South Asia Co-operative Environment Programme (SACEP)
and
International Maritime Organization (IMO)
in partnership with the
Norwegian Agency for Development Cooperation (Norad)

Project to enhance regional cooperation mechanisms on marine pollution preparedness and response in the SACEP region (Bangladesh, India, Maldives, Pakistan and Sri Lanka)

Report on the

Regional Workshop to update the Regional Contingency Plan and its Annexes

held from

22-25 August 2016

and hosted by the **Maritime Transport Authority** of the Maldives

in

Malé, Maldives

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List of Abbreviations

CLC	Civil Liability Convention
IMO	International Maritime Organization
IPIECA	The global oil and gas industry association for environmental and social issues
ITCP	Integrated Technical Cooperation Programme
ITOPF	International Tanker Owners Pollution Federation Ltd
MoU	Memorandum of Understanding
Norad	Norwegian Agency for Development Cooperation
OPRC	International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990
OPRC-HNS	Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous Noxious Substances, 2000
SACEP	South Asia Co-operative Environment Programme
SAS	South Asia Seas
SASAP	South Asia Seas Action Plan
SASP	South Asian Seas Programme
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

1 Introduction

The prevention and control of pollution from ships represents a major concern and challenge for Member States of the International Maritime Organization (IMO) and forms the cornerstone of IMO's Marine Environment Programme. It is also an important component of the IMO's Integrated Technical Cooperation Programme (ITCP), which aims to assist Member States in developing capacity for the implementation of IMO instruments at national and regional levels.

One of the main environmental objectives of the ITCP is to promote regional cooperation on marine pollution preparedness and response. In this regard, the Norwegian Agency for Development Cooperation (Norad) agreed to support the IMO's efforts by funding a specific project, under an existing framework cooperation agreement between IMO and Norad, that aims at assisting the South Asian Seas (SAS) region to develop a regional cooperation mechanism for marine pollution preparedness and response. The long-term objective of the project is the effective implementation of the OPRC Convention[1] and the OPRC-HNS Protocol[2] in the SAS region.

In 1999, a Regional Oil and Chemical Pollution Contingency Plan and a draft Memorandum of Understanding (MoU) for Co-operation on the Response to Oil and Chemical Pollution in the South Asia Seas Region were discussed by the SAS countries. The final draft of the Regional Contingency Plan and of the Regional MoU were approved on 6 December 2000 at the "High Level Meeting", prior to their formal acceptance by the Government of Bangladesh, India, Maldives, Pakistan and Sri Lanka. However, the MoU is yet to enter into force, as it is awaiting signing by India. The short-term objective of the project is therefore to enhance regional cooperation on marine pollution preparedness and response in the region.

The specific scope of the project, as defined in the original project document was to organize and coordinate activities aimed at:

a) preparing the countries for the entry into force of the MoU and of the regional contingency plan, thus leading to an early implementation of the MoU; and

b) revitalizing the regional contingency plan through revisiting and updating the regional plan after conducting a regional exercise; addressing key operational and compensation issues; and identifying the need to strengthen secretarial arrangements.

During the inception phase of the project the SACEP countries requested that the Project should be focussed on objective b as above, as the MoU process was led by the countries by themselves and there was an expectation that without further external interventions, this process would continue. It was therefore agreed that the project would focus on revising and updating the regional contingency plan which will constitute the updated Annex of the MoU and enter into force once the MoU enters into force.

Based on this revised scope of the Project, the following minimum results/outcomes were therefore expected after completion of this three-year project:

i. A regional exercise conducted to test the communication and the operational procedures of the current Regional Contingency Plan and to identify the gaps, if any;
ii. The Regional Contingency Plan revisited, completed and updated as necessary;
iii. The secretarial arrangements for the Regional Contingency Plan reviewed and confirmed; and

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

[2] Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000

iv. Key issues of importance regarding cooperation in case of major pollution incidents, such as the use of dispersants, aerial surveillance and liability and compensation addressed and related agreements reflected in the Regional Contingency Plan.

In order to execute the project, IMO has joined forces with the Secretariat of the South Asia Co-operative Environment Programme (SACEP), which is a regional intergovernmental organization, and the Secretariat of the South Asian Seas Programme (SASP) as well. IMO and SACEP have signed a Memorandum of Understanding to execute the Project and certain responsibilities such as local coordination of activities and procurement of services have been delegated to SACEP under this Agreement.

This regional workshop was the final activity in the region under this three-year project, which gathered key representatives from the five beneficiary countries to update and finalize the Regional Plan. Since the Regional Plan also addresses chemical spills issues, this regional activity also included a workshop to discuss latest developments in the area of hazardous and noxious substances (HNS) spill preparedness and response. The services of international consultants and experts were engaged to assist SACEP and IMO in the preparatory technical work for this regional meeting and workshop and facilitate the discussions at the workshop.

2 Objectives of the Workshop

The workshop brought together national experts from the key relevant competent national authorities of the project's beneficiary countries (Bangladesh, India, Maldives, Pakistan and Sri Lanka), with the following objectives:

- Reach an agreement on the text of the updated Regional Contingency Plan as previously discussed during the regional workshop held in Colombo, Sri Lanka, in November 2015;
- Organize a workshop on latest developments related to HNS preparedness and response so that relevant text can be included in the Regional Contingency Plan; and
- Develop and adopt a three-year programme of trainings and exercises to enhance regional capacity building in oil and HNS spill preparedness and response, which can be used by national competent authorities and the SACEP region to gain funding/support from their own governments and external donors.

3 Workshop Agenda

The workshop agenda was composed of informative and technical presentations. It also included discussions related to proposed updates to the Regional Plan and a programme of training and exercises.

There was an opportunity for each country delegation to provide updates on national marine pollution preparedness and response, under the recognition that national response systems underpin regional cooperation planning.

The sessions took place daily from 09:00h to 17:00h. The detailed agenda is set out in annex 8.1.

4 Location, dates and participants

The workshop was held in Malé, Maldives at the Mookai Hotel from 22-25 August 2016.

A delegation comprising a minimum of two persons represented each of the five countries involved in the project. These country delegations included key technical personnel from Ministries or governmental agencies involved in oil and HNS spill preparedness and response issues.

In addition to the SACEP and IMO Secretariats, a number of international organizations, including the private sector, participated in the workshop. This enabled the sharing of experiences from other regions. Experts from ITOPF and Cedre facilitated the training workshop on latest developments in HNS spill preparedness and response..

The full list of the meeting's 30 participants is set out in annex 8.2.

5 Summary of presentations

The full presentation slides used in each session were distributed to all the participants at the close of the workshop in PDF files, as set out in annex 8.6 (six slides per page). The following sub-sections summarise the workshop proceedings.

5.1 Opening ceremony

After an initial blessing of the event, the opening ceremony comprised welcoming speeches by IMO (Dr. Jose Matheickal), SACEP (Dr. Muhammad Khurshid) and Capt. Abdul Latheef Mohamed, Minister of State for Economic Development of the Maldives.

The speakers emphasised oil spill risks in the region and the importance of achieving environmental protection jointly through the prevention of marine pollution and the establishment of preparedness capacity in case of incidents. They also highlighted the importance of mutual support between countries as a key point for preparedness. In this context, they specified the importance of both the OPRC Convention and the OPRC-HNS Protocol, as well as their linkage to the Regional MoU.



5.2 The Background to the Regional Project

Mr. Pulakesh Mondal (Senior Programme Officer, Regional – SASP, SACEP) introduced the background to the Regional Project, covering the following key items:

Regional risk profile for oil and chemical spills

There is significant potential for crude oil spills from tankers or bunker spills from general shipping. South Asia lies close to main shipping routes and encompasses about 25% of the world total movement of crude oil by sea. There are also various general shipping trade routes. Much of the region's oil demand is met by imported oil, though India is presently undertaking offshore oil exploration, while Sri Lanka is looking at the possibilities. It was highlighted that the region has suffered from major incidents in the past.

Historical background to the MoU and the regional contingency plan for cooperation

Initial moves to develop a regional Marine Pollution Emergency Action Plan were undertaken in 1989 with support from UNEP, UNDP and IMO, but were not finalized. The adoption of the South Asia Seas Action Plan (SASAP) in 1995 and identification of the need to development and implement National and Regional Oil and Chemical Spill Contingency Planning gave momentum to the activity. The first Inter-Ministerial Meeting held in 1999 recommended the updating and finalization of the South Asia Seas Oil Spill Contingency Plan which was organised by SACEP with support from IMO and UNEP. Late in 1999, a Meeting of Senior Officials considered the draft Plan and also prepared a preliminary draft of the regional MoU. A High Level meeting in late 2000 prepared the draft Plan and MoU for acceptance by the Intergovernmental Meeting of the SASP. After the concerned countries came to an agreement on the text of the two documents, the MoU was open for signature in 2009.

An update on the status of signing the MoU

Four of the five member countries have already signed the MoU (Maldives, Pakistan, Bangladesh and Sri Lanka). It was reported that India is in an advanced stage of signing the MoU. The MoU will enter into force three months after the Secretariat (SASP) has been notified of the adoption by all five countries.

First regional meeting of Competent National Authorities

The First Meeting, held in Colombo during 26-28 February 2014, had kicked off the current project to enhance regional cooperation mechanisms on marine pollution preparedness and response in the SACEP region. The meeting brought together national experts from the key relevant competent national authorities, to consider activities in preparation for the entry into force of the MoU. A detailed work plan/roadmap for the project was agreed and National Project Counterparts and project coordination arrangements identified.

National workshops

A series of national-level workshops had been delivered to assist the countries in aligning their national systems to the regional mechanism. These had taken place as follows:

- 16-17 December 2014, Colombo, Sri Lanka
- 12-13 January 2015, Karachi, Pakistan
- 2-3 February 2015, Chennai, India
- 8-9 June 2015, Malé, Maldives
- 5-6 August 2015, Dhaka, Bangladesh

Second regional meeting and exercise

The second regional meeting, held in Colombo during 2-6 November 2015, had examined the mechanisms for effective communication during an oil and chemical spill incident.

The meeting had reviewed the existing Regional Oil and Chemical Pollution Contingency Plan under the MoU. This review had identified the areas that needed amendment based on experiences from the five

national workshops. A table-top regional exercise was held to further identify areas for improvement in the draft. A revised Regional Plan was subsequently produced.

5.3 Introduction to the workshop

Mr Peter Taylor (IMO Lead Consultant) introduced the workshop; he briefly described the elements of preparedness and the tools available for their assessment. This included the Annex 1 to the IMO *Manual on Oil Spill Risk Evaluation and Assessment of Response Preparedness* and the Regional Association of Oil, Gas and Biofuels Sector Companies in Latin America and the Caribbean (ARPEL) *Oil Spill Response Planning and Readiness Assessment Manual*[3].

The status of each country in relation to the key IMO spill conventions was presented:

	Bangladesh	India	Maldives	Pakistan	Sri Lanka
OPRC	✓	✓	×	✓	×
OPRC-HNS	×	×	×	×	×
CLC	×	✓	✓	✓	✓
Fund	×	✓	✓	×	✓
Bunkers	×	×	×	×	×

The workshop objectives were agreed and the agenda outlined. This was followed by a brief introduction from all the participants.

5.4 Current state of national preparedness

Each of the country delegations provided information on the status of their national preparedness in the regional context as follows.

5.4.1 Bangladesh

Brief context on the marine environment was given with the experience gained at two spills (oil tanker collision on Shela River in 2014 and rail bridge collapse near Chittagong in June 2015).

The national oil spill contingency plan was finalised in February 2016 and is now at the stage of approval by the government. The national plan identifies the response organization, alert and notification procedures and sits within the custodianship of the Department of Environment, which acts as the central agency and command and communication hub in the case of emergencies. The development of the plan

[3] This Manual supports the Readiness Evaluation Tool for Oil Spills – RETOS™ – available at: https://arpel.org/library/publication/341/

has been assisted by US AID, which have proposed further support for implementation. It is anticipated that the plan will be approved and implemented in 2017.

Bangladesh has submitted information to SACEP concerning the annexes 1, 2 and 3 of the Regional Plan.

5.4.2 India

The National Plan is long established in India and brings together various agencies (including the Indian Coast Guard), State governments and the shipping, ports and oil industries. The plan was last updated in 2015 to reflect current international norms, good practices, key relevant national regulations and cumulative experiences. The revised version also facilitates national preparedness to HNS incidents.

The national plan establishes a hierarchy of other contingency plans down to State, District and facility levels. A programme of exercises and training is mandated and the National Plan Working Group provides a forum for on-going discussion and development of the plan.

A national Geographic Information System (incorporating sensitivity mapping) and oil spill modelling capability are available to support risk assessment and incident response.

5.4.3 Pakistan

The National Contingency Plan (NCP) provides a coordinated mechanism to deal with marine disasters and a national system for prompt response with Pakistan Navy in the lead role. This includes response to oil and chemical (HNS) spills.

The NCP is periodically reviewed to incorporate experiences gained through exercises/incidents, changes in stakeholders and equipment inventories and organizational or legislative changes. All stakeholders' resources are audited through physical inspection. The information for the Regional Plan annexes was forwarded to SACEP in January 2016.

A proposal was made to consider an operational mechanism for engaging with countries neighbouring the SASP region within the Regional Plan and for inclusion of expanded references to HNS.

5.4.4 Sri Lanka

Information was provided on three spill incidents (Jet A1 pipeline leak into Lunawa lagoon, diesel pipeline leak into Kelani river and palm oil tank farm leak in the Colombo Dockyard).

Latest actions with respect to the national plan were reported, including an update to cover chemical (HNS) spills and filling gaps with respect to alignment to international guidance, places of refuge and dispersant policy. Sri Lanka is working towards ratification of the OPRC Convention and the OPRC-HNS Protocol.

Training and exercise has been undertaken and workshops on HNS conducted. New agencies with specialized capability for HNS response have been identified.

5.4.5 Maldives

The maritime nature of the Maldives was emphasised, with many small islands and 200 of which are inhabited. The primary economies, namely tourism and fisheries, are entirely dependent on a healthy marine environment.

A clear mandate has been given to the Maldives National Defence Force to address and assist oil spills under Act 28/2015. An oil spill contingency is developed, but some of its elements are still being

addressed including sensitivity mapping, dispersant policy and equipment requirements. Mechanisms for settlement of claims are not yet addressed in the plan.

5.5 Workshop on Hazardous and Noxious Substances Incident

A series of presentations were made by experts from ITOPF and Cedre, concerning preparedness and response to HNS incidents, as follows.

Topics	Presenter	Synopsis
HNS Course introduction	Dr. Franck Laruelle and Dr. Camille Lacroix	Explanation of the course objectives and timetable
Introduction to ITOPF	Dr. Franck Laruelle	Explanation of the role of ITOPF as a non-profit organization which provides technical services in relation to oil and HNS incidents from ships
Introduction to Cedre	Dr. Camille Lacroix	Explanation of the role of Cedre as a non-profit private entity assisting the French authorities in oil and HNS spill preparedness and having the ability to provide support to foreign authorities and the private sector
What are HNS?	Dr. Camille Lacroix	An introduction to what are HNS, raising awareness about risk, specificity, complexity and potential impacts of HNS accidents
Transportation of HNS at sea	Dr. Franck Laruelle	Description of the ways in which HNS cargoes may be carried at sea, the regulations and guidance available and the types of maritime accidents that could lead to a release of HNS
Chemical substances: hazard, behaviour and effects	Dr. Franck Laruelle	Explanation about the types of HNS, how they present hazards to people and the environment, their behaviours when released, and important physio-chemical properties to consider
HNS response: Health and Safety issues	Dr. Camille Lacroix	Highlighting the importance of health and safety issues to responders during an HNS incident and providing basic information on suitable safety equipment and procedures
HNS response strategies	Dr. Franck Laruelle	Consideration of the types of response which may be considered, based on the nature of the HNS release
Contingency Planning for HNS	Dr. Camille Lacroix	How plans can be developed for HNS, drawing parallels with planning for oil

Topics	Presenter	Synopsis
		spills
Information resources for HNS	Dr. Franck Laruelle	Guidance on the sources of information relating to HNS, how to identify and interpret this information and introduction to the modelling tools that may be used to support planning and response
Exercise: finding information for five products	Dr. Franck Laruelle & Dr. Camille Lacroix	Worked examples of how freely available sources can be used to provide useful information to support HNS response
International legislation: OPRC Convention, OPRC-HNS protocol and HNS Convention	Dr. Franck Laruelle	Introduction to the key conventions, including the OPRC-HNS Protocol and the HNS Convention (latter not yet in force)
Case studies: IEVOLI SUN and ECE	Dr. Camille Lacroix	Lessons learned from incidents involving HNS and how these can help inform current contingency planning
Case studies: SAMHO BROTHER and STOLT VALOR	Dr. Franck Laruelle	
Places of Refuge	Dr. Franck Laruelle	The history and development of IMO guidelines on identifying place of refuge to ships involved in maritime emergencies

6 Finalization of the Regional Plan

Mr. Peter Taylor facilitated a review by all national delegations of each section of the text of the Regional Plan, including its technical annexes. This incorporated the revisions to the Regional Plan agreed during the last Regional workshop held in November 2015. Additional updates were proposed, discussed and accepted, including increased references to HNS incidents.

The mechanism for future updates to the Regional Plan was incorporated into the Plan's text. All agreed updates were subsequently incorporated into the text and circulated to the workshop attendees prior to final agreement and approval of the updated text on the following (i.e. final) day of the workshop.

The final updated and agreed text of the Regional Plan is included as annex 8.5.

6.1 Development of programme of training and exercises

A discussion paper for this session was prepared by Mr. Peter Taylor and circulated to participants in advance for their better preparation. The paper comprised two parts, the first providing background and context, reproduced as annex 8.3, and the second part being a draft of the training and exercise guidelines and programme for the region. This second part is included (as amended during the workshop) as annex 8.4.

The guidelines do not form an integral part of the Regional Plan but are designed as a tool to support its implementation. It is anticipated that the national operational authorities may use the guidelines either when planning joint training and exercise activities or when approaching potential donors for support to related exercise events.

6.2 Table-top Exercise

Mr. Taylor facilitated the use of the Regional Plan's Pollution Reporting system in response to a fictitious oil spill off the south west coast of India. This demonstrated the value of low-cost, simple exercises to enable awareness building, the testing of procedures and as a means to uncover issues of communications, command and control. Mr. Lee Nai Ming of Oil Spill Response Limited produced spill trajectory and oil weathering simulations to support the scenario.

7 Workshop conclusions and closure

The workshop achieved its three objectives as follows:

Objective	*Action and result*
Reach an agreement on the text of the updated Regional Plan as previously discussed during the regional workshop held in Colombo, Sri Lanka, in November 2015	The Regional Plan was updated and a revised clean version agreed by all participants. This is included as annex 8.5; Microsoft Word versions are held by SACEP and IMO. This updated version will await the signing of the Regional MoU by India, upon which the MoU will subsequently enter into force. This updated Regional Plan, along with the populated annexes 1, 2 and 3 will then be presented to the next intergovernmental meeting of the SASP for adoption.
Develop and adopt a three-year programme of trainings and exercises to enhance regional capacity building in oil and HNS spill preparedness and response, which can be used by national competent authorities and the SACEP region to gain funding/support from their own governments and external donors	A programme was discussed and agreed; this is included as annex 8.4.
Organize a workshop on HNS preparedness and response	Detailed discussions on HNS preparedness and response was incorporated into the workshop and delivered by international experts. This helped the finalization of the text related to chemical spills, in the Regional Contingency Plan.

The workshop was closed with remarks from SACEP (Dr. Muhammad Khurshid, Director General), IMO Dr. Jose Matheickal) and the Maldives Transport Authority (Mr. Abdul Nasir Mohamed, Deputy Director General).

The success in achieving the key objectives was noted and each member of the national delegations was awarded with a certificate of attendance.

8 Annexes

8.1 Meeting Agenda

Day 1 – Monday 22nd August 2016		
08:30-09:00	Arrival and Registration of Participants	
09:00-09:45	**Opening Ceremony** • Opening Remarks by IMO • Opening Remarks by SACEP • Keynote address by host country Group photo	 Mr. Jose Matheickal Dr. Muhammad Khurshid Director General, SACEP Capt. Abdul Latheef Mohamed Minister of State for Economic Development of the Maldives
09:45-10:45	**Coffee Break**	
10:45-11:00	**Presentation of the SACEP - NORAD Project** • Summary of the Project activities to date • Updates since the last Regional Exercise and Workshop • National inputs to the Regional plan • Outcome of SACEP Governing Council meeting in relation to the project	Mr. Pulakesh Mondal, Senior Programme Officer (Regional), SACEP
11:00-11:15	**Introduction of Final Regional Workshop** • Brief overview of current status and levels of preparedness in Region (in detail, updates on NCPs will be introduced in the next slot) • Objectives of workshop and programme • Introduction of the participants • Introduction of the facilitators	Mr. Peter Taylor
11:15-12:45	• Countries presentations on any updates of their National Contingency Plan, including HNS preparedness	Bangladesh India Pakistan
12:45-13:45	**Lunch Break**	
13:45-14:30	• Countries presentations on any updates of	Sri Lanka

	their National Contingency Plan, including HNS preparedness (Cont'd)	Maldives
14:30-15:00 15:00-15:20	**Introduction to Cedre and ITOPF** **What are HNS?**	Dr. Franck Laruelle (ITOPF) and Dr. Camille Lacroix (Cedre) Dr. Camille Lacroix
15:20-15:40	**Coffee Break**	
15:40-16:10 16:10-16:45 16:45-17:30	**Transportation of HNS at sea** **Chemical substances, hazard, behaviour and effects** **HNS response: Health & Safety issues**	Dr. Franck Laruelle Dr. Franck Laruelle Dr. Camille Lacroix
17:30	**End day 1**	
Day 2 – Tuesday 23rd August 2016		
09:00-09:15	Summary of objectives of Day 2	Mr. Yasuhiro Urano, IMO
09:15-10:00 10:00-10:50	**HNS response strategies** **Contingency Planning for HNS**	Dr. Franck Laruelle Dr. Camille Lacroix
10:50-11:15	**Coffee Break**	
11:15-12:00 12:00-12:30	**Information resources for HNS** **Exercise: finding information for 5 products**	Dr. Franck Laruelle Dr. Franck Laruelle and Dr. Camille Lacroix
12:30-13:30	**Lunch Break**	
13:30-14:15 14:15-15:20	**International legislation: OPRC-HNS protocol and HNS Convention** **Case studies: IEVOLI SUN and ECE**	Dr. Franck Laruelle Dr. Camille Lacroix
15:20-15:50	**Coffee Break**	
15:50-16:15 16:15-17:00	**Case studies: SAHMO BROTHER and STOLT VALOR** **Places of Refuge**	Dr. Franck Laruelle
17:00-17:15	Summary of Day 2 and Introduction to Day 3	Mr. Peter Taylor
17:30	**End day 2**	
19:30-	**Welcome Reception**	

Day 3 – Wednesday 24th August 2016		
09:00-09:50	**Finalization of the Regional Plan** • Outline main amendments to Regional Plan agreed during the last Regional workshop • Ascertain that all are still in agreement with the changes • Consider any additional amendments to the Regional Plan reflecting HNS Preparedness and Response Training on Day 1 and Day 2 (e.g., technical additions to the Plan's annexes) • Present the mechanisms for maintaining and updated the Regional Plan • Participants to formally endorse new plan	Mr. Peter Taylor
10:50-11:20	**Coffee Break**	
11:20-12:30	**Development of programme of training and exercises** **(Discussion Paper** for this session was prepared by Mr. Peter Taylor and circulated to participants in advance for their better preparation**)** • Introduction to spill preparedness and response training and exercises • Introduction of existing regional training and exercise programs in other regions (Baltic Sea, Black Sea, etc.) and oil industries (**Part 1 of the Discussion Paper**)	Mr. Peter Taylor
12:30-13:30	**Lunch Break**	
13:30-15:00	**Development of programme of training and exercises (Cont'd)** • Introduction of Regional Training and Exercise Guidelines (**Part 2 of the Discussion Paper**)	Mr. Peter Taylor
15:00-15:30	**Coffee Break**	
15:30-17:00	**Table top exercise**	Mr. Peter Taylor
17:00	**End day 3**	

Day 4 – Thursday 25th August 2016		
09:30-11:00	**Finalize the draft Regional Contingency Plan and the recommendation on the regional training and exercise programme**	Mr. Peter Taylor
11:00-11:30	**Coffee Break**	
11:30-12:00	**Closing Ceremony** • Closing Remarks by SACEP • Closing Remarks by IMO • Provision of Certificates • Closing Remarks by host country	 Dr. Muhammad Khurshid Director General, SACEP Mr. Jose Matheickal Mr. Abdul Nasir Mohamed Deputy Director General Maldives Transport Authority
12:00	**End of Workshop**	

8.2 Meeting Participants

8.2.1 Country Delegations

No.	Name	Position and Institution	Country
1	Mr. Mohammad Mokbul Hossain	Director (Joint Secretary), Department of Environment	Bangladesh
2	Ms. Roksana Tarannum	Deputy Secretary Ministry of Environment & Forests	Bangladesh
3	Mr. Mirza Saifur Rahman	Engineer & Ship Surveyor Department of Shipping	Bangladesh
4	Mr. Vikram Dingley	Vice President (SB & S) The Shipping Corporation of India	India
5	Dr. R. S. Kankara	Sci-F, Head Coastal Processes & Shoreline Management Group, ICMAM-Project Directorate, Ministry of Earth Sciences	India
6	Mr. Abdul Nasir Mohamed	Deputy Director General Maldives Transport Authority	Maldives
7	Mr. Ibrahim Yasir	Deputy Director Maldives Transport Authority	Maldives
8	Mr. Hussain Nazeer	Assistant Director Maldives Transport Authority	Maldives
9	Mr. Mohamed Imthiyaz	National Maritime Consultant Ministry of Economic Development	Maldives
10	Ms. Mariyam Rifga	Assistant Director Environment Protection Agency	Maldives
11	Mr. Ahmed Zaeem	Captain MNDF (Coast Guard)	Maldives
12	Mr. Hussain Faisal	Pilot Maldives Ports Limited	Maldives
13	Mr. Zahir Mohamed	Port Captain State Trading Organization PLC	Maldives
14	Mr. Misru Abdulla	Police Segment Maldives Police Service (Marine Police)	Maldives
15	Mr. Ishrat Ali	Joint Secretary (Development) Ministry of Climate Change	Pakistan
16	Cdre (Ops) Abdul Majid PN	Deputy Director General Pakistan Maritime Security Agency	Pakistan
17	Cdr (Ops) Ghazi Salah Ud-din PN	Commander 23rd Offshore Squadron Pakistan Maritime Security Agency	Pakistan
18	Dr. P. B. Terney Pradeep Kumara	General Manager Marine Environment Protection Authority	Sri Lanka

No.	Name	Position and Institution	Country
19	Commander (N) J. M. B. S. B. Jayaweera	Deputy General Manager Operations Marine Environment Protection Authority	Sri Lanka
20	Mr. A. J. M. Gunasekara	Manager Operations Marine Environment Protection Authority	Sri Lanka

8.2.2 SACEP Secretariat and Support

No.	Name	Position and Institution	Country
21	Dr. Muhammad Khurshid	Director General SACEP	Sri Lanka
22	Ms. Jacintha S Tissera	Administrative Officer SACEP	Sri Lanka
23	Mr. Pulakesh Mondal	Senior Programme Officer (Regional) – SASP, SACEP	Sri Lanka

8.2.3 International Organizations

No.	Name	Position and Institution	Country
24	Mr. Peter Taylor	IMO Lead Consultant (Petronia Consulting Ltd)	United Kingdom
25	Dr. Camille Lacroix	IMO Consultant (Cedre)	France
26	Dr. Franck Laruelle	Technical Team Manager ITOPF	United Kingdom
27	Mr. Lee Nai Ming	Functional Response Manager Oil Spill Response Limited (OSRL)	Singapore
28	Dr. Jose Matheickal	Head, ITCP Implementation and Major Projects, Marine Environment Division IMO	United Kingdom
29	Mr. Yasuhiro Urano	Junior Professional Officer Sub-Division for Implementation Marine Environment Division, IMO	United Kingdom
30	Mr. John Alonso	Principal Project Assistant Globallast Partnership Programme Marine Environment Division, IMO	United Kingdom

8.3 Discussion paper concerning training and exercising: context

8.3.1 Background

This Discussion Paper supports the Final Workshop under the IMO-Norad / SACEP Project to enhance regional cooperation mechanisms on marine pollution preparedness and response in the SACEP region (Bangladesh, India, Maldives, Pakistan and Sri Lanka). The Paper has two Parts:

1. Context: background and experiences from other regional agreements.
2. Draft regional training and exercising guidelines.

The training and exercising of relevant personnel is universally accepted to be critical for effective preparedness for marine pollution. This is captured at the international level, with the *International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990* (OPRC Convention) making the following specific reference:

Article 6(2)(b) [In addition, each Party, within its capabilities either individually or through bilateral or multilateral co-operation and, as appropriate, in co-operation with the oil and shipping industries, port authorities and other relevant entities, shall establish] a programme of exercises for oil pollution response organizations and training of relevant personnel.

Furthermore, pursuant to the implementation of Resolution 7 ('Development and Implementation of a Training Programme for Oil Pollution Preparedness and Response') of the OPRC Convention, the IMO has developed a series of Model Courses for use by Member States.

The draft South Asia Regional Contingency Plan makes specific reference to the OPRC's training and exercising requirements as follows:

Section 1.2.4 In order to achieve these objectives, the following actions referred to in the OPRC Convention are needed to implement the Regional Contingency Plan:

(d) developing and implementing a programme of training courses and practical exercises for different levels of personnel involved in oil pollution prevention and combating;

The Regional Contingency Plan addresses the need for a training and exercising programme in further detail in its Section 2.4 'Joint training and exercises' (reproduced as Annex 1 to this Paper).

This Discussion Paper provides information based on global experiences in the development and implementation of training and exercise programmes and related guidance. It suggests a draft programme to consider in the context of South Asia regional co-operation.

8.3.2 Training courses: international guidance

The IMO has developed a range of training courses to address all aspects of oil spill planning, response and management. These are known as the OPRC Model Courses. These courses have been designed and developed by an international group of experts from governments and industry. They are available to IMO Member States and include instructors' manuals, participants' manuals and training aids, in the form of presentations plus additional guidance and tools.

The OPRC Model Courses were originally developed in the 1990s for three levels of personnel:

- Operational staff (Level 1);
- Supervisors and on-scene commanders (Level 2); and
- Senior management personnel (Level 3).

The IMO's Sub-Committee on Pollution Prevention and Response (PPR) is currently overseeing the updating of the OPRC Model Courses and will finalize the draft new edition at its 4th Session to be held in January 2017 for subsequent approval by MEPC 71 to be held in May 2017. The future training and exercise programmes should incorporate this new edition of the IMO OPRC Model Courses after it is approved.

On the other hand, the OPRC Convention explicitly encourages cooperation with industry in the establishment of training and exercise programmes. In this regard, the IPIECA[4]/IOGP[5] 'Oil spill training' Good Practice Guidelines (2014) are a useful reference, providing the international oil industry's perspective on the training courses and related programmes. This document is available at: http://www.oilspillresponseproject.org/wp-content/uploads/2016/02/GPG-Oil-spill-training.pdf.

Countries in South Asia have already adopted and undertaken OPRC Model Courses to varying degrees. The need for additional and regular courses has been identified and highlighted at previous workshops under the IMO-Norad / SACEP project. National Response Systems and their related national contingency plans provide the framework of national training activities and the bridge to joint training on a bilateral, multilateral or regional basis. Therefore, it is anticipated that there will enthusiastic acceptance for IMO Model Courses to be considered and adopted within the Regional Contingency Plan's framework.

Training courses arranged under the regional framework may attract support from donor agencies. The alignment of proposed activities to the recognized IMO Model Courses' syllabi is likely to promote their acceptance and legitimacy. However, it is usually more cost-effective to run national-level (or possibly bi-lateral) training courses. Regional courses incur additional time and financial outlay, due to international travel for significant number of trainees. If arranged, regional courses inevitably restrict attendance to relatively small numbers from non-host nations. At the regional level, it may be more viable to integrating joint training sessions alongside regional exercises.

8.3.3 Exercises: regional experiences

There is extensive global experience of regional oil spill exercising, stemming from the various regional agreements under the UNEP Regional Seas Programme and through implementation of the OPRC Convention. Drawing upon these experiences when considering South Asia's prospective exercise programme is beneficial.

Specific references of particular relevance are:

- HELCOM Manual on Co-operation in Combating Marine Pollution, Volume I, Chapter 10, *Exercises and Related Guidelines* (Updated 2016). Available at: http://www.helcom.fi/Lists/Publications/HELCOM%20Manual%20on%20Co-operation%20in%20Response%20to%20Marine%20Pollution%20-%20Volume%201.pdf.
- IPIECA/IOGP 'Oil spill exercises' Good Practice Guidelines[6] (2014). Available at: http://www.oilspillresponseproject.org/wp-content/uploads/2016/02/GPG-Exercise-Planning.pdf.

The HELCOM (Baltic Sea) guidelines have been used for decades and represent a sustainable approach to ensuring familiarity with regional co-operation communications and procedures. The Black Sea region adapted the HELCOM approach when developing their regional exercise guidelines in 2005 and these

[4] The global oil and gas industry association for environmental and social issues

[5] International Association of Oil & Gas Producers

[6] These guidelines updated and replaced the IMO/IPIECA Report Series Volume 2: *Guide to Oil Spill Exercise Planning*

have been successfully implemented over the subsequent years. The Black Sea region uses the same five exercise types as HELCOM:

- Exercise (ALPHA)
- Alarm Exercise (BRAVO)
- Equipment Exercise (CHARLIE)
- Operational Exercise (DELTA)
- State-of-the-art Exercise (ECHO)

In establishing the Black Sea exercise programme, the focus was initially placed on BRAVO (Alarm or notification) exercises, followed by ALPHA (Table-top) exercises and ultimately working towards DELTA (Operational or 'full-scale') exercises. This approach allowed the stepwise familiarization of personal with procedures, prior to undertaking more the complex challenges that operational exercises present. It is recommended that South Asia consider a similar approach to build regional capability and working knowledge of the Regional Contingency Plan's procedures. This approach also provided for training activities to be incorporated within the exercise programme.

The IPIECA/IOGP guidelines promote activities that may be undertaken using a variety of methods, as listed below. Examples of the durations of delivery for each method are indicated in brackets (these times exclude the planning and preparation phases, which may be significant). The methods described are based standards published by the International Organization for Standardization[7]. Their equivalence to the three key HELCOM exercise types is indicated.

Discussion-based activities:

- Seminar (1–2 hours)
- Workshop (2–8 hours)
- Table-top (2–4 hours); ALPHA

Operations-based activities:

- Drill (4–8 hours): BRAVO
- Functional exercise (4–8 hours)
- Full-scale exercise (8–72 hours); DELTA

The IPIECA/IOGP guidelines also place emphasis on a set of Guiding Principles relating to oil spill exercising that were originally published in the IMO/IPIECA Report Series. These principles have been incorporated in the draft regional guidelines.

[7] '*Societal security – Guidelines for exercises*', document reference ISO 22398:2013, may be purchased via: http://www.iso.org/iso/home/store/catalogue_tc/catalogue_detail.htm?csnumber=50294.

8.4 Regional Training and Exercising Guidelines

8.4.1 Introduction

These guidelines have been developed to complement the South Asia Regional Contingency Plan (hereafter 'the Regional Plan'). They are to be used in the development and implementation of regional cooperation under the Regional Plan in conformance with its Section 2.4 on Joint Training and Exercises.

The Regional Plan does not replace or supersede the individual National Plans but allows coordination between States in an organized and consistent manner. For the Regional Plan to be effective it requires all the States to understand how it functions and their roles and responsibilities when the Regional Plan is activated. The only way to build knowledge and proficiency in the Regional Plan's use is through a structured exercise programme, aligned with training activities where appropriate. It is also implicit that Member States must have functioning National Plans for regional cooperation to become fully effective.

The backbone of this programme is a series of exercises. However, the exercises in themselves should be regarded as learning and familiarization activities. Table-top exercises in particular can incorporate specific training activities aligned with the wider programme.

In designing, developing and executing oil spill exercises the following eight guiding principles were agreed by the IMO and IPIECA. It is recommended that all exercises carried out in the South Asia under the Regional Plan adopt these same principles:

Guiding Principles for Oil Spill Exercising

1	Ensure that senior management support and endorse the exercise activity.
2	Set clear, realistic and measurable objectives for an exercise.
3	Recognize that the thrust of exercising is to improve - not to impress.
4	Keep exercises simple and more frequent for faster improvements initially.
5	Do not tackle complex exercises until personnel are experienced and competent.
6	Do not overcomplicate an exercise with too many activities, locations and participants.
7	Ensure successful exercise evaluation - this is as important as conducting it successfully.
8	Recognize that planning and conducting a successful exercise is a significant accomplishment.

8.4.2 Types of Exercises

Under the framework of the Regional Plan, the following types of combating exercises are identified:

ALPHA: Table-top Exercise

BRAVO: Alarm or Communication Exercise

CHARLIE: Equipment Deployment Exercise

DELTA: Operational Exercise

ECHO: State-of-the-art Exercise

Decisions on the exercise programme including the types of exercises, aims and goals for the exercises, time for the execution and appointment of Lead Countries are taken during the meetings of the National Operational Authorities responsible for the implementation of the Regional Plan. Exercises may involve the range of potential oil spill risks to the South Asia marine environment, such as shipping, coastal storage facilities or marine terminals, pipelines and offshore units.

BRAVO, CHARLIE, DELTA and ECHO exercises can be executed independently or in combination with each other.

Table-top Exercise (ALPHA)

This exercise type is a 'paper exercise', the aim of which is to create a base for discussion on matters relating to organization, communication, logistics, etc. in combating actions involving two or more Member States.

The exercise will normally take place during meetings of the National Operational Authorities.

The outline of the exercise is pre-planned in such a way that the players will be presented with a scenario of a pollution incident giving such facts of the incident that most probably would be at hand in the initial phase.

The situation in the initial phase will be followed by presentations of the situation as it has developed at certain chosen later stages.

After each presentation the players are given the necessary time to consider their national follow-up action in relation to the incident situation.

The national follow-up actions are then presented and discussed.

Alarm or Communication Exercise (BRAVO)

The aim of this exercise type is to test the agreed procedures and lines of communication for reporting, requesting and providing assistance, and to get a picture of the current response readiness of the Member States when called to assist.

The exercise further aims at familiarizing the personnel with the use and national handling of the adopted POLREP reporting form.

It is not the intention with this exercise that combating equipment and its handling personnel should be activated.

BRAVO Exercises are usually executed without notice but within a specified period of time (normally within a calendar week).

BRAVO Exercises can be carried out in turn between two or more Member States, and the arrangement and the initiation of the exercise are undertaken by representatives of the Member States involved and assisted by SACEP, if needed.

The Initiating Party shall develop a realistic exercise scenario, on which the BRAVO Exercise is based. BRAVO Exercises shall be initiated with a POLREP (POLWARN) message submitted by the Initiating Party to National Contact Points of participating Member States and identified in the Regional Plan.

The initial POLREP (POLWARN) and subsequent messages related to the present BRAVO Exercise shall be submitted in writing by a relevant electronic means of communication to the National Contact Point(s) or any other address identified during the present BRAVO Exercise.

When receiving an exercise POLREP (POLWARN) the participating Member States should record the time of receipt, time of transmission to the responsible national authority and time of the receipt of POLREP (POLWARN) by the person responsible for initiating further national action.

When receiving an exercise POLREP (POLINF/POLFAC) in addition to the times recorded as for POLREP (POLWARN) the participating Member States should make a realistic evaluation of the types and the amount of equipment and personnel at their disposal for rendering assistance called for, as well as the time for its arrival at the scene of the accident.

After the termination of each exercise the participating Member States shall submit a report containing the above mentioned times and evaluations to the Lead State. The Lead State should compile this information in a report, which should be sent to the SACEP Secretariat for further circulation to other Member States in order to have the report presented and discussed at the following meeting of the National Operational Authorities.

The Competent National Operational Authorities of the Member States shall ensure that all operational duty personnel are familiar with the present Exercise Guidelines and the communication procedures set out in the Regional Plan.

Equipment Deployment Exercise (CHARLIE)

The purpose of this exercise is to test the co-operation between the combating units of the Member States with respect to both communication and equipment. Involvement of personnel - except those needed for running the equipment - should be very restricted.

CHARLIE Exercises are carried out between two or more Member States with bordering Areas of Responsibility.

Notice as to the time and event is to be given well in advance of the exercise, and the Member States not taking part in the exercise and the SACEP Secretariat shall be invited to send observers to the exercise.

When planning the date for the execution of the exercise a back-up date should be held in reserve. The participating Member States must be informed as soon as possible and at least three days in advance if the exercise has to be executed on the back-up date or altogether cancelled.

Reports on the exercise should be sent from the Lead State to the SACEP Secretariat for further circulation to other Member States in order to have the report presented and discussed at the following meeting of the National Operational Authorities.

CHARLIE Exercises are arranged and executed after direct consultation between the Member States involved.

Operational Exercise (DELTA)

The aim of this exercise type is partly to test the alarm and communication procedures, the response capability, and the response time of the Member States, partly to test and train the staff functions and the co-operation between response units (including the response equipment) of the Member States.

DELTA Exercises are carried out biennially (every two years), with the execution of exercises rotating between the Member States. At the meetings of the National Operational Authorities it is decided who should arrange the coming exercises and what should be the aims of these exercises.

The Lead State has the overall responsibility to plan and execute the exercise.

At the discretion of the Lead State other relevant and realistic elements of an accident at sea may be included in the Exercise DELTA scenario, i.e.: Search and Rescue (SAR), fire-fighting, emergency transfer of cargo, claims and compensation, shore-line clean-up, wild life protection and restoration etc. Custom and immigration procedures in connection with import and export of emergency response personnel and equipment might also be considered as exercise elements.

Further, the application of dispersants might be considered as a response option during a DELTA Exercise. If this option is used, national procedures of approval and spraying limitations should be included as incidents in the exercise planning.

Taking into consideration that different Time Zones apply to the South Asia region the “Exercise Time” in use should be clarified. The use of UTC-time as “Exercise Time” should be considered as an option.

Custom and Immigration clearance for participating units of other Member States could be time consuming, therefore it is recommended to allow one extra day for foreign units prior to the execution day of the DELTA Exercise.

A report, evaluating the results of the exercise should be send to the SACEP Secretariat for distribution to the Member States in order to have the report presented and discussed at the following meeting of the National Operational Authorities (see further section on *Planning and Evaluation of DELTA Exercises*).

While participation in the exercise is voluntary, it is recommended that at least the neighbouring countries participate.

State-of-the-art Exercise (ECHO)

The aim of this exercise is to demonstrate the state-of-the-art of a specific topic, e.g. a type of equipment, a response method, and means of communication or scientific tests. Traditional operational response activities will not form a part of this type of exercise.

As the aim of ECHO Exercises is to demonstrate the-state-of-the-art, great emphasis should be given to inviting relevant observers from the Member States and relevant international organizations as appropriate.

The exercise should be followed by a 'hot wash-up' in order to benefit from the remarks from the observers. The Lead State should send a report of the exercise to the SACEP Secretariat for further distribution to the Member States in order to have the report presented and discussed at the following meeting of the National Operational Authorities.

8.4.3 Procedures for the Exercises

To identify exercise traffic and to avoid conflict with exercises undertaken within other agreements, the text of all messages (both to and from the Lead State) shall begin with the words:

"EXERCISE [NAME OF EXERCISE]"

All messages shall end with the words:

"EXERCISE-EXERCISE-EXERCISE"

At the end of each exercise the Lead State shall send a final "End of exercise" message to all Participants.

8.4.4 Exercises Reports

After an exercise the Lead State shall prepare a brief report for submission to the SACEP Secretariat for distribution to other Member States and to the National Operational Authorities for consideration at its next meeting. The final report, including comments by National Operational Authorities shall be submitted to the next Meeting of the Member States for information and approval/adoption, as appropriate. (for reports from DELTA Exercises, see further section on *Planning and Evaluation of DELTA Exercises*).

The report should, as a minimum, cover the following items:

1. Preparation of the exercise
   - a short description of how the exercise was prepared and relevant references
2. Implementation of the exercise
   - date and period of exercise,
   - a brief description of how the exercise was initiated
3. Participating Member States

- names of participating Member States with a description of participating units and items

4. Running and finalization of exercise

   Under this heading a brief description of following items (if applicable) should be given:

   - scenario

   - command

   - communications

   - finalization of exercise

5. Comments of the participating Member States

   A brief summary of comments received from each participating Member States. Only comments on important matters should be mentioned.

6. Conclusion

   - a general conclusion from the Lead State's point of view on lessons learned

   - suggestions and recommendations on how to improve exercises in the future.

   Tables, statistics, figures or pictures can be added as necessary under each item as annexes at the end of the heading.

8.4.5 Checklist for an Operational Exercise (CHARLIE or DELTA)

In general, it is up to each littoral State to take care of all formalities itself. But it is advisable that the Lead State undertakes to make precautions in order to facilitate the granting of all clearance and permissions required.

This checklist is to help the Lead State arranging an operational exercise and the participating Member States not to forget issues of importance:

- diplomatic clearance
- customs questions
- general health and safety issues
- conditions of work
- insurance of personnel
- civil liability for injuries or damage
- accommodation and meals
- medical treatment
- equipment and repairs
- report to the meeting of the National Operational Authorities
- general programme well in advance, including:

- exercise condition
- time zone
- transports
- briefing/debriefing
- exercise command
- observers
- operational command

- liaison officer
- social events
- participating units
- communication
- information service
- timetable
- recommended charts
- moorage
- pilot regulation
- required diplomatic clearance
- hotel reservation

8.4.6 Planning and Evaluation of DELTA Exercises

Planning

First announcement and invitation to participation should be sent to the SACEP for distribution to the Member States six months in advance of the exercise. This first announcement should:

- inform on the aim, the date, including a back-up date, and place of the exercise; and

- call for participation of ships and observers.

Announcements of participation should be made to the Lead State four months in advance of the exercise.

Having received the announcements of participation the Lead State should send out practical information about the exercise. Examples of such information are given in the preceding section. This information should not include details of the exercise scenario.

In general it is up to the Lead State to plan the exercise scenario. An Exercise Evaluation Team (EET) shall, however, be established, to enable beforehand comments on the exercise scenario, and thus ensure the best benefits of the scheduled exercise. The exercise scenario shall be send in due time to the members of the EET to enable them to comment thereupon.

The EET normally consists of three members, of which one is from the Lead State, one from the Contracting Party who arranged the previous exercise, and one from the Contracting Party who will arrange the next exercise.

Although the aim of a DELTA Exercise is to check and train the operational system as a whole, efforts should also be made to change the tasks of the participating units during the exercise, in order for personnel to gain as much experience as possible from the exercise.

The participating Member States must be informed as soon as possible and at least three days in advance if the exercise has to be executed on the back-up date or altogether cancelled.

Evaluation

The EET shall, in order to strengthen the operational co-operation between the Member States, do an unbiased evaluation of the exercise.

This evaluation is to be conducted in two steps; as an intermediate evaluation and as a final evaluation.

For the intermediate evaluation the tasks of the EET are:

- to be present during the exercise; and

- to give an oral presentation of the findings and a preliminary evaluation of the exercise to the participants immediately after the exercise (at the debriefing).

For the final evaluation the task of the EET is:

- to make a written report of the final evaluation including lessons learnt and proposals for future similar activities. The report should be submitted by the Lead State to the SACEP Secretariat for further circulation to other Member States in order to have the report presented and discussed at the following meeting of the National Operational Authorities.

The members of the EET decide between themselves their individual tasks and their geographical location(s) during the execution of the exercise.

8.4.7 Financial Considerations

Planning and implementation of regional exercises might have substantial financial impact on the Lead and Host Country as external funding may not be an option. The provision and approval of adequate funding is to be considered as an internal national issue, which will require approval from national fiscal authorities well in advance of the exercise and prior to accepting the role as Host/Lead Country

The following is a non-exhaustive list of expenditures for consideration in connection with planning and implementation of a Regional Exercise:

ITEM	COST ITEM
Exercise planning	***Personnel costs:*** o *Salary* o *Travel* o *Accommodation* o *DSA* o *Local transportation* ***Meeting facilities:*** o *Food & refreshments* o *Secretariat support* ***Necessary Training and Workshops*** ***Planning meetings with national and local authorities*** ***Printing of exercise documents*** ***New documentation, charts, maps etc.***
Exercise execution	***Personnel costs:*** o *Salary* o *Travel, international/national* o *Accommodation* o *DSA* o *Local transportation* ***Ships:*** o *Boats* o *Observer vessel* o *Fuel, bunkers, water etc.* o *Port fees*

ITEM	COST ITEM
	○ *Pilotage* ○ *Charts & maps* ○ *Loading & unloading equipment* ○ *Food and Refreshments* ***Exercise Control Room*** ○ *Personnel costs* ○ *Photocopying* ○ *Printing* ○ *Security guards* ○ *Charts, maps, boards etc.* ○ *Food and refreshments* ○ *Local transportation* ○ *Equipment rent* ***Other Government Agencies*** ***Observers and guests*** ○ *Accommodation* ○ *Local transportation* ○ *Food and refreshment* ○ *Exercise dinner or reception* ○ *Briefing facilities* ○ *Travel, national and international* ○ *Information and assistance* ***Response equipment rent*** ***Lifting, transportation and equipment handling, trucks*** ***First Aide*** ***Shore line response equipment handling and transportation*** ***Air planes and helicopters*** ***Press/Public information*** ○ *Briefing facilities* ○ *Food and refreshments* ○ *Phone and Internet* ***Private contractors*** ***Logo, Certificates, Exercise memorabilia*** ○ *Carrier bags* ○ *T-shirts, caps etc.*
Post Exercise	***Personnel costs*** ***Travels*** ***Local transportation*** ***De-briefing facilities*** ***Dinner / Reception*** ***Reporting and Printing***

ITEM	COST ITEM
	Photograph and video recording of exercise events
	Gifts
	De-commissioning, cleaning, repair and conservation of equipment

8.4.8 Programme Schedule

The responsibility for planning of exercises will in general rotate among the Member States in alphabetically order. However, if a Party is unable to plan and host a scheduled exercise (i.e. due to financial constrains), then a volunteer is sought.

The schedule in the table below rotates the lead for the various exercise types amongst the South Asia countries with the following frequency:

ALPHA exercises: table-tops held annually, in conjunction with meetings of National Operational Authorities.

BRAVO exercises: alarm (notification) held three times per year.

CHARLIE exercises: held ad hoc.

DELTA exercises: full-scale regional exercise held biennially (every two years).

ECHO exercises: held ad hoc.

	Country 1	Country 2	Country 3	Country 4	Country 5
ALPHA	2019	2017	2020	2018	2021
BRAVO	Jan-Apr 2017	May-Aug 2017	Sept-Dec 2017	Jan-Apr 2018	May-Aug 2018
	Sept-Dec 2018	Jan-Apr 2019	May-Aug 2019	Sept-Dec 2019	Jan-Apr 2020
	May-Aug 2020	Sept-Dec 2020	Jan-Apr 2021	May-Aug 2021	Sept-Dec 2021
DELTA	2021	2023	2017	2025	2019

8.5 Updated Regional Plan

8.6 Presentations

REGIONAL OIL AND CHEMICAL POLLUTION CONTINGENCY PLAN FOR SOUTH ASIA

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1. INTRODUCTION

1.1 Background

1.1.1 The Regional Seas Programme was initiated by UNEP in 1974. Since then the governing council of UNEP has repeatedly endorsed a regional approach to the control of marine pollution and the management of marine and coastal resources and has requested the development of regional action plans.

1.1.2 Following the report of a mission to the coastal States by a consultant appointed by UNEP, the South Asia Seas region was established by UNEP in 1983 (Governing Council Decision 11/7). It includes the marine and coastal areas of Bangladesh, India, Maldives, Pakistan and Sri Lanka. The region was included in the Regional Seas Programme in close collaboration with the South Asian Co-operative Environmental Programme (SACEP) and governments in the region.

1.1.3 The International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC) facilitates international co-operation and mutual assistance in preparing for and responding to a major oil pollution incident and encourages States to develop and maintain an adequate capability to deal with oil pollution emergencies. The basic obligation of this convention is for parties to establish a national system for responding promptly and effectively to oil pollution incidents which have, as a basic minimum, a national oil spill contingency plan, designated national authorities and operational focal points responsible for oil pollution preparedness and response, reporting and handling requests for assistance. In order to facilitate the operational aspects of oil spill monitoring and response, the OPRC Convention encourages parties to conclude bilateral or multilateral agreements for oil pollution preparedness and response.

1.1.4 In order to assist the countries to ratify and implement the OPRC convention, UNEP in 1995 adopted the project "Development and Implementation of National and Regional Oil Spill Contingency Planning" as one of the six priority projects in its South Asia Regional Seas Action Plan. Prior to the adoption of this Action Plan, a UNEP/UNDP/IMO mission conducted in 1989, compiled a South Asian Marine Pollution Emergency Action Plan

1.1.5 The Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (OPRC-HNS Protocol) follows the principles of the OPRC Convention. Like the OPRC Convention, the OPRC-HNS Protocol aims to establish national systems for preparedness and response and to provide a global framework for international co-operation in combating major incidents or threats of marine (chemical) pollution. Parties to the OPRC-HNS Protocol are required to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries.

