

The Convention will make it possible for up to 250 million SDR (about US$320 million) to be paid out in compensation to victims of accidents involving HNS, such as chemicals. The HNS Convention is based on the two-tier system established under the CLC and Fund Conventions. However, it goes further in that it covers not only pollution damage but also the risks of fire and explosion, including loss of life or personal injury as well as loss of or damage to property. The unit of account used in the Convention is the Special Drawing Right (SDR) of the International Monetary Fund (IMF).

HNS are defined by reference to lists of substances included in various IMO Conventions and Codes. These include oils; other liquid substances defined as noxious or dangerous; liquefied gases; liquid substances with a flashpoint not exceeding 60°C; dangerous, hazardous and harmful materials and substances carried in packaged form; and solid bulk materials defined as possessing chemical hazards. The Convention also covers residues left by the previous carriage of HNS, other than those carried in packaged form.

The Convention defines damage as including loss of life or personal injury; loss of or damage to property outside the ship; loss or damage by contamination of the environment; the costs of preventative measures and further loss or damage caused by them. The Convention introduces strict liability for the shipowner and a system of compulsory insurance and insurance certificates.

Table A – 1. Maximum amount of compensation available under three international conventions (in US $ millions).

TANKER GROSS TONNAGE	1969 CLC	1992 CLC	1992 FUND
5,000	0.8	3.8	171.41
25,000	4.2	14.5	171.41
50,000	8.5	27.8	171.41
100,000	16.9	54.5	171.41
140,000	17.8	75.8	171.41

Note: The limits of liability under the various regimes are based on specified units of account (Special Drawing Right - SDR). The value of an SDR in terms of a national currency varies. For the purpose of this composition all the limits are expressed in US dollars, based on a rate of exchange of 1 SDR=US $ 1.27 (March 2002). The maximum amount of compensation potentially available under each of the various regimes is, in many cases, inclusive of amounts that would be payable under another regime. For example, the maximum amount of compensation available under the 1992 Fund Convention is inclusive of compensation payable by the tanker owner under the 1992 CLC. The maximum amounts listed above should therefore not be aggregated when determining the total amount of compensation, which may be available in a specific incident.

International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001

Adoption: 23 March 2001.
Entry into force: Enters into force 12 months following the date on which 18 States, including five States each with ships whose combined gross tonnage is not less than 1 million gt have either signed it without reservation as to ratification, acceptance or approval or have deposited instruments of ratification, acceptance, approval or accession with the IMO Secretary-General.

The Convention was adopted to ensure that adequate, prompt, and effective compensation is available to persons who suffer damage caused by spills of oil, when carried as fuel in ships' bunkers. The Convention applies to damage caused on the territory, including the territorial sea, and in exclusive economic zones of States Parties. The Bunkers convention provides a free-standing instrument covering pollution damage only. "Pollution damage" means:

a. loss or damage caused outside the ship by contamination resulting from the escape or discharge of bunker oil from the ship, wherever such escape or discharge may occur, provided that compensation for impairment of the environment other than loss of profit from such impairment shall be limited to costs of reasonable measures of reinstatement actually undertaken or to be undertaken; and
b. the costs of preventive measures and further loss or damage caused by preventive measures.

The Convention is modelled on the International Convention on Civil Liability for Oil Pollution Damage, 1969. As with that convention, a key requirement in the draft bunkers convention is the need for the registered owner of a vessel to maintain compulsory insurance cover. Another key provision is the requirement for direct action - this would allow a claim for compensation for pollution damage to be brought directly against an insurer. The Convention requires ships over 1,000 gross tonnage to maintain insurance or other financial security (such as the guarantee of a bank or similar financial institution) to cover the liability of the registered owner for pollution damage. The amount of coverage is to be equal to the limits of liability under the applicable national or international limitation regime, but in all cases, not exceeding an amount calculated in accordance with the Convention on Limitation of Liability for Maritime Claims, 1976, as amended.

Regional seas conventions and protocols

Mediterranean
The Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona Convention).
Adopted on 16 February 1976,
In force 12 February 1978;
Revised in Barcelona, Spain, 9-10 June 1995 as the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (not yet in force)

- The Protocol Concerning Cooperation in Preventing Pollution from Ships and, in Cases of Emergency, Combating Pollution of the Mediterranean Sea, adopted in Malta on 25 January 2002, not yet into force. (Meant to replace the actual Emergency Protocol)
- The Protocol Concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency (Emergency Protocol); adopted in Barcelona, Spain, on 16 February 1976, in force 12 February 1978
- The Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil (Offshore Protocol); adopted in Madrid, Spain, 13-14 October 1994

Table A-2. General status of international conventions.

