



NATIONAL HNS INCIDENTS AT SEA PREPAREDNESS AND RESPONSE PLAN

Coast Guard Headquarters
Directorate of Fisheries and Environment

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Foreword

India is the 6th largest chemical producing countries in the world and 3rd largest producer in Asia. The chemical industry is playing vital role in the expansion of EXIM trade. The chemicals are used in nearly all manufactured goods and reliance on the chemical industry is substantial. Therefore, logistics of chemicals is a crucial aspect given to understand the sensitive nature of the goods and raw materials, leading to numerous unique challenges.

HNS trade is peculiar since each product has different behaviour and characteristics and therefore, its response in terms of equipment, gear and effects to human health and marine environment are difficult to assess and predict. Indian ports also handle substantial amount of Hazardous and Noxious Substances (HNS). The Maritime Zones of India has major east-west Sea Lanes of Communications (SLOC) through which world's major transportation of HNS takes place.

India is also a member of South-Asian Cooperative Environment Programme (SACEP). The Indian Coast Guard has been nominated as Competent National Agency (CNA) for dealing with chemical spills under the SACEP. As per the Crisis Management Plan of Government of India, Indian Coast Guard is also designated as Central Nodal Agency for the crisis arising out of HNS spill in the Maritime Zones of India. Therefore, it is incumbent on Indian Coast Guard to coordinate all the response to marine HNS pollution incident in the Maritime Zones of India and also to put a plan in place.

This plan brings out the salient aspects of an HNS spill including its effects on human life, marine environment, living organisms and economic impact besides the methodology of responding to such spill. It basically outlines a tiered form of response and division of responsibilities for combating HNS spill. The plan also brings out the responsibilities of various stakeholders and the organisational relationship between them. India being in the process of acceding to the OPRC-HNS Protocol of 2000, this plan will facilitate national preparedness and response to HNS incidents and thereby fulfil India's obligation to have in place a national plan to respond to HNS incidents as a State party to the OPRC-HNS Protocol.

New Delhi
Date ___

Principal Director (FE)

Abbreviations

AEGL	Acute Exposure Guideline Levels
AEGL	Acute Exposure Guidelines levels
AMU	Atomic Mass Units
AoR	Area of Responsibility
BLEVE	Boiling Liquid Expanding Vapour Explosion
BMCs	Biodiversity Management Committees
C	Ceiling
CNA	Competent National Authority
CCA	Central Coordinating Authority
CEDRE	Centre d' Etudes pour la Developpement et la Reussite des Entreprise
CEFIC	European Chemical Industry Council
CIC	Chief Incident Controller
CIDM	Chemical Industrial Disaster Management
Cm	Centimetre
CMGs	Crisis Management Groups
COMAPS	Coastal Ocean Monitoring and Prediction System
COMDIS	Commander Coast Guard District
CMFRI	Central Marine Fisheries Research Institute
CSIR	Council of Scientific and Industrial Research
D	Dissolvers
DE	Dissolver/ Evaporator
DEA	Department of Economic Affairs
DG	Dangerous Goods
DGICG	Director General Indian Coast Guard
DGS	Director General Shipping
DHSCP	District HNS Spill Contingency Plan
DOSC	District On-scene Commander
E	Evaporator
EC 50	Effective Concentration 50 test
ECC	Emergency Control Centre
ED	Evaporated Dissolvers
EEZ	Economic Exclusive Zone
EG	Environment Group
EHS	Evaluation of Hazardous of Harmful substances carried by Ships
ENVIS	Environment Information System
EPA	Environment Protection Act
ESC	Environmental and Scientific Coordinator
F	Floaters
FHNSCP	Facility HNS spill Contingency Plan

FD	Floater/ Dissolver
FE	Floater/Evaporator
FED	Floaters/ Evaporator/Dissolver
FID	Flame Ionisation Detector
FSI	Fishery Survey of India
G	Gas
GC-FID	Gas Chromatography with Flame Ionisation
GC-MS	Gas Chromatography mass Spectrometry
GD	Gas Strokes dissolvers
GESAMP	Group of Experts on the Scientific Aspects of Marine Environmental Protection
GHS	Globally Harmonised System
GoI	Government of India
HAZMAT	Hazardous Material
HELCOM	Helsinki Commission (The Baltic Marine Environment Protection Commission also known as Helsinki Commission)
HNS	Hazardous and Noxious Substances
HS	Harmful substances
IAP	Incident Action Plan
IATA	International Air Transport Association
IBA	Important Bird Areas
IBC	International Bulk Code
ICE	International Chemical Environment
ICG	Indian Coast Guard
IG	International Group for P&I Clubs
IGC	Intergovernmental Committee
IGC Code	The International Code of the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk Code
INCOIS	Indian National Centre for Ocean Information Services
IITR	Indian Institute of Toxicology Research
IMDG	International Maritime Dangerous Goods
IMDG Code	International Maritime Dangerous Goods Code
IMO	International Maritime Organisation
IMSBC	International Maritime Solid Bulk Cargoes Code
IMT	Incident Management Team
INMARSAT	International Maritime Satellite
IR	Infrared
ITOPF	International Tanker Owners Pollution Federation Limited
ITRC	Industrial Toxicology Research Centre
kPA	Kilopascal
LAG	Local Action Group
LC 50	Lethal Concentration 50 Test
LEL	Lower Explosive Limit
LFL	Lower Flame Limit

LNG	Liquefied Natural Gas
LST	Local Action Group support team
MARPOL	The International Convention for the Prevention of Pollution from Ships
MEPC	Maritime Environment Protection Committee of IMO
Mg/L	Milligram per Litre
MHA	Ministry of Home Affairs
MoA	Ministry of Agriculture
MOC&F	Ministry of Commerce & Finance
MoC&I	Ministry of Commerce and Industry
MoEF	Ministry of Environment Forest & Climate Change
MoF	Ministry of Finance
MoFAH&D	Ministry of Fisheries, Animal Husbandry & Dairying
MoLE	Ministry of Labour and Employment
MoP&NG	Ministry of Petroleum & Natural Gas
MoSRT & H	Ministry of Shipping Road Transport & Highway
MoU	Memorandum of Understanding
MP	Marine Pollutants
MPA	Marine Protected Area
MRC	Medical Research Council
MRCC	Maritime Rescue Coordination Centre
MRU	Marine Response Unit
MS Act	Merchant Shipping Act
MSI	Mangrove Society of India
MZI	Maritime Zones of India
NCCR	National Centre for Coastal Research
NCMC	National Crisis Management Committee
NDMA	National Disaster Management Authority
NEBA	Net Environment Benefit Analysis
NEC	National Executive Committee
NGOs	Non- Governmental Organisations
NHNSCMG	National Hazardous Noxious substances Crisis Management Group
NHSCP	National HNS Spill Contingency Plan
NIDM	National Institute of Disaster Management
NOSC	National On-scene Commander
NOSDCP	National Oil Spill Disaster Contingency Plan
OCU	Offshore Control Unit
OISD	Oil Industry Safety Directorate
OPRC	Oil Pollution Preparedness, Response and Cooperation
OPRC-HNS	Oil Pollution Preparedness, Response and Cooperation HNS Protocol
OS	Other Substances
OSCPs	Oil Spill Contingency Plans

OSRL	Oil Spill Response Limited
P & E	Protection and Endowment
PAC	Protective Action Criteria
pH	Potential of Hydrogen
POC	Point of Contact
POLREP	Pollution Report
POLREPs	Pollution Reporting System
PPE	Personal Protective Equipment
Ppm	Parts Per Million
REMPEC	Regional Marine Pollution Emergency Response Centre
ROSC	Regional On-scene Commander
ROV	Remotely Piloted Vehicle
RPAS	Remotely Piloted Aircraft Systems
RWMC	Reef Watch Marine Conservations
S	Sinkers
SACEP	South Asia Cooperative Environment Programme
SAW	Surface Acoustic Wave
SBBs	State Biodiversity Boards
SCUBA	Self Compressed Underwater Breathing Apparatus
SD	Sinker/ Dissolver
SDMA	State Disaster Management Authority
SDR	Special Drawing Rights
SDS	Safety Data Sheet
SEBC	Standard European Behaviour Classification
SHSCP	State HNS Spill Contingency Plan
SIC	Site Incident Controller
SMCU	Salvage Monitoring and Control Unit
SMPEP	Shipboard Marine Pollution Emergency Plan
SOLAS	International Convention for the Safety of Life at Sea
SOSC	State Onscene Coordinator
SPOC	Single Point of Communication
SRC	Shoreline Response Centre
STEL	Short – Term Exposure Limit
TLV	Threshold Limit Value
TLV-C	Threshold Limit Value – C
TOC	Total Organic Carbon
TWA	Time weighted Average
U/T	Union Territory
UEL	Upper Explosive Limit
UFL	Upper Flammable Limit
UN	United Nations
UNCLOS	The United Nations Convention on the Law of the Sea
UNECE	United Nations Economic Commission for Europe
VD	Vapour Density

VHF
VOC
VP

Very High Frequency
Volatile Organic Compound
Vapour Pressure

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Chapter-1: Introduction and Objectives

1.1. General

1.1.1. Maritime transport is the backbone of international trade and global economy. Around 80% of global trade by volume and over 70% by value are carried out by sea and are handled by ports worldwide.¹Oil spills have been attention seekers and therefore National Oil Spill Disaster Contingency Plan (NOSDCP) was developed to address marine pollution by oil. The chemical industry has witnessed continuous development along with increasing demand of raw materials thereby leading to significant enhancement in trend of maritime transport of chemical and hazardous substances. International Maritime Organisation (IMO) estimates that more than half of the packaged goods and bulk cargoes transported by sea today can be regarded as dangerous, hazardous or harmful to the environment.

1.1.2. India is a party to the United Nations Convention on the Law of the Sea (UNCLOS) and the forty second amendment to the Constitution of India obliges the state to endeavour to protect and preserve the marine environment in the Maritime Zones of India. The plan is the measure of fulfilment of the obligation on the State under the UNCLOS and the Constitution of India. India ratified OPRC (Oil Pollution Preparedness Response and Cooperation) Convention 1990 in the year 1995. Subsequently, a comprehensive NOSDCP was developed and implemented in 1993. The plan was approved by the Committee of Secretaries. NOSDCP delineates the responsibilities of various resource agencies and stakeholders beside the Government agencies for oil spill response. India has a robust mechanism and plan presently in force towards preparedness and response to any oil spill in the Maritime Zones of India (MZI).

1.1.3. The 2000 OPRC-HNS Protocol, which entered into force in 2007 requires parties to establish national systems of preparedness for and response to pollution incident involving HNS. India is yet to ratify any of the HNS Conventions / Protocols {The OPRC-HNS Convention 1996, the OPRC-HNS Protocol of 2000 or the 2010 HNS Protocol (also called as the "International Convention on Liability and Compensation for Damage in connection with the Carriage of HNS by Sea, 2010")}. ICG has been designated as Competent National Authority (CNA) by Government of India (GoI) for oil and chemical spill response under the South-Asian Cooperative Environment Programme (SACEP) in 2018 and also as Central Nodal Agency for the crisis arising out of HNS spill at Sea by Cabinet Secretariat in the year 2020. This has necessitated to have a contingency plan in place for responding to the HNS pollution in the

¹UNCTAD Report 2021

MZI. This document will recognise the need to develop and maintain a shared responsibility amongst various resource agencies and stakeholders. It will also provide commitment of all stakeholders to continue to provide timely and effective response including availability of pollution response equipment and trained manpower as and when needed.

1.2. Definition of Hazardous and Noxious Substances (HNS)

1.2.1. An HNS is a substance such as chemicals, which could threaten humans and marine life and interfere with legitimate uses of the sea, if spilled in the sea. There are two different key definitions of HNS, that of the 2000 OPRC-HNS Protocol and the 2010 HNS Convention:-

(a) Under the 2000 OPRC-HNS Protocol (IMO 2002), HNS are defined 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"².

(b) The HNS Convention (IMO 2010) on the other hand includes oil and provides a detailed list of HNS categories as defined by various International Maritime Organisation (IMO) Convention and Codes³:-

(i) "any substances, materials and articles carried onboard a ship as cargo, referred to in (aa) to (af) below:-

(aa) Oils, carried in bulk, as defined in regulation 1 of Annex I to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended.

(ab) Noxious liquid substances, carried in bulk, as defined in regulation 1.1.0 of Annex II to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, as amended, and those substances and mixtures provisionally categorized as falling in pollution category X, Y, or Z in accordance with regulation 6.3 of the said Annex II.

(ac) Dangerous liquid substances carried in bulk listed in Chapter 17 of the International Code of the Construction

² Pg 8, Art 2(2), 2000 OPRC-HNS Protocol

³Art 1(5) 2010 HNS Convention

and Equipment of Ships Carrying Dangerous Chemicals in Bulk, as amended, and the dangerous products for which the preliminary suitable conditions for the carriage have been prescribed by the Administration and Port Administration involved in accordance with Paragraph 1.1.6 of the Code.

(ad) Dangerous, hazardous and harmful substances, materials and articles in packaged form covered by the International Maritime Dangerous Goods (IMDG) Code, as amended.

(ae) Liquefied gases as listed in Chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, as amended, and the products for which preliminary suitable conditions for the carriage have been prescribed by the Administration and Port Administrations involved in accordance with paragraph 1.1.6 of the Code.

(af) Liquid substances carried in bulk with a flashpoint not exceeding 60⁰C (measured by a closed-cup test).

(ag) Solid bulk materials processing chemical hazards covered by the International Maritime Solid Bulk Cargoes (IMSBC) Code, as amended, to the extent that these substances are also subject to the provisions of the International Maritime Dangerous Goods Code in effect in 1996, when carried in packaged form.

(ii) Residues from the previous carriage in bulk of substances referred to in (i) (aa) to (ac) and (i) (ae) to (ag) above.

1.2.2. For the purpose of this plan the meaning of HNS includes substances other than oil as mentioned in para 4(b)(i)-(ii).

1.3. Objectives of the Plan

1.3.1. The objectives of the plan are: -

(a) The plan provides a single comprehensive and integrated response arrangement to minimise the impacts of marine pollution due to HNS from vessels, technical or mechanical faults during storage and transfer, human error, natural disasters, intentional release including

dumping of chemical wastes, acts of war, sabotage or terrorism incidents. Incidents like groundings, fire, explosion, collision or cargo reaction may be the likelihood for occurrence of marine pollution incident due to the HNS.

(b) To establish an effective system for detection and reporting of spills.

(c) To establish adequate measures for preparedness for HNS pollution.

(d) To facilitate rapid and effective response to the HNS pollution.

(e) To establish adequate measures for crew, responders and public health and safety and protection of the marine environment.

(f) To establish appropriate response techniques to prevent, control, and combat HNS pollution.

(g) To establish record keeping procedures to facilitate recovery of costs.

(h) To maintain the evidences for the purpose of identifying the polluter and taking suitable administrative, civil or criminal action against the polluter.

(j) To lay down the arrangements across Government departments, resource agencies, stakeholders and the community towards the specific threats arising from maritime environmental emergencies especially chemicals and HNS.

(k) To provide a national plan for implementing a comprehensive management arrangement through following: -

(i) Governance and effective policy arrangements to ensure accountability, risk assessment, engagement with stakeholders and providing strategic clear direction.

(ii) Preparedness for marine pollution incidents through a tiered approach to contingency planning, training and development of response personnel and maintenance of response assets and services.

(iii) Invoking national contingency plans as response to marine pollution incidents.

(iv) Recovery of the marine environment and affected community from the impacts of marine pollution.

(l) To provide a national plan that provides a single integrated response arrangement through shared responsibility from all levels of Government, industries, non-government entities and the communities. All parties should collaborate and offer collective response capability and capacity.

(m) To implement a risk management approach by understanding the specific hazards, social, environmental, infrastructure and economic vulnerabilities presented by such events.

(n) To implement the polluter pay principle in which response and recovery is funded through implementation of relevant international conventions.

(p) To provide active stakeholder engagement since it is important for preparedness, response and recovery.

(q) To give effective relevance to the obligations relating to national legislations and international conventions such as: -

(i) Territorial Sea, Contiguous Zone, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones of India Act, 1976 (MZI Act 1976).

(ii) Section 14 of Coast Guard Act 1978.

(iii) Environment Protection Act (EPA), 1986.

(iv) Merchant Shipping(Prevention of Pollution by Harmful Substances carried by sea in package form) Rules, 2020.

(v) Articles 198 & 221 of UNCLOS, 1982.

(vi) International Convention for the Prevention of Pollution from Ships(MARPOL).

(vii) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Protocol to the Basel

Convention on the Control of Transboundary Movements of Hazardous Wastes, 1999.

(viii) International Convention on Salvage, 1989.

(ix) International Convention relating to Intervention on the High Seas in cases of Oil Pollution Casualties, 1969 (Intervention Convention).

(x) International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC), 1990.

(xi) Protocol on Preparedness, Response and Cooperation to Pollution Incidents by Hazardous and Noxious Substances (OPRC-HNS Protocol), 2000.

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

1.3.2. The plan is also to provide information to support the preparedness during any such HNS pollution incidents from vessels, HNS facilities close to maritime zones, floating or sunken containers of hazardous materials, chemical debris originating from a maritime casualty and unknown sources. The plan will also provide various resource agencies, stakeholders and other Government departments who will be responsible for actions against such incidents/ accidents to protect precious lives and preserve maritime environment.

1.4. Hierarchy of Contingency Plans

1.4.1. The national contingency plan related to the HNS consists of:-

- (a) National HNS Spill Disaster Contingency Plan.
- (b) State and U/T HNS Spill Disaster Contingency Plan.
- (c) Port or Facility HNS Spill Disaster Contingency Plan.

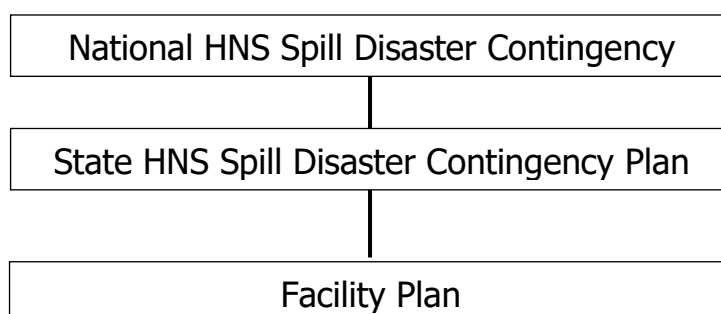


Figure 1: Hierarchy of Contingency Plan

1.5. Geographical Area

1.5.1. The plan applies to all incidents of marine casualty or acts relating to such casualty occurring with grave and imminent danger to Indian coast line or related interests from pollution or threat of pollution in the sea by deliberate, negligent or accidental release of HNS into the sea including such incidents occurring on the high seas.

1.5.2. The plan also covers all incidents in any part of the sea, or inland, that are likely to affect the MZI, that includes all the Territorial Waters and the Exclusive Economic Zone (EEZ) of India, as detailed in Figure 2, and the High Seas where an HNS spill has the potential to impact on Indian interests in the MZI.

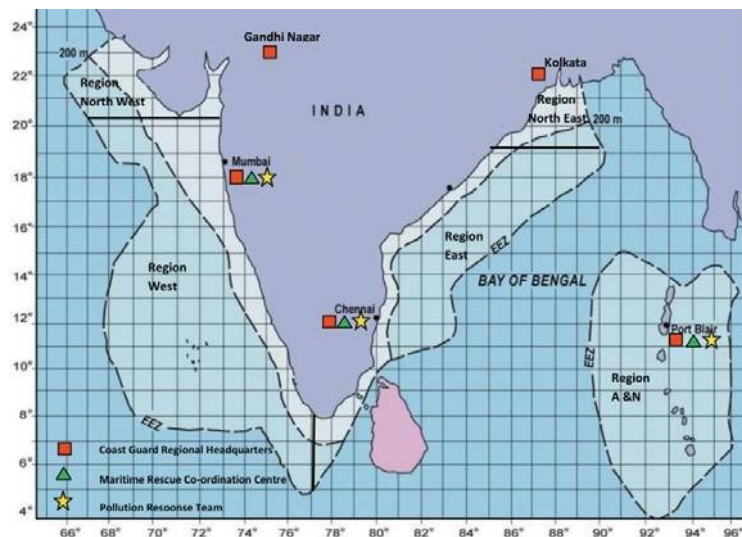


Figure 2: National Pollution Response Area

1.6. Jurisdiction

1.6.1. In keeping with the Law of the Sea Convention, India's jurisdiction under the MZI Act, 1976 extends over the EEZ up to 200 nautical miles seaward of the baseline and the Territorial Sea extends to twelve nautical miles from the baseline.

1.6.2. Both, the Union Government and State Government have concurrent jurisdiction for environment in the territorial waters of India. The Central Government has jurisdiction in the EEZ.

1.7. Legal Basis

1.7.1. The legal basis for this national plan is section 14 of the Coast Guard Act, 1978 (an act of Parliament) which entrusts the Indian Coast Guard to coordinate the national pollution response efforts. In the year 2020, Cabinet Secretariat has entrusted Ministry of Defence as Central Nodal Ministry for coordination of response to crisis arising out of HNS spills at Sea in coordination with concerned ministries. On behalf of MoD, ICG is the Central Coordinating Authority (CCA) to coordinate response to marine HNS pollution incident in a manner specified in this Contingency Plan.

Chapter-2: National and International Regulation and Standards in Force

2.1. International Legislations

2.1.1. The IMO being a specialised agency of United Nations is the standard setting authority for the safety, security and environmental performance of international shipping. The two major conventions that concerns maritime safety and marine environment protection are Convention for Safety of Life at Sea (SOLAS 74) and International Convention for the Prevention of Pollution from Ships (MARPOL) respectively. These IMO conventions also regulate various aspects of HNS transport and management.

2.1.2. **SOLAS Convention.** The SOLAS 1974 specifies following:-

- (a) Minimum standards for the construction, equipment and operation of the ships with respect to their safety.
- (b) Chapter II-2 (Fire protection, fire detection and fire extinction include detail fire safety provisions for all ships and specific measures for passenger ships, cargo ships and tankers).
- (c) Chapter VI (Carriage of cargo and oil fuels) covers all types of cargo (except gases in bulk) which owing to their particular hazards to ships or persons onboard, may require special precautions.
- (d) Chapter VII (Carriage of Dangerous Goods) of the Convention addresses the carriage of dangerous goods in packaged form, solid form in bulk, dangerous liquid chemicals in bulk and liquified gases in bulk, construction and equipment of ships carrying dangerous liquid chemicals in bulk and liquified gases in bulk and gas carriers.
- (e) Chapter XII includes structural requirements of bulk carriers over 150 metres in length.

2.1.3. **MARPOL Convention.** MARPOL is the primary international convention encompassing prevention of pollution of the marine environment by ships from operational or accidental causes. MARPOL has six annexes. MARPOL Annexe II divides the noxious liquid substances into four pollution categories viz X, Y, Z and Other Substances(OS). The Annexe also set out regulations for prevention of pollution by harmful substances in packaged form and includes standards on packing, marking, labelling, documentation, stowage, quantity limitations, exceptions and notifications for preventing

pollution by harmful substances. Annexe III of MARPOL contains regulation for prevention of pollution by harmful substances carried by sea in packaged form. The regulations have been developed to identify marine pollutant, so that they could be packed and stowed onboard ship in such a way to minimise accidental pollution. The regulations prescribe detailed standards on packaging, marking, labelling, documentation, stowage, quantity limitations, exceptions and notifications.

2.1.4. **Other Conventions.** The following conventions also have bearing on HNS management and their spills:-

- (a) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Protocol to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes, 1989.
- (b) International Convention on Salvage, 1989, especially Art 14 of the convention.
- (c) International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances, 1996.
- (d) Protocol on Preparedness, Response and Cooperation to Pollution Incidents by Hazardous and Noxious Substances (OPRC-HNS Protocol), 2000.
- (e) Protocol of 2010 to the International Convention on Liability and Compensation for Damage in connection with the Carriage of HNS by Sea, 1996.

2.1.5. **IMO Protocols.** The following are the IMO protocols that deals with the HNS: -

- (a) **2000 OPRC-HNS Protocol.** The protocol on preparedness, response and cooperation to pollution incidents by HNS provides a global framework for international cooperation and national preparedness for combating major incidents or threats of marine pollution from ships carrying HNS. This protocol follows the principle of International Convention on Oil Pollution Preparedness Response and Cooperation (OPRC 1990).
- (b) **2010 HNS Protocol.** The 1996 HNS Convention was adopted in 1996 and is the International Convention on Liability and Compensation for Damage during carriage of HNS by sea. The

convention provides for compensation to those who have been affected by damages. **However, due to insufficient number of ratifications, HNS convention had not entered into force. Hence, protocol to the HNS Convention (2010 HNS Protocol) was developed and adopted. This protocol was prepared in order to provide practical solutions that prevented number of States to ratify the original Convention.**

2.1.6. **IMO Codes.** There are different IMO codes that addresses safe carriage and transshipment of HNS. The International Maritime Dangerous Goods Code (IMDG code), International Code for Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC), International Gas Carrier Code (IGC) and International Maritime Solid Bulk Cargoes Code (IMSBC) includes provisions related to HNS management.

(a) **The IGC Code** refers to the international standards for the safe carriage of liquified gases in bulk by sea. The code defines vessel design, construction and equipment requirements that aims to minimise the risk to ship, crew and environment⁴. The types of gas cargoes distinguished are Liquified Natural Gas (LNG), Liquified Petroleum Gas (LPG) and different chemical gases such as ammonia. All vessels subject to Code are assigned one of the four types 1G, 2G/2PG and 3G depending on the hazard potential of cargo carried⁵.

(b) **IBC Code** defines the requirements for safe carriage of dangerous chemicals and noxious liquid substances in bulk by sea. It provides requirements for design, construction and equipment to be carried to minimise the risk to vessel, crew and environment with respect to cargo carried. The IBC Code incorporates noxious liquid substances into four pollution categories and also contains list of chemicals.

(c) **IMSBC Code** addresses special requirements for the safe stowage and shipment of solid bulk cargoes providing hazards associated with their carriage. The Code categorises the solid bulk cargo in three groups in which Group A includes cargo that may liquefy, Group B that possess chemical hazards and Group C that neither liquefy nor possess chemical hazards⁶.

(d) **IMDG Code** encompasses safe transport of dangerous, harmful substances, materials and articles in packaged form by sea. This code

⁴IMO, 2016

⁵IGC Code

⁶IMSBC Code

provides framework of rules for safe carriage of dangerous goods by all modes of transport. Dangerous goods have an immediate physical or chemical effect whereas hazardous substances pose considerable risk to human health. The packaged goods are generally carried in containers which are used as dry storage, flat racks, temperature controlled and tank containers. IMDG Code consists of two volumes and a supplement which are published annually.

2.2. National Legislations

2.2.1. India has not yet ratified OPRC-HNS protocol and preparations are underway for ratification. **The draft Merchant Shipping Bill 2022 includes provisions related to HNS carriage.**

2.2.2. However, various national legislations exist in India which are enacted for ensuring the protection of marine environment. The legislations having bearing on the preparedness and response to HNS spill are:-

- (a) Territorial Sea, Contiguous Zone, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones of India Act, 1976 (MZI Act 1976).
- (b) Section 14 of Coast Guard Act 1978.
- (c) Environment Protection Act (EPA), 1986 (amended 1991) and Rules there under.
- (d) Environment Protection Rules, 1986 (amended 2004).
- (e) The Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 (amended 1994 & 2004).
- (f) Hazardous Materials (Management, Handling and Transboundary Movement) Rules, 2008.
- (g) The Environment Prior Clearance Notification, 2006.
- (h) The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996.
- (j) Bio-medical Wastes (Management and Handling) Rules, 1989.
- (k) The Factories Act, 1948 (amended 1987) and State Factory Rules.

- (l) The Dock Workers (Safety, Health and Welfare) Act, 1986 (Covers handling of dangerous goods i.e. IMDG Class cargoes and are applicable to all Major Ports.
- (m) The Inflammable Substances Act, 1952.
- (n) The Public Liability Insurance Rules, 1991 (amended 1992 & 1993).
- (p) The Petroleum Act, 1934 and The Petroleum Rules, 2002.
- (q) The Insecticide Rules, 1968 (amended 2000).
- (r) The National Environment Tribunal Act, 1995.
- (s) The National Green Tribunal Act, 2000.
- (t) The Explosives Act, 1884 (amended 1983).
- (u) The Admiralty (Jurisdiction and Settlement of Maritime Claims) Act 2017.
- (v) The Gas Cylinder Rules, 2004.
- (w) The Static and Mobile Pressure Vessels (Unfired) Rules, 1981(amended 2002).
- (x) The Explosives Rules, 1983 (amended 2002).
- (y) The National Disaster Management Guidelines for Chemical Disasters, 2007.
- (z) Merchant Shipping (Prevention of Pollution by Harmful Substances carried by sea in packaged form) Rules, 2010.
- (aa) Admiralty (Jurisdiction and Settlement of Maritime Claims) Act, 2017.

Chapter-3: HNS Transportation in the Indian Context

3.1. Chemicals in India

3.1.1. India is the 6th largest chemical producing countries in the world and 3rd largest producer in Asia. The chemical industry is playing vital role in the expansion of EXIM trade. HNS trade is peculiar since each product has different behaviour and characteristics and therefore its response in terms of equipment, gear and effects to human health and marine environment are difficult to assess and predict. Since the Indian Chemical industry is growing at a phenomenal pace, the rapid industrialisation along the coastline of India and export/ import of chemicals has enhanced the hazards, risks and vulnerability to the ports, hinterland and also the marine environment. The quantity of HNS handled in Indian ports ranges approximately upto 266,508 metric ton in a quarter from Apr – Jul 2023⁷. Different types of HNS handled by these ports are approximately 120. There are a total of almost 07 major and 25 non-major ports that handle HNS in India.

3.1.2. India ranks 14th in the global exports of chemicals⁸. The major manufacturing chemical States in India are concentrated in Gujarat, Maharashtra, Karnataka, Tamil Nadu and West Bengal. India exports chemicals and chemical products to more than 175 countries with major key export destinations like China, USA, Brazil, Netherlands, Saudi Arabia, Indonesia, UAE, Japan, Germany, Turkiye, Russia and North East Asian countries like Hong Kong, Korea, Taiwan, Macao and Mangolia. It is envisaged that under Petroleum, Chemicals and Petrochemicals Investment Regions (PCPIR) policy 2020-35, investment of US\$ 142 billion is targeted by 2025, US\$ 213 billion by 2030 and US\$ 284 billion by 2035. It can be easily therefore derived from above figures that HNS export will further enhance and result to multi-fold increase in the marine traffic.

3.1.3. It is therefore imperative for India to focus on maritime environment safety and health and to undertake threat assessment in the MZI along with the concerned stakeholders in their respective Area of Responsibility (AoR). Since the chemical incidents are predominantly localised, it is therefore imperative to increase the local capacity to reduce disaster risks and respond to such events that disasters are prevented in the first place.

⁷MoPSW

⁸Department of Chemicals & Petrochemicals, MoC&F

3.2. HNS/Chemical Industries Near the Coastline of India

3.2.1. The list of HNS/Chemical industries located near the coast of India is placed at **Appendix A** of this Plan.

3.3. HNS/Chemicals Handled by Indian Ports

3.3.1. The HNS/Chemicals handled at various Indian ports are placed at **Appendix B** of this Plan.

Chapter-4: Competent National Authority for Preparedness and Response to HNS Spill Incidents

4.1. Designation of a Competent National Authority (CNA)

4.1.1. The designation of Competent National Authority (CNA) or Lead Agency is one of the most significant steps in establishing a National Response System⁹. The designated CNA has the authority and ability to coordinate the efforts and input from various supporting agencies that do possess the supplemental skill sets. It is therefore also essential that the designated Authority has jurisdiction and ultimate decision-making authority for HNS preparedness and response and that the supporting agencies do not have overlapping or duplicative authorities that can lead to contradictory directives or requirements to industry.

4.2. Role of Competent National Authority (CNA)

4.2.1. As per 2000 OPRC-HNS, each Party shall establish a national system for responding promptly and effectively to pollution incidents. This system shall include as a minimum:

- (a) The designation of:-
 - (i) The CNA or authorities with responsibility for preparedness for and response to pollution incidents;
 - (ii) The national operational contact point or points; and
 - (iii) An authority which is entitled to act on behalf of the State to request assistance or to decide to render the assistance requested;
- (b) A national contingency plan for preparedness and response which includes the organizational relationship of the various bodies involved, whether public or private, taking into account guidelines developed by the Organization.

4.2.2. Therefore, the CNA is entitled to act on behalf of the GoI to coordinate efforts of all supporting agencies whether public or private towards HNS spill response and preparedness. As part of the preparedness efforts, the CNA will

⁹Page 5, Chapter 1, IMO Manual on Oil Pollution – Contingency Planning 2018 Edition

engage with International partners through bilateral, multilateral or regional agreements for technical support, equipment, seminars, workshops, exercises etc.

4.2.3. The CNA has overall responsibility for response to HNS emergencies and should be given authority to make and implement decisions to mitigate the impacts of HNS. The plan should define the national policy and responsibilities for HNS spill preparedness, planning and response and cite legislation that authorises the CNA to prepare and implement the plan. The geographic area within which the CNA is authorised to implement the plan should be clearly indicated, with reference made to supporting legislation and agreements¹⁰.

4.3. Role of the Indian Coast Guard

4.3.1. It is pertinent to mention that ICG has been designated as Competent National Authority (CNA) by GoI for oil and chemical/HNS spill response under the South-Asian Cooperative Environment Programme (SACEP) in 2018. In the year 2020, by Cabinet Secretariat has given responsibility to Ministry of Defence (Coast Guard Organisation) as Central Nodal Ministry for responding to crisis/contingency arising out of HNS spill at Sea in coordination with concerned ministries. Therefore, ICG will coordinate all the response to marine HNS pollution incident in a manner specified in this Contingency Plan.

¹⁰Page 15-16, Chapter 2, IMO Manual on Oil Pollution – Contingency Planning 2018 Edition

Chapter-5: Mechanism or Arrangement to Coordinate Response to HNS Pollution Incident

5.1. General Considerations

5.1.1. The marine pollution caused by HNS differs from oil pollution in having a range of potential fate and behaviour once released into the marine environment. Risk for the responder, public safety and impacts associated with HNS can be potentially more severe than with oil. The selection of the appropriate response, options(s) to an HNS incident requires detailed knowledge of the involved substance's physical and chemical properties. Compared to oil, different specialised knowledge and operational expertise are required for an effective response to HNS marine pollution.