1.1.6 In 1999, a Regional Oil and Chemical Pollution Contingency Plan and a draft Memorandum of Understanding (MoU) for Co-operation on the Response to Oil and Chemical Pollution in the South Asia Seas Region were discussed by the South Asia Seas countries. The final draft of the Regional Plan and of the Regional MoU were approved on 6 December 2000 at the "High Level Meeting", prior to their formal acceptance by the Government of Bangladesh, India, Maldives, Pakistan and Sri Lanka.

1.1.7 During 2014-16, IMO and SACEP jointly assisted the South Asia Seas countries to review and update the [draft] Regional Plan taking into account current preparedness frameworks, with financial support from the Norwegian Agency for Development Cooperation (Norad). This project also developed a programme of training and exercising to enhance regional capacity building in oil and chemical spill preparedness and response.

Maritime Oil Traffic

1.1.6 South Asia not only imports much of its own consumption of oil, but India, Maldives, Pakistan, Bangladesh and Sri Lanka lie close to the main shipping route from the Middle East to the Far East. Approximately 25% of the world's crude oil sea transportation passes through the region.

Existing Response Capability in the Region

1.1.7 Although there is some capacity within the Region to respond to spills in harbour and at sea and the five countries continue to develop or enlarge their capabilities, the response to a major oil or chemical spill at sea would probably require the co-operation of the other States in the Region, or assistance from further afield. A Regional Plan is an important first step towards supplementing individual States' response capabilities.

1.2 Purpose and Objectives

1.2.1 The purpose of this Regional Plan is to establish a mechanism for mutual assistance, under which the competent national Authorities of Bangladesh, India, Maldives, Pakistan and Sri Lanka will co-operate in order to co-ordinate and integrate their response to marine pollution incidents either affecting or likely to affect the territorial sea, coasts and related interests of one or more of these countries, or to incidents surpassing the available response capacity of each of these countries alone.

1.2.2 The general objective of the Regional Plan is to organise a safe, prompt and effective response to spills affecting or likely to affect the area of responsibility of one or more of the countries concerned and to facilitate their co-operation in the field of oil and chemical pollution preparedness and response.

1.2.3 For this purpose the following specific objectives are defined to:

a) define areas of responsibility of the Member State to the Regional Plan;

b) determine the extent of co-operation for the implementation of the Regional Plan between the responsible authorities, at the operational level;

c) specify the type of assistance which might be provided and the conditions under which it will be provided;

d) divide the responsibilities and to provide for the transfer of responsibility from one Member State to another;

e) establish the principles of command and liaison, and to define the corresponding structures;

f) determine, in advance, the financial conditions and administrative modalities related to co-operative actions in case of emergency.

1.2.4 In order to achieve these objectives, the following actions referred to in the OPRC Convention are needed to implement the Regional Plan:

a) developing national preparedness measures including an appropriate organisation and effective systems for detecting and reporting pollution incidents affecting or likely to affect the area of responsibility of the Member States;

b) promoting and implementing regional co-operation in oil and chemical pollution contingency planning, prevention, control and clean-up operations;

c) establishing a minimum level of pre-positioned response equipment to restrict spreading and to minimise the hazard posed by oil and chemical spills;

d) developing and implementing a programme of training courses and practical exercises for different levels of personnel involved in oil pollution prevention and combating;

e) developing procedures to increase regional co-operation.

1.2.5 The Member States agree that response operations in case of a marine pollution incident which occurs within the area of responsibility of one of the Member States will be conducted in accordance with provisions of the National Contingency Plan of the Member State concerned.

1.3 Scope and Geographical Coverage

1.3.1 This Regional Plan is intended to be a regional agreement between the following countries: Bangladesh, India, Maldives, Pakistan and Sri Lanka.

1.3.2 It applies to the waters which are under the jurisdiction of the Member States for pollution purposes, including the Exclusive Economic Zone (EEZ) or pollution zone, the territorial sea and internal waters. The Regional Plan may also refer to incidents involving pollution or threat thereof, to the coastline or related interests of a Member State, from a marine casualty on the high seas. (The response to pollution in inland waterways which cross international boundaries would be a matter for bilateral arrangement between the riparian States.)

1.3.3 The Regional Plan identifies the responsible authorities in each country, prescribes a co-ordinated response structure and establishes a method of operation for a joint response to an incident thus building on the co-operative framework already in place within the region.

1.3.4 The Regional Plan applies to marine spills of oil and hazardous substances which cause or could cause damage to the environment in countries neighbouring the source of the incident. It may also apply when only one country is affected but the magnitude is such that the incident requires assistance from another country.

1.4 Definitions, Acronyms and Abbreviations

For the purpose of this Regional Plan:

1.4.1 ***Oil*** means petroleum in any form including crude oil, fuel oil, sludge, oil refuse and refined products.

1.4.2 ***Chemical*** means any hazardous and noxious 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 and adjacent coastal areas.

1.4.3 ***Pollutant*** has the same meaning as oil or chemical.

1.4.4 ***Ship*** means a vessel of any type whatsoever operating in the marine environment and includes hydrofoil boats, air-cushion vehicles, submersibles, and floating craft of any type.

1.4.5 ***Offshore unit*** means any fixed or floating offshore installation or structure engaged in gas or oil exploration, exploitation or production activities, or loading or unloading of oil.

1.4.6 ***Sea ports and oil handling facilities*** means those facilities which present a risk of an oil pollution incident and includes, inter alia, sea ports, oil terminals, pipelines and other oil handling facilities.

1.4.7 ***Maritime casualty*** means a collision of ships as defined in the Regional Plan, stranding or incident of navigation, or other occurrence on board a ship or external to it resulting in material damage or imminent threat of material damage to a ship or cargo; it also means incidents involving offshore units, sea ports and oil handling facilities.

1.4.8 ***Pollution incident*** means an occurrence or series of occurrences having the same origin, which results or may result in a discharge of oil or chemical and which poses or may pose a threat to marine environment, or to the coastline or related interests of one or more States, and which requires emergency action or other immediate response.

1.4.9 ***Related interests*** mean the interests of a coastal State directly affected or threatened, and included among other things:

a) activities in coastal waters, in ports and estuaries, including fishing activities;

b) the historical and tourist appeal of the area in question, including water sports and recreation;

c) the health of the coastal population; and

d) the preservation of living resources.

1.4.10 ***Regional Plan*** means the Regional Oil and Chemical Marine Pollution Contingency Plan for South Asia.

1.4.11 ***Member States*** refers to the following countries - Bangladesh, India, Maldives, Pakistan and Sri Lanka.

1.4.12 ***Area of responsibility*** means the coasts, internal waters, territorial waters and EEZ of Bangladesh, India, Maldives, Pakistan and Sri Lanka, as established in accordance with international law.

1.4.13 ***Lead country*** means the Member State in whose area of responsibility a maritime casualty has occurred and which has activated the Regional Plan or asked for assistance within the framework of the Regional Plan, or the Member State to whom the lead role has been transferred. Lead Country exercises the Operational Command of the Joint Response Operations and designates the Supreme On-Scene Commander (SOSC).

1.4.14 ***Lead Authority*** means the Operational Authority of the Lead Country.

1.4.15 ***Government authority*** means the designated competent government department having the political and governmental responsibility for dealing with accidental marine pollution.

1.4.16 ***Operational Authority*** means the designated competent government department having the operational responsibility for dealing with accidental marine pollution.

1.4.17 ***Joint Response Operations (JROs)*** means counter pollution operations involving two or more of the Member States, including strike teams, equipment and other resources (aircraft, vessels) rendered as assistance by other Member States as well as national resources of the Lead Member State.

1.4.18 ***Operational Command*** means overall co-ordination and control. It is exerted by the Operational Authority of the Lead Country, through the ***Supreme On-Scene Commander (SOSC)***.

1.4.19 ***Operational Control*** means direct control over personnel, means and units taking part in the response operations, including giving orders and supplying information necessary for execution of response operations. It is exerted by ***National On-Scene Commanders (NOSC)*** of the Member States taking part in the operations or officers delegated by them.

1.4.20 ***Tactical Command*** means directing and supervising the execution of specific tasks by teams or units on the scene of operations. It is exerted by the leaders of such teams or commanders of units.

1.4.21 ***Supreme On-Scene Commander (SOSC)*** means a designated officer of the Lead Country, having the overall operational command of all Joint Response Operations undertaken within the framework of the Regional Plan.

1.4.22 ***National On-Scene Commander (NOSC)*** means an officer, designated by the Operational Authority, having operational control of all national pollution response resources which might, if so requested, participate in Joint Response Operations. (Note: NOSC is preferably, but not necessarily, the same officer who performs the duty of On-Scene Commander under the National Contingency Plan.)

1.4.23 ***Liaison Officer*** means an officer from the Party participating in the Joint Response Operations, who is integrated in the staff of the SOSC, with a view to providing necessary information on national resources rendered as assistance to the Lead Country and facilitating communications with his/her respective NOSC.

1.4.24 ***Public Relations Officer*** means an officer in charge of informing the public on the course of events and advising the SOSC on public reaction.

1.4.25 ***Emergency Response Centre (ERC)*** means an office, manned 24 hours a day and equipped with appropriate communications equipment, which has been set up, for the purpose of the Regional Plan, by each Party and which will serve as the Operations Room of NOSC or SOSC respectively, whenever the Regional Plan is activated.

1.4.26 ***Joint Emergency Response Centre (JERC)*** means the Response Emergency Centre of the Lead Country.

1.4.27 ***Strike team*** means a group of personnel, sent as assistance from one Member State to another in order to take part as an independent unit in response operations. It may include personnel on board vessels, aircraft or other self-contained units or personnel assisting in shore clean-up operations.

1.4.28 ***Operations at sea*** means any measures, including intervention on the source of pollution, aerial monitoring, containment of the pollutant, recovery of the pollutant, application

of treatment agents from vessels and aircraft, or any other action taken at open sea (off shore) in order to respond to a pollution incident, restrict the spreading and facilitate the removal of the pollutant and mitigate the consequences of the incident.

1.4.29 ***Operations on shore (shore clean-up operations)*** means any action taken on shore or at sea immediately adjacent to it, in order to recover, remove or destroy the pollutant and reduce its impact or effects.

1.4.30 ***Pollution Report (POLREP)*** means the report by which one party, usually the Lead Country, informs other relevant parties of the situation.

1.4.31 The following are the main Abbreviations used in this document:

• ERC	Emergency Response Centre
• IMO	International Maritime Organization
• IOPC FUNDS	International Oil Pollution Compensation Funds
• JERC	Joint Emergency Response Centre
• NCP	National Contingency Plan
• NOSC	National On-Scene Commander
• OPRC	International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990
• OPRC-HNS	Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000
• POLREP	Pollution Report
• POC	Point of Contact
• SACEP	South Asia Co-operative Environment Programme
• SASP	South Asia Seas Programme
• SITREP	Situation Report
• SOSC	Supreme On-Scene Commander
• UTC	Universal Time-Co-ordinated
• VHF	Very High Frequency

2 POLICY AND RESPONSIBILITY

2.1 Exchange of information

2.1.1 Member States shall keep each other correctly informed at all times on:

a) Competent National Authorities, responsible at government level for the implementation of the Regional Plan and on responsible officers within these Authorities (**Annex 1**);

b) National Operational Authorities, responsible at the operational level for the implementation of the Regional Plan and for exercising Operational Command in case of Joint Response Operations, and on responsible officers within these Authorities (**Annex 1**);

c) national Contact Points responsible for receiving reports of pollution incidents (**Annex 1**);

d) designated national Emergency Response Centres (**Annex 1**);

e) designated National On-Scene Commanders (**Annex 1**);

f) at least those parts of their respective National Contingency Plan which might be relevant in case of conducting Joint Response Operations cf. para. 3.7 (**Annex 2**);

g) inventories of pollution response equipment and products, as well as other means (e.g. vessels and aircraft) available in each country for use in Joint Response Operations (**Annex 3**);

h) directories of experts, trained personnel and strike teams designated by each Member State to take part in Joint Response Operations (**Annex 3**):

i) any services or resources that may be of assistance during a pollution incident response

2.1.2 Information listed above shall be attached to the Regional Plan in **Annexes 1, 2** and **3**

2.1.3 Member States shall inform each other through the Secretariat of any changes in the information listed above as soon as these occur, using routine communication channels and supplying relevant changes to the applicable annexes.

2.1.4 Each Operational Authority is responsible for the accuracy of information pertaining to its Member State.

2.1.5 Each Operational Authority shall acknowledge receipt of any changes or modifications regarding the above information and is responsible for updating its copies of the Regional Plan accordingly.

2.1.6 English language shall be used in all communications related to the Regional Plan.

2.2 Designation of National Authorities and points of contact

2.2.1 National Authorities and points of contact shall be designated and updated in **Annex 1**.

2.3 Meetings of National Operational Authorities responsible for the implementation of the Regional Plan

2.3.1 The Operational Authorities, defined in para. 2.2, shall meet regularly, and as a minimum once a year, in order to discuss questions related to the implementation of the Regional Plan, response to actual incidents, organisation of training courses and exercises and other relevant matters.

2.3.2 Regular meetings shall be hosted by each Member State successively, following alphabetical order or as otherwise agreed, to ensure the participation of the National Operational Authority of each Member State. Video conferencing facilitates may be utilised where appropriate.

2.3.3 The Operational Authority of the host Member State shall, in co-operation with the Operational Authorities of the other Member States, prepare the agenda and issue a final report of such annual meeting, or as otherwise agreed.

2.3.4 Secretarial services "Secretariat" will be provided by the Secretariat for the South Asian Seas Programme based in the SACEP Secretariat, who will also support the coordination, planning and preparations for the meetings.

2.4 Joint training and exercises

2.4.1 The Member States shall endeavour to conduct joint training courses and joint exercises. (The joint exercise and training courses need not involve all parties - in the Bay of Bengal it might involve Bangladesh and India, in the Arabian Sea, India and Pakistan, whereas in the southern part of the region only India, Sri Lanka and Maldives). However, participation in such exercise shall not be mandatory. The option for not participating in the exercises shall be intimated well in advance. Members States may invite either participants or observers from other countries and relevant international organizations, as appropriate

The main objectives of these training courses and exercises shall be to:

a) improve the level of co-operation and co-ordination among operational personnel and in particular strike teams of different Member States;

b) test the command structure of the Regional Plan;

c) test communications between the Member States, including procedures for activating the Regional Plan and calling for assistance;

d) test the logistic arrangements and facilitation procedures for joint operations, and to rehearse the procedures for operations by foreign aircraft and vessels in national airspace or waters;

e) exercise key officials in the roles they would play in joint operations;

f) achieve satisfactory level of communication among personnel and, in particular, strike teams designated to take part in Joint Response Operations;

g) acquire knowledge in handling equipment, products and other means which might be used in Joint Response Operations; and,

h) enable the personnel from different Member States to gain experience in working together.

2.4.2 The Member States shall endeavour to successively host such training courses and exercises. The host country shall organise the training course or exercise and provide necessary logistic support; however, the expenses for the participants and means deployed in joint exercises shall be borne by their respective Member States. Scheduling programmes, duration and other relevant details concerning such training and exercises shall be decided at regular annual meetings of the Member States. The Member States may seek assistance from IMO or other sources in the planning and conduct of joint training and exercises.

2.4.3 The Member States may also agree to combine joint training courses and exercises.

2.5 Revision and Amendment of the Regional Plan

2.5.1 In order to maintain the applicability of the Regional Plan and ensure it remains up to date, revisions or amendments to the Regional Plan can be made under consensus agreement of the Member States. In which case such changes would come into effect immediately upon consensus agreement being reached.

3 RESPONSE ELEMENTS AND PLANNING

3.1 Assumption of lead role

3.1.1 The lead role in the implementation of the Regional Plan shall be assumed by the Operational Authority of the Member State whose area of responsibility has been affected or is likely to be affected by a pollution incident and who has activated the Regional Plan.

3.1.2 The Lead Country shall be responsible for:

a) monitoring of the pollution;

b) assessment of the situation;

c) spill movement forecasting; and

d) initiating and exercising Operational Command over Joint Response Operations.

3.1.3 The lead role shall be transferred from one Member State to another only by agreement between the Operational Authorities of the two Member States. This might be when the major part of the pollutant has moved from the area of responsibility of the Member State initially affected and who has activated the Regional Plan, to the area of responsibility of another Member State, or when the main response activities have moved to such other Member State.

3.1.4 When the pollution incident which has occurred in the area of responsibility of one of the Member States directly (imminently) threatens the interests of another Member State, the Member States may also agree, in direct contacts between their Operational Authorities, that the threatened Member State will assume the lead role.

3.2 National On-scene Commander (NOSC) / Supreme On-scene Commander (SOSC)

3.2.1 For the purpose of the Regional Plan, the Operational Authority of each Member State shall nominate an officer who will exercise operational control over all response activities of that Member State, including control over personnel (strike teams), equipment and self-contained units (vessels, aircraft). These officers shall be called National On-Scene Commanders (NOSC).

3.2.2 After the activation of the Regional Plan and commencement of the Joint Response Operations, NOSC of the Lead State shall assume the role of the Supreme On-scene Commander (SOSC). The SOSC shall have the overall responsibility for all decisions and actions taken in order to combat the pollution and to mitigate its consequences and for co-ordination of Joint Response Operations. The SOSC, working in liaison with his/her Lead Authority, exerts Operational Command over Joint Response Operations.

3.2.3 The NOSCs of the assisting Member States shall operate under the overall Operational Command of the SOSC, but shall nevertheless retain operational control over personnel, equipment and self-contained units of their respective Member States.

3.2.4 In order to relieve the SOSC of a part of his/her duties concerning operational control of national resources, the Lead Authority may, at the time of the activation of the Regional Plan, designate another officer who will have direct operational control of the national

resources taking part in the Joint Response Operations and who will act as the NOSC of the lead country.

3.2.5 In exercising his/her functions, the SOSC shall be assisted by a Support Team (cf. para 3.4).

3.2.6 Relevant information concerning NOSCs is given in **Annex 1**.

3.3 Emergency Response Centres and Joint Emergency Response Centre

3.3.1 For the purpose of this Regional Plan, each Member State shall set up an Emergency Response Centre (ERC) manned 24 hours a day, which will be equipped with appropriate communications systems and have necessary facilities to be used as the operations room of the Operational Command in case of Joint Response Operations.

3.3.2 If deemed necessary, each Member State may decide to establish more than one ERC.

3.3.3 In case of the activation of the Regional Plan, the ERC of the Lead Country shall assume the role of the Joint Emergency Response Centre (JERC). The JERC shall serve as the base of the Supreme On-Scene Commander (SOSC) and the main communications centre for all communications related to the implementation of the Regional Plan.

3.3.4 Alternate sites for JERC, closer to the scene of the incident, may be specified if appropriate at the discretion of the Lead Country.

3.3.5 When the lead role is transferred from one Member State to another, the ERC of the Member State assuming the lead role shall automatically become JERC.

3.3.6 Relevant information concerning ERC(s) of each Member State is given in **Annex 1**.

3.4 Support Teams

3.4.1 With a view to assisting NOSC and SOSC each Member State shall set up its national Support Team, composed of the representatives of various relevant public authorities, national services and industry including, in particular, oil and shipping industries.

3.4.2 The role of the Support Teams is advisory, and their functions include:

a) providing assistance to NOSC/SOSC in case of the activation of the Regional Plan;

b) providing advice to NOSC/SOSC concerning, in particular, methods and techniques for combating oil pollution, safety of navigation and salvage, marine biology and fisheries, (radio) communications, public information and compensation for oil pollution damage;

c) providing support and co-ordinating the activities of national public authorities, services and industry which might take part in Joint Response Operations, concerning in particular the provision of personnel, equipment and other resources, logistic support, immigration and customs formalities;

d) monitoring incoming reports and assessing the situation;

e) co-ordinating all reporting on the status of the pollution incident to their respective national Authorities.

3.4.3 After the termination of response operations, the Support Team shall, together with their respective NOSC:

a) review post-incident reports from the NOSC/SOSC on the handling of the pollution incident for the purpose of analysing and introducing recommendations and improvements needed in the Regional Plan and in their respective National Contingency Plans;

b) forward to their respective national Authorities relevant reports and recommendations, including NOSC/SOSC post-incident reports, Support Team debriefing reports and recommendations concerning amendments to the Regional Plan or its Annexes.

3.5 Command Structure

3.5.1 Any Command Structure to be used in Regional/Joint Operations needs to be agreed in advance and well understood by all participating Member States. (An example of a Command Structure for Joint Response Operations is shown in the **Annex 6**)

3.5.2 The Regional Plan distinguishes between:

a) ***Operational Command*** which is overall co-ordination and control of ***Joint Response Operations*** and consists of taking decisions concerning response strategy and defining the tasks of various groups of teams. Following the activation of the Regional Plan, Operational Command over Joint Response Operations is exercised by the Lead Authority through its NOSC who assumes the role of SOSC.

b) ***Operational / Advisory Control*** which is direct control over personnel, means and units taking part in the response operations, including giving orders to specific groups of teams and units for execution of response operations, in accordance with the strategy and the tasks defined by the Operational Command. Operational Control over national resources is exercised by the NOSCs of the respective Parties. (Operational Control over the resources of the Lead State is exercised by an officer designated to act as NOSC in lieu of the officer who has assumed the role of SOSC.)

c) ***Tactical Command*** which consists of directing and supervising the execution of specific tasks by teams or units on the scene. Tactical Command is exercised by the Leader of each team or the Commander of each unit taking part in the response operations.

3.5.3 Liaison between the Lead Authority and the assisting Party shall be maintained, according to the circumstances and to the type and importance of the assistance rendered, in one of the following ways:

a) by direct e-mail, telex, telefax, telephone or radio contacts between the Lead Authority (SOSC) and Operational Authorities (NOSCs) of the assisting Parties;

b) by a Liaison Officer from the assisting Party who is integrated in the staff of the SOSC. His/her duties shall be to provide necessary information on resources rendered as assistance and to facilitate communication with his/her NOSC, ERC, Strike Teams and self-contained units taking part in the operations;

c) by NOSC of the assisting Party who personally attends at the spill site and participates in Joint Response Operations.

3.6 Communications arrangements

3.6.1 Communications for the implementation of the Regional Plan shall be established by the Parties in accordance with **Annex 4**.

3.6.2 English language shall be used in all communications related to the implementation of the Regional Plan.

3.6.3 Important communications by radio or telephone should be confirmed by fax, telex or e-mail or by any other suitable means of communication. This is to include the activation of the Regional Plan, requests for assistance, offers of assistance, estimated costs of assistance, acceptance of requests, instructions by the command for the movement and deployment of assisting units, tasks assigned to units and termination of operations.

3.7 Response Planning

3.7.1 Response to a pollution incident within the area of responsibility of each Member State shall be conducted in accordance with the provisions of the NCP of the lead country under the overall Operational Command of the Lead Authority exercised through the SOSC.

3.7.2 In order to facilitate smooth proceeding of Joint Response Operations, the Member States shall inform each other about relevant parts of their NCPs and, in particular, those parts describing:

a) national response organisation;

b) likely sources of oil spills, vulnerable resources and priorities for protection;

c) resources for responding to accidental pollution, available at the national level;

d) rules concerning the use of dispersants and in-situ burning;

e) oiled wildlife response/rehabilitation policy;

f) volunteer management policy; and

g) logistic support available within the country.

Copies of English translations of these parts of NCPs or, preferably, complete NCPs are attached to the Regional Plan at **Annex 2**.

3.7.3 Guidelines, if any, concerning the operation of vessels and aircraft of the assisting Member State within the area of responsibility of another Member State shall be provided by the Lead Authority.

3.8 Response strategy

3.8.1 Deciding upon the response strategy to be applied in each particular pollution incident and planning of specific operations shall be the responsibility of SOSC. In taking such decision the SOSC shall follow the outline given below.

a) assessment of the severity of the incident,

b) activation of the National Contingency Plan and notification of other Member States;

c) selection of appropriate response methods;

d) evaluation of available and required response resources;

e) activation of the Regional Plan and request for assistance;

f) implementation of selected response methods, making use of national resources and resources from assisting Member States;

g) re-assessment of the situation and making necessary modifications in response actions;

h) termination of response operations;

i) de-activation of the Regional Plan;

j) returning to the country of origin of personnel, equipment and other means rendered as assistance by the other Member States.

4 RESPONSE OPERATIONS

4.1 Response Phases

4.1.1 For the purpose of the Regional Plan, pollution response operations have been divided into four distinct phases:

Phase I - Notification
Phase II - Evaluation and activation of the Regional Plan
Phase III - Joint response operations at sea
Phase IV - Joint response operations on shore

4.1.2 It is understood that according to circumstances entire phases or parts thereof may take place concurrently with one or more other phases.

Phase I

4.1.3 Notification and verification of information concerning pollution incidents shall be done, at the national level, in accordance with the provisions of the NCP.

4.1.4 When a major pollution incident has occurred that is one requiring counter-pollution resources to be mobilised, the relevant Operational Authority shall inform the Operational Authorities of the other Member States (cf. para. 2.1 and 5.2) through their National Contact Points immediately after receiving and verifying the incident report, regardless of the need for the activation of the Regional Plan. The relevant Operational Authority in this context is that of the Member State in whose area of responsibility the incident has occurred. Note: The POLREP system (**Annex 8**) is the preferred method of communication/reporting.

4.1.5 Consideration must be used when there has been an incident which may cause pollution but has not yet done so: if the pollution would threaten neighbouring sea areas if it occurred, the neighbouring Member State should be informed. Note: The POLREP system (**Annex 8**) is the preferred method of communication/reporting

Phase II

4.1.6 The Operational Authority of the Member State affected by an incident or the Member State likely to be affected first, shall assess the pollution and determine the type and level of response required and whether or not to activate the Regional Plan.

4.1.6 Before activating the Regional Plan, the Operational Authority of the Member State concerned shall activate its NCP.

4.1.7 The decision to activate the Regional Plan shall be taken by the Operational Authority of the Member State affected by the incident or likely to be affected first. After such a decision has been taken, that Operational Authority shall assume the role of the Lead Authority and shall:

a) inform the Operational Authorities of the other Member States through their designated National Contact Points and in accordance with the procedure described in para. 5.2, that the Regional Plan has been activated, and who has been appointed SOSC;

b) activate its own ERC which shall assume the role of JERC;

c) activate its own Support Team;

d) through the SOSC, with the advice of the Support Team, formulate the strategy to deal with the incident and evaluate the need for assistance from other Member States. SOSC shall initiate phases III and IV of the response respectively;

e) request, on the basis of SOSC requirements and advice, assistance from other Member States.

Phase III

4.1.8 The main objectives of Joint Response Operations at sea are to stop the spillage of the pollutant from the source, to restrict its spreading and movement and to remove as much pollutant as possible from the sea surface before it reaches the shores of one of the Member States.

4.1.9 Joint Response Operations at sea shall be conducted in accordance with the procedures described in the NCP of the Lead Country using primarily national resources, which shall be supplemented, as necessary, by the other Member States at the requests of the Lead Authority. Units of the assisting Member States shall work under direct Operational Control and Tactical Command of their respective NOSCs and unit commanders or team leaders. However, at the discretion of the Assisting Member State, Tactical Command may be directed by the Lead Authority, where appropriate.

Phase IV

4.1.10 The main objectives of Joint Response Operations on shore are to protect sensitive coastal areas in accordance with the priorities outlined in the NCP.

4.1.11 This phase includes treatment and final disposal of collected pollutant and contaminated beach material. It may also include the restoration of polluted areas.

4.1.12 Principles outlined under Phase III shall also apply to Phase IV.

4.1.13 In order to increase the effectiveness of Joint Response Operations on shore, JERC may be transferred, at the discretion of the Lead Authority, to adequate alternative premises closer to the site of operations (cf. para. 3.3). In such cases, the Lead Authority shall duly inform Operational Authorities of the assisting Member States.

4.2 Spill Monitoring

4.2.1 For the monitoring of spill movement and behaviour, aerial monitoring is likely to be most effective although any other suitable means might also be used if the aircraft are not immediately available.

4.2.2 The monitoring of the spill and its movement and transmission of relevant reports to the other Member States, prior to the activation of the Regional Plan, is the responsibility of the Lead Authority. Following the activation of the Regional Plan this responsibility rests with SOSC, who shall take all necessary measures to ensure regular monitoring of the spill and its movement and behaviour, in order to properly assess the situation and decide on adequate response measures. For that purpose, SOSC may request assistance from other Member States.

4.2.3 Following, the specific request of the Lead Authority, aircraft of the assisting Member States may be asked to carry out flights over the specific areas of territory or territorial waters

of the Lead Authority which are directly affected by the pollution, for the monitoring of the pollution within the framework of the Regional Plan. In its request, the Lead Authority shall precisely define the aim of the mission and the flight plan. Guidelines, if any, about air and sea operations, including any reservations which Parties may have, should be provided by the Lead Authority. (See also 6.3.2 Over flight Procedures and 6.3.3 Navigation Procedures.)

4.2.4 Reporting procedures, which shall be followed for the purpose of the Regional Plan by the crews of monitoring aircraft, are given at **Annex 5**.

4.3 Requests for Assistance within the Framework of the Regional Plan

4.3.1 Following the activation of the Regional Plan, the Member State who has activated the Regional Plan may request assistance from the other Member States, in any of the cases described in section 1.3.

4.3.2 Assistance might be requested in the form of:

a) trained response personnel and, in particular, strike teams;

b) specialised pollution combating equipment;

c) pollution treatment products; and

d) other means, including, in particular, self-contained units such as vessels and aircraft, and/or any combination thereof.

4.3.3 A request for assistance shall be formulated in a clear and precise manner, using the standard form defined at **Annex 8** (POLREP System**)**. It shall contain detailed description of the kind of assistance required and the purpose for which personnel, equipment, products and other means will be used.

4.3.4 The Member State receiving a request for assistance shall immediately acknowledge receipt.

4.3.5 The Member State or Member States receiving a request for assistance shall use their best endeavours to offer it to the requesting Member State with the shortest possible delay, while not depleting their national resources beyond a reasonable level of preparedness.

4.3.6 With a view to promptly responding to requests for assistance, Member States shall have a part of their national response equipment, products and other means ready for transportation, on short notice, to the other Member States.

4.4 Use of Dispersants

4.4.1 Each Member State shall define its policy regarding the use of dispersants in combating oil pollution and describe it in its NCP. For this purpose, the Member States may be guided by the relevant publications referenced in **Annex 10**.

4.4.2 Each Member State shall inform other Member States in its NCP annexed to this Regional Plan about its policy on the use of dispersants. The information shall include the list of dispersants held by the Member State: it will be for other Member States to consider whether any of the dispersants on the list should not be used in their waters. NCPs should identify specific areas or types of areas where the use of dispersants is restricted or prohibited.

4.4.3 In case of JROs, the Member States shall observe the principle of prior authorisation for the use of dispersants. The authorisation can be given only by SOSC or a person designated by him/her.

4.4.4 In the area of responsibility of each particular Member State, dispersants shall always be used in accordance with the provisions of the NCP of the Member State concerned. If a Member State has prohibited the use of dispersants in its territorial waters, other Member States participating in JROs shall observe this decision.

4.5 Assistance from Outside the Region

4.5.1 It is open to any Member State whose coasts, internal waters, territorial waters or EEZ are polluted or threatened by pollution to request assistance from outside the region.

4.5.2 **Annex 7** to this Regional Plan sets out information on resources which might be available from outside the Region and their contact points, including those from oil companies and States which might reasonably be called on under Article 7 of the OPRC Convention.

4.5.3 A Member State may refer to the IMO's Guidelines on International Offers of Assistance in Response to a Marine Oil Pollution Incident, in cases where assistance from outside the region is requested or offered. These guidelines should be used to supplement the procedures in the Regional Plan, as appropriate.

4.6 Termination of Joint Response Operations and Deactivation of the Regional Plan

4.6.1 The SOSC shall terminate the JROs at his discretion, taking into account

a) whether pollution response measures have been completed, so far as the Lead Country is concerned; or

b) whether or not the pollution threatens the interest of the Lead Country or other Member States or;

c) whether or not the benefits of further counter pollution measures would be justified by their cost; or

d) whether the response has reached a point where the Lead Country can complete it without assistance;

unless any of the other Member States wish to continue the operation as the Lead Authority in accordance with the procedures outlined in 3.1.3.

4.6.2 After taking the decision to terminate the JROs, the SOSC shall immediately inform NOSCs of the other Member States and their respective Operational Authorities of such decision and deactivation of the Regional Plan.

4.6.3 Following the deactivation of the Regional Plan, all personnel, equipment, unused products and other means which took part in the JROs shall return or be returned to their respective countries of origin, unless otherwise agreed - for example the Member States concerned may decide that unused treatment products shall remain in the country that requested the assistance.

4.6.4 The Member State who requested assistance shall take necessary measures for prompt repatriation of the personnel of the assisting Member States, although co-ordination and preparation of necessary arrangements for their repatriation remains the responsibility of their respective Operational Authorities.

4.6.5 The Member State requesting assistance shall be responsible for releasing all equipment rendered as assistance and all unused treatment products so that they can be returned to the country of origin. All equipment used by other Member States shall be returned to its owners clean and, if possible, in working order.

4.6.6 The Member State who requested assistance is responsible for facilitating the departure of all units rendered as assistance from its territory, territorial waters or airspace.

4.6.7 The Member State who requested assistance shall prepare a report on the effectiveness on the personnel, equipment, products and other means received as assistance. These reports shall be circulated to the other Member States.

4.6.8 Joint response operations shall be reviewed during regular meetings of the Parties.

5 REPORTING

5.1 Initial Warning System

5.1.1 Any polluting incident presenting a potential threat to another Member State shall be reported to that country without delay to the emergency centre as in **Annex 1**. The initial notification shall be followed up as soon as possible with a POLREP. **(Annex 8**)

5.2 Pollution Reporting System

5.2.1 For the exchange of information concerning pollution incidents, the Member States shall use the international pollution reporting system (POLREP) which is as described in **Annex 8**.

5.2.2 The Lead Authority shall endeavour to transmit a POLREP, verified by the SOSC, at least once a day.

5.2.3 If pollution combating operations continue at the national level after the deactivation of the Regional Plan, the Member State affected by the incident shall continue to inform other Member States on the situation until the final termination of all pollution response operations.

5.2.4 It is the responsibility of the Operational Authority of each Member State to ensure that the situation reports are transmitted to all interested parties within their country. It is the responsibility of SOSC to ensure that POLREPS and other regular progress reports are communicated to all the units under the SOSC command.

5.3 Post Incident Reports

5.3.1 Following the termination of pollution response operations the SOSC shall prepare the final report including:

a) description of the pollution incident and development of the situation;

b) description of response measures taken;

c) description of assistance rendered by the other Member States (based on reports by the respective NOSCs);

d) assessment of the complete response operation;

e) assessment of assistance rendered by the other Member States;

f) costs incurred during the response by each Member State (in accordance with 6.5);

g) an estimate of environmental and economic damage;

h) description and analysis of problems encountered in responding to the pollution incident;

i) recommendations regarding possible improvement of existing arrangements and, in particular, provisions of the Regional Plan.

5.3.2 Based on that report and their own experience of the incident, the other Member States involved shall prepare recommendations concerning amendments and improvements of the Regional Plan, and if necessary, their NCPs (cf. para. 2.5).

6 ADMINISTRATION, LOGISTICS AND FUNDING

Note: This section should be read in conjunction with the IMO Assembly Resolution A.983(24) Guidelines for the facilitation of response to a pollution incident Pursuant to Article 7 and Annex of the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990, which is attached ***as Annex 9*** *to this Regional Plan.*

6.1 Logistics, immigration and customs formalities

6.1.1 The Lead Authority is responsible for providing all logistic support necessary within its territory for conducting Joint Response Operations.

6.1.2 In particular the Lead Authority shall appoint a Point of Contact (POC) who shall:

a) be responsible for receiving all vessels and aircraft carrying personnel, equipment, products and other means from the assisting Member States

b) make arrangements for accommodation and transportation within the country, of all assisting personnel;

c) when equipment and other means are received from the assisting Parties, take necessary measures to provide:

- unloading and handling facilities as appropriate, including cranes, fork-lifts, and vehicles as necessary; and
- fuel, lubricants, basic repair, maintenance and cleaning facilities.

6.1.3 The Lead Authority shall ensure assistance to the crews at airports and in ports, as appropriate, and provide security services for ships, aircraft and related equipment, while these are in ports or at airports of the Lead Party.

6.1.4 The security of equipment in storage or being transported in its territory shall be the responsibility of the Lead Party.

6.1.5 In order to facilitate the movement of response personnel and equipment the requesting Member State will:

a) make arrangements for the rapid entry of equipment, products and personnel prior to their arrival; and

b) ensure that, should ships and aircraft be provided, ships are granted all necessary authorisations and aircraft cleared to fly in the national air space.

6.1.6 Each Member State shall endeavour to make, at the national level, special arrangements applicable in emergency situations:

a) provisions for rapid granting of entry visas and work permits for personnel; and

b) ensure that customs formalities are facilitated to the maximum extent. Equipment should be admitted on a temporary basis and products should be admitted free of excise and duties as applicable under National Law.

6.1.7 Details of such arrangements shall be included in the National Contingency Plan of each Member State. This shall set out the information which the assisting Member State must

provide to the appropriate national Authorities of the requesting Party in order to facilitate implementation of these special arrangements.

6.1.8 Member States who may offer assistance should hold as much as possible of the necessary documentation with their stockpiles of equipment, or with the headquarters of the units which are designated to assist, so that it does not have to be compiled in an emergency.

6.1.9 The Member States shall designate competent Customs Officers, responsible for prompt clearing of customs formalities in cases of activation of the Regional Plan.

6.1.10 Prior to sending assistance to the Member State who so requests, the Operational Authority of the assisting Member State shall establish direct contact with the competent customs office of the requesting Member State in order to obtain necessary clearance for entry of equipment, products and other means into the country.

6.2 Over flight procedures (see also 4.2 Spill Monitoring)

6.2.1 Within the framework of the Regional Plan and upon the request of the Lead Member State, aircraft of the other Member States might enter and operate in the airspace of the Lead Member State only in the areas specified by the Lead Member State, for one of the following purposes:

a) monitoring flights;

b) transportation of response personnel, equipment and products;

c) spraying of dispersants or other treatment products;

d) other flights related to pollution response operations.

6.2.2 Each Member State shall make, in advance, necessary arrangements concerning rapid granting of permits and clearances for civil aircraft (fixed wing or helicopters) of other Member States, who might be requested to take part in response operations within its airspace. Similar arrangements shall be made for the use of airport facilities by civilian fixed wing aircraft and helicopters engaged in JROs.

6.2.3 Overflight for the above-mentioned purposes, of the national territory or territorial waters of one of the Member States, by military aircraft of the other Member States, shall be decided mutually on a case-by-case basis by the Member States concerned.

6.2.4 Military aircraft of an assisting Member State engaged in maritime spill response operation must not enter the airspace of another Member State unless specifically requested to do so by the Lead Authority.

6.3 Navigation procedures

6.3.1 Within the framework of the Regional Plan and upon the request of the Lead Country, vessels of the other Member States might enter and operate in the territorial waters of the Lead Country only in the area specified by the Lead Country, for one of the following purposes:

a) salvage operations;

b) pollution response operations, including containment and recovery of spilled products, spraying of dispersants or other treatment products, storage and transportation of recovered pollutant;

c) transportation of response personnel, equipment and products;

d) any other voyage related to pollution response operations.

e) any other voyage (e.g. Search and Rescue, Medivac)

6.3.2 Each Member State shall make in advance necessary arrangements concerning rapid granting of permits and clearances for the navigation of civil vessels (vessels and specialised anti-pollution vessels) of other Member States, who might be requested to take part in response operations within its internal and territorial waters. Similar arrangements shall be made for the use of port facilities by civilian vessels engaged in JROs.

6.3.3 Navigation for the above-mentioned purposes, in the internal or territorial waters of one of the Member States, by naval vessels of the other Member States, shall be decided mutually on a case-by-case basis by the Member States concerned.

6.3.4 Naval vessels of an assisting Member State engaged in maritime spill response operations must not enter the territorial sea or internal waters of another Member State unless specifically requested to do so by the Lead Authority.

6.3.5 In all cases the provisions of the International Convention on Facilitation of International Maritime Traffic as amended, shall be observed by the Member States concerned.

6.4 Financial Procedures

In requesting and rendering assistance, the Member States shall observe the following recommendations and principles concerning financial matters related to mutual assistance as appropriate:

6.4.1 The Member States shall inform each other in advance on the wages of personnel, the rental rates for equipment and other means and the cost of treatment products, which might be rendered as assistance. This information shall be included at **Annex 3** and regularly updated by each Member State preferably by the beginning of each year.

6.4.2 The Member States shall endeavour to harmonise their rates and discuss all relevant questions during the regular annual meetings of the Operational Authorities (cf. para. 2.3). However, privately listed resources will be governed by the prevailing rates at the time of the incident.

6.4.3 The assisting Member State shall, immediately following receipt of the request for assistance, submit to the requesting Member State an estimate of the costs of assistance.

6.4.4 If assistance is provided the assisting Member State, they will submit an invoice for the cost as soon as possible after the termination of operations to the requesting Member State. The invoice shall itemise the costs, which shall be clearly related to the tasks performed and if possible should be verified independently.

6.4.5 The following items shall be included in the invoice:

a) wages of personnel engaged in JROs, calculated on the basis of the price list given at **Annex 3** and the daily work logs approved by the SOSC or another responsible officer of the Lead Country;

b) costs of rental of equipment and means calculated on the basis of the price list given at **Annex 3** and daily work logs approved by the SOSC or another responsible officer of the Lead Country;

c) cost of treatment products used during JROs calculated on the basis of the price list given at **Annex 3** and the daily work logs approved by the SOSC or another responsible officer of the Lead Country;

d) all expenses listed in para. 6.5.12 below; and

e) costs for replacement of equipment damaged beyond repair during the JROs.

6.4.6 Financial records and invoices shall be prepared in accordance with the guidelines provided by IOPC Fund in its "Claims Manual" (See **Annex 10**)

6.4.7 The requesting Member State shall pay to the assisting Member State all agreed expenses incurred in rendering such assistance, according to the invoice.

6.4.8 Following the transfer of the lead role, the Member State who has assumed the lead role shall bear all expenses related to the assistance rendered by other Member States. It will be important that financial records show the dates on which costs were incurred.

6.4.9 If the Member State who requested assistance decides to withdraw the request for whatever reason, it shall nevertheless, pay to the assisting Member State all the expenses incurred up to the moment when the request was withdrawn or the personnel and equipment return to their country of origin, as appropriate.

6.4.10 The Member States shall resolve all questions related to financial matters after the termination of joint operations. In cases of dispute the Secretariat will provide for a mutually acceptable resolution procedure.

6.4.11 The provisions of this section shall be considered on a case-by-case basis and shall not prejudice the resolution of any dispute involving third parties which may arise respecting liability and compensation for damages resulting from any pollution incident, wherever it may occur. It shall be for the Lead Member State to pursue its own claim for reimbursement of pollution response related costs, submitted to the party liable for pollution incident, its insurers or an international system for compensation of pollution damages, as appropriate. Payment of those rendering assistance must not depend on the success of claims for compensation from third parties.

6.4.12 In case of JROs the requesting Member State shall directly cover the following expenses related to the stay in its territory of personnel, equipment and means (including vessels and aircraft) of the assisting Member State:

a) board and lodging or daily subsistence allowance as appropriate, of response personnel other than the crews of ships and vessels, unless this was provided by the requesting Member State;

b) any port dues for vessels and ships rendered as assistance;

c) any airport dues for aircraft rendered as assistance;

d) fuel, as might be necessary, for all equipment and means including, in particular, vessels and aircraft, engaged in JROs;

e) medical services provided to injured and ill personnel of the assisting Member State;

f) costs related to repatriation of any person who died, was injured or taken ill during JROs;

g) maintenance and cleaning costs for any piece of equipment, vessel and aircraft engaged in JROs;

h) repair costs for any piece of equipment, vessel and aircraft, damaged in its territory during and due to the JROs, if such repair needs to be made prior to returning it to its country of origin;

i) costs of communications related to the JROs incurred by the assisting Member State in the territory of the Lead Member State.

6.4.13 The assisting Member State shall directly cover the following expenses:

a) mobilisation of personnel, equipment, products or other means;

b) costs of transport to and from the country where JROs are taking place, of personnel, equipment and products;

c) fuel for vessels and aircraft proceeding to the site of JROs under their own power;

d) costs of communications related to JROs originating from the territory of the assisting Member State;

e) medical services rendered, following their return, to any of their own nationals injured or taken ill during JROs;

f) maintenance and repair costs for equipment and means engaged in JROs incurred after their return.

6.5 Medical Insurance and Medical Assistance

6.5.1 Each Member State shall take necessary measures to insure against death, illness and injury, its own personnel who might participate in JROs.

6.5.2 The Lead Countryshall endeavour to offer the best possible initial medical care and services to any person from another Member State who was injured or taken ill during his/her participation in JROs.

6.5.3 The Lead Country shall facilitate repatriation of assisting personnel injured or taken ill during JROs.

6.5.4 The costs of hospitalisation and medical assistance rendered within the Lead Country to injured or ill personnel of the assisting Member State shall be borne by the Lead Country. The Lead Country might decide to claim the reimbursement of all such costs from the party responsible for the pollution incident, its insurer or an international system for compensation of pollution damages as appropriate.

6.5.5 The Member States shall waive the right to make claims against each other for the reimbursement of costs of medical care rendered to persons injured and taken ill during JROs.

6.6 Responsibility for Injury and Damage

6.6.1 If those called upon to assist in the response operations cause, at the site of operations, any damages to third parties, and these damages are related to the response operations, such damages shall be the responsibility of the Member State who had requested assistance, except if the damages are caused by the gross negligence of the assisting Member State.

6.6.2 The provisions of this paragraph shall apply also in case of joint exercises.

6.7 Documentation of Response Operations and Related Costs

6.7.1 SOSC shall take necessary measures to ensure that detailed records of all actions taken in order to respond to a pollution incident, within the framework of the Regional Plan, are accurately kept. For this purpose, SOSC might include a record keeping officer or financial controller in his/her Support Team.

6.7.2 At least the following records shall be regularly kept:

a) Description of the situation, decisions taken and implemented response measures;

b) Daily work log, giving details of:

- operations in progress (place, time, purpose)
- equipment and other means in use (place, time, purpose);
- personnel employed (number, time);
- response products and other material (e.g. fuel) consumed (quantity, purpose).

c) Records of all expenditures made in relation to pollution response operations.

d) Number of incidents/injuries

6.7.3 Following the termination of the response operations, such records shall be made available to the national Authority responsible for the submission of claims for compensation.

7. PUBLIC INFORMATION

7.1 Public Relations Officer (PRO)

7.1.1 After the activation of the Regional Plan, the Lead Authority shall designate a Public Relations Officer (PRO) who shall be seconded to the SOSC's Support Team.

7.1.2 PRO shall be responsible for:

a) maintaining contacts with the press;

b) preparing press releases on behalf of the SOSC and the Lead Authority

c) following information released by the press and clarifying possible misunderstandings; and

d) press reports provided to assisting Member States.

7.2 Press Releases

7.2.1 Press releases shall be prepared and distributed to the press at least once a day during the entire period between the activation and the deactivation of the Regional Plan.

7.2.2 Press releases shall be prepared by the PRO on the basis of accurate facts provided by the SOSC and/or his/her support Team. They shall contain information concerning:

a) pollution incident and development on the situation;

b) injuries of personnel and damages to vessels, equipment, etc.;

c) vessels involved, type of characteristics of the pollutants, etc.;

d) measures taken to combat pollution;

e) progress of response measures.

7.2.3 The following guidelines shall be observed when preparing press releases:

a) prepare titles/headlines;

b) give primarily the most recent and important information;

c) use simple sentences and give only one idea per sentence;

d) avoid quoting estimates, conjectures, and suppositions;

e) avoid giving opinions on environmental or other unquantifiable damages; and

f) draft carefully final wordings.

7.2.4 Maps showing the area of incident, evolution of the spill and sites of response operations should accompany press releases whenever possible.

7.2.5 All press releases shall be vetted and approved by the SOSC before distribution to the press.

7.3 Press Conferences

7.3.1 After the activation of the Regional Plan, the Lead Authority may decide, in consultation with the SOSC, to organise one or more press conferences for briefing the media.

7.3.2 The following persons may take part in such press conferences:

a) SOSC

b) specially designated expert members of the Support Team

c) PRO

d) representative(s) of the Lead Authority

e) representative of the other Member States (e.g. Liaison Officers or NOSCs)

f) representative of ship and cargo owners and/or their insurers, owners or operators of offshore units, sea ports and oil handling facilities as appropriate to the incident

7.3.3 Written information on main facts concerning the pollution incident and JROs, maps and photographs may be prepared in advance by the PRO and approved by SOSC for use during the press conference.

7.3.4 Guidelines concerning the preparation of press releases (cf. para.7.2) shall also be observed by participants in press conferences.

* * *

Annexures to Regional Oil and Chemical Pollution Contingency Plan for South Asia

Annex 1: Directory of Competent National Authorities, Contact Points, Emergency Response Centres, National On-Scene Commanders and Other Relevant Addresses

Annex 2 National Contingency Plans (Or Relevant Parts Thereof)

Annex 3 Directory Of Response Personnel and Inventory of Response Equipment, Products and other means which each Party might offer as assistance in case of the activation of the Regional Plan including information relating to the wages of personnel, the rental rates of equipment and the cost of materials.

Annex 4: Communication System

Annex 5: Guidelines for Reporting Oil Spills (Aerial Monitoring)

Annex 6: Command Structure Template - Example

Annex 7: Resources which might be made available from outside the Region, and their contact points

Annex 8: Requesting Assistance – POLREP Pollution Reporting System

Annex 9: IMO Assembly Resolution A.983(24), Guidelines for Facilitation of Response to an Oil Pollution Incident Pursuant to Article 7 and Annex of the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990

Annex 10: References

Annexure 1

(To Regional Oil and Chemical Pollution Contingency Plan for South Asia)

DIRECTORY OF COMPETENT NATIONAL AUTHORITIES, CONTACT POINTS, EMERGENCY RESPONSE CENTRES, NATIONAL ON-SCENE COMMANDERS AND OTHER RELEVANT ADDRESSES

Bangladesh

Competent National Governmental Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Competent National Operational Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National Contact Point (operational 24 hrs a day) Responsible for Receiving Reports on Pollution Incidents

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Emergency Response Centre

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National On-Scene Commander

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

India

Competent National Governmental Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Competent National Operational Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National Contact Point (operational 24 hrs a day) Responsible for Receiving Reports on Pollution Incidents

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Emergency Response Centre

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National On-Scene Commander

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Maldives

Competent National Governmental Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Competent National Operational Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National Contact Point (operational 24 hrs a day) Responsible for Receiving Reports on Pollution Incidents

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Emergency Response Centre

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National On-Scene Commander

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Pakistan

Competent National Governmental Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Competent National Operational Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National Contact Point (operational 24 hrs a day) Responsible for Receiving Reports on Pollution Incidents

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Emergency Response Centre

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National On-Scene Commander

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Sri Lanka

Competent National Governmental Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Competent National Operational Authority

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National Contact Point (operational 24 hrs a day) Responsible for Receiving Reports on Pollution Incidents

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Emergency Response Centre

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

National On-Scene Commander

Title

Address:

Telephone:

E-mail:

Telex:

Telefax:

Working Hours:

Annexure 2

(To Regional Oil and Chemical Pollution Contingency Plan for South Asia)

NATIONAL CONTINGENCY PLANS (OR RELEVANT PARTS THEREOF)

Bangladesh

Pr = preparedness, Re = response	At Sea		On Shore	
	Pr	***Re***	***Pr***	***Re***
Governmental Level				
Central Authorities				

SUMMARY DESCRIPTION OF THE NATIONAL CONTINGENCY PLAN

TITLE

Prepared:

Became Effective (year):

SCOPE

Geographical Coverage:

Applicable to Pollution by:

Levels of Emergency:

RESPONSIBILITIES

According to administrative division (geographically)

According to administrative hierarchy (decision-making)

RELATION TO OTHER CONTINGENCY PLANS

REPONSE STRATEGY:

USE OF DISPERSANTS
(Policy):

SENSITIVE AREAS:

India

Pr = preparedness, Re = response	At Sea		On Shore	
	Pr	***Re***	***Pr***	***Re***
Governmental Level				
Central Authorities				

SUMMARY DESCRIPTION OF THE NATIONAL CONTINGENCY PLAN

TITLE

Prepared:

Became Effective (year):

SCOPE

Geographical Coverage:

Applicable to Pollution by:

Levels of Emergency:

RESPONSIBILITIES

According to administrative division (geographically)

According to administrative hierarchy (decision-making)

RELATION TO OTHER CONTINGENCY PLANS

REPONSE STRATEGY:

USE OF DISPERSANTS
(Policy):

SENSITIVE AREAS:

Maldives

Pr = preparedness, Re = response	At Sea		On Shore	
	Pr	***Re***	***Pr***	***Re***
Governmental Level				
Central Authorities				

SUMMARY DESCRIPTION OF THE NATIONAL CONTINGENCY PLAN

TITLE

Prepared:

Became Effective (year):

SCOPE

Geographical Coverage:

Applicable to Pollution by:

Levels of Emergency:

RESPONSIBILITIES

According to administrative division (geographically)

According to administrative hierarchy (decision-making)

RELATION TO OTHER CONTINGENCY PLANS

REPONSE STRATEGY:

USE OF DISPERSANTS
(Policy):

SENSITIVE AREAS:

Pakistan

Pr = preparedness, Re = response	At Sea		On Shore	
	Pr	***Re***	***Pr***	***Re***
Governmental Level				
Central Authorities				

SUMMARY DESCRIPTION OF THE NATIONAL CONTINGENCY PLAN

TITLE

Prepared:

Became Effective (year):

SCOPE

Geographical Coverage:

Applicable to Pollution by:

Levels of Emergency:

RESPONSIBILITIES

According to administrative division (geographically)

According to administrative hierarchy (decision-making)

RELATION TO OTHER CONTINGENCY PLANS

REPONSE STRATEGY:

USE OF DISPERSANTS
(Policy):

SENSITIVE AREAS:

Sri Lanka

Pr = preparedness, Re = response	At Sea		On Shore	
	Pr	***Re***	***Pr***	***Re***
Governmental Level				
Central Authorities				

SUMMARY DESCRIPTION OF THE NATIONAL CONTINGENCY PLAN

TITLE

Prepared:

Became Effective (year):

SCOPE

Geographical Coverage:

Applicable to Pollution by:

Levels of Emergency:

RESPONSIBILITIES

According to administrative division (geographically)

According to administrative hierarchy (decision-making)

RELATION TO OTHER CONTINGENCY PLANS

REPONSE STRATEGY:

USE OF DISPERSANTS (Policy):

SENSITIVE AREAS:

Annexure 3

(To Regional Oil and Chemical Pollution Contingency Plan for South Asia)

DIRECTORY OF RESPONSE PERSONNEL AND INVENTORY OF RESPONSE EQUIPMENT AVAILABLE TO OTHER PARTIES

The listing of personnel, equipment or other means of response here does not mean that it can always be made available. Availability depends on the circumstances of the spill, the current employment of the personnel or state of the equipment, and other demands that might be placed on them. The precise details of assistance to be made available in any incident will be a matter for discussion between the requesting party and the assisting party.

