OIL SPILL RESPONSE AND HAZARDOUS WASTE MANAGEMENT AT PORTS

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INDIAN COAST GUARD

SCOPE

- Overview
- Contingency plan
- Oil Spill Response: Ports
- Hazardous Waste Management
- Conclusion
OVERVIEW

HISTORY

- An average of **24.5 number of spills** occurred per year from 1970-79
- No of **major oil spills** till 2018: **598 (>700 tons)**
- Quantity of **oil spilt** till 2018: **6.4 million tons (>7 tons)**
- Environmental impact
  - **Unfathomable**
- Combating Oil spill deemed necessary for clean & green environment
CONVENTIONS

- **MARPOL Convention** adopted on 02 November 1973 at IMO


- **IMO-OPRC** convention established measure to deal with Pollution Control and Response

INDIAN CONTEXT

- **Third largest oil consumer** in the world

- **Major SLOCs** for oil trade passes through IOR

- Major ports handles **7000 POL tankers** each year

- **Over 80 companies** involved in operation of **228 offshore blocks and fields**
CONTINGENCY PLAN

WHY CONTINGENCY PLAN...?

- Pre-emptive contingency plan
- Command, control, co-ordination and communication during any eventuality
- Roles & responsibilities of various stakeholders
- OPRC convention to establish measures to deal oil pollution incidents, either nationally or in co-operation with other countries
Responsibility for coordinating marine oil spills at sea transferred to ICG on 07 Mar 86 from DG Shipping

Draft National Oil Spill Disaster Contingency Plan (NOS-DCP) prepared by ICG in 1988 and circulated to concerned agencies for comments

National Oil Spill Disaster Contingency Plan published in Jul 1996 and circulated to 190 agencies. 67 of them being participating agencies

NOS-DCP SALIENT FEATURES

- Effective system for detection and reporting of spill
- Adequate measures for preparedness in respect of combating oil spill
- Well defined Role & Responsibilities of stakeholders
- Inventory Standards for Port facilities, Oil Handling Agencies & Coastal states
### Combat Responsibilities

- Combat agencies have the operational authority to combat oil spill depending upon the location

- **Oil Terminals**
  - Oil company/terminal operator

- **Ports**
  - Port Operator

- **Shoreline/Intertidal Zone**
  - State Government authority

- **Beyond Baseline**
  - MoD via ICG

- **Offshore Petroleum Ops**
  - Relevant Company

### Response Mechanism

- Two compatible planning approaches
  - Industry concept of tiered response
  - Government Arrangements: Local, National & Regional level

- **Group One**
  - Local Capability

- **Group Two**
  - Area Capability

- **Group Three**
  - Multi-National or Regional Capability

- **International Capability**
RESPONSE MECHANISM

- Tiered Response mechanism in place
- Provides convenient categorisation and practical basis for planning
- NOSDCP details Tiers of response viz Tier-1, Tier-2, Tier-3
- **Tier-1** response **concerns** with preparedness & immediate response to small spill

**Tier-1**

- Small Spill
- Additional resources from other ports/ICG
- Response up to 700 tons
- Agencies being first responder
- Within port/facility operator capacity
- Includes trained manpower & equipment

**OIL SPILL RESPONSE: PORT**
PORT RESPONSIBILITIES

- Maintain Tier-1 Pollution Response capabilities
- Preparation and implementation of Facility Contingency Plan
- Training and Exercise
- Coordinate oil spill response in jurisdiction

RISK CATEGORISATION FOR PORT

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Port handling crude oil/tanker visits /SPM/STS</td>
</tr>
<tr>
<td>B</td>
<td>Ports which handle products only OR Ports which handle ships carrying &gt; 1000 tons of fuel/bunker oil</td>
</tr>
<tr>
<td>C</td>
<td>Other than Cat ‘A’ and Cat ‘B’</td>
</tr>
</tbody>
</table>
## PR INVENTORY STANDARDS FOR PORTS

<table>
<thead>
<tr>
<th>Description</th>
<th>Risk Category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Inflatable Boom (meters)</td>
<td>2000</td>
</tr>
<tr>
<td>Skimmer (20TPH)</td>
<td>06</td>
</tr>
<tr>
<td>OSD Applicator</td>
<td>04</td>
</tr>
<tr>
<td>Oil Spill Dispersant (litres)</td>
<td>3000</td>
</tr>
<tr>
<td>Bioremediation (litres)</td>
<td>2000</td>
</tr>
<tr>
<td>Flex Barge (10 Tons)</td>
<td>04</td>
</tr>
<tr>
<td>Boom sustainable in strong currents, if current within 4 knts (meters/nos)</td>
<td>400/2</td>
</tr>
<tr>
<td>Sorbent boom (min 5 inch dia, 5 ft length)</td>
<td>500</td>
</tr>
<tr>
<td>Sorbent Pads (Nos) 20x20 inch</td>
<td>2000</td>
</tr>
<tr>
<td>Shoreline cleanup Equipment</td>
<td></td>
</tr>
<tr>
<td>Mini Vacuum pumps</td>
<td>05</td>
</tr>
<tr>
<td>Portable temporary storage facility</td>
<td>05</td>
</tr>
<tr>
<td>200 m Shoreline sealing boom</td>
<td>03</td>
</tr>
<tr>
<td>Work Boats</td>
<td>04</td>
</tr>
<tr>
<td>Tugs</td>
<td>04</td>
</tr>
<tr>
<td>IMO Level 1</td>
<td>20</td>
</tr>
<tr>
<td>IMO Level 2</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>15</td>
</tr>
</tbody>
</table>

