Oil Spill Response

The Importance of Pre-planning and Logistics for successful Incorporation of Dispersants into a National Response Programme.

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Overview

- Why Plan?
- Dispersant – the numbers
- Logistics – supply chain
- Developing Readiness
- Realities of Response

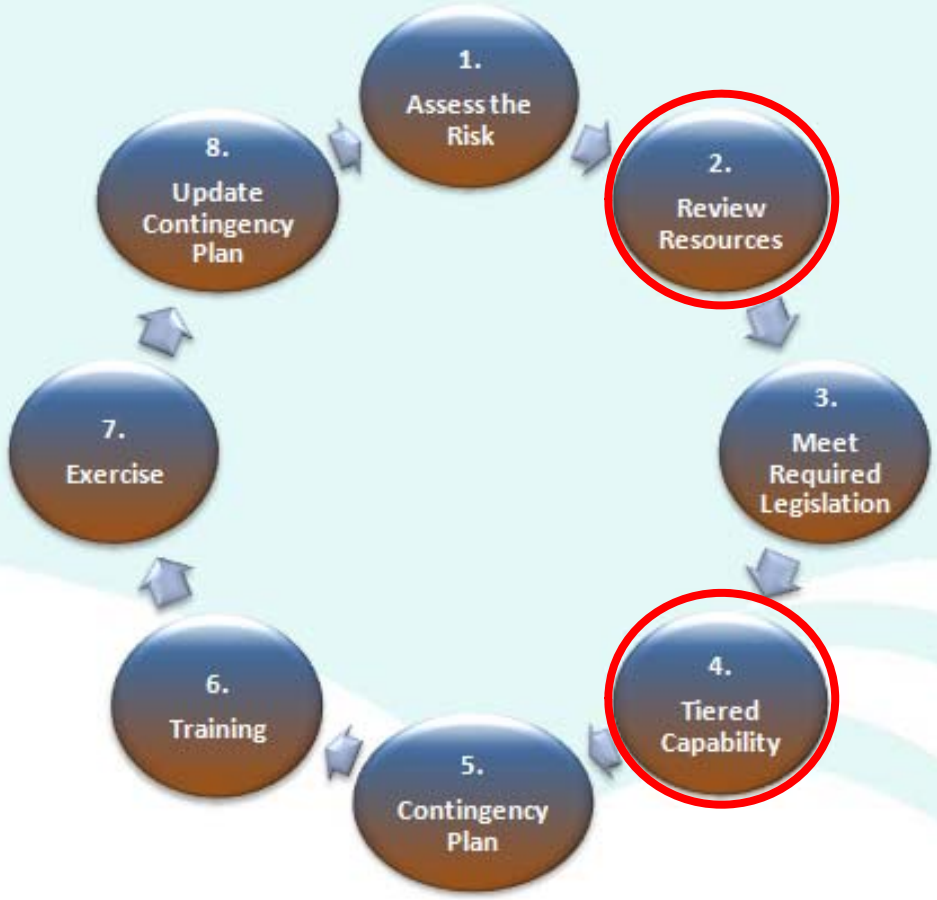
Why Plan?

- Preparedness
  - Peace time preparation
  - Worse case scenario identification
- Response
  - Guidance and instruction during an incident
- Industry requirements
  - Regulators
- Company policy
  - HSE

Benefits of Contingency Planning

- Provides a response structure & procedures
- Improves operational efficiency & effectiveness
- Identifies issues in advance and allows mitigations to be put in place
- Ensures resources are identified and are accessible
- **Saves time in an emergency**
  - ‘Window of Opportunity’

Planning Cycle



2.
Review
Resources

Review Resources

- Resources available should be **adequate for the assessed risk**
  - **Tiered response options** must be identified
- Resources must be well maintained and **accessible**

What are the numbers?