Instrument	Entry Into Force Date	No. of Contracting States	Percent of World Shipping Tonnage
MARPOL 73/78 (Annex I/II)	02-Oct-83	123	96.92
MARPOL 73/78 (Annex III)	01-Jul-92	105	82.95
MARPOL 73/78 (Annex IV)	27-Sep-03	89	51.14
MARPOL 73/78 (Annex V)	31-Dec-88	110	89.26
MARPOL Protocol 1997 (Annex VI)	-	6	24.97
INTERVENTION 1969	06-May-75	77	71.09
SALVAGE 1989	14-Jul-96	42	33.42
OPRC 1990	13-May-95	67	53.67
OPRC/HNS 2000	-	2	1.25
CLC 1969	19-Jun-75	46	4,97
CLC Protocol 1976	08-Apr-81	55	57.53
CLC Protocol 1992	30-May-96	89	91.26
FUND Protocol 1976	22-Nov-94	33	46.85
FUND Protocol 1992	30-May-96	83	87.14
FUND Protocol 2000	27-Jun-01	-	
HNS Convention 1996	-	2	1.79
BUNKERS CONVENTION 2001		1	0.37

Source: Lloyd's Register of Shipping/World Fleet Statistics as of December 2001. Updated by IMO as of November 2002.

Kuwait region

Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution (Kuwait Convention); adopted 1978, in force 1979

- Protocol Concerning Regional Co-operation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency; adopted 1978, in force 1979

West and Central Africa

Convention for Co-operation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (Abidjan Convention); adopted 1981, in force 1984

- Protocol concerning cooperation in combating pollution in cases of emergency; adopted in 1981, in force 1984

South-East Pacific

Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific (Lima Convention), adopted 1981; in force 1986

- Agreement on Regional Cooperation in Combating Pollution of the South-East Pacific by Hydrocarbons or Other Harmful Substances in Case of Emergency; adopted 1981
- Supplementary Protocol to the Agreement on Regional Co-Operation in Combating Pollution of the South-East Pacific by Hydrocarbons or Other Harmful Substances in Cases of Emergency; adopted 1983, in force 1987

Red Sea and Gulf of Aden

Regional Convention for the Conservation of the Red Sea and Gulf of Aden Environment (Jeddah Convention); adopted 1982, in force 1985

- Protocol Concerning Regional Co-Operation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency; adopted 1982; in force 1985

Wider Caribbean

Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention); adopted 1983, in force 1986

- Protocol Concerning Co-operation in Combating Oil Spills in the Wider Caribbean Region; adopted 1983, in force 1986

Eastern Africa

The Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region (Nairobi Convention); adopted 1985, in force 1996

- The Protocol concerning Co-operation in Combating Marine Pollution in Cases of Emergency in the Eastern African Region; adopted 1985

South Pacific

Convention for the Protection of Natural Resources and Environment of the South Pacific Region (Noumea Convention); adopted 1986, in force 1990

- Protocol Concerning Co-operation in Combating Pollution Emergencies in the South Pacific Region; adopted 1986, in force 1990

Black Sea

Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention); adopted 1992, in force 1994

- Protocols on Cooperation in Combating Pollution of the Black Sea Marine Environment by Oil and other Harmful Substances in Emergency Situations; adopted 1992, in force 1994

North-East Pacific

The Convention for Cooperation in the Protection and Sustainable Development of the Marine and Coastal Environment of the Northeast Pacific; adopted 2002.

Partner programmes

Baltic: Convention on the Protection of the Marine Environment of the Baltic Sea Area (Helsinki Convention), adopted 1974, in force 1980, revised 1992, in force 2000).

North Sea: Agreement for cooperation in dealing with pollution of the North Sea by oil and other harmful substances (Bonn Agreement); adopted 1969; in force 1983.

North-East Atlantic: The Convention for the Protection of the Marine Environment of the North-East Atlantic – Oslo and Paris conventions (adopted 1974, revised and combined into OSPAR Convention 1992, in force 1998)

(No conventions have yet been developed for East Asian Seas, South Asian Seas, Upper South-West Atlantic, North West Pacific, Arctic.)

Table A-3. Status of international conventions by nation.