5.2. Response Options

5.2.1. Two general response options can be adopted by the affected during an HNS incident, which can briefly be summed as follows:-

(a) The operational response with onboard actions is designed to prevent, stop or contain an HNS release incident. It will require the affected States to decide which specialized and experienced personnel and equipment it will deploy, usually from the competent national authorities in charge for marine pollution (operational responders).

(b) The response within the risk area requires detailed procedures to be in place to safeguard responders and the public, when an HNS incident poses a risk but cannot be prevented, stopped or contained. Such actions touch upon civil safety issues and it is upto the State to decide how to proceed with implementing the appropriate actions.

5.3. Reporting of Pollution Incident

5.3.1. The HNS contingency plan seeks to put in place a coordinated mechanism or arrangement towards response to a pollution incident. Delineation of responsibilities will be there for reporting HNS marine pollution incidents and its coordination thereof. **Any marine environment threat with respect to HNS incident shall be followed with a reporting procedure.** Under MARPOL as amended, it is the master's (or ship owner's) duty to report incidents involving a discharge or probable discharge of HNS to the nearest coastal state. Incident reports can also be made by responding or

passing vessels. The standard reporting format is described in IMO Resolution A.851(20) (1997), as amended by Resolution MEPC.138(53) (2005), which differentiates between:-

- (a) Harmful Substances report (HS) for spills of oil and noxious liquid substances in bulk.
- (b) Packaged dangerous goods report (DG)
- (c) Marine Pollutants report (MP).

5.3.2. Such reports should include information about the vessel (name, location, etc.) but also the type of oil or correct technical name of HNS on board/ discharged/ lost, UN number/IMO hazard classes, pollution category, type of packages, names of manufacturers where known, quantity on board/lost, whether substances are floating or have sunk, cause of loss, estimation of the surface area of the spill, name and number of the ship's owner and representative, measures taken so far. The format of report is placed at **Appendix C**.

5.3.3. **Appraisal of Incident.** Maritime Rescue Coordination Centres (MRCC) of India and DG Commcentre of Directorate General of Shipping India act as nodal centres for receiving information regarding pollution incident. Pollution reports received by MRCCs are assessed and analysed for more information to verify details of the reported incident. Depending upon the area of jurisdiction and responsibility, the statutory and the combat agencies will initiate actions as per this plan. ICG will undertake internal assessment of the incident for finalisation of the actions to be initiated and mobilisation of the resources. Scale of the incident is decided on the basis of appraisal of the incident and tiered level of response will be decided after discussions with the concerned stakeholders including local authorities.

5.3.4. The format for information flow on HNS spill is as given below: -

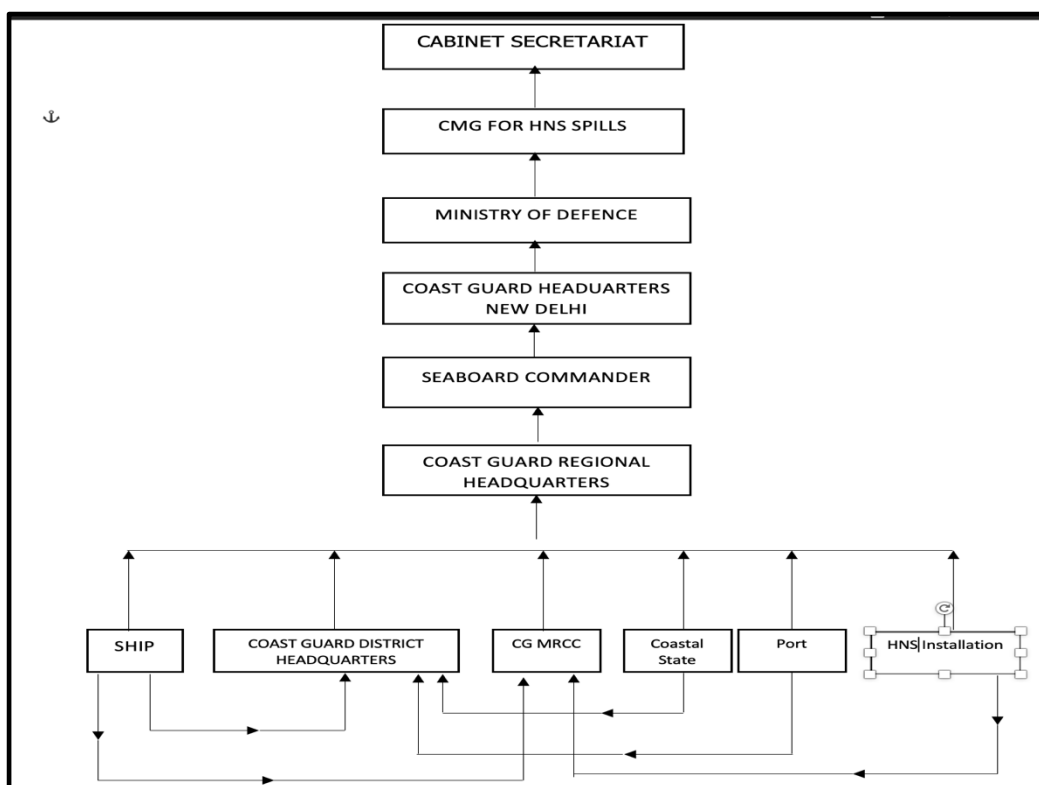


Figure 3: Flow of Information on HNS Spill

5.4. Statutory and Combat Responsibilities

5.4.1. Responsibilities for responding to HNS spills in Indian waters are shared between the Indian Coast Guard, coastal State/UT Governments, Port Authorities and Corporations, and the HNS facilities. Liability for clean-up of HNS spills remains with the polluter. **The polluter will be liable to pay the cleanup cost, if the cleanup is undertaken by any agencies of the Government of India if the polluter fails to undertake cleanup of the spill.** Such cleanup cost incurred by the agencies will be calculated based on the policies of Government of India on the reimbursement of such costs, as well as the national law of India on the subject matter. The cleanup cost will be over and above the compensation liable to be paid by the polluter with respect to the damage suffered by the victims of the pollution or the marine environment whether a consequential damage of pure economic damage.

5.5. Statutory Agencies

5.5.1. The Statutory Agency is responsible for the institution of prosecutions and the recovery of cleanup costs on behalf of all participating agencies. The Statutory Agencies for HNS spills are appended at table 1 given below:-

Source/	Statutory Agency
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Location	
From ships	The relevant Designated Authority under the Merchant Shipping Act, 1958
From shore terminals	The relevant Designated Authority under the Petroleum and Natural Gas Regulatory Board Act, 2006
In major ports	The relevant Port Authority under the Major Ports Authority Act
In non-major ports	The relevant Designated Authority in the Coastal State, or Union Territory

Table 1: Statutory Authorities HNS Spill

5.6. Combat Agencies for HNS Spills

5.6.1. Combat Agencies are the response organisations which are to be set up by the Chemical Industries that are responsible for the maritime transportation of the chemical and HNS materials that are manufactured, processed, stored, exported or imported by them through ships. The combat agencies are to maintain adequate response resources at strategic places to respond to a chemical or other hazardous or noxious substance spill in the marine environment in cooperation with the statutory authorities in accordance with the relevant contingency plan. Table 2 below outlines the Combat Agencies for responding to chemical spills in various locations.

Source/ Location	Combat Agency
At chemical terminals on land near a maritime area	The relevant chemical company or terminal operator under industry arrangements, under the provisions of NDMA guidelines or under the provisions of the Chemical Accidents Rules 1996 established by the Ministry of Environment and Forests. If the response is beyond the capacity of the chemical company or terminal resources, the Statutory Agency like Port Authority or NDMA will respond with assistance from the combat agencies maintained exclusively to address the maritime chemical spills.
In ports and port limits	The chemical industry/ exporter/ importer/ polluter through a tie-up with combat agencies and the relevant port as specified in the relevant contingency plan, with response assistance from other National Plan stakeholders as required.

Source/ Location	Combat Agency
within shorelines and inter-tidal zones	The relevant chemical company or terminal operator under industry arrangements/ polluter, under the provisions of NDMA guidelines or under the provisions of the Chemical Accidents Rules 1996 established by the Ministry of Environment, Forests & Climate Change. The polluter and the responsible State/UT Statutory Agency with response assistance from other National Plan stakeholders as required.
in the maritime zones of India	The Indian Coast Guard with response assistance from the combat agencies and other National Plan stakeholders as required. In incidents close to shore when chemicals are likely to impact the foreshore, the State/UT via the Statutory Agency will organize the Combat Agency for protecting the coastline, while DG Shipping assumes responsibility for ship operational matters and international coordination, e.g. organizing salvage, claims, etc.

Table 2: Combat Agencies for HNS Spill

Chapter-6: Division of Responsibilities

6.1. Allocation of Responsibilities

6.1.1. **Ministry of Defence.** The Ministry of Defence with administrative responsibility for the Coast Guard organisation is the Ministry responsible for central coordination of HNS spills of national significance in coastal and marine environment of various maritime zones.

6.1.2. **Indian Coast Guard.** The ICG is responsible for maintaining and implementing the **National HNS Spill Contingency Plan**. ICG is also responsible for acting as the Central Coordinating Agency for combating of HNS pollution in various maritime zones, except in the waters of ports and within five hundred meters of coastal/offshore HNS facilities and associated facilities such as pipelines.

6.1.3. **Ministries and Departments of the Government of India.** The functional responsibilities of ministries and departments are placed at **Appendix D**.

6.1.4. **State Governments.** The State Governments of coastal states are responsible for coordinating the district and local administration and operation of the National Plan for shoreline response and as per the provisions of the National Disaster Management Plan, 2019. The State and District Authorities will provide a wide range of site-specific information and resources, either in relation to environmental impacts, or response activities through authorities, such as Transport, Conservation and Resource Management Departments, Environmental Protection Authorities, emergency services, port/ harbour authorities, and local conservation groups. Some of the specific responsibilities of the states are as mentioned in the table below:-

Ser	Responsibility
(a)	Identification of shelters with basic facilities like drinking water and first aid for chemical exposure
(b)	Ensuring water storage facilities and sources for water for accident containment and firefighting operations
(c)	Providing wide roads and multiple routes in the industrial area to allow quick access by first responders and to ensure escape pathways
(d)	Establish decontamination facilities
(e)	Medical aid
(f)	Shore line clean up

Table 3: Responsibilities of States

6.1.5. **Support Agencies.** The responsibilities allocated to various support agencies for implementation of the National HNS Spill Contingency Plan are described below:-

(a) The Navy/ coastal state authorities/ port authorities will make their communication/ operation centres facilities available to receive and disseminate reports of marine pollution accidents.

(b) The Indian Navy and the Indian Air Force will provide fixed wing aircraft or helicopters to conduct aerial surveillance or provide logistic support in movement of men and materials to the incident site. They will also provide ground to air communication link at the site for use by the On scene Commander.

(c) The Port Authority shall provide tugs, manpower, sea going vessels and other relevant appurtenant including pollution control equipment at the incident site.

(d) The MoPS&W shall issue necessary directives for provision of vessels for transfer of HNS.

(e) Ministry of Petroleum and Natural Gas (MoPNG) shall provide necessary assistance and expertise in controlling LNG and other gas leakages.

(f) The Director General of Shipping (DGS) under MoPS&W shall be responsible for all negotiations with the vessel, cargo owners, flag state, IOPC and insurers. DGS shall also conduct all negotiations regarding compensations and indemnification.

(g) The Ministry of Environment, Forest, and Climate Change (MoEF&CC) and Ministry of Fisheries, Animal Husbandry & Dairying (MoFAH&D) will provide scientific advice regarding species at risk, shore-line sensitivity, restriction of fishing activities, use of dispersant, chemicals, neutralising agents and beach cleaning methods, etc.

(h) Coastal state authorities/ district administration/ departments/ public works/ Civil Defence Corps/NDRF/SDRF will provide personnel and equipment, as required, for shoreline clean-up and ensure safety and protection of the local population and resources.

6.2. Specialist Advice and Assistance

6.2.1. Specialist technical advice is to be made available to response managers from a variety of sources. Advice can vary from the fate of HNS, selection and deployment of pollution control equipment to the associated environmental effects of an HNS spill. Specialist advice can also be provided in relation to the safety and stability of ships. The range of specialist environmental and operational technical advice in the event of an HNS spill in the marine environment that can be provided by varied departments and organisations of the Government of India and other agencies is enumerated in the succeeding paragraphs.

6.2.2. Directorate General of Shipping.

- (a) Invoking relevant provision of extant regulations and acts in case the polluting ship fails to take action as required by the act to prevent or minimize pollution.
- (b) Advising concerned affected ports or other entities to deal with evidences for the purpose of raising claims on accounts of damage caused by the pollution and initiating legal action against the polluter.
- (c) Reporting such incidents to the Flag State of the ship or the neighbouring Coastal State which is affected due to pollution.
- (d) Supervising salvage operations while dealing with HNS pollution casualty if requested by the affected ports or other entity.
- (e) Investigating pollution contravention under the provisions of MS Act, 1958.
- (f) Initiate all actions towards prevention and control of pollution as per the Allocation of Business Rules allocated to MoPS&W and keep the Ministry and other stakeholders informed on the progress of actions taken. Prevention and control of pollution includes:-
 - (i) Prevention and control of pollution arising from ships, shipwrecks and abandoned ships in the sea, including the port areas;
 - (ii) Enactment and administration of legislation related to prevention, control and combating of pollution arising from ships; and

(iii) Monitoring and combating of oil & HNS pollution in the port areas.

(g) To take administrative and legal action for processing claims against damages incurred by Indian Coast Guard and other agencies relating to pollution incidents and act as a Single Point of Communication (SPOC) for claims.

(h) Advise concerned agencies to collect evidences for the purpose of claims.

(i) To further advise the receiver of wreck in terms of provisions of MS (Wrecks & Salvage) Rules, 1974 with respect to pollution aspect and response.

(j) To advise Indian ship-owners to mobilize ships for the purpose of transshipment if required.

6.2.3. **Indian Register of Shipping and Other Classification Society**¹¹.

(a) To provide advice relating to ship safety, structural integrity and stability of marine casualties.

(b) To depute representatives to attend to a casualty and salvage at the Salvage Monitoring and Control Unit (SMCU) when established.

6.2.4. **Maritime Rescue Co-Ordination Centre**.

(a) In addition to coordinating the rescue and saving of life.

(b) Enabling messages to be communicated directly to vessels, during an incident, with its range of communication facilities and networks.

6.2.5. **DG Shipping Communication Centre**. To provide advice relating to ship safety, structural integrity and stability of maritime casualties and other details of the ship through coordination established with the Flag State of the stricken vessel, Salvage agencies, Classification Societies, Insurer, Owner, Charterer and other interested parties.

¹¹IRS is a classification society and a Recognised Organisation which provides independent third party technical inspection and certification services for ships, marine craft and structures and offshore and industrial projects.

6.2.6. **Ministry of Home Affairs/ DM Division**. To implement the provisions of National Disaster Management Guidelines for Chemical Disasters through NDMA and SDMA.

6.2.7. **Ministry of Chemicals and Fertilisers**. To provide expert advice, resources, specialist equipment along with personnel for sampling, analysis during response to HNS spill area, especially organic and inorganic chemicals.

6.2.8. **Ministry of Environment, Forest and Climate Change**.

(a) To develop and implement national policy, programs and legislation to protect and conserve India's marine environment including regulation of dumping of wastes at sea, declaration and management of marine protected areas in Indian waters and conservation of listed threatened, migratory and marine species.

(b) To advise on matters relating to the Marine Environment Protection from Dumping at Sea including the permitting and reporting of emergency dumping of material at sea.

(c) To advise on potential impacts of oil and HNS spills on threatened marine and migratory species, such as seabirds, marine turtles, whales and dolphins.

(d) To advise on likely to impact of oil and HNS spill on marine protected areas in Indian waters.

(e) To provide advice on habitats in Marine Protected Areas (MPA), seabirds, marine mammals, marine invertebrates and macro algae, along with advice on rates of biodegradation, dispersal and the use of dispersants.

(f) To determine policy for usage of neutralising agents in the sea areas.

6.2.9. **Archaeological Survey of India**.

(a) Conduct underwater archaeological studies in maritime zones of India.

(b) Assist/ advise in protection and maintenance of cultural heritage of the nation near to shore.

(c) Documentation of underwater sites and ancient shipwrecks.

6.2.10. **Indian National Centre for Ocean Information Services (INCOIS).**

- (a) To provide ocean state forecast and early warnings
- (b) To provide software-based prediction of the trajectory of spilled HNS.

6.2.11. **Indian Navy.**

- (a) Augment aerial surveillance capability of ICG as necessary in the area when HNS spill has occurred.
- (b) To make arrangements for oil and HNS transshipment operations from any tanker which has caused or is causing or is expected to cause HNS spillage.
- (c) Promulgate general cautionary messages through NAVAREA.
- (d) Provide support for HNS response involving underwater search, survey, salvage, recovery, technical expertise and specialist equipment/vehicles.

6.2.12. **Indian Air Force.**

- (a) Augment aerial surveillance efforts as necessary in the area when oil or HNS spill has occurred.
- (b) To make available its aircraft for aerial monitoring of spills and aerial spraying of neutralising agents and mobilisation of response resources.

6.2.13. **Ministry of Earth Sciences/ Department of Ocean Development/ National Institute of Oceanography.**

- (a) Mapping of ecologically sensitive areas in the coastal and offshore region in consultation with Ministry of Environment and Forests.
- (b) Review of the sensitivity mapping listed by other agencies.
- (c) To provide scientific support through Coastal Ocean Monitoring and Prediction System (COMAPS) Centre and Units in investigations of

oil/ HNS pollution monitoring during spills and also deployment of its research vessels for this purpose, whenever necessary.

(d) To organise research on impact of pollution on marine life based on actual HNS pollution incidents.

6.2.14. **Ministry of Fisheries, AH & D (Department of Fisheries)**

(a) To arrange for suitable fishing vessels or Fishery Survey of India (FSI) vessels on which equipment containing neutralising agents can be mounted if the local action group concerned is unable to mobilise this requirement locally.

(b) Sensitivity mapping of the sea areas, particularly within the territorial waters with specific information on fish breeding grounds.

(c) To issue notifications and implement exclusion zones for fisheries.

(d) To undertake studies on impact on long term basis (Post spill monitoring) on fisheries yield.

6.2.15. **Ministry of Petroleum and Natural Gas and HNS Agencies.**

(a) To assist, when required with chartering of tanker(s) for HNS transshipment operations.

(b) To make available pollution response equipment and chemicals as are available with them.

(c) To assist in the storage ashore of HNS transhipped from wrecked or damaged tanker.

(d) To assist in the assessment of the value of the HNS transhipped.

(e) To provide equipment and personnel resources and advice on a range of issues, including HNS characteristics and local industry resource availability.

(f) To depute an Industry Adviser during response to a major HNS spill.

6.2.16. **Shipping Corporation of India.**

(a) To arrange for tankers or ships or tank barges for transport and collection of recovered HNS.

(b) To arrange for any personnel required to assist HNS transshipment operation or to assist otherwise as may be required.

6.2.17. **Major Ports/Non-Major Ports/ HNS Facilities.**

(a) To ensure preparedness and capabilities towards HNS spill response and combat HNS spills within Port limits.

(b) To be in charge of the overall co-ordination of HNS pollution response actions in jurisdiction of ports.

(c) To identify suitable tugs, vessels and crafts when required for the operations.

(d) To identify surface crafts, on which HNS neutralising equipment can be mounted.

(e) To ensure that for the purpose of the Merchant Shipping Act, 1958, actions are taken by the various authorities under the overall legal responsibility of the receiver of wrecks in port waters.

(f) To ensure that at least the minimum equipment are kept available locally at all times.

(g) To arrange for training of personnel expected to be engaged in above operations.

(h) To arrange for periodical mock drills and exercises so as to keep equipment and personnel on continuous readiness for oil/ HNS spill response operations.

(i) To consult the ICG, DG Shipping, Oil Industry Safety Directorate (OISD) or other authority, when further advice/ assistance is required.

(j) To provide place of refuge and suitable berthing to vessels when requested as per risk assessment.

(k) To provide for reception facilities at ports for recovered HNS.

(l) To keep the ICG apprised of actions being taken.

6.2.18. Coastal State/UT and State Pollution Control Boards.

- (a) To take all suitable measures to protect shoreline from possible impacts of HNS spill.
- (b) To render all possible assistance to the prevention and response efforts in accordance with the contingency plan.
- (c) To maintain adequate quantity of basic pollution response equipment. (As per **Appendix Q** Quantity as per the assessment of the State)
- (d) To identify suitable type of tug/boat/fishing vessel in consultation with On-Scene Commander/ Indian Coast Guard for mounting the neutralising agent spraying equipment.
- (e) To identify places for waste HNS disposal/ pits.
- (f) To take actions as applicable to the major ports, in respect of incidents at ports under jurisdiction.

6.2.19. Mercantile Marine Department.

- (a) To assist the coordinator of local contingency plan if requested.
- (b) To provide a technical advice to local group if requested.
- (c) To carry out survey of subject vessel for safety and stability aspect, verifying the dangerous cargoes as per cargo manifest which may be a potential threat in aggravating the chemical pollution and participate in response planning.
- (d) To identify surface craft to assist Coast Guard for pollution response if requested.
- (e) To assist Coast Guard if requested or instructed by DG Shipping to examine ships for efficiency of pollution response equipment as per the provision of Merchant Shipping Act, 1958.

6.2.20. Local Fisheries Authority.

- (a) To assist/advise Local Groups in identifying the rich fishing grounds so as to give priority for protection of such grounds from HNS spills as well as use of neutralising agents.

(b) The local action groups in consultation with ICG to identify the fishing vessels suitable for mounting the equipment for neutralising agents.

(c) Coordinate with fisheries association and state administration for implementation of any temporary ban or exclusion zones and take punitive measures for violators.

6.2.21. **Coastal HNS Facilities.** In case of an incident from the Coastal HNS facilities where a spill reaches the sea:-

(a) To assist the Local Action Group (LAG) in the implementation of the Local Action Plan.

(b) To assist the local action group in obtaining from their headquarters available additional equipment and chemicals if and when required.

6.2.22. **Receiver of Wrecks.**

(a) To assist Local Action Groups in whatever manner necessary and possible.

(b) To take all actions necessary under Part XIII of the Merchant Shipping Act, 1958 (In this connection, the receiver of wreck shall consult the DGS, as and when required).

(c) In situations where he has the local responsibility for certain actions and/ or operations, he may authorise other agencies, who are better equipped.

6.2.23. **Central Marine Fisheries Research Institute (CMFRI).**

(a) Assist in estimating the effect of spill to fish and livelihood of fishermen in the area.

(b) Assist in identifying the types of fishes in the area.

(c) Assist in restoration of fishing in area after clean-up.

(d) Assist in estimating the Economic loss due to ban of fishing in the affected area.

(e) To understand the fluctuations in abundance of marine fisheries resources in relation to change in the environment.

(f) To develop suitable mariculture technologies for finfish, shellfish and other culturable organisms in open seas to supplement capture fishery production.

(g) To act as repository of information on marine fishery resources with a systematic database.

(h) To provide consultancy services.

6.2.24. **National Centre for Coastal Research(NCCR), MoES**

(a) Responsible for preservation and conservation of marine environment in India.

(b) Identify the highrisk areas.

(c) Promulgate the sensitivity mapping and area of priority.

6.2.25. **National Biodiversity Authority, MoEFCC.**

(a) To regulate and advise the Government of India on issues of conservation, sustainable use of biological resources and fair and equitable sharing of benefits arising out of the use of biological resources.

(b) To advise the Central Government agencies on matters relating to the conservation of biodiversity, sustainable use of its components and equitable sharing of benefits arising out of the utilization of biological resources; and advise the State Governments in the selection of areas of biodiversity importance to be notified as heritage sites and measures for the management of such heritage sites.

(c) The State Biodiversity Boards (SBBs) are to advise the State Governments, on matters relating to the conservation of biodiversity, sustainable use of its components and equitable sharing of the benefits arising out of the utilization of biological resources.

(d) The local level Biodiversity Management Committees (BMCs) are to promote conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivars, domesticated stocks and breeds

of animals and microorganisms and chronicling of knowledge relating to biological diversity.

6.3. International Assistance

6.3.1. In the event of a major HNS spill incident, it is likely that additional overseas assistance may be sought from overseas in accordance with the International Convention on Oil Pollution Preparedness, Response and Cooperation HNS Protocol(2000 OPRC-HNS). In such cases, customs and immigration authorities of ports and air ports need to provide immediate facilitation for temporary import of equipment and personnel in order to transfer them in the scene of action expeditiously. If resources in addition to the national resources are required to respond to an incident in India, assistance from other international agencies may have to be called in. The Indian Coast Guard, in accordance with current MoU and relevant International Conventions, may also assist neighbouring countries in relation to oil/HNS spill incidents in their waters.

6.3.2. The OPRC Convention and its HNS Protocol place an obligation on parties, subject to their capabilities and availability of relevant resources, to provide technical support and equipment for the purposes of responding to an incident, when the severity of such an incident so justifies, upon the request of any party affected or likely to be affected. The CCA/CNA has responsibility and responsibility for making or receiving such requests in conjunction with other government agencies with an interest or responsibility. This will generally be undertaken through diplomatic channels and in accordance with any IMO guidance on international offers of assistance and any applicable bilateral or multi-lateral agreements.

6.3.3. **Other international and Regional Agreements.** The National Plan provides a mechanism for CCA on behalf of GoI to enter into mutual aid arrangements with other countries impacted by maritime environmental emergencies, giving effect to India's obligations under OPRC and the OPRC-HNS Protocol.

6.4. Cross Border Incidents

6.4.1. In case of incidents close to International Maritime Boundary Line, or incidents which are likely to result in transboundary pollution, high-level consultation and cooperation will be maintained with the Competent National Authority or Authorities of concerned State(s), with due regard to the provisions of any State Contingency Plan or Memorandum of Understanding or other arrangement, with an objective to ensure a clear delineation of responsibility for the response. In case of incidents close to State or Union

Territory borders, high-level consultation and cooperation will be maintained between the two Statutory Agencies, with an objective to ensure a clear delineation of responsibility for the response.

6.5. National Plan Key Contacts

6.5.1. The Contact Directory listing contact details for key National Plan personnel is at **Appendix E**.

Chapter-7: Emergency Organisation for HNS Spill Disasters

7.1. Need and Importance of Emergency Response Organisation

7.1.1. It is important that HNS spill contingency plans for the facilities, ports, refineries or the coastal State/ UTs along the coastline bring out clearly the organisation as well as teams that will be utilised to implement the tactical activities and manage the response. A well-defined emergency response organisation will ensure and enhance the concerned organisation capacity and capability to manage any such incident effectively and proactively. Facility owners or operators may have multi-level response organisation that consists of one or more teams for each level. The first level would be activated for all levels and subsequently other levels are activated as the situation escalates. All contingency plans should contain the information about how and when plan is to be activated. The designated person or entity should be clearly mentioned as to who will be overseeing the plan activation. The contingency plan of each facility shall contain an emergency response organisation that will be constituted automatically and assemble at designated place in the facility, port or coastal State as laid out in the plan. All the contingency plans must designate a position like Duty Officer/ qualified individual within their organisation delineating authority and responsibility to implement the plan and manage the response.

7.1.2. Figure below depicts the emergency organisation for HNS spill disasters at sea and the interactive linkages among various agencies for synergized management HNS spill disasters.

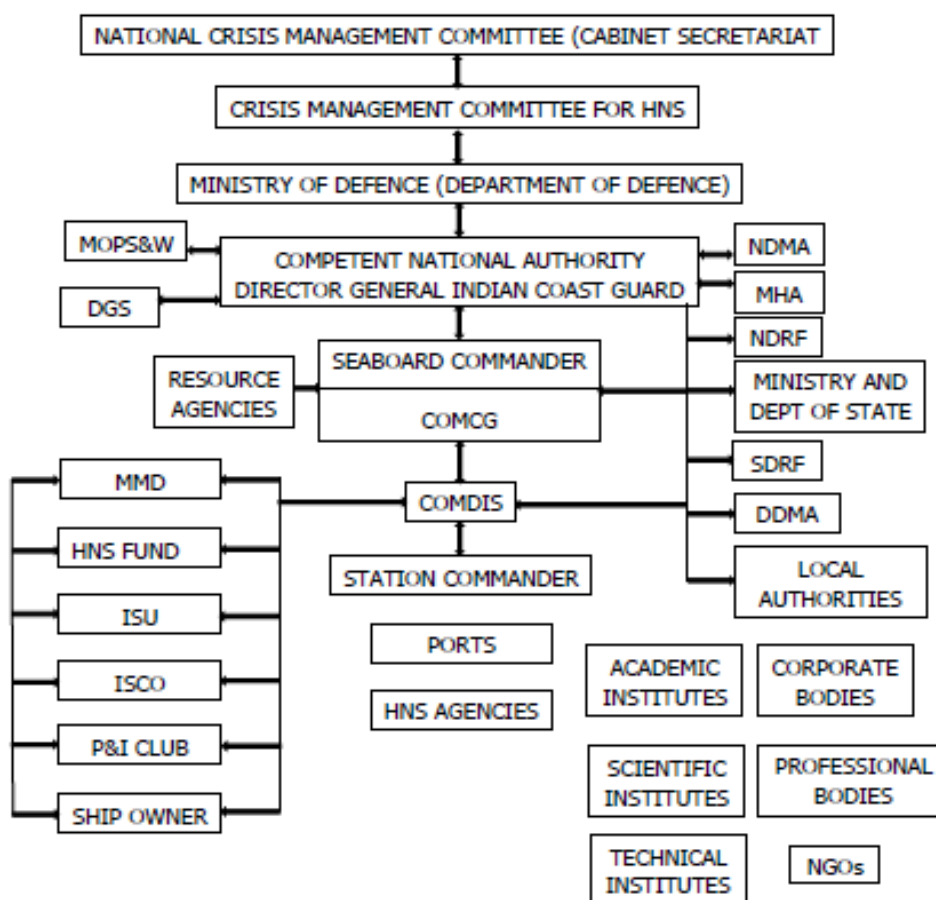


Figure 4: National Level Emergency Organisation

7.2. National Framework for Chemical (Industrial) Disasters Onshore

7.2.1. The institutional framework over land for the enforcement and monitoring of chemical safety and emergency management involve various central/state ministries/departments viz. MHA, MoEF, MoLE, MoA, MoP&NG, MoC&F, MoSRT & H, Ministry of Commerce and Industry (MoC & I), Department of Economic Affairs (DEA), Ministry of Finance (MoF), and others are depicted in the figure given below¹².

¹² National Disaster Management Guidelines, Chemical Disasters, 2007, Ch 2, pg 5

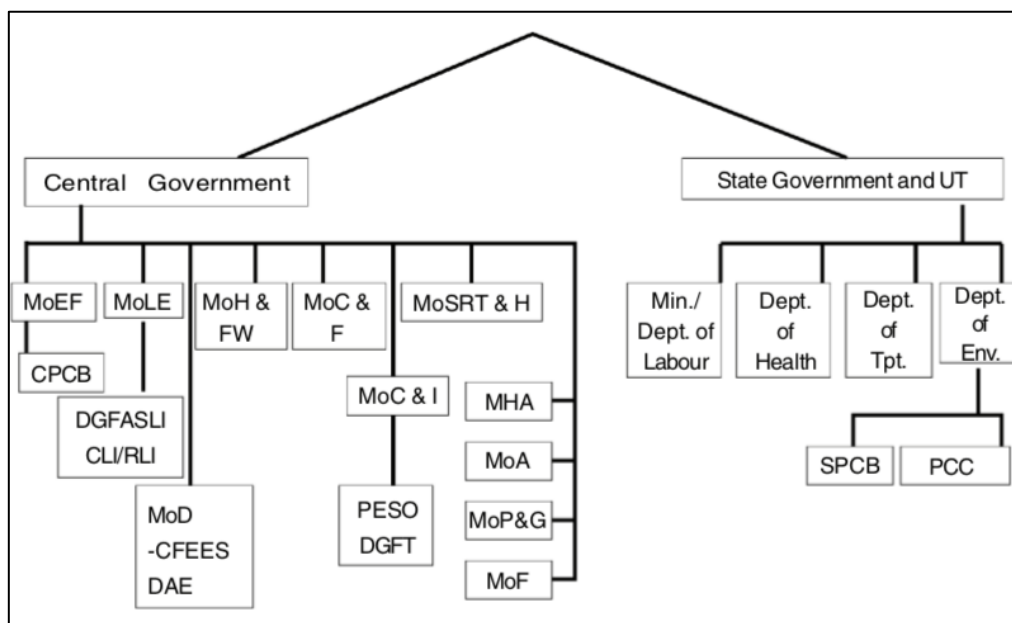


Figure 5: National Level Ashore Institutional Framework

7.2.2. The above organisation will come into force when an HNS disaster occurs in both situations either the spill happens in land and spreading to sea or happens at sea in close proximity of the coastline. The NDM guidelines 2007 also covers framework for Chemical (Industrial) Disasters and the Chemical Accidents (Emergency Planning, Preparedness and Response Rules, 1996). Further National Disaster Plan 2019 covers Chemical (Industrial Disaster). Therefore, this section is to be read in conjunction with these documents.

7.3. Emergency Management Structure

7.3.1. At the apex operational level, the National Executive Committee (NEC) headed by the Union Home Secretary coordinates and guides the work of different departments of the Government of India in times of crisis. The National Crisis Management Committee (NCMC) headed by the Cabinet Secretary constitutes institutional framework at the apex level and deals with major crises which have serious or national ramifications. NCMC is supported by the Crisis Management Groups (CMGs) of the various Central nodal ministries and assisted by NEC as may be necessary.

7.4. National Level Crisis Management Group for HNS Spills

7.4.1. The Defence Secretary¹³ is the Chairman of the national level CMG for marine HNS spill emergencies, or NHNS-CMG. The composition of the NHNS-CMG is at **Appendix F**.

7.5. Functions of the NHNS-CMG

7.5.1. The NHNS-CMG is the apex body to deal with major HNS pollution incidents and to provide expert guidance for handling major HNS spills. The NHNS-CMG would perform the following functions:-

- (a) Continuously monitor the post incident situation arising out of a major HNS pollution incident and suggest measures for prevention and to check recurrence of such incidents;
- (b) Arrange, in the event of an HNS pollution incident, all manpower, equipment, resources, and financial assistance as may be necessary;
- (c) Conduct post-accident analysis of such major HNS pollution incidents and evaluate responses; and
- (d) Review the adequacy of national and other contingency plans, and suggest measures to reduce risks of HNS pollution from sea ports and installations.