***Note**: each Member State to the Regional Plan should produce a section of this annex listing the personnel and equipment that it could make available to the other Member States on request under the terms of the Regional Plan. The form of the annex shown here does not need to be followed precisely, provided sufficient information is shown to guide the Lead Country to make sensible requests for assistance. The cost information, however, is important: it should be shown here, preferably expressed in $US. Exceptionally the annex could indicate that cost information would be made available on request during an incident. Assistance should neither be requested nor provided unless its cost was agreed by the two Member States concerned beforehand.*

Bangladesh

Type	Quantity	Provider	Location	Cost (Where appropriate.)

Type: the nature of the personnel, equipment, products that might be made available

Quantity: numbers of personnel, vessels, vehicles etc. that might be made available

Provider: the employer of personnel or the owner of equipment (Government, local authority, oil company, shipping company, commercial responder etc.).

Location: where the personnel are based or the equipment is stored.

India

Type	Quantity	Provider	Location	Cost (Where appropriate)

Type: the nature of the personnel, equipment, products that might be made available

Quantity: numbers of personnel, vessels, vehicles etc. that might be made available

Provider: the employer of personnel or the owner of equipment (Government, local authority, oil company, shipping company, commercial responder etc.).

Location: where the personnel are based or the equipment is stored.

Maldives

Type	Quantity	Provider	Location	Cost (Where appropriate)

Type: the nature of the personnel, equipment, products that might be made available

Quantity: numbers of personnel, vessels, vehicles etc. that might be made available

Provider: the employer of personnel or the owner of equipment (Government, local authority, oil company, shipping company, commercial responder etc.).

Location: where the personnel are based or the equipment is stored.

Pakistan

Type	Quantity	Provider	Location	Cost (Where appropriate)

Type: the nature of the personnel, equipment, products that might be made available

Quantity: numbers of personnel, vessels, vehicles etc. that might be made available

Provider: the employer of personnel or the owner of equipment (Government, local authority, oil company, shipping company, commercial responder etc.).

Location: where the personnel are based or the equipment is stored.

Sri Lanka

Type	Quantity	Provider	Location	Cost (Where appropriate)

Type: the nature of the personnel, equipment, products that might be made available

Quantity: numbers of personnel, vessels, vehicles etc. that might be made available

Provider: the employer of personnel or the owner of equipment (Government, local authority, oil company, shipping company, commercial responder etc.).

Location: where the personnel are based or the equipment is stored.

* * *

Annexure 4

(To Regional Oil and Chemical Pollution Contingency Plan for South Asia)

To be updated at a later stage

COMMUNICATIONS

Note: what follows is an outline that the Member States will need to discuss amongst themselves, providing the relevant details.

Section 3.6 of the Regional Plan deals with communications arrangements by reference to this Annex. The Annex sets out the way in which communications will be made among the Member States for:

a) Routine exchange of information when there is no emergency.

b) Exchange of information between the Member States when there is an incident which requires or may require the activation of the Regional Plan.

c) Operational communications during Joint Response Operations including those related to
- Operational Command
- Operational Control
- Tactical Command

ROUTINE EXCHANGE OF INFORMATION

For communications among the Operational Authorities of the Member States and for the exchange of information relevant to the maintenance of the regional system for preparedness and response Member States should use ordinary public switched networks. The use of telefax, telex or e-mail should be given preference, although telephone may be used as necessary.

Exchange of information between the Member States when there is an incident that requires or may require the activation of the Regional Plan

For alerting other Member States, informing them of the activation of the Regional Plan, requesting assistance and for maintaining subsequent contacts the Member States should use ordinary public switched networks using the numbers listed in **Annex 1**. All alerts and POLREP messages should be sent in written form using telefax, telex or e-mail. Such messages should be immediately acknowledged by the recipients.

OPERATIONAL COMMUNICATIONS DURING JOINT RESPONSE OPERATIONS

OPERATIONAL CONTROL

Normally, Operational Command will be exercised by the Supreme On-Scene Commander (SOSC) from the Joint Emergency Response Centre (JERC). For transmission of his orders the SOSC should use:

a) ***Public Switched Networks*** for shore-shore communications with ERCs and NOSCs of other Parties.

b) ***VHF Radio*** for shore-sea communications with units taking part in the response operations. VHF Channels to be used are listed *(to be completed at a later stage)*.

c) ***Coast Radio Stations on MF frequencies*** should be used when vessels are outside VHF range. MF frequencies to be used are listed *(to be completed at a later stage)*.

d) Some vessels involved may be fitted with ***satellite communications systems***. The Captain or Master of such vessels should advise the JERC if they advise that these systems should be used during joint operations. The national operations centres – which may become Emergency Response Centres – that are fitted with satellite communications equipment are listed *(to be completed at a later stage)*. Vessels with satcoms can also be contacted through the ordinary public switched network.

e) ***Mobile telephone systems***, where these exist with suitable coverage, may be useful for shore-shore or shore-sea communications.

COMMUNICATION PLAN

At an early stage of the incident the SOSC should issue a ***Communication Plan*** listing the methods and frequencies to be used for communications with the JERC.

Operational Control

Communications for conducting response operations between the relevant National On-Scene Commander (NOSC) and the response units and strike teams under his or her command should be as follows:

a) ***Public Switched Networks*** for shore-shore communications with ERCs and NOSCs of other Parties.

b) ***VHF Radio*** for shore-sea or sea-sea communications with and between units taking part in the response operations. Portable VHF sets may be useful here if they are available. VHF Channels to be used are listed *(to be completed at a later stage)*.

c) ***Coast Radio Stations on MF frequencies*** should be used when vessels are outside VHF range. MF frequencies to be used are listed *(to be completed at a later stage)*.

d) ***Mobile telephone systems***, where these exist with suitable coverage, may be useful for shore-shore or shore-sea communications.

e) ***Portable Satellite Communications Systems*** may be used by some responders, including commercial response organisations.

COMMUNICATION PLANS

At an early stage of the incident NOSCs should issue ***Communication Plans*** listing the methods and frequencies to be used for communications with the response units under their control.

TACTICAL COMMAND

Communications at the scene of response operations, concerning the direction and supervision of response activities by the teams and units involved, as well as exchange of information between those response teams and units should be maintained using:

a) ***VHF Radio*** for shore-shore, shore-sea or sea-sea communications with and between units taking part in the response operations. Portable VHF sets may be useful here if they are available. For communications with aircraft see below. VHF Channels to be used are listed *(to be completed at a later stage)*.

b) ***Mobile telephone systems***, where these exist with suitable coverage, may be useful for shore-shore or shore-sea communications.

COMMUNICATIONS WITH AIRCRAFT

Preferably aircraft taking part in oil spill monitoring or dispersant spraying operations should be fitted with Marine Band VHF equipment, or portable equipment should be carried. The equipment should be capable of working on the channels listed under *(to be completed at a later stage)*.

Otherwise vessels and shore stations will not be able to communicate with aircraft unless they have the appropriate HF equipment, or can pass messages through airports or other centres so equipped.

Mobile phones should not generally be used on board aircraft.

Use of Mobile Telephonics with Fax

When other means of transmission of important text messages are not available it is possible that mobile phones could be used, connected to fax machines.

* * *

Annexure 5

(To Regional Oil and Chemical Pollution Contingency Plan for South Asia)

GUIDELINES FOR REPORTING OIL SPILLS **(AERIAL MONITORING)**

1 INTRODUCTION

Aerial monitoring of oil spills is made either from helicopters or from fixed-wing aircraft. It could be made using sophisticated remote sensing equipment, however, visual aerial observation is often the most convenient means of assessing oil pollution at sea and on shore, which if properly carried out, can give an important indication, sometimes of a decisive nature, concerning:

- the extent of pollution (overall surface totally or partly covered);
- the evolution of pollution and its follow-up;
- the quantity of floating oil;
- the evaluation of the threat;
- the selection of appropriate combating techniques;
- the evaluation of the effectiveness of means used;
- the assessment of damage.

Unfortunately, aerial monitoring is in most cases done by personnel not specifically trained in this activity (pilots, photographers, aerial navigators), which in turn often results in unreliable and inaccurate reports. In order to ensure that the information provided by observers is precise and quantifiable enough to be of use for the authorities responsible for pollution combating, an attempt has been made to prepare a set of basic instructions for observers and to standardise the terminology used in reports.

The objectives of this Annex are to instruct non-specialised observers on:

- what to look for;
- how to locate the pollution;
- how to observe, describe and report the pollution;
- how to prepare the information for further processing.

Note: Remote Sensing, monitoring and visualisation of marine spill incidents continues to advance and develop, therefore it is recommended to consult the latest publications or guidelines in this field to determine the current state of the art technology available (Annex 11)

2 ORGANISATION OF AN AERIAL OBSERVATION MISSION

- The aircraft (either helicopter or fixed-wing) chosen for aerial monitoring of oil spills should have good all round visibility.
- Helicopters are more suitable for missions near the shore, while fixed-wing aircraft provide more speed and longer range for missions over the open sea.
- Safety of the crew and observers must always have priority over all other considerations and therefore multi-engined (at least twin) aircraft should be used for all missions over remote sea areas.
- In order to reduce, as much as possible, the time spent searching for pollution, a flight plan should be prepared before the flight.

- Observers should be provided with the charts of the area. For more accurate identification of positions and reporting, it is useful to draw a grid on the chart using e.g. grid squares with the sides of 1 Nautical mile each.
- A "ladder search" (illustrated on the following page) across the direction of the wind is considered to be the most efficient method of surveying the area in which the oil might be found. A systematic search for oil over a large sea area is recommended since forecasting of oil movement is intrinsically not very accurate, and accordingly oil might be found at larger distances or in directions different from those predicted on the basis of calculation.

Movement of oil from A to position B three days later is predicted by combining 100% of the current speed and 3% of the wind speed as shown. The arrows from A represent current, wind and oil movement for one day. A cross-wind ladder search pattern is shown over position B.

Reproduced from "Response to Marine Oil Spills", International Tanker Owners Pollution Federation Ltd., 1987.

- When the visibility is good (in clear weather) a recommended altitude is approximately 500 m, however, in order to obtain better view of the oil, once found, it is necessary to drop to lower altitudes (200 m or less).
- In order to determine the position of oil sightings, the observer should be able to consult aircraft instruments; in particular, when oil is found far from shore and points of reference on the shore.
- In order to enable the undisturbed communication between the observer and the pilot of the aircraft, wearing of headsets is highly recommended.
- Sun glasses (with polarising lenses, if possible) will help detection of oil at sea under certain light conditions.

3 APPEARANCE OF OIL SPILLS

When spilled at sea, oil forms a slick which drifts with the wind and current, and subsequently breaks up into smaller slicks (patches), usually interspersed with the areas of relatively thin sheen, and scatters over areas which, with time, become very large. With a change in wind direction oil already deposited on shores might refloat. After being at sea for some time most crude oils and heavy refined products will form a water-in-oil emulsion (“chocolate mousse”) which increases their volume and viscosity and changes their colour. Oil or emulsion can also become mixed with algae and debris.

Three main groups of oil can be distinguished in accordance with their appearance when floating on the sea surface:

- Light refined products (petrol, gasoil, kerosene) which spread uniformly on big surfaces and undergo strong evaporation and rapid natural dispersion processes, often resulting in their total disappearance in 2 to 3 days. They form thin sheens.
- Heavy refined products (fuel No. 6 and most types of fuel oils used by merchant ships) which are very viscous spread less rapidly and do not disappear naturally. These form dark thicker patches, separated by areas of intermediate and thin sheens. May form emulsions.

- Crude oils whose characteristics and behaviour vary greatly according to their type and origin. Usually these rapidly break into areas of dark, thicker oil interspersed with areas of intermediate and thin sheens. Most crude oils will form emulsions within 24 – 48 hours.
- In general terms, the thick parts of an oil slick have dull (dark) colours, the colour of patches of intermediate thickness is blue or iridescent (rainbow), and the thinnest parts of a slick appear as areas of grey or silvery sheen.

Sheen consists of only small quantities of oil but is the most visible proof of pollution. Frequently, thick patches are discovered in the midst and windward of an area covered by sheen (silver, grey or iridescent).

Thick patches represent big quantities of oil. Generally, black or dark brown at the early stages of pollution, but once emulsified may appear as brown, red, orange or yellow patches.

The Bonn Agreement Oil Appearance Code (BAOAC)

Since the colour of the oil itself as well as the optic effects is influenced by meteorological conditions, altitude, angle of observation and colour of the sea water, an appearance cannot be characterised purely in terms of apparent colour and therefore an "appearance" code, using terms independent of specific colour names, has been developed.

The Bonn Agreement Oil Appearance Code is used widely internationally including in the North Sea, the Mediterranean Sea, Black Sea the USA and others areas. The code was been developed as follows:

- In accordance with scientific literature and previously published scientific papers,
- Its theoretical basis is supported by small scale laboratory experiments,
- It is supported by mesoscale outdoor experiments,
- It is supported by controlled sea trials.

Due to slow changes in the continuum of light, overlaps in the different categories were found. However, for operational reason, the code has been designed without these overlaps. Using thickness intervals provides an estimation of volumes that can be used both for legal procedures and for response. The Member States may consider using the lower figure is used in official statements whereas the upper figure is used to indicate the required response measures.

Five levels of oil appearances are distinguished in code detailed in the following table:

Code	**Description - appearance**	**Layer thickness interval (µm)**	**Litres per km²**
1	Sheen	0.04 to 0.30	40 – 300
2	Rainbow	0.3 to 5.0	300 – 5,000
3	Metallic	5.0 to 50	5000 – 50,000
4	Discontinuous True Oil Colour	50 to 200	50 000 – 200,000
5	Continuous True Oil Colour	More than 200	More than 200,000

The appearances described cannot be related to one thickness; they are optic effects (codes 1-2-3) or true colours (codes 4-5) that appear over a range of layer thickness.

There is no sharp delineation between the different codes; one effect becomes more diffuse as the other strengthens.**4 DESCRIPTION OF POLLUTION**

It is recommended to use the same observers throughout the pollution incident, to minimise disparity in reporting. However, if this is not possible, observers should be instructed to use the following terminology when reporting (describing) oil spills:

a) Sheen:

"light sheen"	-	sea surface covered with faint silvery sheen, barely visible under favourable light conditions;
"sheen"	-	sea surface covered with consistent silvery and grey sheen, no patches of thick oil;
"heavy sheen"	-	sea completely covered with grey sheen, occasionally having rainbow colours (iridescent), no patches of thick oil.

b) Patches:

"small patches"	-	less than 1 m2, hardly visible from higher altitudes, ranging in colour from blue and brown to black;
"medium patches"	-	10-100 m2, clearly visible from the air, colours blue, brown or black.
"big patches"	-	large slicks of 100 m2 and over, clearly visible, colours blue, brown or black.

In order to indicate what percentage of the sea area is covered by oil, the observer should describe the slicks as:

"scattered"	-	if 1 to 2% of the sea is covered;
"not too compact"	-	if up to 5% of the sea is covered;
"compact"	-	if up to 20% of the sea is covered;
"very compact"	-	if over 20% of the sea is covered.

In order to estimate as accurately as possible the percentage area of the sea covered by oil, it is recommended to view vertically down on the sea surface, to time overflying each type of oil (sheen, patch, mousse) at the constant (and recorded) speed of the aircraft, and to calculate the percentages on the basis of these records once the monitoring flight is over.

Big patches should be reported singly. The report should include the colour of the patch and information on (description of) any sheen (iridescence) present around these patches of darker oil. Particular attention should be paid to identifying brownish/red/orange/yellow colours which indicate the presence of chocolate mousse (this is important for the selection of response techniques, since the presence of emulsions may mean that certain types of skimmers or dispersants will be less effective).

If possible, colour or infra-red black and white photographs or slides, or video recording of the slick should complement each report.

5 REMARKS

- Often up to 90% of the oil is concentrated on 10% of the surface covered by a slick, in its downwind end. This phenomenon is more pronounced in cold sea and weather conditions.
- A strong wind, of more than 20 knots, causes formation of separate windrows.
- The absence of iridescence (rainbow colour bands) is almost always an indication of slick weathering and emulsion formation.
- The appearance of a slick can change, depending on the position of the sun in relation to the observer. If there are any doubts, several over flights from different directions should be made in order to verify the initial observation.
- Certain phenomena (shadows of clouds, algae or seaweed under the sea surface, suspended sediments in an estuary) can be mistaken for oil slicks. If there are any doubts, the observer should request additional over flights of the suspicious area.
- During very strong storms (sea 6), even a major pollution can be difficult to notice and it may become visible only once the weather has calmed down (CAUTION: only large multi-engine aircraft could be used for aerial monitoring under such conditions).

6 METEOROLOGICAL CONDITIONS

The influence of meteorological conditions is as decisive for the observation of a spill as it is for its combating. TABLES 2, 3, 4 give standard scales for wind force (Beaufort wind force scale), sea state and nebulosity, respectively, which should be used by observers when reporting meteorological conditions in the surveyed area.

TABLE 2: BEAUFORT WIND FORCE SCALE

DESCRIPTIVE TERM	BEAUFORT NUMBER	LIMITS OF WIND VELOCITY		PROBABLE MEAN HEIGHT OF WAVES *
		in knots	in m/sec	in metres
Calm	0	<1	0-0.2	-
Light air	1	1-3	0.5-1.5	0.1
Light breeze	2	4-6	1.6-3.3	0.2
Gentle breeze	3	7-10	3.4-5.4	0.6
Moderate breeze	4	11-16	5.5-7.9	1.0
Fresh breeze	5	17-21	8-10.7	2.0
Strong breeze	6	22-27	10.8-13.8	3.0
Near gale	7	28-33	13.9-17.1	4.0
Gale	8	34-40	17.2-20.7	5.5
Strong gale	9	41-47	20.8-24.4	7.0
Storm	10	48-55	24.5-28.4	9.0
Violent storm	11	56-63	28.5-32.6	11.5
Hurricane	12	64-+	32.7-+	>14

* This column is only a guide, showing roughly what may be expected in the open sea, far from land.

TABLE 3: SEA STATE

DESCRIPTIVE TERM	SEA STATE	WAVE HEIGHT
Calm (glassy)	0	0
Calm (rippled)	1	0-0.1
Smooth (wavelets)	2	0.1-0.5
Slight	3	0.5-1.25
Moderate	4	1.25-2.5
Rough	5	2.5-4
Very rough	6	4-6
High	7	6-9
Very high	8	9-14
Phenomenal	9	>14

The sea state is completed with SWELL indications:

Height		Length	
Small	0-2 m	Short	0-100 m (Probably different from the wind direction)
Moderate	2-4 m	Medium	100-200 m
High	4 m	Long	200 m

TABLE 4: NEBULOSITY

Part of the sky covered with clouds in oktas from 0 to 8

0: no clouds

8: entirely cloudy

* * *

Annexure 6

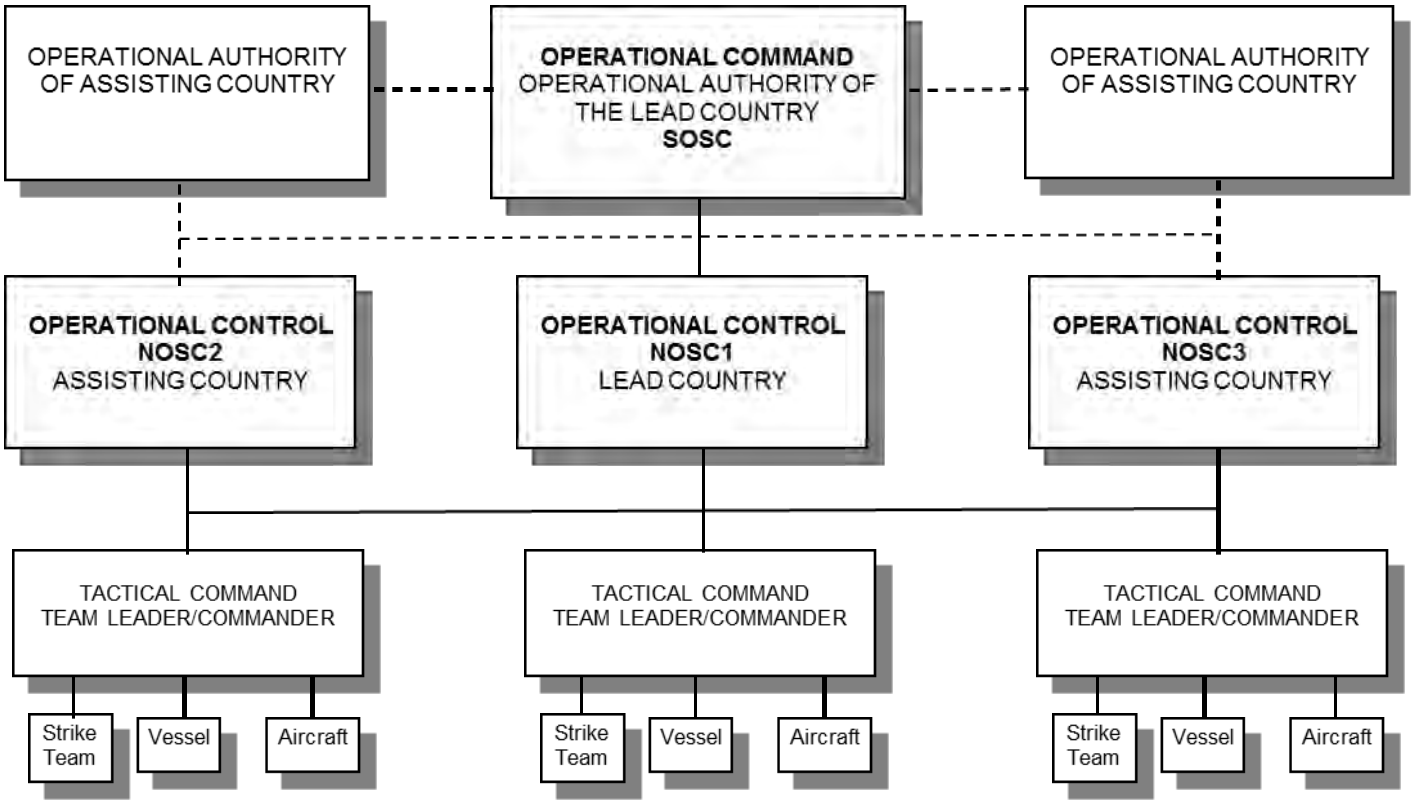
(To Regional Oil and Chemical Pollution Contingency Plan for South Asia)

COMMAND STRUCTURE

TEMPLATE

EXAMPLE

Diagram 1 – Command Structure



Operational Command which is overall co-ordination and control of ***Joint Response Operations*** and consists of taking decisions concerning response strategy and defining the tasks of various groups of teams. Following the activation of the Regional Plan, Operational Command over Joint Response Operations is exercised by the Lead Authority through its NOSC who assumes the role of SOSC.

Operational/Advisory Control which is direct control over personnel, means and units taking part in the response operations, including giving orders to specific groups of teams and units for execution of response operations, in accordance with the strategy and the tasks defined by the Operational Command. Operational Control over national resources is exercised by the NOSCs of the respective Parties. (Operational Control over the resources of the Lead State is exercised by an officer designated to act as NOSC in lieu of the officer who has assumed the role of SOSC.)

Tactical Command which consists of directing and supervising the execution of specific tasks by teams or units on the scene. Tactical Command is exercised by the Leader of each team or the Commander of each unit taking part in the response operations.

Liaison between the Lead Authority and the assisting Member State shall be maintained, according to the circumstances and to the type and importance of the assistance rendered, in one of the following ways:

- by direct e-mail, telex, telefax, telephone or radio contacts between the Lead Authority (SOSC) and Operational Authorities (NOSCs) of the assisting Member States or by any other suitable means of communication identified.
- by a Liaison Officer from the assisting Member State who is integrated in the staff of the SOSC. His/her duties shall be to provide necessary information on resources rendered as assistance and to facilitate communication with his/her NOSC, ERC, Strike Teams and self-contained units taking part in the operations;
- by NOSC of the assisting Member State who personally attends at the spill site and participates in Joint Response Operations.

Annexure 7

(To Regional Oil And Chemical Pollution Contingency Plan For South Asia)

RESOURCES WHICH MIGHT BE MADE AVAILABLE FROM OUTSIDE THE REGION INCLUDING CONTACT POINTS /OIL INDUSTRY INTERNATIONAL TIER 2/3 RESPONSE CENTRES

INDUSTRY STOCKPILES

These centres have been established and are funded by groups of oil companies. In the "3 Tier" concept of oil spill response, Tier 3 arrangements provide for a combined national or international response to a major oil spill. The international centres have been established to avoid duplication of expensive resources which may only be required infrequently. They are consistent with the OPRC Convention which recognises the importance of cooperation between public and private bodies in providing expertise and resources for responding to oil spills.

Although member companies have preferential access, the centres are available to third party users such as governments and tanker owners. There is a charge for their use, except for the PAJ stockpile. The daily rental rates are published by the centres. The PAJ stockpiles are free, but users must repair or replace damaged equipment.

The main centres which could respond in the South Asia Region are:

Oil Spill Response Ltd (OSRL)	Singapore
Oil Spill Response Ltd (OSRL),	Southampton, UK
Petroleum Association of Japan, *(to be confirmed)*	Ras Al Khafji, Saudi Arabia; Abu Dhabi; Malaysia; Singapore; Jakarta, Indonesia and 6 bases in Japan]
Australian Marine Oil Spill Centre, (AMOSC)	Geelong, Australia

OSRL

OSRL is an Industry funded "Global Alliance" with response bases in Singapore, Bahrain in the Arabian Gulf, Southampton in the UK and Fort Lauderdale in the USA. They also have call off arrangements with majority number of other response organisations whereby they can pool their resources and expertise. In effect a request to either one of their bases may make available the resources of all. Both have comprehensive stockpiles ready for rapid transport by air, but would rely on local transport to the scene.

The effective use of outside resources, such as those of the Tier 3 centres, will depend very much on the planning, organisation, facilitation and command provided by the Lead Country. OSRL may have sufficient manpower to operate its equipment at the scene of an oil spill but, in a major spill, they would need to be supplemented by outside personnel.

AMOSC (Australian Marine Oil Spill Centre)

Formally, AMOSC's area of operation is bounded by 110 deg E, 0 deg S, 145 deg W, 50 deg S. This therefore excludes the South Asia region countries.

However, if it were a very serious spill, their resources may either be sourced through the Industry Global Alliance or through an Asian country to country support initiative through AMSA (Australian Maritime Safety Authority). (AMOSC has a standing contract with AMSA.) AMSA has a number of MOUs with neighbouring countries. Although none of these are in South Asia it might be worth approaching AMSA if there were a serious spill and further resources were still needed in addition to those made available from sources closer to hand.

For completeness, all the Asian resources are shown below with their location and contact details :**Global Bases Providing Tier 2/ 3 Capability**

Name of Centre	Location/ Area of Operation	Comment	Direct Focal Point
Australian Marine Oil Spill Centre (AMOSC)	Territorial Australia with the ability to operate in the South West Pacific.		Nick Quinn General Manager Australian Marine Oil Spill Centre PO Box 1497 Geelong, Victoria, 3220 Telephone: (03) 5272 1555 Fax: (03) 5272 1839 Email: amosc@amosc.com.au
China Offshore Environmental Services Ltd (COES)	China		Address: TianJin TangGu BohaiShiYou Road 688, China, BoHaiShiYou Building B zone A801 room. Mail Code: 300452 Contact People: Feng Quan, Deputy Manager of OSR Dept. Mobile: +86 13752395456 Office Phone: 022-25808079 Website: http://www.coes.org.cn Email: fengquan@coes.org.cn
Hong Kong Response Ltd	Hong Kong	Spill response consortium funded by 4 oil companies, Sinopec, ExxonMobil, Chevron, and Shell	Hong Kong Response Limited Contact Person: Mr. MING Chuen-hoi, & Mr. LEUNG Wai-lun Contact e-mail: GM@hkrl.com.hk tel: (852) 2434 3338 Fax : (852) 2434 0444 Company Address: ESSO Tsing Yi Terminal Lot. 46, Tsing Yi Road, Tsing Yi Island, New Territories, Hong Kong
Industry Environmental Safety Group (IESG)	Main stockpiles in Chonburi and Songkhla (sub-stockpiles in Bangkok and Rayong), Thailand	Reached 20 member companies in 2012.	Teerapol Phaparkhom IESG Chairman Email:Teerapol.p@pttar.com Office: 8, 1-8 Road, Map Ta Phut Industrial Estate, Map Ta Phut, Muang District, Rayong, 21150 Thailand Tel: (66) 2239 7955 56 Fax: (66)2-239-7917 Website: www.iesg.or.th

Korea Marine Environment Management Corporation(KOEM)	**Korea**	**Formerly KMPRC**	**Woo-Rack SUH General manager, Response Dept. Korea Marine Environment Management Corporation(KOEM) www.koem.or.kr suhwoorack@naver.com tel +82 (0)2 3498 8593 fax +82 (0)2 3462 7707 mp +82 (0)10 3100 6756**
OSRL	**Spill response bases in United Kingdom, Singapore, Bahrain and Florida. Also has anumber of bases for capping stacks (see separate section)**	**Reponse bases for capping stacks identified separately**	**Paul Foley, Technical Manager, Oil Spill Response ltd. Lower William Street, Southampton, Hants. SO14 5QE. UNITED KINGDOM. Tel: +44 (0) 2380 331551 Fax: +44 (0) 2380 331972 email: paulfoley@oilspillresponse.com web: http://www.oilspillresponse.com**
Petroleum Association of Japan (PAJ) Oil Spill Co-operative	**Asia Pacific and Middle East**	**Six domestic bases in Japan and five overseas bases (Singapore, Saudi Arabia, Malaysia, UAE, Indonesia**	**http://www.pcs.gr.jp/default_e.html**
Petroleum Industry of Malaysia Mutual Aid Group (PIMMAG)	**Malaysia (including EEZ)**	**PIMMAG operates and maintains seven OSR equipment stockpiles in Malaysia. Three of these stockpiles are in manned bases at Kemaman, Port Dickson and Labuan. The unmanned stockpiles are at Kuching, Miri, Kertih and Tawau**	**Capt. Amir Murad Al-Haj, General Manager, PIMMAG, Level 5, Menara Dayabumi Kompleks Dayabumi, Jalan Sultan Hishamuddin 50050 Kuala Lumpur, Malaysia TEL: 603-2783 6993/6997, FAX: 603-2783 6992, H/P: 019 3500 197, E-mail: amir@petronas.com.my; amir@pimmag.com.my**
Singapore Oil Spill Response Centre (SOSRC)	**Singapore and Malaysian waters**		**Fabian Tao ER Divisions POSH Semco Pte Ltd DID: (65) 6839 6515 Fax: (65) 6839 6702 Mobile: (65) 9230 6160 fabianteo@paccoffshore.com.sg**

Swire Emergency Response Services (SERS)	**Dubai**		**Fergus Perry, Operations Manager fergus.perry@swire-ers.com**
	Douala		
	Singapore (Swire Pacific)		

Other Sources of Equipment and assistance e.g. Governmental

Marine Emergency Mutual Aid Centre (MEMAC)) in Bahrain Captain Abdul Munem Al-Janahi
memac@batelco.com.bh
(973) 39622744
: http://www.memac-rsa.org/

Annexure 8

(To Regional Oil and Chemical Pollution Contingency Plan for South Asia)

REQUESTING ASSISTANCE
POLREP POLLUTION REPORTING SYSTEM

INTRODUCTION

In order to retain the consistency with the POLREP Pollution Reporting System, which has been agreed for use in accordance with the recommendation of IMO, the format for requesting assistance within the framework of the present Regional Plan has been based on Part III-POLFAC (Pollution Facilities) of POLREP, aimed at "requesting assistance from Parties and for defining operational matters related to assistance".

Lines 80 to 87 of the original POLFAC message should be completed in accordance with general instructions given while specific questions reflecting the requirements of the Regional Plan should be entered in lines 88 to 98 of the standard POLFAC message.

Description of the complete POLFAC message, which should be used as the standard format for requesting assistance within the framework of the present Regional Plan is given below:

It might be recalled that the request for assistance can be transmitted either separately or together with the other parts (POLWARN, POLINF) of the PLOREP message.

When answering a request for assistance, the Parties do not have to adhere to the POLREP format, although it would be desirable that the figures using POLFAC message are also used in response message, for easier reference.

Requesting Assistance - Taken from the standard POLREP format Part III (POLFAC)

	CONTENTS	REMARKS
80	DATE AND TIME	No. 80 is related to the situation described below
81	REQUEST FOR ASSISTANCE	Type and amount of assistance required in the form of: - 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 delivered assistance.
83	PRE-ARRANGEMENTS FOR THE DELIVERY OF ASSISTANCE	Information concerning customs clearance, access to territorial waters, etc. in the requesting country.

	CONTENTS	REMARKS
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 ORGANIZATIONS	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 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 country taking over the command.
88-98		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.

POLREP POLLUTION REPORTING SYSTEM

Summarized list of POLREP

	Address	From
	Date Time Group	to
	Identification	
	Serial number	
	1	Date and time
PART I (POLWARN)	2	Position
	3	Incident
	4	Out flow
	5	Acknowledge
	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
PART II (POLINF)	46	Sea state and visibility
	47	Drift of pollution
	48	Forecast
	49	Identity of observer and ships on scene
	50	Action taken
	51	Photographs or samples
	52	Names of other States informed
	53-59	Spare
	60	Acknowledge
	80	Date and time
	81	Request for assistance
	82	Cost
PART 111 (POLFAC)	83	Pre-arrangements for the delivery
	84	Assistance to where and how
	85	Other States requested
	86	Change of command
	87	Exchange of information
	88-98	Spare
	99	Acknowledge

Table 1

CONTENTS	REMARKS
DTG (Day Time Group)	Day and time for drafting of the telex (DTG). Always 6 figures. Can be followed by month indication. The DTG can be used as a reference.
POLREP Regional Oil and Chemical Spill Contingency Plan for South Asia	This is the identification report. "POL…" indicates that this is a report on a pollution incident "…REP". indicates that the report might deal with all aspects of pollution (such as oil as well as other harmful substances). It can contain up to 3 main parts: Part I (POLWARN) Is an initial notice (a first information or a warning) of a casualty or the presence of oil slicks or harmful substances. This part of the report is numbered from 1 to 5. Part II (POLINF) Is a detailed supplementary report to part I. This part of the report is numbered from 40 to 60. 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. See **Annex 6** ROCSCPSA It may be helpful to have a word to identify the particular plan referred to. Parts I, II and III can be transmitted all together in one report or separately. Furthermore, single figures from each part can be transmitted separately or combined with figures from the two other parts. Figures without additional text shall not appear in the POLREP. When part I is used as a warning of a serious threat, the telex should be headed with the traffic priority word "URGENT". ALL POLREPS containing ACKNOWLEDGE figures (5, 60 or 99) should be acknowledged as soon as possible by the competent national authority. POLREPS 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.

CONTENTS	REMARKS
B 1/1	Each single report should be possible to identify 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 (B, IN, P, M, SL) followed by a stroke system, where the figure before the stroke indicates the incident to which the report refers and the figure following the stroke indicates the actual number of reports which have been originated on the incident in question. POLREP SACEP B 1/1 this indicates the first report from Bangladesh of the incident in question in the South Asia region. POLREP SACEP B 1/2 will, in accordance with the described system, then indicate the second report from the same incident. If the pollution caused by the incident splits up into clearly defined patches - in this example two - the wording POLREP SACEP 1 now splitting into POLREP SACEP 2 and POLREP SACEP 3 should be included in the last report on the incident which is identified by figure 1 preceeding the stroke i.e. SACEP 1/... The first reports on the two patches originating from the incident first reported will then be numbered POLREP SACEP B2/1 and POLREP SACEP B3/1 and consecutive numbers after the stroke could then be used.

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 6 figures. Time should be stated as [GMT/UTC ?] for example 091900[z] (i.e. the 9th 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 TANKER GROUNDING, TANKER COLLISION, OIL SLICK, etc.
4	OUTFLOW	The nature of the pollution, such as CRUDE OIL, CHLORINE, DINITROL, PHENOL, etc., as well as the total quantity in tonnes of the outflow and/or the flow rate, as well as the risk of further outflow. If there is no pollution but a pollution threat, the words NOT YET followed by the substance, for example NOT YET FUEL OIL, should be stated.

CONTENTS		REMARKS
5	ACKNOWLEDGE	When this figure is used the telex should be acknowledged 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 figures 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 known to the receiver if other than indicated in figure 2. Estimated amount of pollution (e.g. size of polluted areas, number of tonnes of oil spilled if other than indicated in figure 4, or number of containers, drums, etc. lost). Indicates length and width of slick given in nautical miles if not indicated in figure 2.
42	CHARACTERISTICS OF POLLUTION	Gives type of pollution, e.g. type of oil with 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, discolouration 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 and speed in degrees and m/sec. The direction always indicates from where the wind is blowing.
45	CURRENT DIRECTION AND SPEED AND/OR TIDE	Indicates current direction and speed in degrees and knots and tenths of knots. The direction always indicates the direction in which the current is flowing.
46	SEA STATE AND VIABILITY	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 knots and tenths of knots. In case of air pollution (gas cloud) drift speed is indicated in m/s.

48	FORECAST OF LIKELY EFFECT OF POLLUTION AND ZONE AFFECTED	e.g. arrival on beach with estimated timing. Results of mathematical models.
49	IDENTITY OF OBSERVER/REPORTER IDENTITY OF SHIPS ON SCENE	Indicates who has reported the incident. If a ship, name, home port, flag and call sign must be given. Ships on scene can also be indicated under this item by name, home port, flat and call sign, especially if the polluter cannot be identified and the spill is considered to be of recent origin.
50	ACTION PLAN	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 ORGANIZATIONS 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 personnel, etc.
60	ACKNOWLEDGE	When this figure is used the telex should be acknowledged as soon as possible by the competent national authority.

PART III (POLFAC)
(See Annex 6 – Standard Format for Requesting Assistance)

TABLE 2
POLREP
Example No. 1
Full report (parts I, II &III)

Address		From:	DK
		To:	FRG and NL
Date Time Group		181100z june	
Identification		POLREP BONN AGREEMENT	
Serial number		DK1/2 (DK 1/1 for FRG)	
1	Date and Time	1	181000Z
2	Position	2	55° 30`N-07°00`E
3	Incident	3	Tanker collision
4	Outflow	4	Crude oil, estimated 3,000 tonnes
41	Position and/or extent of pollution	41	The oil is forming a slick 0.5 nautical

	on/above/in the sea		miles to the south-east. Width up to 0.3 nautical miles.
42	Characteristics of pollution	42	Venezuela crude. Viscosity 3,780 Cs at 37.8°C. Rather viscous.
43	Source and cause of pollution	43	Danish tanker ESSO BALTICA of Copenhagen, 22,000 GRT, call sign xxx in collision with Norwegian bulk carrier AGNEDAL of Stavanger, 30,000 GRT, call sign yyy. Two tanks damaged in ESSO BALTICA. No damage in AGNEDAL.
44	Wind direction and speed	44	270-10 m/s.
45	Current direction and speed and/or tide	45	180-0.3 knots.
46	Sea state and visibility	46	Wave height 2m. 10 nautical miles.
47	Drift of pollution	47	135-0.4 knots.
48	Forecast of likely effect of pollution and zones affected	48	Could reach the island of Sylt, FRG or further south, NL on 23rd of this month.
49	Identify of observer /reporter. Identity of ships on scene	49	AGNEDAL, figure 43 refers.
50	Action taken	50	2 Danish strike teams high mechanical capacity on route to the area.
51	Photographs or samples	51	Oil samples have been taken. Telex 64 471 SOK DK.
52	Names of other States and organizations informed	52	FRG
53	Spare	53	DENGER PLAN is activated.
81	Request for assistance	81	FRG is requested for 2 strike terms with high mechanical pick-up capacity.
82	Cost	82	FRG is requested for an approximate cost rate per day of assistance rendered.
83	Pre-arrangements for the delivery of assistance	83	FRG units will be allowed to enter Danish territorial waters for combating purposes or Danish harbours for logistics informing SOSC beforehand.
84	To where assistance should be rendered and how	84	Rendezvous 57°30`N-07°00`E Report on VHF channels 16 and 67. SOSC, Lieutenant Commander Hansen in GUNNAR SEIDENFADEN, call sign OWAJ.
99	ACKNOWLEDGE	99	ACKNOWLEDGE

Annexure 9

(To Regional Oil And Chemical Pollution Contingency Plan For South Asia)

IMO Resolution A.983(24)
Adopted on 1 December 2005

GUIDELINES FOR FACILITATION OF RESPONSE TO A POLLUTION INCIDENT[1]

[1] For the purposes of this resolution, "pollution incident" is an incident where the pollution is caused by either oil or hazardous and noxious substances.

THE ASSEMBLY,

RECALLING Article 15(j) of the Convention on the International Maritime Organization concerning the functions of the Assembly in relation to guidelines concerning the prevention and control of marine pollution from ships,

RECALLING ALSO resolution A.625(15) concerning the arrangements for the entry and clearance of marine pollution response resources during emergency situations,

RECALLING FURTHER resolution A.869(20) concerning the facilitation of response to an oil pollution incident,

BEING AWARE that:

(a) the International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC Convention), 1990, in particular Article 7; and
(b) the Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances (OPRC-HNS Protocol), 2000, in particular Article 5,

stipulate, *inter alia*, that each Party to the OPRC Convention and each Party to the OPRC-HNS Protocol shall take the necessary legal or administrative measures to facilitate: the arrival and utilization in and departure from its territory of ships, aircraft and other modes of transport engaged in responding to a pollution incident or transporting personnel, cargoes, materials and equipment required to deal with such an incident; and the expeditious movement into, through, and out of its territory of such personnel, cargoes, materials and equipment,

BEING AWARE ALSO that the Annex to the OPRC Convention and the Annex to the OPRC-HNS Protocol make provision for the reimbursement of costs of assistance,

RECOGNIZING that experience in responding to a major pollution incident requiring resources outside a country has clearly demonstrated the critical importance of administrative procedures to facilitate rapid provision of assistance and deployment of human resources and equipment,

HAVING CONSIDERED the decisions and recommendations made by the Marine Environment Protection Committee at its fifty-second session:

1. ADOPTS the Guidelines for Facilitation of Response to a Pollution Incident set out in the annex to the present resolution;
2. URGES Parties to the OPRC Convention and Parties to the OPRC-HNS Protocol to implement the Guidelines;
3. URGES ALSO all Member Governments to implement the Guidelines;
4. REQUESTS the Marine Environment Protection Committee to keep the Guidelines under review taking into account experience gained in their use;
5. REVOKES resolution A.869(20).

ANNEX

GUIDELINES FOR FACILITATION OF RESPONSE TO A POLLUTION INCIDENT[2]

1 If a State needs assistance in the event of either an oil pollution incident or a pollution incident by hazardous and noxious substances ("pollution incident"), it may ask for assistance from other States, indicating the scope and type of assistance required. A State to which a request for assistance is directed should promptly decide and inform the requesting State whether it is in a position to render the assistance required and indicate the scope and terms of the assistance that might be rendered.

2 The States concerned should co-operate to facilitate the prompt provision of assistance agreed to under paragraph 1 of these Guidelines, including, where appropriate, action to minimize the human health, safety and environmental consequences of a pollution incident, and to provide general assistance. Where States do not have bilateral or multilateral agreements which cover their arrangements for providing mutual assistance, the assistance should be rendered in accordance with the following provisions, unless the States agree otherwise.

3 The requesting State is responsible for overall supervision, control and co-ordination of the response to the pollution incident and of the assistance supplied. Personnel sent by the assisting State are normally in charge of the immediate operational supervision of its personnel and equipment. The personnel involved in the assisting operation should act in accordance with the relevant laws of the requesting State, which should endeavour to inform the assisting State of the relevant laws. The appropriate authorities of the requesting State shall co-operate with the authority designated by the assisting State.

4 The requesting State should, to the extent of its capabilities, provide local facilities and services for the proper and effective administration of the assistance, including decontamination activities, and should ensure the protection and return of personnel, equipment and materials brought into its territory by, or on behalf of, the assisting State for such a purpose.

5 The requesting State should use its best efforts to afford the assisting State and persons acting on its behalf the privileges, immunities or facilities necessary for the expeditious performance of their assistance function. The requesting State should not be required to apply this provision to its own nationals or permanent residents or to afford them the privileges and immunities referred to above.

6 A State should, at the request of the requesting or assisting State, endeavour to facilitate the transit through its territory of duly notified personnel, equipment and property involved in the assistance, to and from the requesting State.

7 The requesting State should facilitate the entry into, stay in and departure from its national territory of duly notified personnel and of equipment and property involved in the assistance.

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[2] For the purpose of these Guidelines, "pollution incident" is an incident where the pollution is caused by either oil or hazardous and noxious substances.

8 With regard to actions resulting directly from the assistance provided, the requesting State should reimburse the assisting State for any loss of or damage to equipment or other property belonging to the assisting State. The requesting State should also reimburse the assisting State for expenses involved in such assistance, arising from the death of or injury to persons or the loss of or damage to property, incurred by personnel acting on behalf of the assisting State. This would not prevent the requesting State from seeking reimbursement as part of its claim under the appropriate compensation convention.

9 The States concerned should co-operate closely in order to facilitate the settlement of legal proceedings and claims which could result from assistance operations.

10 The affected or requesting State may at any time, after appropriate consultations and by notification, request the termination of assistance received or provided under the Guidelines. Once such a request has been made, the States concerned should consult one another with a view to making arrangements for the proper termination of the assistance.

11 As the assistance should not be delayed for administrative or other reasons, the necessary legislation should be adopted during the preparedness phase, i.e. before the incident which would require assistance. This is particularly relevant to paragraphs 4 to 8 above.

12 Similar facilitation should be implemented by States concerned when personnel or equipment are provided on behalf of a shipowner, a cargo owner or other relevant entities.

13 In some pollution incidents, a shipowner, cargo owner or other private entity may be best placed to call upon dedicated equipment, materials and trained operators to assist with the clean-up response. In order to benefit from the availability of such resources and to ensure their rapid deployment, the State requesting or being offered assistance should facilitate the entry, clearance and subsequent return of the persons, materials and equipment provided. Public authorities should, in so far as it is possible, waive customs and excise duties and other taxes on any equipment and materials provided on a temporary basis for the purpose of assisting in the response to a pollution incident.

* * *

Annexure 10

(To Regional Oil And Chemical Pollution Contingency Plan For South Asia)

References

Organization	Home page	Resources
Bonn Agreement Regional cooperation in the Greater North Sea and its Wider Approaches	www.bonnagreement.org	Counter Pollution Manual and Aerial Operation Manual www.bonnagreement.org/manuals
Cedre Centre of Documentation, Research and Experimentation on Accidental Water Pollution	http://wwz.cedre.fr/en	Chemical Response Guides http://wwz.cedre.fr/en/Our-resources/Documentation/Chemical-response-guides Operational Guides to Oil Spill Response http://wwz.cedre.fr/en/Our-resources/Documentation/Operational-guides
Environment Canada	www.ec.gc.ca	Environmental Emergencies Information Resources www.ec.gc.ca/ee-ue/default.asp?lang=En&n=6C9C412C-1
HELCOM Baltic Marine Environment Protection Commission - Helsinki Commission	www.helcom.fi	Response to Spills publications www.helcom.fi/action-areas/response-to-spills
IMO	www.imo.org	Pollution Preparedness and Response Information Resources www.imo.org/en/OurWork/Environment/PollutionResponse/Pages/information-resources.aspx
IOPC Funds	www.iopcfunds.org	Publications including Claims Information Pack www.iopcfunds.org/publications
IPIECA/IOGP	www.ipieca.org www.iogp.org	Oil industry associations' oil spill Good Practice Guides www.oilspillresponseproject.org
ITOPF	www.itopf.com	Technical Information Papers www.itopf.com/knowledge-resources/documents-guides/technical-information-papers
NOAA US National Oceanic and Atmospheric Administration	www.noaa.gov	NOAA Office of Response and Restoration, Publications http://response.restoration.noaa.gov/publications CAMEO® (Computer-Aided Management of Emergency Operations) software suite http://response.restoration.noaa.gov/oil-and-chemical-spills/chemical-spills/response-tools/cameo-software-suite.html ADIOS (Automated Data Inquiry for Oil Spills) oil weathering model http://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/response-tools/adios.html
NOWPAP MERRAC Northwest Pacific Action Plan Marine Environmental Emergency Preparedness and Response Regional Activity Centre	http://merrac.nowpap.org	Technical reports http://merrac.nowpap.org/publication/connector/2/data/tech/basic/Glist/1/
OSRL Oil Spill Response Limited	www.oilspillresponse.com	Field Guides www.oilspillresponse.com/technical-library/?tag=Field%20Guides
REMPEC Regional Marine Pollution	www.rempec.org	Manuals and Guidelines www.rempec.org/rempec.asp?theIDS=1_131&theName=INFO

Emergency Response Centre for the Mediterranean Sea		RMATION%20RESOURCES&theID=13&daChk=4&pgType=2

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REGIONAL OIL SPILL PREPAREDNESS AND RESPONSE IN SOUTH ASIAN SEAS REGION
(FINAL MEETING)

Pulakesh Mondal, Senior Programme Officer (Regional)
South Asia Cooperative Environment Programme (SACEP)

Regional Exercise and workshop on "Oil Spill Preparedness and Response"
Venue: Mookai Hotel, Male' Maldives, Date: 22-25 August, 2016

PRESENTATION OUTLINE

- Summary of the Project activities to date
- Updates since the last Regional Exercise and Workshop
- National inputs to Regional plan
- Outcome of SACEP Governing Council meeting in relation to the project

OBJECTIVES OF THE PROJECT

The long-term objective:

Effective implementation of the OPRC Convention and the OPRC-HNS Protocol.

Short-term Objective:

To enhance regional cooperation on marine pollution preparedness and response in the SACEP region through an early and effective implementation of the MoU on regional cooperation in case of emergency.

Objectives of the Final workshop

- Expected to finalize and consolidate the updates to the Regional Contingency Plan;
- To identify the need for future training activities and develop a three-year programme of trainings and exercises to enhance regional capacity building in spill preparedness and response; and
- To raise awareness of the unique considerations and challenges associated with preparing for, and responding to, an HNS spill.

