THE ROLE OF INTERNATIONAL INSTRUMENTS IN ADDRESSING PREVENTION, PREPAREDNESS AND RESPONSE TO OIL POLLUTION AND THE EXTENSION OF THESE TO ADDRESS THE CHALLENGE OF HAZARDOUS AND NOXIOUS SUBSTANCES (HNS)

Patricia Charlebois
Head, Pollution Response
International Maritime Organization
London, United Kingdom

ABSTRACT

As knowledge, policies and infrastructure related to marine oil spill prevention, preparedness and response have continued to evolve and are now considered to have reached a state of relative maturity; attention has more recently turned to developing systems to address spills of hazardous and noxious substances (HNS) in the marine environment.

The International Maritime Organization (IMO), as the specialized agency of the United Nations with a global mandate for the protection of the marine environment from pollution caused by shipping, discharges its commitment to protecting the marine environment from pollution from oil and HNS at the global level along four different but interdependent paths: prevention, preparedness and response, and technical co-operation.

Two mutually supporting IMO instruments that together address the Prevention-Preparedness-Response (PPR) continuum for HNS are: The International Convention for the Prevention of pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 relating thereto (MARPOL Convention), notably Annexes II (noxious liquid substances in bulk) and III (harmful substances carried by sea in packaged form), covering prevention, and the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (HNS Protocol), which addresses preparedness, response and co-operation to spills of HNS.

Together, these instruments provide a framework for countries to establish the necessary systems for tackling the complex issue of prevention, preparedness and response to HNS, with the goal of embedding the principles set out in these instruments into national legislation and policy that are fully implemented at both institutional and operational levels. At the same time, it is equally recognized that the topic of preparedness and response to HNS is still in its infancy and that any systems developed must borrow heavily from the established systems for oil pollution, in order to maximize the use of existing capacity in planning and preparing for HNS, at the same time acknowledging the unique issues presented by these substances.

The paper will examine these elements in greater detail and will discuss the requirements for developing systems for preparedness and response for oil and HNS, comparing areas of similarity, contrasting the differences and identifying the distinct considerations that are necessary for each.

INTRODUCTION

The world's oceans are the lifeblood of our planet, providing our main source of water and serving as home to half the world's biodiversity. Yet never before has the marine environment been so vulnerable to ever increasing environmental influences such as global warming, CO_2, pollution from various sources and other human-induced impacts, which together have converged to upset the delicate ecosystem balance in seas and oceans throughout the world.

In the past thirty years, as the global environmental agenda has moved from the fringes of international attention to centre stage, maritime shipping's environmental performance has come under sharper scrutiny than ever before. And under this scrutiny, with the experience and lessons learned from some of the larger oil spills the world has experienced, the maritime sector, with the support of the petroleum industry, has responded to these challenges to make maritime transport one of the safest and most environmentally sound forms of transportation.

Numerous measures have been introduced over time that have effectively reduced both the risk and occurrence of major pollution incidents from ships and that have improved preparedness and response to pollution incidents when they inevitably occur. The introduction of two international Conventions, the MARPOL Convention and its mandatory Codes and the International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 (OPRC 90 Convention), have led to significant decreases in both operational discharges as well as in the number of large-scale oil pollution incidents from ships. As the global system for prevention, preparedness and response to oil pollution has now reached a state of relative maturity, attention has more recently turned to the complex issue of tackling pollution from hazardous and noxious substances.

On the prevention side this has been achieved by strengthening the MARPOL Convention through a serious of recent amendments to Annex II, which covers noxious liquid substances carried

in bulk, and on the preparedness, response and co-operation side through the recent entry into force of the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (HNS Protocol) in June 2007.

THE INTERNATIONAL MARITIME ORGANIZATION

The International Maritime Organization (IMO), as the specialized agency of the United Nations with a global mandate for the protection of the marine environment from pollution caused by shipping, fulfills its commitment to protecting the marine environment from pollution from oil and hazardous and noxious substances at the global level along four different but interdependent paths: prevention, preparedness and response, all three supported by a technical co-operation programme directed towards countries in need of assistance. By developing and adopting international treaties such as the MARPOL Convention and its mandatory Codes, which apply primarily to the prevention of accidental and operational discharges of pollution from ships, together with the OPRC 90 Convention and its HNS Protocol, which address preparedness, response and co-operation for pollution incidents involving oil and HNS, Flag States are provided with the necessary tools to limit the introduction of unwanted pollutants into the marine environment and, where this is not possible, to effectively manage the consequences.