7.5.2. The NHNS-CMG will meet on as required basis.

7.6. State Level Crisis Management Group For HNS Spills

7.6.1. The State Government of a coastal state would constitute a State level Crisis Management Group for management of HNS pollution incidents, termed SHNS-CMG. The commended composition of the SHNS-CMG is at **Appendix G**. The SHNS-CMG co-opts any person whose assistance or advice is considered useful in performing any of its functions, to participate in the deliberation of any of its meetings. SHNS-CMG should meet at least once in a year. **The Coastal States, which have already constituted Crisis Management Group for Oil Pollution shall include the marine HNS spill management under the functions of the same crisis group.**

7.7. Functions of the SHNS-CMG

¹³ No approved CMG composition is promulgated for HNS. Therefore, it is recommendatory to have Defence Secretary as chairman and thus a parity with NOSDCP will exist since the entire spectrum of responding to marine pollution lies with Coast Guard.

7.7.1. The SHNS-CMG is the apex body in the State to deal with major HNS pollution incidents and to provide expert guidance for handling major HNS pollution incidents. The SHNS-CMG would:-

- (a) Review at least once a year, local HNS spill contingency plan for the State, local and all facility HNS spill contingency plans with a view to examine its adequacy and forward a report to the CNA for HNS spills.
- (b) Nominate personnel to the LAG and Local Action Group Support Team (LST) and review the status of these teams;
- (c) Assist the State Government in managing HNS pollution incident at a site in the State;
- (d) Assist the State Government in the planning, preparedness and mitigation of major HNS pollution incident at a site in the State;
- (e) Continuously monitor the post incident situation arising out of a major HNS pollution incident in the State and forward a report to the Central Coordinating Authority for HNS spills;
- (f) Review the progress report submitted by the District Crisis Management groups;
- (g) Respond to queries addressed to it by the District Crisis Management groups;
- (h) Publish a list of experts and officials in the State who are concerned with the management of HNS pollution incidents.

7.8. District Level Crisis Management Group

7.8.1. The recommended composition of the District Crisis Management Group (D-CMG) is specified at **Appendix H**. The D-CMG shall meet at least once in six months and send a report to the SHNS-CMG. **The Coastal States, which have already constituted District Level Crisis Management Group for Oil Pollution shall include the marine HNS spill management under the functions of the same crisis group.**

7.8.2. **Functions of the D-CMG.** The D-CMG is the apex body in the district to deal with major HNS pollution incidents and to provide expert guidance for handling HNS pollution incidents; The D-CMG would:-

- (a) Review all the facility HNS spill contingency plans prepared by the occupier of Major Accident Hazards installation viz., seaports and HNS installations for the preparation of the district HNS spill contingency plan.
- (b) Assist in the preparation of the district HNS spill contingency plan.
- (c) Assist the district administration in the management of HNS pollution incidents.
- (d) Continuously monitor every HNS pollution incident.
- (e) Ensure continuous information flow from the district to the NHNS-CMG and SHNS-CMG regarding HNS pollution incident situation and mitigation efforts.
- (f) Forward a report of the HNS pollution incident within fifteen days to the SHNS-CMG.
- (g) Conduct atleast one full-scale mock-drill of an HNS pollution incident at a facility each year and forward are port of the strength and the weakness of the plan to the SHNS-CMG.
- (h) In case of an accident resulting in a ship becoming wreck and subsequently HNS spill, the D-CMG shall coordinate with receiver of wreck for initiating pollution response activity (MoS P&W under the MS Act 1958 notifies the Receiver of the Wreck at various places).

7.9. Emergency Coordination Structure

7.9.1. The Indian Coast Guard is designated as the CNA for HNS spill response in the MZI. The Director General Indian Coast Guard (DGICG) is the Central Coordinating Authority (CCA) for HNS spills and has the overall responsibility to coordinate response to any incidence in the seas around India. He will direct the various aspects of the pollution response operations and will be assisted by the Seaboard Commander and Commanders, Coast Guard Region North-West, West, East, North-East, and Andaman & Nicobar as required, depending on the proximity to the scene of contingency. The Regional Commanders will in turn be assisted by the Coast Guard District Commanders of the respective Coastal States and Union Territories in the coordination of response to HNS pollution within a coastal State.

7.9.2. The NHNS-CMG and/ or SHNS-CMG as appropriate, will provide management, operational, technical and environmental advice and support to

the Combat Agency as required. This may include support for the management of the response. **During major incidents, the overall response strategy shall be formulated by relevant Regional Commanders** and implemented by Chief Incident Controller (CIC) and the Incident Management Team (IMT). **The Coast Guard Seaboard Commander shall oversee the response measures.** During lesser incidents, the CIC shall be responsible for overall response strategy. The CIC shall keep the Statutory Agency informed of progress with the response. The response actions will be supported by the LAG and LST.

7.10. National Plan Working Group

7.10.1. The National Plan Working Group will provide advice to the CCA for HNS spills on the strategic policy making and funding direction for the National Plan. It will support the CCA by considering the overall operational aspects of the National Plan. It will consider issues such as the NHNS-DCP, HNS spill response equipment and training, aerial spraying of neutralising agent and contingency plan audits. It will address research, development, technology and the environmental and wildlife interests of all the parties to the National Plan. The block diagram for coordination of HNS spill emergencies in Indian waters is given at Figure-6 Organogram of National Structure for Coordination of HNS Spill Emergencies in Indian Waters is given in Figure below. The composition of the National Plan Working Group is at **Appendix J. The National Plan Working Group is similar to that of constituted for Oil Pollution response under NOSDCP.**

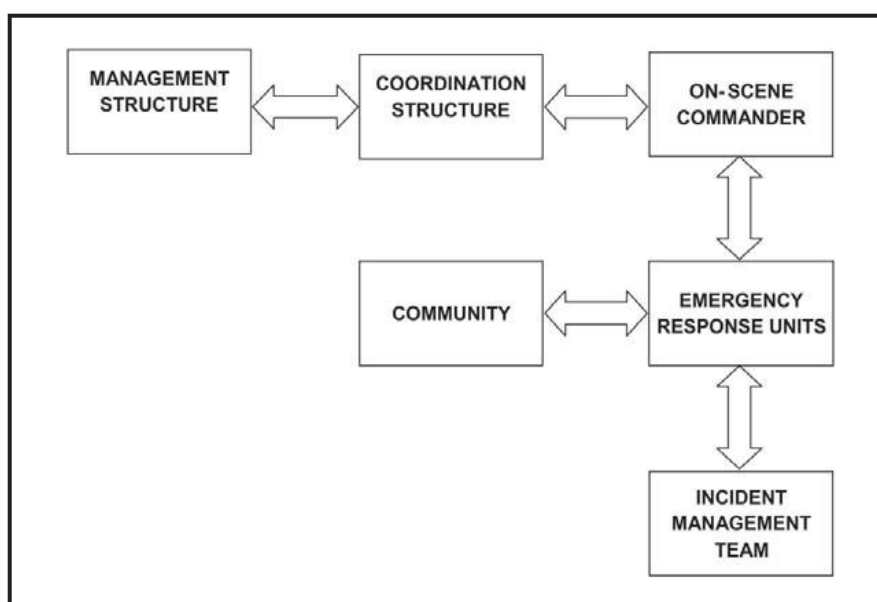


Figure 6: Block diagram of National Structure for Coordination of HNS Spill Emergencies in Indian waters

Emergencies in Indian waters

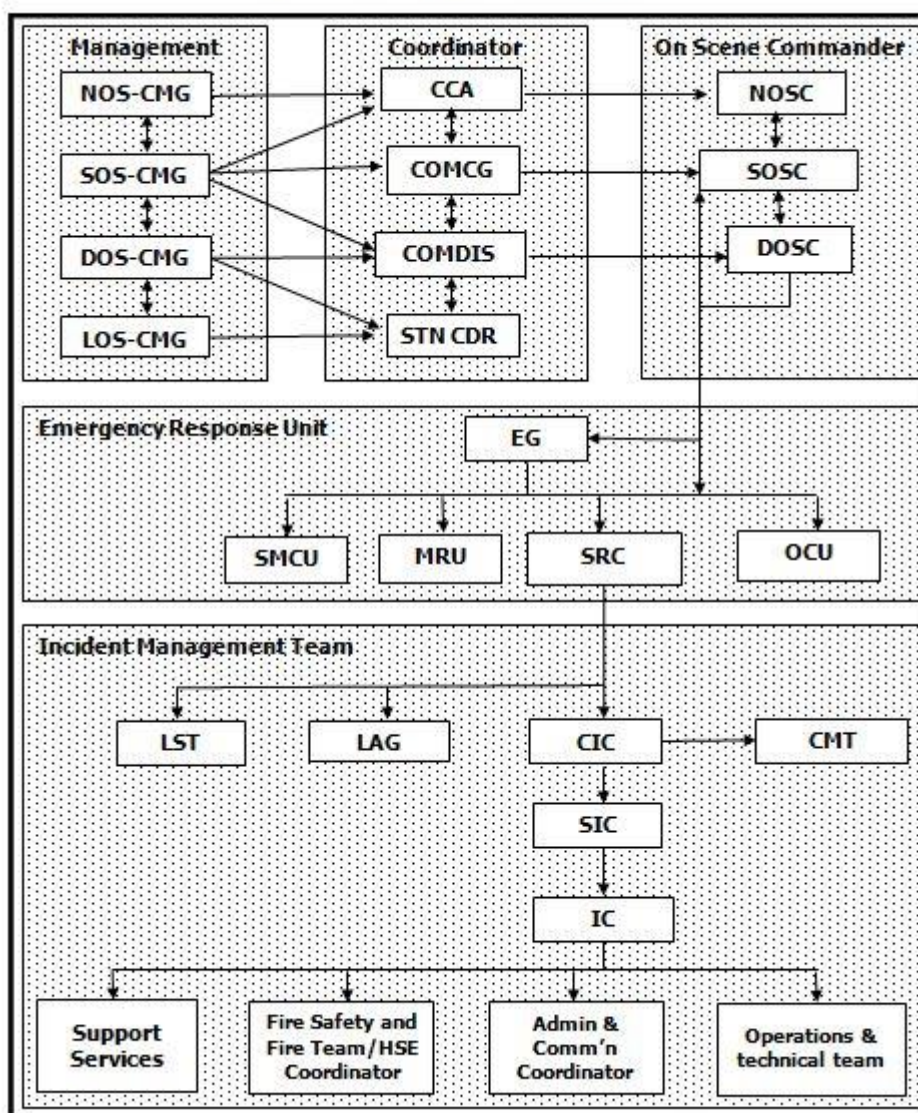


Figure 7: Organogram of National Structure for Coordination of HNS Spill Emergencies in Maritime Zones of India

7.11. Pre-Designated On-Scene Commanders

7.11.1. The Principal Director (Environment) at Coast Guard Headquarters serves as the National On-scene Commander (NOSC) in the event of a spill of national significance. The Regional Pollution Response Officer will be the Regional On-Scene Commander (ROSC) and act as the representative of the Regional Commander to co-ordinate all activities at the scene of pollution through the relevant Coast Guard District Commander (COMDIS) in the vicinity of the region/area. The ROSC will pass on regular reports to the Regional Headquarters, respective Seaboard and the Coast Guard Headquarters, of his assessment, and of resources and assistance required. The Coast Guard District Commanders (Coast Guard Commander of the particulate Coastal

State) will designate an officer as Pollution Response Officer for the concerned Coastal State/ UT who will act as the State On-scene Commander (SOSC) and lead the initial response team to the scene of incidence within his area of jurisdiction under the overall guidance of the Regional Pollution Response Officer. He will be responsible for the following:-

- (a) Directing the employment of needed resources for prevention of pollution, containment, clean-up, and disposal of any pollutants, and restoration of the site;
- (b) Providing a focal point of information for all agencies concerned;
- (c) Preparing cost analysis and detailed report covering all aspects of the spill; and
- (d) Collecting samples for possible analysis.

7.11.2. The organogram of pre-designated on-scene commanders are given in Figure below: -

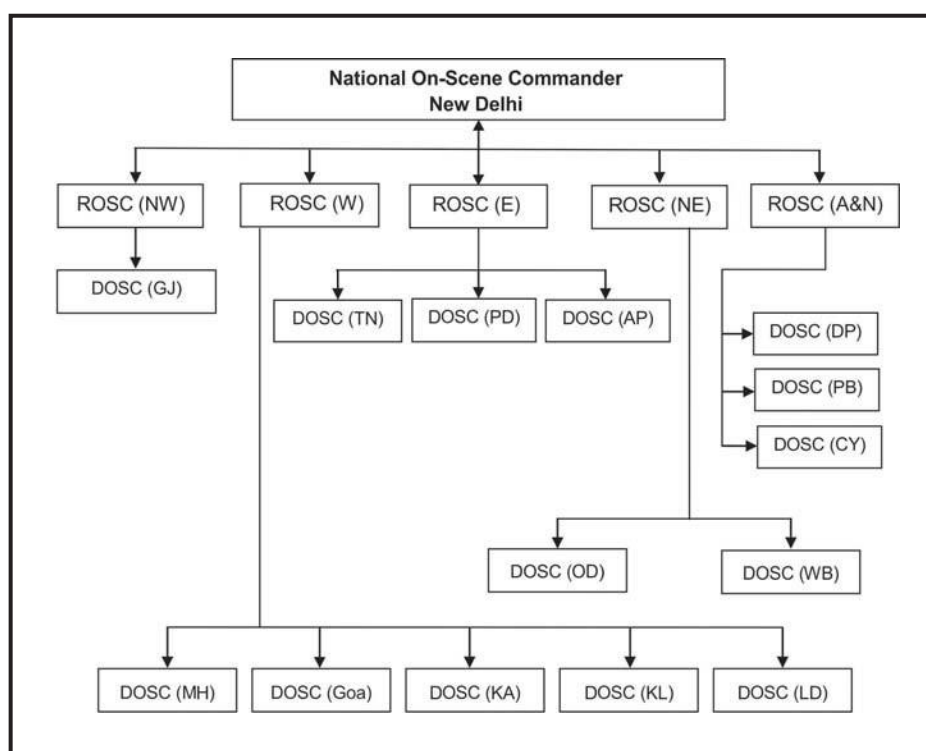


Figure 8: Organogram of Pre-designated On-scene Commanders

7.12. Emergency Response Units

7.12.1. In managing the counter pollution response to an incident, the hierarchy of aims is:-

- (a) First, to prevent pollution from occurring.
- (b) Second, to minimize the extent of any pollution that occurs.
- (c) Third, to mitigate the effects of that pollution.

7.12.2. Separate, but linked emergency response units would direct operations in the event of an incident requiring response under this plan, as indicated at table-4.

Ser	Response Unit	Title	Role
(a)	Salvage Monitoring and Control Unit. To be designated by DOSC	SMCU	To monitor and control salvage operations
(b)	Offshore Control Unit. To be designated by DOSC	OCU	To direct response action at offshore installations
(c)	Marine Response Unit. To be designated by DOSC	MRU	To direct response action at sea
(d)	Shoreline Response Centre. To be designated by DOSC.	SRC	To direct shoreline response
(e)	Environment Group. To be activated by DOSC.	EG	To provide environmental and public health advice to all these response units
(f)	Emergency Control Centre. To be activated by DOSC.	ECC	To monitor operations to contain any potential pollution within an offshore installation and its reservoir and a port facility jurisdiction

Table 4: Emergency Response Units

7.12.3. Not all incidents require all these emergency response units. However, the arrangements for managing the incidents must allow for the possibility of salvage operations, action at sea and action on shore taking place simultaneously. The SMCU may be co-located with the MRU, or ECC, if need be. Each HNS handling facility and sea-port facility shall have the provision of an Emergency Control Centre (ECC) preferably with a back-up arrangement. The ECC shall be away from potential hazards and provide maximum safety to personnel and equipment. Preference should be given to a

non-combustible building of either steel frame or reinforced concrete construction. The ECC should have at least two exits and adequate ventilation.

7.12.4. Each emergency response unit including the ECC should be provided with the following basic supplies and dedicated equipment:-

- (a) A copy of the relevant HNS Spill Contingency Plan (HNS-CP).
- (b) Maps and display charts and diagrams showing buildings, roads, underground fire mains, important hazardous material and process lines, drainage trenches, and utilities such as steam, water, natural gas, and electricity.
- (c) Situation boards (continuously updated to present a summary of the current situation and response actions being taken).
- (d) Aerial photographs, if possible, and maps showing the site, adjacent industries, the surrounding community, high-ways, rivers, etc., to help determine how the disaster may affect the community so that the proper people can be notified, adequate road blocks established, and the civil authorities advised.
- (e) Sufficient telephone lines to enable full liaison without side bodies.
- (f) Names, addresses, and telephone numbers of employees, off-site groups and organizations that might have to be contacted; all telephone lists being reviewed for accuracy on a scheduled basis and updated, as necessary.
- (g) Dedicated and reliable communication equipment; enough telephones and at least one fax line to serve the organization for calls both on and off-the-site.
- (h) Fixed and portable two-way radio equipment to keep in contact with activities on-scene and to maintain continuity of communications when other means fail.
- (i) Plan board, log book, voice recorder, television, DVD and video facilities for playing back records from aircraft and helicopters, as well as monitoring media coverage of the incident with a person assigned to record pertinent information and to assist in investigating cases, evaluating performance, and preparing reports.

- (j) Emergency lights so that operations can continue in the event of power failure.
- (k) Photocopy, fax and e-mail facilities.
- (l) Dedicated computers with LAN/ internet facility to access the installation data and the latest and updated soft copies of all Standard Operating Practices (SOP)etc.

7.12.5. The Shoreline Response Centre (SRC) in Coastal States/ UTs may be equipped as required, with specifications for ECC as guidelines. Each response unit will be supported by an Administration Team responsible for the general management of the unit and provided personnel for: -

- (a) Communication links between the units.
- (b) The distribution of messages within the units.
- (c) Keeping records of messages and expenditure.
- (d) Taking minutes during meetings to record decision.
- (e) Office Management including preparation of documents, etc.
- (f) Updating situation boards and charts.
- (g) Providing catering to the units.

7.13. Facility Level Incident Management Team

7.13.1. The facility HNS spill contingency plan (F-HNSCP) shall identify the safe transition from normal operation to emergency operations and systematic shut down, if any, and the delegation of authority from operations personnel to emergency response personnel. For this purpose, persons in charge of seaports and Chemical handling facility shall identify in the Facility HNS Contingency plan, an emergency response organization with appropriate individual stopper form designated responsibilities through specified lines of authority with succession planning and actuating the response management in accordance with relevant contingency plan requirements. Responsibilities for decision making shall be clearly shown in an emergency organization chart. The plan shall identify each responder's position, mission, duties and reporting relationship. Overall objectives of the facility HNS spill emergency control organization shall be:-

- (a) To promptly control HNS pollution problems as they develop at the scene.
- (b) To prevent or limit the impact of HNS pollution on other areas and off-site.
- (c) To provide emergency personnel, selected for duties compatible with their normal work functions wherever feasible, with duties and functions assigned making full use of existing organizations and service groups such as fire, safety, occupational health, medical, transportation, personnel, maintenance, and security.
- (d) To provide for employees who must assume additional responsibilities as per laid down procedure of the facility HNS CP in the event of HNS spill contingency.
- (e) To provide for round-the-clock coverage, with shift personnel being prepared to take charge of the emergency control functions or emergency shutdown of system, if need be, until responsible personnel arrive at the site of emergency.
- (f) To provide for an alternate arrangement for each function.

7.13.2. The emergency organisation shall be based on an incident command system to provide a standardised organizational structure that is flexible yet provides compatibility between agencies and events, whilst ensuring accountability and standardised records. The system clearly defines roles and responsibilities and provides inter operability between resource agencies. The structure also allows for the ability to escalate or downsize the response as required.

7.13.3. Figure-9 indicates the basic HNS organogram and Figure-10 below is a typical facility level Incident Management Team (IMT) for control of an HNS spill emergency. An entity can merge the functions as per their other statutory requirements and based on level of risk and range of operations. The organization shall have to address all services and support system required and available to it.

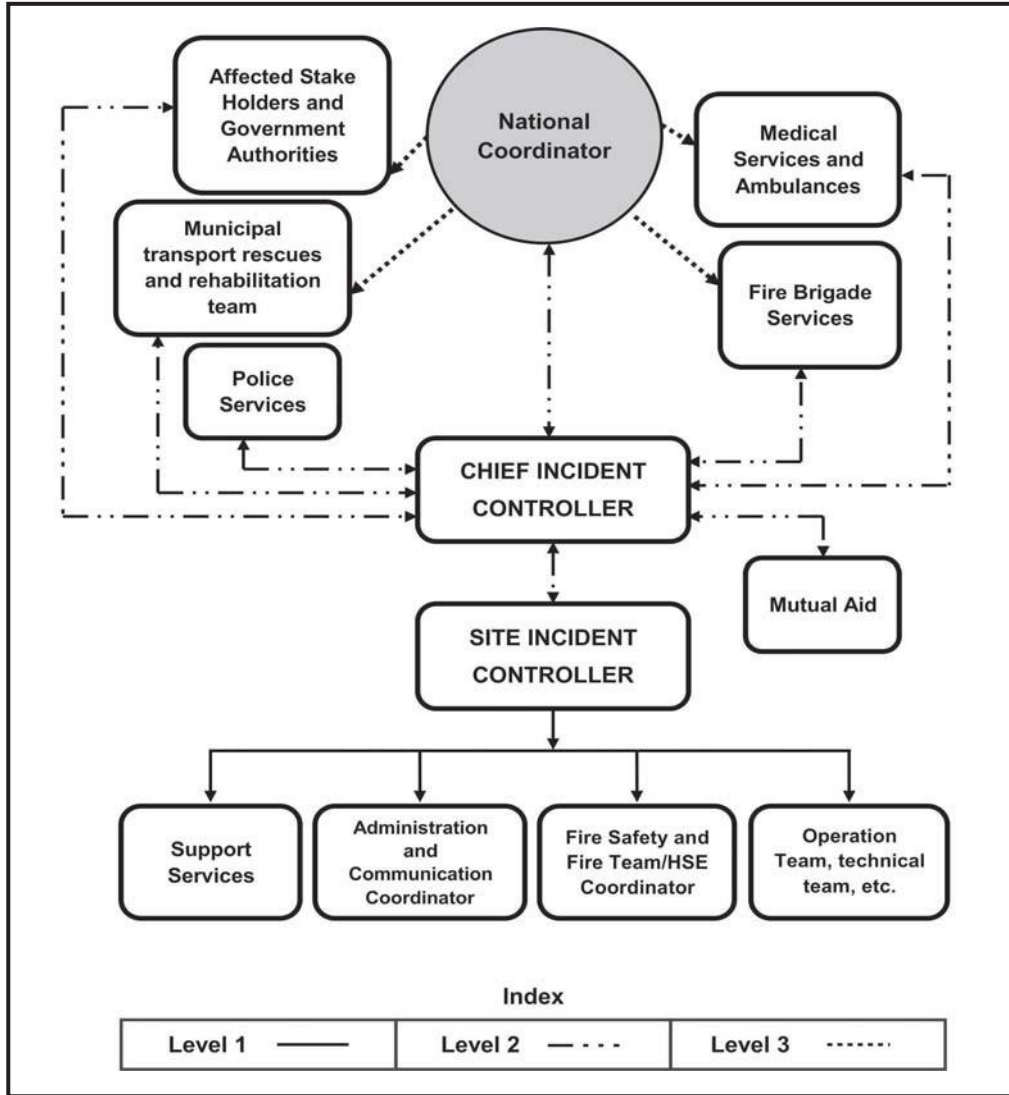


Figure 9: Basic HNS spill emergency organogram

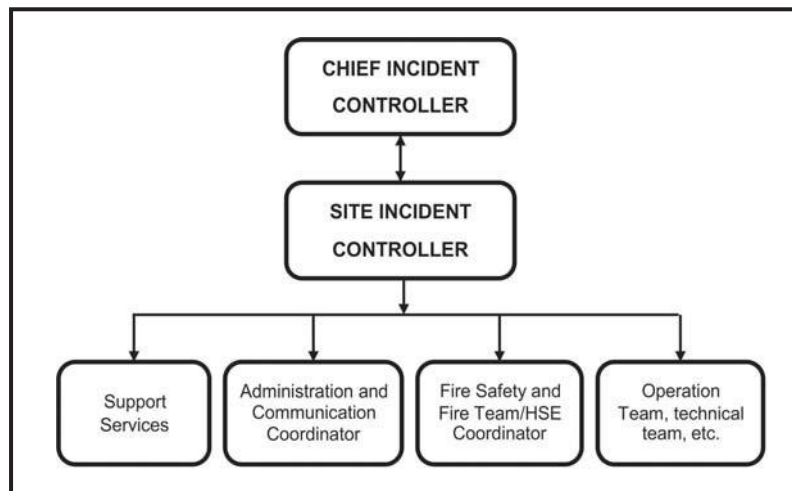


Figure 10: Typical facility level IMT for control of an HNS spill

7.13.4. Support Services include Communication Services, Engineering/Maintenance Services, Medical and Occupational Health, Human Resource and Welfare Service, Security, Media/ Public Relations, Transport and Logistics, Finance, Contract and Procurement and Environmental Services.

7.13.5. The number of staff required to fill positions in the IMT of the emergency organization can be varied according to the size and complexity of the incident and the number of staff available. In a major incident all positions may be filled, but in a lesser incident one person may fill several positions. In a very small incident, the Site Incident Controller (SIC) will be able to carry out all management functions.

7.13.6. Persons in charge of sea ports and HNS installations ensure that persons with appropriate experience and skills are identified so that they can be appointed to the various positions in the emergency organization in the event of a marine pollution incident. If agency input into a response is required, the Coast Guard may place its liaison officers with in the IMT, so as not to burden personnel that will be fully engaged in response activities.

7.13.7. The concerned Coast Guard Commander takes overall responsibility for management of the response in the event of a tier 2 or tier 3 HNS spill and assumes charge of senior government, industry, and media liaison as per the Regional and International agreements.

7.14. Chief Incident Controller

7.14.1. Persons in charge of seaports and HNS installations shall identify appropriate individuals to act as a Chief Incident Controller (CIC). The CIC is responsible for the management and coordination of response operations at the scene of a pollution incident to achieve the most cost effective and least environmentally damaging resolution to the problem. During a major incident, the CIC is responsible to the relevant Coast Guard Commander for the operational aspects of the response. The Chief Incident Controller (CIC) shall have overall responsibility to protect personnel, site facilities, and the public before, during, and after an emergency or disaster. The CIC shall be present at the ECC for counsel and overall guidance. Responsibilities of the CIC shall include the following: -

- (a) Preparation, review and updation of the HNS-CP.
- (b) Assessment of situation and declaration of an HNS spill emergency.

- (c) Mobilisation of main coordinators and key personnel.
- (d) Activation of ECC.
- (e) Taking decision on seeking assistance from mutual aid members and external agencies.
- (f) Continuously reviewing situation and deciding on appropriate response strategy.
- (g) Taking stock of casualties and ensuring timely medical attention.
- (h) Ensuring correct accounting and position of personnel after the emergency.
- (j) Ordering evacuation of personnel as and when necessary.
- (k) Taking decision in consultation with local Coast Guard and District Authorities, when a tier-2 or tier-3 spill is to be declared.

7.15. Site Incident Controller

7.15.1. The Site Incident Controller (SIC) shall be identified by the CIC and will report directly to him. SIC should be nominated by the entity in each shift of 24 hours. During lesser incidents, the SIC shall have overall responsibility for managing the response. Persons in charge of seaports and chemical facility should ensure that the SIC is assisted by a response team with appropriate planning, operational, technical, scientific, chemical, environmental, logistical, administrative, financial, and media liaison skills. Responsibilities of the SIC shall include the following:-

- (a) To maintain a workable HNS spill emergency control plan, establish emergency control centers, organize and equip the organization with HNS-CP and train the personnel.
- (b) To make quick decisions and take full charge.
- (c) To communicate to the ECC where it can coordinate activities among groups.
- (d) To be responsible for ensuring that appropriate local and national government authorities are notified, preparation of media statements, obtaining approval from the CIC and releasing such statements once approval received.

- (e) To ensure that the response to the HNS pollution emergencies is in line with entity procedures, and to coordinate business continuity or recovery plan from the incident.
- (f) To co-ordinate any specialist support required for the above purpose.
- (g) To decide on seeking assistance of mutual aid members and external agencies.

7.16. Administration and Communication Coordinator

7.16.1. Responsibilities of the administration and communication coordinator shall include the following: -

- (a) To coordinate with mutual aid members and other external agencies.
- (b) To direct them on arrival of external agencies to respective coordinators at desired locations.
- (c) To mobilize HNS spill responders and resources for facilitating the response measures.
- (d) To monitor mobilization and demobilization of personnel and resources.
- (e) To provide administrative and logistics assistance to various teams.
- (f) To be responsible for all financial, legal, procurement, clerical, accounting and recording activities including the contracting of personnel, equipment, and support resources.
- (g) To be responsible for the management of the ECC.

7.17. Support Services

7.17.1. The following additional coordinators will be nominated at the sea ports and HNS installations and delegated the specific responsibilities falling under the basic functions of SIC and/or CIC:-

- (a) Human Resources Services Coordinator.

(b) Logistics Services Coordinator.

7.17.2. In any response there is a vital need to ensure that response personnel are provided with adequate resources to enable an effective response to be mounted. The Logistics Services Coordinator shall ensure that all resources are made available as required. This includes the procurement and provision of personnel, equipment, and support services for operations in the field and for the management of resources tagging areas.

7.18. Media and Public Relations Coordinator

7.18.1. The Media and Public Relations Coordinator shall ensure adequate liaison between the incident management team and the media. All queries received from the media should be directed to this person. Before releasing any information, the Media and Public Relations Coordinator's action should have the approval of either the relevant Coast Guard Commander or CIC, depending on the size of the spill.

7.19. Operations and Technical Coordinator

7.19.1. The Operations and Technical Coordinator is responsible for the provision of scientific and environmental information, maintenance of incident information services, and the development of Strategic and Incident Action Plans. He shall ensure the distribution of all information to the Incident Management Team and to all response personnel generally. He is responsible to the CIC for all response operational activities. This includes ensuring that the requirements of Incident Action Plans (IAP) are passed on to operational personnel in the field, and for ensuring that the plans are implemented effectively.

7.20. Environmental and Scientific Coordinator

7.20.1. The State Government shall pre-appoint the Environmental and Scientific Coordinator (ESC), either on a State, regional or local area basis. During a spill response, the ESC will normally form part of the Operations team. In this role the Operations Team is to provide the CIC with an up-to-date and balanced assessment of the likely environmental effects of an HNS spill. The Planning Section will advise on environmental priorities and preferred response options, considering the significance, sensitivity and possible recovery of the resources likely to be affected. In major incidents, the ESC may directly advise the relevant Coast Guard Commander.

7.21. Local Action Group

7.21.1. The Local Action Group (LAG) provides support to the Union and State/UT Governments in the event of a major HNS pollution incident, specifically in the roles of response managers, and response team leaders. Each coastal State/UT nominates personnel to the LAG as indicated in table 5, except Goa, Puducherry, Daman and Diu, Lakshadweep and Minicoy, and Andaman and Nicobar which will nominate one response team leader instead of five.

Role	Positions per State
Planning Coordinator	1
Operations and Technical Coordinator	1
Logistics and Administration Coordinator	1
Response Team Leader	5

Table 5: Composition of Local Action Group

7.22. Local Action Group Support Team

7.22.1. The Local Action Group Support Team (LST) is required to support an incident. The following roles have been identified for a national capacity:-

- (a) Environmental Advisers.
- (b) Finance & Administration Officer.
- (c) Wild life Officer.
- (d) Equipment Operator:-
 - (i) Offshore Containment/ Recovery.
 - (ii) Inshore Containment/ Recovery.
 - (iii) Engined river and Laskar.
 - (iv) Vessel-based dispersant spraying.
 - (v) Shoreline Assessment.

(vi) Shoreline Clean-up.

7.22.2. The Equipment Operator role has been broken down into areas of specific expertise. Equipment Operators may be competent in more than one area. Training of LST is the responsibility of the respective coastal States with support of the seaports, chemical handling facilities agencies, Coast Guard and other government agencies, non-governmental organisations, etc. Each coastal State would identify personnel to fulfil these roles, as these personnel would be required when responding to major incidents within their own jurisdictions, and will become part of the LAG when succession planning. Seaports and HNS installations are expected to nominate personnel to these positions. Certified personnel of private HNS spill response organisations may also be considered for such roles.

7.22.3. During a National Plan incident, the Chief Incident Controller or the relevant Coast Guard Commander may require personnel from other coastal States to become part of the Incident Management Team or the incident response team. A formal requisition will be issued to the State Disaster Management Authority or District Disaster Management Authority. A requisition for personnel will include:-

- (a) Roles or skills required (e.g. Planning officer).
- (b) Number of personnel required to fill each role.
- (c) Contact name, address, and time of where personnel are to initially report.
- (d) Brief overview of the work to be undertaken.

7.22.4. Suitable personnel will then be selected from the LAG or the LST of the coastal State, unless special circumstances exist. This procedure does not apply to the activation of LAG and LST personnel from within the State where the incident has occurred. In such circumstances, the relevant combat or statutory agency is responsible for activation in accordance with applicable contingency plans or State arrangements. The maximum release period will be ten days (including travel time) unless the LAG/LST member's organisation has consented to a different period. Personnel will remain in the employment of their own agency, and all entitlements in relation to their contract of employment will remain unchanged. The individual's employer will initially meet all costs. Costs include salary, travel, accommodation, incidental expenditure, and where appropriate overtime expenses. The loaning agency may recover such costs by forwarding deployment cost details, including

supporting documentation, directly to the polluter or the Directorate General of Shipping for cost recovery purposes.

7.23. Environment Advice and Monitoring

7.23.1. Response to any maritime incident requiring a regional or national response would involve the establishment of an Environment Group. All those involved in operations at sea (including salvage) and shoreline cleanup need timely environment advice. The Environment Group would:-

- (a) Perform a purely advisory role.
- (b) Advise on environment aspects and public health impacts of the incident and associated response operations both, real and potential.
- (c) Being a common facility, provide comprehensive advice to all response units and represent all environmental and public health interest considered being at risk.
- (d) As well as provision of expert advice based on immediately available and prepared data and information, may encourage the collection of real time environmental data by the relevant government agencies; such environment data may provide accurate baseline data of vulnerable environmental features immediately before impact of the pollution plume, so that risk can be identified and the damage can be quantified.
- (e) Track the success of preventive and counter pollution measures throughout the incident, and begin to assess the overall long term environment impact, dependent on timely provision, from each response unit, of all relevant information on the fate and modelling of pollutants, and each unit's forecasts, plans actions and outcomes.
- (f) If a marine pollution incident is expected to have a significant impact on the marine environment, or the shoreline, to promptly make arrangements to begin to monitor and assess the impact in the longer term.