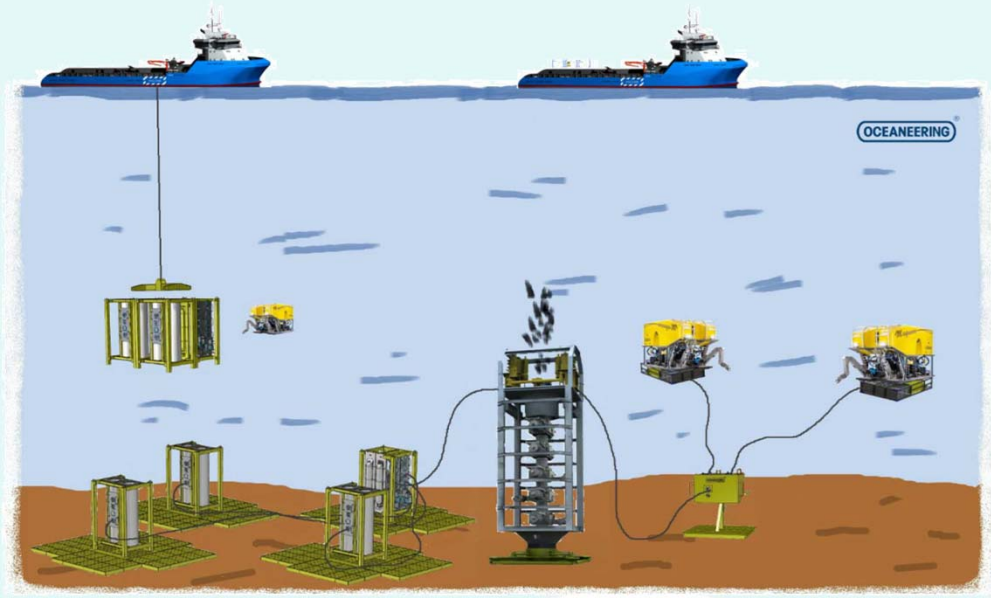
- **Planning for a WCS of 100,000bbls (15,899m^3) / day**
- For a ***Surface Response***, assume:
  - DOR of 1:20 (1m^3 of dispersant will treat 20m^3 of oil)
  - 100% contact and effectiveness
- Air:
  - Large scale aerial application, e.g. ADDS Pack
    - 17m^3 of dispersant per sortie
  - Assume 3 sorties in a 12 hour period
    - **51m^3** per day = 1020m^3 oil treated per day
- Sea:
  - Single boat spray system, e.g. AFEDO Nozzles
    - 50l/min for 12 hour period
    - **36m^3**/day per vessel = 720m^3 treated per day
    - 2 x offshore systems = **72m^3** / day
- Total = **123m^3 / day**

  (2,460m^3 oil treated)

What are the numbers?

- For a ***Sub-Surface Response***, assume:
  - DOR of 1:100 (1m^3 of dispersant will treat 100m^3 of oil)
  - 100% contact and effectiveness
- Dispersant injection system
  - 110 l/min per wand (max 5 wands) = 6.6m^3 / hr
  - Assume 24 hour continuous operation
- Total = **<u>159m^3 day</u>**

  (15,840m^3 oil per day treated)



Surface + Subsurface Total = **282m^3** per day required for a 100,000bbl/day spill*

*Illustrative purposes only : 100% effectiveness for either technique is unlikely.