																		BUNKERS Convention 01
Afghanistan																		
Albania										x	x		x	x				
Algeria	x	x	x	x						d		x	d		x			
Andorra																		
Angola	x	x	x	x		x		x				x			x	x		
Antigua & Barbuda	x	x	x	x				x		d	x	x	d		x			
Argentina	x	x	x	x		x		x				x			x			
Armenia																		
Australia	x	x		x		x	x	x		d	x	x	d	x	x			
Austria	x	x	x	x														
Azerbaijan																		
Bahamas	x	x		x	x	x		x		d	x	x	d	x	x			
Bahrain										d	x	x	d	x	x			
Bangladesh						x												
Barbados	x	x	x	x		x				d	x	x	d	x	x			
Belarus	x	x	x	x														
Belgium	x	x	x	x		x				d	x	x	d	x	x			
Belize	x	x	x	x						d	x	x			x			
Benin	x	x	x	x		x				x			x					
Bhutan																		
Bolivia	x	x	x	x														
Bosnia & Herzegovina																		
Botswana																		
Brazil	x	x	x	x				x		x								
Brunei Darussalam	x									x	x	x	x		x			
Bulgaria	x	x	x	x		x		x										
Burkina Faso																		
Burundi																		
Cambodia	x	x	x	x						x	x	x			x			
Cameroon						x				d	x	x	x		x			
Canada	x	x					x	x		d	x	x	d	x	x			
Cape Verde																		
Central African Republic																		
Chad																		
Chile	x	x	x			x		x		x		x						
China	x	x		x		x	x	x		d	x	x	d					
Colombia	x	x	x	x						x	x	x	x	x	x			
Comoros	x	x	x	x				x				x			x			
Congo												x			x			
Cook Islands																		
Costa Rica										x	x							
Cote d'Ivoire	x	x	x	x		x				x			x					

Table A-3, continued.

															BUNKERS Convention 01
Croatia	x	x	x	x		x	x	x		d		x	d		x	
Cuba	x			x		x										
Cyprus	x			x						d	x	x	d	x	x	
Czech Republic	x	x	x	x												
Dem. People's Rep. Korea	x	x	x	x												
Dem. Rep. of the Congo																
Denmark	x	x	x	x		x	x	x		d	x	x	d	x	x	
Djibouti	x					x		x		d		x	d		x	
Dominica	x	x		x			x	x				x			x	
Dominican Republic	x	x	x	x		x				x		x			x	
Ecuador	x	x	x	x		x		x	x	x						
Egypt	x	x	x	x		x	x	x		x	x	x				
El Salvador								x		x	x	x				
Equatorial Guinea	x	x	x	x		x				x						
Eritrea																
Estonia	x	x	x	x			x			x			x			
Ethiopia																
Fiji						x				d		x	d		x	
Finland	x	x	x	x		x		x		d	x	x	d	x	x	
France	x	x	x	x		x	x	x		d	x	x	d	x	x	
Gabon	x	x	x	x		x				x		X	x		X	
Gambia	x	x	x	x						x			x			
Georgia	x	x	x	x		x	x	x		x	x	x			x	
Germany	x	x	x	x		x	x	x		d	x	x	d	x	x	
Ghana	x					x				x			x			
Greece	x	x	x	x			x	x		d	x	x	d	x	x	
Grenada												x			x	
Guatemala	x	x	x	x						x						
Guinea	x	x	x	x			x	x				x			x	
Guinea-Bissau																
Guyana	x	x	x	x		x	x	x		x			x			
Haiti																
Holy See																
Honduras	x			x						x						
Hungary	x	x	x	x												
Iceland	x	x		x		x	x	x		d	x	x	d	x	x	
India	x					x	x	x		d	x	x	d	x	x	
Indonesia	x									x		x	d			
Iran (Islamic Republic of)	x			x		x	x	x								
Iraq																
Ireland	x	x		x		x	x	x		d	d	x	d	d	x	
Israel	x	x						x								

Table A-3, continued.