Shipping route

Oil and Chemical Spill Records in SAS Region

Country	Vessel Name	Year	Quantity spilled	
			Amount	Type
Bangladesh	Southern Star VII	2014	350,000 Litters	Furnace oil
India	MSC Chitra	2010	2500 MT	Heavy oil and diesel
Sri Lanka	M/T Granba	2009	6250 MT	Sulfuric acid
Sri Lanka	Marina Sedna	2007	176 MT	Fuel oil
Pakistan	Tasman sprit	2003	30,000 Tonnes	Crude oil
Sri Lanka	M V Meliksha -	1999	16500 MT	Fertilizer and heavy fuel
India	Aviles	1979	11,000 Tonnes	White Product
India	Cretan star	1976	29000 Tonnes	Crude oil

Background of Regional Plan

- In 1989 a draft South Asian Marine Pollution Emergency Action Plan was prepared by the IMO/UNEP/UNDP.
- In 1995 SACEP identified "Development and Implementation of National and Regional Oil and Chemical Spill Contingency Planning" under South Asian Seas Action Plan.
- The first Inter-Ministerial Meeting Held in Pakistan in 1999
- In July 1999 SACEP secured funding support from UNEP, NORAD
- In November 1999 IMO consultant undertook a mission to the region
- In 14-16 December 1999, a Meeting of Senior Officials was held in Colombo, Sri Lanka (adopt the draft plan and MoU).
- In December 2000, a High Level meeting was convened
- In 2008, 4th Intergovernmental meeting of Ministers (IMM) held in Jaipur, India

1ST MEETING OF COMPETENT NATIONAL AUTHORITIES

Venue : Colombo, Sri Lanka
Date: 26- 28 February, 2014

- Enhance regional cooperation mechanisms on marine pollution preparedness and response in the SACEP region
- The meeting brought together national experts from the key relevant competent national authorities
- To consider activities in preparation for the entry into force of the MOU.
- Detailed work plan / road map for the project;
- National Project Counterparts and project coordination arrangements;

Designated National Authority for the preparing of Oil spill Plan

Country	Contact Ministry
	Ministry of Environment and Forest
	Ministry of Earth Science
	Ministry of Transport and Communication
	Ministry of Climate Change
	Ministry of Mahaweli Development and Environment

Designated Focal Point

Country	Designated Focal Point
	Director, Department of Environment, Chittagong Division Government of Bangladesh
	Director, Integrated Coastal area Management, NIOT, Chennai. Government of India.
	Director General, Transport Authority Government of Maldives
	DG, Pakistan Maritime Security Agency (MPSA) Government of Pakistan.
	Chairman, Marine Environment Protection Authority (MEPA), Government of Sri Lanka.

NATIONAL WORKSHOPS

Country	Date of National meeting
	16-17 December,2014, Colombo, Sri Lanka
	12-13 January,2015, Karachi, Pakistan
	2-3 February, 2015, Chennai, India
	8-9 June, 2015, Male' Maldives
	5-6 August, 2015, Dhaka, Bangladesh

2nd REGIONAL WORKSHOP AND EXERCISE

Venue : Colombo, Sri Lanka
Date: 2- 6 November, 2015

- To examine the mechanisms for effective communication during an oil and chemical spill incident.
- Facilitate the decision making process and enhance the effectiveness of the response.
- To review the existing 'Regional Oil and Chemical Pollution Contingency Plan.

- To identify the areas of the regional plan that would need strengthening and further revision based on experiences from the five national workshops.
- Regional exercise and the latest technological advances in incident preparedness and response.

UPDATE STATUS OF THE SIGNING OF THE MOU

Country	Date of signing of MoU
	13 October 2009
	22 July 2010
	27 September 2010
	17 December, 2014

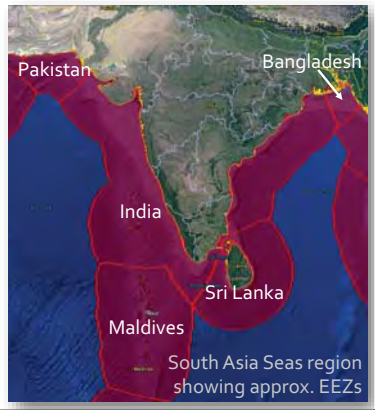
Updates since the last Regional Exercise and Workshop

- Hosting and maintaining the Regional Contingency Plan and National Contingency Plans on the SACEP Website.
- Coordinating the update of contact points for the implementation of Regional Contingency Plan i.e. Annex 1 of the Regional Contingency Plan, by routinely initiating and coordinating the update process.
- Undertake the coordination and provision of secretarial services for the regular meetings of National Operational Authorities proposed in the regional plan.
- Provision of a dedicated Technical Officer responsible for promoting spill preparedness and response capacity in the SACEP region
- Co-ordination of spill preparedness and response capacity building activities such as training and exercises in the SACEP region.

Thank you very much

TRAINING AND WORKSHOP TO UPDATE THE REGIONAL CONTINGENCY PLAN & ANNEXES

Held in Malé, Maldives
22-25 August 2016



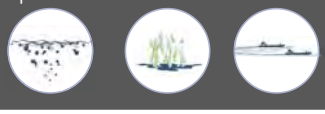
CURRENT STATUS OF PREPAREDNESS

- Elements of preparedness
  1. Legislation and regulation
  2. Contingency planning
  3. Response equipment and supporting resources
  4. Training
  5. Exercises
- How to assess adequacy of preparedness?

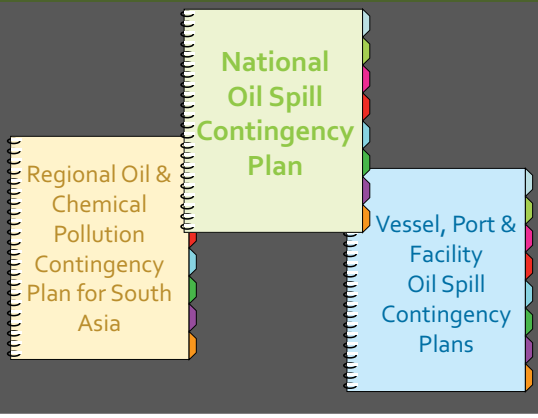
ELEMENT 1 LEGISLATION AND REGULATION

	Bangladesh	India	Maldives	Pakistan	Sri Lanka
OPRC	✓	✓	×	✓	×
OPRC-HNS	×	×	×	×	×
CLC	×	✓	✓	✓	✓
Fund	×	✓	✓	×	✓
Bunkers	×	×	×	×	×

- Regulation of oil spill methods
  - Dispersant product approval and use authorization
  - In-situ (controlled burning) approval and procedures
  - Decanting separated water offshore
  - Waste handling



ELEMENT 2 CONTINGENCY PLANNING



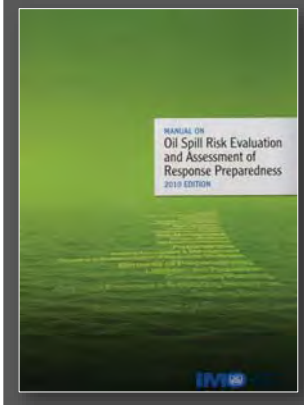
ELEMENT 3 EQUIPMENT AND SUPPORT

- Commensurate with the risk
- Tiered preparedness framework
- Stockpile(s) content, size and location
- Logistics (transport, storage, deployment platforms)

ELEMENTS 4 & 5 TRAINING AND EXERCISES

- Training
  - IMO OPRC Model Courses
- Exercises
  - Notification drills through to full-scale exercises
- To be discussed in detail on Day 3 & 4

ASSESSING PREPAREDNESS: IMO MANUAL



- Annex 1: "Illustrative questions which could be used to support assessment of preparedness"
- Over 50 questions relating to the elements of preparedness

ASSESSING PREPAREDNESS: ARPEL "RETOS" TOOL

- Detailed guidance aimed at both governments and industry
- Self assessment tool
- Users chooses the scope from 7 options – includes national planning
- Series of questions across 10 preparedness categories
- Provides 'Toolbox' of references to encourage improvement
- Allows increasing detail of assessment through three levels
  (A. minimum / B. more rigorous / C. excellence)

ASSESSING PREPAREDNESS: ARPEL "RETOS" TOOL

WORKSHOP OBJECTIVES

1. Reach agreement on the updated Regional Contingency Plan as discussed during the regional workshop held in Colombo, Sri Lanka, in November 2015
2. Develop and adopt a 3-year programme of trainings and exercises to enhance regional capacity building in oil and HNS spill preparedness and response, which can be used by national competent authorities and the SACEP region to gain funding/support from their own governments and external donors
3. Provide training on HNS preparedness and response

WORKSHOP PROGRAMME

DAY 1: Introductions, context, national updates and HNS training

DAY 2: HNS training

DAY 3: Finalization of the Regional Contingency Plan and development of training/exercise programme

DAY 4: Development of training/exercise programme and table-top exercise

ROUNDTABLE INTRODUCTIONS

Bangladesh Context for updating the Regional Oil and Chemical Spill Contingency Plan and it's Annexes in SAS Region

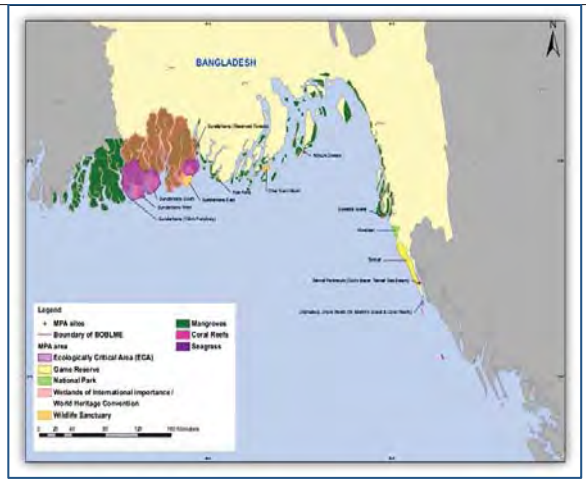
Date: 22nd August, 2016
Venue: Male, Maldives.

Delegates from Bangladesh

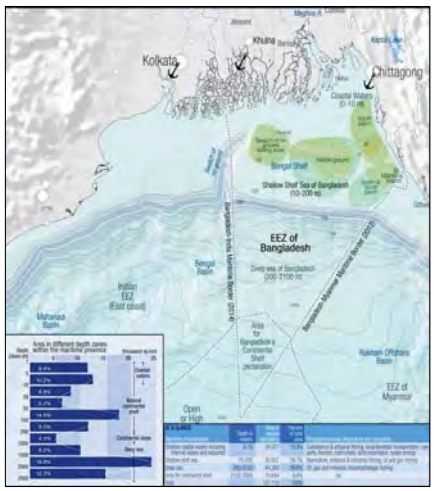
Mohammad Mokbul Hossain
Director (Joint Secretary), DoE and Counterpart; NOSCOP-BD.

Roksana Tarannum
Deputy Secretary
Ministry of Environment and Forests.

Mirza Saifur Rahman
Engineer and Ship Surveyor
Department of Shipping



Marine Protected Area (MPA), Ecologically Critical Areas (ECA's) & Sensitive Area of Bay of Bangle, Bangladesh.



Marine Boundary of Bangladesh

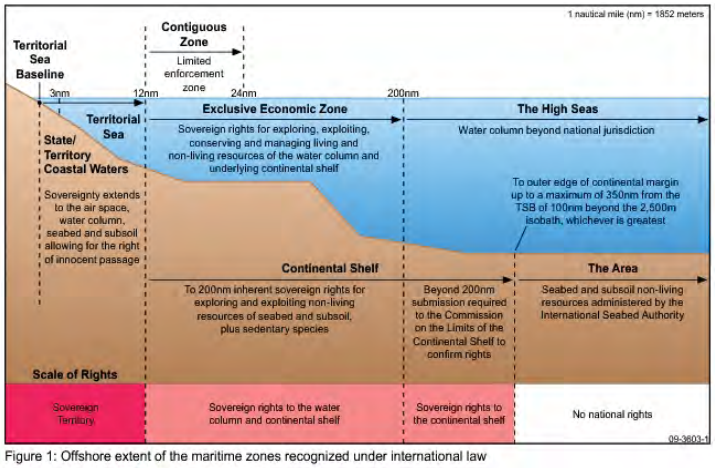


Figure 1: Offshore extent of the maritime zones recognized under international law

SIGNING MEMORANDUM OF UNDERSTANDING

SACEP Secretariat will circulate the final **Regional Oil and Chemical Pollution Contingency Plan for South Asia.**

The government of Bangladesh signed the Memorandum of Understanding (MoU) with SACEP on 27th September, 2010. Former Minister of MoEF Dr. Hasan Mahmud signed on behalf of the Bangladesh Government.

Agreed issues as per MoU

1. To cooperate in responding to major marine pollution incidents in EEZ, territorial seas and Internal water.
2. To adopt the "Regional Oil and Chemical Pollution Contingency Plan for South Asia".
3. To take individually and jointly necessary response measures according to the Regional Plan.
4. To establish a national system for responding to marine pollution incidents.

Agreed issues as per MoU (Cont..)

5. To prepare a National Contingency Plan.
6. To use the best endeavors to maintain the ability to respond marine pollution of South Asian Sea Areas.
7. To prepare risk assessment.
8. Communication, Training, Exercises

Recent Oil Spillage in Bangladesh

Feature		
Location	Shela River, Sundarban, Khulna.	Bengura, Boalkhali, Chittagong
Coordinates	22°21′50.57″N 89°40′1.34″E	22°20.729″N 091°56.985″E
Date	9 December 2014	19 June 2015
Cause	Collision between oil tanker and cargo vessel	Rail bridge collapsed.
Oil Carrier	MS Harun & Co.	Bangladesh Railway.
Volume	350,000 litres (77,000 imp gal; 92,000 US gal)	Around 90000 liters
Area	350 km^2 (140 sq mi)	Spread across 20 km^2 of the Canal and Karnaphuli River

NOSCOP Initiative: Progress of BD.

NATIONAL WORKSHOP ON NOSCOP PREPARATION:

The Director General (DG), Department of Environment (DoE) requested all capable stakeholder and organizations to provide the list of resources. He also requested 26 organization/ministry to nominate a capable resource person who will take apart in the time emergency oil spillage.

DoE completed a survey to enlist equipments and resources present in different organization.

First National Workshop on National Oil Spillage Contingency Plan (NOSCOP) Bangladesh initiatives was held on 5-6 August, 2015 at Dhaka, Bangladesh. The objectives of this workshop was to identify the stakeholders and capable organizations and resource persons

NOSCOP Initiative: Progress of BD. (Cont..)

RECOMMENDATION ON WORKSHOP:

Followings are the recommendation accepted after the National Workshop-

a) DoE should take the lead role to prepare the NOSCOP-BD in the light of discussion with others.
b) There should be a core group representing different organizations to prepare a draft NOSCOP.
c) Accommodation/Inclusion of domestic legislation should also be considered.
d) reparation of risk mapping along the sites of the Bay of Bengal Coast.

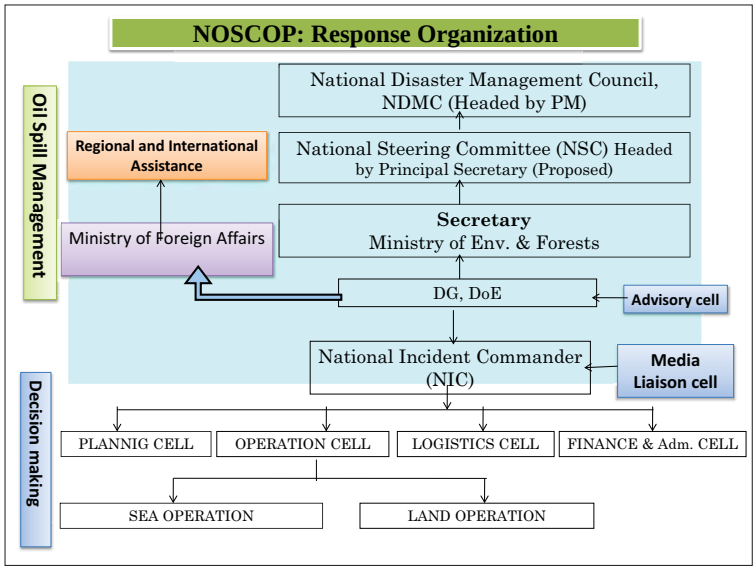
NOSCOP Initiative: Progress of BD. (Cont..)

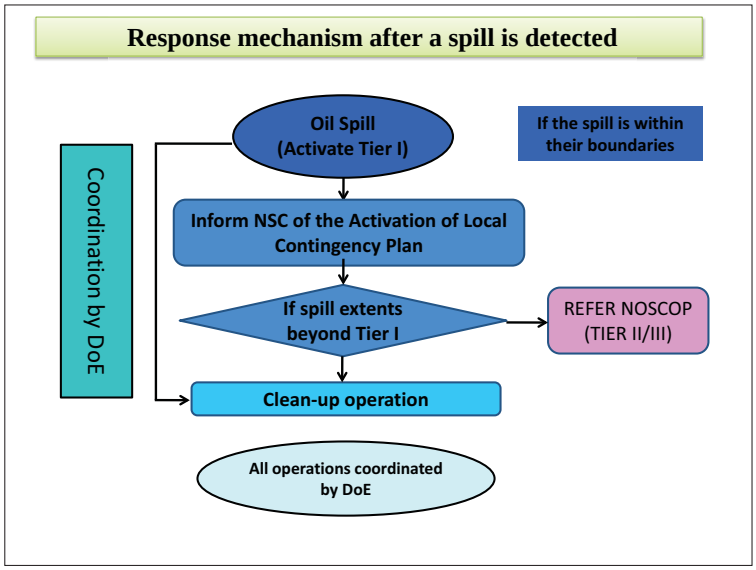
PREPARING ZERO DRAFT OF NOSCOP-BD:

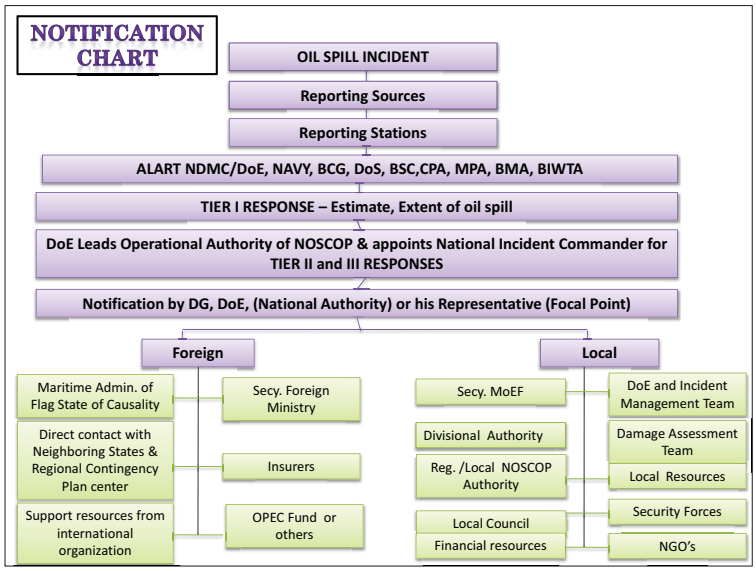
According to the agreement with SACEP, the National Consultant **Dr. Md. M. Maruf Hossain** submitted a draft copy of NOSCOP-Bangladesh part on 8th February, 2016.

National competent authority of NOSCOP-BD, Director General (DG) of DoE formed a core committee to finalize it. It is now in the stage of approval by the government.

Response organization, response mechanism and notification chart in the time of emergency oil spillage in Bangladesh according to NOSCOP is proposed following ways.







A Brief on NOSCOP-BD.

The NOSCOP is sponsored by DoE, BCG, BN, SACEP, NORAD and IMO. It comes as a developmental progress of the SAS regional contingency plan overseen by SACEP.

The custodian of the plan is DoE, Bangladesh who is the ***central agency*** and a ***command and communication hub*** issuing instruction and requests in the case of emergencies.

The plan mentions the geography of the coastal region with the economic and environmental areas of the Bay of Bengal. It identifies relevant organizations and how SASEP and SAS region are integral to the plan implementation process.

The legal framework under which the BD Govt. is invested with responsibility of the plan and all policy action specifics are laid out.

A Brief on NOSCOP-BD. (Cont..)

The plan has two approaches like Strategic and Operational.

In the strategic level, it defines a hierarchy which brings all ***facilitator agencies*** and ***resource providing agencies***.

In the Operational level, it lays out organizations of on site teams which are ***directly involved in pollution mitigation***.

The plan contains the transactional details and its process. It also includes record keeping and its integrity to process policy action in the court of law for ***claiming compensation, insurance and distribution of funds*** across the agencies.

The plan ends its description by referring to series of appendices- all important Contact Address, Reporting format, Maps, List of Resources and Equipments, related Law and regulation, Mitigation method, support organizations etc.

NOSCOP Initiative: Progress of BD. (Cont..)

PARTICIPATION ON THE REGIONAL TRAINING & EXERCISE:

The Regional Training and Exercise for Oil Spill Preparedness and Response under **"Enhancing Regional Cooperation Mechanisms on Marine Pollution Preparedness and Response in the SACEP Region"** was held on 02-06 November, 2015 at Colombo, Sri Lanka.

The Counterpart of NOSCOP-BD, **Mohammad Mokbul Hossain,** National Consultant **Dr. Md. M. Maruf Hossain** and other three officials were participated.

In Regional workshop, Sri Lanka Bangladesh proposed followings recommendation to consider:

a) IMO/ORSL/ITOPE should provide support for training and practical workshop.
b) SACEP should play more proactive role.
c) SACEP should host the RCP and NCP's on their website.

NOSCOP Initiative: Progress of BD. (Cont..)

SUBMITTING ANNEXURE I, II AND III:

In the time of Regional workshop on November, 2015 Sri Lanka, SACEP provided Annexure i, ii and iii to prepare for all member countries. Bangladesh submitted the draft annexure to SACEP which is now under process of approval by Bangladesh Government.

Proposed Annexure i, ii and iii	
Title	**Authority**
Competent Nat. Govt. Authority	DG, Department of Environment
Competent National Operational Authority	Operations Director, Bangladesh Coast Guard, DG of BCG, DG of DoS and Deputy Conservator of Port Authority.
National Contact Point	Director, DoE, Chittagong
National On-Scene Commander	Zonal Commander, East Zone, Bangladesh Coast Guard.

Preparedness and Response Authority of Bangladesh

Preparedness and Response Authority in Annexure I, ii and iii	
Govt. Level preparedness Authority	Principal Secretary to PM, Secretary, concern Ministry & Representative of concern Departments (National Committee)
Govt. Level Response Authority	Operations Director, Bangladesh Navy
Central Preparedness Authority	DG, Department o Environment
Central Response Authority	Operation Director, BD Coast Guard
District Preparedness Authority	Deputy Commissioner
District Response Authority	Zonal Commander, BD Coast Guard

NOSCOP Initiative: Progress of BD. (Cont..)

HELP FROM USAID:

USAID, an American organization helping Bangladesh to prepare a good contingency plan .

USAID met two times with Department of Environment (DoE) in order to finalize the National Plan.

USAID wants to help Bangladesh in technical parts like to provide necessary equipments, train up national and local authority how to work in the time of emergency oil spillage.

Conclusion

With the help of NORAD-IMO, Bangladesh prepared a draft of Oil Spillage Contingency Plan which is now on the process of Govt. approval.

USAID propose to help Bangladesh with providing logistics and training in NOSCOP initiative.

Hopefully Bangladesh can finalize the NOSCOP-BD in 2017 and we can handle any oil spillage according to the Plan.

Thank you All

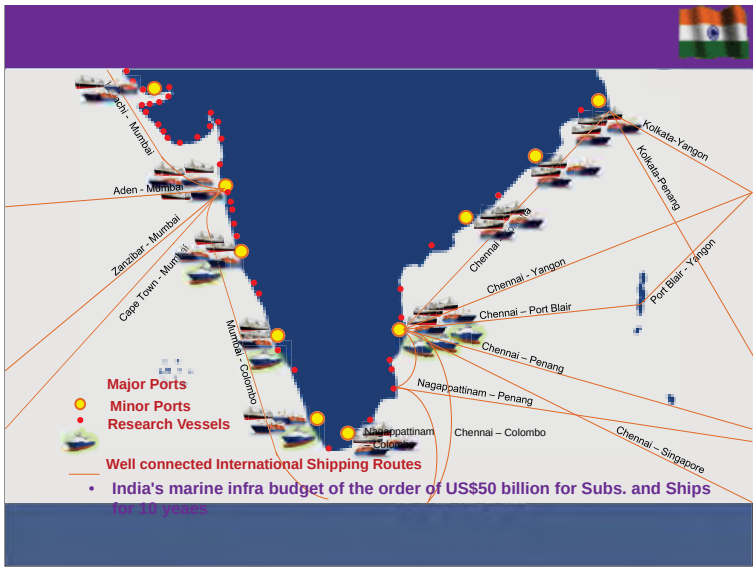
Regional Exercise & Workshop on Oil Spill Preparedness and Response
22-25 August 2015, Colombo, Male, Maldives

UPDATES ON ATIONAL OIL SPILL DISASTER CONTINGENCY PLAN

R S Kankara, Ph D
National Focal Point India

- Fast growing economy
- Enhanced Budget allotment for R&D
- Large pool of scientific and technical expertise
- Oceanographic research started in India about six decades
- Marine Industry

WE SEE MORE SEA
MORE COAST
MORE ISSUES



- India's marine infra budget of the order of US$50 billion for Subs. and Ships for 10 years

Background of Indian National Plan

Historical overivew

- The responsibility for co-ordination of marine oil spills at lies with Indian Coast Guard (ICG) since March 1987
- First draft National Oil Spill Disaster Contingency Plan (NOS-DCP) was circulated to all concerned agencies in April 1988
- Final draft was approved by the Committee of Secretaries on 04 Nov. 1993
- The NOS-DCP was published in July 1996

The NOS-DCP brings together the combined resources of:

- the various agencies of Government of India including the ICG
- the State Governments including emergency services; and
- the shipping, ports, and oil industries.

Updates of national plan

- First promulgated in July 1996
- Updated in 1998, 1999, 2000, 2002 and 2006
- Originally designed for responding to oil spills
- Revised NOS-DCP 2014 comprises nine Chapters and 41 Appendices

- Updated version NOS-DCP 2015 comprises nine Chapters (www.Indiancoastguard.gov.in)
- Completely revised to reflect current international norms and best practices, key relevant national regulations, and cumulative experience
- Revised version facilitates national preparedness to HNS incidents and also fulfils obligation to have in place national plan to respond to HNS incidents

National plan inventory & Contact directory

6

Scheme of Chapters

1. Introduction
2. Emergency Organization
3. Division of Responsibility
4. Preparedness Management
5. Discovery and Notification
6. Initial Response
7. Response to Oil Spills
8. Response to HNS Incidents
9. Plan Review

Objectives of NOS-DCP

To establish…

- Effective system for detection and reporting of spill
- Adequate measures for preparedness for pollution
- Rapid and effective response to oil pollution
- Procedures for disposal of recovered material in an environmentally sound manner
- Record-keeping procedures for recovery of costs

Designed Spill Size

NO CHANGE

10,000 tons

Regulatory Framework

- Merchant Shipping Act, 1958
- Rules under Merchant Shipping Act
- Other related national regulations
- The Environment (Protection) Act, 1986
- Rules under Environment Protection Act
- Other related statutes for management of HNS

Regulatory Framework

Statutes on Oil Spill & HNS management under EP Act, 1986

The Environment (Protection) Act, 1986 (amended 1991) and Rules thereunder
The Environment (Protection) Rules, 1986 (amended 2004)
The Manufacture, Storage & Import of HazChem Rules, 1989 (amended 1994, 2004)
The Hazardous Wastes (Management and Handling) Rules, 1989 (amended 2000, 2003)
Hazardous Materials (Management, Handling and Trans-boundary Movement) Rules 2008
The Environment Prior Clearance Notification, 2006
The Chemical Accidents (Emergency Planning, Preparedness and Response) Rules, 1996
Bio-medical Wastes (Management and Handling) Rules. 1989

Regulatory Framework

Other relevant statutes on management of HNS

The Factories Act, 1948 (amended 1987) • State Factory Rules
The Inflammable Substances Act, 1952
The Public Liability Insurance Rules, 1991 (as amended 1992 and 1993).
The Petroleum Act, 1934 • The Petroleum Rules, 2002
The Insecticide Rules, 1968 (amended 2000) • The Insecticide Rules, 1971 (amended 1999)
The National Environment Tribunal Act, 1995
The National Green Tribunal Act, 2000
The Explosives Act, 1884 (amended till 1983) • The Gas Cylinder Rules, 2004 • The Static and Mobile Pressure Vessels (Unfired) Rules, 1981 (amended 2002) • The Explosives Rules, 1983 (amended 2002)
National Disaster Management Guidelines for Chemical Disasters, 2007

HNS Response

- Monitoring
  - Gases in Air
  - Water Column
  - Surface Slicks
  - Sunken Spills
- Response Techniques
  - Gases and Evaporators
  - Floating Chemicals
  - Dissolved Chemicals
- HNS Inventory

Hierarchy of Contingency Plans

National Oil Spill Disaster Contingency Plan

Regional Oil Spill Disaster Contingency Plan

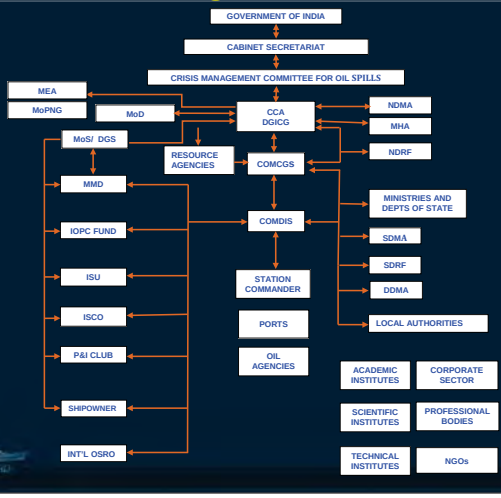
State Oil Spill Disaster Contingency Plan

District Oil Spill Disaster Contingency Plan

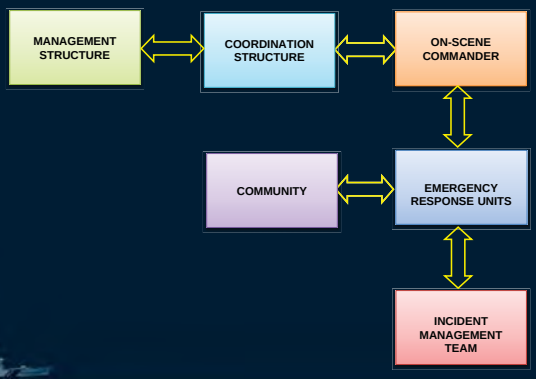
Facility Plan

EMERGENCY RESPONSE ORGANISATION

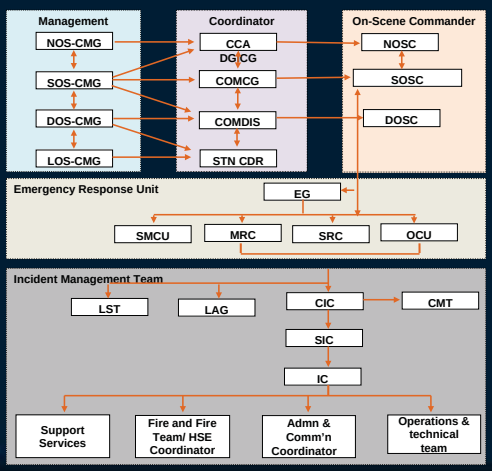
Organisation



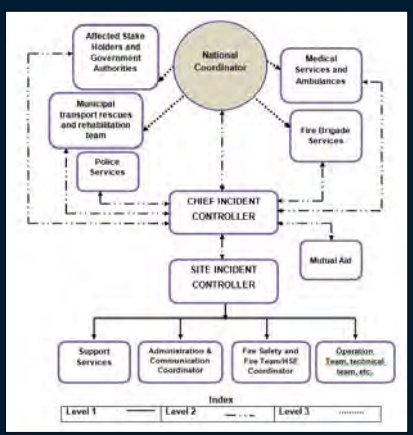
Block Diagram - National Structure



National Structure



Organogram



Functions of NOS-CMG

- Continuously monitor the post incident situation
- Evaluate response to major oil pollution incidents
- Arrange manpower, equipment, resources and financial assistance
- Review adequacy of national and other contingency plans
- Suggest measures to prevent recurrence of incidents
- Suggest measures to reduce risk of pollution from ports/ oil installations

Functions of SOS-CMG

- Review local and facility contingency plans
- Assist the State Government in planning, preparedness and mitigation of major pollution incidents
- Review/ facilitate work of District Crisis Management groups
- Nominate personnel to the Local Action Group (LAG) and Local Action Group Support Team (LST)
- Publish a list of experts and officials in the State who are concerned with the management of oil pollution incidents

Functions of DOS-CMG

- Review facility contingency plans of ports/ oil installations
- Assist in preparation of the district oil spill contingency plan
- Assist the district administration in management of oil pollution incidents
- Continuously monitor every pollution incident
- Ensure continuous information flow to SOS-CMG regarding incident situation and mitigation efforts
- Conduct at least one full scale mock-drill at a facility each year and report observed strengths and the weaknesses of the plan to SOS-CMG

Functions of LOS-CMG

- Prepare local oil spill contingency plan
- Train personnel involved in incident management
- Educate the population at risk of pollution about remedies and existing preparedness in the area
- Conduct at least one full scale mock-drill at a site every six months and forward a report to DOS-CMG
- Respond to all public inquiries on the subject

Periodicity of meeting - CMGs

CMG	Periodicity of meeting
NOS-CMG	As required basis
SOS-CMG	Once in six months
DOS-CMG	Every three Months
LOS-CMG	Every month

Mock drills and Exercises

- By every port facility and oil installation
  - at least once every three months
- Area or regional level exercises
  - will be conducted at least once every six months
- National level pollution response exercises
  - will be conducted at least once a year
  - will involve mobilization of stakeholder resources

Pollution Control Vessels

- **Dedicated response vessels**

Oil pollution response resources

OIL SPILL RESPONSE TRAINING

OIL SPILL RESPONSE DRILLS & EXERCISES

NATPOLREX

Competency Standards training

- **Level 1**
  - o all responders, and supervisors appointed as on-site managers
  - o certificate deemed to be valid for 5 years from date of issue
  - o periodic training to maintain currency of certification
- **Level 2**
  - o middle management personnel responsible for managing the operational response, e.g. CIC, SIC, IC, and environment and scientific coordinators, and Fire Brigade (Haz Mat) specialists

Discovery and Notification

- Duty to Report
- Occasions for Report
- Contents of Report
- Supplementary Report
- Reporting Procedures
- Follow-up on Reports

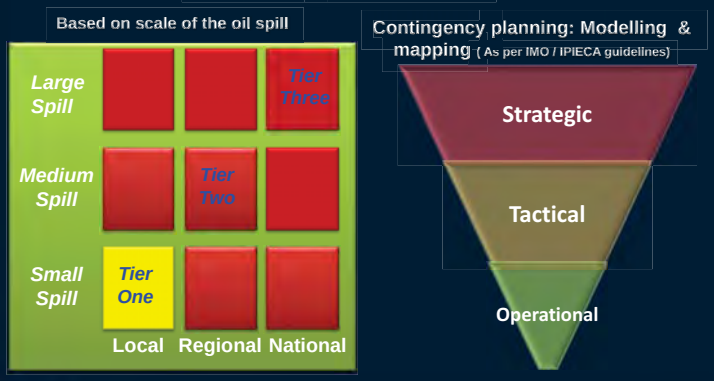
Initial Response

- Criteria for triggering regional or national response
- Initial actions
- Online Oil Spill Advisory
- Action after initiating a national or regional response
- Situation Reports
- Final Report

National Plan Working Group Functions

- Advice CCA on strategic policymaking and funding direction
- Support CCA by considering overall operational aspects
- Consider issues such as the national plan, response equipment stockpiles, training, and contingency plan audits
- Address research, development, and technology, and environmental and wildlife interests of stakeholders to the Plan

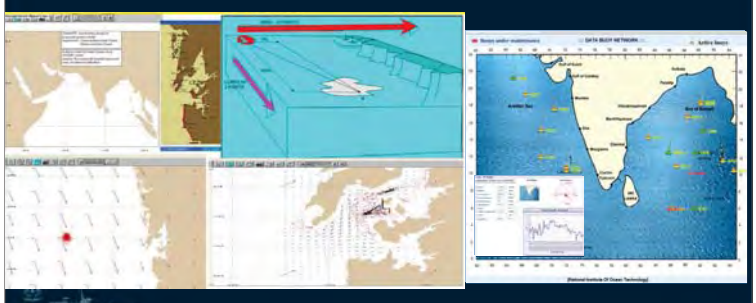
Oil Spill management: a generalized approach Modelling and mapping



GIS and Modelling : An useful tool for oil spill sensitivity mapping, risk assessment

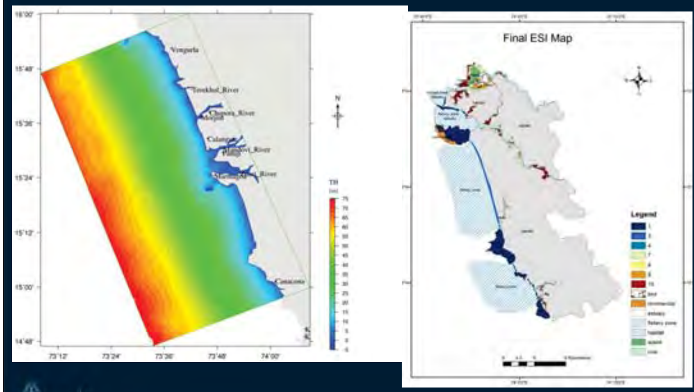
Data from MoES operational and observational programs

- Impact assessment: Water Quality Monitoring programme (COMAPS)

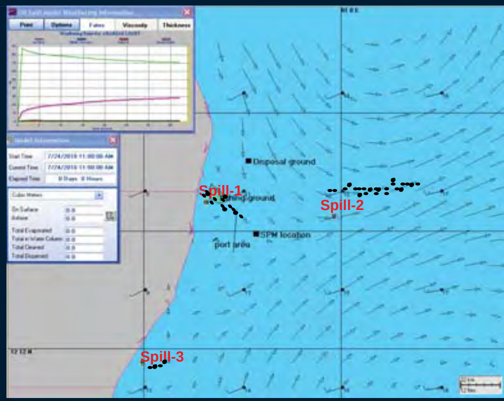


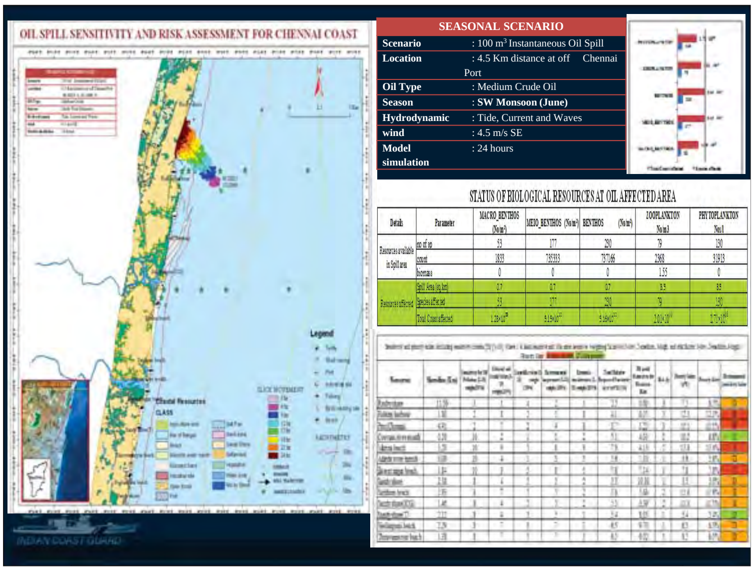
Risk assessment & Strategic mapping of ecosystems at National Level

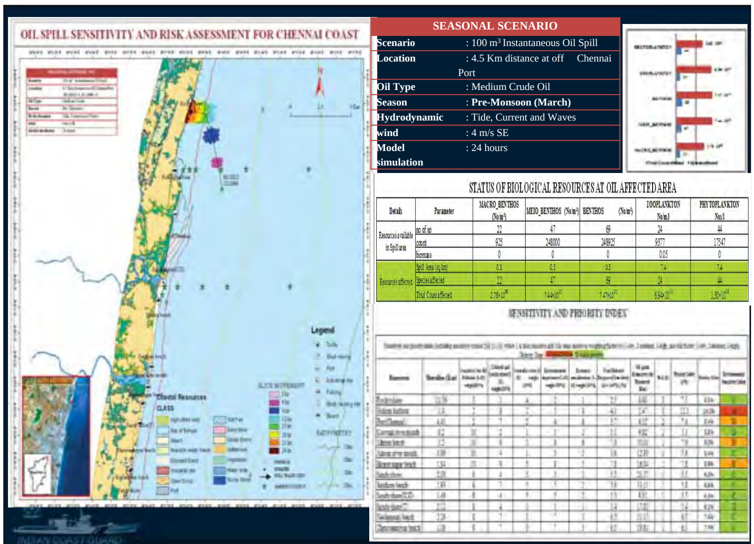
Tactical map (Regional level): an example of Goa

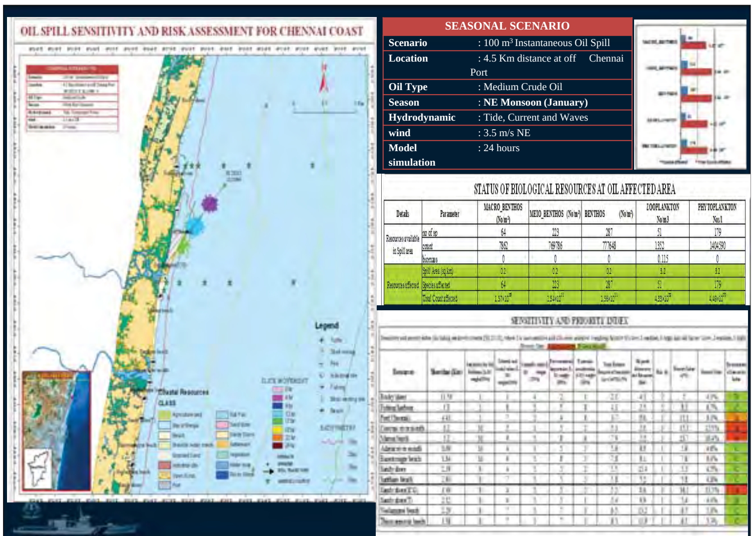


Local Scale Sensitivity Mapping: GIS and Oil Spill Modeling for Chennai









Maps and Information

- **Strategic sensitivity maps (National Scale): Decision makers**
  - The strategic maps is primary level of map in small scale which help the planners and decision makers in devising the general response strategy
  - In identifying the most sensitive sites to define priority actions
  - considers technical feasibility, potential limitations of various response operations
- **Tactical sensitivity maps (Regional Scale)- for Planners & OSC**
  - provides information about the various types of environment that may be affected by a spill (sand beaches, rocky coast, marshes, etc.).
  - takes into account operational constraints (limited access, hazardous areas, etc.) that the planner should consider when developing the response strategy.
- **Operation sensitivity maps(Local Scale) – Executers & Operators**
  - the operational map with risk analysis, combined with an oil spill drift study based on the prevailing winds and currents, should be prepared.
  - Identifies the location of High Risk Areas with on large scale maps

Online Oil Spill Advisory

Plan Review

Plan will be kept under review by the Central Coordinating Authority

National meeting on
Enhancing Regional Cooperation Mechanisms on Marine Pollution Preparedness and Response in SACEP region, India,
held at NIOT Chennai
2- 3 February 2015

Thank you

بسم الله الرحمن الرحيم

In the name of Allah, Most Gracious, Most Merciful.

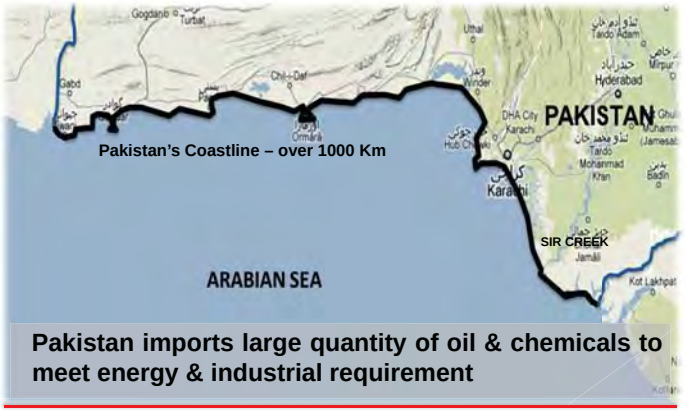
OIL SPILL RESPONSE CONTINGENCY PLAN - PAKISTAN

2

SCHEME OF PRESENTATION

- Overview - NMDCP
- National Contingency Plan (Pollution)
- Introduction & Objectives
- Tiered approach & Response mechanism

OVERVIEW



Pakistan imports large quantity of oil & chemicals to meet energy & industrial requirement

OVERVIEW

Major World's Oil Routes

- Over 1/3rd of the world's oil needs are met by countries in Arabian Gulf
- 2/3rd of world's oil/gas reserves
- Region is vital from the Global perspective

OVERVIEW

- Grave risk of Oil/ Chemical pollution are always present
- Affects humans, marine life & environment
- Incident of MV Tasman Spirit (2003)
- National Contingency Plan was refined & accordingly implemented considering various models

OVERVIEW

- Provides:
  - Coordinated mechanism to deal with marine disasters
  - National system for prompt response & relief operations with Pakistan Navy in lead role
- Effective throughout Maritime Zones of Pakistan
- Pollution from oil & chemicals
- Search & Rescue
- Salvage in harbour & at sea

NATIONAL LEGAL FRAMEWORK

- Party to UNCLOS & OPRC-90
- Constitution of Pakistan (Articles 9 & 14)
- Pakistan Environment Protection Act 1997
- Pakistan Merchant Shipping Ordnance 2001
- Port Authorities Acts
- Pakistan Territorial Water & Maritime Zones Act 1976
- Pakistan Penal Code

ORGANIZATION

- Pakistan Maritime Disaster Management Board (National Level)
- Maritime Disaster Response Committee (MDRC) (Operational Level)
- On Scene Commanders (OSC) (Tactical Level)

DISASTER RESPONSE CENTRE

- Disaster Response Centre (DRC) at HQ PMSA - 24/7
- Coordinator MDRC (DG PMSA) evaluates & advises Chairman PMDMB
- Acts as nerve centre for conduct of operation

CONTENTS-CONTINGENCY PLAN

- Scope
- Procedure for reporting & initial assessment
- Activation procedural plan
- Response phases/ procedures
- Out sourcing procedures & options
- Resource agencies
- Restoration & monitoring

OBJECTIVES

- Ensure timely response to deal with oil / chemical spills
- Develop efficient detection & reporting mechanism
- Ensure correct assessment of the incident
- Encourage cooperation amongst stakeholders
- Ensure correct response & techniques

OBJECTIVES

- Strengthen capacity of stakeholders
- Facilitate information/ resource sharing, joint exercises and training
- Mitigate damages & restore environment as far as possible
- Evolve procedure for multinational cooperation

RESOURCE AGENCIES

- Pakistan Navy
- Karachi Port Trust
- Port Qasim Authority
- Gwadar Port Authority
- Oil Company Advisory Committee (OCAC)
- Ministry of Climate Change
- Ministry of Petroleum & Natural Resources
- Ministry of Ports & Shipping
- National Institute of Oceanography
- Sindh Environment Protection Agency (SEPA)

NCP - POLLUTION

- NMDCP is based on Tiered Response Concept:
  - Tier-1 less than 7 tonnes
  - Tier-2 7 to 700 tonnes
  - Tier-3 greater than 700 tonnes

PROTECTION PRIORITIES

- Health & safety of population
- Habitat & cultural resources
- Flora & fauna
- Vital industries
- Beaches/ recreational spots

SUSTAINABILITY/ GROWTH - NCP

- NCP is reviewed periodically by MDRC to cater:
  - Experiences gained through exercises/ incidents
  - Change in stakeholders & equipment/ inventories
  - Organizational or legislative changes

FEEDBACK/ READINESS

- Periodical reports to Coordinator MDRC about statistics of oils/chemicals spills within AOR by all stakeholders
- Approved organizational contingency plan forwarded to Coordinator MDRC
- Organizational Risk assessment survey report to Coordinator MDRC

UPDATES FOR RCP

- Audit of all stakeholders resources through physical inspection
- Conduct of spill response seminar initially planned on 21 Aug
- All annexes of RCP updated and forwarded to SACEP in Jan 2016

PROPOSALS/ SUGGESTIONS

- Operation mechanism among non SACEP countries with countries bordering/ SACEP member countries
- Fresh risk assessment with regards to HNS
- More specific and concerted approach needed to address this weak link

THANK YOU

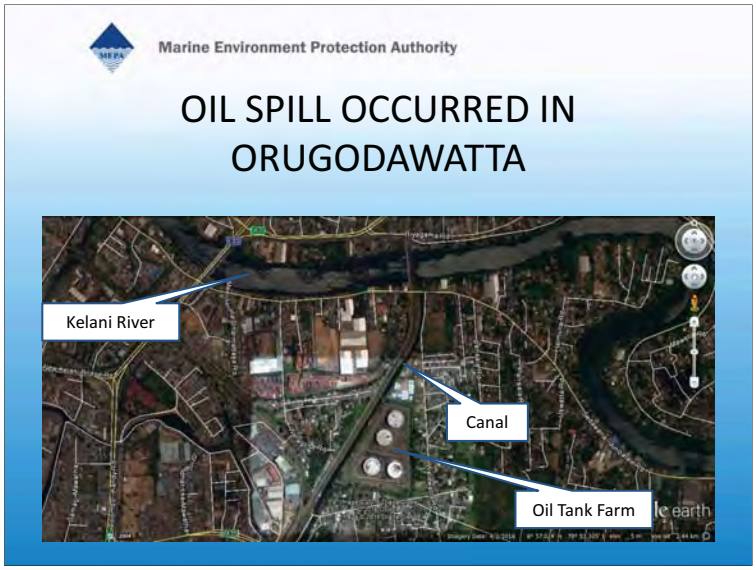
IMO and NORAD in partnership with
the South Asia Co-operative Environment Programme (SACEP)

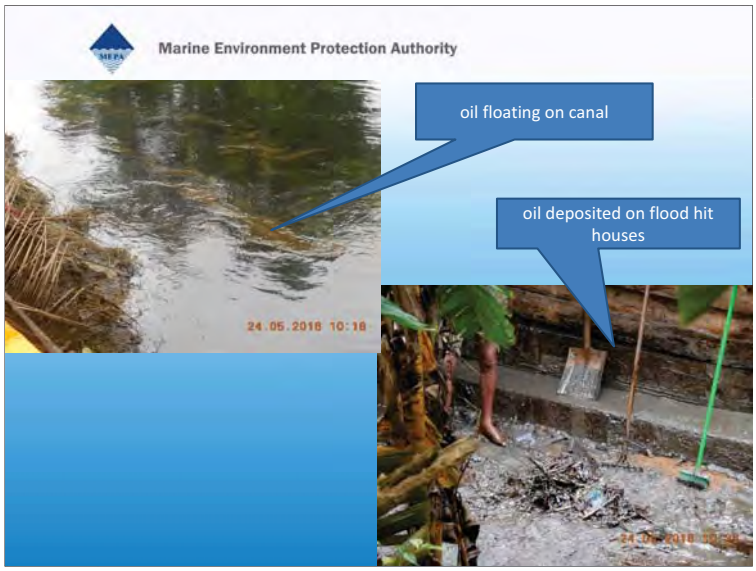
Regional Workshop for Updating the Regional Oil and Chemical Spill Contingency Plan and Its Annexes In South Asian Seas Region

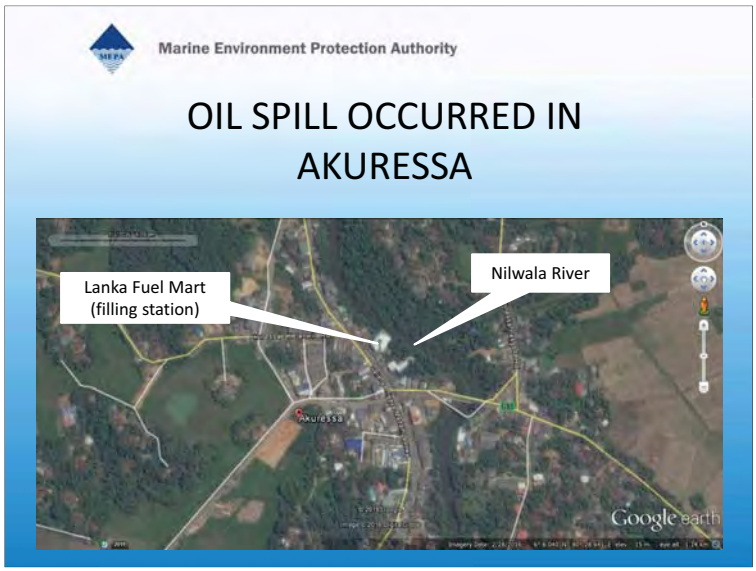
22-25 August 2016 - Male, Maldives

Updates of National Oil Spill Contingency Plan of Sri Lanka

A J M Gunasekara
Marine Environment Protection Authority







Marine Environment Protection Authority

OIL SPILL OCCURRED IN LUNAWA LAGOON (USWETAKEIYAWA)

Marine Environment Protection Authority

General details ……..

Date	: 31/12/2015
Location	: Lunawa lagoon, Thaldiyawatta, Uswetakeiyawa
Source	: Pipeline owned by Ceylon Petroleum Storage Terminals Ltd, Orugodawatta
Type of oil	: Kerosene (Jet A -1)
Amount spilt	: More than 22 tons
Impact	: - Lethal impacts on mangroves and aquatic fauna - Social impacts on nearby community

Marine Environment Protection Authority

Affected animals

Affected mangroves

Marine Environment Protection Authority

Responding to the oil spill

Marine Environment Protection Authority

OIL SPILL INCIDENT OCCURRED IN BIYAGAMA

Marine Environment Protection Authority

General details ……..