7.23.2. Response units will make all reasonable efforts to consult the Environment Group, or its chair, about any proposed action that is likely to have lasting impact on the environment. If time does not permit the response unit to consult before acting, it will circulate a written report to the Environment Group and all other response units as soon as possible after the action (or decision) has been taken. The statutory environment protection or

fishery authority will consult locally with members of the standing Environment Group.

7.23.3. The Coast Guard would initiate the request on the relevant civil administrative authority for the formation of the Environment Group. The core membership of the Group would come from the relevant statutory authorities and include relevant civil administration authorities, forest and wildlife authorities, fisheries authorities, Block Development Officer, local public health officials and relevant non-governmental organisations for appropriate expert advice. The Group may also include a Coast Guard representative.

7.23.4. The chair decides when it is necessary to convene the Environmental Group at the scene of the incident and appoint an Environment Liaison Officer for each response unit established.

7.24. Community

7.24.1. Support of the local community is essential for the success of any response operation, particularly shoreline response. The community will include volunteers from the National Cadet Corps, National Disaster Mitigation Resource Centres, National Service Scheme and Non-Governmental Organisations. The specialized National Disaster Response Force may be called in addition to the community volunteers.

7.25. 24-Hour Emergency Advice Centre

7.25.1. Ensuring access to the initial risk assessment capability 24-hours a day, 365 days a year should be a central element of the contingency planning to deal with chemical spills on water. At a national level, there would ideally be one contact point for ensuring immediate access to information on chemical hazards. It would be linked to the ICE (International Chemical Environment) scheme a voluntary programme, co-ordinated through European Chemical Industrial Council (CEFIC), to create an international network for chemical distribution incidents. Regional Marine Pollution Response Centre shall advice formation of ICE equivalent organisation. The aim of ICE is to ensure that information on the chemical hazards posed by an incident, practical help and, if necessary and possible, appropriate equipment is provided to the emergency services to minimise adverse effects.

7.25.2. However, it will take time to have a complete database in India and to establish an agency for monitoring the origin of chemicals, its hinterland movements, the destination, the customer, the chemical characteristics, the possible threats, the response to such threats and the likely threat to environment. In the interim, it is necessary that as much

information available through open sources and from the manufacturers and exporters of the chemical substances that are moved from the Indian ports is gathered and a database maintained by Indian Ports Association or other suitable organisation, for supporting an effective spill response.

Chapter-8: Risk Assessment and Preparedness

8.1. Guidelines for Risk Assessment

8.1.1. Understanding the risk of a marine accident or incident leading to a spill is the first step prior preparedness to respond to such incidents¹⁴. Risk assessment is the preparation of what can go wrong and what can be the consequences of that. The process of risk assessment alone will not remove the risk but will help in identifying, reducing and managing the risk¹⁵. In combination with many other factors the risk assessment defines the minimum level of preparedness¹⁶.

8.1.2. Prior initiating the process of risk assessment several factors are to be considered¹⁷. The factors to be considered are: -

- (a) Potential source identification.
- (b) Hazard identification include potential dangerous navigational channel, poor or old equipment, etc,.
- (c) **Event**. A hazards interaction with source can create an event.
- (d) **Frequency**. The statistical number of times an event will occur. For example, X tonnes in Y times in Z years.
- (e) **Probability**. Expressed between 0 (Zero chance) and 1(certain).
- (f) **Likelihood**. It can be covering either frequency or probability.
- (g) **Consequence**. The socio-economic or environment damage from the incident.
- (h) **Risk**. Measure of both likelihood and consequence.

¹⁴ Para 1.1, Pg1, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

¹⁵ Para 1.2, Pg1, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

¹⁶ Para 1.2, Pg1, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

¹⁷ Para 1.4, Pg1-2, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

8.1.3. Major HNS spills could be human induced and therefore will fall into the scrutiny of public and their expectations¹⁸. Such spills have a potential to widespread damage and disruption to public livelihood and environment and thus gives significance in the eyes of public¹⁹. The significance of such risk has more prominence than the effect of chronic pollution²⁰. The risk assessment process therefore shall include the expectations of the stakeholders and the communities²¹. This factor should not be underestimated during risk analyses²².

8.1.4. Risk = likelihood X consequences²³. Through risk assessment likelihood and consequences are together to allow balanced and reasoned judgements concerning what spill prevention and preparedness measures may be appropriate or required in the risk management²⁴. Risk management decisions can be based on the data aggregated during risk assessment²⁵.

8.2. Guidelines for Risk Management

8.2.1. "*Risk management is a process that evaluates the outputs from the risk assessment and puts in place measures to ensure that identified risks are acceptable or require mitigation*"²⁶. The measures of mitigations should be focusing on reducing likelihood (prevention) and or consequences (preparedness measures)²⁷. Risk management process ends in having a preparedness level or capacity required for mitigating the risk²⁸.

8.2.2. Stakeholder engagement will be another major facet of risk management²⁹. The process of analyses should be based on this engagement³⁰. The acceptability of the risk among the stakeholders are important. It should be based on the examination of all viable alternatives chosen to reduce risk have been examined and the acceptable risk have been

¹⁸ Para 1.27, Pg15, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

¹⁹ Para 1.27, Pg15, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²⁰ Para 1.27, Pg15, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²¹ Para 1.28, Pg15, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²² Para 1.28, Pg15, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²³ Para 1.29, Pg15, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²⁴ Para 1.30, Pg15, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²⁵ Para 1.31, Pg15, Ch 1, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²⁶ Para 2.1, Pg16, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²⁷ Para 2.1, Pg16, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²⁸ Para 2.1, Pg16, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

²⁹ Para 2.2, Pg16, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

³⁰ Para 2.2, Pg16, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

arrived upon³¹. A practical approach could be arriving at Risk "As Low As Reasonably Practical (ALARP)"³².

8.2.3. **Reducing Likelihood of Risks (Prevention)**. The likelihood of risk can be reduced by under mentioned measures³³: -

- (a) Improvements to facility design.
- (b) Locating areas of lower incident probability.
- (c) Robust maintenance and inspection procedures.
- (d) Training programmes in standard operating procedures.
- (e) Operating to the highest standards.
- (f) Improving security to prevent external elements causing damage to the facility.

8.2.4. **Reducing Consequences**. Rational assessment of preparedness will enable overstocking of response equipment³⁴. If other elements are weak more equipment will not contribute into preparedness³⁵. Therefore, meaningful cooperation between planners and stakeholders are important³⁶.

8.2.5. Further details to the above factors may be referred in Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010 since same is applicable in HNS spill as well. The manual may be referred while carrying out risk assessment and management.

8.3. Risk Factors

8.3.1. The location of national resources is based on a risk profile of Indian waters. The risk is profiled based on data relating to the pollution of Indian waters by discharges of chemicals/HNS from ships and the HNS industries located along the coastline. The following are recognized as important risk factors: -

³¹ Para 2.2, Pg16, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

³² Para 2.4, Pg16, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

³³ Para 2.7, Pg18, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

³⁴ Para 2.9, Pg18, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

³⁵ Para 2.9, Pg18, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

³⁶ Para 2.9, Pg18, Ch 2, Manual on Spill Risk Evaluation and Assessment of Response Preparedness, IMO 2010

- (i) Type of HNS.
- (ii) Geographic location.
- (iii) Weather.
- (iv) Sea conditions.
- (v) Coastline.
- (vi) Vigilance.
- (vii) Traffic density.
- (viii) Time of day.
- (j) Navigation hazards.
- (k) Terminal design.
- (l) Condition of facilities.
- (m) Legislation.
- (n) Vessel quality/ age/ sea worthiness.
- (p) Vessel types/sizes.
- (q) Types of operation.
- (r) Quantities handled.
- (s) Frequency of handling.
- (t) Training program.
- (u) Risk of collision.
- (v) Risk of grounding.
- (w) Hazards to navigation.

- (x) Negligence and competence of the owner/ operator, master or crew.
- (y) Stowage and control of cargoes.
- (z) Environmental factors including tidal flow and weather, etc.

8.4. Response Policy

8.4.1. The primary aim of an HNS spill response is to: -

- (a) Protect human health and safety.
- (b) Minimize environmental impacts; and
- (c) Restore the environment, as near as is practicable, to pre-spill conditions.

8.4.2. The environmental impact of an HNS spill can be minimised by good management and planning, and by the response actions put into effect by the Combat Agency. Such actions will largely depend on several factors: -

- (a) The type of HNS involved.
- (b) The size of the spill.
- (c) The location of the spill.
- (d) The prevailing sea and weather conditions at the spill site.
- (e) The environmental sensitivity of the coastline/site impacted.

8.5. Level of HNS Response

8.5.1. The national plan is to be based around three different levels of HNS Response:-

- (a) **Advisory**. The focus of the advisory service is to provide an assessment of the risks to health, immediate response advice and an assessment of the need for additional assistance to a ship's crew or the facility. The arrangements shall be maintained with relevant HAZMAT agencies for the provision of hazardous materials advice on a 24/7 basis. The broad advisory includes:-

- (i) Preventive.
- (ii) Curative.
- (iii) Mitigative/Restorative.

(b) **Shipboard Response**. The objective of a shipboard response capability is to provide rapid intervention in order to contain an incident to a vessel and prevent damage to the vessel or loss of material into the environment where possible.

(c) **Major Incident Response**. During few situations, it may be beyond the capability of a shipboard response and the relevant Control Agency to contain the material to the vessel. In such situations, which may result in the loss of material into the marine environment, a full response under the National Plan shall be launched similar to an oil spill.

8.6. Tiered Preparedness and Response Framework

8.6.1. Tiered preparedness and response are the benchmark for establishing a robust HNS spill preparedness and response framework. The tiered structure established during contingency planning explains to users the effectiveness of response to any type of HNS spill that may vary from small operational spillages to a worst-case release at sea or inside facility, port or coastal State. The aim of tiered response is to clearly define responsibility and also to ensure availability of suitable resources at the right place at the right time. Thus, the resulting capability should:-

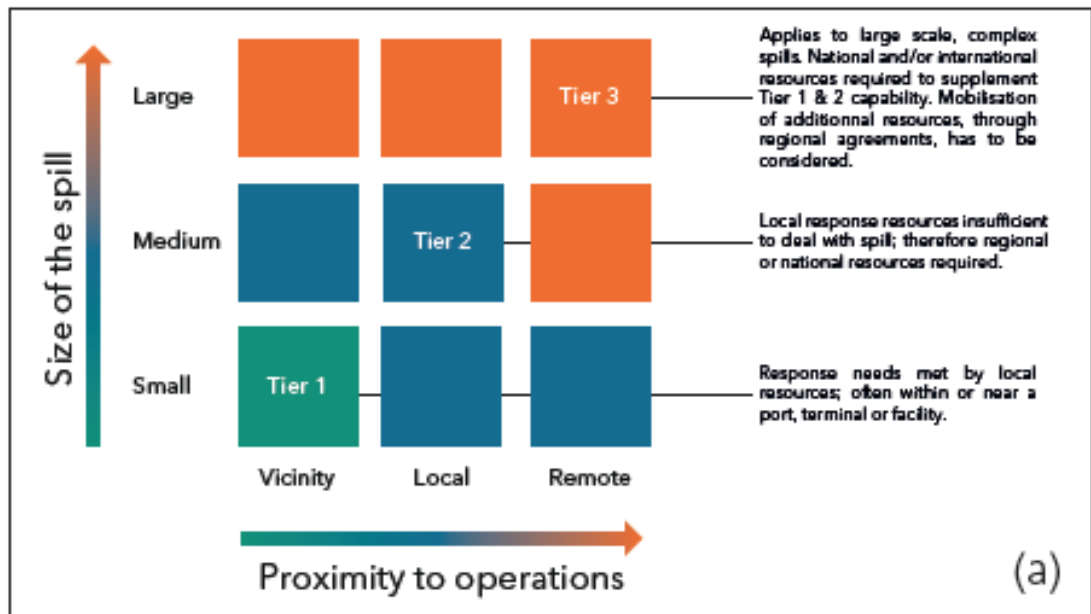
- (a) Be commensurate with the assessed risk.
- (b) Encourage cooperation, mutual assistance and integration of shared resources.
- (c) Be fully scalable via mechanism of escalation through the three tiers.
- (d) Be tested, maintained and verified as part of defined preparedness framework.
- (e) Employ the most appropriate response options, reflecting a Net Environment Benefit Analysis (NEBA).

8.6.2. Response capability and contingency plan of an organisation should be directly proportional to potential spill scenarios and cover each tier appropriately. It is important to understand that tier system is strictly for planning purposes and in the event of any spill, resources necessary to adequately respond to the spill must be mobilised regardless of the tier level. The resources held at three tiers work to complement and enhance the overall capability by enabling seamless escalation as required during the incident. Tiered response is to be understood as concept of cumulative response. The elements of Tier 1 response are supplemented by higher tier capability and not superseded or replaced with it. In an oil spill response organisation, there is a three tier concept, similarly levels of HNS response are defined as follows:-

(a) Tier 1 capabilities describe the operator's locally held resources used to mitigate spills that are typically operational in nature occurring on or near an operator's own HNS facility. The resources also should provide an initial response to spills that may potentially escalate beyond the scope of Tier 1 initial conditions and capabilities. **In the Indian scenario, the seaports, HNS Facilities and the Coastal State would be having Tier I responsibility in their respective area. The Coastal State, Ports and HNS facilities along the coastline of India are to undertake risk assessment while deciding the level of response required and the same has to be reflected in the inventory** in their area of responsibility.

(b) Tier 2 capabilities are additional, often shared national or regional resources necessary to supplement a Tier 1 response or support an escalating response. Tier 2 capability includes a wider selection of equipment and expertise suited to range of strategic response options. In the Indian scenario Tier 2 area of responsibility is the Maritime Zones of India but outside the limits of ports. **The Combat agency would be the Indian Coast Guard with the support of Tier I agencies and other resource agencies.**

(c) Tier 3 capabilities are globally available resources that further supplement Tier 1 and Tier 2. **The resource of the combat agency to be supplemented by the local, regional and national resources. They also comprise of the international resources necessary for spills that require a substantial external response due to the incident scale, complexity and/ or impact potential.**



8.6.3. A typical diagram indicating tiered responsibilities are as given below: -

Figure 11: The Conventional Definition of Tiered Preparedness and Response (Source Marine HNS Response Manual Regional Bonn Agreement, HELCOM, REMPEC, 2021, Pg 45)

8.7. Resource Agencies

8.7.1. The list of government departments and agencies that will act as resource agencies as required to support the combating of marine HNS pollution is at **Appendix K**³⁷.

8.8. Place of Refuge

8.8.1. Indian coast has significant traffic passing close to it but not calling Indian ports. The Indian coast is vulnerable to incidents involving passing traffic, especially in heavy weather in monsoons. It is difficult to deal with maritime casualty expeditiously and till the time the assistance arrives the casualty is at the mercy of perils of open sea. The longer the damaged ship is exposed to perils at sea the greater the chance of marine pollution. Therefore, a place of refuge with favourable conditions are require for the ship to stabilize its conditions, protect the human life, and minimize environmental hazard. The International Convention on Salvage 1989 places an obligation on

³⁷It is a proposed composition as there is no approved numbers of resource agencies. A case may be progressed for including the proposed numbers of resource agencies in the Contingency Plan.

response authorities to take into account the need for cooperation between various parties concerned in a salvage operation, including public authorities, when considering admittance of damaged vessels to ports. It is ideal to pre-designate places of refuge; however, where no pre-designated place exists, it is imperative to have policies in place to enable the selection of a place of refuge.

8.8.2. The Coastal State Government is required to adopt specific policies on places of refuge as part of its contingency plan, and these should be followed as appropriate. Regardless of whether places of refuge are pre-designated or not, the following criteria form the basis for their selection: -

- (a) Adequate water depth.
- (b) Good holding ground.
- (c) Shelter from the effect of prevailing wind/ swell.
- (d) Relatively unobstructed approach from seaward.
- (e) Environmental classification of adjacent coastline and fisheries activity.
- (f) Access to land/ air transport.
- (g) Access to loading/ unloading facilities for emergency equipment.

8.8.3. Guidelines on places of refuge are at **Appendix L**. The checklist for grant of refuge to a ship in need of assistance developed based on the IMO guidelines is at **Table L-1** and pro forma for Risk Evaluation of place of refuge is at **Table L-2**.

Chapter-9: Contingency Planning

9.1. Objectives

9.1.1. An effective contingency plan is made based on the risk assessment³⁸. It is an operational document containing actions and procedures to be implemented in case of a spill³⁹. It should contain practical requirements necessary for implementation at the time of crisis. The contingency plan should contain all actions that is required to mitigate the impact of the spill on people, environment and properties⁴⁰.

9.2. Salient Aspects of the Contingency Plan

9.2.1. The plan should comply with legal frameworks and internal policies. It should provide framework for⁴¹: -

- (a) Establishing alert, communication procedures and immediate actions to be implemented.
- (b) Define roles and responsibilities.

9.2.2. Develop complex response in a non-emergency situation free from pressures⁴²: -

- (a) Prioritise sites from protection.
- (b) Specify response strategies and techniques.
- (c) Identify and allocate resources to be mobilized.

9.3. Responsibilities of Various Agencies in Maintaining Contingency Plan

9.3.1. Statutory Agencies supported by Combat Agencies, are primarily responsible for ensuring that contingency plans are developed at national level, State, regional and local levels, and that these plans complement adjacent plans.

³⁸ Marine HNS Response Manual Multi-regional Bonn Agreement, HELCOM, REMPEC, pg 39

³⁹ Marine HNS Response Manual Multi-regional Bonn Agreement, HELCOM, REMPEC, pg 39

⁴⁰ Marine HNS Response Manual Multi-regional Bonn Agreement, HELCOM, REMPEC, pg 39

⁴¹ Marine HNS Response Manual Multi-regional Bonn Agreement, HELCOM, REMPEC, pg 39

⁴² Marine HNS Response Manual Multi-regional Bonn Agreement, HELCOM, REMPEC, pg 39

9.3.2. Statutory Agencies may be supported by National Plan State Committees and will provide advice and support to Combat Agencies during pollution incidents.

9.3.3. The National HNS Spill Contingency Plan will be maintained by the Indian Coast Guard Headquarters with inputs from, and in consultation with, stakeholders and resource agencies to the national plan. The Regional Headquarters of the Indian Coast Guard at Gandhinagar, Mumbai, Chennai, Kolkata, and Port Blair with inputs from, and in consultation with, stakeholders and resource agencies will supervise the implementation of plan at state level in accordance with the jurisdiction.

9.3.4. The State HNS Spill Contingency Plan will be maintained by the Commander Coast Guard of the respective coastal state/UT of the Indian Coast Guard with inputs from, and in consultation with, stakeholders to the district plan.

9.3.5. The Local Contingency Plan for shoreline cleanup will be maintained by the Coastal State, district wise in the form of State HNS Spill Contingency Plan with inputs from, and in consultation with, stakeholders in the respective coastal state. The local contingency plan should include the following or a cross reference to where such advise can be located: -

- (a) The mechanism for escalating the response in accordance with the tiered response concept; guidance on what equipment and personnel is at the disposal of the SRC, including neighboring local authority resources.
- (b) Arrangements for establishing working accommodation and catering arrangements for members of the SRC and Environment Group and other groups involved in the incident who may need to be in the area away from their own base.
- (c) Arrangements for handing the media, including the logistics of their presence.
- (d) Temporary, intermediate, and final sites and routes for the recovery, rescue, or final disposal of waste.
- (e) Maps, clearly depicting sensitive sites, access points, terrain types etc.
- (f) Guidance on the health and safety of workers involved in

preventing measures and clean-up activities.

(g) Financial implications of coastal pollution and actions that can be taken for cost recovery.

Chapter-10: Contingency Plan of HNS Facilities and Emergency Plan for Ships

10.1.1. Article 4.1 of the OPRC HNS Protocol imposes requirement on authorities and operators of facilities, ports and administration of the Coastal States to have HNS pollution emergency plans or similar arrangements which are coordinated with the National Preparedness and Response System as deemed appropriate by the designated National Authority or Competent National Authority (CNA)⁴³. Such requirement for developing contingency plans for facilities, Ports and Coastal States/ UTs is determined in part by national legislation and by the international conventions like in this case OPRC HNS Convention. The formation of local contingency plan may be entrusted to major stakeholders such as facilities, ports, refineries and Coastal States/ UTs who will submit each deliverable for validation by the Coastal State. In addition, for each specific section of the plan, complementary resources and expertise may be mobilized by the Coastal State. Broadly, the Local Contingency Plan must address the following:-

- (a) Identification of risks related to substances handled or transported.
- (b) Identification of potential stakeholders and their responsibilities.
- (c) Inventory and preparation of equipment (protective equipment, response equipment).
- (d) Actions to be taken in the event of a spill.
- (e) Training of persons liable to be involved in response.

10.1.2. Every ship is required by MARPOL regulations to maintain a SMPEP (Shipboard Marine Pollution Emergency Plan) approved by the Flag State Administration. The Merchant Shipping (Control of Pollution by Noxious Liquid Substance in Bulk) Rules, 2010 and Merchant Shipping (Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form) Rules, 2010 requires maintenance of a pollution emergency plan by Indian ships approved by the Administration or Recognized Organisation acting on its behalf.

10.1.3. Every seaport facility and offshore installation and every installation on shore with risk of chemical/HNS pollution is required to

⁴³ OPRC-HNS Protocol, International Maritime Organisation, 2002, Art 4

maintain a facility contingency plan approved by the ICG. The format of following will be similar to **Appendix M** :-

- (a) The Facility Contingency Plan.
- (b) The guidelines for contingency plan for pipelines carrying chemicals.
- (c) Environmental Sensitivity Index Mapping Guidelines.
- (d) A Certificate of Endorsement and Certificate of Compliance is required to be submitted along with a facility contingency plan.
- (e) MSDS is required to be submitted by ports, terminals, installations, in respect of chemical/HNS handled at such facilities.

10.1.4. The contingency plan should describe implementation process towards response to HNS spill by the facilities, ports or coastal States/ UTs. The general sequence of implementation may be as follows, although many other steps are conducted in parallel:-

- (a) Initial spill and hazard assessment.
- (b) Notifying the concerned authorities.
- (c) Initial response actions including controlling the source, securing the area, ensuring safety of responders, public and others.
- (d) Mobilising the resources.
- (e) Activation of response organisations.
- (f) Development and implementation of response strategies.
- (g) Decontamination, demobilisation, termination of the response and debrief.

10.1.5. **Validation.** A contingency plan must be tested through exercises in order to ensure that it is relevant and that the personnel likely to be mobilised to implement the plan are fully familiar with it. Through training and exercises, contingency plans can be implemented, validated and improved. Training and exercises carried out on a regular basis, aimed at:-

- (a) Providing responders with knowledge of how to minimise impacts on human health and the environment due to HNS spills in the ecosystem.
- (b) Familiarising stakeholders with response methods aiming to minimise the effects of chemical pollution and techniques to recover or neutralise chemical substances.
- (c) Exchanging expertise, experience, and opinions amongst stakeholders.
- (d) Enhancing the capability of institutions tasked with managing maritime emergencies because they are likely to differ from other incidents.
- (e) Regularly checking the applicability of the HNS contingency plan and making any necessary improvements.
- (f) Improving the overall response capability.

10.1.6. **Training.** Providing training and organising exercises for response teams are the best ways to improve the overall response capability. All personnel liable to be called upon to handle hazardous materials must acquire specific knowledge and skills. In particular, they must be familiar with:-

- (a) The intrinsic hazards of various substances, in particular by referring to the UN Recommendations on the Transport of Dangerous Goods (TDG) and understand their fate and behavior.
- (b) All relevant sources of information, such as Material Safety Data Sheets (MSDS), dangerous good declarations, shipping documents, as well as all other relevant documents.
- (c) Protective equipment and clothing.
- (d) Chemical detection kits.
- (e) Emergency procedures, first actions to implement.
- (f) Specialised response strategies, techniques and equipment.
- (g) Methods and procedures for communicating clearly as per the communication plans.

10.1.7. **Exercises.** Regular and realistic exercises are essential for validating the response plan and response capability and enable all parties involved to maintain and improve the theoretical and technical knowledge acquired during training. The frequency of the exercises will be similar to Pollution Response Exercises. For instance, both the exercises may be clubbed together. Scope of exercise may include:-

- (a) Clarify roles and responsibilities.
- (b) Optimise communications within CMG.
- (c) Meet and exchange with various people involved in the response, integrate the procedures set out in the contingency plans to be validated or updated.
- (d) Validate the response capabilities.
- (e) To effectively prepare first responders, various types of exercises should be organised as part of an exercise programme.

10.1.8. **Revision and Updates.** The facility contingency plans are to be updated at least annually and revised at least once in every five years. Whenever there is a significant change in any of the elements underlying the plan or following an incident or organizational change, or when new protection or response measures become available the plan shall be revised. The occasions for revision could include, but may not be limited to; any major changes in the level of HNS transport activities, populations or neighbouring industrial activities require a revised risk analysis addition to capacity, change in traffic density, change in risk, etc. Obtaining fresh approval is mandatory when revising a facility contingency plan. The Ministry of Shipping will provide to the Ministry of Defence and the Indian Coast Guard, and update from time to time, the list of sea port facilities required to maintain a facility HNS spill contingency plan. Each holder of a plan is required to submit an annual report on preparedness to the CCA, namely, The Director General Coast Guard, along with a copy sent to the local Coast Guard Authorities, the State District Administration and such other authorities as may be necessary. The formats for the annual returns are placed at **Appendix N**.

10.2. Template for Facility Contingency Plan

10.2.1. Every owner or operator of a port facility or an installation handling HNS near coastline is required to maintain HNS spill contingency plan duly approved in accordance with this plan. The elements of the facility

contingency plan is placed at **Appendix M**. They may be used either as a guiding template when writing a new contingency plan or as a checklist when reviewing an existing plan. The plan elements outlined are, however, not to be construed as being either restrictive or exhaustive in nature. A contingency plan will typically comprise of three parts:-

- (a) A strategy section, describes the scope of the plan, its geographical coverage, perceived risks, roles and responsibilities of those charged with implementing the plan and the proposed response strategy.
- (b) An action and operations section specifies the emergency procedures that will allow rapid assessment of the spill and mobilisation of appropriate response resources.
- (c) A data directory containing all relevant maps, resource list and data sheets required to support an HNS spill response effort and conduct the response according to an agreed strategy.

10.3. Vetting of Contingency Plans of Ports/ HNS Handling Agencies

10.3.1. The of vetting of contingency plans of Ports, facilities and the coastal States/ UTs shall be undertaken by a Committee constituted by CNA drawing members from concerned ministries and stakeholders. Table top exercises, functional exercises and full-scale exercises may be exercised during the visit of the committee members. Table top exercise will involve concerned participants with informal settings to discuss their role and response during a spill incident. Functional exercise helps in validating plan by allowing participating personnel to perform their duties in the simulated environment. It also ensures exercising specific teams alongwith procedures and resources that may entail to promote familiarity with the equipment and its intended working. The visit of committee will be scheduled by CAN when the readiness for vetting the plan is intimated by the committee. The committee will give recommendations on the shortcomings or deficiencies in the plans which need to be liquidated by the facilities in a time bound manner. Thereafter the facility plan has to be approved by the competent authority administering the facility.. The depositary of approved contingency plan will be the CNA.

10.3.2. Assessment/vetting procedure for HNS facility/ports is placed at **Appendix P**.

10.4. Minimum Equipment Requirement By HNS Facilities

10.4.1. The minimum equipment requirement by HNS facilities are given in **Appendix Q**.

10.5. Emergency Plan for Ships Carrying HNS Cargo

10.5.1. Regulation 17 of MARPOL Annex II mandates ships to carry a "Shipboard Marine Pollution Emergency Plan (SMPEP) for HNS" which must be coordinated with national systems for responding promptly and effectively to HNS pollution incidents. Whether acting as Flag State or Port State, countries should ensure that these plans onboard ships are complete and should address communication capabilities required to adequately respond to HNS spill. The requirements of contingency plan onboard ships will be determined by the national legislation and the relevant international conventions. The majority of ships operating commercially are required to comply with the provisions under MARPOL to have onboard an operational SMPEP, describing the actions to be taken following a pollution incident, including the procedures for reporting to an authority on shore. The vessel crew onboard should be well versed with SMPEP. Prompt measures are expected from the crew to minimise or manage the discharge of HNS and establish protocols and contact points for this purpose.

10.5.2. The Merchant Shipping (Control of Pollution by Noxious Liquid Substance in Bulk) Rules, 2010 (MARPOL Annex II) and Merchant Shipping (Prevention of Pollution by Harmful Substances carried by Sea in Packaged Form) Rules, 2010. (Annex-III) shall be complied by Indian Ships.

Chapter-11: The Organizational Relationship of the Various Stakeholders Involved

11.1. Engagement Matrix Between Main Stakeholders

11.1.1. The stakeholders are a group or organisation with an interest in or concern for response preparedness and likely to be consulted or participate in spill response⁴⁴. Engagement with stakeholders is a key to a successful contingency planning process and response⁴⁵.

11.1.2. Early identification of stakeholders and consistent engagement throughout the contingency planning process should lead to meaningful discussions and the resolution of conflicting interests and opinions while in a non-emergency situation⁴⁶. It also provides planners with the opportunity to identify important environmental resources and socio-economic features and their value to the community, a keystone before contingency plan drafting⁴⁷.

11.1.3. The figures below represent the engagement matrix between main stakeholders (onshore and offshore) involved in the preparedness process and HNS spill response.



Figure 12: Attributes and Main Task of Effective Stakeholders Involved in a Spill Response (Source Marine HNS Response Manual, Multi-regional Bonn Agreement, HELCOM, 2021 pg 33)

⁴⁴ Marine HNS Response Manual, Multi-regional Bonn Agreement, HELCOM, 2021 pg 33

⁴⁵ See note above

⁴⁶ See note above

⁴⁷ See note above

11.2. Role of Agencies and Stakeholders

11.2.1. The role of main agencies and stakeholders after an event of spill of HNS in the marine environment is as depicted in the tables as given below⁴⁸.

Authorities	Expertise	Concerned Parties
<p>Coast Guard –R, I Lead or oversee the response depending on the scale of the incident. Liaise with other government agencies in particular when potential impacts are expected on land</p>	<p>Aerial/Maritime/Shoreline / Wildlife expertise, Public health specialist-R, I, DP</p>	<p>Sea professionals , tourists industry – D, R, T, I May suffer economic losses (due to interruption of activity or spill). May be involved in response (logistics or operations). May claim for compensation under national or international legislation</p>
<p>Civil defense/Fire brigade/First HNS responders - R, I Usually lead the first actions response and works with salvors to take the first measures onboard or on the shore</p>	<p>Environmental protection agencies - R, I, DP Provide specific input and make recommendations on their field of expertise during response operations and damage assessment</p>	<p>Local communities - D, T, I, DP May suffer from health hazards (loss of life, injuries) and financial loss due to the exposure to the substance(s) spilled (loss of recreational</p>

⁴⁸ Marine HNS Response Manual, Multi-regional Bonn Agreement, HELCOM, 2021 pg 33

Authorities	Expertise	Concerned Parties
		space, loss of activities due to lockdown).
Local/Regional/National authorities - R, T, I, DP Liaise with the at sea responders and are involved mostly if spill is likely to impact the shore	Chemical expertise - R, I, DP MARICE network, CEFIC, Chemical industries, manufacturers. Useful sources of information of the substances, their behaviour and how to handle a spill.	NGOs - T, DP
Elected officials - D, R, T, I, DP	Surveyors/ Technical advisers R, I, DP Government, department, agencies or independent technical specialists. Carry out surveys, make recommendations on their field of expertise. Assess and propose strategies, techniques.	Media - T, I, DP
Harbour master - D, R, T, I, DP		
Terminal operator - D, R, T, DP		

Table 6: Role of Main Agencies and Stakeholders after an event of spill

Liabile Parties	
Ship Owner <i>Responsible for carrying out the response supervised by authorities, until they take the entire responsibility of it. May be represented on site by a local shipping agent (DPA, Designated Person Ashore), surveyors or lawyers.</i>	D, R, T, I, DP
Cargo Owner <i>Support response efforts by providing precise information on the cargo. May participate in the clean-up or waste treatment if they have the necessary resources available.</i>	D, R, T, I, DP
P&I - 3rd party insurers. <i>Assist the shipowner in dealing with the incident, legal advice, finding appropriate advisers/contractors, approving claims. Represented on site by a local correspondent.</i>	R, T, I, DP
Expert for P&I (ITOPF)	I, DP

<i>Mobilised by the P&I Clubs and make recommendations on their field of expertise.</i>	
Responders	
Salvage contractors <i>Usually appointed by the P&I Club, ship owner or authorities. Lead the effort to salvage the ship and reduce environmental damage caused by the ship or its cargo at source. May appoint additional experts (e.g. marine chemists).</i>	R, T, DP
Clean-up Contractors <i>Contracted by the ship owner, P&I Club or authorities. Provide the equipment and workforce for response activities.</i>	D, R, I
Public responders <i>First responders (Firemen, civil defence, etc.) or member of administration, local communities, harbours.</i>	D,R,I
Volunteers	D, T, DP
Indian Coast Guard <i>Usually lead or oversee the response depending on the scale of the incident. Liaise with other governmental agencies in particular when potential impacts are expected on land</i>	R, I
Civil defense/Fire brigade/First HNS responders - <i>Usually lead the first actions response and works with salvers to take the first measures on board or on the shore</i>	R, I
Local/Regional/National authorities - <i>Liaise with the at sea responders and are involved mostly if spill is likely to impact the shore</i>	R, T, I, DP
Elected officials	D, R, T, I,
DP Harbour master	D, R, T, I,
DP Terminal operator	D, R, T, DP
Environmental protection agencies - <i>Provide specific input and make recommendations on their field of expertise during response operations and damage assessment</i>	R, I, DP
Chemical expertise - <i>MAR-ICE network, CEFIC, Chemical industries, manufacturers. Useful sources of information of the substances, their behaviour and how to handle a spill.</i>	R, I, DP
Surveyors/Technical advisers <i>Government, department, agencies or independent technical specialists. Carry out surveys, make recommendations on their field of expertise. Assess and propose strategies, techniques.</i>	R, I, DP
Sea professionals, tourist industry - <i>May suffer economic losses (due to interruption of activities or spill). May be involved in the response (logistics or operations). May claim for compensation under national or</i>	D, R, T, I

<i>international legislation.</i>	
Local communities <i>May suffer from health hazards (loss of life, injuries) and financial loss due to the exposure to the substance(s) spilled (loss of recreational space, loss of activities due to lockdown).</i>	D, T, I, DP
NGOs	T, DP
Media	T, I, DP

Table 7: Role of Liable Parties and Responders

D = Dependency, those who are directly or indirectly dependent on the organisation or those whom the organisation is dependent upon for operation;

R = Responsibility, those towards whom the organisation has, or in the future may have, legal, operational, commercial, or moral/ethical responsibilities;

T = Tension, groups or individuals who need immediate attention with regard to financial, wider economic, social, or environmental issues;

I = Influence, those who can have an impact on strategic or operational decision-making;

DP = Diverse perspectives, those whose different views can lead to a new understanding of the situation and identification of unforeseen opportunities

Chapter-12: Response Termination and Demobilization

The termination and demobilisation Plan should be a part of the HNS Contingency Plan with due regard to the Release Priorities and dynamics of the ongoing spill response and impacts of the Spill. A prior authorisation is to be availed prior executing termination and demobilisation.