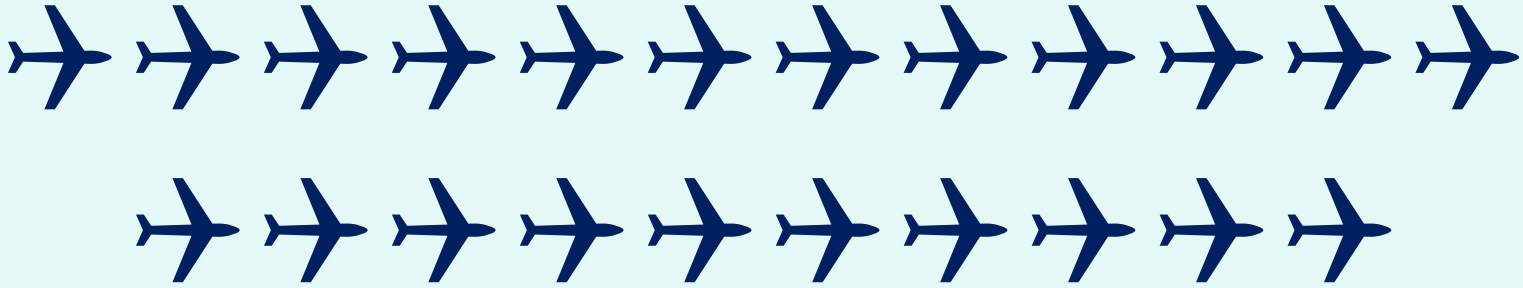
Logistical Considerations

- Maintaining your supply chain for an ongoing event
- Dispersant is not an ‘off the shelf’ item
  - Supplier manufacture ramp up takes time
  - Shipment
    - International shipment
      - e.g. 1 x 747 = 90m^3
    - In-country logistics
      - e.g. 1 x standard 40ft HGV trailer holds 24m^3
- Import restrictions may create a ‘pinch point’

Stressing the International Supply Chain

- 1974m^3 of dispersant for one week of operation:

  = 22 x Boeing 747 loads

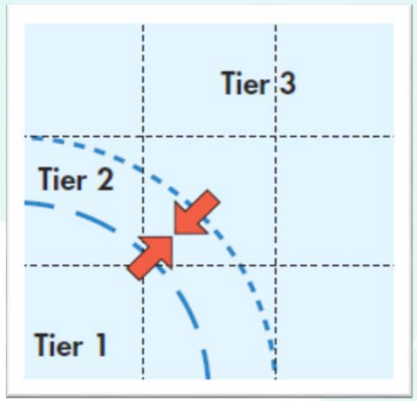


= 82 x Heavy Goods Vehicles

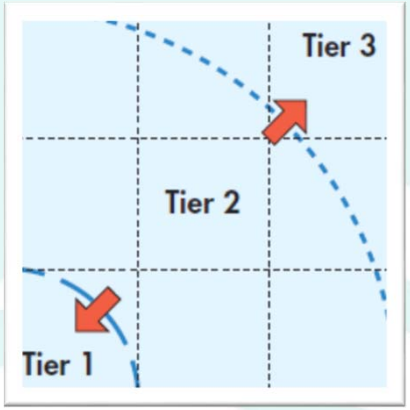
4.
Tiered Capability

Tiered Capability

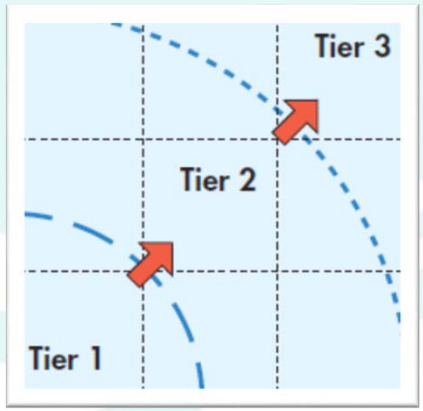
- Operational factors
  - Probability and frequency of a spill occurring
  - Worst case scenario incidents
  - Oil type
  - Impact on business operations
- Setting factors
  - Proximity to operations
  - Operating conditions
  - Sensitive resources at risk
  - Legislation



Inadequate Tier 2 capability



Robust Tier 2 capability

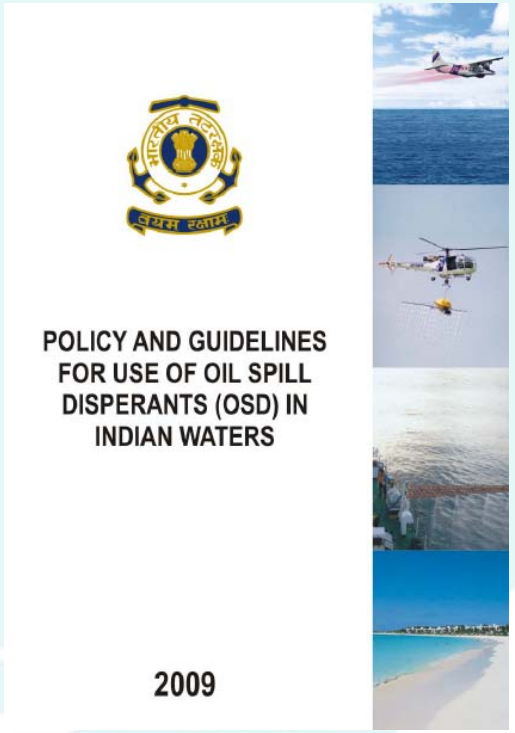


Remote operation, less reliance on Tier 3

Tiered Response & Logistics Supply Chain

- Local first strike Tier 1 capability
  - Rapid response
  - Buys time to activate logistics