PREVENTION

The MARPOL Convention is the main international instrument aimed at protecting the marine environment from operational and accidental pollution from ships. Its six annexes regulate the prevention of marine pollution by oil; noxious liquid substances in bulk; harmful substances carried by sea in packaged form; sewage; and garbage, as well as the prevention of air pollution.

According to the provisions of the MARPOL Convention and its associated mandatory Codes, vessels should be designed, constructed and operated in an integrated manner, with the objective of preventing and ultimately eliminating harmful discharges and emissions from ships throughout their working life. This holistic philosophy encompasses all vessel operations and their possible impact on the environment, and provides increased opportunities for transport managers to choose environmentally-sound sea transport options.

MARPOL Annex I, the portion of the Convention that covers prevention of pollution by oil, includes measures that have been specifically introduced to ensure oil tankers are constructed and operated in a way that reduces the amount of oil spilled from operational activities or in the event of an incident. This Annex has recently been amended to incorporate more stringent requirements for existing and newly-constructed ships, including the phasing-in of double hull requirements for oil tankers; improvements to pump-room bottom protection on oil tankers exceeding 5,000 tonnes deadweight; a requirement for double bottom pump rooms for vessels constructed on or after 1 January 2007; and more stringent requirements aimed at reducing the accidental outflow of oil in the event of stranding or collision.

Recent amendments to MARPOL Annex II, which covers the prevention of pollution from noxious liquid substances carried in bulk, which entered into force on 1 January 2007, will also contribute to lowering the risk of pollution and resulting damage to the environment.

The revised Annex II for the control of pollution by noxious liquid substances in bulk includes a new categorization system for noxious and liquid substances.

The new categories are:

- Category X: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a major hazard to either marine resources or human health and, therefore, justify the prohibition of the discharge into the marine environment;
- Category Y: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and therefore justify a limitation on the quality and quantity of the discharge into the marine environment;
- Category Z: Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a minor hazard to either marine resources or human health and therefore justify less stringent restrictions on the quality and quantity of the discharge into the marine environment; and
- Other Substances: Substances which have been evaluated and found to fall outside Category X, Y or Z because they are considered to present no harm to marine resources, human health, amenities or other legitimate uses of the sea when discharged into the sea from tank cleaning of deballasting operations. The discharge of bilge or ballast water or other residues or mixtures containing these substances are not subject to any requirements of MARPOL Annex II.

The revised Annex II includes a number of other significant changes. Improvements in ship technology, such as efficient stripping techniques, has made possible significantly lower permitted discharge levels for certain products, which have been incorporated into the Annex. For ships constructed on or after 1 January 2007, the maximum permitted residue in the tank and its associated piping left after discharge is set at a maximum of 75 litres for products in categories X, Y and Z - compared with previous limits which set a maximum of 100 or 300 litres, depending on the product category.

Alongside the revision of MARPOL Annex II, the marine pollution hazards of thousands of chemicals have been evaluated by the Evaluation of Hazardous Substances Working Group, giving a resultant revised GESAMP Hazard Profile which indexes the substance according to its bio-accumulation; bio-degradation; acute toxicity; chronic toxicity; long-term health effects; and effects on marine wildlife and on benthic habitats.

As a result of the hazard evaluation process and the new categorization system, vegetable oils which were previously categorized as being unrestricted are now required to be carried in chemical tankers. The revised Annex includes, under Regulation 4 Exemptions, a provision for the Administration to exempt ships certified to carry individually identified vegetable oils, subject to certain provisions relating to the location of the cargo tanks carrying the identified vegetable oil.

An MEPC resolution has been developed providing guidelines for the transport of vegetable oils in deep tanks or in independent tanks specially designed for the carriage of such vegetable oils on board dry cargo ships. This resolution allows general dry cargo ships that are currently certified to carry vegetable oil in bulk to continue to carry these vegetable oils on specific trades. These guidelines came into effect on 1 January 2007.

