Spill Assessment/ Assessment of Oil Quantity

The International Tanker Owners Pollution Federation Ltd

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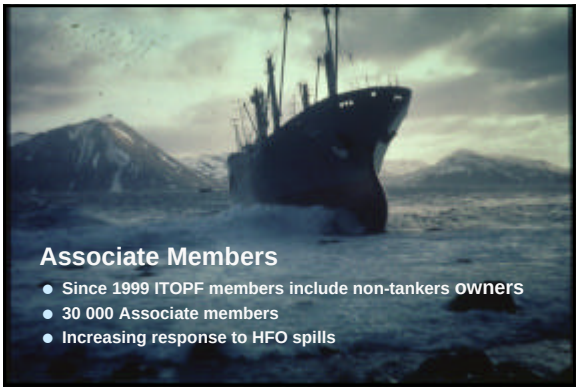
Technical Support Co-ordinator

Tbilisi, Georgia, 22nd - 26th January 2001

- Who is ITOPF ?
- Established in 1968, after Torrey Canyon
- Not for profit organisation based in London
- Technical Advisers (Biologists, Chemists, Engineers)
- International Service

ITOPF Members

- Priority service to tanker owners
- 4000 owners, 7000 tankers
- 98% of the world 's tonnage



Associate Members

- Since 1999 ITOPF members include non-tankers owners
- 30 000 Associate members
- Increasing response to HFO spills

Technical Services

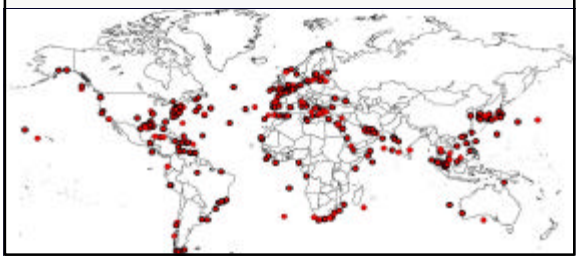
Response to marine oil spills

- Damage assessment & claims analysis
- Contingency planning & advisory work
- Training, seminars, conferences
- Information services
  - Publications
  - Databases
  - Website:
- www.itopf.com

ITOPF

Over 420 spills attended in more than 83 countries since 1969

Over 220 spills attended since 1989



Spill Assessment/ Assessment of Oil Quantity

OUTLINE

- Initial Spill Assessment
- Estimating Spill Size by Source
- Aerial Observation
- Appearance of Oil at Sea
- Estimating Spill Size by Aerial Observation
- Recording & Reporting

INITIAL SPILL ASSESSMENT

INFORMATION FOR RESPONSE STRATEGY

- Spill size and source
- Location (and time)
- Oil type/condition
- Oil trajectory and potential damage
  - – Weather conditions & sea state
  - – Hydrography (e.g. depth & currents)

ESTIMATING SPILL SIZE

- Source of Spill - Vessel vs Non-vessel
- Type of Vessel - Tanker vs Non-tanker
- Bunkers vs Cargo spill
- Cause of Incident
- Estimate ONLY

NO RESPONSE OPTION

- Oil will dissipate
  - non persistent oil
  - weather conditions (heavy seas / strong winds)
- Response ineffective / impossible
  - heavy seas
  - remote location
- Low impact
  - area of low importance
  - remote location

RESPONSE OPTION

- Protection / clean-up strategy
- Priorities
- Selection, availability and location of equipment and manpower
- Contingency plan

Spill Assessment/ Assessment of Oil Quantity

AERIAL OBSERVATION

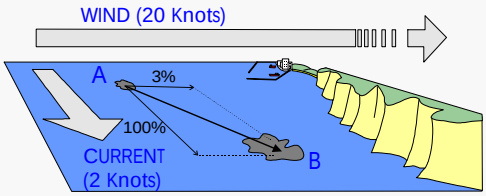
FLIGHT PREPARATIONS

- Safety
- Choice of aircraft
- Flight plan
- Navigation and communication
- Observers

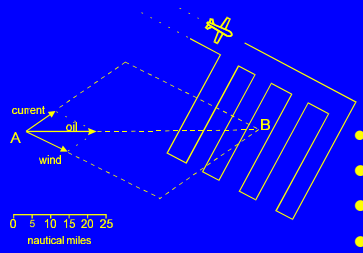
- **Safety:**
  - twin engine
  - pilot briefings
  - p.p.e.

- **Choice of aircraft:**
  - visibility
  - manoeuvrability
  - navigation aids
  - endurance