12.1. Termination

12.1.1. The NOSC, ROSC, DOSC and LOSC may include a consultative approach on advice of Environmental Group to terminate joint spill response Operations. The Lead Members considers that pollution response measures have been finalised or completed to a point where the benefits of further counter pollution measures would not be justified by their cost , or that the response capabilities and resources of the Lead Member are sufficient for successfully finalising them, provided that the other stakeholders and Environmental Group involved agree that the pollutant does not further threaten their interests, and further continuance will not accrue tangible benefits.

12.1.2. After the decision has been taken to terminate the joint HNS Spill Response, the LOSC should immediately inform the stakeholders involved regarding the decision and the operational actions to deactivate the Plan. Following the deactivation of the Plan, the requesting member should release all personnel, equipment, vessels, aircraft, unused materials etc. which took part in the JROs for return to their respective Members of origin. No units, personnel, or equipment will leave the incident until authorized to do so. All equipment used by other responders should preferably be returned to its owners after cleaning and, if possible, in working order. In the case of HNS equipment, it will be fully decontaminated. It is the responsibility of the respective responder and owner of the equipment to check it and to compile an inventory of the equipment returned, and its condition. The check should if possible be carried out with, and be agreed between, the requesting and assisting stakeholder before the equipment leaves control of requesting stakeholder. Any defects or shortfalls found subsequently should be notified immediately to the requesting stakeholder for further financial settlement.

12.1.3. The LOSC/DOSC/NOSC as the case may be should take all possible measures to facilitate the departure from Action Area or airspace of all units rendered as assistance.

12.1.4. Each responder and stakeholders are to submit final Incident

Report to the LOSC/DOSC/NOSC in the form of a consolidated report of the whole incident including the effectiveness of the personnel, equipment, products and other means.

12.2. Points Pertinent to Demobilisation

12.2.1. Some of the common points pertinent to demobilisation are as under:-

- (a) Safety of all personnel is paramount during demobilization.
- (b) Ensure demobilization information contained is disseminated in sufficient time to ensure the timely and orderly downsizing of the incident resources.
- (c) Submit proposed release of resources for IC/UIC approval.
- (d) Identify and communicate excess personnel, equipment, and resources available for demobilization.
- (e) Coordination of transportation including required approvals for all personnel and equipment to their final destinations.
- (f) Conduct of briefing and passing special instructions to all responders and stakeholders.
- (g) Evaluate logistics and transportation capabilities required to support demobilization.
- (h) Supervision/Monitoring of Demobilisation by Incident Command Team leaders.
- (j) Special attention to decontamination and waste management disposal and approvals.
- (k) All units to fill up demobilisation check list and submit upon completion.
- (l) If contracted communications devices/equipment (e.g. cell phones, radios, etc.) is to be demobilized, ensure they are cleaned and checked for full operation, prior to returning them to the contract source.
- (m) Consolidated Billings/Invoices are to be promptly forwarded to

the ICS Finance Chief/Appropriate Logistics/Claim processing authority.

Chapter-13: Post Operational Activity

13.1. Monitoring Incident Site

13.1.1. Assessment of the extent and severity of impacted environmental compartments is based on three main components of monitoring methods.

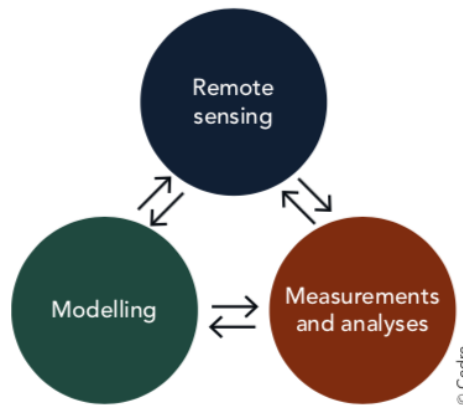


Figure 13: Main Components of Surveying and Monitoring

13.1.2. These monitoring systems are complementary and might all need to be considered during a response. Indeed, remotely sensed data needs to be verified with in situ data, while models rely on in situ measurements and remote sensing. The integration or consultation of environmental monitoring experts in the Incident Management Team is recommended.

13.2. Responsibility for Monitoring

13.2.1. The Environment Group with the support of response units and other resource agencies would monitor the spill impacts. Response units will make all reasonable efforts to consult the Environment Group, or its Chair, about any proposed action that is likely to have lasting impact on the environment. If time does not permit the response unit to consult before acting, it will circulate a written report to the Environment Group and all other response units as soon as possible after the action (or decision) has been taken.

13.2.2. The statutory environment protection or fishery authority will consult locally with members of the standing Environment Group. The Coast Guard would initiate the request on the relevant civil administrative authority for the formation of the Environment Group depending upon the circumstances. The core membership of the Group may include the relevant

statutory authorities, relevant civil administration authorities, forest and wildlife authorities, fisheries authorities, Block Development Officer, local public health officials, IITR under CSIR, and relevant Non-Governmental Organisations (NGOs) for appropriate expert advice. The Ministry of Earth Sciences/Dept of Ocean Development, National Institute of Oceanography can provide sensitivity mapping, utility of Coastal Ocean Monitoring and Prediction System (COMAPS) and organize research on impact of pollution on marine life based on actual incident. The Coastal State/ UT Governments and State Pollution Control Boards (SPCBs), NGOs, Central Marine Fisheries Research Institute (CMFRI), Integrated Coastal and Marine Area Management Project Directorate, National Biodiversity Authority, etc., amongst others can provide valuable inputs to the Environmental Group.

13.2.3. The objectives of monitoring mentioned earlier must be prioritised and integrated in a coordinated monitoring programme to avoid duplication of work, as well as to avoid missing chances of important measurements. It must be accepted that the survey strategy may continue after the response phase and will cover long- term clean-up or environmental follow-up. The Environmental Group should continue their activity during the whole period, including post-spill. The objective is to gather information potentially from multiple sources or various locations over a period of time to obtain a better/more accurate overview of the situation.

13.3. Long Term Monitoring Programme

13.3.1. Post-spill monitoring is a very useful activity, in order to evaluate the: -

- (a) Environmental consequences of an HNS spill and the extension of the effects both in space and in time.
- (b) Natural recovery of the environment involved as well as the effectiveness of any restoration and recovery activities and assess when these activities are considered to be complete.

13.3.2. This is a very complex matter; therefore, it could be considered in a post-spill monitoring guide included in the contingency plan to define the objectives to be achieved and strategies for sampling, transport and analysis of sediment samples, water, and marine organisms. It is especially necessary in case of spills of significant quantities of pollutants and in the case of permanent substances in the marine environment and/or products with long-term effects (e.g. mutagenicity and carcinogenicity effects).

13.3.3. To perform good post-spill monitoring, the quality of data acquired during the emergency phase is important and especially useful for understanding the behaviour of substances involved and their final fate in the marine environment. This allows the biota most involved (seafloor, shoreline, water column ecosystems) to be identified and investigations to focus on these. For this reason, field activities must be preceded by a detailed post-spill monitoring plan.

13.3.4. Monitoring is usually carried out by comparing data obtained with baseline data, when available, or with data measured at a reference site, chosen with environmental and morphological characteristics similar to those of the affected area but certainly not affected by spilled pollutants. Choosing a reference site is a challenging process due to the difficulties in identifying an area with characteristics very similar to those of impacted one, where there are no other possible impacts that alter its characteristics. Statistical comparison of results obtained in terms of chemical, biological, ecotoxicological and ecological status analyses leads to an understanding of the extent of negative effects on the affected area.

13.3.5. The monitoring strategy must prioritise surveys on matrices that are representative of the environment that is intended to be assessed. For this reason, analyses of marine sediments are a priority with respect to water and air, which will move on, driven by sea currents and winds. The choice of organisms to be sampled must also take the same approach: sampling of specimens that live in close contact with the bottom (sedentary species with a small home range) compared to species that have more erratic behaviour (e.g. pelagic fish).

13.3.6. Post-spill monitoring uses a multidisciplinary approach to acquire evidence; common elements monitored to assess impact could include ecological community structure (abundance, diversity, etc.), sub-lethal biomarkers of effect in a range of species (e.g. enzyme levels, reproductive and behavioural parameters), contamination and/or tainting in commercial species, ecotoxicological assessments of contaminated water/sediment and recovery and recruitment measurements in the affected area. Besides, many central and state authorities, the role of Fisheries Authorities, NGOs and Indian IITR (formerly known as Industrial Toxicology Research Centre (ITRC)) under the Council of Scientific and Industrial Research (CSIR) will be instrumental in analysing the impact on the marine environment.

13.3.7. The investigations that could be taken into consideration during post-spill monitoring include:-

- (a) Chemical analysis of samples, mainly sediment and possibly air and water.
- (b) Biological assays on sediment and water samples.
- (c) Ecotoxicology of specimens of sedentary marine organisms.
- (d) Assessment of the ecological status of characteristic populations of the area.

13.4. Chemical Analysis

13.4.1. Chemical analyses are mainly conducted on sediments which represent the sector of the marine environment indicating long-term pollution. Investigations that can be conducted are both generic and specific to the pollutants involved; particle size, pH and Eh, Total Organic Carbon (TOC), concentrations of pollutant(s) and their degradation products. Granulometry (particle size) is an important value to know, because smaller particles are more able to "retain" pollutants, therefore fine-grain sediment is a better matrix in which to search for the presence of spilled substances.

13.5. Biological Assays

13.5.1. A biological assay (or bioassay) is an analytical method to determine the concentration or potency of a substance by its effect on living animals (in vivo) or tissue/ cell culture systems (in vitro). In practical terms, the water or sediment sample is placed in contact with living marine organisms or with cells or tissues and specific variations are observed such as: the presence of the contaminant in the tissues; alteration of enzymatic activity, change in mortality rate, change in larval development, etc. Comparison with results obtained with similar samples taken in the reference area provides indications of effects related to the presence of pollutant(s).

13.6. Ecotoxicology

13.6.1. Many analyses conducted with bioassays can be applied to specimens of marine organisms taken from the affected and reference areas. In this case, researchers are applying ecotoxicology. As mentioned above, the use of sedentary species is important because their health status can be an indicator of the state of the environment studied. Examples of sedentary organisms are fish such as rockfish, scorpion fish, conger eel or moray eel, sea urchin, mussels.

13.7. Assessment of Impacted Area's Ecological Status

13.7.1. Assessment of the ecological status of some characteristic biocoenosis (living communities) will facilitate to evaluate the effects at ecosystem level present in the area. Some characteristic parameters of each biocoenosis are analysed, which are based above all on the abundance and diversity of species, whose values are used to establish specific indices that help to define the ecological status which is usually expressed with qualitative evaluations such as high, good, sufficient, insufficient, poor. Assessment of the ecological status can be conducted on the water column, on typical populations of the seabed or on the shore.

13.8. Monitoring of Personnel During and Post Incident

13.8.1. When response activities are conducted where atmospheric contamination is known or suspected to exist, Personal Protective Equipment (PPE) must be worn. PPE is designed to prevent/reduce skin and eye contact as well as inhalation or ingestion of the chemical substance.

13.8.2. Protective equipment to protect the body against contact with known or anticipated chemical hazards are divided into four categories Level A-D.

Level	Remark
A	Highest level of respiratory, skin, and eye protection.
B	Highest level of respiratory, skin, and eye protection; The breathing apparatus is worn outside the suit.
C	The types of airborne substance is known and the criteria for using air purifying respirators are met.
D	A work uniform affording minimal protection, used for irritating contamination only.

Table 8: Protective Equipment Categories

13.8.3. Level A protection should always be used if the airborne substances are unidentified. The type of environment and the overall level of protection should be reevaluated periodically during the operation when more information is gained about the hazards.

13.9. Decontamination

13.9.1. Decontamination aims at removing or neutralising contaminants that have accumulated on personnel and equipment. It is critical to health and

safety at hazardous waste sites. Different methods can be used depending on the nature and behaviour of the chemical; they can be physical, chemical or a combination of both. A decontamination plan, linked with waste management, is a necessary step and should be prepared before a response is set up.

13.9.2. Decontamination should be well organised and a team of trained operators, in-charge of decontamination, should be led by a person in-charge of conducting and supervising the decontamination process. Depending on the subjects to be decontaminated, some method(s) should be identified as well as procedures to implement them in a defined area of decontamination. The following figure highlights key points to be considered in order to establish a decontamination plan. The subjects to be decontaminated, as well as the method(s) and layout, are enumerated in succeeding paragraphs.

13.9.3. Decontamination should be conducted on three possible subjects:-

(a) Decontamination of accidentally exposed personnel: personnel may be exposed immediately after the spill or after cross-contamination. In these cases, refer to Safety Data Sheet content and contact a doctor.

(b) Decontamination of responders after intervention: even if no exposure has been noticed, each responder should undergo a decontamination process. Surface contamination should be considered along with contamination due to permeation and influence of contact time, concentration, temperature and physical state.

(c) Decontamination of equipment (including response vessels) should also be thoroughly considered as, depending on the pollutant, it can be time-consuming and expensive.

13.10. Monitoring of Response Personnel

13.10.1. During an incident, it may be necessary for rescue and response teams to board the vessel in distress to carry out evacuations (MEDEVAC), establish a towing connection, or conduct other response or salvage operations. Boarding can be done either via a smaller craft launched from a larger response vessel in the vicinity or by helicopter. Monitoring of response personnel and their activities therefore becomes instrumental for overall safety. For occupational health and safety, exposure limits are often stated for various routes of contact such as inhalation, dermal exposure, ingestion with different exposure times.

13.10.2. The Protective Action Criteria for Chemical (PAC) dataset uses a single set of values (PAC-1, PAC-2, and PAC-3) for each chemical, but the source of those values are likely to vary depending on data availability. During an emergency response, PACs can be used to evaluate the severity of the event, to identify potential outcomes, and to decide what protective actions should be taken. Each threshold stands for:-

- (a) **PAC-1:** Mild, transient health effects.
- (b) **PAC-2:** Irreversible or other serious health effects that could impair the ability to take protective action.
- (c) **PAC-3:** Life-threatening health effects. The PAC dataset uses various occupational exposure limits, which are explained below.

13.10.3. The international term **Threshold Limit Value (TLV)** (equivalent to the EU Occupational Exposure Limit, EU OEL) of a chemical substance is the level to which a **worker** can be safely exposed 8 hours a day, 5 days a week without adverse effects. There are typically three categories of TLV:-

- (a) **Threshold Limit Value- Time-Weighted Average (TLV-TWA)** for daily life-time exposure.
- (b) **Threshold Limit Value - Short-Term Exposure Limit (TLV-STEL)** for maximum exposure during a 15-minute period.
- (c) **Threshold Limit Value - Ceiling (TLV-C)** for maximum exposure at any given time.

13.10.4. To predict the severity of chemical exposure in humans, emergency response planners and responders use public exposure guidelines such as **Acute Exposure Guideline Levels (AEGl)**. AEGls are expressed as concentrations of airborne chemicals at which health effects might occur following "rare/once in a lifetime" exposure. They are calculated for five exposure periods (10 minutes, 30 minutes, 1 hour, 4 hours, and 8 hours) and concentrations are given in three "levels":

- (a) **AEGl Level 1:** the concentration predicted for the population to experience notable discomfort. The effects are not disabling and are transient upon cessation of exposure.
- (b) **AEGl Level 2:** the concentration predicted for the population to experience irreversible, serious, long-lasting health effects or an impaired ability to escape.

(c) **AEGL Level 3:** the concentration predicted for the population to experience life-threatening health effects or death.

13.10.5. Responders may also encounter the IDLH value (Immediately Dangerous to Life and Health), which is the maximum concentration from which one could escape within 30 minutes without irreversible adverse effects. In practice, if airborne concentrations are above the IDLH, SCBA must be worn. For a given chemical, several values and limits may be available, and it is useful to put these values into perspective for responders. Some atmospheric modelling software can estimate how a toxic cloud from a chemical release might travel and disperse. Such modelling results often include the visualisation of a "threat zone", which is the area where predicted hazards (such as toxicity, flammability, thermal radiation, or damaging overpressure) exceed a specific value.

13.11. Precautions by Response Personnel

13.11.1. All boarding options should be discussed in consultation with the casualty's master and other key personnel e.g. HNS experts, relevant authorities and the boarding team. When boarding the casualty via a response craft, the most practical means of access will depend on the vessel's specific layout; access to an up-to-date General Arrangement (GA), from the vessel's master or owner, will provide the required detail to establish a boarding plan. Furthermore, the vessel's fire and safety plan, in conjunction with crew communication to provide vessel-specific knowledge, can be particularly useful to guide the decision-making process when planning boarding operations.

13.11.2. Having crew members involved with the boarding party provides significant advantages with respect to locating and operating deck machinery e.g. to restore the vessel's power or establish a tow. Options for boarding from another vessel might include the pilot ladder, lifeboat ladders, gangway or stern ramp. When considering boarding the casualty via helicopter, it is important to keep in mind that landing on board a casualty will most likely not be possible, and instead a suitable winching location must be identified.

13.11.3. Prior to any teams boarding a casualty a Situation assessment must be carried out and the units/teams involved (e.g. boarding team, back-up team and decontamination team) must be informed of the action plan, associated tasks and have been given a briefing about the scenario the boarding team are likely to encounter on board. Roles and responsibilities need to be clearly defined and team members aware of the exit strategy and Decontamination plan (ideally primary decontamination should be conducted

on the vessel and secondary decontamination following disembarkation, if feasible).

13.11.4. In the case of chemical accident involving a hazardous vapour/gas cloud, it is crucial to bear in mind that all boarding and accident response must be performed from the opposite direction of the cloud. The risk of explosion/fire may be of further concern and will need to be considered prior to approaching the casualty. As for further safety precautions, emergency responders boarding a vessel should be equipped with appropriate PPE.

13.12. Debriefing of Incident Personnel

13.12.1. Every crisis management and incident response, independently of its size or nature, will be exposed to scrutiny. Such scrutiny can be helpful to learn lessons from past incidents and to improve the response for future operations. The main objectives of incident review are to:-

- (a) Draw lessons that are primarily of benefit to local stakeholders;
- (b) Keep track of events;
- (c) Identify avenues for progress;
- (d) Strengthening communication and co-ordination between different stakeholders during the response.

13.13. Compilation of Incident Report and Analysis of Lessons Learnt

13.13.1. Every crisis management and incident response, independently of its size or nature, will be exposed to scrutiny. Such scrutiny can be helpful to learn lessons from past incidents and to improve the response for future operations. The main objectives of incident review are to:-

- (a) Draw lessons that are primarily of benefit to local stakeholders;
- (b) Keep track of events;
- (c) Identify avenues for progress;
- (d) Strengthening communication and co-ordination between different stakeholders during the response

13.13.2. For this purpose, the incident review can be substantiated through the following items, depending on the size of the incident, statistics, briefing note/report or description and analysis of events for better understanding. Most of all, incident reviews as well as lessons learnt must be used to raise awareness and to update the contingency plan.

Chapter-14: Service Contracts and MoU

Considering wide variety of HNS, it requires specialized response functions and technical expertise, a wide range of service contracts, MoU and arrangements to facilitate training, technical co-operation and other support to those responding to HNS incidents.

14.1. Institutional Arrangement

14.1.1. The Service Contracts and MoUs are recommended for parties in following areas (not limited to): -

- (a) **Information Services**. To receive, collate and disseminate on request the information provided by stakeholders and relevant information provided by other services.
- (b) **Education and Training of Personnel**. Promote training in the field of preparedness for and response to pollution incidents.
- (c) **Technical Services**. To facilitate co-operation in research and development, provide advice to Coastal States/UTs, facilities, ships and pre-designated OSCs.
- (d) **Technical Assistance**. To facilitate the provision of technical assistance to responders and combat agencies. Also to facilitate technical assistance and advice upon the request from other countries under various other MoUs and Regional Frameworks.
- (e) Availing lab technologies and extending benefits of academics and research institutions in HNS spill response.
- (f) Optimizing efforts through collaborative approach with NDMA, SDMA, CIDM/NIDM, MoEF & CC, MoST, MoES, MoCF and other institutes dealing with Chemical Disasters.

14.2. International Co-operation

14.2.1. In the event of a major HNS spill incident, it is likely that additional overseas assistance may be sought from overseas in accordance with the OPRC-HNS Protocol. In such cases, customs and immigration authorities of ports and airports need to provide immediate facilitation for temporary import of equipment and personnel in order to transfer them in the scene of action expeditiously.

14.2.2. If resources in addition to the national resources are required to respond to an incident in India, then Oil Spill Response Limited (OSRL) will be called out invoking the membership of the concerned HNS company. The Indian Coast Guard, in accordance with current MoU and relevant International Conventions, may also assist neighboring countries in relation to HNS spill incidents in their waters.

14.3. Cross Border Incidents

14.3.1. In case of incidents close to International Maritime Boundary Line, or incidents which are likely to result in transboundary pollution, high-level consultation and cooperation will be maintained with the CAN or Authorities of concerned State(s), with due regard to the provisions of any Regional Contingency Plan or Memorandum of Understanding or other arrangement, with an objective to ensure a clear delineation of responsibility for the response.

14.3.2. In case of incidents close to State or Union Territory borders, high-level consultation and cooperation will be maintained between the two Statutory Agencies, with an objective to ensure a clear delineation of responsibility for the response.

14.3.3. Parties shall endeavor to conclude bilateral or multilateral agreements, service contracts and MoU towards preparedness. Copies of such service contracts and MoUs shall be communicated to the CNA and respective predesignated SOSC/DOSC.

Chapter-15: Regional Dimension/ Cooperation under SACEP/ Bilateral MoUs

15.1.1. OPRC HNS requires countries to cooperate and provide advisory services, technical support and equipment for the purpose of responding to HNS pollution incident on the request of the party affected or likely to get affected. Such cooperation generally results in regional agreements amongst a group of neighbouring countries or in the form of bilateral/ multilateral agreements. These agreements thereby result in development of regional contingency plans with declaration and establishment of coordination centres in one of the host countries or such coordination centres in the respective countries as the Point of Contact (POC) during any marine pollution response incident/ accident.

15.1.2. **Cooperation under Bilateral/ Multilateral MoUs and Regional Agreements.** The bilateral and multilateral agreements aim to establish a framework for facilitating operational aspects of marine pollution response within two or more countries. The agreement and plans should agree on following points of cooperation and may further dwell upon additional ones:-

- (a) Request for assistance during HNS spill incident.
- (b) Exchange of information among the contracting parties should include: -
 - (i) Preparedness and response mechanisms to pollution response.
 - (ii) Notification and reporting procedure.
 - (iii) Relevant national legislation, policies, national authorities, availability of resources etc.
- (c) To achieve a good coordination of response amongst the parties during HNS marine pollution incident, cooperation mechanisms need to be strengthened between the national emergency response centers.
- (d) National response strategies to be harmonized whilst conducting joint response operations such as custom, immigration, liability and compensation issues.

(e) Implementation of provisions of bilateral/ multilateral contingency plans with respect to command structure and operational procedures.

(f) Initiatives on collaboration among the contracting parties by conduct of joint training, exercises, field visits between regional/ national coordinators, exchange of information and sharing of technical expertise.

15.1.3. **Information Sharing.** Information of responsible authorities or organisations under the contingency plan should be shared between the parties to the regional agreements and bilateral/ multilateral MoUs. The single POCs should be identified which must be available on 24 hour basis. When any marine pollution incident takes place in the Area of Responsibility (AoR) of one country, it should immediately inform the neighbouring countries in case it is likely to affect their sea areas and shorelines. Notification information should include source, date/ time, position, type and quantity of HNS spilled, likelihood of further spillage, prevailing and weather forecast and envisaged actions. A standardised notification performa should be developed. All available information such as meteorological, hydrographic data and inputs from surface/ air assets and software developed should be shared to provide approximate prediction of spill in case it's going to affect any adjoining country's maritime zones.

15.1.4. **Regional Agreement – SACEP.** India is already party to South Asia Cooperative Environment Programme (SACEP) and ICG is designated as CNA by GoI. SACEP has developed regional contingency plan and it requires all parties to share their contact points, stockpile of equipment held for response, procedure for mobilising equipment and their relevant charges. The Secretariat may also have agreements in place with commercial and Government resources outside the region in order to mount a reasonable response during worst case scenarios. Arrangements by all parties should be in place to make all administrative arrangements to expedite customs, immigration and control of other material and personnel leaving or entering its territory for the purposes of assisting other country during response to HNS spill. The claims during such response operations should be preferred through the Government since Polluter Pay Principle is applicable under OPRC HNS 2000. Such claims should be collated and preferred through the host country to the Polluter.

Chapter-16: Training and Exercise Programmes

16.1. Training

16.1.1. Providing training and organising exercises for response teams are the best ways to improve the overall response capability. All personnel liable to be called upon to handle hazardous materials must acquire specific knowledge and skills. In particular, they must be familiar with:-

- (a) The intrinsic hazards of various substances, in particular by referring to the UN Recommendations on the Transport of Dangerous Goods (TDG), and understand their fate and behaviour.
- (b) All relevant sources of information, such as Safety Data Sheets (SDS), dangerous good declarations, shipping documents, as well as all other relevant documents.
- (c) Protective equipment and clothing.
- (d) Chemical detection kits.
- (e) Emergency procedures, first actions to implement.
- (f) Specialised response strategies, techniques and equipment.
- (g) Methods and procedures for communicating clearly as per the communication plans.

16.2. Exercises

16.2.1. Regular and realistic exercises are essential for validating the response plan and response capability, and enable all parties involved to:-

- (a) Maintain and improve the theoretical and technical knowledge acquired during training.
- (b) Clarify roles and responsibilities.
- (c) Optimise communications within the Incident Management System (IMS).
- (d) Meet and exchange with various people involved in the response (often from different departments with otherwise very little interaction).

- (e) Integrate the procedures set out in the contingency plans to be validated or updated.
- (f) Validate the response capabilities.
- (g) To effectively prepare first responders, various types of exercises should be organised as part of an exercise programme.

16.2.2. The frequency with which the exercises are carried out should be tailored to the complexity of preparation and implementation, but will also be regulated according to the human, material and financial resources available. For instance, if table-top exercises are to be carried every six months, large-scale exercises may be carried out on a biennial basis along with national level oil pollution response exercise.

	Seminars	Workshops	Table-top ALPHA	Functional BRAVO	Equipment deployment CHARLIE	Full Scale DELTA
Aims	Provide an overview of oil spill contingency plans and their related policies.	Build or achieve a product. Produce new or revised plans, procedures, mutual cooperation agreements, etc.	Test procedures for cooperation. Learn and test the framework on response matters relating e.g. to organisation, communication and logistics.	Test the agreed procedures and communication for reporting. Test requesting and providing assistance. Get a picture of the current response readiness of the contracting parties.	Test and learn the use of specific equipment.	Test the national or multi-national response capability and equipment. Test and train complex cooperative abilities or the coordination of several different participants, units and equipment.
Who's for	Public or private operators. Local, regional, national authorities.	Operators & authorities. Level of interaction increased compared to seminar.	Decision-makers.	Different levels of decision-makers.	Responders.	All levels of the pollution response task.
Type	Informal orientation event.	Informal orientation event.	Paper format. No deployment of equipment. Remotely tested or in one location.	Exercise scenario with event updates drives activity.	Deployment on site.	Several crisis management cells. On different sites. At sea and on the shoreline.
May involve	Organisations that are developing or making major changes to existing plans or procedures.	Organisations that are developing or making major changes to existing plans or procedures.		Movement of personnel and equipment is usually simulated.		Public or private operators. Local, regional, national and international authorities.
Timing	One for induction. No constraints imposed by real-time simulation	One per heading.	One per quarter.	One per semester.	One per semester.	One per year.

*Figure 14: Progressive Development of Different Exercise Programmes
(Source pg 54, Marine HNS Response Manual, Multi-regional Bonn Agreement,
HELCOM, REMPEC)*

Chapter-17: Framework for Coordination and Cooperation between National and International Stakeholders in the Event of a Significant Incident

17.1.1. When a nation faces marine pollution emergency, it will be necessary to augment and seek international assistance. A framework needs to be in place for identification of such elements, those should be considered while developing mechanisms of coordination and cooperation amongst regional and international stakeholders. These plans and agreements will ensure that general arrangements are in place for cooperation during the event of a significant incident by the Government towards response to any HNS spill or also threat through such spills. These plans may be bilateral, multilateral or exist under regional mechanism.

17.1.2. ICG has developed framework for coordination and cooperation with neighboring countries in form of bilateral, multilateral, and regional plans in the event of any significant incident of marine HNS pollution through bi-lateral frameworks. The plan may be invoked whenever assistance is sought.

Chapter-18: HNS Incident Insurance Methodology

18.1. Liability and Compensation Regarding Marine Pollution Incidents Involving HNS

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

Compensation for the impact from an HNS incident may become available via the International Convention on Liability and Compensation for Damage in Connection with the Carriage of HNS by Sea 1996. The HNS Convention is based upon the two-tier systems developed for oil pollution compensation under the CLC and Fund Conventions. However, given the nature of impacts from an HNS pollution incident which includes Safety, Socio-Economic, Environmental impacts. The HNS Convention goes further by not only covering pollution damage, but also risks of fire and explosion, including loss of life or personal injury as well as loss of or damage to property outside of the ship. It also covers loss or damage by contamination of the environment, costs of preventative measures and further loss or damage caused by them. The HNS Convention has not yet entered into force.

18.1.2. The article 4 of the HNS Convention, 1996 apply to claims, other than claims arising out of any contract for the carriage of goods and passengers, for damage arising from the carriage of HNS by sea. This Convention does not apply to the extent that its provisions are incompatible with those of the applicable law relating to workers' compensation or social security schemes. The convention does not apply to damage caused by a radioactive material of class 7 either in the IMDG Code, as amended, or in appendix B of the Code of Safe Practice for Solid Bulk Cargoes, as amended. Except as provided in paragraph 5, the provisions of this Convention shall not apply to warships, naval auxiliary or other ships owned or operated by a State and used, for the time being, only on Government non- commercial service.

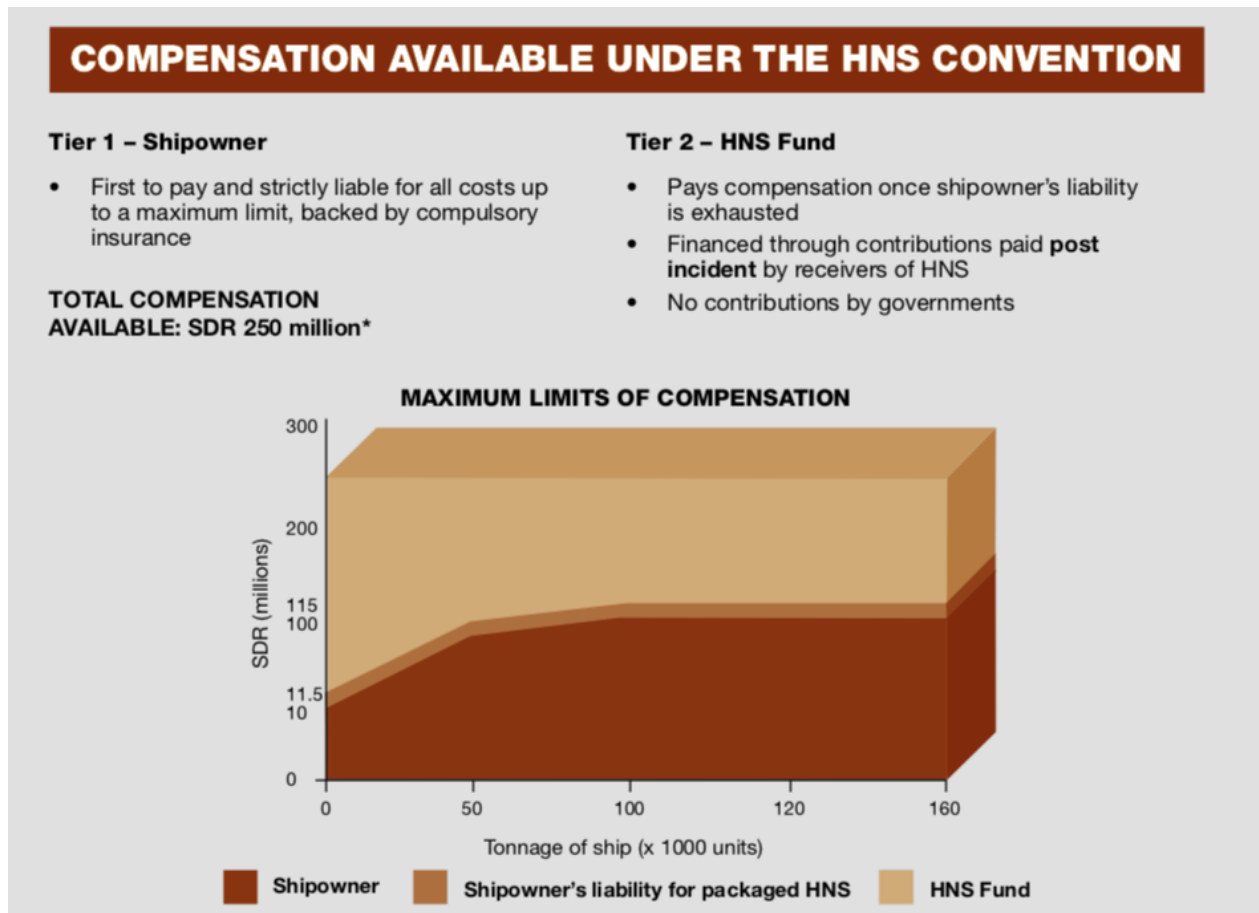


Figure 15: Compensation under HNS Convention

18.2. National Regulations

18.2.1. A number of legislations covering the safety in transportation, liability, insurance and compensations have been enacted. Some of the relevant provisions that may be applicable are as under:-

Ser	Legislations
(a)	Explosives Act 1884
(b)	Factories Act 1948
(c)	Environment Protection Act 1986
(d)	Public Liability Insurance Act 1991
(e)	Petroleum Act 1934
(f)	Insecticides Act 1968
(g)	Motor Vehicles Act 1988
(h)	Disaster Management Act 2005
(i)	Hazardous and other Wastes (Management & Transboundary Movement) Rules, 2016
(j)	Manufacture, Storage and Import of Hazardous Chemical(Amendment) Rules 1989

Ser	Legislations
(k)	Ozone Depleting Substances (R&C) Rules 2000

Table 9: Legislations applicable for Transportation, Insurance and Liability of HNS

18.2.2. Claims for compensation should be made in the first instance to the shipowner or to the insurer of the vessel's third-party liabilities, usually a Protection & Indemnity (P&I) Club. The shipowner's P&I Club will provide insurance cover for ship sourced pollution damage and will handle and assess any pollution damage claims accordingly, and up to an amount set by relevant international conventions (often with a direct liability on the insurer/P&I Club where this is the case) or by national legislation. The 13 P&I Clubs that are members of the International Group of P&I Clubs (IG), between them, provide cover for approximately 90% of the world's ocean-going tonnage. These P&I Clubs provide cover on behalf of their shipowner and charterer members for a wide range of third party liabilities relating to the operation of ships, including:-

- (a) Loss of life and personal injury to crew, passengers and others on board.
- (b) Cargo loss and damage.
- (c) Pollution by oil and other hazardous substances.
- (d) Wreck removal, collision and damage to property.