MARPOL Annex III for the prevention of pollution by harmful substances carried by sea in packaged form has recently been revised to harmonize the regulations with the criteria for defining marine pollutants which have been adopted by the UN Transport of Dangerous Goods (TDG) Sub-Committee, based on the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS). The revisions will enter into force on 1 January 2010.

PREPAREDNESS AND RESPONSE

Good prevention initiatives can go a long way to reducing risk and the objective is to reduce and then manage this risk to the extent possible. At the same time, it must be recognized that, in spite of best efforts, oil spills will continue to occur underscoring the need for a good state of preparedness to ensure a timely and effective response to limit the adverse consequences of spills from oil and other pollutants.

The OPRC 90 Convention is the international instrument that provides a framework designed to facilitate international co-operation and mutual assistance in preparing for, and responding to, major oil pollution incidents and to encourage States to plan and prepare by developing emergency response structures in their respective countries, and by maintaining adequate capacity and resources to address oil pollution emergencies.

Specifically, the OPRC 90 Convention includes requirements for oil pollution emergency plans for ships, offshore units, sea ports and oil handling facilities operating in State waters, and procedures for reporting oil pollution incidents when these occur. The Convention also requires a national emergency system, including the development of a national contingency plan and the designation of a competent national authority and a national operational contact point(s). In addition, Parties to the Convention are obliged to have trained staff and a minimum level of pre-positioned oil spill equipment available at the State level or through bi-lateral or multi-lateral arrangements. Possibly the most important aspect of the OPRC 90 Convention is the international co-operation dimension, which enables a Party to request international assistance from other State Parties. To further facilitate co-operation during pollution incidents, States are also urged to develop bi-lateral and multi-lateral operational agreements for preparedness and response.

HAZARDOUS AND NOXIOUS SUBSTANCES

Although oil spills remain the largest environmental threat due to the volumes transported, the risk of incidents involving chemicals or 'hazardous and noxious substances' is on the rise, as the volume of chemicals transported by sea continues to increase. These substances are also generally considered to represent a higher degree of hazard than that presented by petroleum products, not only to the marine environment, but also to human health. Acknowledging the growing threat from the carriage of HNS by sea, in 2000 IMO adopted the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (HNS Protocol), which entered into force on 14 June 2007. The HNS Protocol follows the principles set out in the OPRC 90 Convention and extends these to hazardous and noxious substances other than oil, providing the same basic framework and platform for co-operation and mutual assistance.

There are a number of unique challenges in addressing HNS, given the higher risk element associated with them. Hazardous and noxious substances represent a category of compounds numbering in the millions, with widely varying properties and hazards and completely different behaviors. This creates not only a number of operational challenges, as oil spill response organizations struggle to identify how they will now tackle preparedness and response to products for which they have little knowledge or experience, but also for policymakers as Member States turn their attention to the task of embedding the principles of the HNS Protocol into the national legislation. A summary of the key differences between oil and HNS with respect to preparedness and response, which underscores the challenges of HNS that also influences policy development, is provided in Table 1.

TABLE 1 – SUMMARY OF DIFFERENCES BETWEEN OIL AND HNS

Oil	HNS
• Preparedness & response to marine oil spills is relatively well understood • Although there are different types, there is some uniformity in properties and behaviour • Approach and equipment options are the same and relatively standard • Relative danger and hazard to human health is low • Oil normally floats and spills are visible • Oil spill technology is well developed	• Response difficult or impossible, depending on substance • Large number and wide variety of substances (> 8 million), with differing properties and behaviour from substance to substance • Varying type and degree of hazard • Potential for significant danger (explosive, flammable) and hazard to human health (corrosive, toxic) • In many cases, spills would not be visible • Marine chemical spill response technology is still in its infancy

POLICY IMPLICATIONS

The HNS Protocol, as is the case for the parent the OPRC 90 Convention, is by design, a framework international instrument that identifies a series of obligations and requirements for Member States, but without being prescriptive in how these should be met. This allows Member States a wide degree of flexibility in implementing the provisions of the HNS Protocol.

For instance, the definition of hazardous and noxious substances under the Protocol, which defines HNS as "any substance other than oil which, if introduced into the marine environment, is likely to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea", is very broad. This has the advantage of providing maximum protection of the marine environment from any possible substance that could be construed as being 'harmful' to the marine environment if released. From an environmental protection perspective, this is a great achievement covering virtually any substance that has potentially deleterious environmental effects. However, from a practical and policy application perspective, this represents a somewhat problematic scenario and a challenge for policy makers and regulators faced with the task of developing appropriate legislation to address the wide range of substances that such a definition would cover.