> *"13.1: **Stocking Criteria**. Minimum quantity of OSD to be stocked shall be commensurate with oil spill risk as per approved contingency plan..."*



- National / Regional Tier 2 support
  - Plugs any gaps between T1 and T3

- Centralised international Tier 3 capability
  - Shared costs; purchase, stockpile maintenance, testing, replacement
  - e.g. Global Dispersant Stockpile (GDS) of 5000m^3

Developing Readiness

- Aviation Considerations
  - Airport requirements; runway length, strength (PCN), ground support (forklifts)
  - Minimising tarmac time during reload (IBC vs. Bulk Carrier)
  - Permits; overflying sensitive areas, low level, application
  - Refuelling arrangements
  - Flight scheduling – commercial passenger priority
  - Access to surveillance support aircraft / comms
- Vessel Application
  - Vessel preidentification / appropriateness
  - Resupply plan / distance from port
- Effectiveness Monitoring
  - Vessels / Fluorometer / Expertise

Some Realities

- Major ‘Macondo’ events are rare
  - Dispersant use is even more rare
- The importance of time cannot be overstated
- Size Matters!
  - Major events open doors in ways that smaller events struggle
- Mechanical recovery alone will **not** be adequate (average 10% effective)
  - Encounter rate is limiting factor
- Dispersant is only part of the toolbox
  - Cone of Response Concept

Cone of Response

At Source

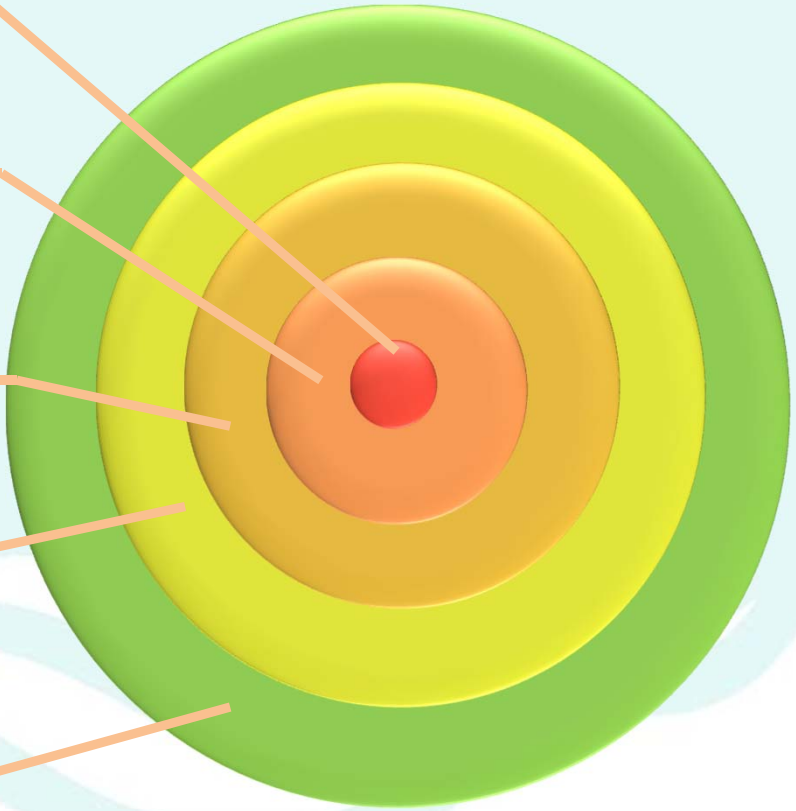
1. Control the subsea release
2. Apply appropriate quantities of dispersants, subsurface injection

Oil Surfacing Nearest the Wellhead

1. Dispersant application
2. Containment and Recovery
3. In Situ burning

Beyond the Immediate Vicinity of the Wellhead

1. Aerial Dispersant applied



Further from the Wellhead

1. Dispersant Application
2. Mechanical Recovery using VOOs

Both with the assistance of remote sensing / spotter aircraft to ensure maximum efficiency