Date	: 17/08/2015
Location	: Kelani river, Biyagama
Source	: Pipeline owned by Coca-cola Beverages Sri Lanka Ltd
Type of oil	: Diesel
Amount spilt	: Not known
Impact	: - Kelani river contaminated with diesel - Caused problems to the operations at Ambatale water intake

Marine Environment Protection Authority

Oil patches on Kelani River

Oil intrusion to Ambatale water pumping intake

Marine Environment Protection Authority

OIL SPILL INCIDENT OCCURRED IN COLOMBO DOCYARD

Marine Environment Protection Authority

General details ……..

Date	: 31/05/2015
Location	: Dolphin pier – Colombo Dockyard
Source	: Summer-hill Tank Farm operated by NMK Warehouse and Logistics (Pvt) Ltd
Type of oil	: Palm oil
Amount spilt	: Approx. 10 tons
Impact	: Obstructions to the operations of Colombo Dockyard

Marine Environment Protection Authority

Oil contained with a boom

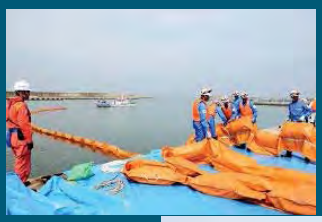
Marine Environment Protection Authority

Actions taken

- Update the National Oil Spill Contingency Plan to cover chemical spills
- Fill the gaps in NOSCOP
  - Deviation from International guideline
  - Response strategies
  - Place of refuges
  - Dispersant usage policy

Become party to OPRC and OPRC HNS Protocol

Training and exercise



Amend NOSCOP to cover chemical spill

- Conducted several workshop
- New agencies identified and incorporate to the plan with responsibilities to identified agencies
  - National Authority for the Implementation of Chemical Weapons Conventions in Sri Lanka (NACWC), under the Ministry of Industry and Commerce.
  - Fire brigade
  - ITI etc

Response team training



Thank you …

Regional Exercise and workshop
22 – 25 August 2016

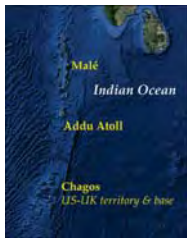
Oil Spill

The Maldives Perspective

Country profile

- A water-based country consisting of atolls ringed by islands scattered across the Indian Ocean with India and Sri Lanka to the north and East of the country.

- 26 atolls
- 1,190 islands
- 200 islands are inhabited.
- Over 100 tourist resorts in operation with many under construction across the country
- Out of the total 90,000 sq. km, the land area is of roughly 300 sq. km.
- Local population currently stands at around 3,000.
- Over 1 million tourists a year



The Islands

- Most islands are very small, some as small as few hundred meters.
- The 200 inhabited islands are divided in to groups with an administrative capital.

- The number of smaller inhabited islands in the atoll group may range from 4 to 16.
- Most public services in the Atolls are available in the respective administrative capital.
- 2/3rd of the country's population lives in the capital
- Any spill that spreads across the Indian Ocean either from the West or East will have disastrous consequences on the Maldives as a whole.
- Two major economies, tourism and fishing, are marine based activities and will have a dramatic impact on both.

Male' – the capital city

- The epicenter of all activities
- Main public services concentrated in the capital
- Almost all commerce to and from the islands centered in the capital moved across the country exclusively by sea

Male' – the bustling island city capital

Impact on the Maldives

- Unlike many other countries and in fact those in the South Asia Region, the Maldives has it's unique distinct features which make it very vulnerable to an oil spill that spreads across the Indian Ocean.
- Throughout the year the Ocean currents in the Bay of Bengal the Arabian Sea and the North Indian Ocean flow in a direction such that any spill around the wider northern Indian Ocean may have its effect on the Maldives
- The communities are dispersed living in islands in the Maldives means that any spill reaching the country will affect every individual community unlike land massed countries where much of populations are concentrated away from coast lines; affect on the Maldives is relatively very high.
- Therefore any spill that spreads across the Indian Ocean may have disastrous consequences on the Maldives as a whole.

Impact on the Maldives....

- Two main economies, tourism and fishing, are marine based activities and will have a direct and dramatic impact on both, including;
  - Fresh water as large proportion potable water is desalinated;
- The country with wide spread navigational marine hazards lying across major shipping routes is another vulnerability since that increases the possibility of a mishap from a freighter or a liner inside the country – rather than outside of it - the possibility of a spill right at the door step of an island community.

UNLIKE OTHER COUNTRIES, AN OIL SPILL IN MALDIVES IS A THREAT TO PHYSICAL SURVIVAL OF THE COUNTRY AND HER PEOPLE!!

SACEP 1st National Meeting

- Meeting was held on 08th and 09th of June under the banner "Enhancing Regional Cooperation Mechanisms on Marine Pollution Preparedness in the Sacep Region"
- The purpose of the workshop was to obtain a comprehensive understanding of the current status related to marine oil pollution through discussion among stakeholders
- Stakeholder ministries and private organization took part in the workshop notably:
  - The Transport Authority
  - Ministry of Environment and Energy
  - Maldives Coast Guard
  - Marine Police of the Maldives Police Service

SACEP 1st National Meeting .....

- Main concerns raised during the workshop re: The Maldives role in the implementation process of a regional plan:
  - that the Maldives did not have an all inclusive, all embracing national oil spill contingency plan;
  - participants were of the opinion that there was no clear direction as to which government organization is exclusively responsible for taking charge in the preparation and implementing the national oil spill contingency plan;
  - noting that the Maldives National Defense Force has a clear mandate to address and assist national disaster situations such as oil spills;
  - that the MNDF in fact has a working Oil Spill Contingency Plan.
- Both above issues are now being addressed, notably:
  - the Maldives is currently working on a tri-lateral security agreement with India – Sri Lanka – Maldives, aimed at strengthening the current Contingency Plan, and;
  - working with other friendly nations to further enhance the current OSCP in order to:

SACEP 1st National Meeting .....

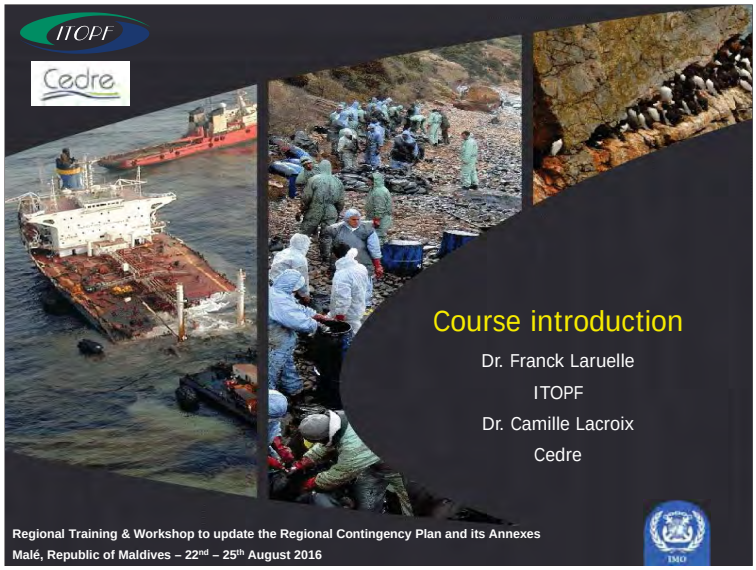
  - establish sensitivity mapping of Maldives – national bio diversity index and national socio economic index;
  - Establish national dispersant policy and national geographic information system;
  - Addressing the immediate equipment requirement;
- the irregularity in the regulatory mechanism vesting responsibility for disasters has now been resolved with the passing of the National Disaster Management Act under which comes the National Disaster Management Authority headed by the president;
- Act 28/2015 sets out clear and unequivocal mandate to NDMA.
- Still it is understood that some key features such cost bearing and claims settlement mechanisms are not addressed in the current OSCP.
- List of available equipment is again another important element of the plan not included since very limited resources are available in the country.

With those issues currently being addressed, it is hoped that the Maldives is currently on the right path in addressing this important issue of oil spill contingency planning, and once the National Plan is finalized, it can then be integrated in to the regional contingency plan through SACEP

Obviously we don't want to deprive these children of their beaches nor;

these fisherman of their livelihood which depends entirely on fishing.....

Thank you



Overview

- HNS course aims and objectives
- Course timetable and administrative matters
- Introduction to Cedre and ITOPF

Objectives of the workshop

- Provide an overview of preparedness and response to an hazardous and noxious substances (HNS) incident involving a vessel.
- Facilitate the development of national contingency plans for the response to HNS in the marine environment.
- Present real cases and discuss the issues which arose based on ITOPF and Cedre experiences.

HNS Course timetable

Day 1: 22nd August 2016

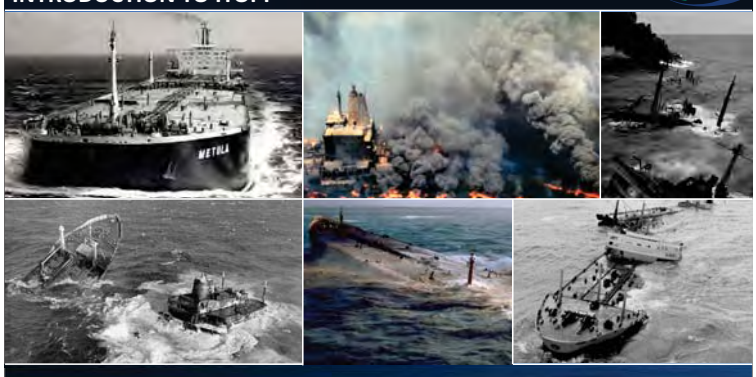
13.30	Introduction to Cedre and ITOPF	Franck Laruelle Camille Lacroix
14.00	What are HNS?	Camille Lacroix
14:30	Transportation of HNS at sea	Franck Laruelle
15.00	Coffee break	
15.30	Chemical substances, hazard, behaviour and effects	Franck Laruelle
16.15	HNS response: Health 7 Safety issues	Camille Lacroix
17.15	Summary of Day 1 and Introduction to Day 2	Peter Taylor
17.30	End of Day 1	

HNS Course timetable

Day 2: 23rd August 2016

09.00	Summary of objectives of Day 2	IMO
09.15	HNS Response Strategies	Franck Laruelle
10.00	Contingency Planning for HNS	Camille Lacroix
10.30	Coffee break	
11.00	Information resources for HNS • Web base / literature / etc...	Franck Laruelle
12.00	• Exercise: Finding information for 5 products	Franck Laruelle Camille Lacroix
12.30	Lunch break	
13.30	International legislation: OPRC-HNS protocol and HNS Convention	Franck Laruelle
14.15	Case Studies: IEVOLI SUN and ECE	Camille Lacroix
15.00	Coffee break	
15.30	Case studies: SAHMO BROTHER and STOLT VALOR	Franck Laruelle
16.15	Places of Refuge	Franck Laruelle
17.15	Summary of Day 2 and Introduction to Day 3	Peter Taylor
17.30	End of day 2	

INTRODUCTION TO ITOPF



- Not-for-profit organisation established in 1968
- Primarily funded by the shipping industry (via P&I Clubs)
- Main role: objective advice on effective response to marine spills of oil & HNS
- Based in London but provide a global service

ITOPF MEMBERS

Stena

- 6,970 tanker owners and bareboat charterers
- 11,700 tankers, barges & OBOs - 357 million GT (>97% world fleet)

ITOPF ASSOCIATES

Maersk

- Owners of other types of ship (since 1999)
- 717 million GT of non-tanker shipping (>90% world fleet)

ITOPF RESOURCES

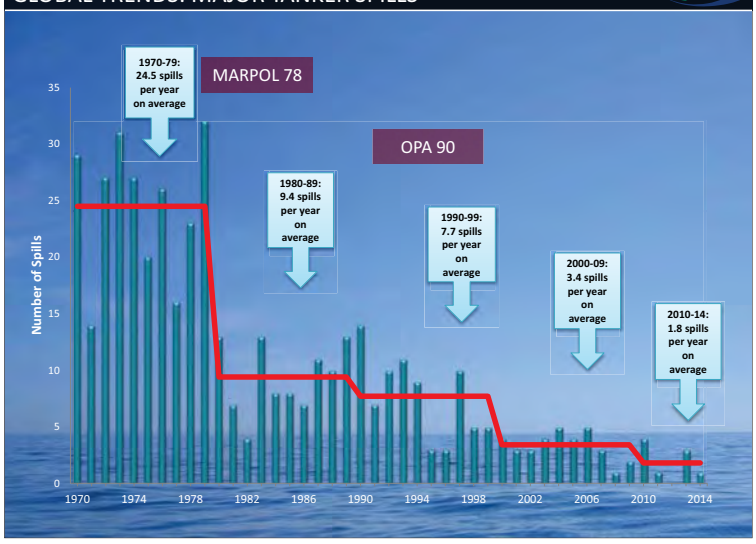
- Single office in London with 33 staff
- Technical team with 15 responders:
  - Scientific background & spill experience
  - On site at >700 spills in 100 countries
- In-house databases and technical library
- China Liaison Officer in Shanghai since 2012

SPILLS ATTENDED LAST 12 MONTHS

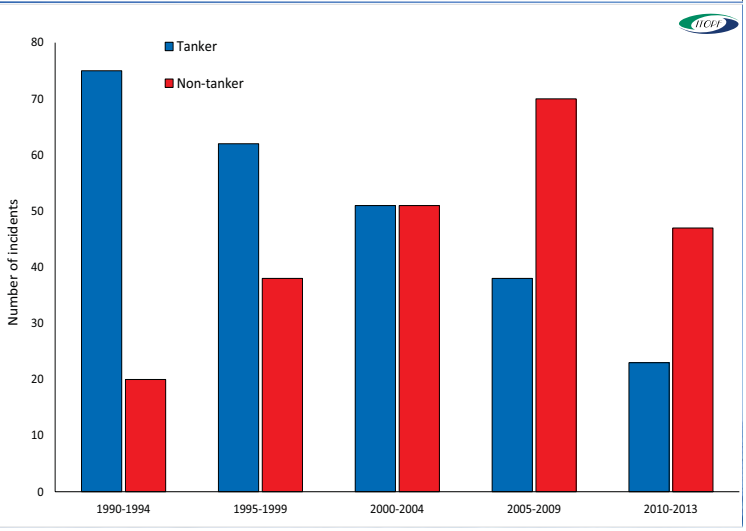
- 23 incidents attended in last 12 months
- 6 tanker incidents
- 17 incidents involving non-tank vessels
- Ongoing involvement with several incidents

INCIDENTS ATTENDED – SACEP REGION

GLOBAL TRENDS: MAJOR TANKER SPILLS



ITOPF ATTENDANCE: TANKER & NON-TANKER SPILLS



ROLE ON SITE

- Role varies depending on the requirements and preparedness
- Provide technical advice to government, responders & victims
- Promote effective response, joint assessments & cooperation
- Monitor spill response & investigate damage to sensitive resources
- Arrange for additional expertise & equipment to be brought on site

'PEACE-TIME' ROLE

- Main aim of ITOPF: to promote effective response to marine oil & HNS spills
- Often requested to advise on contingency plans for government & industry
- ITOPF also helps to test existing plans during oil spill exercises & response drills
- Organise & participate in training courses, seminars, workshops & conferences
- Key partners include the IOPC Funds, IMO & IMO-UNEP Regional Seas Centres

MORE INFORMATION

Cedre
www.cedre.fr

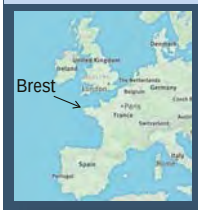
Cedre, Brest, FRANCE

CEntre of
Documentation,
Research and
Experimentation on accidental water pollution

Dr. Camille Lacroix
Cedre Research Department

HNS training
SACEP regional workshop,
Malé, Maldives, 22nd August 2016

Presentation



- Non-for-profit private structure funded by French government and industry
- 2 locations
  - Main offices in Brest
  - One office in Fort de France (Caribbean, ½ person)
- Annual turnover around 5 M€
- 50 staff
- Strong international cooperation (IMO, EU, ITOPF,…)
- Strong cooperation with industry (OSRL, Exxon Mobil, …)
- ISO certified and approved by French government

Missions

- Historic mission: to assist French authorities to improve the processes of:
  - Preparing and conducting response to oil spills in the marine environment
- But today missions also include: inland waters and all types of pollutants including hazardous and noxious substances
- Support can also be provided to foreign authorities or private sector structures

Since its creation in 1979, *Cedre* has provided consultancy services and assistance in the field in response to over 900 spills, both at sea and in inland waters, both in France and abroad.

Activities

- Assistance 24/7
- Research
- Analysis and testing
- Training and exercises
- Studies et contingency planning
- Information and documentation

Assistance 24/7

Emergency hotline
+33 (0)2 98 33 10 10

- In the event of an accident, *Cedre* provides information and advice on:
  - the pollutants
  - appropriate response strategies, techniques and equipments
- In an emergency, *Cedre* can conduct laboratory testing and study:
  - the pollutant's behaviour and weathering
  - the efficiency of response techniques
  - the impact of the pollution

Research

- *Cedre* conducts its own research projects and is involved in national and international research programs to:
  - Further develop response strategies
  - Better understand the fate and impacts of oil and HNS spills in the marine environment

- *Cedre* carries out reviews of past incidents (worldwide)

Analysis and testing

Cedre has a physical / chemical analysis laboratory with high performance analyzers (GC/MS, GC/FID, IR, …)

- Identification of pollutants
- Pollutants weathering
- Performance of response techniques (dispersants, sorbents, cleaners,…)
- …


Training and exercices



Cedre provides trainings:

- All types of training related to accidental pollution response, from shoreline clean up to crisis management (IMO Levels 1, 2 and 3 certified
- Specific installations enable training for at sea / shoreline response using real hydrocarbons
- Training sessions at *Cedre* facilities or on site
- When session at *Cedre*, lectures by professional trainers and *Cedre* experts on their specific subjects

Cedre can contribute to spill response exercises:

- Building scenarios
- Organizing and monitoring the exercises
- Reporting on results and making recommendations

Studies and contingency planning

➡ Oil and HNS

- *Cedre* involved in preparation of French national and local Spill Contingency Plans (SCP)
- *Cedre* prepares also SCPs for private companies or foreign authorities according to their own standards :
  - Refineries
  - Oil depots
  - Power plants
  - Port authorities
  - Regional / National CP
  - …

Studies and contingency planning

Cedre's references

Information and documentation

www.cedre.fr
www.pollution-chimique.com

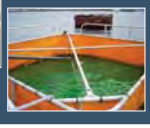
Cedre's premises and tools

Unique Technical Facilities!

- Artificial beach
- Outdoor basin
- Flume tank
- Experimental Column
- Chemical bench
- Laboratory
- Greenhouse (biology study)
- Flotting cells





More information

www.cedre.fr
contact@cedre.fr

24/7

Emergency hotline
+33 (0)2 98 33 10 10

Presentation video

What are HNS?

Dr. Camille Lacroix
Cedre Research Department

HNS training
SACEP regional workshop,
Malé, Maldives, 22nd August 2016

Objective and overview

➡ To introduce what are HNS
To raise awareness about risk, specificity, complexity and potential impacts of HNS accidents

- Definition
- Trends and statistics
- Rise of awareness
- Challenges and concerns

➡ Definition

HNS: definition

Hazardous and Noxious Substances

The IMO OPRC-HNS Protocol 2000 defines HNS as:

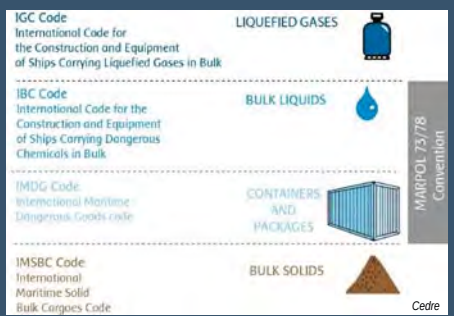
"any substance other than oil which, if introduced into the marine environment, is likely to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea."

[OPRC - HNS: The Protocol on Preparedness, Response and Cooperation to Pollution Incidents by Hazardous and Noxious Substances, 2000]

HNS: definition (2)

A substance is classed as HNS in the HNS convention (1996/2010) if:

- It is included in one or more of IMO Convention and Codes designed to ensure maritime safety and prevention of pollution



What are HNS?

They include, but are not limited to:

- oil derivatives
- liquid substances that are noxious and dangerous
- liquids with flashpoints below 60° C
- gases and liquefied gases
- packaged dangerous, harmful and hazardous materials
- solid bulk material with associated chemical hazards

What are HNS?

But also any products that may produce impacts or dangerous substances when released in the environment !

Fénès (1996): the foodstuffs problem

- Wheat cargo
- Grounding after a storm
- 2500 Tons spread over a seagrass bed
- Production of hydrogen sulphide, methanol and ethanol
- Health issue for the response team
- Evident environmental impact

➡ Trends and statistics

HNS accidents: an old story

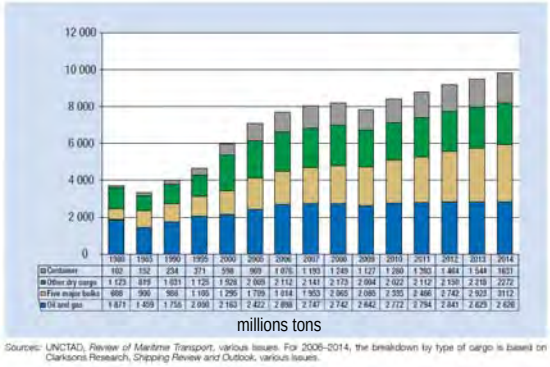
➡ Killed 2000 and injured 1000 people!

HNS accidents: an old story

➡ Grandcamp: killed 600 and injured 3000 people
Ocean Liberty: killed 22 and injured over 100 people

HNS accidents today: the context…

- Evolution of maritime transport



Sources: UNCTAD, *Review of Maritime Transport*, various issues. For 2006-2014, the breakdown by type of cargo is based on Clarksons Research, *Shipping Review and Outlook*, various issues.

HNS accidents today: the context…

- Evolution of maritime transport

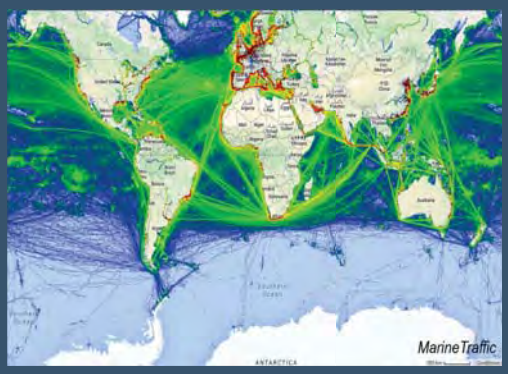
  - Increase of ship deadweight tonnage (size)
  - Increase of ship number

Maritime transport:

The only solutions to transport large quantities over long distance at low cost

HNS accidents today: the context…

- Maritime traffic worlwide



All ships/AIS data (2015)

HNS transported at sea

- Increase of chemicals transported at sea
- Volumes and types of chemicals highly variable

Rank	Chemical	Behaviour	Main hazard
1	Sulphuric acid	Sinker/dissolver	Corrosive / exothermic reaction with water / fumes
2	Hydrochloric acid	Sinker/dissolver	Corrosive / exothermic reaction with water / fumes
3	Sodium hydroxide / caustic soda	Sinker/dissolver	Corrosive / exothermic reaction with water
4	Phosphoric acid	Sinker/dissolver	Corrosive / exothermic reaction with water / fumes
5	Nitric acid	Sinker/dissolver	Corrosive / exothermic reaction with water / fumes
6	LPG/LNG	Gas (transported as a liquid)	Flammable / explosive
7	Ammonia	Gas (transported as a liquid)	Toxic
8	Benzene	Floater/evaporator	Flammable / explosive
9	Xylene	Floater/evaporator	Flammable / explosive
10	Phenol	Dissolver/evaporator	Toxic / flammable
11	Styrene	Floater/evaporator	Flammable / toxic / polymerisation
12	Methanol	Floater/dissolver	Flammable / explosive
13	Ethylene glycol	Sinker/dissolver	Toxic
14	Chlorine	Gas (transported as a liquid)	Toxic
15	Acetone	Floater/evaporator/dissolver	Flammable / explosive
16	Ammonium nitrate	Sinker/dissolver	Oxidizer / explosive
17	Urea	Sinker/dissolver	Irritating
18	Toluene	Floater/evaporator	Flammable / explosive
19	Acrylonitrile	Floater/evaporator/dissolver	Flammable / toxic / polymerisation
20	Vinyl acetate	Floater/evaporator/dissolver	Flammable /toxic / polymerisation

Table 2: IMO list of the top 20 chemicals likely to pose the highest risk of being involved in an HNS incident, not including crude oil, liquid distilled crude oil products or vegetable oils (source: MEPC/OPRC-HNS/TG 10/5/4, see www.imo.org)

IMO Top 20 HNS

HNS accidents today: a reality

Date	Name of Ship	Location	Cargo	Type of Vessel
15/01/2007	GOLDEN SKY	Latvia	Potash (KCl)	Bulk carrier
18/01/2007	MSC NAPOLI	UK	Acrylonitrile Epichlorhydrin Phosphorus Phosphorus pentasulfide / Toluene-2,4-diisocyanate …	Containership
17/03/2007	HUI RONG	China	Urea / Sodium metabisulfite	General Cargo
25/12/2007	EASTERN BRIGHT	S. Korea	Nitric Acid	Chemical tanker
11/03/2009	PACIFIC ADVENTURER	Australia	Ammonium Nitrate	Containership
07/08/2010	MSC CHITRA	India	Aluminium phosphide / Pesticides	Containership
08/10/2010	YM URANUS	France	Pyrolysis Gasoline (Pygas)	Chemical tanker
03/02/2012	HALDOZ	Spain		Chemical tanker
15/03/2012	STOLT VALOR	Saudi Arabia		Chemical tanker
15/03/2012	BARELI	China		Containership

➡ Different types of ship and cargo

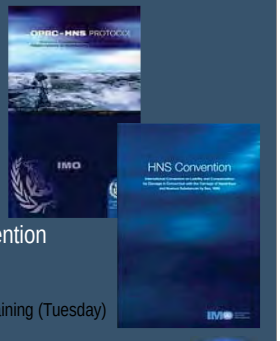
HNS accidents worldwide

➡ Anywhere in the world

➡ Rise of awareness

Rise of awareness: International community

Development of guidelines and legal instruments

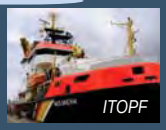


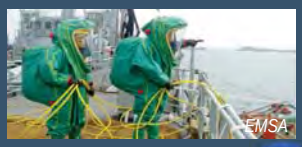
- 1980's: 3 IMO Manuals
- 1985: IBC Code
- 1996: HNS Convention
- 2000: OPRC-HNS Protocol
- 2007: OPRC-HNS entry in force
- 2009: IMO R&D Forum
- 2010: amendments to the 1996 HNS Convention

Futher discussed in the « International legislation » training (Tuesday)

Rise of awareness: Coastal states

- Contingency planning covering HNS
- Monitoring capacities:
  - Cloud/plume trajectory modelling
  - Sampling and measuring devices
- Specialised response capacities
  - Vessels (bridge with positive pressure, etc)
  - Safety equipment and storage devices
  - Response team
  - Response contractors
- Co-operation networks

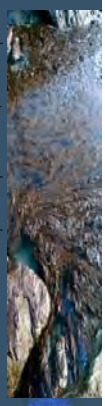




➡ Challenges and concerns

Challenges: HNS vs. Oil

HNS	Oil
Wide variety of substances with specific properties and behaviour	Some uniformity in properties and behaviour
Potentially high danger and hazard to human health	Relatively low danger and hazard to human health
Equipment specific of the substance	Equipment relatively standard
Product transported in various physical state	Product transported as a liquid
Generally colourless (low visibility)	Generally coloured (high visibility)
Response difficult or limited	Preparedness and response well understood



HNS accidents: challenges

- Expertise needed
- Specific procedure to ensure protection and safety
- Specific equipement
- Rapid assessment is crucial

➡ Need of specific preparedness and planning

- Pre-planning
- Structure and organization
- Safe and effective response
- Comprehensive contingency plan
- Training and exercising

HNS accidents: concerns

➡ Rapid growth in the transport and storage of HNS that pose a danger to:

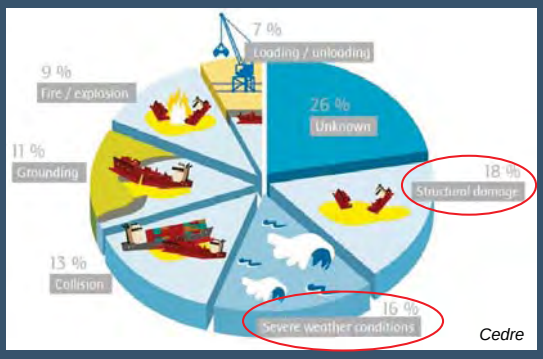
- ship's crew
- the vessel
- coastal populations and/or
- the environment

HNS accident: concerns

Major HNS accidents are not as frequent as oil spills but are not rare

- There is a wide range of cargoes which need to be considered as potential threats.
- Most accidents involved mainly two classes of HNS: flammable liquids and corrosive materials.
- One to two major HNS accidents can be expected each year.
- A wide variety of ship types were associated with HNS accidents.
- HNS accidents were almost equally divided between "bulk" and "packaged" goods shipments.

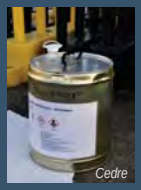
HNS accident causes

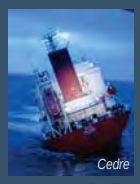


Causes of ship-source accidents involving HNS worldwide
(between 1917 and 2010)

Take-home message

- A large number of substances are considered as HNS
- HNS can pose a risk to human health, the environment and to various activities
- HNS accidents are a reality worldwide
- Response to an HNS spill can be very challenging due to their various nature
- HNS accidents can have disastrous consequences
- Planning and preparedness are essential!





What are HNS: To go further…

Websites, guides, …

www.pollution-chimique.com

Download on www.cedre.fr

www.cedre.fr

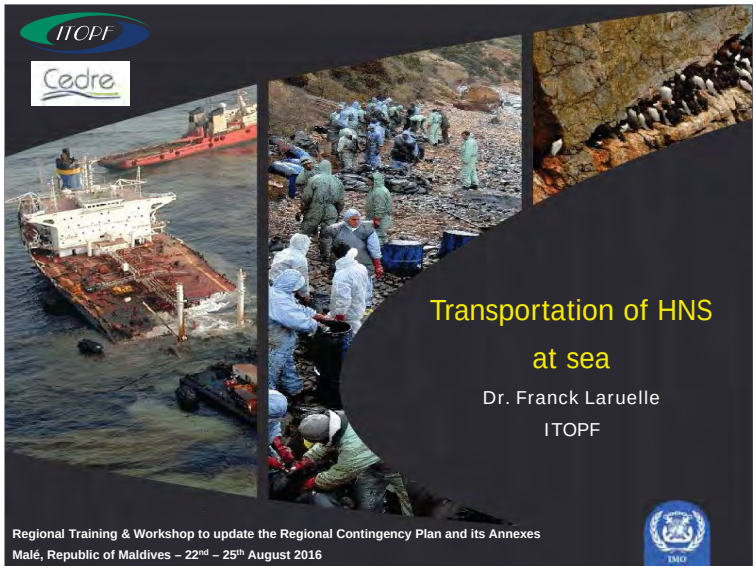
Thank you
Any questions?

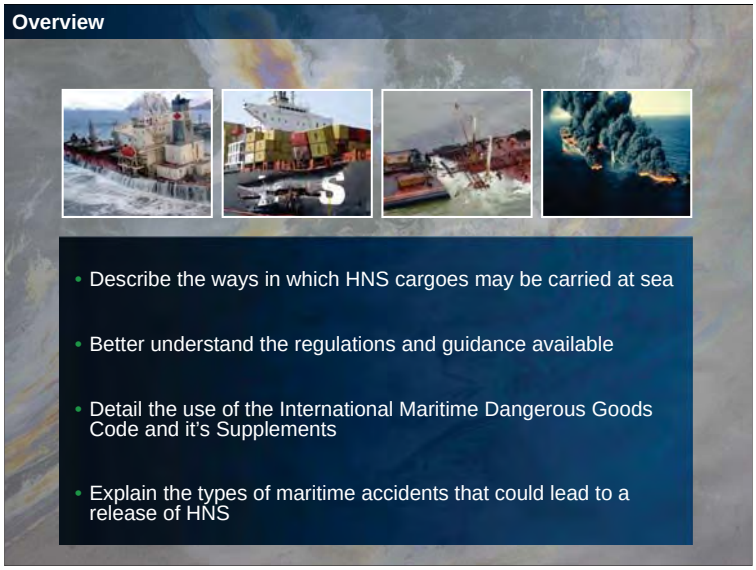
Adamandas, Indian Ocean, 2003 — Cedre

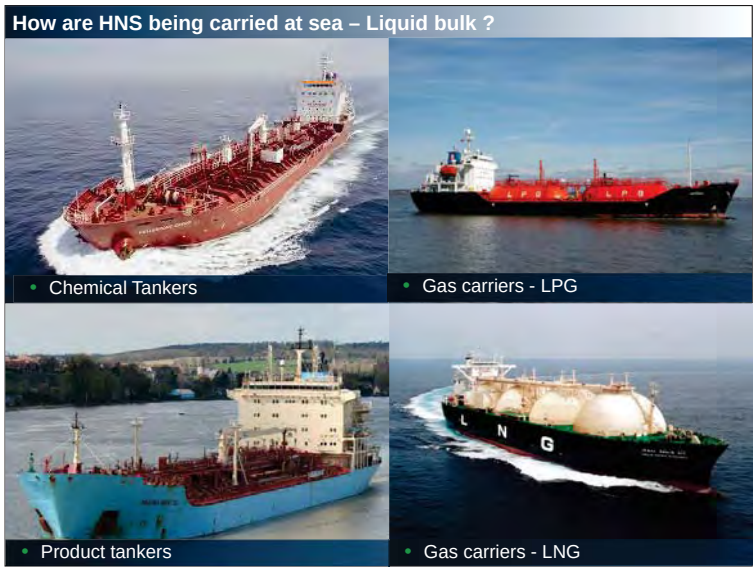
contact@cedre.fr
camille.lacroix@cedre.fr

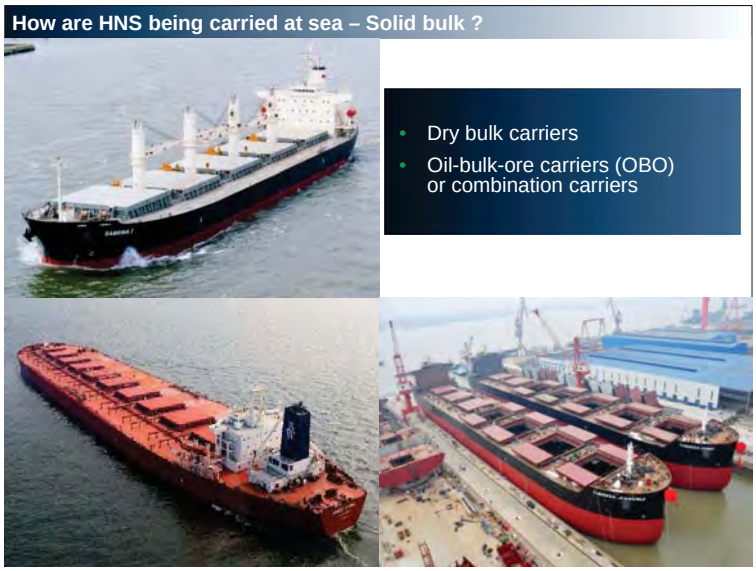
Thank you
Any questions?

contact@cedre.fr
camille.lacroix@cedre.fr


ITOPF
Cedre
Transportation of HNS at sea
Dr. Franck Laruelle
ITOPF
Regional Training & Workshop to update the Regional Contingency Plan and its Annexes
Malé, Republic of Maldives – 22nd – 25th August 2016
IMO


Overview
Describe the ways in which HNS cargoes may be carried at sea
Better understand the regulations and guidance available
Detail the use of the International Maritime Dangerous Goods Code and it's Supplements
Explain the types of maritime accidents that could lead to a release of HNS


How are HNS being carried at sea – Liquid bulk ?
Chemical Tankers
Gas carriers - LPG
Product tankers
Gas carriers - LNG


How are HNS being carried at sea – Solid bulk ?
Dry bulk carriers
Oil-bulk-ore carriers (OBO) or combination carriers


How are HNS being carried at sea – Packages ?
Containerships
General cargo ships
Ro/Ros & Ro/Ro container vessels
Ferries


Methods of carrying HNS at sea
Packaged goods – containers
Tank container
Container (20' and 40')
IBC (intermediate bulk container)
Drums (steel, plastic, cardboard)
Boxes
Cylinders
Other

Methods of carrying HNS at sea

- Containers

- Refrigerated containers

- Tank containers

- IBC (intermediate bulk container)

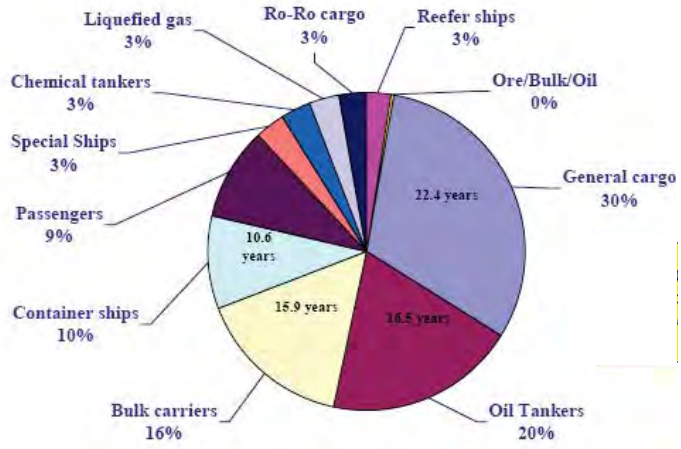
Methods of carrying HNS at sea

- Drums (steel, plastic, cardboard)

- Cylinders

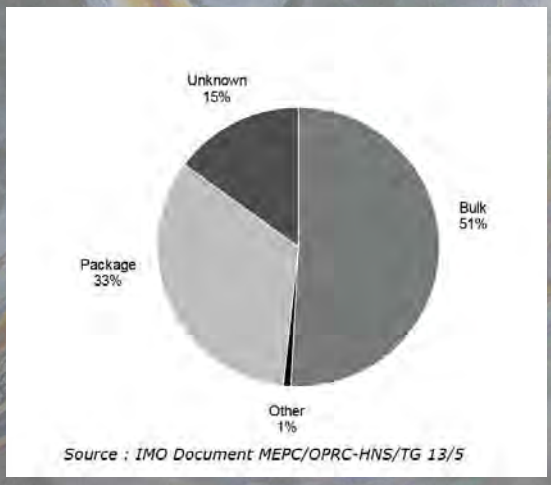
- Boxes, bottles, bags…

Statistics – World merchant fleet by ship type (over 300GT)



Source: LMIU Jan 2008

Statistics - % of incidents by package type (2006-2011)



Source: Data compiled by IMO (2012)

Statistics – most transported HNS (Convention)

Chemical	Million tonnes/yr
Methanol	10
Xylene	6
MTBE	6
Caustic Soda	5
Styrene	4
Phosphoric Acid	4
Sulphuric Acid	4
Ethyl Dichloride	3
Ethylene Gylcol	3
Toluene	2
Benzene	2

[Source: IPTA based on data for 2000 provided by CEFIC].

Statistics – Top ten most spilled HNS substances (OPRC)

Rank	Product
1	Iron ore
2	Sulfuric acid
3	Caustic soda
4	Fertilisers
5	Cereals
6	Ammonium nitrate
7	Phosphate
8	Coal
9	Sulphur
10	Vegetable oils

Source: Data compiled by IMO (2012)

Statistics – % of HNS incidents by product behaviour category (2006-2011)

Behaviour of package or cargo		No of incidents by behaviour category	% of incidents by behaviour category
Dissolvers	D	40	16
Dissolver - evaporator	DE	19	8
Evaporator	E	9	4
Floater	F	3	1
Floater - dissolver	FD	1	0.4
Floater - evaporator	FE	14	6
Floater - evaporator - dissolver	FED	1	0.4
Persistent Floater	Fp	16	6
Gas	G	17	7
Gas - dissolver	GD	2	1
Sinker	S	9	4
Sinker - dissolver	SD	2	1
Unknown	unknown	114	46

Source: Data compiled by IMO (2012)

International Conventions

- International Convention for the Safety of Life at Sea
  - SOLAS Chapter VII (Carriage of Dangerous Goods)
- International Convention for the Prevention of Marine Pollution from Ships
  - MARPOL Annex II (Bulk liquids)
  - MARPOL Annex III (Packaged Form)

IMO codes

- International Bulk Code – IBC Code (liquids)
  - Design and construction standards
  - Lists chemicals and their hazards
  - Determines environmental hazard rating
  - Determines the ship type
  - Ships built post 1st July 1986

- Code for the Construction and Equipment of Ships Carrying Dangerous Goods in Bulk – BCH Code
  - Ships built pre 1st July 1986

Safe carriage guidance

- Code of Safe Practice for Solid Bulk Cargoes
  - IMSBC Code
  - Lists commonly transported cargoes
- International Maritime Dangerous Goods Code
  - IMDG Code
  - IMDG Code Supplements
- Revised Recommendations on the Safe Transport of Dangerous Cargoes and Related Activities in Port Areas, 2007

The International International Maritime Dangerous Goods Code

Volume 1
- General provisions, definitions, training
- Classification
- Packing and tank provisions
- Consignment procedures
- Construction and testing
- Road tank vehicles
- Transport operations

Volume 2
- The dangerous goods list
- Limited quantities exceptions
- The index
- Appendices
  - A – Generic names
  - B – Glossary

Supplement to the IMDG code

- **EmS guide**
- **Medical First Aid Guide**
- **Reporting Procedures**
- **Packing CTUs (cargo transport units)**
- **Safe use of pesticides**
- **Irradiated Nuclear Fuel**
  - **Class INF 1 Ship**
  - **Class INF 2 Ship**
  - **Class INF 3 Ship**

Class 1 - Explosives

- Division 1 (mass explosion hazard)
- Division 2 (fragments hazard)
- Division 3 (fire hazard)
- Division 4 (no mass explosion hazard)
- Division 5 (very insensitive substance)
- Division 6 (extremely insensitive substance)

ex. Dynamite 1.1 - UN0081

Class 2 - Gases

- Division 1 (flammable gas)

ex. Propane - UN1075

- Division 2 (non-flammable, non-poisonous, non-corrosive)

ex. Nitrogen - UN1066

- Division 3 (Poison gas)

ex. Sulphur dioxide - UN1079

Class 3 – Flammable liquids

ex. Gasoline - UN1203

Class 4 – Flammable Solids

- Division 1 (flammable solids)

ex. Sulphur - UN1350

- Division 2 (substances liable to spontaneous combustion)

ex. Phosphorus - UN1381

- Division 3 (water-reactive substances)

ex. Sodium - UN1428

Class 5 – Oxidising substances and organic peroxides

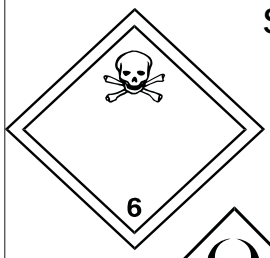
- Division 1 (oxidizing substances)

ex. Calcium hypochlorite - UN1748

- Division 2 (organic peroxides)

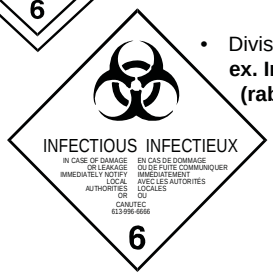
ex. Benzoyl peroxide - UN2087

Class 6 – Toxic and Infectious substances



- Division 1 (toxic substances)

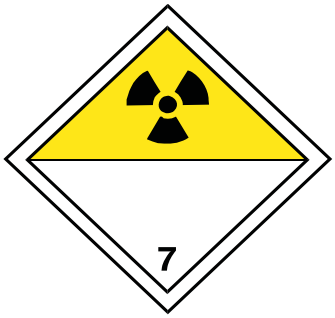
ex. Sodium fluoride - UN1690



- Division 2 (infectious substances)

ex. Infectious substance, affecting humans (rabies virus) - UN2814

Class 7 – Radioactive materials

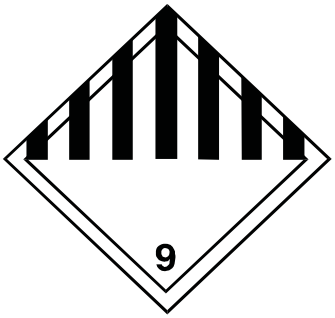


ex. Uranium hexafluoride - UN2977

Class 8 – Corrosive substances

ex. Sulphuric acid - UN1830

Class 9 - Miscellaneous substances



IMDG Hazard classification – Substances with several hazards

Ammonium Polysulphide Solution

Primary Hazard Sign

Subsidiary Hazard Sign

IMDG Hazard classification

Wastes (Basel Convention)
Class 9 (Misc.)

Marine pollutants
- P
- PP (severe)

Packing Groups
- Group I - substances presenting high danger
- Group II - substances presenting medium danger
- Group III - substances presenting low danger

IMDG Hazard classification

All dangerous goods are assigned UN number and proper shipping names according to their hazard classification and composition

Entries in the dangerous goods list fall into one of the following categories

- Single entries
- Generic entries
- Specific not otherwise specified
- General not otherwise specified

- For example:
  - Class 6.1 UN 1851
  - Proper Shipping Name:
    MEDICINE, LIQUID, TOXIC. N.O.S.

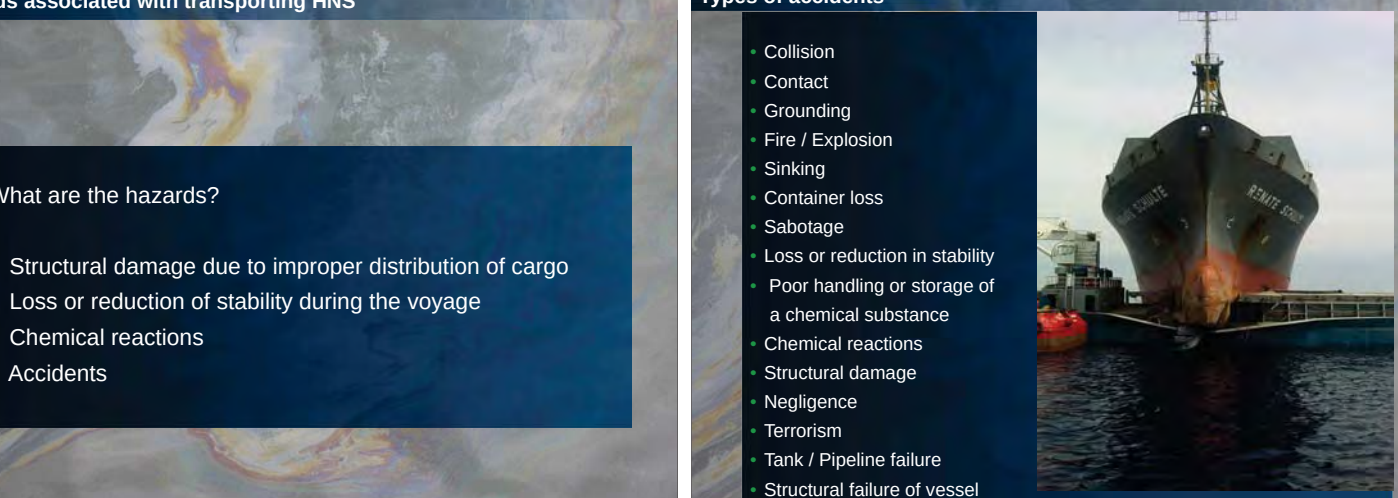
Hazards associated with transporting HNS

What are the hazards?

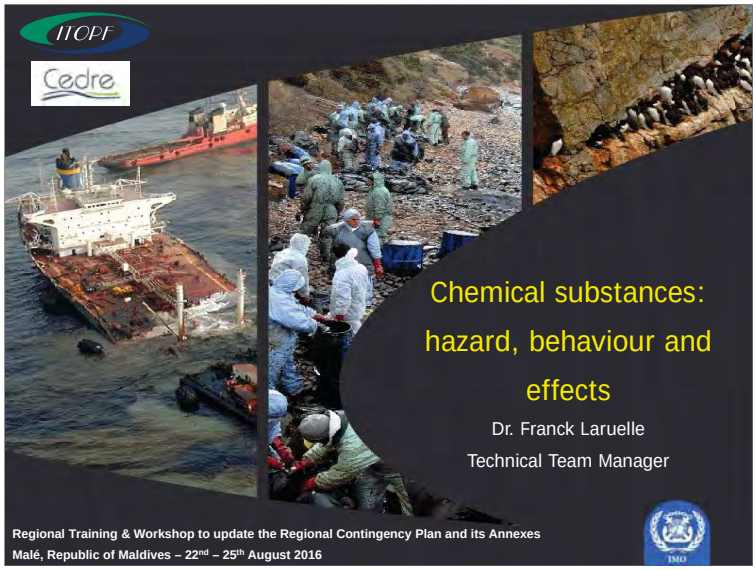
- Structural damage due to improper distribution of cargo
- Loss or reduction of stability during the voyage
- Chemical reactions
- Accidents

Types of accidents

- Collision
- Contact
- Grounding
- Fire / Explosion
- Sinking
- Container loss
- Sabotage
- Loss or reduction in stability
- Poor handling or storage of a chemical substance
- Chemical reactions
- Structural damage
- Negligence
- Terrorism
- Tank / Pipeline failure
- Structural failure of vessel




Any Questions?



Overview

- Substances and Hazards
- Behaviour of Chemicals
- Important physical-chemical properties

Introduction – HNS vs. Oil

- Crude oil is a mixture of compounds (HNS) with a common behaviour (floaters)
- A number of HNS are obtained through oil refining
  - LPG (Butane / Propane)
  - Crude oil distillates : Naphta / Gasoline / Diesel / Kerosene
  - Benzene / Toluene / Xylene / Ethylbenzene
  - Hydrocarbons derivatives (Styrene…)
- HNS includes a large variety of other compounds
  - LNG (Methane)
  - Alcohols / Ketones / Aldehydes
  - Acids / Alkalis
  - Salts / Minerals / Fertilizers
  - Synthetic chemicals / Pesticides…

Introduction – Points to note

- HNS spills not as frequent as oil spills
- Quantities spilled variable
  - Chemical tanker: 40,000 m^3 – 150,000 m^3
  - Container: 10 m^3
  - IBC: 1 m^3
  - Drum: 100 l
- Can involve more than one product

Hazards related to chemicals

- Main hazards:
  - Fire
  - Explosion or BLEVE
  - Reactivity (with water, air or other chemicals)
  - Toxicity
  - Radiation

Substances and hazards

UN hazard classes for HNS transportation

Substances and hazards

NFPA (US National Fire Protection Association) diamond

Explosion and BLEVE

Explosion = violent release of energy caused by rapid combustion or reaction

BLEVE = Boiling Liquid Expanding Vapour Explosion

Liquefied gas cylinder exposed to intense heat →rapid evaporation → explosion.

BLEVE Video

Explosion and BLEVE

Shore-based large scale BLEVE (Refinery fires)

Explosion and BLEVE

Huge quantity of energy would be necessary to result in a LNG or LPG tanker BLEVE...

... E.g. a collision with an oil tanker and subsequent oil fire

Fire

Combustion of flammable material producing flames, heat and smoke

Reactivity

- Chemicals have the ability to react with other products (air, water, etc.)
- Speed of reaction can vary (slow to violent)
- Often result in the production of new substances with new dangers!
- Ex: sulfuric acid fuming (oleum) + metals = hydrogen gas

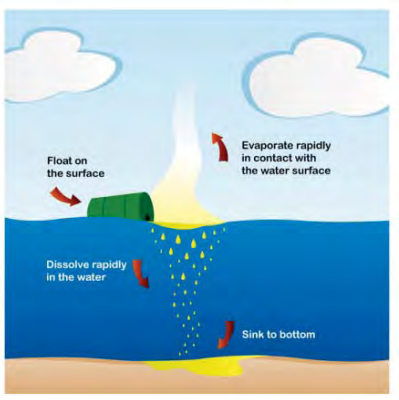
Toxicity

- Property of all chemical substances (dose-dependent)
- May cause lethality of the entire body, specific organs, includes carcinogenicity and irritation

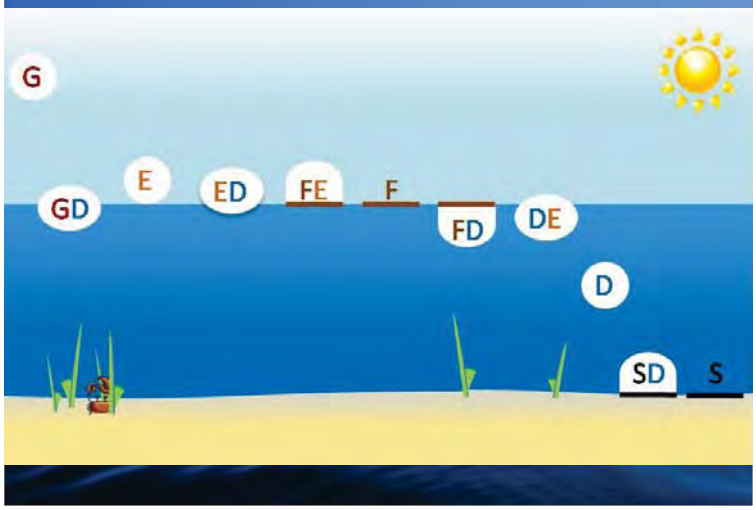
Basic behaviour of chemical

4 typical behaviours:

Float
Sink
Dissolve
Evaporate



Combination of behaviours



Behaviour class	Density (kg/m^3)	Vapour Pressure (Pa)	Solubility % Gas	Liquid	Solid
Gas	<1030	>3000	<10	-	-
Gas/Dissolver			>10		
Evaporator			-	<1	-
Evaporator/Dissolver				>1	
Floater		<300		<0.1	<10
Floater/Evaporator		300-3000			-
Floater/Evaporator/Dissolver				0.1-5	
Floater/Dissolver					10-100
Dissolver		<10,000		>5	100
Dissolver/Evaporator		>10,000			
Sinker	>1023	-		-	<10
Sinker/Dissolver					10-100

Important physical-chemical properties

- Flash point
- Explosive limits
- Vapour pressure
- Vapour density
- Specific gravity (density)
- Solubility
- Reactivity
- Toxicity

Flash point

Lowest temperature at which a liquid gives off sufficient vapour in air to ignite when exposed to a flame.