18.2.3. P&I Clubs also provide a wide range of services to their members on claims, legal issues and loss prevention, and often play a leading role in the management of casualties. P&I Clubs are non-profit mutual (i.e. cooperative) insurance associations enabling shipowners to share risk and the payment of claims. A number of commercial vessels, many of which operate solely in domestic markets, are insured for third party liabilities by other, usually smaller, P&I providers either on a mutual or fixed-premium basis. Military vessels as well as other government vessels, including warships and other vessels on military duty or charter, usually operate outside established P&I and other commercial insurance.

18.2.4. In the event of a large incident where the total cost of claims exceeds the compensation available from the shipowner, the settled claims may be pro-rated to the maximum amount available. Compensation to supplement money available from a vessel's insurer may be available from other sources, including international and domestic funds. The 2010 HNS

Convention will cover damage caused by HNS within the EEZ of a country in which the Convention is in force, as well as damage caused by HNS carried onboard ships registered in, or entitled to fly the flag of, a signatory country outside the territory of any State (country). Compensation will be available for pollution damage and damage caused by other risks, e.g. fire and explosion, for loss of life or personal injury on board or outside the ship carrying HNS, damage to property outside the ship, damage caused by contamination of the environment, loss of income in fishing, tourism and other economic sectors, and the costs of preventive measures.

18.2.5. Where damage is caused by HNS in bulk, the shipowner will normally be able to limit their financial liability to an amount between 10 million and 100 million SDR (approximately US\$15 million to US\$150 million), depending on the gross tonnage of the ship. Where damage is caused by packaged HNS, the maximum liability for the shipowner is 115 million SDR (approximately US\$175 million), also dependent on the vessel's gross tonnage. The HNS Fund will provide an additional tier of compensation up to a maximum of 250 million SDR (approximately US\$380 million), including any amount paid by the shipowner and their insurer. Once in force, claims under the HNS Convention should be submitted within three years of the damage or ten years of the date of the incident, whichever is sooner.

18.3. Types of Claims

18.3.1. There are four main categories of claims in general arising from an HNS incident:-

- (a) **Clean-up and Preventive Measures.** Cost will be incurred as the result of the deployment of resources to prevent/minimise pollution damage, protect sensitive areas and carry out clean-up response. Activities such as aerial observation, at-sea response, and shoreline clean-up all fall under this category as well as the personnel engaged for carrying out this work.
- (b) **Property Damage.** Property damage may arise for cleaning, repairing or replacing items damaged by the chemicals or as a result of clean-up activities (e.g. damage to roads used for access by workers).
- (c) **Economic Losses (pure economic losses, consequential economic loss).** A spill may impact companies, individuals or organisations in a different way, either pure economic loss when no damage to the property has occurred (e.g. beach access blocked by response activities, business interruption) or consequential economic loss when the spill has directly damaged assets (e.g. fishing nets).

(d) **Environmental Monitoring, Damage and Restoration.**

These claims are related to monitoring, impact assessment studies and possibly restoration studies.

18.3.2. Till the time the HNS Convention enter into force and India become party to the convention, the claim by damages suffered by Indian citizens or entities are to be preferred in accordance with national laws applicable.

18.4. Claims Process

18.4.1. Anyone who has suffered a loss or damage as a result of an incident, provided a link of causation can be established, is entitled to submit a claim. Claimants can file either an individual claim or submit it as a group (group of municipalities or consolidated government claims) to the relevant paying parties. Ultimately, it is the responsibility of the claimants to prove their loss.

18.4.2. In India, all the govt agencies involved in the response operations should claim through DG Shipping.

Appendix A

(Refers to Para 4 of Chapter 3)

List Of Chemical (HNS) Industries Located near the Coast of India

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
Northwest				
1.	Gujarat	M/s C.R.L Terminal Pvt. Ltd	Near Oil Jetty, Old Kandla, Kutch 23 ⁰ 04'.14N 070 ⁰ 08'.09E	Acrylonitrile Ethyl Alcohol Acetone Benzene Toluene Methanol Butanol Cydo Hazanar Dichloro Ethane Iso Butanol Isopropanol Styrene Monomer
2.		M/s Friends Oil & Chemical Terminal Pvt. Ltd.	K.K Road Dist Kutch, Kandla 23 ⁰ 02'.04N 070 ⁰ 12'.11E	Class A flammable liquids
3.		M/s Friends Salt Works and Allied Industries	Kandla Kharirohar Road, Kandla, Kutch 23 ⁰ 01'.46N 070 ⁰ 11'.25E	Flammable chemicals
4.		M/s I.M.C Ltd (Gas)	Plot No.44, Old Kandla, Kutch 20 ⁰ 56'.25N 071 ⁰ 30'.06E	Butadiene
5.		M/s I.M.C Ltd (Liquid)	Unit-2(Liquid Terminal) Behind IOC Foreshore Terminal, Kandla 20 ⁰ 56'.31N 071 ⁰ 30'.08E	Edl Mc N
6.		M/s Indian Farmer Fertiliser Co-Op. Ltd.	Kandla 21 ⁰ 51'.17N 073 ⁰ 07'.25E	Ammonia
7.		M/s Indian Oil Corp. Ltd.	LPG Import Plant KK Road, Old Kandla,	Propane Butane

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
			Kutch 23°02'.02N 070°11'.40E	
8.		M/s Indo Nippon Chemical Corporation Ltd.	Plot No-2, KK. Road, Old Kandla Kutch 23°01'.56N 070°12'.33E	Heptane
9.		M/s J.R.E Tank Terminus Pvt. Ltd.	Plot No.3, Old Kandla, Kutch 23°01'.54N 070°12'.37E	Class A Flammable liquids
10.		M/s Styrolution ABS India Ltd.	Plot No. 8, Old Kandla, Kutch 22°41'.58N 073°27'.06E	Acrylonitrile Styrene Monomer
11.		M/s Rishikiran Logistics Pvt. Ltd	Plot No. 7, Link Road Old, Kandla-2, Kutch 23°01'.46N 070°12'.45E	Acrylonitrile
12.		M/s DORF Ketel Speciality Catalysts Pvt. Ltd.	Plot-2, Cluster-F, Sector-12N, Mundra, Adani Ports and SEZ Ltd., Kutch 22°48'.48N 069°42'.23E	Ammonia Heptane Butanol Ethanol IPA(Alcohol)
13.		M/s Saurashtra Chemicals	Porbandar 21°37'.40N 069°37'.32E	Sodium Bicarbonate Caustics Lye
14.		M/s Sahakari khand Udyog Mandal Ltd.	Navsari 22°34'.56N 072°57'.17E	Ethyl Alcohol
15.		Gujarat State Energy Generation Ltd.	Surat 21°09'.57N	Methane, HCL, S2SO4, Hydrogen Gas, Chlorine

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
			072°39'.42E	Ammonia
16.		M/s Krishak Bharati Coop. Fertiliser Ltd.	Surat 21°10'.09N 072°42'.17E	Ammonia LPG Chlorine
17.		M/s Reliance Industries Ltd.	Surat 21°10'.38N 072°40'.00E	Chlorine Ethylene Oxide Flammable Gases Hydrogen Chloride
18.		M/s Atif Ltd	Valsad 20°31'.38N 072°58'.00E	Chlorine SO ₃ (Oleum COCL ₂)(Phosgene)
19.		M/s Bharat Rasayan Ltd.	Bharuch 20°22'.40N 072°55'.41E	Chlorine
20.		M/s Expanded Polymer System Pvt Ltd.	Bharuch 21°44'.20N 072°35'.53E	Ethylene Oxide Propylene Oxide
21.		M/s Hindalco Ind. Ltd	Bharuch 21°46'.20N 072°31'.53E	Propane Ammonia Naphtha
22.		M/s Indo Baijin Chemical Ltd.	Bharuch 21°42'.28N 072°37'.09E	Carbonade Sulphide
23.		M/s Meghmani Fine Chemicals Ltd.	Bharuch 21°43'.06N 072°36'.33E	Chlorine
24.		M/s Srf Limited	Bharuch 21°42'.43N 072°37'.54E	Chlorine Methanol Bromine Acetonitrile Ethylene Dichloride Acid
25.		M/s Gujarat Heavy Chemical Ltd (GHCL)	Veraval 20°50'.49N 070°27'.55E	Ammonia
26.		M/s Indian Rayon	Veraval 20°55'.07N	Chlorine

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
			070 ⁰ 21'.16E	
27.		M/s Indian Oil Corporation	Opp.Tata Thermal Station, Trombay, Mumbai 19 ⁰ 00'.17N 072 ⁰ 54'.17E	Oil & Gases
28.		M/s Indian Oil Corporation Ltd. Kerosene Oil Installation	Sewree, Mumbai 18 ⁰ 59'.59N 072 ⁰ 51'.36E	Kerosene, Oil
29.		M/s Madh Vividh Karyakari SOC. Ltd.	Ice FY.& Cold Storage Madh Koliwada, Malad, Mumbai 19 ⁰ 08'.40N 072 ⁰ 47'.23E	Ammonia
30.		M/s MCGM Versova Sewage Pumping Station - 400053	Versova Sewage Pumping Station, Andheri Link Road, Near D.N. Nagar Metro Station, Andheri, Mumbai Suburban 19 ⁰ 08'.19N 072 ⁰ 48'.22E	Chlorine
31.		M/s Versova Waste Water Treatment Facility & Lagoon	Andheri West, Mumbai 19 ⁰ 08'.19N 072 ⁰ 48'.22E	Chlorine
32.		M/s Sunil Coating Pvt. Ltd.	Mahaprabhu Vallabhacharya Indl. Estate, Shirgaon, Palghar (West), Tal & Dist. Palghar 18 ⁰ 09'.07N 073 ⁰ 25'.09E Shirgaon	Mineral Turpentine Oil and Xylene
33.		M/s Morsun Coating Systems, (Sunil Paints and Varnishes Company Pvt.	Old Satpati Road, Opp. Ghodila Garden, Dhansar Village, Palghar (West), Tal & Dist. Palghar	Mineral Turpentine Oil and Xylene

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
		Ltd.) -401 404	19 ⁰ 09'.16 N 073 ⁰ 32'.09E	
34.		M/s Dhaval Synthetics Ltd.	Mahaprabhu Vallabhacharya Indl. Estate, Old Satpati Rd, Dhansar, Palghar (West) 19 ⁰ 58'.05 N 072 ⁰ 59'.04E	Mineral Turpentine Oil and Xylene
35.		M/s Rashtriya Chemical Fertilizer (RCF) Company	Thal, Alibaug 18 ⁰ 42'.19 N 072 ⁰ 52'.38E	Straight Inorganic Fertilizers
36.		M/s IMC Ltd.	Uran, Raigad 18 ⁰ 55'.24 N 072 ⁰ 58'.08E	Fine Chemical & Other Chemical products
37.		M/s Ganesh Benzo Plast Ltd.	Uran, Raigad 18 ⁰ 55'.24 N 072 ⁰ 02'.57E Uran	Receipt, Storage and Dispatch of Chemical
38.		M/s Finolex Industries Ltd.	Ranpar-Golaptal, Dist-Ratnagiri 16 ⁰ 08'.83 N 073 ⁰ 28'.33E	LPG, vinyl Chloride Monomer Chloride, ethylene, Ethylene Dichloride
39.		M/s Auchtel products Ltd.	Mirjole MIDC, Ratnagiri, Tal-Dist- Ratnagiri 16 ⁰ 08'.83 N 073 ⁰ 28'.33E	Methanol, Styrene, Oleum
40.		M/s VAV Lipids PVT Ltd.	Mirjole MIDC, Tal-Dist-Ratnagiri 16 ⁰ 08'.83 N 073 ⁰ 28'.33E	Ethanol, acetone
56.	Kerala	M/s Kerala Minerals and Metals Ltd.	Chavara, Kollam 08 ⁰ 30'.50 N 076 ⁰ 54'.00 E	Titanium Sponge Plant
57.		M/s Indian Rare	Chavara, Kollam	Minerals separation

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
		Earths Ltd (IREL)	080 ⁰ 52'.27 N 076 ⁰ 35'.45 E	unit and Research centre
58.		M/s Travancore Titanium Products Ltd.	Tiruvananthapuram 09 ⁰ 01'.03 N 076 ⁰ 31'.22 E	Traco cables & steel products
59.		M/s NTPC Choolatheruvu	Alappuzha 09 ⁰ 14'.20N 076 ⁰ 25'.49E	Indigenous Naphtha
60.		M/s Ganesh Benzoplast	Willington Island, Ernakulam 09 ⁰ 56'.13 N 076 ⁰ 16'.16 E	Chemical Storage
61.		M/s HPCL	09 ⁰ 59'.01 N 076 ⁰ 21'.16 E Fort Kochi	Chemical Storage
62.		M/s BPCL Crude Storage Ltd	Fort Kochi, Ernakulam 09 ⁰ 59'.18 N 076 ⁰ 13'.23 E	Oil/ Chemical Storage
63.		M/s Malabar Fuel Corporation	Thalassery, Ernakulam 11 ⁰ 43'.52 N 075 ⁰ 32'.58 E	Oil Storage
64.		M/s Chemplast Cudalore Vinyl Pvt. Ltd.	Semmankuppam, Cuddalore 11 ⁰ 38'.45N 079 ⁰ 10'.47E	Raw Material (i) Vinyl Chloride Monomer(VCM) Manufacturing Product (ii) Caustic Soda (iii) Chloro-chemicals (iv) Hydrogen peroxide (v) Refrigerant Gas (vi) Industrial Salt
65.	Tamil Nadu	M/s PPN Power Plant Pvt Ltd.	Thirukadiaryur, Mayilduthurai,north of Karaikal. 11 ⁰ 04'.32N 079 ⁰ 50'.09E	Naphtha

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
66.		Southern Petrochemical Industries Corporation(SPIC)	Tuticorin 08 ⁰ 44'.33N 078 ⁰ 08'.03E	Urea(Neem Coasted, Ammonia and carbon dioxide)
67.		Tuticorin Alkali Chemicals and Fertilisers Ltd (TFL)	Tuticorin 08 ⁰ 44'.27N 078 ⁰ 08'.57E	All grade of soda ash and coproduces ammonium chloride fertilizer
68.		Super Gas	Tuticorin 08 ⁰ 46'.12N 078 ⁰ 11'.49E	Propane and butane
69.		Heavy water plant (HWP)	Tuticorin 08 ⁰ 44'.16N 078 ⁰ 08'.41E	Ammonium Hydrogen Mono Thermal Exchange process
70.	Puducherry	M/s Chemplast Sanmar Pvt. Ltd. Karaikal	Karaikal 10 ⁰ 51'.00N 079 ⁰ 51'.43E	Raw Material (i) Ethelene (ii) Barium Chloride (iii) Sulphuric Acid Manufacturing Product (i) Caustic Soda (ii) Chloride Gas (iii) Hydrogen Gas (iv) Hydrochloride Acid (v) Sodium Hypo Chloride (vi) Ethelene Dichloride
71.	Tamil Nadu	M/s Thirumalai Chemicals Ltd.	Mannarsamy Koil Street, Royapuram, Chennai 13 ⁰ 02'.21N 080 ⁰ 13'.50E	Storage 01 Orthozylene
72.		M/s Alchymaric ICM SM Private Ltd.	Alathur, Thanjavur district 13 ⁰ 01'.39N 080 ⁰ 15'.16E	Phosphorous Oxy Chloride Hydrochloric Acid Sulphuric Acid Thionyl Chloride Ammonia Acetic Acid
73.		M/s Vivmed Life	Alathur, Thanjavur	Methanol (DL2)

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
		Sciences Pvt Ltd/ Pharmaceutical Manufacturing	district 13°01'.39N 080°15'.16E	Rectified Sprite (RL2) Rectified Sprite (RL4)
74.		M/s Orchid Pharma Ltd.	Alathur-API Thanjavur district 13°05'.35N 080°15'.54E	Acetic Acid Acetaldehyde Acetone Acetonitrile Aluminium Chlorine Ammonia Chloride Benzoyl Chloride Boron Tri Fluoride Butyl Acetate Cyclohexane Cyclohexylamine Diethyl Amine Di Methyl Acetamide Di Methyl Carbonate Di Methyl Formamide Ethyl Acetate Ethyl Chloro Formate Formaldehyde Formic Acid Hexamethyl Disilane Hydro Chloric Acid(Com) Iodine Isopropyl Alcohol Iso Propyl Ether Methanol N-Butyl Acetate N-Methyl Morpholine Nitric Acid Phenol Phosphoric Acid Phosphorous Penta Chloride Potassium Hydroxide Pyridine Sodium Hydroxide Flakes Sodium Hydroxide Sulphuric Acid Tetra Hydro Furan Thionyl Chloride Thio Urea Toluene Triethyl Amine

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
				Carbon Disulphide Methyl Isobutyl Ketone Hydrogen Peroxide Caustic Soda Iye Diethyl Amine N-Heptane Hexamethyl Disilazane Hydrogen Gas Cylinders

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
75.	Tamil Nadu	M/s Par Active Technologies Private Ltd.	Alathur, Thanjavur district 12 ^o 41'.34N 080 ^o 11'.24E	2-Methoxyethanol Acetic Acid Acetic Anhydride Acetone for ZAF/SPB Activated Carbon Activated Carbon Colours orb P5-05 Activated Carbon for SPB/BSP Chloroform Citric Acid Cyclohexane Dimethyl chloric Acid Dimethyl chloric Acid(SPB) Dimethyl chloric Acid(ZAF) Hyflo Isopropyl Alcohol Isopropyl Alcohol, NF L(+)-Tartaric Acid Malonic Acid Methane Sulfonic Acid Methanol Methyl Iodine Methyl Dichloride Methyl Dichloride(MPP & DPP) Potassium Iodide Pyridine Silver Carbonate Sodium Acetate Anhydrous Sodium Bicarbonate Sodium Borohydride Sodium Carbonate Sodium Hypochlorite Sodium Sulphate Anhydrous Sulphuric Acid(MAF) Tertiary Butyl methyl ether (MTBE) Tetrahydrofuran Thionyl Chloride Toluene Triethyl Amine
76.		M/s Madras Fertilisers Ltd.	Manali, Chennai	Anhydrous Ammonia (NH ₃ -1000 MT)

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
			13 ⁰ 10'.45N 080 ⁰ 15'.53E	
77.		M/s Chennai Petroleum Corpn. Ltd	Manali, Chennai 13 ⁰ 02'.43N 080 ⁰ 14'.49E	Ammonia-08 T Chlorine-0.74 T Ethyl Mercaptan -1.0 T HCL-21 T M.I.B.K-0.85 T Morpholine-0.16 T Nitrogen-0.27 T Furfural-1.8 T Sulphuric acid-1.78 T Mono ethanal amine-0.1 T Di-ethanol amine-0.1 T Tolune-1.1 T Hydrazine-0.03 T Asphalt-1.334 T Hexane-15.7 T LPG-646 T Naptha-2422 T Paraffin wax-65 T Sulphur-120 T
78.		M/s Hindustan Petroleum Corporation Limited	Athipet, Chennai 13 ⁰ 05'.27N 080 ⁰ 09'.45E	Motor Spirit-43350 T High speed Diesel-71089 T Ethanol -7340 T Superior Kerosene Oil-12250 T Mineral Turpentine Oil-120 T Solvent-120 T Hexane-70 T Aviation TURBINE Fule-27089
79.		M/s Tamilnadu Petro Products Ltd., Heavy Chemicals Division	Chennai 13 ⁰ 10'.27N 080 ⁰ 16'.45E	Anhydrous Hydrofluoric Acid (HF)-50 MT Benzene-1500-2500 MT Butyl Mercaptan -0.86 MT Chlorine-1 MT Furnace Oil-700-2000 MT Hot Oil-50 MT Hydrochloride Acid-20 KL

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
				Hydrogen-245 cu.m (35 cylinders-7 cu.m each) Iso-Octane-30 MT Kerosen-5000 MT Liquefied Petroleum Gas-10 MT Linear Alkyl Benzene-5000 MT Nitrogen-200 cu.m(4 bullets-50 cu.m each) N-Paraffin-1500-2000 MT N-Pentane-20 MT Olefin-Nil Potassium Hydroxide-15 MT Sodium Hydroxide-10 KL Sulphuric Acid-8 KL
80.		M/s Manali Petrochemicals Ltd., (Plant-I)	Manali, Chennai 13 ⁰ 10'.24N 080 ⁰ 16'.27E	Propylene-228 Mt Propylene oxide-340 MT Ethylene Oxide-62 MT METHANOL-32 MT Dichloropropane-405 MT Propylene Glycol Mono Methyl Ether-90 MT Hydrochloric Acid-18 MT Sodium Hydroxide-24 MT Chlorine-22 T
81.		M/s Manali Petrochemicals LTD., (Plant)	Sathangadu, Tiruvottiyur, Chennai, 13 ⁰ 09'.18N 080 ⁰ 16'.25E	Propylene-86 MT Propylene oxide-340 MT Ethylene Oxide-48 MT Chlorine-366 MT Styrene -18 MT Dichloropropane-184 MT Furnace Oil-286 MT Diesel -39 MT Chlorine-122 MT Hydrochloric Acid-33 MT

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
				Sodium Hydroxide-32 MT
82.		M/s Ceetex Petrochemicals Ltd.,	Manali, Chennai 13 ⁰ 05'.04N 080 ⁰ 16'.13E	Secondary butyl alcohol Methyl ethyl ketone-851 KL
83.				Methyl iso butyl carbinol Methyl iso butyl ketone-1584 KL
84.				98% SULPHURIC ACID-300 KL Butene-2985 KL
85.		M/s Piramal Enterprises Ltd.	Chennai 13 ⁰ 07'.48N 080 ⁰ 12'.15E	Methanol-20 KL Totuene-10 KL Ethyl Acetate-15 KL Methylene dichloride-15 KL
86.		M/s Kothari Petro Chemicals Ltd.	Manali, Chennai 13 ⁰ 09'.33N 080 ⁰ 16'.20E	LPG-997 MT Aluminium Tri Chloride-4.8 MT Sodium Hydroxide-20 MT Hydrochloric Acid-13 MT Ammonia -0.25 MT Diesel-15 KL
87.		Supreme Petrochem Ltd.,	Manali, Chennai 13 ⁰ 10'.50N 080 ⁰ 05'.32E	Pentane-200 MT Styrene Monomer-1500 MT Furnace oil-115 KL
88.		Indian Additives Ltd.,	Manali, Chennai 13 ⁰ 10'.18N 080 ⁰ 16'.58E	Ethyl Hexanol Capacity-60 m3 filling051m3 Secondary Butyl Alcohol- Capacity-300 m3- filling-255m3
89.		Toshiba JSW Turbine & Generator Pvt.	Manali, Chennai 13 ⁰ 11'.29N 080 ⁰ 15'.50E	LPG 15 MT Ammonia-2500 L
90.		M/s Ponneri Tech Services	Ponneri, Thiruvallur 13 ⁰ 23'.29N 080 ⁰ 55'.50E	Toulene-400 KL
91.	West Bengal	M/s Aegis Vopak Terminal	Chrinjitpur, Haldia	Nitric Acid Acetic Acid

Ser	Coastal State/UT in AoR	Name of Industry/ factory	Location	Type of HNS
			23 ⁰ 01'.45N 070 ⁰ 12'.01E	Sulphuric Acid Phosphoric Acid
92.		M/s Indorama India Pvt. Ltd.	Durgachak, Haldia 22 ⁰ 05'.41N 088 ⁰ 08'.44E	Liquid Ammonia Phosphoric Acid Sulfuric Acid Solid Sulphur
93.		M/s Exide Industries Ltd.	Durgachak, Haldia 22 ⁰ 03'.52N 088 ⁰ 08'.01E	Automotive Batteries Containers
94.		M/s Shaw Wallace Co. Ltd.	Haldia 22 ⁰ 34'.12N 088 ⁰ 21'.39E	Dimethoate Fenitrothion Ethion
95.		M/s Hind Lever Chemicals Ltd.	Durgachak Haldia	Industrial Phosphate & Acid

Appendix B
(Refers to Para5 of Chapter3)

Chemicals/HNS Handled at Various Indian Ports

Ser	HNS Handled
Deen Dayal Port Kandla	
1.	2 Ethyl Hexanol
2.	2 Ethyl HexylAcrylate
3.	2 Methyl1,3PropanediolHexanol
4.	2 Ethyl HexylAcrylate
5.	2-ProelHeptanol
6.	2-Ethyl Hexyl Acrylate
7.	Acetic Acid
8.	2-ProelHeptanol
9.	Acetone
10.	A 0 C10
11.	Acrylonitrile
12.	A0C10
13.	Alpha OlefinsC14
14.	A Acetate
15.	Alpha Plus C-10
16.	Alpha Plus C-16
17.	Alpha plusC20-24
18.	Acrylonitrile
19.	Aniline Oil
20.	AO C12-14
21.	Alpha OlefinsC14
22.	B.C.Solvent
23.	Alpha Plus C-10/1
24.	Base Oil
25.	Alpha PlusC20-24
26.	Butadiene
27.	Butyl Acetate
28.	Aoc-C16/A CN
29.	Butyl AcrylateMonomer
30.	B. Acetate
31.	Butyl Diglycolether
32.	Butyl Glycol
33.	Benzene
34.	Butyle Acrylate
35.	C-10 Linear Alpha Olefins
36.	C-10-C-13 NParaffin
37.	C-12 Linear Alpha Oleffins
38.	C-14-18 Linear AlphaOlefins

Ser	HNS Handled
39.	C9 Aromatic
40.	C9 Solvent Naptha
41.	Butyl Glycol/Butyl Cellosve
42.	Butyle Acrylate
43.	C9 Techsol-100
44.	Caradol
45.	C-10 Linear Alpha Olefins
46.	Caradol SC 56-16S
47.	C-10-C-13 NParaffin
48.	Carbpowax
49.	C-12 Linear Alpha Olefins
50.	Carbowax Peg400
51.	C-14-18Linear AlphaOlefins
52.	Caustic Soda
53.	C9 Aromatic
54.	Chloroform
55.	C9 SolventNaptha
56.	Cyclohexanone
57.	C9 Techsol-100
58.	DenaturedEthyl Alcohol
59.	Dicyclopentadiene
60.	E.B. Solvent
61.	EDC
62.	CarbowaxPrg400
63.	Ethyl Alcohol
64.	EthyleneDiamine
65.	EthyleneDichloride
66.	Cyclohexanone
67.	EthyleneGlycol Mono Butyl Ether EB
68.	DenaturedEthyl Alcohol
69.	EthyleneGlycol Monoalkyl Ethers
70.	Dicyclopentadiene
71.	Exxa 9S(ISONonyl Alcohol)
72.	Exxa113 ISO Tridecanol
73.	EDA
74.	Exxsal 11
75.	Exxsal 13
76.	Ethyl Alcohol
77.	Exxsol D130
78.	Ethylene Diamine
79.	Exxsol D80
80.	FthyleneDichloride
81.	Ethylene Glycol

Ser	HNS Handled
	MonoalkylEthers
82.	Exxsol Hexane Fluid
83.	Ethylene Glycol MonoalkylEthers
84.	Glacial Acetic Acid
85.	Ethylenediamine
86.	Exxal 9S(ISO Nonyl Alcohol)
87.	Exxali13 ISO Tridecanol
88.	GTL Waxy Raffinate
89.	Heavy Aromatics
90.	Exxal13 ISOTridecanol
91.	Exxsal 11
92.	Heavy NormalParaffin
93.	Hexane
94.	Exxsol D130
95.	ISO Butanol
APSEC Mundra	
96.	Various Cargo poses physical and health hazard
Sikka	
97.	Fertilizers Grade Phosphoric Acid
98.	Anhydrous Ammonia (28141000)
Bedi/Rozi Port	
99.	Sulphur
GMB Port Porbandar	
100.	Flammable Gases
Dahej Harbour & Infrastructure Ltd (Aditya Birla Group)	
101.	Sulphuric Acid
Gujarat Chemical Port Ltd, Dahej	
102.	Various Cargo poses physical and health hazard
Petronet LNG Ltd Dahej	
103.	LNG
Gujarat Pipavav Port Ltd (GPPL)/APM Terminal	
104.	Butadiene
105.	Butene-1
106.	LPG
107.	Benzene
108.	Cumene
109.	EDC
110.	Ethanol
111.	Olephin
112.	RPO
113.	Toluene
114.	Bitumen
115.	Glycol

Ser	HNS Handled
116.	LAB
117.	Neodol
118.	LNG
Pipavav Port	
119.	Flammable Gas Cat 1
120.	Cargo poses physical and health hazard
Hazira Port Pvt Ltd(HPPL)	
121.	LNG
Reliance Industries Ltd, Hazira	
122.	Gas
Mumbai Port	
123.	Data Yet to be received
Jawaharlal Nehru Port	
124.	Data Yet to be received
Finolex Terminal Ratnagiri	
125.	EDC-Flammable liquid
126.	VCM-Flammable Gases
127.	Ethylene-Flammable Gases
Kokan LNG Pvt. Ltd.	
128.	LNG
Dighi Port Ltd.	
129.	Ethyl Alcohol
130.	Caustic Soda
131.	Ethanol
132.	Glycol
NMPA New Mangalore	
133.	Phosphoric Acid
134.	Ammonia Butylene
135.	Acrylate Methanol
136.	Sty Monomer
137.	Sulphuric Acid
138.	Paraxylene Benzene
139.	Raffinate Stearin
Cochin Port	
140.	Reformate
141.	Liquid Ammonia
142.	Sulphuric Acid
143.	Phosphoric Acid
144.	Methanol
145.	LNG
146.	Ethylene Dichloride
VOC Port Tuticorin	
147.	Naphtha
148.	LPG
149.	V.C.M.