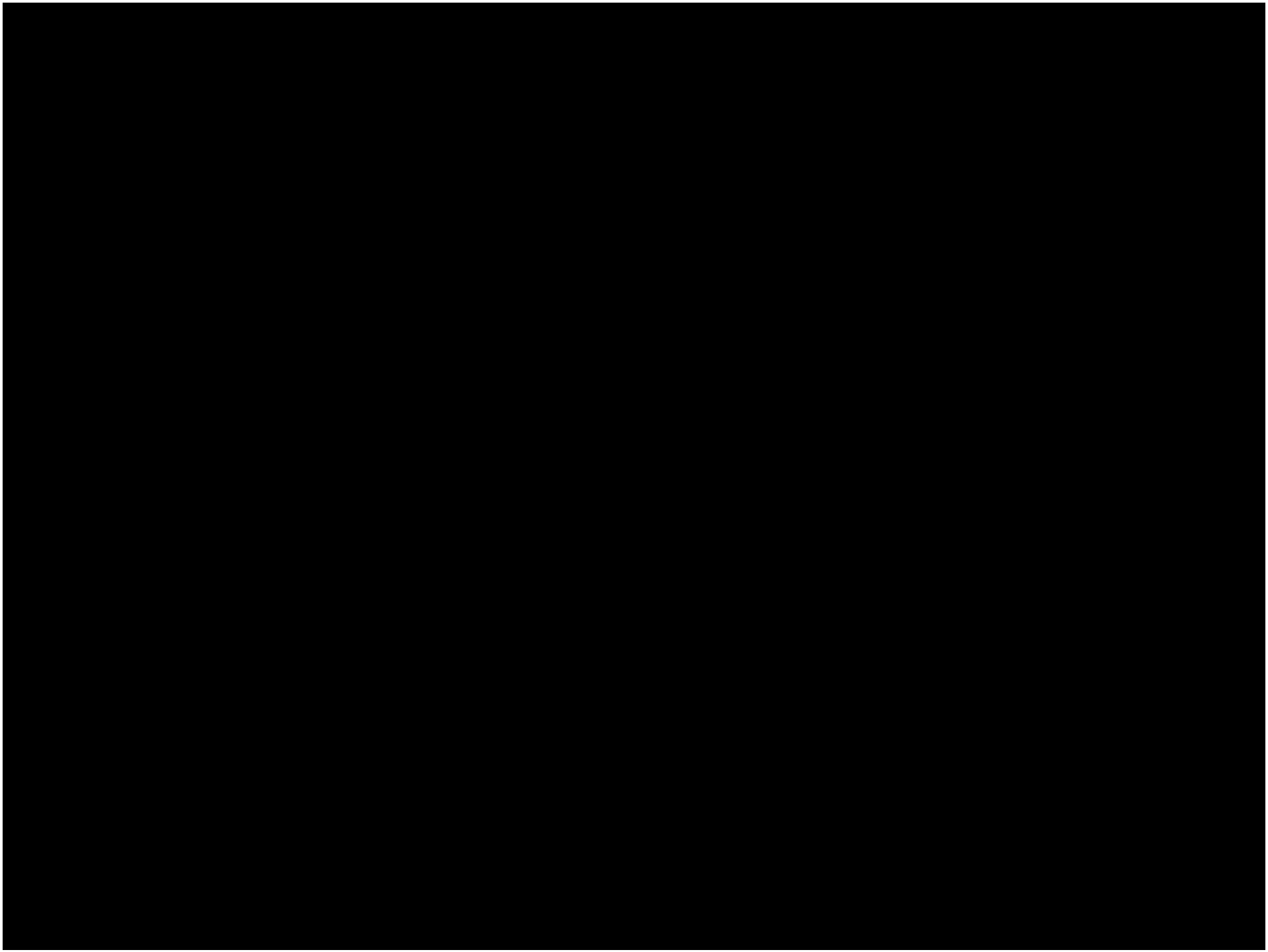
Shoreline

Protective booming of priority areas identified through SCAT assessments / area response plan

Summary

- Risk based pre-planning is essential
- Major events are rare, but not impossible
- Dispersant is just one tool in the toolbox
- Maintaining the supply chain is a challenge
- Tiered approach provides most efficient mix of in-country capability and international support.