Provide an indication of flammability

- Low FP = higher risk of fire;
- High FP = lower risk of fire;

As a guide:

- FP < -10°C = highly flammable (Gasoline FP < -43°C)
- -10°C < FP < 20°C = very flammable
- 20°C < FP < 60°C = flammable (PCB FP > 140°C)

Explosive limits (LEL & UEL)

Concentration range of vapour in air between which propagation of a flame occurs on contact with a source of ignition.

This range is between the LEL = Lower Explosive Limit and UEL = Upper Explosive Limit

Explosive limits (LEL & UEL)

Examples:

Benzene: 1.4% to 8.0%
Methanol: 6.0% to 36.5%

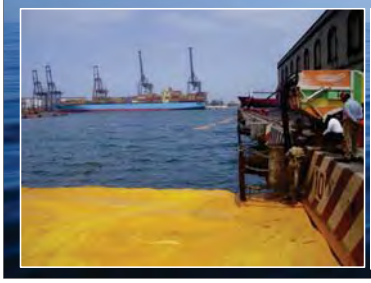
Benzene = higher risk of fire/explosion

Specific gravity (density)

Ratio of the weight of a solid or liquid to the weight of an equal volume of water.

SG < 1 = float
SG > 1 = sink

Density is the mass/volume unit

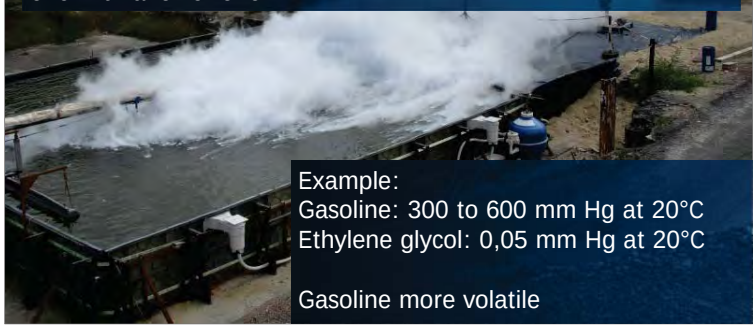


Vapour pressure

Pressure that a vapour exerts on its surroundings.

Increases with temperature.

Liquid with a high vapour pressure gives off more vapour than one with a lower one.



Example:
Gasoline: 300 to 600 mm Hg at 20°C
Ethylene glycol: 0,05 mm Hg at 20°C

Gasoline more volatile

Vapour density

The ratio of the weight of vapour to the weight of an equal volume of dry air at the same pressure and temperature.

VD <1 disperse vertically in air (Ammonia: Vapour density = 0,6)
VD >1 tendency to remain at ground level (Chlorine: Vapour density = 2.49)

Solubility

Ability of a substance to dissolve.
As a guide:

Soluble in all proportions	>100 g/100 ml
Very soluble	> 50 g/100 ml
Soluble	10 to 50 g/100 ml
Moderately soluble	1 to 10 g/100 ml
Slightly soluble	0.1 to 1 g/100 ml
Insoluble	< 0.1 g/100 ml

Example: Phosphoric acid 548 g/100ml

Reactivity

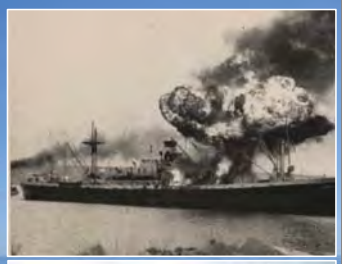
Various types of reactions: oxidation, dehydration, polymerisation...

Heat production during exothermic reactions can have secondary effects

Example for fuming sulphuric acid (oleum):

Reacts as a strong acid, as an oxidising agent and as a dehydrating agent.

Reacts with many metals to liberate hydrogen gas which can form explosive mixtures with air.



Toxicity - useful exposure limits

TLV (Threshold limit value)

Concentration at which one can be exposed 8 hrs/day, 5 days a week without any adverse effects (working environment)

IDLH (Immediately dangerous to life and health)

Maximum concentration from which one could escape within 30 min without irreversible adverse effects.

Examples:

Ammonia	Chlorine
TLV = 25 ppm	TLV = 1 ppm
IDLH = 300 ppm	IDLH = 10 ppm

Toxicity - useful exposure limits

ERPG (Emergency Response Planning Guidelines)

ERPG-1: maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to 1 hr without experiencing other than mild transient adverse health effects or perceiving a clearly defined, objectionable odour.

ERPG-2: ... without developing irreversible or other serious health effects.

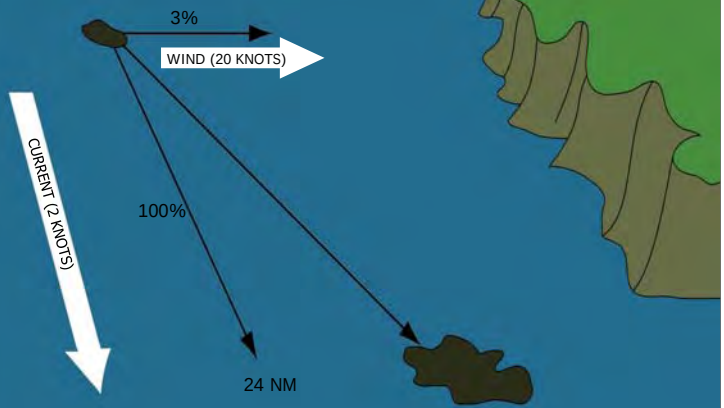
ERPG-3: ... without experiencing or developing life-threatening health effects.

Guideline for population confinement or evacuation (Also AEGLs / Acute Exposure Guideline Levels and TEELs / Temporary Emergency Exposure Limits)

Examples:

Ammonia	Chlorine
ERPG-2 = 150 ppm	ERPG-2 = 3 ppm

Floaters trajectory modelling



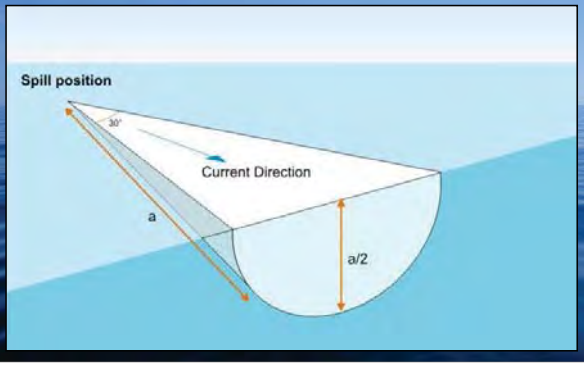
Trajectory (slick) modelling

Estimate movement & likely resources to be impacted based on winds speed (3%) and current (100%)

Dissolvers plume modelling

Plume modelling

- Sub-surface modelling with concentration gradient difficult – 3D plume, complex system
- Need detailed knowledge of local currents, weather



Sensitive resources

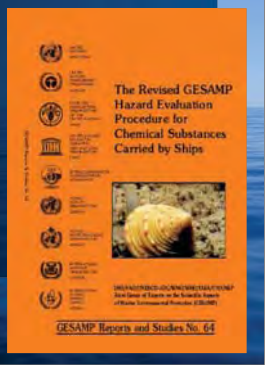
Environmental resources will be affected according to behaviour

- Floaters
  - Birds, shorelines, man-made structures, mangroves
- Dissolvers
  - Water column organisms, mangroves, water intakes
- Sinkers
  - Benthos, sediments
- Evaporators
  - Sea birds and mammals, usually short term

GESAMP Profiles

The Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) is an advisory body, established in 1969, that advises the United Nations (UN) system on the scientific aspects of marine environmental protection

Bioaccumulation
Biodegradation
Acute Toxicity
Chronic Toxicity
Acute Mammalian Toxicity
Irritation, Corrosion & Long term health effects
Tainting
Physical effects on Wildlife & benthic habitats
Interference with Coastal Amenities



Points to note

- Wide variety of products
- Wide variety of behaviour
- Wide variety of toxicity/effects
- Effects on marine environment not well known
- Response technologies not as developed as oil
- Effects on population potentially more severe than oil

Thank you

Any Questions?

HNS response: Health and safety issues

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Cedre Research Department

HNS training
SACEP regional workshop,
Malé, Maldives, 22nd August 2016

Introduction

During an HNS accident, health and safety of the:

– Crew

– Response staff (evaluation, intervention, cleaning and recovery)

– Population



Introduction

Health and safety of the response staff, an issue?

Introduction

Health and safety of the response staff, an issue?

➡ Example: Fénès (1996): grounding/wheat cargo


- Production of hydrogen sulphide, methanol and ethanol
- Health issue for the response team
- Response operations suspended

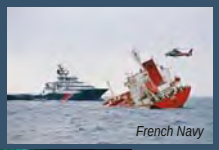
Protective equipment required!

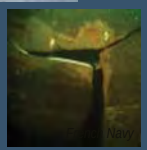
Provision of facial protection and gloves (divers)
masks and filters (on the barge)

Introduction

Health and safety of the response staff, an issue?

➡ Example: Ece (2006): collision/phosphoric acid cargo



- Diving inspection before towing
- Crack in the hull: leak
- Divers not protected

Lack of protective equipment!

Objectives and overview

➡ To highlight the importance of health and safety issues during an HNS response

To provide basic information in health and safety equipments and procedures

HNS hazards

Hazards monitoring

Personal Protective Equipment (PPE)

Safety Plan and officer

Work zones

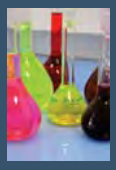
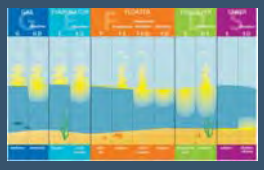
Decontamination

Other hazards

➡ HNS hazards

HNS health and safety issues

- Wide range of toxicological and physical properties
- Many products are not or poorly known
- Chemical response personnel may not realise that they are being exposed to chemicals


➡ Need of very strict response procedure to protect personnel!

Memory refresh: HNS hazards

- Physical hazards : fire / explosion

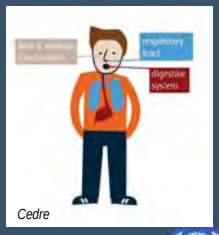
- Chemical hazards

Basic rule

- "Everything is toxic, nothing is toxic"
- The amount and the contact time make the poison
- The toxic needs to penetrate the body
- The product may be transformed in the body

Penetration ways:

- Inhalation
- Contact (skin/eyes)
- Ingestion



➡ Hazards monitoring

Hazards monitoring

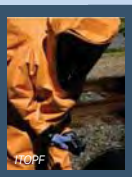
Why?

- To detect the presence of HNS
- To identify a specific HNS
- To measure the concentration of a HNS substance
- To validate dispersion models

- This information allows risk evaluation in order to protect the responders
- The information can be used to delineate contaminated zones and determine personnel protection

Hazards monitoring

- Air monitoring:
  for all responders



⚠ But do not forget:

- Seawater:
  for divers


Air exposure limits

IDLH

- Immediately Dangerous to Life and Health concentration
- Maximum concentration from which one could escape within 30 min without irreversible effects

TLV

- Treshold Limit Value
- Concentration at which one can be exposed 8hrs/days, 5 days a week without any adverse effects

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➡ Personal Protective Equipment (PPE)

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Personal Protective Equipment (PPE)

Preventing exposure to toxic chemicals is the primary concern

PPE reduces the exposure of responders to chemicals
=> Clothing
=> Respiratory equipment

No material can protect against all chemical substances!




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Personal Protective Equipment (PPE)

- Respiratory equipment


- The atmosphere is or can become contaminated
- The atmosphere is deficient in oxygen
- A combination of the above

Two types:

- Air purifying respirators with particulate and chemical cartridges
- Supplied-air respirators which includes Self-Contained Breathing Apparatus (SCBA)

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Personal Protective Equipment (PPE)

- Respiratory equipment: Protection factor (PF)

- Ratio between a contaminant's concentration inside and outside the mask

$$PF = \frac{Outside\ concentration}{Inside\ concentration}$$

- PF must be high enough to reduce concentration inside the mask to an acceptable level
- Acceptable level < TLV (threshold limit value)
- Perfect fit needed to maintain the PF

Example: a beard can reduce PF by 10 fold

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Personal Protective Equipment (PPE)

- Respiratory equipment: Protection factor (PF)

Equipment	Protection factor
Air purifying respirators – particulate	
Disposable mask	5
Nose cup mask	10
Full face mask	50
Air purifying respirators – chemical cartridges	
Nose cup mask	10
Full face mask	50
Self contain breathing apparatus (SCBA)	
SCBA, negative pressure	50
SCBA, positive pressure	10 000

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Personal Protective Equipment (PPE)

- Clothing

Main characteristics of material:

- strength
- chemical resistance
- thermal resistance
- flexibility
- cleanability
- ageing resistance

Personal Protective Equipment (PPE)

- Clothing: chemical resistance

Chemical substances can go through protective clothing in three ways:

- Degradation: Destruction of material due to contact with a chemical
- Penetration: Flow of chemical through imperfections in a material (zipper, seams, pinholes, etc…)
- Permeation: Process by which a chemical moves through a protective clothing at a molecular level

Personal Protective Equipment (PPE)

- Clothing: Permeation data

- Breakthrough time is the time elapsed between the first contact of a chemical with the external surface of a material and its detection inside the protective clothing
- Results are in minutes or hours
- Material types, thickness and substance concentration will affect the permeation rate

Personal Protective Equipment (PPE)

- Foot protection: boots

- Very important part of the protective equipment. Often, they are in direct contact with the chemical substances
- Always check permeation data
- Boots coated with materials having elastomeric properties should be worn during liquid spills (i.e. natural and synthetic rubbers)

Personal Protective Equipment (PPE)

- Hand protection: gloves

- Second most important part of the protective clothing
- Always check permeation data
- Wide range of gloves available:
  - Work gloves vs. chemical gloves
  - Resistance and fit important
  - Different materials :

Butyl
Natural rubber
Nitrile
PVA

Neoprene
PVC
Viton

Personal Protective Equipment (PPE)

- Head/face protection

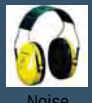
- Hard (physical protection) or soft hats (heat protection)
- Earplugs / ear defenders
- Safety glasses / face shields

Confined space

Eye

Increased eye protection

Splash



Noise

Personal Protective Equipment (PPE)

- Levels

Selection of proper level:

- Type of chemical
- Concentration
- Toxicity
- Exposure potential

North American system: 4 levels of protection

➡ Based on different levels of respiratory and skin protections

⚠ Different system in Europe: based on physical state of the substance

Personal Protective Equipment (PPE)

- Level A: maximum protection

When to use:

- Maximum protection for respiratory tract, skin and eyes
- Unknown exposure conditions (substance and concentration)
- Known product but requires a high level of protection for respiratory tract and skin

Required equipment:

- Self-Contained Breathing Apparatus (SCBA) (positive pressure)
- One piece fully encapsulating chemical resistant suit
- Boots and gloves resistant to chemicals
- Hard hat
- Two way communications

Personal Protective Equipment (PPE)

- Level B: intermediate protection

When to use:

- Maximum respiratory protection and some degree of skin protection are needed
- Ambient air composition is known but does not meet the criteria for air purifying respirators
- Concentration is at or above IDLH

Required equipment:

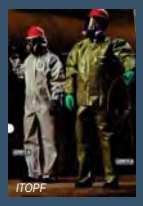
- Pressure demand SCBA
- Chemical-resistant suit
- Gloves (inner and outer)
- Boots and boots cover (disposable)
- Two way radio communications
- Hard hat
- Face shield

Personal Protective Equipment (PPE)

- Level C: intermediate protection

When to use:

- Chemical substances and concentrations are known
- Concentration is below IDLH
- Criteria for use of air purifying respirators are met
- Chemical substances in ambient air are not dangerous for the skin
- Oxygen concentration is at least 19.5%



Required equipment:

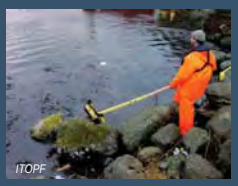
- Full face respirator
- Anti-splash suit
- Boots and gloves for chemical substances
- Hard hat
- Safety glasses or face shield

Personal Protective Equipment (PPE)

- Level D: minimum protection

When to use:

- Ambient air has no contaminants
- No exposure potential to any chemical
- Should not be used when there are hazards to: - Respiratory tract
  - Skin



Required equipment:

- Coveralls
- Boots/shoes
- Gloves
- Safety glasses
- Hard hat

Personal Protective Equipment (PPE)

To adapt as the situation changes

Reasons to upgrade

- Dermal hazards
- Gas or vapour emission
- Change in work task
- Request of the individual

Reasons to downgrade

- New information
- Change in site conditions
- Change in work task

Personal Protective Equipment (PPE)

- No universal materials
- Always take into account the highest potential risk
- Verify degradation and permeation data – always use the most conservative!
- High level of protection increases other risks

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Personal Protective Equipment (PPE)

PPE can inconvenience or disable the responder

- Claustrophobia
- Heat stress
- Rapid fatigue
- Impaired communication
- Limited vision
- Limited movement

➡ Response personnel should be monitored closely

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➡ Safety Plan and officer

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Safety Plan

- A Safety Plan must be developed for the response (includes all response activities)
- Establish requirements for protection of response team
- Contains safety information, instruction and procedures
- Periodically reviewed

Key elements of a Safety Plan:

- Evaluate potential hazards
- Implement essential safety requirements:
  - Establish site control
    (safety perimeter, work zones, evacuation)
  - Safety training / briefings
  - Equipment
  - Decontamination
- Reporting

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Health and safety officer

- Set up site Safety Plan
- Conduct risk assessment and Re-evaluate the risks periodically
- Ensure that health and safety procedures are in place
- Establish a medical response team
- Disseminate all useful information on the HNS
- Ensure all monitoring and detecting devices are available, calibrated and in working order

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➡ Work zones

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Work zones

The Safety Plan:

- Establish safety perimeter to:
  - Control site access
  - Avoid contamination of non protected personnel
- Establish work zones inside the perimeter to:
  - Avoid spreading contamination
  - Confine / help manage operations
  - Facilitate evacuation of personnel in case of emergency

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Work zones: 3 areas

Classification of work areas:

- Exclusion zone

Contaminated
Danger of exposure
Right protective equipment required

- Contamination reduction zone

Low or no contamination
Decontamination

- Support zone

No contamination
Command post and staging area

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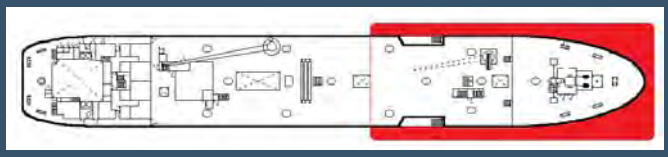
Work zones: 3 areas

Support Zone | Contamination Reduction Zone | Exclusion Zone



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➡ Decontamination

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Decontamination

➡ Removal or neutralisation of contaminant

IMPORTANT!!!!

But often overlooked…

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Decontamination

Methods of decontamination

- Physical methods
- Chemical methods

Examples

- Sorption
- Vacuuming
- Chemical alteration
- Dilution and washing
- Isolation and disposal

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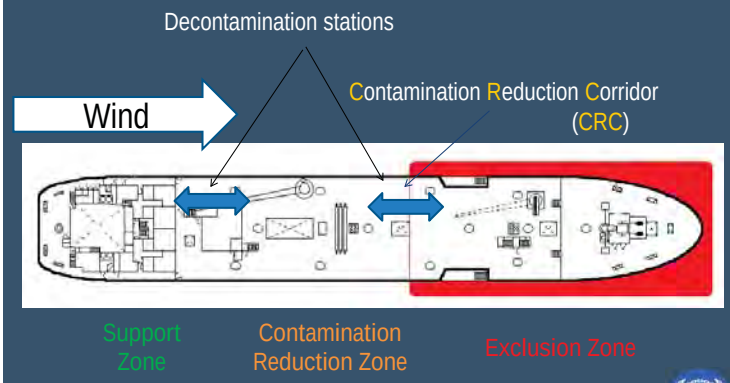
Decontamination

Decontamination Control Officer

- Determine the level and type of decontamination
- Supervise and operate the system
- Ensure correct PPE is worn
- Ensure PPE is available for replacement
- Organise the handling and removal of contaminated waste
- Organise handling and removal of contaminated equipment
- Control exit of personnel and equipment post incident
- Post incident clean up

- Flexibility

Decontamination

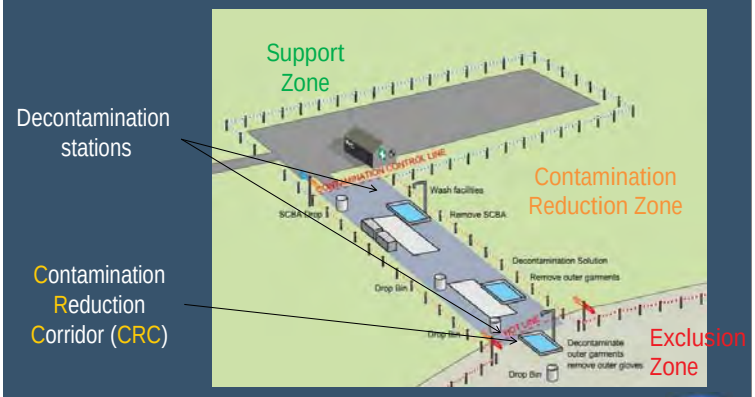


Decontamination

Contamination Reduction Corridor (CRC):

- Equipment
  - Water supply
  - Water sparying devices and pumps
  - Shower assembly
  - Eye wash stations
  - Brushes, etc…
  - Detergents
  - Absorbents
  - Drop bins
  - Rags, cloths, paper towels
- Containment and disposal of wash water
- Protective ground sheeting
- Segregate clean and contaminated material

Decontamination



Decontamination

Personnel/equipment decontamination – dos and don'ts

- Plan carefully
- Pay attention to where you put your hands and feet
- Buddy system for decontamination
- Don't sit down
- Don't lean against drums or debris
- Don't put equipment on the ground
- Be practical

➡ Other hazards

Do not forget… other risks!

Do not forget… other risks!

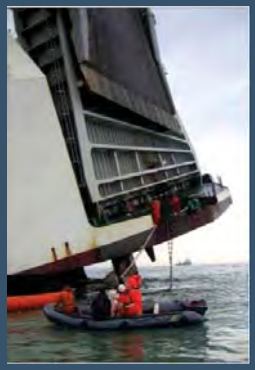
- Mechanical injury
- Adverse environmental conditions (heat, cold,…)
- Protection from wildlife
- Slips, trips and falls (know your work area for its hazards)
- Working near water (drowning)
- Inadequate training and awareness
- Fatigue

Take-home message

- Multiple hazards when responding to an HNS accident:
  - Physical
  - Chemical
  - Environmental
  - Wildlife
- Ensuring health and safety of people should be the utmost priority during an HNS accident reponse
- Health and safety good practices include:
  - Proper PPE
  - Training
  - Site control and supervision
  - Monitoring
  - No source of ignition
  - Personal awareness and responsability

➡ Are the following good working practices regarding health and safety?

What are the health and safety risks?



- Fumes / toxicity
- Fall from height

What is wrong with the pictures?

- No buoyancy aids

Anything that could be improved?

- Smoking next to flammable materials is not advised!
- Clean up crew does not have adequate PPE

Poor practice!

Thank you
Any questions?

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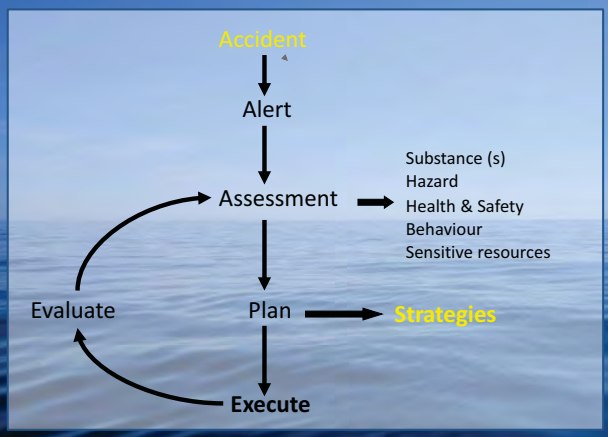
Chemical emergency response



Evaluation team

Place an evaluation team on-board

- Experienced personnel equipped with appropriate PPE
- Ascertain full status of the vessel
  - Cargo and disposition
  - Equipment and facilities on board
  - Measure gas levels
  - Operational status of machinery, etc
  - Carry out risk assessment and stabilise situation

Strategy planning

- Is a response necessary?
- What type of action needs to be taken?
- Is response action possible?
- Will response action need to be postponed?

- Actions on the vessel
- Actions on the cargo
- Action on the released HNS

Actions on the vessel

- Extinguish fire
- Reduce/contain fire
- Move vessel
- Scuttle vessel
- Monitor

ADAMANDAS, La Réunion Island, 2003

- Bulk carrier carrying 21,000 MT of de-oxidised iron ore balls
- Cargo re-oxidises in the presence of humidity
- Re-oxidization is a highly exothermic reaction and produces hydrogen
- Cargo hold temperature reached 300°C – Most of the crew evacuated.
- No inerting equipment available onboard or on the island
- Finally, ship was scuttled after evacuation of remaining crew

Actions on the vessel / cargo

- Fire-fighting
- Water is the most available fire-fighting agent but how will the cargo react with water?

The consequences must balanced against the risk

Actions on the vessel / cargo

- Lightering / Cargo removal
- May imply significant logistical issues

Response strategies – function of physical behaviour

Four Main Strategies

- Prevent further entry into the environment
- Forecasting trajectory of spill plume
- Monitor
- Active response / combat spill

Selection of appropriate strategy must be based on the behaviour of the spilled product

- Evaporators/gas
- Dissolvers
- Floaters
- Sinkers

Evaporators & Gases – Response strategies

Prevent further entry into the environment - Lightering of containers, plugging of holes, reducing pressure in cargo tanks

- First and best option
- Difficult and may be unsafe or not possible

Monitoring the plume - Evaluate presence and concentration of contaminants in air

- Most important is protection of responders and population
- Monitor oxygen levels, flammability and toxic levels
- Use real time monitoring and trained personnel
- Equipment:
  Multi gas detectors, explosimeter, PID, FID, colorimetric tubes, GC, etc..

Evaporators & Gases – Response strategies

Monitoring

Portable equipment: Multi gas detectors, explosimeter, PID, FID, colorimetric (dräger) tubes, GC, etc...

Colorimetric Tubes

Flame Ionization Detector (FID)

Gas meters

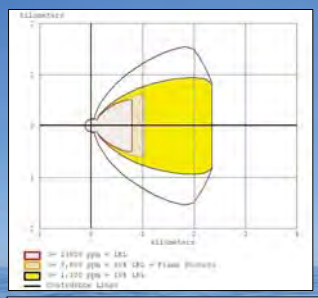
Photo-ionization Detector (PID)

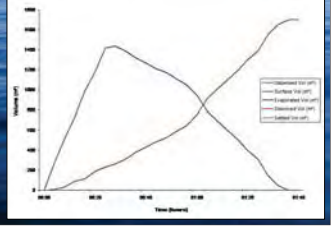
Evaporators & Gases – Response strategies

Trajectory modelling

- based on wind speed, direction and atmospheric conditions
- Weather forecast models
- E.g. ALOHA (NOAA U.S.)

- Models – only a guide
- They depend on accuracy of input data
- Skill of model user
- Validity of model

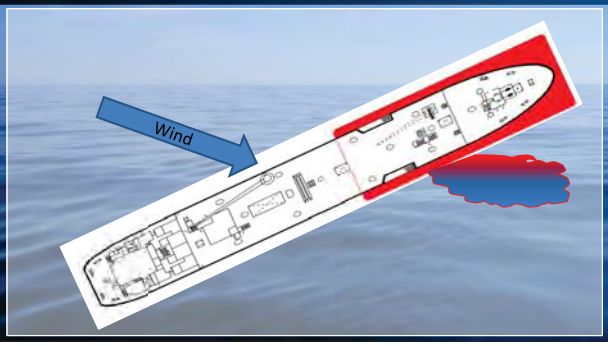




Evaporators & Gases – Response strategies

Recovery - Is containment possible? Probably not..

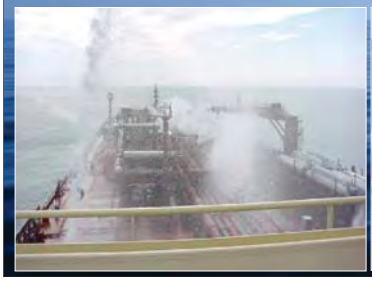
Steer gas cloud away from people/population – may be possible to manoeuvre vessel so that gas moves away from important areas



Evaporators & Gases – Response strategies

Vapour release

- manoeuvre vessel, if possible
- eliminate ignition sources
- generate water mists to knock down vapours



Evaporators & Gases – Evacuate

Evacuate when:

- There is time to relocate people
- Personnel are sufficiently far downwind to permit evacuation
- The release is expected to be over a prolonged period of time
- A fire has also occurred, which may get out of control
- People are threatened by a future wind shift

Evaporators & Gases – Shelter

Shelter-in-place when:

- There is no time to evacuate
- The release is short-term
- Weather changes are difficult to predict
- Personnel may be injured during the evacuation

Floaters – Response strategies

Prevent further entry into the environment?

- Controlling list of vessel
- Internal tank transfer

Floaters – Response strategies

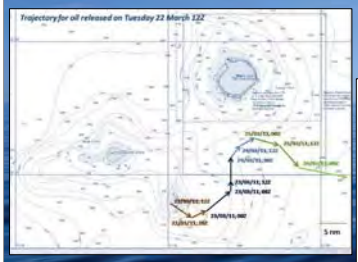
Monitoring the slick – Very similar to oil spill response

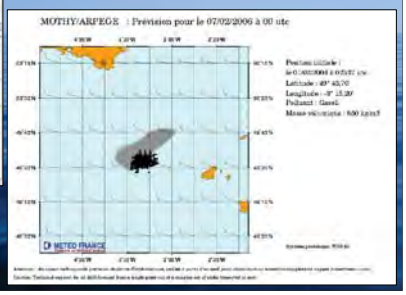
- Aerial detection using trained observers, SLAR, Infra-red
- Is the spilled substance visible? Many chemicals are colourless.

Floaters – Response strategies

Trajectory (slick) modelling

Estimate movement & likely resources to be impacted based on winds speed (3%) and current (100%)

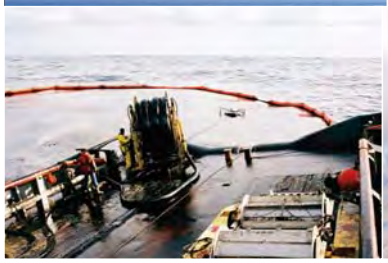




Floaters – Response strategies

Containement and recovery

- Can spill be safely contained?
- Booms may be suitable, but need to ensure containment does not increase risk – Increase of concentration!



Floaters – Response strategies

- Bubble barriers may also be used
- Use of foam can reduce vapours & flammability
- But think about recovery – use of skimmers, pumps or sorbents? Intrinsically safe?

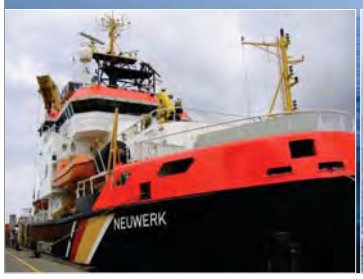
Floaters – Response strategies

- Floaters include floating containers
- Need offshore response units / tugs

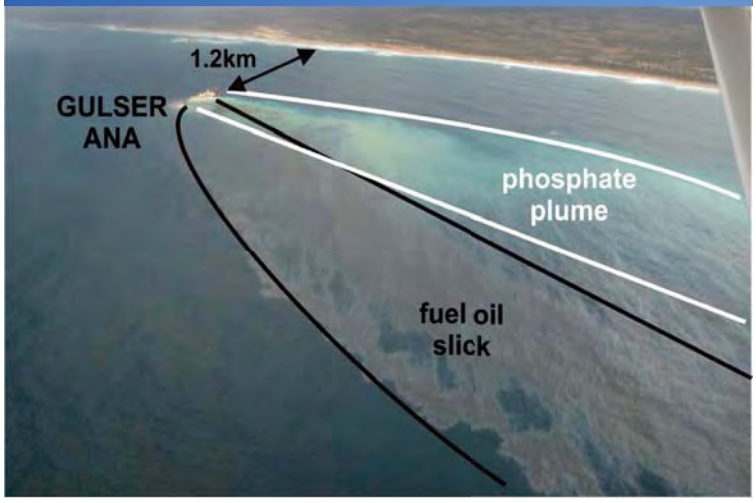
Floaters – Specialised vessels

Specialised vessels

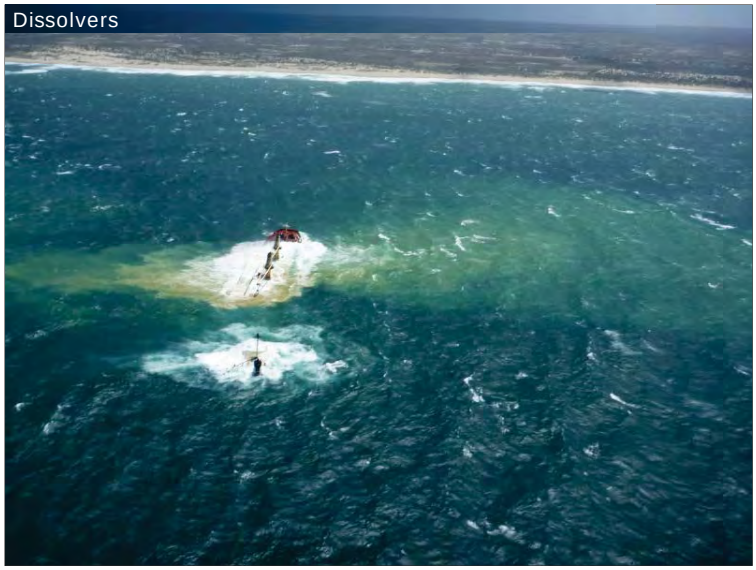
- Gas-protected multipurpose vessels
- Bridge & accommodation with positive pressure
- Anti-spark systems
- Sampling of air and water and in situ monitoring of the atmosphere (quantifying and qualifying).



Fuel oil and Cargo Release



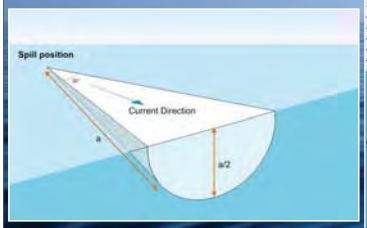
Dissolvers

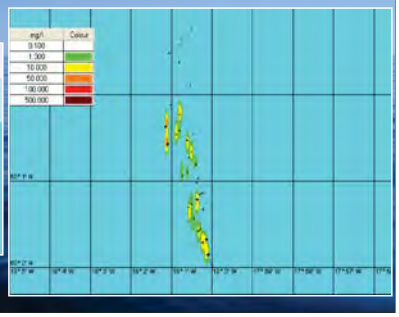


Dissolvers – Response strategies

Trajectory modelling

- Sub-surface modelling with concentration gradient
- 3D plume, complex system / 2D graphical output
- Need detailed knowledge of local currents, weather





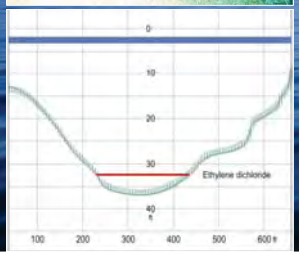
Dissolvers – Response strategies

Monitoring

- Few real time field measurements (pH, O_2)
- Mainly water and biota samples analyzed in lab
- Important to track spread so can identify possible hazards to resources (esp. fisheries, water intakes, recreational areas)
- Knowledge of background concentrations

Sinkers – Response strategies

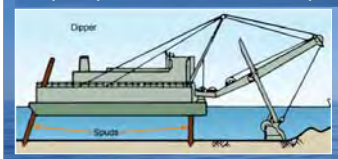
Difficult to accurately locate – use divers, ROV, Sonar, echo sounders to locate pools on seabed

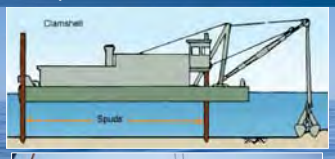


Sinkers – Response strategies

Recovery; possible with:

- Dredges (mechanical, hydraulic, pneumatic)
- Crane – particularly containers
- Problems: spreading of contaminant, Material compatibility (hoses, pumps, diver's suits, etc..), wastes & disposal



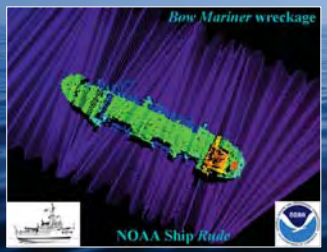


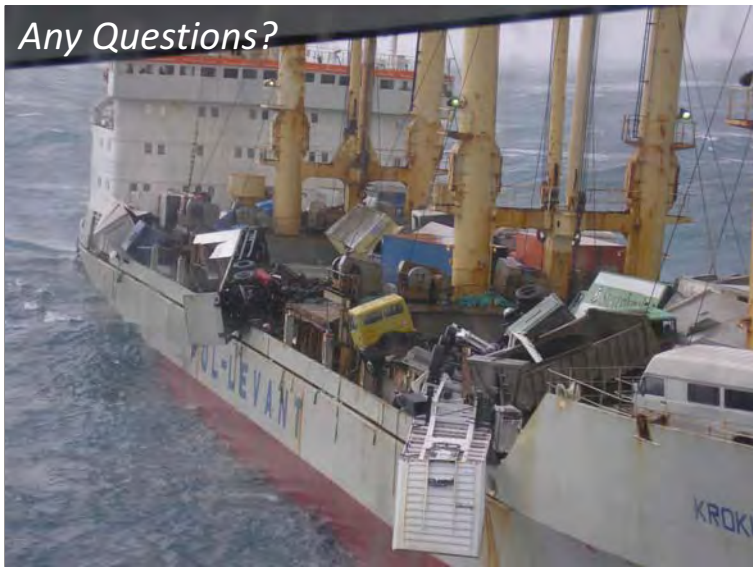
Wrecks – Response strategies

Dealing with chemicals still in sunken wrecks

Risk assessment

- Leave alone: passive release if unlikely to result in significant damage
- Controlled release: dissolvers unlikely to cause widespread damage
- Cargo removal: substances raising high concerns / potential damage to human health / the environment / economic activities




Any Questions?

Contingency Planning for HNS

Dr. Camille Lacroix
Cedre Research Department

HNS training
SACEP regional workshop,
Malé, Maldives, 23rd August 2016

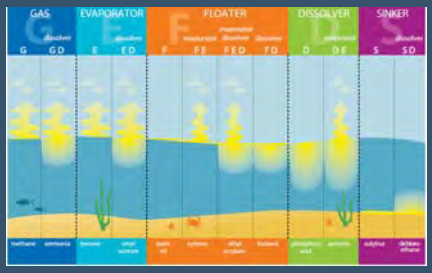
Objective and overview

➡ To present what is contingency planning and its importance in the context of HNS incident
To describe the main elements of a contingency plan

- Purpose of a contingency plan
- Plan types and levels
- Main stages of contingency planning
- Key components of a plan

➡ Purpose of a contingency plan

Reminder: HNS vs. Oil spills



Reminder: HNS vs. Oil spills

- Despite similarities, differences with oil spills

Which means…

- Different knowledge-requirement, approach, protective and response equipment and decontamination needs
- Different set of skills and expertise
- Rapid risk assessment is crucial

➡ Specific prevention, preparedness and response for HNS spills

What is a contingency plan?

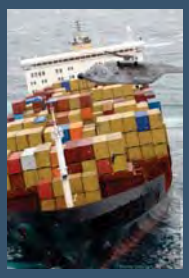
- Methodology to be adopted in the event of an accident
- Aim: respond promptly and effectively
  to protect people / goods / environment
- Crucial points: risks
  stakeholders
  equipment
  actions to be taken
  training

Hartmann

Why have a contingency plan?

- To provide the policy and response framework for the organisation(s) that will be involved
- To develop a complex response in a calm, non-emergency environment free from pressures and agreed by all
- To fulfill the requirements of:

  - Company policy
  - National laws
  - International agreements



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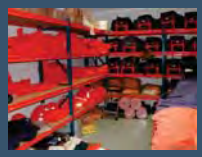
Why have a contingency plan?

Other reasons…



- Because resources are limited:
  maximise options, capabilities and efficiency
  minimise cost and improve cost recovery
- Because many people can be involved:
  need to define roles and responsabilities

- Can reduce environmental damage
- Because Plan helps to build confidence

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➡ Plan types and levels

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Plan types and levels

- Local:
  - Oil terminals; oil platforms; ships
  - Ports
- Regional:
  - Province/region
  - Industry mutual aid agreement
- National:
  - Entire national coastline

- International:
  - co-operation agreement between countries

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Tiered response concept

- Importance of having a CP at different levels ackowledged under a regulatory framework

  ➡ Traditionnal approach: 3 tiered response

- Function of the size of the spill: small / medium / large

- Function of the scale of the area affected: local / vicinity / remote

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Tiered response concept

- Tier 1: Local resources: rapid response within own capabilities
  Local « oil pollution emergency plan »

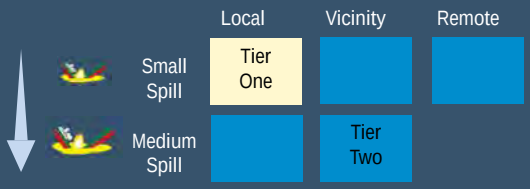
e.g. bunkering operations; ship transfer

	Local
Small Spill	Tier One

12

Tiered response concept

- Tier 2: Local plus some external resources
  Area plans or industry mutual help plans
  Pooled resources



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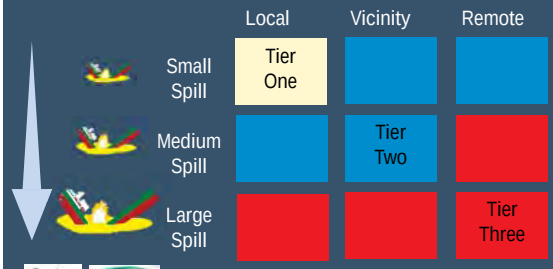
Tiered response concept

- Tier 3: for spills of national interest
  National contingency plan
  International cooperation



14

Responsability for preparedness and response

- Lead agency

Overall responsability for preparedness and response to spills

- Other agencies

Different agencies responsible for specific aspects (e.g. salvage, monitoring, fisheries, ...)

- Industry

Co-operation

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➡ Main stages of contingency planning

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Development of contingency planning

Key steps of contingency planning

1. Gathering information
2. Development of a strategy
3. Implementation of the plan (actions)

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Information gathering

- Description of the area
- Risk assessment :
  - Spill experience
  - Pollution sources
  - Potential pollutants
  - Potential size
  - Scenarios
- Resources at risk
  - Sensitivity mapping
- International and regional agreement

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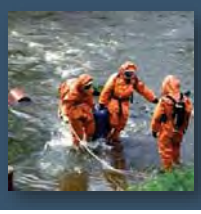
Strategy development

- Response objectives and priorities
- Response strategies
- Emergency procedures
- Other procedures
- Co-operation agreements

Strategy development

- Emergency procedures
  - Alert, evaluation and immediate action
  - Reponse organisation (tiered approach)
  - Communication
  - Survey / assessment
  - Health and safety
  - Equipment



Strategy development

- Other procedures
  - Record keeping/archives
  - Waste management
  - Post-crisis management
  - Feedback/plan updating
  - Assessment of impacts/financial and legal aspects

Implementation of the Plan

- Procurement of expertise and equipment
- Drafting of the Plan
- Training and exercising
  ⇒ the only key to get an operational CP and aware staff
- Reviewing and up-dating of the Plan

➡ Continuous improvement of the Plan

➡ Key components of a Plan

Key components of a plan

Part 1: Policy or strategy section
- What do you want to do
- Legal framework

Part 2: Operations section
- How are you going to do it?

Part 3: Ressources/contacts/data section
- Who and what have you got to help?

Contact list
(where is it and is it up to date?)

Part 1: Policy section

- Scope of the plan
- Geographical area addressed in the plan
- Roles and responsabilities
- Domestic, regional and international agreements
- Risk of a spill
- Resources at risk
- Priorities for protection
- Response strategies
- Media relations plan
- Training and exercises

Part 2: Operations

- Operational procedures
  - Notification and reporting procedures
  - Initial actions (e.g. alert)
  - Response actions (water/shoreline)
  - Response evaluation
  - Communication plan
  - Termination
- Technical Guidelines
  - Spill assessment/monitoring and surveillance
  - Trajectory/dispersion/behaviour modelling guidelines
  - Collection and handling of samples
  - Transport and disposal of recovered products
  - Environmental monitoring
  - Public health considerations

Part 3: Data Directory

- Sensitivity maps
- List of contact points
- Lists of equipment available
- Lists of manpower resources
- Lists of relevant MSDS databases
- Data: weather and currents
- Contingency Plan distribution list

Is your Plan Adequate?

Are:

- Risks well assessed?
- Priorities and techniques for response pre-agreed?
- Roles and responsabilities of all clearly defined?
- Correct PPE available?
- Sufficient resources and back-up options identified?
- Waste storage and final disposal sites identified?
- Notification and mobilisation procedure clear?
- Arrangements for communications described?
- All aspects of the plan fully tested regularly?

Take-home message

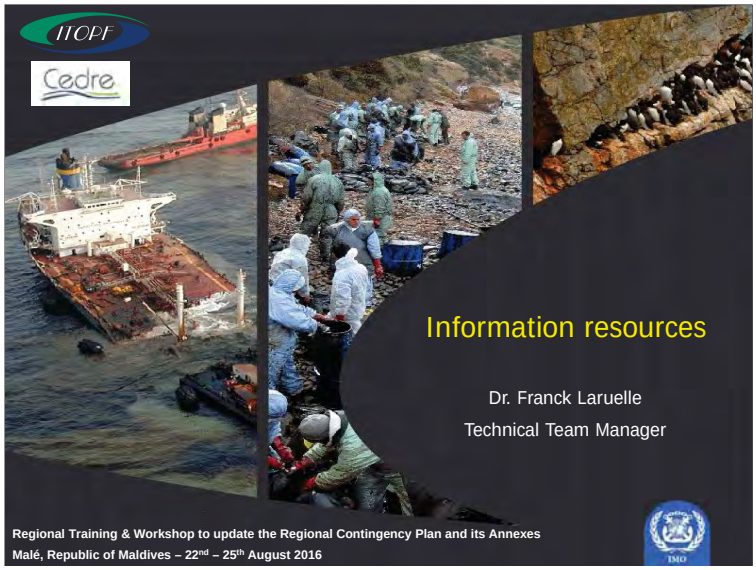
- Careful planning is essential for a successful operation

Failing to plan is planning to fail!

- In order to be efficient, a CP must be:

1. Operational => concise and complete
2. Known, understood and agreed by all users
3. Tested, reviewed and upgraded regularly

camille.lacroix@cedre.fr
contact@cedre.fr



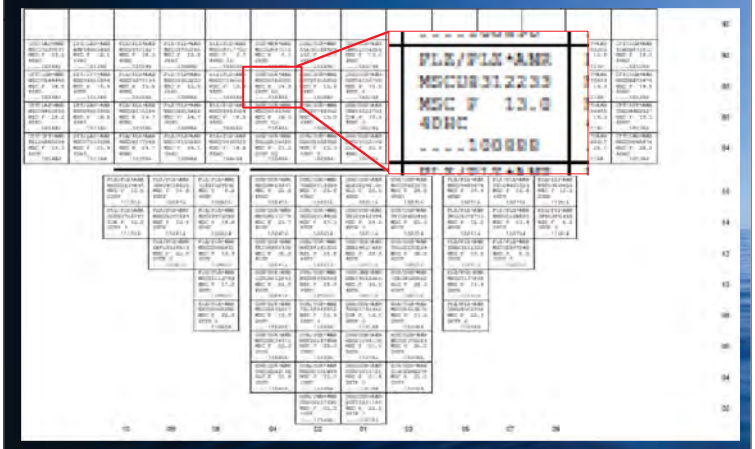
Objectives

- Find the sources of information
- Identify and interpret the available information
- Use these sources in the assessment of the HNS incident
- Introduction to a few models

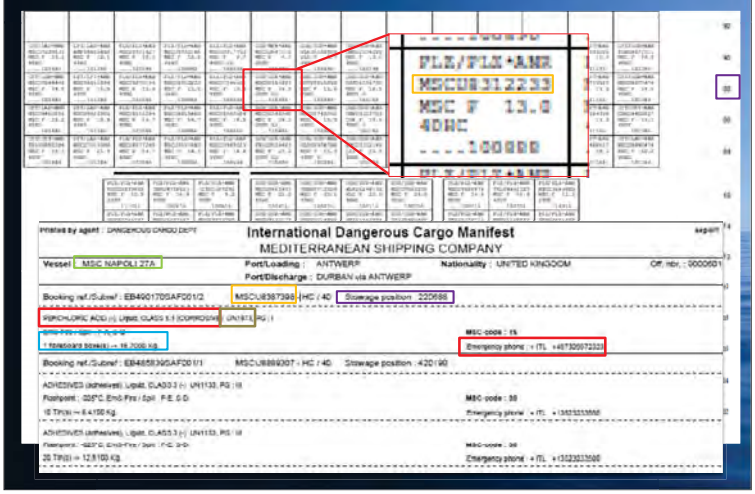
Information Needed for a HNS Response

1- Products identification & quantity	• Cargo Manifest • UN/CAS number
2- Products characteristics	• MSDS • Manufacturer
3- Fate, Behaviour & Hazards of products	• Internet websites (NIOSH, CHEMSIS) • Guidebooks (ERG, IMDG Code) • Software (CAMEO)
4- Sensitivities	• GESAMP

1- Product Identification- Cargo Manifest / stowage plan



1- Product Identification- Cargo Manifest



1- Products Identification

Keep in mind that a single product can have multiple names (synonymy, different languages, nomenclatures, etc…)

- **Formal identification**: **CAS Number**

Number registry by Chemical Abstracts Service
Each compound has a UNIQUE CAS number.
CAS Registry identifies more than 67 million organic and inorganic substances

CAS Sodium Hydroxide: 1310-73-2

1- Products Identification

- **Formal identification: CAS Number**

Number registry by Chemical Abstracts Service
Each compound has a UNIQUE CAS number.

- **Relative identification: UN Number**

UN0004 to UN3506 assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods .

- Some hazardous substances have their own UN numbers
- Different substances with similar properties can share the same UN number.
  all flammable liquids, not otherwise specified, have UN1993

1- Products Identification

- **Formal identification: CAS Number**

Number registry by Chemical Abstracts Service
Each compound has a UNIQUE CAS number.

- **Relative identification: UN Number**

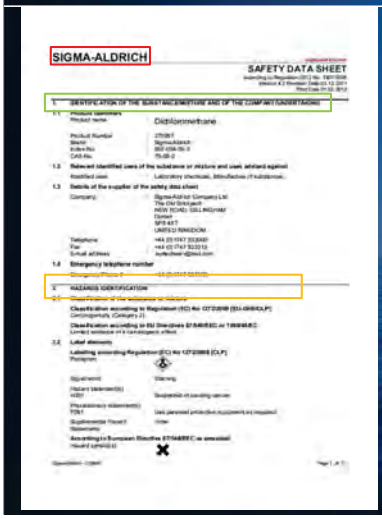
UN0004 to UN3506 assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods .

- A chemical in its solid state may receive a different UN number than the liquid phase if their hazardous properties differ significantly

UN 1823 Sodium hydroxide, **solid** UN 1824 Sodium hydroxide **solution**

BUT CAS Sodium Hydroxide: 1310-73-2

2- Product Characteristics- MSDS


SIGMA-ALDRICH

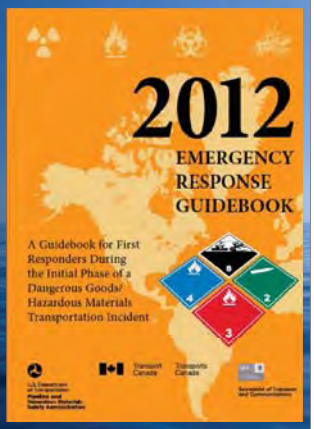
SAFETY DATA SHEET

Dichloromethane

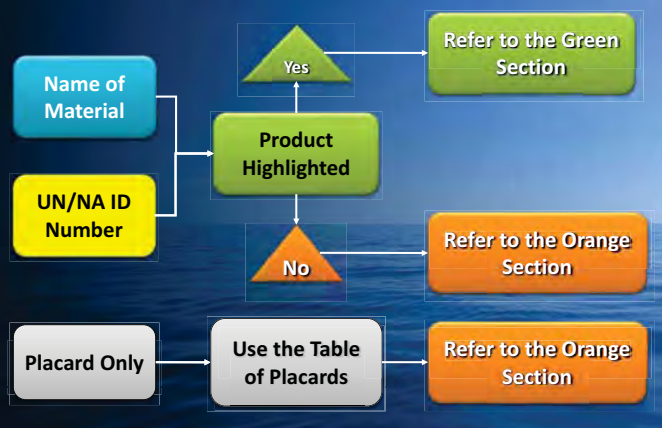
1. Identification
2. Hazard(s) identification
3. Composition/ingredients
4. First-aid measures
5. Fire-fighting measures
6. Accidental release measures
7. Handling & storage
8. Exposure controls/personal protection
9. Physical & chemical properties
10. Stability & reactivity
11. Toxicological information
12. Ecological information
13. Disposal considerations
14. Transport information
15. Regulatory information
16. Other information

3- Fate, Behaviour & Hazards- Guidebook ERG

- Intended for first responders
- Generally useful for the first 10-30 minutes of an incident
- Gives non specific advice on response
- Developed by the Dept. of Transportation (Canada)
- Outlines hazard information as well as *initial actions* to be taken at HAZMAT incidents



3- Guidebook ERG- How to use it?



Otherwise, Guide 111, until the product has been identified

3- Guidebook ERG- Identification by Material Name

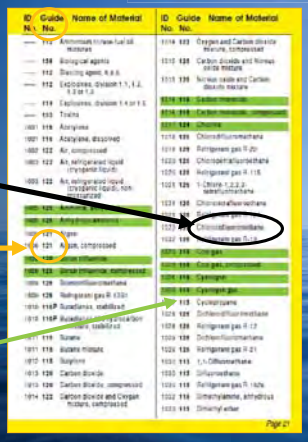
Blue Section

- Lists the material names in alphabetical order
- Contains the following information:
  - UN/NA ID number
  - **Guide number** assigned to the material (go to the orange section)
  - **Highlighted chemicals** are a poison or inhalation poison risk

3- Guidebook ERG- Identification by UN ID Number

Yellow Section

- Lists the UN/NA ID numbers in numerical order from 1001 to 9279
- Contains the following information:
  - **Material name** used in shipping
  - **Guide number** assigned to the product (go to the orange section)
  - **Highlighted chemicals** are a poison or inhalation poison risk



3- Guidebook ERG- Identification by Placard

White Section

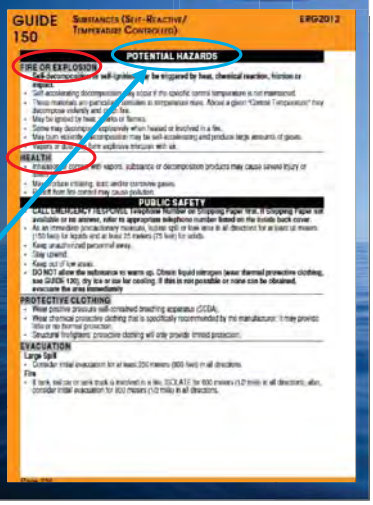
- Table of placards (beginning of the ERG)
- White pages provide additional information such as guidebook instructions and definitions
- To use ONLY if no ID number/material name visible or known
  - Match the placard on the vehicle to one in the table and reference the guide number
  - **Guide number** assigned to the placard (go to the orange section)

3- Guidebook ERG- Initial Actions

Orange Section

- Identifies the most significant hazards
- Informs first responders of initial actions to be taken to protect from immediate hazards
- Use when the entry in the yellow or blue section is NOT highlighted
- Contains the following information:
  - Potential Hazards: Health and fire/explosion hazards

The hazard listed first represents the most serious danger



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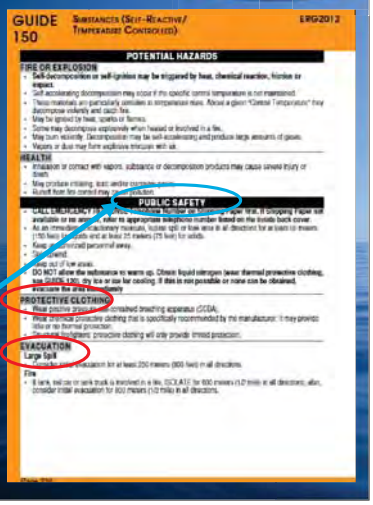
  - Public Safety: Protective clothing and evacuation information



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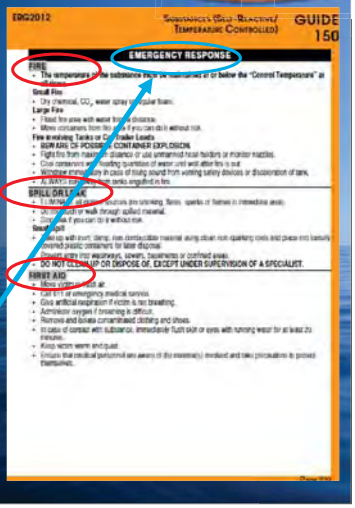
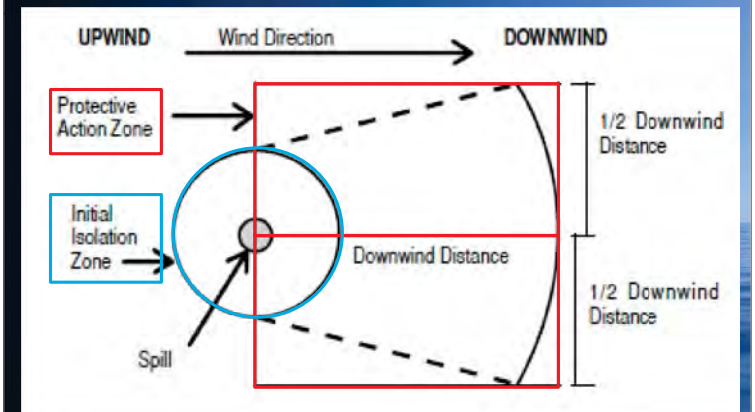
- Use when the entry in the yellow or blue section is NOT highlighted
- Contains the following information:
  - Potential Hazards: Health and fire/explosion hazards
  - Public Safety: Protective clothing and evacuation information
  - Emergency Response: Fire, spill or leak and first aid information



3-Initial Isolation & Protective Distances

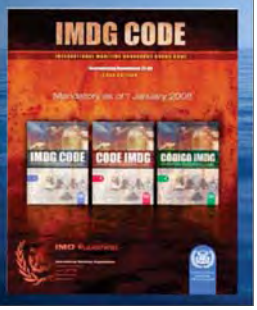


3- Further Hazard Information- IMDG Code

IMDG Code is intended to protect crew members but can also be used by all those connected with shipping and to prevent marine pollution in the safe transportation of hazardous materials by vessel.

What is in the Code?

- Recommendations for individual substances materials and articles
- Recommendations for good operational practice including advice on terminology, packing, labelling, stowage, segregation and handling, and emergency response action.



3- Further Hazard Information- IMDG Code, Part 3

UN No.	Proper Shipping Name (PSN)	Class or division	Subsidiary risk(s)	Packing group	Special provisions
(1)	(2) 3.1.2	(3) 2.0	(4) 2.0	(5) 2.0.1.3	(6) 3.3
2505	AMMONIUM FLUORIDE	6.1	-	III	-

3- Further Hazard Information- IMDG Code, Part 3

Stowage and segregation	Properties and observations
(16) 7.1 7.2	(17)
Category A. "Separated from" acids.	Colourless crystals or powder with an ammonia-like odour. Readily soluble in water. Decomposes in contact with acids, evolving hydrogen fluoride, a corrosive gas. Toxic if swallowed, by skin contact or by dust inhalation.

3- Further Hazard Information- IMDG Code, EmS (Supplement)

EmS is the Emergency Response Procedures for ships carrying dangerous goods

The EmS Guide – Index

Each current UN substance identification number (UN Number) is allocated to EmS Fire and Spillage Schedules as shown below:

UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill	UN No.	EmS Fire	EmS Spill
0004	F-B	S-Y	0078	F-B	S-Y	0167	F-B	S-X
0005	F-B	S-X	0079	F-B	S-Y	0168	F-B	S-X
0006	F-B	S-X	0081	F-B	S-Y	0169	F-B	S-X
0007	F-B	S-X	0082	F-B	S-Y	0171	F-B	S-X
0009	F-B	S-X	0083	F-B	S-Y	0173	F-B	S-X

3- Further Hazard Information- IMDG Code, EmS (Supplement)

SPILLAGE SCHEDULE Foxtrot

S–F

WATER-SOLUBLE MARINE POLLUTANTS

General comments		Wear suitable protective clothing and self-contained breathing apparatus. Stop leak if practicable. Substances covered under this schedule will present a hazard to the marine environment. Try to avoid disposal overboard. The use of inert absorbent material, as used in machinery spaces, is appropriate in all cases. For sticky liquids, shovels may be used. Discharge of spilled substance overboard will damage the marine environment, including living resources of the sea. In this case, contact coastal authorities. Report discharge overboard according to MARPOL reporting requirements.
Spillage on deck	Packages (small spillage)	*Liquid:* Smother spillage with inert absorbent material. Collect spillage in oil drums, metal boxes or salvage packagings. *Solid:* Collect material.
	Cargo Transport Units (large spillage)	Restrict flow of leakage to an enclosed area (e.g., by barricading with inert material or cement if available). *Liquid:* Collect spillage in empty tanks, oil drums, metal boxes or salvage packagings. You may use inert absorbent material. *Solid:* Collect spillage in oil drums or metal boxes.
Spillage under deck	Packages (small spillage)	*Liquid:* Smother spillage with inert absorbent material. Collect spillage in oil drums, metal boxes or salvage packagings. *Solid:* Collect material.
	Cargo Transport Units (large spillage)	Restrict flow of leakage to an enclosed area (e.g., by barricading with inert material or cement if available). *Liquid:* Collect spillage in empty tanks, oil drums, metal boxes or salvage packagings. You may use inert absorbent material. *Solid:* Collect spillage in oil drums or metal boxes. Otherwise, wash down to the bottom of the hold. Use copious quantities of water. Treat effluent according to Shipboard Oil Pollution Emergency Plan.

Special cases: None.

3- Software- CAMEO & ALOHA

Directly on the web or to be downloaded on a computer

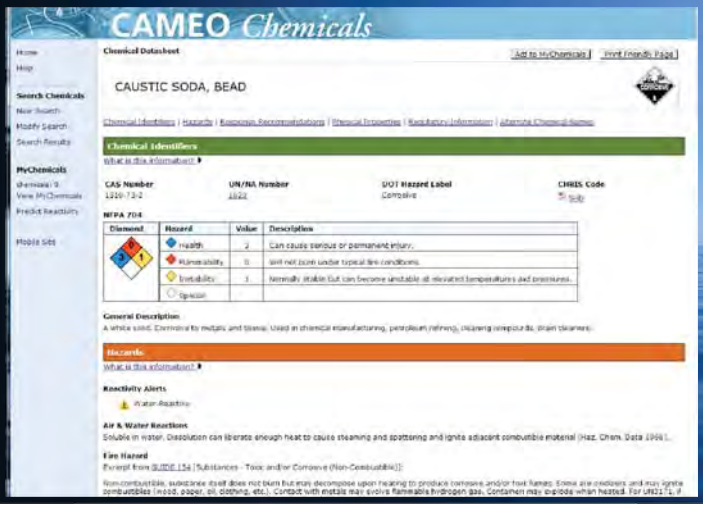
Provides:

- Detailed response information
- Chemical hazard assessment
- PPE compatibility data
- Plume modelling

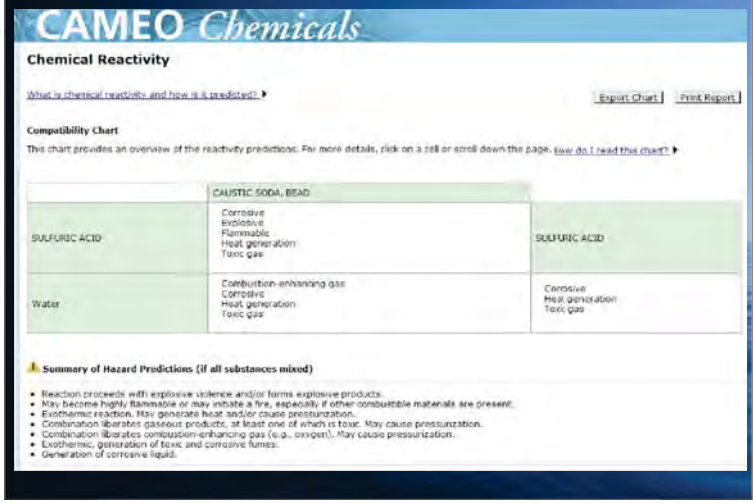
EPA United States Environmental Protection Agency

Computer-Aided Management of Emergency Operations (CAMEO®)

3- Software- CAMEO



3- Software- CAMEO- Reactivity



3- Software- CAMEO- Reactivity

3- Software- ALOHA

- ALOHA (Areal Locations of Hazardous Atmospheres) models chemical releases and estimate how a toxic cloud might disperse after a chemical release with a threat zone

The threat zone is an area where a hazard (such as toxicity, flammability, thermal radiation, or damaging overpressure) has exceeded a user-specified Level of Concern (LOC).

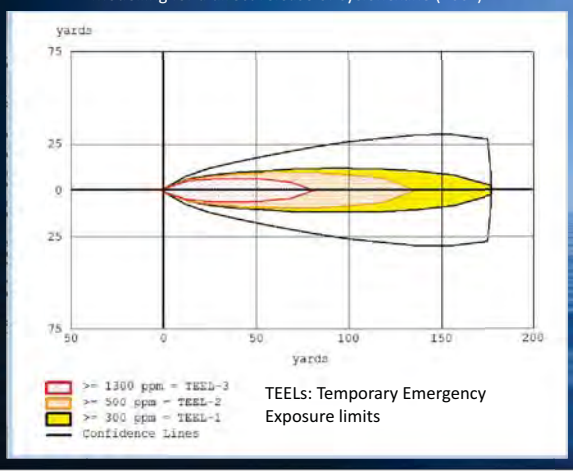
- Calculate how quickly chemicals are escaping from tanks, puddles and gas pipelines

- Predict how that release rate changes over time.

- A trained operator is necessary to use this tool to ensure that the results are as reliable as possible.

3- Software- ALOHA

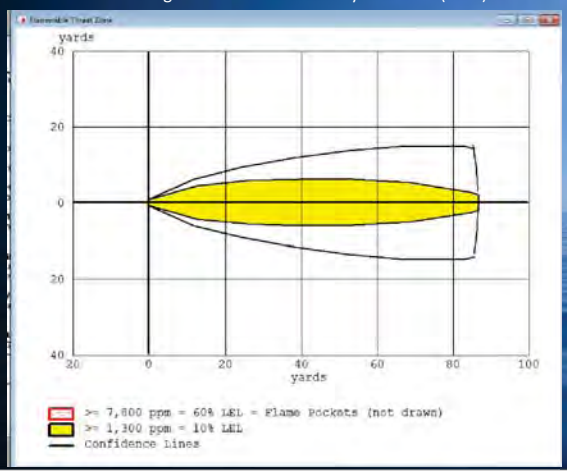
Modelling for a direct release of cyclohexane (100L)



TEELs: Temporary Emergency Exposure limits

3- Software- ALOHA

Modelling for a direct release of cyclohexane (100L)



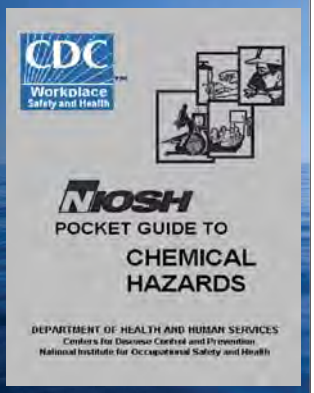
3- Websites- NIOSH

• http://www.cdc.gov/niosh/npg/ (downloadable or available on CD or hard copy)

• Source of general industrial hygiene information on several hundred chemicals/classes for workers, employers, and occupational health professionals.

• The guide presents key information and data in abbreviated or tabular form for chemicals or substance groupings (e.g. cyanides, fluorides, manganese compounds) that are found in the work environment.

• Available to download on line



3- Websites- NIOSH - what's inside?

DOT are UN Number

Sodium hydroxide	Formula: NaOH	CAS#: 1310-73-2	RTECS#: WB4900000	IDLH: 10 mg/m³
Conversion:	DOT: 1823 154 (dry, solid); 1824 154 (solution)			
Synonyms/Trade Names: Caustic soda, Lye, Soda lye, Sodium hydrate				
Exposure Limits: NIOSH REL: C 2 mg/m³ OSHA PEL†: TWA 2 mg/m³				**Measurement Methods (see Table 1):** NIOSH 7401
Physical Description: Colorless to white, odorless solid (flakes, beads, granular form).				

Chemical & Physical Properties:
MW: 40.0
BP: 2534°F
Sol: 111%
FLP: NA
IP: NA
Sp.Gr: 2.13
VP: 0 mmHg (approx)
MLT: 605°F
UEL: NA
LEL: NA
Noncombustible Solid, but when in contact with water may generate sufficient heat to ignite combustible materials.

Personal Protection/Sanitation (see Table 2):
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contam
Remove: When wet or contam
Change: Daily
Provide: Eyewash
Quick drench

Respirator Recommendations (see Tables 3 and 4):
NIOSH/OSHA
10 mg/m³: Sa:CfE/100F/PaprHieE/ ScbaF/SaF
§: ScbaF:Pd,Pp/SaF:Pd,Pp:AScba
Escape: 100F/ScbaE

Incompatibilities and Reactivities: Water; acids; flammable liquids; organic halogens; metals such as aluminum, tin & zinc; nitromethane [Note: Corrosive to metals.]

Exposure Routes, Symptoms, Target Organs (see Table 5):
ER: Inh, Ing, Con
SY: Irrit eyes, skin, muc memb; pneu; eye, skin burns; temporary loss of hair
TO: Eyes, skin, resp sys

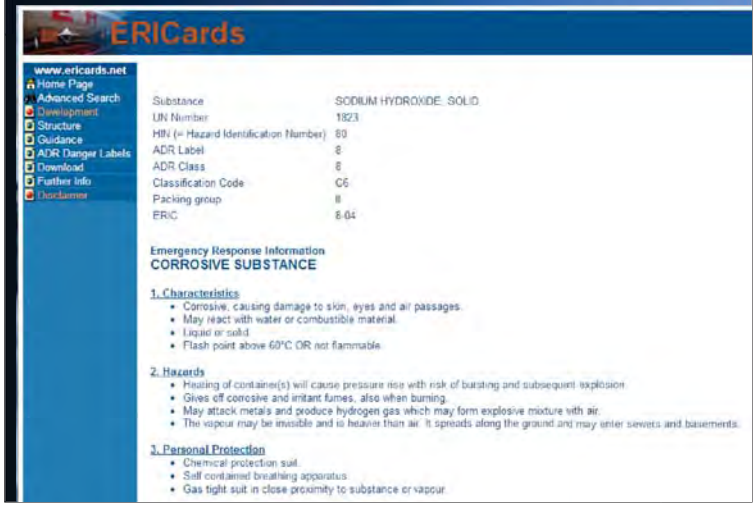
First Aid (see Table 6):
Eye: Irr immed
Skin: Water flush immed
Breath: Resp support
Swallow: Medical attention immed

3- Websites- ICSC

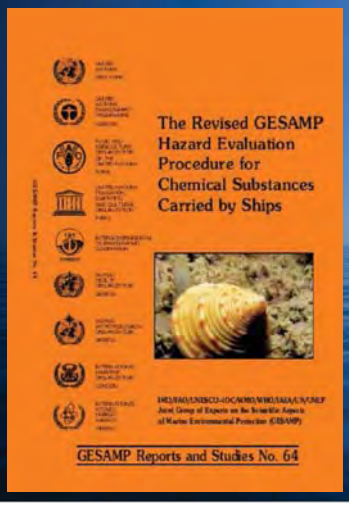
• International Chemical Safety Cards summarize essential health and safety information on chemical substances

• 1,700 Cards are available

3- Websites- CEFIC ERICARDS (Emergency Response Intervention Cards)



4- Sensitivities- GESAMP



4- Sensitivities- GESAMP

A & B Aquatic environment
A 1: Bioaccumulation
A 2: Biodegradation

B 1: Acute Toxicity
B 2: Chronic Toxicity

C&D Human Health (Toxic Effects to Mammals)
C1-C3 Acute Mammalian Toxicity
D1-D3: Irritation, Corrosion & Long term health effects

E Interference with other uses of the sea
E1: Tainting
E 2 Physical effects on Wildlife & benthic habitats
E3: Interference with Coastal Amenities

Rate the different categories from 1 (low sensitivity) to up to 6 (very high sensitivity)

EHS Name / TRN Name	EHS TRN	A1a	A1b	A1	A2	B1	B2	C1	C2	C3	D1	D2	D3	E1	E2	E3
Acetic acid	13	0		0	0	R	1	Ni	1	1	1	3C	3			D 3
Acetic acid	64		RTECS No	AF1225000						CAS No	64-19-7					

Some Sources Of Information

Electronically

- NIOSH
- ERICARDS (CEFIC)
- WISER
- International Safety Cards
- Chemdata
- CAMEO
- ALOHA
- TOXNET
- CEDRE
- CHEMMAP
- NCEC
- TROCS (REMPEC)
- INERIS
- GESAMP

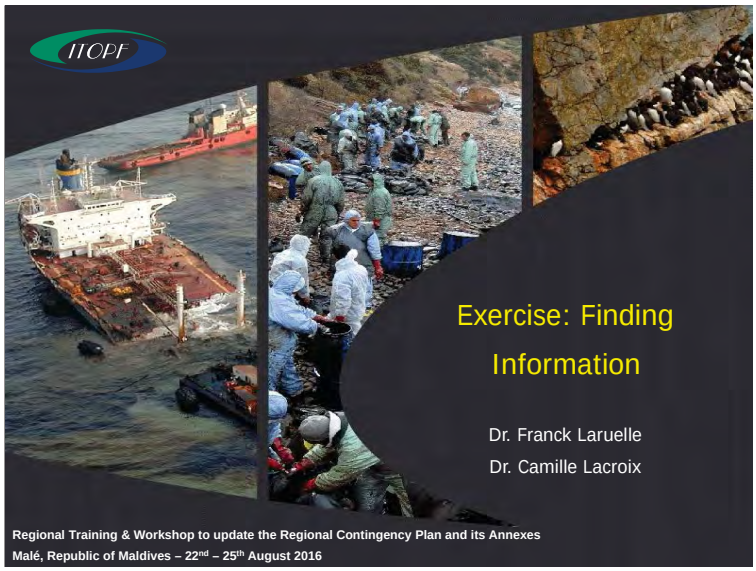
Verbally

- Anti-Poison Centre's
- Manufacturers

Summary

- Know which sources of information are available to you and your organisation
  - Ship cargo manifest
  - Product manufacturer
  - IMO codes
  - Own databases or free access databases
- Understand the benefits of different types of resources
- Train staff to use and interpret these information
- Better not to rely on a single source when possible

Exercise: finding information for five products



Find Information on....

Find information on the following 5 products

Its UN Number, appearance form, chemical and physical properties, GESAMP profile, PPE required, main issues...

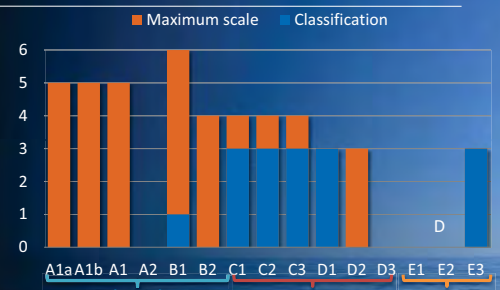
1.Phosphoric acid
2. Ammonia
3. Styrene
4. Epichlorhydrin
5. Dimethyl disulfide

PHOSPHORIC ACID

Phosphoric acid (UN 1805):
- Used in making fertilizers and detergents and in food processing
- Corrosive to metal and tissues (Class 8)
- MARPOL category Z
- Not inflammable
- Stable

• Appearance Form:	Clear colourless liquid or transparent crystalline solid
• Flash point:	Not flammable
• Upper explosion limit:	Not flammable
• Lower explosion limit:	Not flammable
• Vapour pressure:	0.4 mmHg at 20 °C
• Vapour density:	3.24
• Relative density:	1.89 g/cm^3
• Water solubility:	totally miscible

PHOSPHORIC ACID- GESAMP



- Dissolver
- Soluble
- Relatively high toxicity through ingestion, skin contact or inhalation by mammals
- Severely irritating the skin and eyes
- Heat release if water poured on concentrated acid
- Does not bioaccumulate
- High objectionable, closure of amenity

PHOSPHORIC ACID

GUIDE 154
PPE:
HAZMAT suit
Safety goggles
Face shield
Chemical resistant gloves (recommended gloves: LLDPE (linear low density polyethylene)
Coveralls
Boots

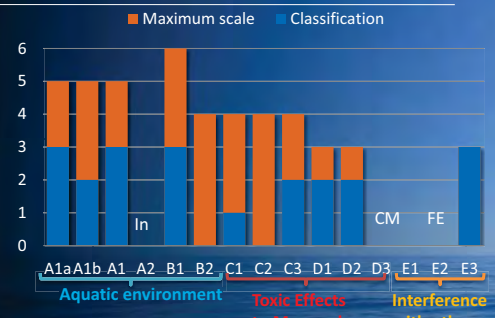
Main issues:
- Corrosive

STYRENE

Styrene (UN 2055):
- Used to make paints, plastics and synthetic rubbers
- MARPOL classification Y
- Highly flammable
- Vapour heavier than air
- Subject to polymerisation
- Floater
- Harmful

• Appearance Form:	Clear colourless to dark liquid
• Flash point:	32 °C
• Upper explosion limit:	6.1 %
• Lower explosion limit:	1.1 %
• Vapour pressure:	4.3 mmHg at 20 °C
• Vapour density:	3.6
• Relative density:	0.91 g/cm^3
• Water solubility:	<1 mg/mL

STYRENE- GESAMP



- Carcinogen and mutagenic
- Floater and evaporates
- Toxic to aquatic environment
- Readily biodegradable

STYRENE

GUIDE 128P

PPE:
Maximal protection in case of high concentration
-Depending of concentration: gas mask or respiratory tract protection or SCBA
-Feet: use long boots
-Hands: wear gloves that cover forearms
-Eyes: air tight goggles or full face mask or full suit integrated masks with A2 organic vapour and gas filter cartridges
-Clothes: wear suitable chemical suits
-Material advisable to use: PVA (polyvinyl alcohol) or LLDPE
-NOT nitrole, neoprene, PVC or rubber

Main issues:

- Polymerisation
- Toxic
- Flammable / explosive mixture with air

EPICHLOROHYDRIN

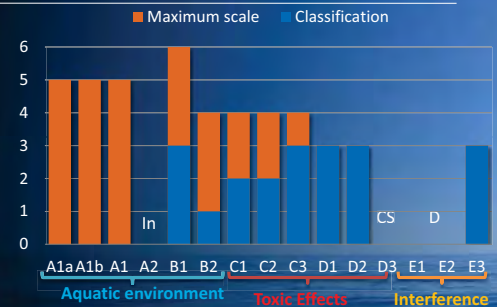


Epichlorohydrin (UN 2023):

- Other name: 1-chloro-2,3-epoxypropane
- Used to make plastics and as a solvent
- Polymerisable
- Carcinogen
- Toxic by ingestion

Appearance Form:	colourless liquid
Flash point:	35 °C
Upper explosion limit:	21 %
Lower explosion limit:	3.8 %
Vapour pressure:	10 mmHg at 20 °C
Vapour density:	3.26
Relative density:	1.2 to 1.8 g/cm^3
Water solubility:	50-200 mg/mL

EPICHLOROHYDRIN- GESAMP



- Carcinogen and sensitising
- Dissolves
- Readily biodegradable
- Toxic to mammals

EPICHLOROHYDRIN

GUIDE 131P

Skin: Wear appropriate personal protective clothing to prevent skin contact.

Eyes: Wear appropriate eye protection to prevent eye contact.

Wash skin: The worker should immediately wash the skin when it becomes contaminated.

Remove: Work clothing that becomes wet should be immediately removed due to its flammability hazard(i.e. for liquids with flash point < 100°F)

Main issues:

- Highly toxic
- Polymerisation
- Flammable

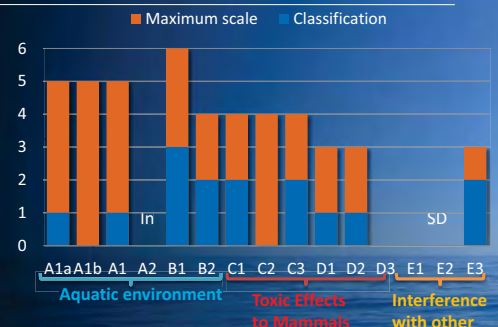
DIMETHYL DISULFIDE

Dimethyl disulfide (UN 2381):

- Also called DMDS
- Used in oil refining, in decoking operation and in metallurgy
- No NFPA data available
- Vapour heavier than air
- Denser than water

Appearance Form:	pale yellow liquid, strong odour
Flash point:	25 °C
Upper explosion limit:	16 %
Lower explosion limit:	1.1 %
Vapour pressure:	29 mmHg at 20 °C
Vapour density:	3.24
Relative density:	1.06 g/cm^3
Water solubility:	1 mg/mL

DIMETHYL DISULFIDE- GESAMP



- Sink and dissolves
- Moderate aquatic toxicity
- Moderate toxicity through ingestion, skin contact and ingestion by mammals
- Not readily biodegradable
- Possible closure of amenity

DIMETHYL DISULFIDE

GUIDE 130
PPE:
Skin: Wear appropriate personal protective clothing to prevent skin contact.

Eyes: Wear appropriate eye protection to prevent eye contact.

Wear chemical splash suit
Gloves made of nitile

Main issues:
- Flammable
- Moderate aquatic toxicity

AMMONIA

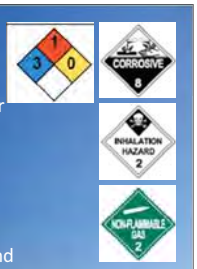
ERG: GREEN SECTION

See initial isolation and protective action distances

For small spill
- isolate: 30 m
- Protect: 0.2 km

For large spill
- isolate: 150 m
- Protect 2 km

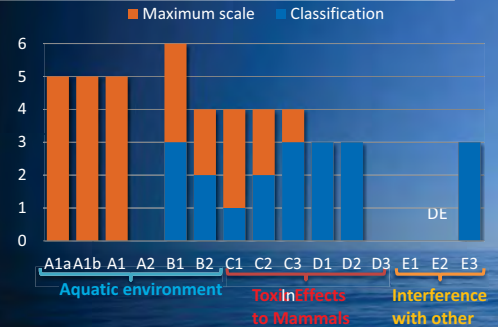
AMMONIA



Ammonia (UN 1005):
- Used as fertilizer, refrigerant and in the manufacture of other chemicals
- Highly volatile
- Ship as a liquid at his own vapour pressure
- Contact with the liquid can lead to frostbite
- Non flammable gas
- Gas lighter than air but vapours from leak stays on the ground

• Appearance Form:	Clear colourless gas, strong odour
• Flash point:	N/A
• Upper explosion limit:	25 %
• Lower explosion limit:	16 %
• Vapour pressure:	400 mmHg at 20 °C
• Vapour density:	0.6
• Relative density:	0.68 g/cm^3
• Water solubility:	N/A

AMMONIA- GESAMP



- Dissolves and evaporates
- Readily bioaccumulable
- Ammonia vapour are highly toxic through inhalation
- Corrosive through skin contact
- When spilt in water, boils violently
- Moderate aquatic toxicity
- High objectionable, closure of amenity

AMMONIA

GUIDE 125
PPE:
Protective suit adapted to gas should be worn
Protect response personnel against the heat (curtain of pressurised water)
SCBA or gas mask depending of the concentration

Main issues:
- Toxic gas
- Violent evaporation

Introduction

International Legislation and Liability

- International legislation covering HNS at sea
- Compensation and Liability

Key conventions

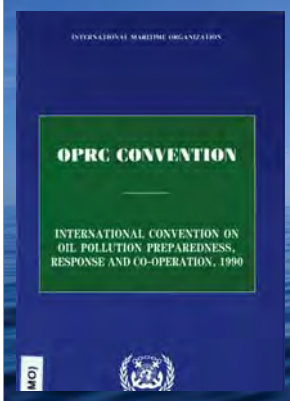
- The United Nations Convention on the Law of the Sea (UNCLOS)
- Safety of Life at Sea (SOLAS)
- International Convention for the Prevention of Pollution from Ships, 1973/78 (MARPOL)
- International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (OPRC Convention)
  - OPRC – HNS Protocol 2000

MARPOL

- International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978

Annex	Description
I	Regulations for the Prevention of Pollution by Oil
II	Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk
III	Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form
IV	Prevention of Pollution by Sewage from Ships
V	Prevention of Pollution by Garbage from Ships
VI	Prevention of Air Pollution from Ships

OPRC Convention



- Global framework for international co-operation in combating major incidents or threat of marine pollution
- Requires parties to establish measures to deal with pollution incidents, either nationally or in co-operation with other countries:
  - Ships are required to have shipboard oil pollution emergency plans (SOPEPs).
  - Reporting procedures and actions
  - Calls for establishment of stockpiles of oil spill equipment, training, exercises and contingency plans.
- Entered into force May 1995

OPRC-HNS Protocol

- Protocol on Preparedness, Response and Co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000
- Follows the principles of OPRC Convention (for oil)
- Requires national & regional systems for preparedness and response to HNS incidents.
- Calls for co-operation between governments, port authorities, shipping industry and the chemical industry.
- Entered into force 14th June 2007

OPRC-HNS Protocol

National obligations

A requirement for pollution emergency plans for:

- Ships; offshore oil operations; ports & oil/HNS handling facilities

A national system for responding to Oil/HNS pollution incidents which includes:

- A national contingency plan
- Designated national authorities
- An identified national operation focal point

Preparedness and response capacity:

- Individually or through co-operation: equipment;
- Exercises and training of personnel; communication capabilities;
- A mechanism for coordinating the response

International Standards

- **IMSBC (BC) Code –** (*International Maritime Solid Bulk Cargoes*)
  Solid bulk cargoes
- **IBC / BCH Code –** (*International Building Code*)
  Dangerous chemicals in bulk dependant on when vessel built
- **IGC Code –** (*International Gas Cargoes*)
  Liquefied gases in bulk
- **IMDG Code –** (*International Maritime Dangerous Goods*)
  Classification, packing, marking, labelling and placarding, documentation and stowage of dangerous goods

GESAMP

GESAMP - Group of Experts in the Scientific Aspects of Marine Environmental Pollution

- Provide advice relating to specific aspects of marine environmental protection
- Prepare periodic reviews and assessments of the state of the marine environment, to identify problems and areas requiring special attention

International Compensation Regime

Conventions	Scope
HNS CONVENTION 2010 PROTOCOL Not in force	*International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea, 1996*
CIVIL LIABILITY CONVENTION (CLC '92)	*The International Convention on Civil Liability for Oil Pollution Damage, 1992*
FUND CONVENTION (Fund '92)	*The International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992*
BUNKERS CONVENTION	*International Convention on Civil Liability for Bunker Oil Pollution Damage, 2001*

The HNS Convention

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

Current situation

- No compensation available for HNS spills
- Convention on Limitation of Liability for Maritime Claims (LLMC) 1976 could be used

Example: IEVOLI SUN, France, 2000

- Compensation claims = €11,620,048
- Available according to LLMC = €1,078,000
- HNS Convention = €15,170,990

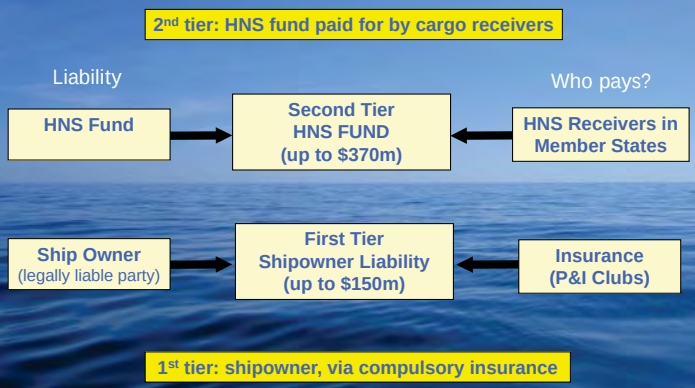
1. Definition of HNS

- Based on lists of individual substances that have been previously identified in a number of IMO Conventions and Codes:
  - **MARPOL** (Appendix I of Annex I)
  - **MARPOL** (Appendix II of Annex II)
  - **IBC Code**
  - **IMDG Code**
  - **IGC Code**
  - **IMSBC (BC) Code**
- Bulk cargoes and packaged goods. Bulk cargoes can be solids, liquids, including both persistent and non-persistent oils, or liquefied gases, such as liquefied natural gas (LNG) and liquefied petroleum gas (LPG)

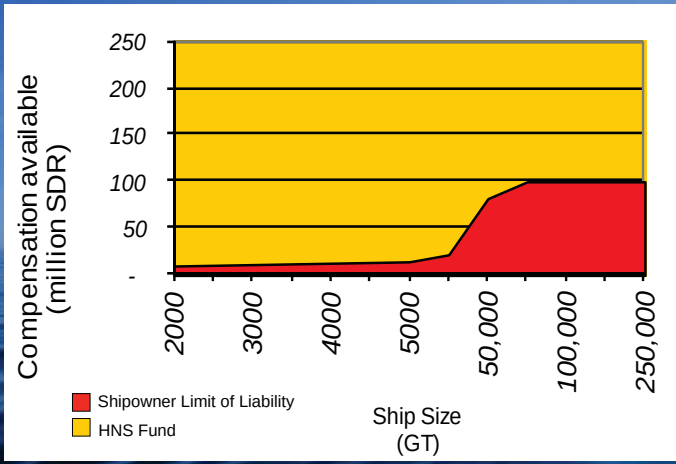
2. Key features

- Adequate, effective & prompt compensation
- Loss or damage to persons, property and/or environment
- Based on principles of CLC/FUND:
  - Strict liability
  - Reasonable measures
    - based on a technical appraisal of the incident
    - not be purely for public relations reasons
    - Be proven
- Convention based on a 2-tier system
  - Tier 1 = Shipowner
  - Tier 2 = Cargo Industry

2-tier compensation system



3. Limitation of compensation



4. Damage covered

- Loss of life
- Personal injury
- Property damage
- Prevention/protection measures
- Salvage
- Environmental damage
- Loss of income

5. HNS Fund accounts

Will consist of 4 separate accounts

- General account: bulk solids & other HNS
- Oil
- LPG
- LNG

No cross-subsidisation between accounts

6. Entry into force

18 months after 12 states ratify:

- 12 states must have received >40 million tonnes of HNS cargo
- At least 4 states each must have at least 2 million registered GT

6. Entry into force

As of today, 8 states have signed the 2010 Protocol, subject to ratification:

- Denmark
- Canada
- France
- Germany
- Greece
- the Netherlands
- Norway
- Turkey

7. Interaction with other conventions

- CLC & FUND Conventions (in force)
- Bunkers Convention (in force since 21st November 2008)
- HNS Convention (not in force) is part of a total compensation package

www.hnsconvention.org

Cedre
www.cedre.fr

HNS spills: case studies

Ievoli Sun and *Ece*

HNS training
SACEP regional workshop,
Malé, Maldives, 23rd August 2016

Dr. Camille Lacroix
Cedre Research Department

Objective and overview

➡ French response to 2 liquid bulk spills

Objective and overview

➡ French response to 2 liquid bulk spills

The chemical tanker *Ievoli Sun*
– October 2000

The chemical tanker *Ece*
– January 2006

Objective and overview

➡ French response to 2 liquid bulk spills

The chemical tanker *Ievoli Sun*
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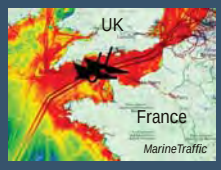
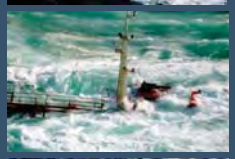


Intense traffic area

International waters between UK and France (the « Channel »)

The wreck of the *Ievoli Sun* (2000)

Ievoli Sun



- The ship:

Chemical tanker
Flag: Italian
Recent vessel (1989)
Double hull
Liquid bulk cargo

- The cargo

- 3 chemicals: Styrene
  Methyl-Ethyl-Ketone
  Isopropylic Alcohol
- bunker oil

Incident scenario

Ievoli Sun

30th - 31st October 2000: the towing trip… in the storm

Cause of the incident: structural damage

30th October:
4:30am: distress call sent to MRCC Corsen
=> Leak in the bow section
8:05am: begining of crew rescue operation
12:00am: activation of French CP
5:15pm: begining of towing

31st October:
9:00am: sinking

Quick hazard assessment

Ievoli Sun

Cargo: 4000 T. Styrene

low solubility, potential for toxic cloud, for explosion, for tainting

1030 T. MethylEthylKetone (MEK)

moderate solubility, potential for explosion/fire

1000 T. IsoPropyl Alcohol (IPA)

high solubility, danger limited to recovery operations

Bunker oil: 150 T. IFO 180 (hot subject 10 months after the Erika OS)

60 T. Gasoil

Cedre

Early november: first line of response

Ievoli Sun

- Activation of the French contingency plan (POLMAR)
- Activation of the regional cooperation plan (Manche Plan, France and UK)
- Calling for immediate partners support (German HNS response vessel)

Cedre

Early november: first line of response

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- Activation of the French contingency plan (POLMAR)
- Activation of the regional cooperation plan (Manche Plan, France and UK)
- Calling for immediate partners support (German HNS response vessel)
- Air monitoring
- Spill monitoring on water, over wreck

➔ small leaks
➔ no visible pollution (surface, coastline)
➔ no recovery/cleaning

Cedre

Early november: first line of response

Ievoli Sun

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- Spill monitoring on water, over wreck
- Investigating response options at sea/on land ➔ little to do
- Getting prepared for a possible toxic cloud ➔ the key challenge

Cedre

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- Investigating response options at sea/on land ➔ little to do
- Getting prepared for a possible toxic cloud ➔ the key challenge
- Coming to a first conclusion ➔ threat should be removed

But a lot of unknown…

Cedre

Questions addressed to *Cedre*

Ievoli Sun

Few days later…

1- Protection of citizen: risk of population exposure
- To cargo (styrene)
- To contaminated organisms *(Seafood contamination)*

2- Response techniques
- Styrene polymerisation risk (pumping)
- Products solubility (release)

Lack of information
NEED to perform experimental work!

Cedre

Protection of population: cargo

Ievoli Sun

- Styrene solubility: Fresh water => 40 mg/L and Sea water => 20 mg/L
- Styrene evaporation from water: 0.03 - 0.04 g/m²s

RISK for a Toxic cloud?

In case of compounds leakage and their transfer in the atmosphere
ERPG 3 = 1000 ppm => High level of risk for life

Restricted area:
6500 x 500 m upon the wreck

* ERPG = Emergency Response Planning Guidelines; ERPG 3 = 1 hour of exposure

Protection of population: seafood

Ievoli Sun

Around the wreck, no detectable styrene in the sea water.

BUT :

contaminated crustaceans were fished 1.7 km North of the wreck
crabs 230 µg/kg (flesh)
340 µg/kg (gill)

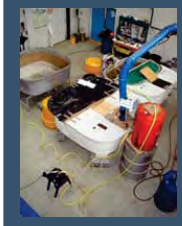
Is it necessary to establish a monitoring of the quality of the seafood sold?

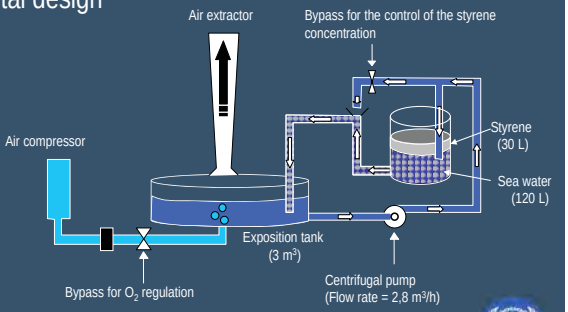
Protection of population: seafood

Ievoli Sun

Contamination and decontamination kinetics?

Experimental design





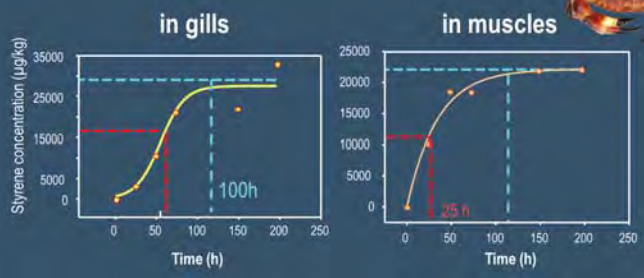
Crabs: 150, Oysters: 20, Mussels: 800

Protection of population: seafood

Ievoli Sun

Contamination kinetics: RESULTS

Crabs



Maximum concentration in tissue 24 mg/kg
Concentration factor: x 12

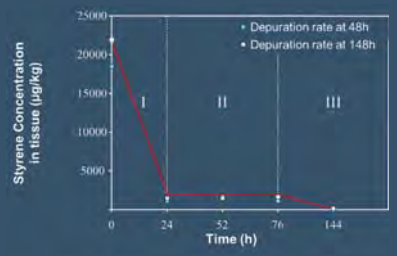
Protection of population: seafood

Ievoli Sun

Decontamination kinetics: RESULTS

Crabs

In clean seawater



Depuration in 3 steps and not dependant of the duration of the exposure

Protection of population: seafood

Ievoli Sun

CONCLUSION

No mortality (styrene concentration = 2 mg/L)

Contamination: maximum after 100-120h
Maximum concentration in tissue: 24 mg/kg
Concentration factor: x 12

Quick recovery (less than 24h)
Depuration rate in 3 steps

➡ No risk for consumption

Questions addressed to *Cedre*

Ievoli Sun

1- Protection of citizen: risk of population exposure
- To cargo (styrene)
- To contaminated organisms *(Seafood contamination)*

2- Response techniques
- Styrene polymerisation risk (pumping)
- Products solubility (release)

Response techniques:

Ievoli Sun

1) To evaluate the feasibility of the styrene pumping

Problematic: Polymerisation is inhibited by para tertio butyl catechol (pTBC) which is soluble in sea water.

Is it possible that styrene polymerise during time at sea water temperature if pTBC concentration decrease ?

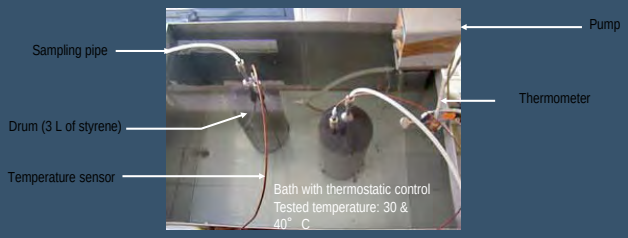
=> LABORATORY and *PILOT* tests

Response techniques: styrene

Ievoli Sun

Polymerisation?

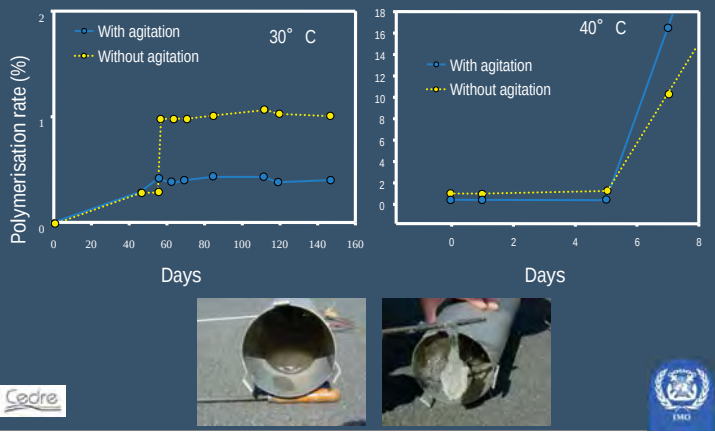
Experimental design: Lab test



Response techniques

Ievoli Sun

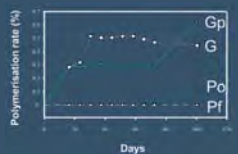
Lab test results



Response techniques

Ievoli Sun

In situ test: *Cedre* basin



100 days after the beginning, polymerisation is below 1%

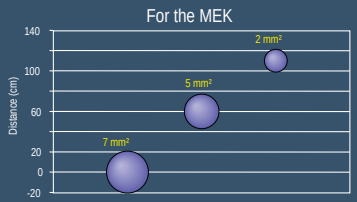
Response techniques

Ievoli Sun

1) To assess the dissolution rate of MEK and IPA

Cedre Experimental Column

- To evaluate the speed
- To estimate the diameter decrease of bubble



IPA is totally soluble

MEK can reach the surface depending of the flow

Selected response techniques

Ievoli Sun

Styrene:

- No polymerisation
- Possible to pump

MEK:

- For a small flow, the dissolution is 100%: release
- With an instantaneous release, the MEK will reach the sea surface

IPA:

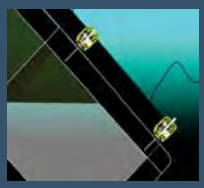
- Dissolution is 100%: release
- Dissolution independent of the release flow

The operational response

Ievoli Sun

8 months later (12 April-5 June 2001)

- An experienced consortium: Smit Tak (Netherlands) with Framo (Norway) Remote Operated Offloading System "ROLS"
- Pumping of styrene: effective but long, complicated and costly operations
- Controlled release of MEK and IPA



The operational response

Ievoli Sun

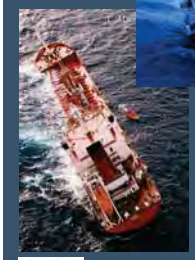
From 2 May to 5 June,
despite extreme currents:

- pumping of 3012 m3 of styrene
- pumping of 88 m3 of IFO
- other products released

A successful challenge!

The wreck of the *Ece*

Ece



- The ship:

Chemical tanker
Flag: Marshall Island
Recent vessel (1988)
Double hull
Liquid bulk cargo

- The cargo
  - 1 chemical: phosphoric acid
  - bunker oil

Incident scenario

Ece

Collision on the night of 30th to 31st January 2006

Night of 30th to 31st January:
Collision with the General Grot Rowecki
Distress call sent to MRCC Jobourg
=> Leak and significant list

31st January :
5:00am: arrival of helicopters (British and French)
=> crew rescue operation
=> diving inspection
7:00am: arrival of a tug boat
3:30pm: begining of towing

1st February :
3:37am: sinking

Quick hazard assessment

Ece

Cargo: 10 000 T. phosphoric acid

soluble, non volatile, corrosive, non toxic, non bioaccumulable
Marpol D (Z after 1rst january 2007)

BUT contained heavy metals and impurities

(potential toxicity and radioactivity)

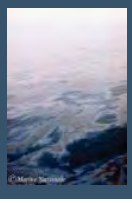
Bunker oil: 70 T. IFO 180
20 T. Marine diesel
40 T. Lubricating oil

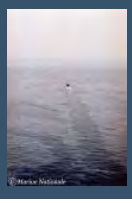
The situation

- The hull is damaged

- Oil spill observed at surface

=> Illegal release (at least 3)





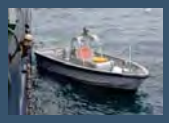
First line of response

Ece

- Oil spill survey and response

=> Spraying of dispersant (Tug boat Abeille Liberté)

- Chemicals monitoring in air using a remotely operated vessel



- Wreck inspection using ROV and Sonar

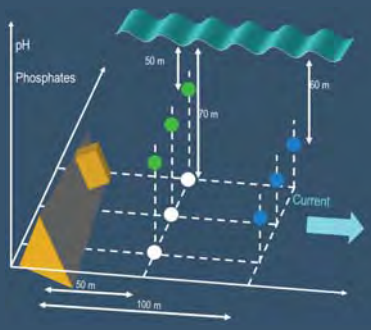
=> Hull damaged
=> 2 tanks of acid leaking
=> 1 tank of IFO 180 leaking

First line of response

Ece

- Monitoring around the wreck: pH and phosphates

Sampling design



➡ Several peaks of phosphates detected at J0 and J+10

Response organisation

French Navy Headquarter in Cherbourg ,
Manche Plan activated (UK and France),
Support by MCA (1 person at Cherbourg)

Meetings with the owner → Response strategy
Water quality monitoring

Group of experts → Examine response options proposed by the owner
(French Navy, Ceppol, Ifremer, MCA and *Cedre*)

Questions addressed to experts

Ece

- What are the risk and what are the means necessary to respond to spill generated by:

=> Hydrocarbons

?