Ser	HNS Handled
150.	Liquid Ammonia
151.	Phosphoric Acid
152.	Sulphuric Acid
153.	Urea
154.	M.O.P.
155.	Other Finished Fertiliser
156.	Rock Phosphate
157.	Sulphur
158.	Caustic Soda Lye
Chemplast Sanmar Karaikal Terminal	
159.	Cat – 1 Ethylene (Flammable Gas)
160.	Cate – 3 Refrigerated Liquified Gases, Target organ toxicant (Central nervous system, narcotic effects)
Chemplast Sanmar Cuddalore Vinyls Terminal	
161.	2.1 Vinyl chloride Monomer
PPN Thirukadaiyur	
162.	Cat – 2 & 3 HNS CAS Numbers 8030-30-6
LNG Terminal Kamarajar Port	
163.	Flammable Gases-Category-1 under pressure Refrigerated Liquified Gas
Container Terminal Kamarajar Port	
164.	Handling dangerous goods containers such as flammable gases, liquids, solids, Oxidizing substances, Toxic and infectious substances
Marine Liquid Terminal Kamarajar Port	
165.	Acetic Acid
166.	Acetone
167.	Butyl Acralate
168.	Hexane
169.	ISO Propyl Alcohol
170.	Phenol
171.	Styrene Monomer
172.	Toluene
173.	Mixed Xylene
174.	Methacrylate monomer
175.	Linear Alkyl Benzene
176.	Propylene Oxide
177.	N-Heptane
178.	Gum turpentine Oil
179.	Mono Propylene Glycol
180.	LPG (Propane/Butane)
Chennai Port	
181.	Chemicals
182.	Other liquid
183.	CCTL
184.	CITPL
185.	Iron ore pellets

Ser	HNS Handled
186.	Barytes
187.	Fert Finished
188.	Fert Raw
189.	Dolomite
190.	Industrial salt
191.	Gypsum
192.	Limestone
193.	Cobble stone
194.	Cement clinkers
Marine Infrastructure Developer Private Limited (MIDPL) Adani Port Ltd, Kattupalli	
195.	IMDG class (3,4,4.2,4.3,5.1,5.2,6.1,8,9)
Vishakhapatnam Port	
196.	Acetone Acid (CI-D)
197.	Ammonia (CI-C)
198.	Ethyl Alcohol (CI-OC) Isopropyl Alcohol (IPA) (CI-OC) Methyl alcohol (CI-OC)
199.	Palm Oil (CI-D) Palm Oil fatty Acid Meth yester (CI-D)
200.	Phosphoric Acid (CI-D)
201.	Styrene Monomer (CI-B)
202.	Sulphuric (Molten)(CI-OC)
203.	Sulphuric Acid (CI-C)
204.	Toluene (CI-C)
205.	Hexane (CI-C)
Paradip Port	
206.	Alkylate
207.	Naphtha
208.	Propylene
209.	Ammonium phosphate
210.	Ammonium Sulphate
211.	Di- Ammonium phosphate
212.	Ammonia
213.	Phosphoric Acid
214.	Sulphuric Acid
215.	Sulphur
216.	Urea
Dhamra Port	
217.	Acetic Acid
218.	Ammonium Anhyd
219.	Benzene/(Export)
220.	Lab (Benzene)
221.	Bitumen
222.	Butadiene
223.	Butane-I
224.	Caustic Soda

Ser	HNS Handled
225.	CBFS
226.	DEG
227.	LPG
228.	Molo Ethylene gas
229.	Methyl Alcohol
230.	Methyl Tert Butyl Ether
231.	Moto Spirit
232.	Naphtha
233.	Nitric Acid
234.	Paraxylene
235.	Phosphoric Acid
236.	PY Gas
237.	Reformate
238.	Sulphuric Acid
239.	Toluene
SPM Port Kolkata	
240.	Lab
241.	Mixed Xylene
242.	White Spirit
243.	Phenol
244.	EXXSOL D80
245.	C9 Aromatics

Appendix C

(Refers to para 4 of Chapter5)

HNS Spill Reporting Form: IMO standards

POLREP MESSAGE FORMAT (See amplification in succeeding table) Reference : IMO – 560 (1995)		
Address	From	To
Date		Time Group
Identification		
Serial Number		
Part I (POLWARN)	SI No.	
	1.	Date and Time
	2.	Position
	3.	Incident
	4.	Outflow
	5.	Acknowledge
Part II (POLINF)	40.	Date and Time
	41.	Position
	42.	Characteristics of Pollution
	43.	Source and cause of pollution
	44.	Wind direction and speed
	45.	Current or tide
	46.	Sea state and pollution
	47.	Drift of pollution
	48.	Forecast
	49.	Identify of observer and ships on scene
	50.	Action taken
	51.	Photographs or samples
	52.	Names of other agencies informed
	53- 59.	Spare
60.	Acknowledge	
Part III	80.	Date and time

(POLFAC)	81.	Request for assistance	
	82.	Coast	
	83.	Pre-arrangements for the delivery	
	84.	Assistance to where and how	
	85.	Other agencies requested	
	86.	Change of command	
	87.	Exchange of information	
	88.	Names and number of	
	89.	Description of equipment	
	90.	ETA and arrival information	
	91.	Place of embarkation	
	92.	Place of disembarkation	
	93-98.	Spare	

Instructions for Filling POLREP Message Format

Contents	Remarks
DTG (Date & Time Group)	Day and time of drafting of the telex (DTG). Always six figures. Can be followed by month indication. The DTG can be used as a reference.
POLREP BONN AGREEMENT/ NORDIC/ BALTIC/ DANGER	<p>This is the identification of the report.</p> <p>"POL....." indicates that the report might deal with all aspects of pollution (such as oil as well as other harmful substances.)</p> <p>".....REP" indicates that this is a report on a pollution incident.</p> <p>It can contain up to three main parts:</p> <p>Part I (POLWARN) is an initial notice (a first information or a warning) of casualty or the presence of oil slicks or harmful substances. This part of the report is numbered from 1 to 5.</p> <p>Part II (POLINF) is a detailed supplementary report to part I. This part of the report is numbered from 40 to 60.</p> <p>Part III (POLFAC) is for requests for assistance from other contracting parties, as well as for operational matters in the assistance situation. This part of the report is numbered from 80 to 99.</p>

Contents	Remarks
	<p>BONN AGREEMENT is for identifying the agreement in question (other code words: "NORDIC" for the Copenhagen Agreement, 1971: "BALTIC" for the Helsinki Convention, 1974: and "DANGER" for the Danish German Joint Maritime Contingency Plan, 1962)</p> <p>Parts I, II and III can be transmitted all together in one report or separately.</p> <p>Furthermore, single figures from each part can be transmitted separately or combined with figures from the two other parts.</p> <p>Figures without additional text shall not appear in the POLREP.</p> <p>When part I is used as a warning of a serious threat, the telex should be headed with the traffic priority word "URGENT" (URGENT is optional under the Bonn agreement.)</p> <p>All POLREPs containing ACKNOWLEDGE figures (5, 60 or 99) should be acknowledge as soon as possible by the competent national authority.</p> <p>POLREPs for a specific incident shall always be terminated by a telex from the reporting State which indicates that no more operational communication on that particular incident can be expected.</p>
Contents	Remarks
DK 1/1	<p>Each single report should be easily identifiable and the receiving agency should be in a position to check whether all reports of the incident in question have been received. This is done by using a nation-identifier (DK, FRG, UK, PO, FI etc) followed by a stroke system, where the figure before the stroke indicated the incident to which the report refers and figure following the stroke indicates the actual number of reports which have been originated on the incident in question.</p> <p>POLREP BONN AGREEMENT DK 1/1 indicates the first report from Denmark of the incident in question in the Bonn Agreement region.</p> <p>POLREP BONN AGREEMENT DK 1/2 will, in accordance with the described system, then indicate the second report from the same incident.</p>

Contents	Remarks
	<p>If the pollution caused by the incident splits up into clearly defined patches in this example two - the wording "POLREP BONN AGREEMENT 1 now splitting into POLREP BONN AGREEMENT 2 and POLREP BONN AGREEMENT 3" should be indicated in the last report on the incident identified by figure 1 preceding the stroke.</p> <p>The first reports on the two patches originating from the incident first reported will then be numbered POLREP BONN AGREEMENT DK 2/1 and POLREP BONN AGREEMENT DK 3/1, and consecutive numbers after the stroke could then be used.</p>

Part I (POLWARN)

Contents	Remarks
1 DATE AND TIME	The date of the month as well as the time of the day when the incident took place or, if the cause of the pollution is not known, the time of the observation should be stated with six figures. Time should be stated as GMT. For example 091900Z (i.e. the 9 th of the relevant month at 1900 GMT)
2 POSITION	Indicates the main position of the incident in latitude and longitude in degrees and minutes and may, in addition, give the bearing of and the distance from a location known by the receiver.
3 INCIDENT	The nature of the incident should be stated here, such as BLOWOUT, TANKER GROUNDING, TANKER COLLISION, OIL SLICK, OIL SLICK, ETC.

Contents	Remarks
4 OUTFLOW	The nature of the pollution, such as CRUDE OIL, CHLORINE, DINITROPHENOL, etc. as well as the total quantity in tones of the outflow and/ or flow rate, well as the risk of further outflow. If there is no pollution but a pollution threat, the words NOT YET followed by the name of the substance for example NOTYET FUEL OIL, should be stated
5 ACKNOWLEDGE	When this figure is used the telex should be acknowledge as soon as possible by the competent national authority.

Part II (POLINF)

Contents	Remarks
40 DATE AND TIME	No. 40 relates to the situation described in figure 41 to 60 if it varies from figure 1.
41 POSITION AND/ OR EXTENT OF POLLUTION ON ABOVE/ IN THE SEA	Indicates the main position of the pollution in latitude and longitude in degrees and minutes and may in addition give the distance and bearing of some prominent landmark know to the receiver if other than indicate in figure 2. Estimated amount of pollution (e.g. size of polluted areas, number tonnes of HNS spilled if other than indicated in figure 4, or number of containers, drums, etc. lost). Indicates length and width of slick, in nautical miles, if not indicated in figure 2.
42 CHARACTERISTICS OF POLLUTION	Gives type of pollution, e.g. type of oil with its viscosity and pour point, packaged or bulk chemicals, sewage, for chemicals, give proper name or United Nations Number, if known. For all, give also appearance, e.g. liquid, floating solid, liquid oil, semi-liquid sludge, tarry lumps, weathered oil, discoloration of sea, visible vapour. Any markings on drums, containers etc. should be given.
43 SOURCE AND CAUSE OF POLLUTION	e.g. from vessel or other undertaking, if from vessel, say whether as a result of a deliberate discharge or casualty, if the latter, give brief description. Where possible, give name, type, size, call sign, nationality, and port of registration of polluting vessel. If vessel is proceeding on its way give course, speed and destination.
44 WIND DIRECTION AND SPEED	Indicates wind direction in degrees and speed in m/s. The direction always indicates from where the wind is blowing.
45 CURRENT AND SPEED AND/ OR TIDE	Indicates current direction in degrees and speed in knots and tenths of knots. The direction always indicates the direction in which the current is flowing.
46 SEA STATE AND VISIBILITY	Sea state indicated as wave height in metres. Visibility in nautical miles.
47 DRIFT OF POLLUTION	Indicates drift course and speed of pollution in degrees and in knots and tenths of knots. In case of air pollution (gas cloud), drift speed is indicated in m/s.

Contents	Remarks
48 FORECAST OF LIKELY EFFECT OF POLLUTION AND ZONES AFFECTED	e.g. arrival on beach, with estimated timing. Results of mathematical model.
49 IDENTITY OF OBSERVER/REPORTER IDENTITY OF SHIPS ON SCENE	Indicated who has reported the incident. If a ship, its name, home port, flag and call sign must be given. Ships on scene can also be indicated under this item by name, home port, flag and call sign, especially if the polluter cannot be identified and the spill is considered to be the recent origin.
50 ACTION TAKEN	Any action taken for the disposal of the pollution.
51 PHOTOGRAPHS OR SAMPLES	Indicates if photographs or samples from the pollution have been taken. Telex number of the sampling authority should be given.
52 NAMES OF OTHER STATES AND ORGANISATIONS INFORMED	
53-59	SPARE FOR ANY OTHER RELEVANT INFORMATION (e.g. results of sample or photographic analysis, results of inspections of surveyors, statements of ship's personal etc.
60 ACKNOWLEDGE	When this figure is used the telex should be acknowledge as soon as possible by the competent national authority.

Part III (POLFAC)

Contents	Remarks
80 DATE AND TIME	No. 80 is related to the situation described below, if it varies from figures 1 and/ or 40.
81 REQUEST FOR ASSISTANCE	Type and amount of assistance required in the form of:- <ul style="list-style-type: none"> - Specified equipment - Specified equipment with trained personnel - Complete strike teams - Personnel with special expertise with indication of country requested.
82 COST	Requirements for cost information to requesting country of

Contents	Remarks
	delivered assistance.
83 PRE-ARRANGEMENTS FOR THE DELIVERY OF ASSISTANCE	Information concerning customs clearance, access to territorial waters, etc. in the requesting country.
84 TO WHERE ASSISTANCE SHOULD BE RENDERED AND HOW	Information concerning the delivery of the assistance, e.g. rendezvous at sea, with information on frequencies to be used, call sign and name of Supreme On-Scene Commander of the requesting country, or land-based authorities with telephone number, telex number and contact persons.
85 NAMES OF OTHER STATES AND ORGANISATION	Only to be filled in if not covered by figure 81, e.g. if further assistance is later needed by other States.
86 CHANGE OF COMMAND	When a substantial part of an oil pollution or serious threat of oil pollution moves or has moved into the zone of another Contracting Party, the country which has exercised the supreme command of the operation may request the other country to take over the supreme command.
87 EXCHANGE OF INFORMATION	When a mutual agreement has been reached between two parties on a change of supreme command, the country transferring the supreme command should give a report on all relevant information pertaining to the operation to the country taking over the command.
88-89	SPARE FOR ANY OTHER RELEVANT REQUIREMENTS OR INSTRUCTIONS
99 ACKNOWLEDGE	When this figure is used the telex should be acknowledged as soon as possible by the competent national authority.

Appendix D
(Refers to Para 3 of Chapter 6)

Division of Responsibilities

Ministry/Department/ Agency	Responsibilities	Functional Responsibilities Allocated
Ministry of Environment, Forest and Climate Change	Environment and ecology, including environment in coastal waters, in mangroves, coral reef but excluding marine environment on the high seas.	<p>Environment and ecology including environment in coastal waters, in mangroves, coral reefs and especially</p> <ol style="list-style-type: none"> 1. Enactment of legislation for prevention and control of marine pollution from land and sea-based sources. 2. Prevention and control of marine pollution at source, on land or the sea. 3. Monitoring of pollution upto the shore. 4. Cleaning of beaches affected by oil pollution through coastal States and Union Territories.
Ministry of Ports, Shipping and Waterways	Maritime shipping and navigation Administration of Indian Ports Act, 1908 and ports declared as major ports	<ol style="list-style-type: none"> 1. Prevention and control of pollution arising from ships all over the sea including the major ports areas. 2. Enactment and administration of legislation related to prevention, control and combating of pollution arising from ships. 3. Functions through DG (Shipping).To comply with provisions of Merchant

Ministry/Department/ Agency	Responsibilities	Functional Responsibilities Allocated
		<p>Shipping Act, 1958 for the purpose of:-</p> <p>(a) Inspection of construction of ships and tankers in order to comply with provisions of MARPOL or other conventions on maritime pollution formulated by IMO and/ or other related bodies, Merchant Shipping Act and issue of necessary certificates, and</p> <p>(b) Penalising the offenders apprehended by the Indian Coast Guard and port authority for violations of the above provisions of the Act, including processing of pollution damage claims etc.</p> <p>4. Functions through major ports/MMD authorities within port limits</p>
		<p>(a) Checking of vessels for carrying necessary insurance certificate against pollution damage.</p> <p>(b) Empowered to handle necessary antipollution provisions mentioned under Indian Ports Act, 1908.</p> <p>(c) Monitoring and combating of HNS pollution in the port areas.</p>

Ministry/Department/ Agency	Responsibilities	Functional Responsibilities Allocated
Department of Ocean Development	Policies including co-ordination regulatory measures and development relating to prevention, conservation and protection of oceans	Scientific monitoring of marine pollution arising from land based ship-based and other resources in various maritime zones including coastal waters, but excluding monitoring of pollution within the limits of major ports, installations and structures.
Ministry of Defence (Indian Coast Guard Organisation)	Response and coordination at sea	Responding to crisis arising out of HNS spill at including coordination with concerned ministries.

Appendix E

(Refers to Para 35 of Chapter 6)

National Contact Directory for HNS Spill Response in India

Ser	Name of Agencies	Contact Details	Email Address
Coast Guard			
1.	Operational Room (North West)	079-23243264/ 23243283	ops-nw@indiancoastguard.nic.in
2.	Operational Room (West)	022-24332554/ 24301455	ops-east@indiancoastguard.nic.in
3.	Operational Room (East)	044-25395016/ 23460404	ops-east@indiancoastguard.nic.in
4.	Operational Room (North East)	033-23248006/ 23248006	ops-ne@indiancoastguard.nic.in
5.	Operational Room (A&N)	03192-232681/ 245942	ops-an@indiancoastguard.nic.in
6.	Operational Room (DHQ 1)	0286-2247148/ 2242451/ 2244056	dhq1@indiancoastguard.nic.in
7.	Operational Room (DHQ 2)	022-24366046/ 24222696	dhq2@indiancoastguard.nic.in
8.	Operational Room (DHQ 3)	0824-2405266/ 2405267	dhq3@indiancoastguard.nic.in
9.	Operational Room (DHQ 4)	0484-2218969/ 2217164	dhq4@indiancoastguard.nic.in
10.	Operational Room (DHQ 5)	044-23460424/ 23460456	dhq5@indiancoastguard.nic.in
11.	Operational Room (DHQ 6)	0891-2547266/ 2547260	dhq6@indiancoastguard.nic.in
12.	Operational Room (DHQ 7)	06722-223359	dhq7@indiancoastguard.nic.in
13.	Operational Room (DHQ 8)	03224-267755	dhq8@indiancoastguard.nic.in
14.	Operational Room (DHQ 9)	03192-272315	dhq9@indiancoastguard.nic.in
15.	Operational Room (DHQ 10)	03192-264235/ 264666	dhq10@indiancoastguard.nic.in
16.	Operational Room (DHQ 11)	0832-2521051 0832-2520584	dhq11@indiancoastguard.nic.in
17.	Operational Room (DHQ 12)	04896-263491/ 263497	dhq12@indiancoastguard.nic.in
18.	Operational Room (DHQ 13)	0413-2257956	dhq13@indiancoastguard.nic.in
19.	Operational Room (DHQ 14)	03192-232038	dhq14@indiancoastguard.nic.in

Ser	Name of Agencies	Contact Details	Email Address
20.	Operational Room (DHQ 15)	0289-2262261 7698981236	dhq15@indiancoastguard.nic.in
21.	Operational Room (DHQ 16)	0461-2352046	dhq16@indiancoastguard.nic.in
22.	MRCC Mumbai	022243-88065 MSAR call 1554 (toll free)	mrcc-west@indiancoastguard.nic.in
23.	MRCC Chennai	044 253 95018	mrcc-east@indiancoastguard.nic.in
24.	MRCC Port Blair	03192 245530	mrcc-ptb@indiancoastguard.nic.in
MOPSW			
25.	Secretary	011-23714938 011-23716656	secyship@nic.in
26.	Addl Secretary	011-23736125 011-23733051	as-psw@gov.in
27.	Addl Secretary & Financial Advisor	011-23736455 011-23721235 011-23724822	asfa-ship@nic.in
28.	Senior Economic Advisor	011-23716619 011-23350648 011-23711323	rsachar@nic.in agrim@nic.in
29.	Joint Secretary (SM&PPP) JS(SM)	011-23711499 011-23721564	bhushank.k@gov.in
30.	Joint Director(Admin Parl & DGLL)	011-23350647	Ajay.sirohi@nic.in
DG Shipping/MOPSW			
31.	Secretary	011-23714938 011-24615656(R) 011-23716656	secyship@nic.in
32.	Joint Secretary	011-23710189 011-23722855	jsship@nic.in
33.	Joint Secretary (Port)	011-23711873	js-port@nic.in

Ser	Name of Agencies	Contact Details	Email Address
		011-23328549	
34.	Deputy Secretary	011-23710505	nayak.gn@gov.in
35.	Director (Shipping)	011-23715905 011-23710039	director-ship@gov.in
36.	Development Advisor (Port)	011-23710456 011-23710836 011-23711022 011-23739621	hn.aswath.nic.in
37.	Director (Engg)	011-23711022 011-23719031	anil.pruthi.nic.in
State / U/T Governments			
Gujarat			
38.	District Collector, Kutch	02834-250020 02834-250430	collector-kut@gujarat.gov.in
39.	District Collector, Jamnagar	0288-2555869 0283-2555899	collector-jam@gujarat.gov.in
40.	District Collector, Porbandar	0286-2221800	collector-por@gujarat.gov.in
41.	District Collector, Junagadh	0285-2650201 0285-2650202 0285-2651332	collector-jun@gujarat.gov.in
42.	District Collector, Amreli	02792-222307 02792-242710	collector-amr@gujarat.gov.in
43.	District Collector, Bhavnagar	0278-2428822 0278-2427941	collector-bav@gujarat.gov.in
44.	District Collector, Anand	02692-262271 02692-261575	collector-and@gujarat.gov.in
45.	District Collector, Bharuch	02642-240600 02642-240602	collector-bha@gujarat.gov.in
46.	District Collector, Surat	0261-2471121	collector-sur@gujarat.gov.in

Ser	Name of Agencies	Contact Details	Email Address
		0261-2465116	
47.	District Collector, Navsari	02637-244299 02637-281540	collector-nav@gujarat.gov.in
48.	District Collector, Valsad	02632-253612 02632-243417	collector-val@gujarat.gov.in
Mahrashtra			
49.	District Collector, Thane	022-25344041 022-25349200	collector.thane@maharashtra.gov.in
50.	District Collector, Mumbai	022-26514742 022-26556805	collector.mumbaisuborb@maharashtra.gov.in
51.	District Collector, Raigad	02141-222001 02141-222025	collector.mumbaicity@maharashtra.gov.in
52.	District Collector, Ratngiri	02352-222301 02352-226250	collector.ratnagiri@maharashtra.gov.in
53.	District Collector, Sindhudurg	02362-228844	sindhudurgmahsin@nic.in
Karnataka			
54.	District Collector, Dakshin Kannada	0821-2220588	dc.mnglr@gmail.com
55.	District Collector, Udupi	0820-2524925 0820-2524926	dc.udp@dataone.in
Kerala			
56.	District Collector, Kasargod	04994-256400 04994-4255833	dckas@kerala.nic.in
57.	District Collector, Kannur	0497-2700243 0497-2704243	dcknr@kerala.nic.in
58.	District Collector, Kozhikode	0495-2371400 0495-2370582	dckzk@ker.nic.in
59.	District Collector, Mallapuram	0483-2734355	mlp-collectorate@messaging.kerala.nic.in
60.	District Collector, Trissur	0487-2361020 0487-2362210	tsrcolle.ker@nic.in

Ser	Name of Agencies	Contact Details	Email Address
61.	District Collector, Ernakulam	0484-2423001 0484-2322282	collectorekm@sifi.com dckm.ker@nic.in
62.	District Collector, Alappuzha	0477-2251720	dcalp.ker@nic.in
63.	District Collector, Kollam	0474-2794900 0474-2792970	dcklm.ker@nic.in
64.	District Collector, Thruvananthapuram	0471-2731177 0471-2731166	dctvm@kerala.nic.in
Tamil Nadu			
65.	District Collector, Kanyakumari	04652-279555 04652-260999 04652-279090	collrkkm@nic.in
66.	District Collector, Tirunelveli	0462-2500828 0462-250024	collrtnv@nic.in
67.	District Collector, Ramanathapuram	04567-230558	pag@ramnad.tn.nic.in
68.	District Collector, Pudukkottai	04322-221663	collrpdk@tn.nic.in
69.	District Collector, Nagapattinam	04365-253080 04365-252700 04365-253048	collector.tnngp@nic.in
70.	District Collector, Cuddalore	04142-230999 04142-230555	collrud@nic.in
71.	District Collector, Kanchipuram	044-27237433 044-27238478	collrkpm@nic.in
72.	District Collector, Chennai	044-25228025	collchn@nic.in
Andhra Pradesh			
73.	District Collector, Nellore	0861-2331999 0861-2325025	collectornlr@ap.gov.in
74.	District Collector, Ongole	08592-231222 08592-231444	collector_pkm@ap.gov.in jc_pkm@ap.gov.in
75.	District Collector, Krishna	08672-252222	collector_krsn@ap.gov.in,

Ser	Name of Agencies	Contact Details	Email Address
76.	District Collector, West Godavari	08812-230051 08812-230052	collector_wg@ap.gov.in
77.	District Collector, Godavari	0884-2361200	collector_eg@ap.gov.in
78.	District Collector, Vishakhapatnam	0891-2526999	collector_vsk@ap.gov.in
79.	District Collector, Srikakulam	08942-222565 08942-222648	collector-skim@ap.gov.in
Odisha			
80.	District Collector, Ganjam	06811-263700 06811-263344	origan@nic.in
81.	District Collector, Puri	06752-223939	dm-puri@nic.in
82.	District Collector, Jagatsinghpur	06724-220379 06724-220299	dm-jagatsinghpur@nic.in
83.	District Collector, Kendrapara	06727-232602 06727-232002	dm-kendrapara@nic.in
84.	District Collector, Bhadrak	06784-250436 06784-240800	dm-bhadrak@nic.in
85.	District Collector, Balasore	06782-262001 06782-262008	dm-balasore@nic.in
West Bengal			
86.	District Collector, Purbamedinipur	03228-263329 03228-263728	ddmopmdn@gmail.com
87.	District Collector, Kolkata	033-24793713	dm-ali@wb.nic.in
88.	District Collector, Hooghly	033-26802044 033-26802048 033-26806134	dm-hoog@wb.nic.in

Ports

Ser	Name of Ports	Contact Details	Email Address
Ports			
Bedi Port			
89.	Port Officer	0288-271805 0288-221334 0288-271806 0288-275207	pojam-gmb@gujarat.gov.in
90.	Port Control Office	0288-220214 0288-271815 0288-220213 0288-221491 9638112186	<u>gmb@gujarat.gov.in</u>
Chennai Port Trust			
91.	Chairman	044-25361086, 044-23562201, 044-25361228	chpt@vsnl.com
92.	Dy. Chairman	044-25361720, 044-25369799 044-25362201 044-25381551(R)	dycpt@chennaiport.gov.in
93.	Secretary	044-25361228, 044-25367754	secry@chennaiport.gov.in
94.	Dy. Conservator	044-25361228, 044-25360833, 044-25360722(R)	dc@chennaiport.gov.in
95.	Pollution Response Officer	044-25362201/ 044-25312000	portofchennai@gmail.com
96.	Harbour Master	044-25362630	hm@chennaiport.gov.in

97.	Technical Asst,	044-25362201	
98.	Marine Engineer (Pollution)	044-29550380	p.vijayaanand71.chpt@gov.in,
Ennore Port			
99.	Chairman	044-25251666, 044-27950030	into@ept.gov.in gudena.rao@adani.com
100.	Dy.Chairman	044-24983052	
ESSAR Bulk Terminal Ltd,Surat Hazira			
101.	General Manager	<u>261-7136500</u> <u>9879202849</u>	<u>anuj.kaushik@essarport.co.in</u>
102.	Control Room, Mumbai	022-6682171 022-6682292	<u>esl.secretarial@essar.com</u>

Finolex Marine Terminal, Ratnagiri			
103.	General Manager	02352-238015 9552546958	rbp@finolexind.com
104.	Director (Technical)	02352-238023, 02352-238045, 02352-238033	sc@finolexind.com
105.	Marine Operations	02352-238027	ram@finolexind.com
106.	Control Room	02352-238034	etfctrl@finolexind.com
Gangavaram Port			
107.	Dy Conservator	02838-2701177, 02838- 2889999	dc@gangavaram.com marine@gangavaram.com
108.	Harbour Master	02838-2701177, 02838- 2703377	port@gangavaram.com
Adani Ports & Sez Limited, Mundra			
109.	Chief Operating Officer	02838-255726	parveer.vasistha@adani.com
110.	Head Marine Services	02838-255727, 289170, 296142	sachin.srivastav@adani.com
111.	HOS-Marine Services & PFSO	02838-255947, 289170, 296142	sachin.srivastav@adani.com
112.	Pollution Response Officer	02838-255787	sachin.srivastav@adani.com
113.	Port Control	02838-255761	marine.control@adani.com
Haldia Dock Complex			
114.	Dy Chairman HDC	03224-263209, 263152, 263114, 264877	dychairman@kopt.in
115.	General Manager (Operations)HDC	03224-263303, 252252, 252449	a.ghosh@kolkataporttrust.gov.in

116.	Dy Dock Master	252513 03224-263170	ymanna.hdc@nic.in
Hazira Port			
117.	Chief Executive Officer	0261-2207780 079-30011111 079-26470101	niraj-bansal@adani.com
118.	Port Manager	3051151, 3051158	shahzad@adani.com
119.	Harbour Master	3051151, 3051158	ajith.kotty@shell.com
120.	Terminal Manager	3051262/1150, 3051041	tarak.kachaliya@adani.com
121.	HPPL Security Incharge	3051094, 3051158	ahppl.marathe@adani.com
122.	HSSE Manager	3051009, 3051041	
Jawaharlal Nehru Port Trust			
123.	Chairman	022-27244001, 022-27242290, 022-27244000, 022-22832458(R)	chairman@jnport.gov.in
124.	Deputy Chairman	022-27244011, 022-27241749, 022-27242219, 022-27241592, 022-22045372(R)	<u>deputychairman@jnport.gov.in</u>
125.	Deputy Conservator	022-27244171, 022-27473110(R), 022-27242301, 022-27472234(R)	<u>dyconservator@jnport.gov.in</u>

126.	Chief Manager Port Planning	022-27424256	cmppd@jnport.gov.in
127.	Harbour Master	022-66165600 022-27244173, 022-27244170, 022-27242334	harbourmaster@jnport.gov.in
128.	Sr. Dock Master	022-27244173, 022-27473103(R)	dockmaster@jnport.gov.in
129.	Asst Manager Safety	022-27245013	cma@jnpt.gov.in
130.	Port Control Station	022-27245178, 022-27245151, 022-27242367	cma@jnport.gov.in
Jindal South West Port Jaigarh			
131.	Manager Marine	02357-242551/53, 02357 -242556	mct.jpl@jsw.in
132.	Junior Manager	02357-242551, 02537- 242556	mct.jpl@jsw.in
133.	PR Department	02357-242551/53, 02357-242556	miraj.shah@jsw.in
Kakinada Sea Port			
134.	General Manager, Operations	2354171	capt@kakinadaseaports.in
135.	Deputy General Manager, Operations	2349619, 2354170, 2368246, 2349620, 2365589	dgmops@kakinadaseaports.in
136.	Dy Conservator	2365889, 2385402	maikkd@kakinadaseaports.in

137.	Control Room	2365089, 2385402	mails@kakinadaseaports.in
Kandla Port			
138.	Secretary	233174	fac@kandlaport.com
139.	Dy Conservator	220235, 233585, 234347(R)	dc@kandlaport.com
140.	Harbour Master	270201, 270427, 270624	hm@kandlaport.com
141.	Signal Station	270194, 270624, 270549	signalkpt@gmail.com
142.	Port Coordinator	234007, 234341	
Kochi Port			
143.	Chairman	0484-2668200, 2668566, 2668100(R), 2666859(R) 2668163	chairman@cochinport.gov.in
144.	Deputy Chairman	2666512, 2666592, 2666480(R)	deputychairman@cochinport.gov.in
145.	Deputy Conservator	2666417, 2666002(R)	dc@cochinport.gov.in
146.	Harbour Master	2666410, 2368242(R), 2360213(R)	nm@cochinport.gov.in
147.	Dock Master	2667721, 2666417, 2666082(R)	tm@cochinport.gov.in
Kolkata Port			
148.	Chairman	033-22305370, 22304901, 22303451	chairman@kolkataporttrust.gov.in
149.	Dy Chairman	22309164	dy.chairman.kds@kolkataporttrust.gov.in
150.	CE & Incharge Environment Cell	22300413	ce@kolkataporttrust.gov.in
151.	OSD(Environment)	22303451	dmd@kolkataporttrust.gov.in

152.	Director Marine Department	22306212, 22303214, 22310105	dmd@kolkataporttrust.gov.in
Krishnapatnam Port			
153.	President	0861-2377041 0861-2377992, 0861-2377046	bibhupada.sahoo1@adani.com
154.	General Manager	0861-2377999 0861-2377992, 0861-2377046	gm@krishnapatnamport.com
155.	Asst General Manager	0861-2377992, 0861-2377046	agm@krishnapatnamport.com
156.	VP(Marine) Dy Conservator	0861-2377041 0861-2377999, 0861-2324428, 0861-2377984	Captrajat.garg@adani.com
157.	SrOfficer,Port Control, MarineDept	2377046, 2377046	portcontrol@krishnapatnamport.com
Marg Karaikal Port			
158.	Emergency control room	044-45622000 256610, 256603	secretariat@karaikalport.com
159.	Port Control	044-45624000 044-224773	secretariat@karaikalport.com
160.	Head Office	044-45624000, 044-044- 45624617	secretariat@karaikalport.com
Mormugao Port			
161.	Chairman	0832-2521100, 0832-2521105, 0832-2521200	chairman@mptgoa.com
162.	Dy Chairman	0832-2521115, 0832-2521110	dychairman@mptgoa.com

163.	Secretary	0832-2521120, 0832-2521125	secretary@mptgoa.gov.in
164.	Deputy Conservator	0832-2521150, 0832-2521155	dc@mptgoa.com
165.	Harbour Master	0832-2521152, 0832-2521155	hm@mptgoa.com
Mumbai Port			
166.	Chairman	022-22621234, 022-66564011	chairman@mbpt.com
167.	Deputy Chairman	022-2261011, 022-66564012,	dychairman@mbptmail.com
168.	Deputy Conservator	022-66564021, 022-2261204,	dc@mbptmail.com
169.	Director(P&R)	022-66564041, 022-2261011, 022-22610241	facao@mbptmail.com
New Mangalore Port			
170.	Chairman	0824-2407300, 0824-2407200(R), 0824- 2408390	nmptchairman@sify.com
171.	Dy Chairman	0824-2408300, 0824-2407315, 0824-2407316(R)	dychairman@nmpt.in
172.	Secretary	0824-2407438, 0824-2407438, 0824-2407141(R)	nmptsecretary@gmail.com
173.	Dy Conservator	0824-2407419, 0824-2407423(R), 0824- 2407419	dcnmpt@gmail.com
174.	Harbour Master	0824-2407289,	chairman@nmpt.gov.in

		0824-2407696(R)/ 0824-2407289 0824-2407341	
175.	Dock Master	0824-2407289, 0824-2407583(R)/ 0824-2408295	chairman@nmpt.gov.in
176.	FA & CAO	0824-2407353	fa@nmpt.in
177.	Pollution Control Officer	0824-2407263, 0824-2400983(R), 0824-2407419	pccnmpt@yahoo.in
178.	Port Trust	0824-2407341, 0824-2408390/ 0824-2407341	chairman@nmpt.gov.in
179.	Port Control/VTMS	0824-2407428, 0824-2011206 0824-2887277	nmptvtms@ gmail.com
180.	Port Fire Services	0824-2407488 0824-2405092	chairman@nmpt.gov.in
181.			
PARADIP PORT			
182.	Chairman	06722-222168/ 06722-222046, 06722-222047, 06722-222127 06722-222168	secy@paradipport.gov.in
183.	Deputy Chairman	06722-222017, 06722-222047	dychmppt@paradipport.gov.in
184.	Traffic Manager	06722-222151, 06722-222112	tm_ppt@yahoo.co.in tmppt@paradipport.gov.in

185.	Public Relations Officer	06722-222242,	proppt@paradipport.gov.in
186.	Dy. Manager(MS)&Web Information	06722-222395, 06722-222149	dmmsppt@paradipport.gov.in
187.	Deputy Conservator	06722-222025, 06722-222025, 06722-222635(R)	deputyconservatorppt@email.com dcppt@paradipport.gov.in
188.	Harbour Master	06722-223498, 06722-223498	harbourmaster_ppt@email.com
189.	Pollution Control Officer & Deputy PFSO	06722-222025	dcppt@paradipport.gov.in
190.	Chief Vigilance Officer	06722-222673	cvoppt@paradipport.gov.in
191.	Sr. Hydro. Surveyor	06722-222303	pankanjs@paradipport.gov.in
Pipavav Port			
192.	General Manager HSE	02794-302601, 302402	gm@apmterminals.com
193.	General Manager	02794-302413	
194.	Chief Operating Officer	02794-302402	inppvportcontrol@apmterminals.com
195.	Harbour Master	02794-302667/ 02974-242604	ajay.kumar@apmterminal.com
196.	Head container	02794-302602/ 9824577725	kushagra.nigam@amptrminals.com
197.	Port Captain	02794-302428, 302667	Iramesh.korlapu@apmterminal.com
198.	Port Control Room	9904086633	inppvportcontrol@apmterminal.com
Port Blair Port			
199.	Chief Port Administrator	03192-232773, 03192-233675, 03192-233679(R)	pmb.and@nic.in
200.	Harbour Master	03192-237804,	harbourmaster@gmail.com

		03192-233231(R)	
201.	Chief Port Administrator	03192-232773, 03192-233675, 03192-233679(R)	pmb.and@nic.in
202.	Harbour Master	03192-233647 03192-237804, 03192-233231(R), 03192-237804	portblairportradio@rediffmail.com
V.O. Chidambaranar Port Trust			
203.	Chairman	0461-2352500, 0461-2352160, 0461-2321490	chairman@vocport.gov.in
204.	Dy. Chairman	0461-2352580, 0461-2352398, 0461-2352774	dycpt@vocport. gov.in
205.	Secretary	0461-2352232, 0461-2325553, 0461-2352301	secy@vocport. gov.in
206.	Dy. Conservator	0461-2352313, 0461-2352287, 0461-2352385	dc@vocport.gov.in