																BUNKERS Convention 01
Italy	x	x	x	x		x	x	x		d	x	x	d	x	x	
Jamaica	x	x	x	x		x		x				x			x	
Japan	x	x	x	x		x		x		d	x	x	d	x	x	
Jordan							x									
Kazakhstan	x	x	x	x						x						
Kenya	x	x	x	x			x	x		d		x	d		x	
Kiribati																
Kuwait						x				x	x		x			
Kyrgyzstan																
Lao People's Dem. Rep.																
Latvia	x	x	x	x		x	x	x		x		x			x	
Lebanon	x	x	x	x		x				x						
Lesotho																
Liberia	x	x		x	x	x		x		d	x	x	d	x	x	
Libyan Arab Jamahiriya																
Liechtenstein																
Lithuania	x	x	x	x			x					x			x	
Luxembourg	x	x	x	x						x	x					
Madagascar								x				x			x	
Malawi	x	x	x	x												
Malaysia	x			x				x		x			x			
Maldives										x	x		x			
Mali																
Malta	x									d	d	x	d	d	x	
Marshall Islands	x	x	x	x	x	x	x	x		d	x	x	d	x	x	
Mauritania	x	x	x	x		x		x		x	x		x			
Mauritius	x	x	x	x				x		d	x	x	d	x	x	
Mexico	x			x		x	x	x		d	x	x	d	x	x	
Micronesia (Fed. States)																
Monaco	x	x	x	x		x		x		d		x	d		x	
Mongolia																
Morocco	x	x	x	x		x				d		x	d	x	x	
Mozambique										x		x	x		x	
Myanmar	x															
Namibia	x											x			x	
Nauru																
Nepal																
Netherlands	x	x		x		x	x	x	x	d	x	x	d	x	x	
New Zealand	x	x		x		x	x	x		d		x	d		x	
Nicaragua	x	x	x	x		x				x	x					
Niger																
Nigeria	x	x	x	x			x	x		x		x	x		x	

Table A-3, continued.

																	BUNKERS Convention 01
Norway	x	x	x	x	x	x	x	x		d	x	x	d	x	x		
Oman	x	x	x	x		x	x			d	x	x	d		x		
Pakistan	x	x	x	x		x		x									
Palau																	
Panama	x	x	x	x		x				d		x	d		x		
Papua New Guinea	x	x	x	x		x				d		x	d		x		
Paraguay																	
Peru	x	x	x	x				x		x	x						
Philippines	x	x	x	x								x			x		
Poland	x	x	x	x		x				d	x	x	d	x	x		
Portugal	x	x	x	x		x				x	x	x	x	x	x		
Qatar						x				d	x	x	d		x		
Republic of Korea	x	x		x				x		d	x	x	d		x		
Republic of Moldova																	
Romania	x			x			x	x				x					
Russian Federation	x	x	x	x		x	x			d	x	x	d	x	x	x	
Rwanda																	
Saint Kitts and Nevis	x	x	x	x						x			x				
Saint Lucia	x	x	x	x													
St. Vincent & Grenadines	x	x	x	x		x				d		x			x		
Samoa	x	x	x	x								x			x		
San Marino																	
Sao Tome & Principe	x	x	x	x						x							
Saudi Arabia							x			x	x						
Senegal	x	x	x	x		x		x		x							
Seychelles	x							x		d		x	d		x		
Sierra Leone	x	x	x	x			x			d		x	d		x		
Singapore	x	x		x	x			x		d	x	x			x		
Slovakia	x	x	x	x													
Slovenia	x	x	x	x		x		x		d		x	d		x		
Solomon Islands																	
Somalia																	
South Africa	x	x		x		x				x							
Spain	x	x	x	x		x		x		d	x	x	d	x	x		x
Sri Lanka	x	x	x	x		x				d		x	d		x		
Sudan																	
Suriname	x	x	x	x		x											
Swaziland																	
Sweden	x	x	x	x	x	x	x	x		d	x	x	d	x	x		
Switzerland	x	x	x	x		x	x	x		d	x	x	d				
Syrian Arab Republic	x					x	x			x			x				
Tajikistan																	

Table A-3, continued.

	BUNKERS Convention 01
Thailand	
The former Yugoslav Republic of Macedonia	
Togo	
Tonga	
Trinidad & Tobago	
Tunisia	
Turkey	
Turkmenistan	
Tuvalu	
Uganda	
Ukraine	
United Arab Emirates	
United Kingdom	
United Rep. of Tanzania	
United States	
Uruguay	
Uzbekistan	
Vanuatu	
Venezuela	
Viet Nam	
Yemen	
Yugoslavia	
Zambia	
Zimbabwe	
Hong Kong, China (Associate Member)	

NOTE: x = accession to, or ratification of, a Convention; d = denunciation of a preceding Convention.

[1] See Appendix A for summary discussion of major international preparedness and response conventions and protocols