Other policy questions that may arise are: How does one determine what substances should and should not be covered and on what basis should this determination be made? What volumes should be regulated and made subject to the various requirements such as, for example, requiring an emergency plan? For instance, should regulations address only cargo shipments? And if so, only substances carried in bulk? Or should these be extended to packaged goods? Should other chemicals carried on board for other purposes related to regular running of a ship be included or excluded for the emergency planning requirement? Whereas the answers to such questions have not presented any particular difficulty in the past for oil carried either as cargo or as fuel, when these questions are extended to HNS the situation becomes far more complex.

The inherent flexibility of the Protocol allows for a host of possible options for establishing a national level regulatory framework to meet its provisions. For example, Member States may require differing types of pollution incident emergency plans to meet the requirement as identified in Article 3 of the HNS Pro-

tocol. Whereas one State may require a high level of detail be included in the plan, another State may wish to adopt a much more basic regulatory requirement. Such variability in approach has the advantage of providing a high degree of flexibility for policy development, but can also give rise to a lack of harmonization in systems from one Member State to another that can present challenges to compliance for those who are regulated by them.

To further complicate the picture, the various international instruments regulating the transportation of HNS by sea, such as MARPOL Annex II for bulk liquid chemicals; MARPOL Annex III and the IMDG Code for packaged dangerous goods; the HNS Protocol for preparedness, response and co-operation for spills and releases of HNS; and the HNS Convention, when it enters into force, covering liability and compensation for spills of certain types of HNS, use different definitions and systems for categorizing the hazardous substances that they regulate.

In the short term, the more prescriptive instruments identified can provide clues and assistance for establishing regulations and policy to meet the requirements outlined in the HNS Protocol. For instance, MARPOL Annex II identifies the need for a 'shipboard marine pollution emergency plan for noxious liquid substances', with further guidance on the specific provisions and the structure for the required plan elaborated in a series of IMO resolutions. This information, for example, could easily serve as the basis for the development of the pollution incident emergency plan required by the HNS Protocol. Based on this analysis and the limited experience amassed to date, given its recent entry into force, it is clear that additional policy guidance on implementation of the HNS Protocol will be needed to assist both Member States and those being regulated.

CONCLUSION

The systems in place for prevention, preparedness and response to oil pollution incidents at sea are well-established and have reached a state of relative maturity. With the recent entry into force of the HNS Protocol 2000 in June 2007, the international policy framework for preparedness to and response to releases and spills of hazardous and noxious substances has advanced such that, together with the provisions in and recent amendments to the MARPOL Convention for the transportation of noxious liquids in bulk (Annex II) and packaged dangerous goods (Annex III and the IMDG Code), moves a step forward towards establishing systems to cover the PPR continuum, consistent with that which has been established for and that has proven successful in addressing oil pollution incidents.

In spite of this achievement, the HNS Protocol 2000, which has recently entered into force, does present some challenges for policymakers and regulators. The HNS Protocol provides a comprehensive framework, providing maximum environmental protection due to its broad definition of HNS and wide degree of flexibility for policy makers. However, more policy guidance is still needed to assist those faced with incorporating the provisions of the HNS Protocol into domestic legislation and to facilitate a harmonized international regime.

Some guidance and assistance can be found in instruments which regulate other aspects associated with hazardous substances. However, these will not be sufficient to answer all the policy and regulatory questions that may arise. As the topic continues to evolve and be discussed amongst experts from both Member States and other Observing Organizations that contribute to relevant Committees of the International Maritime Organization and as practical application and experience grows, it is expected that this will be brought to the fore and shared widely to assist countries which are Party to the HNS Protocol and to provide more practical policy guidance on the subject.

BIBLIOGRAPHY

International Maritime Organization. 2006. The International Convention for the Prevention of pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 relating thereto (MARPOL)

International Maritime Organization. 1991. International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990

International Maritime Organization. 2000. Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 (HNS Protocol)

International Maritime Organization. 2006. International Maritime Dangerous Goods Code (IMDG Code)

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