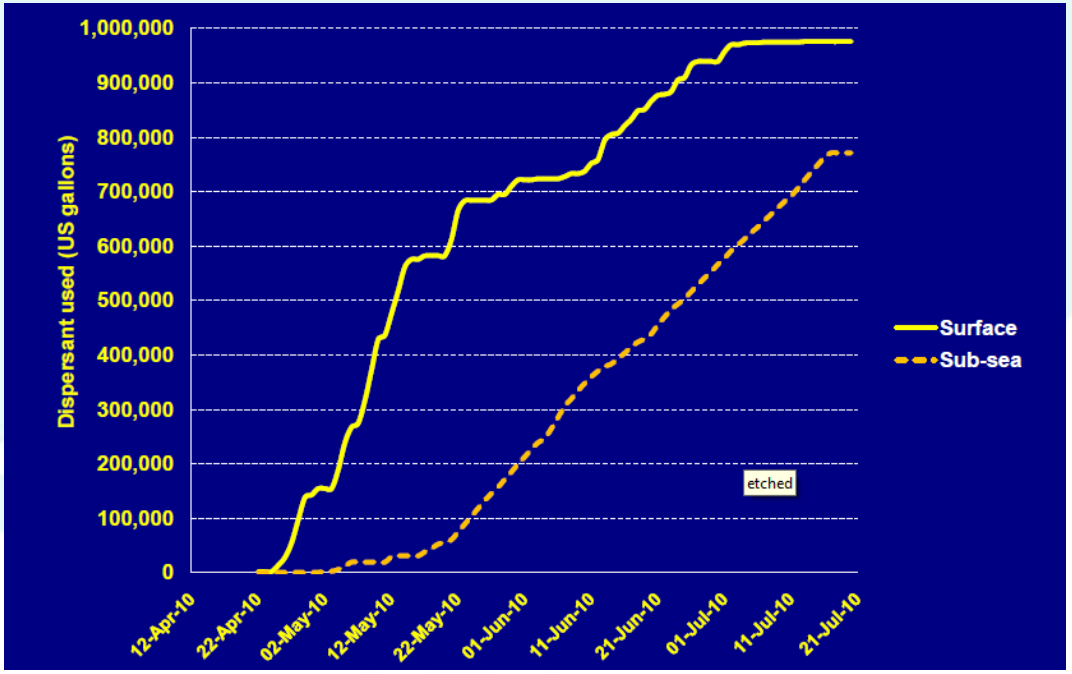
Questions?



BACKUP

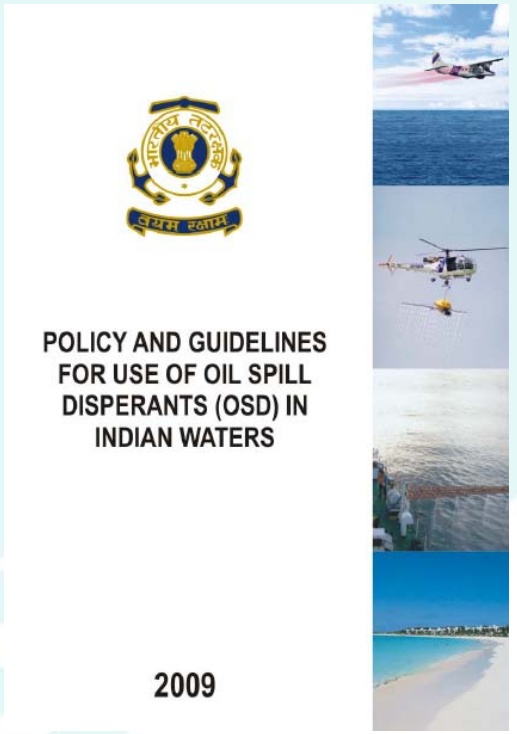
Macondo Dispersant Use

- 6979m^3 of dispersant used in total
  - 3695m^3 from air
  - 2920m^3 subsea
  - 364m^3 from ship



Indian Context

- Dispersant use must be documented in OSCP
- Mechanical recovery is preferred option
- ICG permission required
- NEBA required
- No shallow water use
- No application on emulsion
- Final shoreline cleanup



Response - Dispersant

- Aerial Application
  - UK Hercules L382-G
  - ADDS Pack