### CONTAINMENT EQUIPMENT

- Inflatable booms
- Category A to have variety of booms

- Ocean Boom
- Beach Sealing Boom
- Fence Boom
RECOVERY EQUIPMENT

- 20 TPH capacity Skimmers
- Inventory to be maintained depending upon type of oil handled

DISC SKIMMER  
WEIR SKIMMER

STORAGE EQUIPMENT

- 10 Tons flex barge else dumb barges
- Capacity can be provided onboard tugs also

PORTABLE TANKS  
FLEX BARGES
OIL SPILL DISPERSANT

- Ports to hold Oil Spill Dispersant (OSD) as per inventory
- OSD held should be NIO certified for usage in Indian Waters
- Usage of OSD to be undertaken as per Policy and Guidelines for Use of OSD in Indian Waters
- Sufficient OSD applicators to be held
- Approval from ICG to be sought prior usage

COAST GUARD RESOURCES

- Coast Guard also maintains resources for mobilisation in case of requirements.
- This includes Booms, skimmers, barges etc.
COAST GUARD RESOURCES

- Skimmers with varied capacity are held with ICG
- This includes weir type, vortex type and rope type skimmers

COAST GUARD RESOURCES

HELI-SKIMMER SYSTEM
FACILITY CONTINGENCY PLAN FOR PORTS

- All ports are required to have a Facility Contingency Plan (FCP) duly approved by ICG.

- FCP should include following elements:
  - Strategy:
    - Introduction to FCP
    - Risk Assessment
    - Response Strategy
    - Equipment
    - Management
    - Communications
  - Actions & Operations:
    - Initial procedures
    - Operations Planning
    - Control of Operations
    - Terminations
  - Maps/Charts:
    - Coastal Facilities & Charts
    - Risk locations
    - Shoreline types & resources
    - Sea & coastal zone response strategy
    - Storage/Disposal sites
    - Sensitivity mapping
  - Lists:
    - Primary OSR Equipment
    - Auxiliary OSR equipment
    - Support Equipment
    - Manpower Sources
    - Experts & Advisors
  - Data:
    - Commonly traded Oil
    - Wind & Weather
    - Information sources

SHADES OF ESI MAPPING

- ESI - 1: Exposed Rocky Shore & Man-Made Structure
- ESI - 2: Exposed Scarps and Steep Slopes in Clay
- ESI - 3: Fine to Medium Grained Sandy Beaches
- ESI - 4: Coarse Grain Sandy Beaches
- ESI - 5: Mixed Sand and Gravel Beaches
- ESI - 6: Gravel Beaches
- ESI - 7: Exposed Tidal Flats
- ESI - 8: Sheltered Rocky Shores & Man-Made Structure
- ESI - 9: Sheltered Tidal Flats
- ESI - 10: Mangrove Cover, Swamps, Fresh Water Marshes
Endangered species taken into consideration during ESI mapping.

Endangered species include:

- Birds
- Marine mammals
- Terrestrial mammals
- Fish
- Invertebrates
- Reptiles
SENSITIVE SOCIO ECONOMIC FEATURES

Aqua culture, fishing operations, tourist beaches, hotels, ports and industrial activities

Final ESI Map

Legend:
1. 1
2. 3
3. 4
4. 7
5. 8
6. 9
7. 10
8. bird
9. commercial
10. estuary
11. fishery zone
12. habitat
13. island
14. river

Legend:
0  4.5  5  9 Kilometers

Final ESI Map
TRAINING & EXERCISE

- Mock drills and exercises be conducted at least once every quarter

- Maintain record of exercise including personnel participated & resources mobilized

- IMO Level 1 & 2 be undertaken for operator level & middle management level respectively

COAST GUARD ASSISTANCE

- Oil Spill Contingency Plan
  - Vetting, Approval and operationalization

- Pollution Response Equipment
  - Audit and Inspection

- Train Personnel
  - IMO Level-1 & Level-2

- Joint Exercises
  - At Local, Regional and National level
HAZARDOUS WASTE MANAGEMENT

WHAT IS HAZARDOUS WASTE?
- Any waste threat to public health and environment
- Also includes disposal of protective clothing
- It is important to be familiar with legislation pertaining to disposal of hazardous waste which includes storage & transportation
- Treatments may be carried out to reduce the potential damage done by hazardous waste prior final disposal
HAZARDOUS WASTE MANAGEMENT

- States of Gujarat, Maharashtra and Andhra Pradesh are top three hazardous waste generators.
- Data reveals, at 22 places in 10 states land based Treatment Storage and Disposal Facility (TDSFs) has been developed.
- 14 numbers of Common Incinerators in 7 States and 127 Nos. of individual incinerators in 12 States are installed in India.

DISPOSAL OF HAZARDOUS WASTE

- Recycling
- Treatment for ease in disposal: Physical, Chemical or Biological
- Solidification: Convert the waste into insoluble rock hard substance
- Incineration: Thermal disposal of waste by burning
- Land disposal: Waste sequestered in permanent disposal facility
THANK YOU