Pollution Control Boards

Ser	Name	Contact Details	Email Address
Gujarat			
1.	Gujarat State Pollution Control Board	Phone : (079) 2323 2152 Fax : (079) 2323 2156, 2322 2784, 2323 2161	gpcbchairman@gmail.com , chairman-gpcb@gujarat.gov.in
2.	Chairman Gujarat State Pollution Control Board	(079) 2323 2152 079) 2323 2156, 2322 2784, 2323 2161	membersecretarygpcb@gmail.com , ms-gpcb@gujarat.gov.in
Maharashtra			
3.	Maharashtra State Pollution Control Board	022-24010437 (Head Office) 022-24020781 (Head Office)	romumbai@mpcb.gov.in , mpcbmumbai@mpcb.gov.in
4.	Chairman	022 24042418	chairman@mpcb.gov.in
5.	Member Secretary	022 24010706	ms@mpcb.gov.in
Goa			
6.	Goa State Pollution Control Board	0832-2407700, 0832-2407701, 0832-2407702, 0832-240770	mail.gspcb@gov.in
7.	Chairman	0832-2407700, 2407701	chairman-gspcb.goa @nic.in
8.	Member Secretary	0832-2407700	ms-gspcb.goa @nic.in
Karnataka			
9.	Karnataka State Pollution Control Board	080-255891114 080-25586520 080-25588142 080-25581383 Fax: 080-25586321	memsecy@kspcb.gov.in

Ser	Name	Contact Details	Email Address
10.	Chairman	080-25588270	chairman@kspcb.gov.in
11.	Member Secretary	080-25588151	ms@kspcb.gov.in
Kerala			
12.	Kerala State Pollution Control Board	0471-2318153, 0471-2318154, 0471-2318155, 0471-2318156, 0471-2312910	chn.kspcb@gov.in
13.	Chairman	0471 - 2318150, 9444256675	chnkspcb@gov.in
14.	Member Secretary	0471 - 2318151, 9447975711	mkskspcb@gov.in
Puducherry			
15.	Chairman Committee	0413-2235595 0413-2235595	direnvir@md3.vsnl.net.in
16.	Member Secretary	Phone: 0413-2201256 Fax: 0413-2203494	ppcc.pon@nic.in
Tamil Nadu			
17.	Tamil Nadu State Pollution Control Board	Phone : 044-22353134 Fax : 044-22353068	grievance@tnpcb.gov.in
18.	Chairman	044 - 22353076	tnpcb@md3.vsnl.net.in
19.	Member Secretary	044- 22353145	grievance@tnpcb.gov.in
Andhra Pradesh			
2.	Chairman & Chief Secretary	0866-2463202	chairman@appcb.gov.in
3.	Member Secretary	0866-2463204	membersecretary@appcb.gov.in
Odisha State			
5.	Chairman	0674-2580973	paribesh1@ospchoard.org

Ser	Name	Contact Details	Email Address
		0674-2560955	
6.	Pollution Control Board	0674-2560973 0674-2562368	paribesh@dte.vsnl.net.in
7.	Member Secretary	0674-2561909 0674-2562822	paribesh@dataone.in
West Bengal			
8.	Chairman	033-23355975	chairman@wbpcb.gov.in
9.	Member Secretary	033-23358213	ms@wbpcb.gov.in
Andaman & Nicobar			
10.	Chief Secretary, A&N Administration & Chairman, A&NI KVIB	03192-233110 / 234087	cs-andaman@nic.in
11.	Pollution Control Board	03192-233270 03192-250370	dstandamans@gmail.com

Appendix F

(Refers to Para 6 of Chapter 7)

National Level HNS Crisis Management Group

1.	Defence Secretary	Chairman
2.	Home Secretary	Member
3.	Foreign Secretary	Member
4.	Secretary Environment, Forests and Climate Change	Member
5.	Secretary Shipping	Member
6.	Secretary Chemical Industry and Fertilizers	Member
7.	Secretary Petroleum and Natural Gas	Member
8.	Secretary Urban Development	Member
9.	Secretary MoES	Member
10.	Secretary Science and Technology	Member
11.	Secretary Agriculture and Co-operation	Member
12.	Secretary Chemicals and Petro Chemicals	Member
13.	Secretary Industrial Development	Member
14.	Secretary (Security) - Cabinet Secretariat	Member
15.	Director General Coast Guard	Member
16.	Chairman of the Concerned Port	Member
17.	Director General Hydrocarbons	Member
18.	Any member co-opted as deemed necessary	Member

Appendix G

(Refers to Para 9 of Chapter7)

Composition of State HNS Spill Crisis Management Group

1.	Chief Secretary	Chairperson
2.	Secretary (Labour)	Member
3.	Secretary (Environment)	Member
4.	Secretary (Health)	Member
5.	Secretary (Industries)	Member
6.	Secretary (Public Health Engg.)	Member
7.	Secretary (Fisheries)	Member
8.	Chairman, State Pollution Control Board	Member
9.	4-Experts (Industrial Safety & health) to be nominated by the State Government	Member
10.	Secretary/ Commissioner/ Chief Inspector of Factory	Member
11.	Director (Industrial Safety)/Chief Inspector of Factories	Member
12.	Fire Chief	Member
13.	Commissioner of Police	Member
14.	One Representative from the Industry to be nominated by the State Govt.	Member
15.	State Civil Defence Chief	Member
16.	Secretary (Revenue/ Home)	Member
17.	Directorate of Industrial Safety and Health	Member
18.	Chairman State Maritime board#	Member Secretary
19.	Any other member deemed necessary by the Chairperson	

+ *The composition is recommendatory in nature and may be decided by the coastal State as deemed necessary.*

The Secretary of the ministry in charge of the non-major ports shall be a member in lieu of the Chairman State Maritime Board in Coastal States where a State Maritime Board is yet to be established.

Appendix H
(Refers to Para11 of Chapter 7)

Composition of District HNS Spill Crisis Management Group

1.	District Collector	Chairperson
2.	Inspector of Factories	Member Secy.
3.	District Energy Officer	Member
4.	Chief Fire Officer	Member
5.	District Information Officer	Member
6.	Controller of Explosives	Member
7.	Chief, Civil Defence	Member
8.	One Representative of Trade Unions to be nominated by the District Collector	Member
9.	Deputy Superintendent of Police	Member
10.	District Health Officer/Chief Medical Officer	Member
11.	Commissioner, Municipal Corporations	Member
12.	Representative of the Department of Public Health Engineering	Member
13.	Representative of Pollution Control Board	Member
14.	District Agriculture Officer	Member
15.	4 Experts (Industrial Safety & Health) to be nominated by the District Collector	Member
16.	Commissioner (Transport)	Member
17.	One Representative of Industry to be nominated by the District Collector	Member
18.	Chairperson/Member-Secretary of Local Crisis Groups	Member
19.	Representative of the Port	Member
20.	Representative of State Maritime Board	Member
21.	District Forest Officer/ Wildlife advisor	Member
22.	Any other member deemed necessary by the Chairperson	

The composition is recommendatory in nature and may be decided by the coastal State as deemed necessary.

Appendix J

(Refers to Para 15 of Chapter 7)

Composition of National Plan Working Group

1.	Representative of Ministry of Environment, Forests and Climate Change
2.	Representative of MoP S&W
3.	Representative of Adviser Chemical & Pharmaceuticals
4.	Representative of Director General, Civil Defence
5.	Representative of Ministry of Health
6.	Representative of Chairman, Central Pollution Control Board
7.	Representative of Director General, Indian Council of Agriculture Research
8.	Representative of Industrial Safety and Health Experts
9.	Representatives of Industries nominated by the Central Govt.
10.	Representative of Centre for Environment and Explosive safety
11.	Representative of Dept. of Petro Chemical & Fertilizers
12.	Representative of Indian Chemical Manufacturers Association
13.	Representative of National Institute of Oceanography
14.	Representative of Integrated Coastal and Marine Area Management Project Directorate
15.	Any other member who could advise the CCA/CNA on specialist matter pertaining to HNS spill

The composition is recommendatory in nature and may be decided by the coastal State as deemed necessary.

Appendix K

(Refers to Para 17 of Chapter 8)

List of Resource Agencies

1. Ministry of Home Affairs
2. Ministry of External Affairs
3. Ministry of Environment, Forests and Climate Change
4. Ministry of Food Processing Industries
5. Ministry of Earth Science
6. Ministry of Petroleum and Natural Gas
7. Ministry of Shipping
8. Ministry of Chemicals and Fertilisers
9. Indian Navy
10. Indian Air Force
11. Directorate General of Shipping
12. Chemical and Industrial Disaster Management
13. Central and Coastal State Pollution Control Boards
14. National Institute of Oceanography
15. Shipping Corporation of India
16. Archaeological Survey of India
17. National Disaster Response Force
18. National Disaster Management Authority
19. Central Marine Fisheries Research Institute
20. Coastal HNS Facilities
21. Coastal State Authorities
22. Department of Animal Husbandry, Dairying & Fisheries
23. Indian Register of Shipping
24. Integrated Coastal and Marine Area Management Project Directorate
25. National Biodiversity Authority
26. Local Fisheries Authority
27. Major Port Authorities
28. Mercantile Marine Department
29. Surveyor General of India
30. Oil and Natural Gas Corporation
31. National Cadet Corps
32. National Service Scheme
33. NGOs
34. Any other concerned agency

Appendix L

(Refers to Para 20 of Chapter 8)

Grant of Refuge to Ships in need of Assistance

1. When a ship has suffered an incident, the best way of preventing damage or pollution from its progressive deterioration is to transfer its cargo and bunkers, and to repair the casualty. Such an operation is best carried out in a place of refuge. However, to bring such a ship into a place of refuge near a coast may endanger the coastal state, both economically and from the environmental point of view, and local authorities and populations may strongly object to the operation. Therefore, when granting access to a place of refuge, careful consideration would need to be given to balancing the interests of the affected ship with those of the environment.
2. According to Article 11 of the Salvage Convention, "A State Party shall, whenever regulating or deciding upon matters relating to salvage operations such as admittance to ports of vessels in distress or the provisions of facilities to salvors, take into account the need for co-operation between salvors, other interested parties and public authorities in order to ensure the efficient and successful performance of salvage operations for the purpose of saving life or property in danger as well as preventing damage to the environment in general."
3. International law recognizes the right of States to regulate entry into their ports. UNCLOS, Article-2, refers to the sovereignty of a coastal State over its land territory, internal waters, archipelagic waters and the territorial sea. The right of a foreign ship to stop and anchor in cases of force majeure or distress is explicitly referred to by UNCLOS in the case of navigation in the territorial sea (Article 18(2)), straits used for international navigation (Article 39.1(c)) and in archipelagic waters (Article 54). The right of a foreign ship to enter a port or internal waters of another State in situations of force majeure or distress is not regulated by UNCLOS, although this constitutes an internationally accepted practice, at least in order to preserve human life. This, however, does not preclude the adoption of rules or guidelines complementing the provisions of UNCLOS.
4. The right of a coastal State to take action to protect its coastline from marine pollution is well established in international law. Relevant provisions include: UNCLOS, Articles 194, 195, 198, 199, 211, 221, 225; Salvage Convention, Article 9; and Facilitation Convention, Article V(2).
5. Under long standing maritime tradition and the practice of good seamanship, the master of a ship faced with a serious emergency is expected

to seek shelter to avoid disaster. To some extent the practice is codified in the revised Chapter V of SOLAS, which requires that the owner, the charterer or the company operating the ship or any other person, shall not prevent or restrict the master of the ship from taking or executing any decision which, in the master's professional judgment, is necessary for safe navigation and protection of the marine environment.

6. By focusing more on human life and safety rather than on what is to be done with the ship in cases of force majeure or distress, these provisions do not of themselves give a right of entry to a place of refuge, nor do they explicitly refer to the question of a coastal State's obligation to establish places of refuge. On the other hand, neither do they preclude such a principle.

7. The IMO vide Resolution A.949(23) has developed *Guidelines on places of refuge for ships in need of assistance* in a manner which retains a proper and equitable balance between the rights and interests of coastal States and the need to render assistance to ships which are damaged or disabled or otherwise in distress at sea.

8. The checklist for grant of refuge to a ship in need of assistance developed on the basis of the IMO Guidelines is at **Table L-1** and Proforma for Risk Evaluation of place of refuge is at **Table L-2**.

TABLE H-1
CHECKLIST FOR GRANT OF REFUGE TO
SHIPS IN NEED OF ASSISTANCE

1. ACTIONS BY MASTER	
Situation Appraisal	With assistance of company/salvor, identify reasons for ship's need of assistance
Hazard Identification and risk assessment	taking into account both the casualty assessment and the cargo and bunkers on board estimate, with assistance of company and/ or salvor, consequences of the potential casualty, if ship remains in same position, continues on its voyage, reaches a place of refuge, or is taken out to sea in order to overcome the inherent danger of the situation
Identification of the required actions	Identify assistance required from the coastal State
Contacting coastal State authority	Make contact with the Maritime Assistance Service (MAS) in the coastal State, transmit particulars
Establishment of responsibilities and communications with all parties involved	notify MAS of the intended actions and time period of actions
	Obtain information from MAS of the facilities that can be made available with a view to assistance or admittance of the ship to a place of refuge
Response actions	Subject to prior consent of Directorate General of Shipping, take necessary response actions, such as signing a salvage or towage agreement or the provision of any other service for the purpose of dealing with the ship's situation
	Comply with requirements resulting from coastal State's decision-making process

	Reporting procedures	Comply with reporting procedures in accordance with safety management system
2.	ACTIONS BY MAS	
	Requiring actions by master and ship-owner	The Indian Coast Guard or other Competent Authority may require the ship's master or company to take appropriate action within a prescribed time limit with a view to halting a threat of danger. In cases of failure or urgency, authority will be exercised in taking response action appropriate to the threat
	Generic assessment of places of refuge	The port authorities shall, for each place of refuge, make an objective analysis of the advantages and disadvantages of allowing a ship in need of assistance to proceed to a place of refuge, taking into consideration the relevant analysis factors, and incorporate such analysis in their contingency plans
	Event-specific ship analysis	Seaworthiness of the ship, in particular buoyancy, stability, availability of means of propulsion and power generation, docking ability, etc
		Nature and condition of cargo, stores, bunkers, and hazardous goods
		Distance and estimated transit time to place of refuge
		Whether the master is still onboard
		The number of other crew and/or salvors and other persons onboard and assessment of human factors, including fatigue
		Whether the ship concerned is insured or not insured
		If ship is insured, identification of insurer, and limits of liability available
		Agreement by the master and company of the ship to the proposals of the coastal State/salvor to proceed or be brought to a place of refuge
		Provisions of the financial security required

		Commercial salvage contracts already concluded by the master or company of the ship
		Information on the intention of the master/salvor
		Designation of company representative at the SMCU
		Any measures already taken
3.	ACTIONS BY SMCU	
	Expert Analysis	Board ship, when appropriate and if time allows, gather evaluation data
		Compare between risks if ship remains at sea and risks that it would pose to the place of refuge and its environment by considering following points: - <ul style="list-style-type: none"> — safe guarding of human life at sea — safety of persons at the place of refuge and its industrial and urban environment (risk of fire or explosion, toxic risk, etc.) — risk of pollution — risk of disruption to the port's operation (channels, docks, equipment, other installations)
		Inform appropriate authorities of final analysis
4.	ACTIONS BY COMPETENT AUTHORITY	
	Decision-making process for the use of a place of refuge	When permission requested, no obligation to grant weigh all factors and risks in a balanced manner and give shelter whenever reasonably possible
		Decide to allow or refuse admittance, coupled, with practical requirements
5.	ACTIONS BY	
		Possible security in favour of the port to guarantee payment of all expenses which may be incurred in connection with its operations, such as: measures to safeguard the operation, port dues, pilotage, towage, mooring operations, miscellaneous expenses etc

Table H-2. Proforma for Risk Evaluation of Place of Refuge

EVENT IDENTIFICATION						
Fire	Explosion	Damage/structural failure	Collision	Pollution	Impaired stability	Grounding
ENVIRONMENTAL AND SOCIAL FACTORS						
Threat to safety of crew						
Threat to public safety						
Distance to nearest populated areas						
Worst case pollution that may be caused by the ship						
Designated environmental areas						
Proximity to sensitive areas such as areas of high ecological value likely to be affected by possible pollution						
Availability of a better choice of place of refuge close by on environmental grounds						
Impact on sensitive habitats and species						
Impact on fisheries						
Danger to offshore fishing or shell fishing activities in the transit area or in the approaches to the place of refuge or vicinity likely by incoming ship in need of assistance						
Scale of economic/industrial facilities in area						
Distance to nearest industrial areas						
Scale of amenity resources and tourism						
Facilities available						
Availability of specialist vessels and aircraft and other necessary means for providing necessary assistance						
Availability of transfer facilities, such as pumps, hoses, barges, pontoons						
Availability of reception facilities for harmful and dangerous cargoes						
Availability of repair facilities, such as dockyards, workshops, cranes						

NATURAL CONDITIONS	
Prevailing winds in the area	
Level of shelter from heavy winds and rough seas	
Tides and tidal currents	
Weather and sea conditions	
Local meteorological statistics and number of days of in operability or inaccessibility of the place of refuge	
Bathymetry	
Minimum and maximum water depths in the place of refuge and its approaches	
Maximum permissible draught.	
Suitability of the bottom to ground a problem vessel in the haven or its approaches	

Appendix M

(Refers to Para 3 & 9 of Chapter10)

Format for Approving Facility Contingency Plan**Contingency Planning Compliance Checklist**

NAME OF HNS HANDLING AGENCY			
DESCRIPTION		COMPLIED YES/ NO	REMARKS
RISK ASSESSMENT			
1.	Whether the facility produces/ handles/ uses/ imports/ stores any type of petroleum product		<i>Specify</i>
2.	Whether risk assessment is done		
3.	Who did the risk assessment		
4.	Whether maximum volume of HNS spill that can occur in the worst case scenario is considered		State qty
5.	Whether relative measure of the probability and consequences of various HNS spills including worst case scenario are taken into account		
6.	Whether all types of spills possible in the facility are considered including Grounding, Collision, Fire, Explosion, Rupture of hoses		
7.	Please specify the list of HNS considered for risk assessment		
8.	Whether the vulnerable areas are estimated by considering maximum loss scenario and weather condition		
9.	Whether impacts on the vulnerable areas are made after considering the Marine protected		

	areas, population, fishermen, saltpans, mangroves, corals and other resources within that area		
10.	Whether measures for reduction of identified high risks are included by reducing the consequences through spill mitigation measures		
11.	Whether steps have been considered to reduce risks to the exposed population by increasing safe distances by acquiring property around the facility, if possible		
12.	Whether risk levels are established for each month after considering the probability with tide and current and consequences of each such spill		
13.	Whether prevention and mitigation measures are included in the plan		
14.	Whether the spill may affect the shoreline. (length of the shoreline with coordinates)		If yes, specify
15.	Whether time taken the HNS spill to reach ashore in each quantity of spill in various months are mentioned in the plan		
16.	Whether sensitivity mapping has been carried out		
17.	Does the sensitivity mapping clearly identify the vulnerable areas along with MPAs, corals, fishermen community, saltpans, mangroves and other socio– economic elements in the area		
18.	Do the sensitivity maps indicate area to be protected on priority		
19.	Does the map indicate boom deployment locations		

20.	Whether any Marine Protected Area will be affected		Please specify
21.	Whether total number of fishermen likely to be affected is mentioned in the plan		
22.	Whether any saltpan in the area is going to be affected		Please specify total area
23.	Whether any mangroves in the area will be affected by a spill		Please specify location
Preparedness			
24.	Whether any containment equipment is available		Qty with ops status
25.	Whether any recovery equipment is available		Qty with ops status
26.	Whether the facility is having any temporary storage capacity		Specify in tons
27.	Whether location of the HNS spill response equipment is mentioned in the plan		
28.	Whether suitable vessels available for deploying the boom, skimmer etc.		
29.	Whether neutralising agent held with facility		Specify qty
30.	Whether the neutralising agent held with the facility is approved for use in Indian waters		
31.	Whether the facility has MoU with other operators for tier-1 preparedness		
32.	Whether the list of HNS spill response equipment available with each agency in MoU is deliberated		
33.	Whether the facility has any MoU with private Response Organisation		
34.	Whether the procedure for evoking the mutual aid is clearly described in		

	the plan		
35.	Whether additional manpower is available		
36.	Whether list of approved recyclers is mentioned in the plan		
37.	Whether NEBA (Net Environmental Benefit Analysis) has been undertaken		
38.	Whether the areas from priority protection have identified in the plan		
39.	Whether relevant authorities and stakeholders were consulted for NEBA and during the areas for priority protection		
40.	Whether District administration has been appraised of the risk impact of HNS spills?		
Action Plan			
41.	Whether the plan outlines procedure for reporting of HNS spills to Indian Coast Guard		
42.	Whether the HNS spill response action is clearly mentioned		
43.	Whether the action plan includes all duties to be attended in connection with an HNS spill		
44.	Whether the action plan includes key personnel by their names and designation viz. C/C, S/C		
45.	Whether alternate coverage is planned to take care of the absence of a particular person [in cases where action plan is developed basis names]		

46.	Whether the plan includes assignment of all key coordinators viz. the Communication Controller, Safety Coordinator, Emergency management team, Administration and Communication Coordinator and Safety Coordinator		
47.	Whether contact directory containing numbers of key response and management personnel is intimated in the plan		
48.	Whether approved recyclers are identified for processing recovered chemical / HNS debris		
49.	Whether the shoreline likely to be affected is identified		
50.	Whether final report on the incident is submitted to CGHQ		
51.	Whether the spill incident and its consequences are informed to fishermen and other NGOs for environment protection through media		
Training and Exercises			
52.	Whether mock fire / emergency response drills are specified in the plan		If yes, periodicity of emergency response drills
53.	Whether the mock drills cover all types of probable HNS spills		
54.	Whether the plan mentions list of trained manpower		
55.	Whether records for periodic mock drills are maintained in a well-defined format		
56.	Whether the plan is updated according to the findings in mock-drills and exercises		

57.	What is the frequency of updation/ review of contingency plan?		
58.	Periodicity of joint exercise with mutual aid partners		
59.	Frequency of mock-drills for practice		
60.	Whether the records for periodic mock drills are maintained in a well- defined format		
61.	Whether the plan is updated according to the findings of mock- drills and exercises		
62.	Frequency of updation/review of contingency plan		
<p>I, hereby, declare that the all information appended above and true and correct to my knowledge or belief.</p> <p>Date: _____ Chief Conservator/ Installation Manager</p>			
VERIFIED			
<p>Date: _____ (District Commander ICG) or his representative</p>			
<p>Date: _____ (Regional Commander ICG) or his representative</p>			

AppendixN

(Refers to Para 8 of Chapter 10)

Format for Annual Return**Annual Returns on Preparedness for HNS spill Response**

1	NAME OF PORT / HNS HANDING AGENCY					
2	CONTAINMENT EQUIPMENT	DESCRIPTION	LENGTH	QUANTITY (NO.)	DATE OF PURCHASE	OPERATIONAL STATUS
3	RECOVERY EQUIPMENT	DESCRIPTION	CAPACITY	QUANTITY (NO.)	DATE OF PURCHASE	OPERATIONAL STATUS
4	TEMPORARY STORAGE FACILITY	DESCRIPTION	CAPACITY	QUANTITY (NO.)	DATE OF PURCHASE	OPERATIONAL STATUS
5	OSD SPRAYING SYSTEM	DESCRIPTION		QUANTITY (NO.)	DATE OF PURCHASE	OPERATIONAL STATUS

6	HNS SPILL DISPERSANT	MAKE		QUANTITY (NO.)	DATE OF PURCHASE	EXPIRY DATE
7	SHORELINE RESPONSE EQUIPMENT	DESCRIPTION	CAPACITY (if applicable)	QUANTITY (NO.)	DATE OF PURCHASE	OPERATIONAL STATUS
8	IMO OPRC LEVEL TRAINED RESPONDERS	NAME	DESIGNATION	CONTACT NO	IMO OPRC LEVEL 1/2	
9	HNS SPILL RESPONSE CRAFT	CRAFT NAME	DESCRIPTION	RESPONSE CAPABILITY		
				PLEASE PROVIDE PARTICULARS AT SECTION 2-6		
10	OSRO PARTICULARS (IF OUTSOURCED)	OPERATOR NAME				

		ADDRESS			
		PHONE NO.			
		FAX NO.			
		E-MAIL			
		ENGAGEMENT EXPIRY DATE			
		EQUIPMENT ON HIRE		PLEASE PROVIDE PARTICULARS AT SECTION 2-7	
		IMO OPRC LEVEL TRAINED		PLEASE PROVIDE PARTICULARS AT SECTION 8	
		PERSONNEL ON HIRE			
		MANPOWER ON CALL			
		CRAFT ON HIRE		PLEASE PROVIDE PARTICULARS AT SECTION 9	
11	HNS SPILL CONTINGENCY PLAN	YEAR PUBLISHED		DATE OF LAST REVISION	STATUS OF APPROVAL BY COAST GUARD
12	PERSONNEL TO BE CONTACTED IN CASE OF SPILL	NAME	DESIGNATION	CONTACT PARTICULARS (a) LANDLINE (b) MOBILE (c) FAX (d) E-MAIL	

13	MoU DETAILS (IF ANY)	

Appendix P

(Refers to Para 11 of Chapter 10)

Elements of Facility Contingency Plan**Strategy**

1. Introduction
 - (a) Authorities and responsibilities
 - (b) Coordinating committee
 - (c) Statutory requirements
 - (d) Mutual aid agreements
 - (e) Geographical limits of plan
 - (f) Interface with HNSDCP
2. Risk assessment
 - (a) Quantity and types of HNS handled
 - (b) Identification of activities and risks
 - (c) Types of HNS likely to be spilled
 - (d) Probable fate of spilled HNS
 - (e) Development of HNS spill scenarios including worst case discharge
 - (f) Shoreline sensitivity mapping
 - (g) Shoreline resources, priorities for protection
 - (h) Special local considerations
3. Response strategy
 - (a) Philosophy and objectives

- (b) Limiting and adverse conditions
 - (c) HNS spill response in offshore zones
 - (d) HNS spill response in coastal zones
 - (e) Shoreline HNS spill response
 - (f) Storage and disposal of HNS and its waste
4. Equipment
- (a) Marine HNS spill response equipment
 - (b) Inspection, maintenance and testing
 - (c) Shore line equipment, supplies and services
5. Management
- (a) Crisis manager and financial authorities
 - (b) Incident organization chart
 - (c) Manpower availability(on-site, on-call)
 - (d) Availability of additional manpower
 - (e) Advisors and experts-spill response, wildlife, and marine environment
 - (f) Training/safety schedules and drill/exercise programme
6. Communications
- (a) Incident control room and facilities
 - (b) Field communications equipment
 - (c) Reports, manuals, maps, charts and incident logs

Action and Operations

7. Initial procedures

- (a) Notification of spill to concerned authorities
- (b) Preliminary estimate of response Tier
- (c) Notifying key team members and authorities
- (d) Manning control room
- (e) Collecting information (HNS type, sea/ wind forecasts, aerial surveillance, beach reports)
- (f) Estimating fate of HNS released into environment (24, 48 and 72 hours)
- (g) Identifying resources immediately at risk, informing parties

8. Operations planning

- (a) Assembling full response team
- (b) Identifying immediate response priorities
- (c) Mobilizing immediate response
- (d) Media briefing
- (e) Planning medium-term operations (24-, 48- and 72-hour)
- (f) Deciding to escalate response to higher tier
- (g) Mobilizing or placing on standby resources required
- (h) Establishing field command post and communications

9. Control of operations

- (a) Establishing a management team with experts and advisors
- (b) Updating information (sea/ wind/ weather forecasts, aerial surveillance, beach reports)
- (c) Reviewing and planning operations

- (d) Obtaining additional equipment, supplies and manpower
 - (e) Preparing daily incident log and management reports
 - (f) Preparing operations accounting and financing reports
 - (g) Preparing releases for public and press conferences
 - (h) Briefing local and government officials
10. Termination of operations
- (a) Deciding final and optimal levels of beach clean-up
 - (b) Standing-down equipment, cleaning, maintaining, replacing
 - (c) Preparing formal detailed report
 - (d) Reviewing plans and procedures from lessons learnt
11. Maps / Charts
- (a) Coastal Facilities, access roads, telephones, hotels etc.
 - (b) Coastal charts, currents, tidal information (ranges and streams), prevailing winds.
 - (c) Risk locations and probable fate of HNS.
 - (d) Shoreline resources for priority protection.
 - (e) Shoreline types.
 - (f) Sea zones and response strategies.
 - (g) Coastal zones and response strategies.
 - (h) Shoreline zones and clean-up strategies.
 - (j) HNS and waste storage/disposal sites.
 - (k) Sensitivity maps/atlas

Data Directory

12. Lists

- (a) *Primary HNS spill equipment*
- (b) *Auxiliary equipment:* tugs and workboats, aircraft, vacuum trucks, tanks and barges, loaders and graders, plastic bags, tools, protective clothing, communications equipment, etc (manufacturer, type, size, location, transport, contact, delivery time, cost and conditions).
- (c) *Support equipment:* aircraft, communications, catering, housing, transport, field sanitation and shelter etc (availability, contact, cost and conditions).
- (d) *Sources of manpower:* contractors, local authorities, caterers, security firms (availability, numbers, skills, contact, cost and conditions).
- (e) *Experts and advisors:* environment, safety, auditing, (availability, contact, cost and conditions).
- (f) *Local and national government contacts:* (name, rank and responsibility, address, telephone, fax, telex).

13. Data

- (a) Specifications of HNS commonly traded.
- (b) Wind and weather.
- (c) Information sources.

Appendix Q

(Refers to Para 12 of Chapter 10)

Recommended List of Equipment for HNS Facilities and States

1. **Detection Devices.** The detection devices are:-
 - (a) Thermal Conductivity Detector (Katharometer)
 - (b) Surface Acoustic Wave (SAW) Sensors
 - (c) Oxygen Meter
 - (d) Photo-Ionization Detector
 - (e) Ph-Meter
 - (f) ION Mobility Spectrometry
 - (g) Flame Spectrophotometry
 - (h) Photo Ionisation Detector (PID)
 - (i) Chemical Detector with Video Overlay Mode (VOM)
 - (j) LIDAR based standoff detector
 - (k) Handheld Raman Spectrometer
2. **Plugging & Sealing Devices**
 - (a) **Plugging Devices**
 - (i) Cone / Wedge.
 - (ii) Toggle Screw.
 - (iii) Cone / Inflatable Wedge.
 - (iv) Cone / Wedge + Inflatable Tube.
 - (v) Inflatable Bag – Sealing Strip.

(vi) Lifting Bag.

(b) **Sealing Devices**

(i) Self Adhesive Tape.

(ii) Ice Plug / Patch.

(iii) Inflatable tube + clamp.

(iv) Mechanical Valve.

(v) Flange tightening.

(vi) Inflatable Sleeve.

(viii) Valve closure.

(ix) Inflatable Plug.

3. **Recovery Devices**

(a) Mechanical, pneumatic or hydraulic dredges.

(b) Explosion proof Vacuum Suction Pump / Vacuum Cleaners.

(c) Excavator, or hand shovel.

(d) Nets, Dip Nets.

(e) Impermeable Containers for collection and transportation.

4. **For Mechanical Covering of Pollutants**

(a) Sorbents heavier than water.

(b) Inert covering materials like gravel, sand, etc.

(c) Active covering material like activated carbon, calcium carbonate etc.

5. If the substance is liable to show low evaporation (vapour pressure at $20^{\circ}\text{C} > 0.003 \text{ bar}$ or 300 Pa) or does not penetrate the ground:-

- (a) Sorbent socks, sorbent pads and bulk sorbents (Universal / Hydrophobic Sorbents).
- (b) Tarp – Foam Blanket {Protein, Fluoroprotein, Synthetic, Aqueous Film Forming Foam (AFFF), Film Forming Fluoroproteins (FFFP), Alcohol resistant etc.}.
- (c) Sorbent booms for containment operations.
- (d) Sorbent pom poms to filter wash effluents following site clean-up operations.
- (e) Spreading equipment for bulk sorbents – air blower, hydro ejector.

6. **Marking Equipment**

- (a) Odorous Additives – Used for Gas / Evaporators (make the substances olfactively detectable, especially for explosive or toxic clouds).
- (b) Fluorescent Dye – Used for floater or dissolver (make the substance visually detectable).
- (f) Smoke Bombs – make the location where the substance was spilled visually detectable.
- (g) Buoys – make the substance visually detectable (floater or floating packaged goods).
- (h) Acoustic transmitters – facilitates localisation of the substances on the sea bed (for sinker or packaged goods likely to sink).

7. **Personal Protective Equipment (PPE)**

- (a) SCBA (Self Contained Breathing Apparatus)
- (b) Full coverage Hazmat suit.
- (c) Inner and outer chemical resistant gloves.
- (d) Chemical resistant boots with steel toe.

- (e) Long sleeved cotton shirt (under suit).
- (f) Helmet (under suit).
- (g) Work overalls (under Hazmat suit).
- (h) Radio Communication system (under suit).
- (j) Disposable boot covers.
- (c) External protective visor.
- (d) Air purifying respirator.
- (e) Disposable chemical protective coveralls (spray tight).
- (f) Uniform for non-dangerous chemicals.
- (p) Work overalls.
- (q) Safety shoes or boots.

8. **Description of PPE Categories(Selection of the system of PPE is the discretion of the HNS Facilities)**

(a) **European System**

- (i) Type 1 – Protects against liquid and gaseous chemicals. Gas tight.
- (ii) Type 2 – Protects against liquid and gaseous chemicals. Non gas tight.
- (iii) Type 3 – Protects against liquid chemicals. Liquid tight.
- (iv) Type 4 – Protects against liquid chemicals. Spray tight.
- (v) Type 5 – Protects against solid particulates.
- (vi) Type 6 – Splash tight.

(b) **North American System**

- (i) Type A – Maximum respiratory and skin protection.

(ii) Type B– Maximum respiratory and moderate skin protection.

(iii) Type C – Minimal respiratory and skin protection.

(iv) Type D – No respiratory and minimum skin protection.

9. Shoreline cleanup equipment:-

(a) Mini Vacuum pumps.

(b) Fast Tanks.

(c) Shore sealing booms.

(d) Inflatable shelters.

(e) Decontamination Station Equipment.

(f) Portable temporary storage tanks.

(g) Minivac systems.

(h) Command Pallet – Walkie Talkie, Torch, Folding Table, Folding Chair, Map of area etc.

(i) Small boat with outboard motor.

10. National Level Requirement / Capability

(a) Emergency Towing Vessels.

(b) Salvage Vessel.

(c) Ecological Sensitivity Mapping.

(d) Testing Labs.

Note. States/Firms may keep equipment as per risk assessment