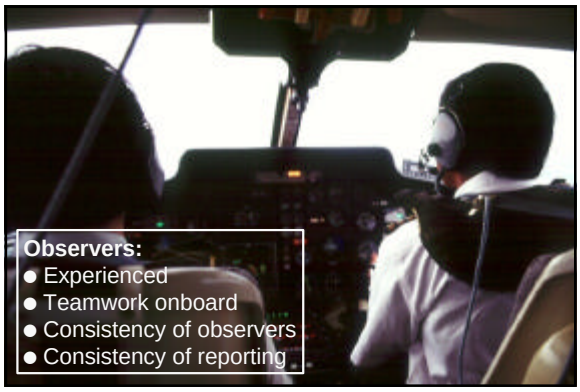
MOVEMENT OF OIL AT SEA



FLIGHT PLAN AND CONTROL



- Windrows
- Altitude
- Navigation aids
- GPS
- Communications



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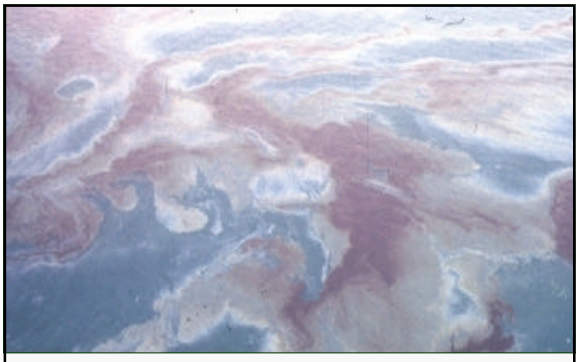
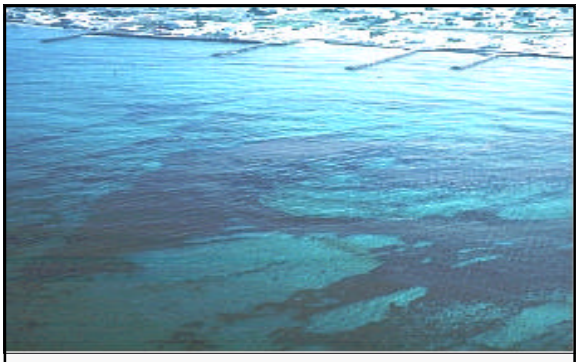
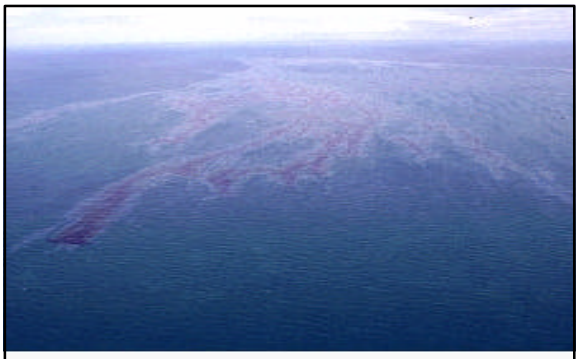
APPEARANCE OF OIL AT SEA



HFO: Thick Brown - silver sheen in warm conditions @ 300m



HFO: Large broken slicks @ 300m



Windrows of Black oil & sheen @ 250m

Emulsion

Patches of Silver & Iridescent Sheen

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OTHER FEATURES
THAT ARE CONFUSED AS OIL

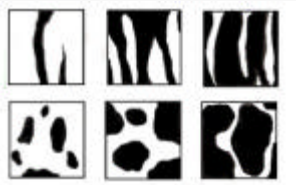
Dark cloud shadows @ 150m

Sediment plumes in shallow area @ 150m

Coral in shallow water

ESTIMATING SPILL SIZE BY
AERIAL OBSERVATION

RELATIVE OIL COVERAGE



25% 50% 75%

Spill Assessment/ Assessment of Oil Quantity

The Relationship between the Appearance, Thickness and Volume of Floating Oil

Oil Type	*Appearance*	*Approximate thickness (mm)*	*Approximate Volume (m3/km2)*
Oil sheen	silvery	0.0001	0.1
Oil sheen	iridescent	0.0003	0.3
Crude and fuel oil	black/dark brown	0.1	100.0
Water-in-oil emulsions ('mousse')	brown/orange	>1	1000.0

ESTIMATING SPILL SIZE BY AERIAL OBSERVATION

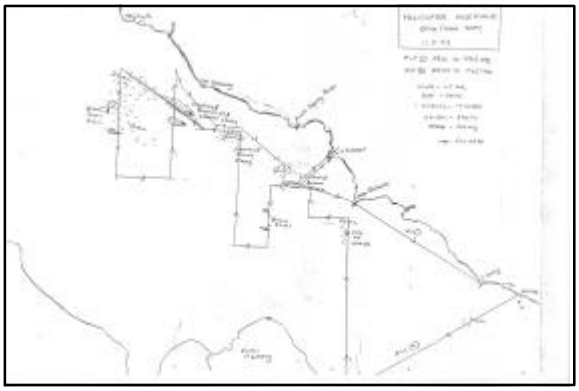
- Dimensions of area covered by aircraft
- Relative oil coverage of area
- Approximate thickness
- Estimate ONLY
- Final quantity from a vessel =

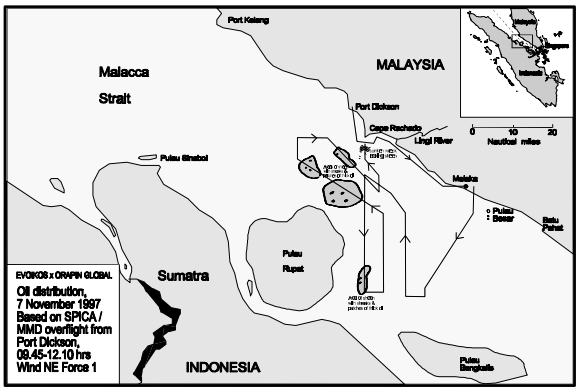
  Original volume - volume recovered from vessel

RECORDING AND REPORTING

- Speed & accuracy
- Presence & absence of oil
- Oil quality & quantity

- Sensitive areas & clean-up
- Photography





SUMMARY

Spill Assessment / Assessment of Oil Quantity

- Rationale for clean-up
- Information required
- Aerial surveillance
  - movement of oil
  - appearance of oil
  - estimating spill size
- Continual re-evaluation