=>The phosphoric acid cargo

Experts' work

Ece

- Hydrocarbons: IFO 180 (70 tons)

Gasoil (20 tons)

Lubricating oil (40 tons)

Behaviour with ADIOS (Density < density of seawater, slightly soluble, potential for evaporation and emuslfication processes…)

Slick forecast MOTHY

Experts' work

Ece

- Phosphoric acid cargo:

Acidity and acid dilution in seawater

- Dilution modelling (Chemmap)
- Experimental work at *Cedre*

Eutrophication risk

- Modelling (collaborative work with European labs)

Heavy metals and radioactivity

- Comparison of predicted concentrations with surrounding contamination and toxicity threshold

Cedre

Cedre experimental work

Ece

- Acidity and acid dilution in seawater?

In the lab

Density = 1,53

➡ H3PO4: Totally soluble BUT low kinetic

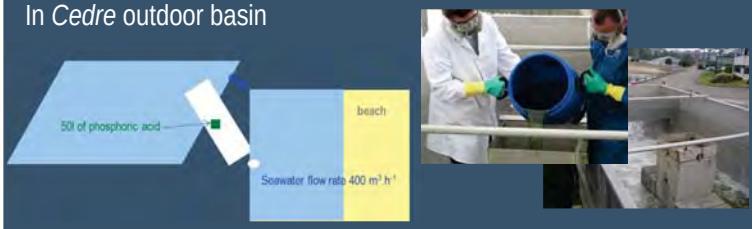
Cedre

Cedre experimental work

Ece

- Acidity and acid dilution in seawater?

In *Cedre* outdoor basin



20 days after T0, pH lower than 3 in the tank

➡ Confirmation of lab test: very slow dilution

Cedre

Experts' work

Ece

- Eutrophication risk?

$H_3PO_4 \overset{2.1}{\Rightarrow} H_2PO_4^- + H^+ \overset{7.2}{\Rightarrow} HPO_4^{2-} + H^+ \overset{12.4}{\Rightarrow} PO_4^{3-} + H^+$

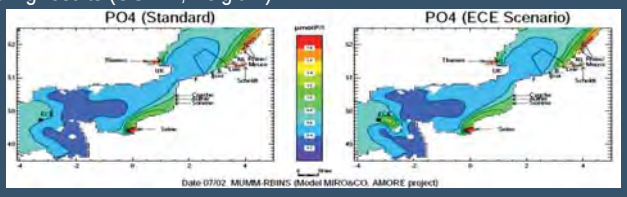
$H_2PO_4^{2-}$ can by used by algae

4-6 : 100% $H_2PO_4^-$

6-7: 50% $H_2PO_4^-$ et 50% HPO_4^{2-}

8 : 20% $H_2PO_4^-$ et 80% HPO_4^{2-}

Modeling results (UGMM, Belgium)



➡ Area with strong currents, fast dilution of phosphoric acid below concerning levels

Cedre

Experts' work

Ece

- Heavy metals and radioactivity

Impurities Hg (5kg), Pb (20kg), As (130kg), Cr (800kg), Cd (400kg), V (1000kg)

- Heavy metals are a natural constituent of phosphate rock.
- These heavy metals would have been exposed to the environment in any case.

Methodology applied

- following OSPAR, area = zone II = chronic heavy metals inputs
- Cd, 6 ppm = 60 kg in 10 000 tones (cargo) and OSPAR estimations give 50 to 79 tones per year

➡ Negligeable quantities compared to chronic inputs

Cedre

Experts' work

Ece

- Heavy metals and radioactivity

Bioavailability, bioaccumulation and biomagnification

- In seawater, heavy metals will form complexes with organic and inorganic materials
- Biomagnification appears not to occur with inorganic metals

Radioactivity

- Negligeable compare to ambient radioactivity

➡ Limited environmental impact

➡ Release can be considered

Cedre

Selected response

Ievoli Sun

Phosphoric acid:

- Slow release of the cargo

Bunker and lubricating oil:

- Recovered when reachable (pumping)

The operationnal response:

September 2006

21 days on the wreck

➡ Take-home message

Take-home message

- All answers are not in the litterature…
- Important to be able to conduct experiments in emergency conditions in order to provide authorities / responders with right data
- In some conditions, slow release of chemicals can be the best option
- Do not forget "secondary" pollution
- HNS incidents involve also OIL

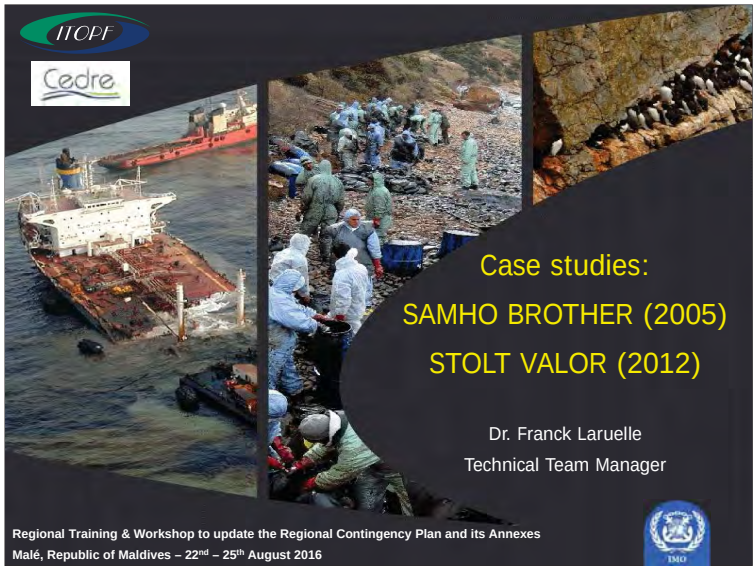
No perfect solution, do not precipitate, calculate the risk and consider all options

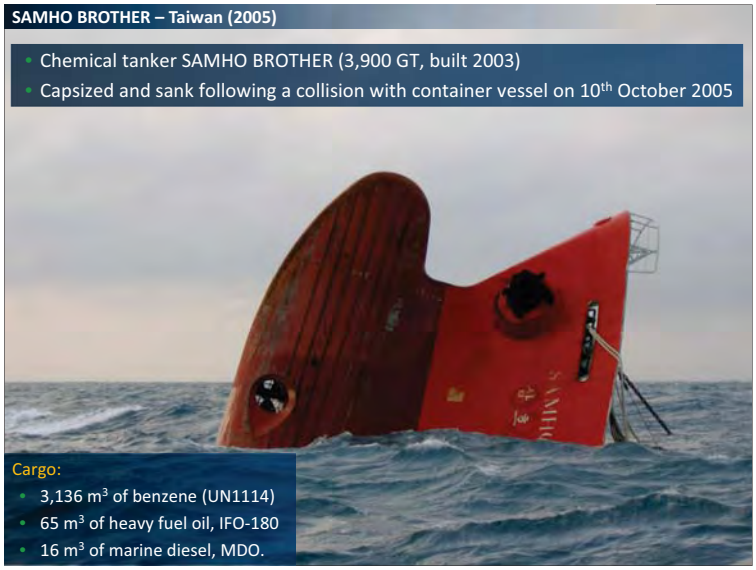
More information…

Cedre accidents database

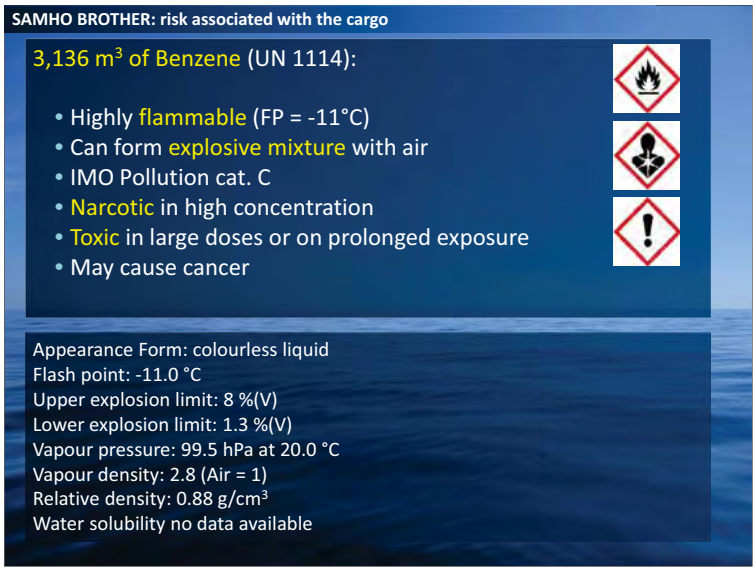
www.cedre.fr

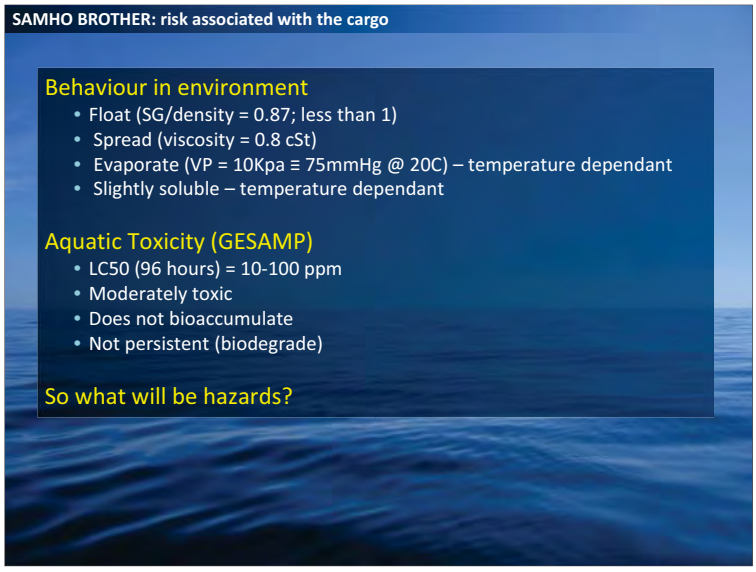
contact@cedre.fr
camille.lacroix@cedre.fr

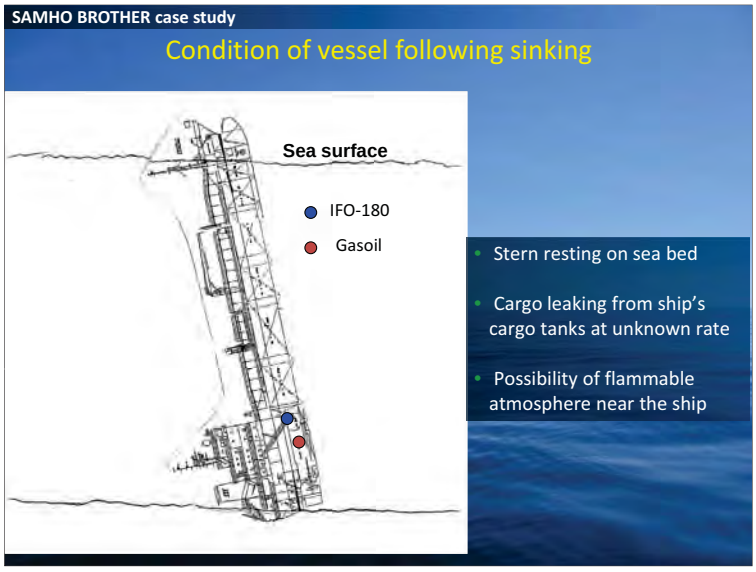

ITOPF
Cedre
Case studies:
SAMHO BROTHER (2005)
STOLT VALOR (2012)
Dr. Franck Laruelle
Technical Team Manager
Regional Training & Workshop to update the Regional Contingency Plan and its Annexes
Malé, Republic of Maldives – 22nd – 25th August 2016
IMO


SAMHO BROTHER – Taiwan (2005)
Chemical tanker SAMHO BROTHER (3,900 GT, built 2003)
Capsized and sank following a collision with container vessel on 10th October 2005
Cargo:
3,136 m3 of benzene (UN1114)
65 m3 of heavy fuel oil, IFO-180
16 m3 of marine diesel, MDO.


SAMHO BROTHER case study
Samho Brother
East China Sea
South China Sea
Philippine Sea


SAMHO BROTHER: risk associated with the cargo
3,136 m3 of Benzene (UN 1114):
Highly flammable (FP = -11°C)
Can form explosive mixture with air
IMO Pollution cat. C
Narcotic in high concentration
Toxic in large doses or on prolonged exposure
May cause cancer
Appearance Form: colourless liquid
Flash point: -11.0 °C
Upper explosion limit: 8 %(V)
Lower explosion limit: 1.3 %(V)
Vapour pressure: 99.5 hPa at 20.0 °C
Vapour density: 2.8 (Air = 1)
Relative density: 0.88 g/cm3
Water solubility no data available


SAMHO BROTHER: risk associated with the cargo
Behaviour in environment
Float (SG/density = 0.87; less than 1)
Spread (viscosity = 0.8 cSt)
Evaporate (VP = 10Kpa ≡ 75mmHg @ 20C) – temperature dependant
Slightly soluble – temperature dependant
Aquatic Toxicity (GESAMP)
LC50 (96 hours) = 10-100 ppm
Moderately toxic
Does not bioaccumulate
Not persistent (biodegrade)
So what will be hazards?


SAMHO BROTHER case study
Condition of vessel following sinking
Sea surface
IFO-180
Gasoil
Stern resting on sea bed
Cargo leaking from ship's cargo tanks at unknown rate
Possibility of flammable atmosphere near the ship

SAMHO BROTHER case study

SAMHO BROTHER case study

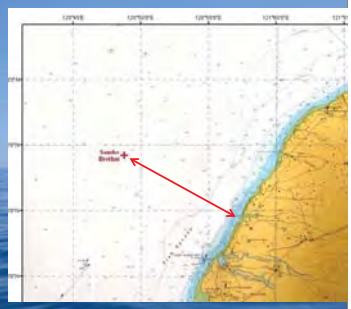
Initial assessment

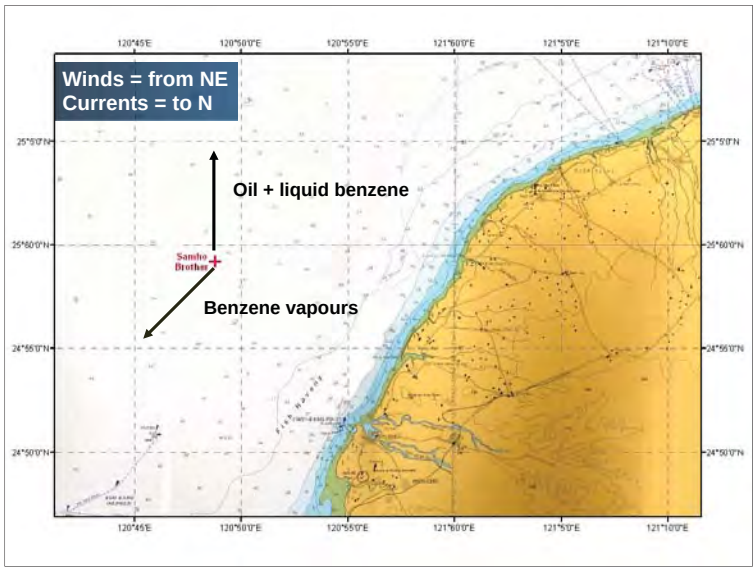
Risks from benzene most important – Evaporator

Primary concern – human health (9nm from closest populated area)

Modelling essential to conduct proper assessment of risks

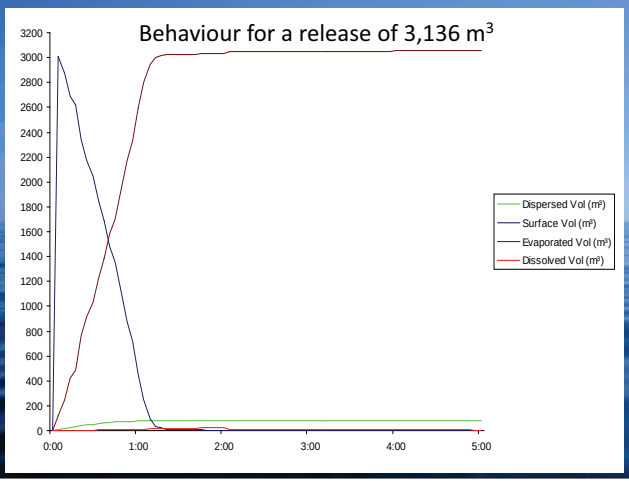
- Scenarios:
  - All cargo released at once - 3,136m^3
  - 1 tank (485m^3)
  - Moderate leak – 10m^3/hr
- Vapours travel with the wind direction (mainly North-easterly)





SAMHO BROTHER case study: modelling

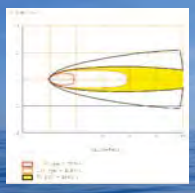
Modelling of fate and behaviour



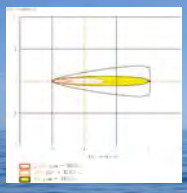
SAMHO BROTHER case study: modelling

Plume modelling

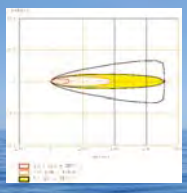
- ALOHA Model different size plumes of benzene – results showed plume will not reach land



All Cargo – 3136m^3, 10kts wind



1tank – 485m^3, 10kts wind



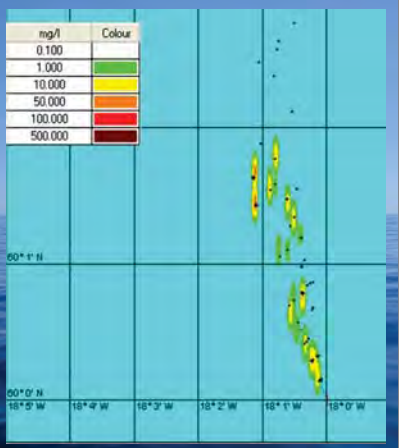
Slow release -10m^3/hr, 10kts wind

- Implement safety zone for shipping
  - 5km x 5km until ship has sank
  - 10km x 10km during sinking ops.
  - Once on bottom, 500m upwind, 1000m x 2000m downwind

SAMHO BROTHER case study: modelling

Aquatic Monitoring

- Used to help assess risk to fisheries
- up to 5% of benzene could dissolve (partial dissolver)
- Outputs showed [benzene] in water column quickly reduced to background levels



SAMHO BROTHER case study

Response plan - Benzene

Continual Monitoring – to verify model (only a tool)

- Air + water – using PID (VOC monitor; instant) and water samples (5 day turn around)
- Outside safety zone
- Depending on results, re-evaluate safety zone

Since beginning of incident

- Air: no detection (5km, 1km, 500m)
- Water: no detection (5km, 1km, 500m)

SAMHO BROTHER case study

Proposed action plan

- Establish safety zone
- Arrange controlled sinking of the ship
  - ✓By puncturing the hull from a safe distance
  - ✓Use military ship/aircraft
- Alternatively, blow up the entire ship
- Contingency plan for benzene and oil

SAMHO BROTHER case study

Controlled sinking of ship

- On 27-10-05, Taiwanese Air Force bombed the vessel
  - ✓2 warplanes using four missiles
    1. Small damages to bow
    2. Unable to sink ship
  - ✓2 Attack helicopters using 12 <Hell Fire> missiles
    1. Non exploded
    2. Limited damages
- Vessel sank by itself 5 days later

SAMHO BROTHER case study

After sinking

- Oil visible on sea surface
- Some recovery using sorbents
- Air monitoring
- No benzene detected at 10km, 5km, 1km, 500m
- Cargo recovery operation in 2008-2009

SAMHO BROTHER case study: Lessons learnt

- Initial evaluation – risks from benzene most important – Evaporator
- Modelling essential to conduct proper assessment of risks
- Pollutants drifting in different directions
- Exclusion zone applied
- Monitoring showed no elevated levels of benzene in air or water
- Exclusion zone reduced
- Attempted to blow up, actually sank
- Cargo removal

STOLT VALOR, PERSIAN GULF, 16th March 2012

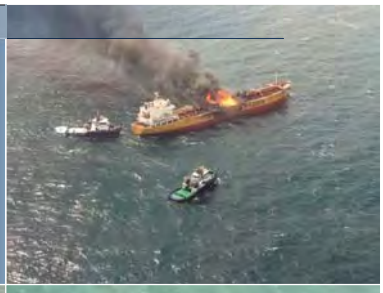
- Chemical tanker (15,732 GT; Built 2004)
- Cargo:
  - ✓13,000 MT of methyl tertiary-butyl ether (MTBE)
  - ✓1,300 MT of isobutylaldehyde (IBAL)
- 430 MT of IFO380
- Explosion and fire off Al Jubail, Saudi Arabia

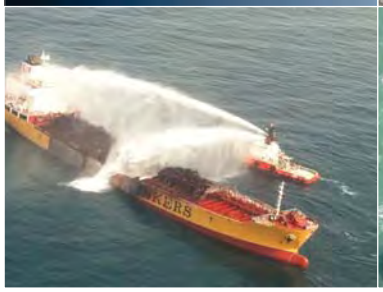
STOLT VALOR, PERSIAN GULF, 16th March 2012

- SMIT Salvage appointed by owner
- Ablaze for 5 days
- Towed offshore – line broke in bad weather
- Nearly grounded on northern coast of Qatar before towline re-established

STOLT VALOR, PERSIAN GULF, 16th March 2012

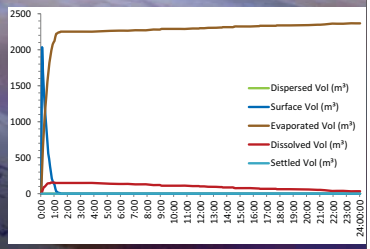
- Fire-fighting
- Boundary cooling of hot-spots
- Assessment once fire under control
- Extensive damage to tanks 6, 7, 8, 9 (later 10)
- Lines established at both ends / closing of vents and oultlets



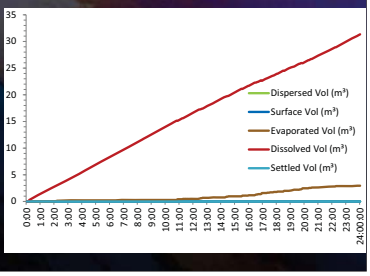


STOLT VALOR, PERSIAN GULF, 16th March 2012

- MTBE
  - ✓Evaporator / dissolver
  - ✓Main hazard: fire / explosion / irritant
  - ✓GESAMP profile: low aquatic toxicity
- IBAL
  - ✓Evaporator / dissolver / self-condensation
  - ✓Main hazard: fire / explosion / irritant
  - ✓GESAMP profile: no profile



- Modelling NCEC (National Chemical Emergency Centre):
  - ✓Explosive threat zone/ fate & behaviour
- 2 scenarios:
  - ✓Instant release of 1,680 tonnes of MTBE at the sea surface (larger tank)
  - ✓Continuous release of 1 tonne of MTBE per hour at 60 metres



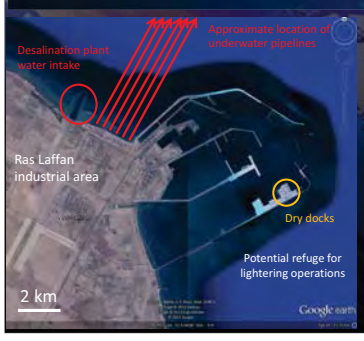
STOLT VALOR, PERSIAN GULF, 16th March 2012

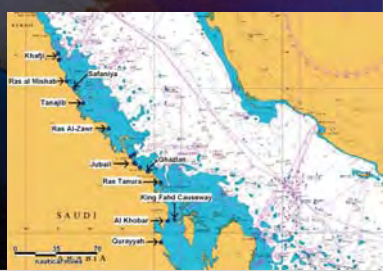
- Places of refuge requested in Saudi Arabia, Bahrain, Qatar and Iran
- None granted

STOLT VALOR, PERSIAN GULF, 16th March 2012

Issues with the Places of Refuge

- Bahrain: desalination plants / single shipping channel to Port
- Qatar: desalination plant / underwater pipelines
- Saudi Arabia: desalination plants





STOLT VALOR, PERSIAN GULF, 16th March 2012

- Coordination role of MEMAC (Marine Emergency Mutual Aid Centre)
- Offshore anchoring granted in Saudi waters on 1st April

STOLT VALOR, PERSIAN GULF, 16th March 2012

- Oil and cargo removal carried out at sea
- Contingency response vessels deployed by Qatar Petroleum (oil removal)

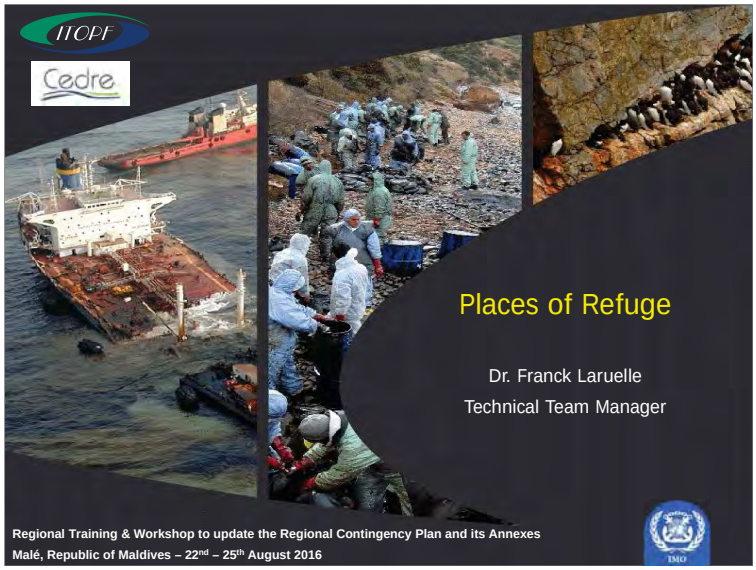
- Contingency Plan prepared by ITOPF and OSRL on behalf of the shipowner (Supply Tug with OSRL equipment deployed under SMIT contract) (oil removal)
- Risk assessment of a catastrophic cargo release (NCEC / ITOPF)

STOLT VALOR, PERSIAN GULF, 16th March 2012

- Passage plan from current position off Saudi Arabia to a dockyard in Bahrain
- Tank samples taken and analysed for residual cargo
- Risk Assessment provided by ITOPF

STOLT VALOR: KEY POINTS

- Coordination role of MEMAC
- Successful salvage operation
- Issue of place of refuge / acceptance within national waters
- All lightering operations carried out at sea
- No significant spillage despite poor condition of the casualty
- ITOPF assistance on contingency plans / risk assessments



Background

CASTOR, 2000: fully laden tanker (29,500 MT gasoline cargo):

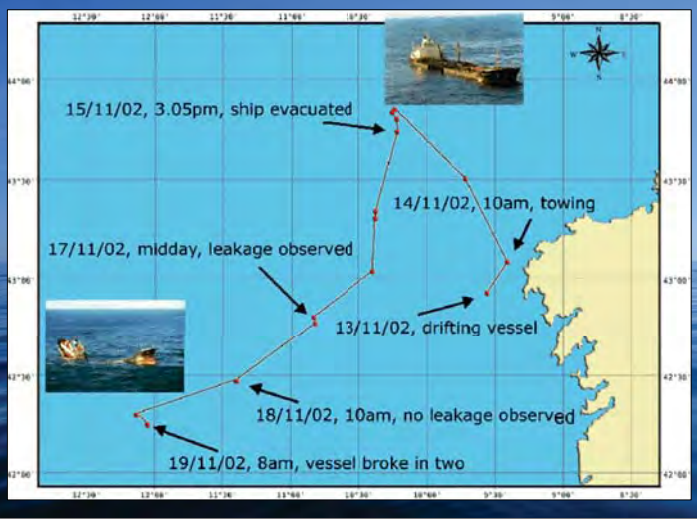
- structural problem in the Mediterranean Sea
- Towed around the Mediterranean Sea for 40 days
- Place of Refuge granted off Tunisia where successful lightering operation carried out.

Background

PRESTIGE, 2002: fully laden tanker (77,000 MT HFO cargo)

- 13th November: difficulties off Galicia, Spain / distress call.
- After drifting towards the coast, she was towed offshore until 19th November
- Split in two resulting in a spill of 64,000 MT of HFO.

Background



Legal framework – IMO Resolutions

- No international instrument granting ships a right to seek refuge in territorial waters of a coastal State
- UNCLOS: grant the signatory State the right to regulate entry into her ports and to protect their coastlines from pollution or the threat of pollution following a maritime casualty
- SOLAS Convention 1974 & SAR Convention 1979: both request signatory States to render assistance to ships in distress, albeit both restrict it to the saving of life aboard the ship

Legal framework – 2003 IMO Resolutions

"When dealing with ships in distress, the requirement is to find them an area of sheltered water where the situation can be stabilized, the cargo made safe and the salvors and authorities can evaluate what further steps are necessary without the pressure of a crisis hanging over their heads. The concern of port authorities that they should not be exposed to the risks of pollution, fire or explosion is well understood and is not in any way challenged. But equally, this is an issue which will not go away and must be addressed. We cannot continue to permit a situation to unfold in which salvors dealing with a damaged vessel containing a potentially hazardous cargo have nowhere to go."

IMO Secretary General, 2001

- IMO Resolution A.949(23) (IMO Assembly, 2003): Guidelines on Places of Refuge for Ships in Need of Assistance
- IMO Resolution A.950(23) (IMO Assembly, 2003): Maritime Assistance Services

Guidelines for granting access to a place of refuge

Intended to assist National Maritime Administrations:

- In identifying places of refuge suitable to deal with maritime emergencies
- On the appropriate decision making process in deciding to grant or refuse a request for access to a place of refuge

Application of the Guidelines

- Ensure that decisions are made in a consistent manner
- Within international and national maritime law
- May be necessary to balance the interests of a ship in need of assistance and the National interest
- Case by case approach
- A cooperative and consensual approach often necessary
- Request should come from Master or person in charge of the ship, salvage master, owner or manager through Maritime Assistance Service (focal point)

Application of the Guidelines

Request for a place of refuge might arise as a consequence of:

- A maritime disaster (fire, collision, grounding, explosion)
- A technical defect (breakdown of vital machinery, black out)
- A stability incident (shifting or liquefaction of cargo
- A pollution incident
- *Force majeure* (storms, hurricanes or other natural disasters)
- Any other incident resulting in a need of assistance

- Not intended to apply for warships or other government vessels solely engaged on governmental purposes

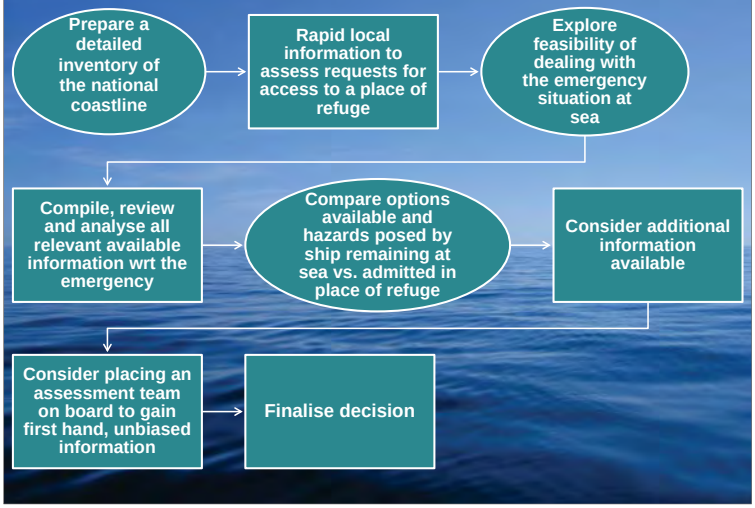
Why seek or provide a place of refuge?

Ships in distress forced to remain at sea over a prolonged period at the mercy of the elements are very likely to deteriorate

Guidelines advocate that a place of refuge should be provided with the intention of protecting and safeguarding:

- The safety of human life and health in the immediate vicinity of the vessel
- The marine, coastal and/or terrestrial environments and ecological and marine resources both in the vicinity of the vessel and envisaged place of refuge
- Economic infrastructure and installations both in the vicinity of the vessel and envisaged place of refuge, as well as ports or estuaries
- The vessel as a piece of property
- The ship's cargo as a piece of property

Procedure flowchart



Implications of denying a request for access to a place of refuge

- Effect that a denial of a request could have on the maritime environment of neighbouring coastal States should be taken into account
- The decision has to balance the right of a coastal State to protect his coastline vs. the duty of the coastal State not to transfer directly or indirectly damage or hazards from one area to another (UNCLOS Art. 195)
- In case of denial, the Competent Authority should attempt to consider other alternative arrangements to assist the vessel

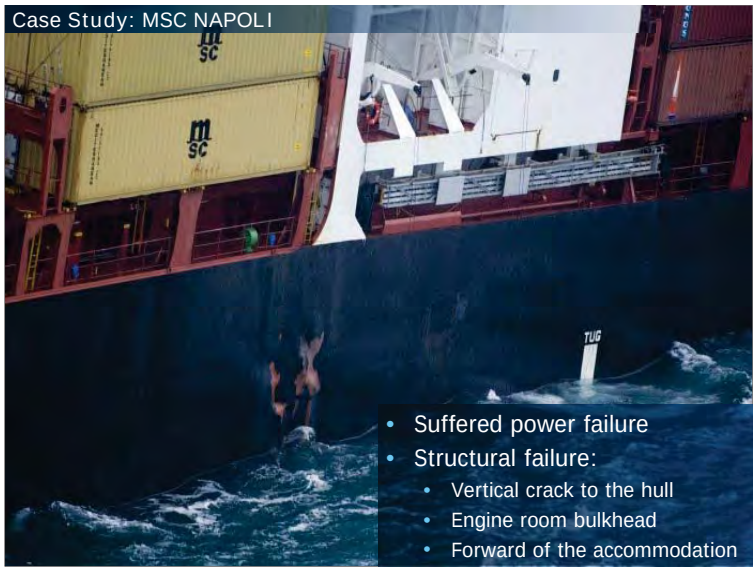
Handing over to another jurisdiction

- Depending on the situation, might be necessary or adequate to hand over the coordination process to a neighbouring jurisdiction (drifting casualty, more suitable place of refuge…)
- Need for a clear and unambiguous procedure in place (e.g. Memorandum of Agreement)
- As a general rule, neighbouring States should always be alerted about the fact that a ship is in need of assistance and has requested permission to seek refuge

Case Study: MSC NAPOLI

- 18 January 2007, English Channel – French jurisdiction
- Weather – WSW gale 8-9, 5-7 metre swell

Case Study: MSC NAPOLI



- Suffered power failure
- Structural failure:
  - Vertical crack to the hull
  - Engine room bulkhead
  - Forward of the accommodation

Case Study: MSC NAPOLI

- 2,318 containers on-board:
  - 967 above deck
  - 1,351 below deck
- Dangerous goods 159 units
- 3,512 MT IFO 380

Case Study: MSC NAPOLI

- 10:30: Distress call to both UK and France
- Manche Plan implemented
- 10:53: French Navy helicopter on site (1st evaluation)

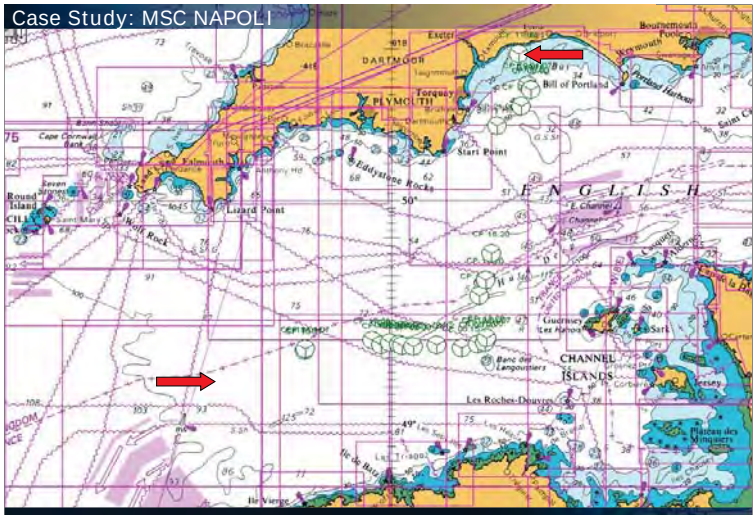
Case Study: MSC NAPOLI

- 11:15: Crew abandon ship / France requested UK assistance for Rescue ops
- Early afternoon: 26 crew airlifted from life boats to safety

Case Study: MSC NAPOLI

- 16:30: MSC NAPOLI under towage (Eastward)
- Refuge options in France (Cherbourg 145 NM or Le Havre 210 NM)
- Refuge options in UK (Falmouth 50 NM or Portland 125 NM)

Case Study: MSC NAPOLI

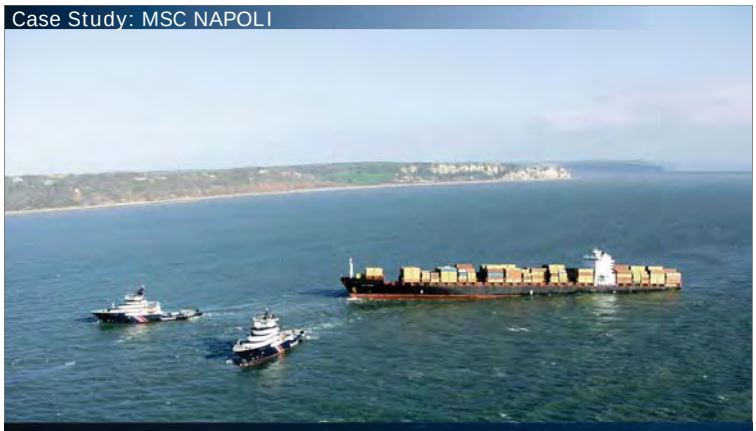


- Least environmentally risky option : place of refuge in UK. Agreed by SOSREP (UK Secretary of State Representative) ⇒ Vessel towed to Portland Harbour

Case Study: MSC NAPOLI

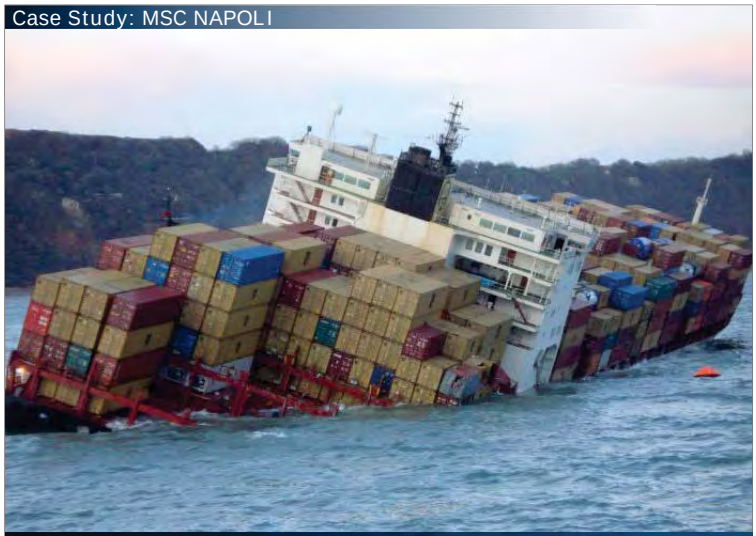
- 19th January pm: French Navy evaluation team winched on casualty to attempt to unblock the rudder and to re-assess the integrity of the Napoli
- Two breaches, on each side of the hull and engine room flooded

Case Study: MSC NAPOLI



- 19th January pm: coordination and command handed over to UK MCA
- 20th January am: Salvage Master onboard the Napoli informed the SOSREP that the ship's condition had deteriorated further and that she was at real risk of sinking. Given these conditions, the SOSREP decided to beach the vessel in Lyme Bay nearest to the coast.

Case Study: MSC NAPOLI



- 20th January midday: the MCA beached the Napoli on a sand bank

Case Study: MSC NAPOLI

Of the 2,318 containers on board:

- Lost overboard: 114
- Identified ashore: 82
- Identified submerged: 14
- Un-located: 18

Cargo manifest

Manifest assessed and items of concern highlighted, based on flammability, reactivity, toxicity:

- Methyl bromide
- Glycophosphate
- Epichlorohydrin
- Phosphorus
- Polystyrene beads
- Toluene disocyanate
- Phosphorus pentasulphide
- Acrylonitrile
- Trimethylaluminium
- Dichlorobenzene
- Organophosphorus pesticide

Oil removal

Oil removal operation:

Estimated 50 MT of IFO 380 and 150 MT of MDO lost following incident and towage

Container discharge

Container discharge

Health and Safety

Ship stability issues

Logistics

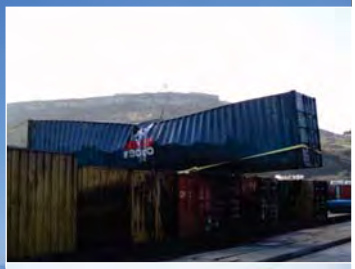
Port operations

Containers brought to Portland Port and stored depending on condition and risk:

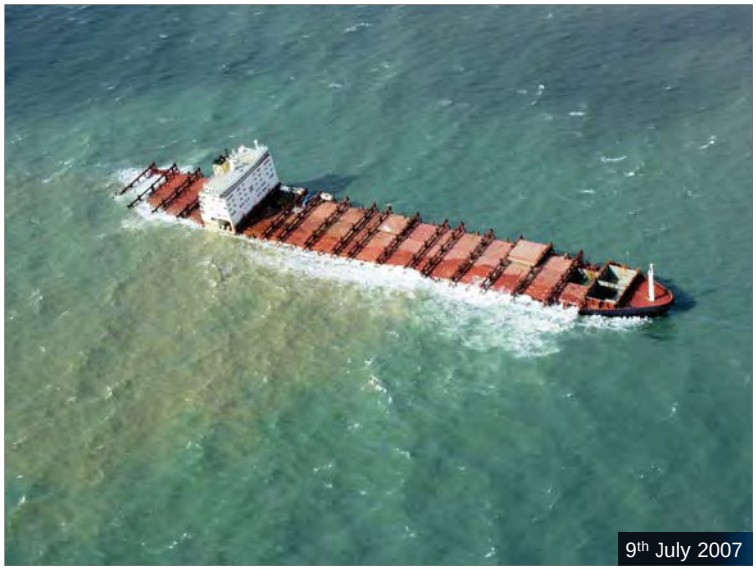
Safe

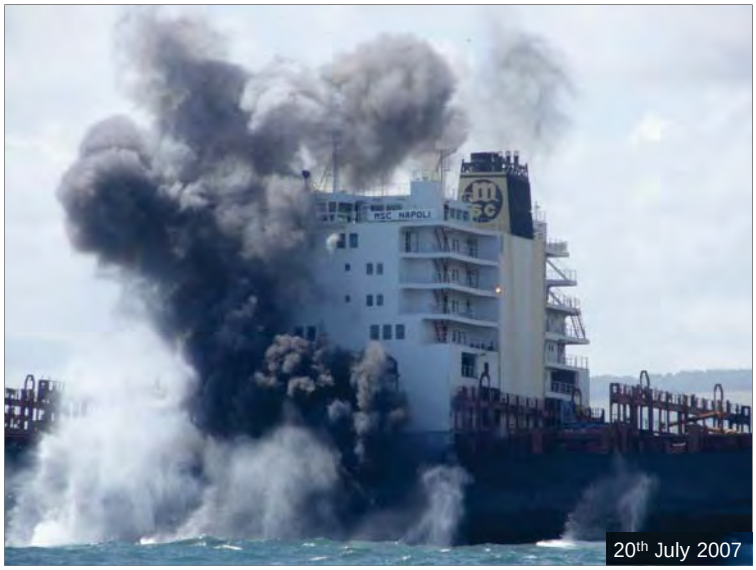
Questionable

Dangerous goods



Container processing





Conclusions

- Good cooperation between neighbouring countries
- Quick decision making despite risk (UK SOSREP)
- Crew rescued
- The beaching of MSC NAPOLI prevented:
  - Spillage of 3,512 MT of Heavy Fuel Oil
  - Loss and ultimate spillage of 159 containers with DG
  - Loss of entire cargo (2,318 containers)
  - Navigation hazard from potentially floating containers

Guiding Principles of Oil Spill Exercising: 1

Ensure that management from the top down supports the exercise activity

Guiding Principles of Oil Spill Exercising: 2

Set clear, realistic and measurable objectives for an exercise

Guiding Principles of Oil Spill Exercising: 3

The thrust of exercising is to improve - not to impress

Guiding Principles of Oil Spill Exercising: 4

Simpler, more frequent exercises lead to faster improvements initially

Guiding Principles of Oil Spill Exercising: 5

Do not tackle complex exercises until personnel are experienced and competent

Guiding Principles of Oil Spill Exercising: 6

Too many activities, locations and participants can over-complicate an exercise

Guiding Principles of Oil Spill Exercising: 7

Evaluating the exercise successfully is as important as conducting it successfully

Guiding Principles of Oil Spill Exercising: 8

Planning and conducting a successful exercise is a significant accomplishment

Black Sea Experience:
Implementing a Regional Exercise Programme

Black Sea Region: the framework

- Six littoral States
- *Bucharest Convention* and its *Emergency Protocol*
  - Regional plan of cooperation implements operational cooperation
  - Integrates regional support under the NOSCPs
- Coordination through the *Black Sea Commission*
  - Relevant advisory group meets annually

Regional Exercise Programme

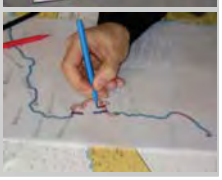
- Originally developed in 2005
  - Based on existing experience, particularly the Baltic Sea
- Implements and tests the regional cooperation plan
  - Alpha: table-top exercise
  - Bravo: communication exercise
  - Delta: full scale exercise

Comprehensive Exercise Schedule

Alpha	2011	2009	2012	2014	2010	2013
Bravo	Jan-Apr 2010	May-Aug 2010	Sept-Dec 2010	Jan-Apr 2009	May-Aug 2009	Sept-Dec 2009
	Jan-Apr 2010	May-Aug 2010	Sept-Dec 2010	Jan-Apr 2011	May-Aug 2011	Sept-Dec 2011
	Jan-Apr 2012	May-Aug 2012	Sept-Dec 2012	Jan-Apr 2013	May-Aug 2013	Sept-Dec 2013
	Jan-Apr 2014	May-Aug 2014	Sept-Dec 2014	Jan-Apr 2015	May-Aug 2015	Sept-Dec 2015
Delta	2013	2011	2009	2017	2019	2015

Exercise SULH 2007, Turkey

- First regional 'delta' exercise
- Significant preparatory activity
  - 2 x national planning workshops
  - 6 x exercise planning meetings
  - Regional technical workshops
    - dispersants; claims; sensitivity mapping; aerial surveillance; integration of international resources; media interface; equipment deployment training
- Significant investment - with many contributors
  - 200+ persons

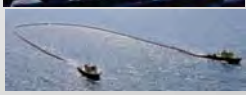


Exercise Objectives

- Establish the governmental command structure for major oil spills using the national system
- Use the regional 'POLREP' system to mobilise (on paper or actual) resources from neighbouring States.
- Establish a functional Joint Emergency Response Centre under the Black Sea Contingency Plan
- Integrate industry and private organizations' resources

Industry Contributions

- Assistance with scenario planning
- Facilities for exercise briefings etc…
- Technical support to workshops
- Participation and role-play
  - ship-owners, insurers and their technical advisors (e.g. ITOPF)
  - cargo interests
  - marine terminal and refinery operators
  - response cooperatives
  - equipment deployments
- Exercise evaluation and feedback

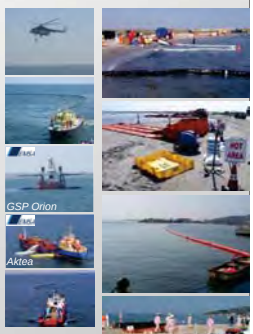


Government and Industry Integration

- All six littoral States involved
  - Working under Turkish national response system
  - Cooperation through the regional plan
- Tested joint and integrated response:
  - Oil company played the cargo owner
  - Shipping company played the tanker owner
- Broad range of participants:
  - IMO
  - IOPC Fund
  - ITOPF
  - OSRL
  - Local contractors

Subsequent Delta Exercises

- Biennial event
  - Turkey, 2007
  - Romania, 2009
  - Georgia, 2011
- Evaluation and feedback is vital



Key Lessons Learned

Good practice

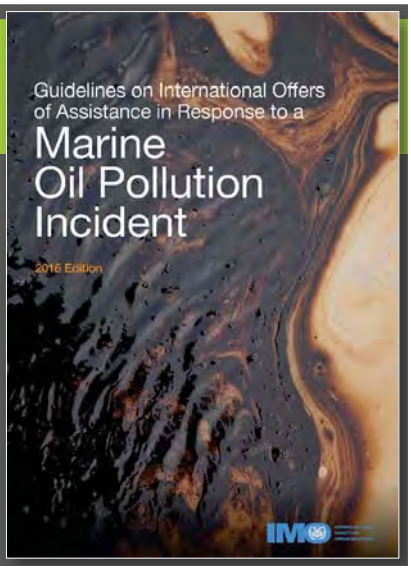
- ✓ Demonstrable commitment
- ✓ Network building
- ✓ Communications tested
- ✓ Clear objectives
- ✓ Preparatory activities are inherently valuable
- ✓ Political support

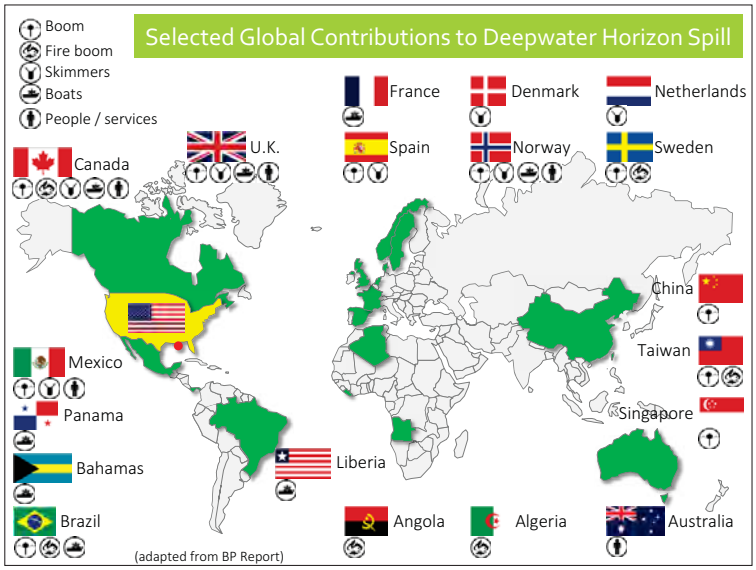
Improvement areas

- Reduce the level of scripting
- Use more ‘injects’ or ‘event cards’
- Increase focus on decision making
- Ensure autonomous ‘exercise direction’
- Further strengthen integration
- Include media role-play

IMO PUBLICATION 2016

- Prompted by USA's experience during Deepwater Horizon incident
- Focussed on large, complex or significant spills that exceed regional capabilities
- Aims to build on existing regional arrangements





LESSONS FROM DEEPWATER HORIZON

- Incident required international response far exceeding the resources available in the USA
- Complex response highlighted significant gaps:
  - How best to request and search for the resources specifically needed and who best to contact?
  - How to evaluate and document the many generous, unsolicited offers and choose only those that meet operational needs?
  - How to manage logistics once an offer is accepted?


Example Staging Area during DWH

THE PUBLICATION ADDRESSES:

- Coordination system
- Communication between requesting and assisting parties
- Recommendations for offer processing and evaluation
- Customs, legal and financial issues
- Situation awareness and common operating picture
- Advanced planning
- Equipment stockpiles and source considerations
- Common lexicon for equipment and personnel types

Oil Spill Response

Oil Spill Response Limited

A global company with a strong regional focus

Who we are

- International industry funded Tier 3 oil spill response co-operative
  - Owned by major oil and gas production / transportation companies
  - Train and respond effectively anywhere in the world

Membership

Participant Members

And over 100 Associate Members

Our global capability

9 locations worldwide

Our global capability

Current Base Location	Aircraft Type	Service
Singapore	Hercules L382	SLA response with dispersant system installed
Doncaster, UK	Piper PA-31 Navajo	UKCS Supplementary Service – Surveillance aircraft
Accra, Ghana	Embraer 110 Bandeirante	WACAF Supplementary Service - dispersant system installed upon mobilisation.
UK	Boeing 727	Global (SLA) wide area surface dispersant response; Freight logistics capability

(For the latest aviation capability updates, please visit www.oilspillresponse.com)

What we do

Preparedness

- Training
- Consultancy
- Oil spill modelling
- Capability reviews
- Equipment hire
- Exercises and drills
- Secondments

Response

- Technical advice
- Spill management
- Specialist personnel
- Equipment and transportation
- Aerial dispersant and monitoring systems
- Response integration

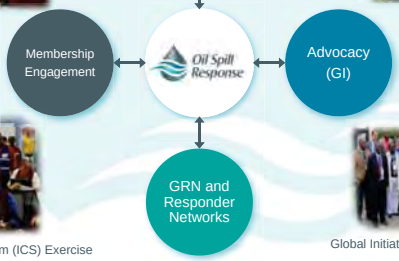
Stakeholder Engagement

Members' Technical Forum

Industry Technical Advisory Committee

Incident Command System (ICS) Exercise

Global Initiative Workshop, Namibia



Oil Spill Response

Thank You