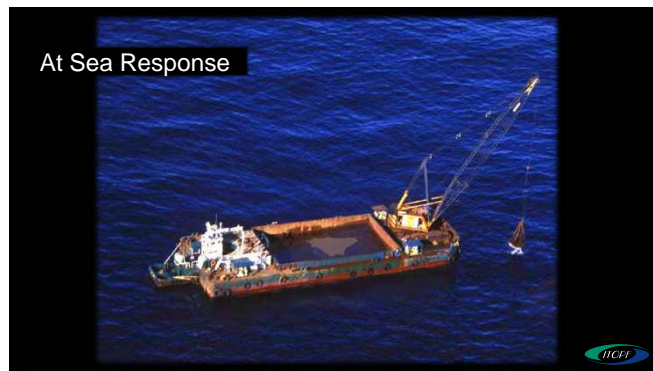
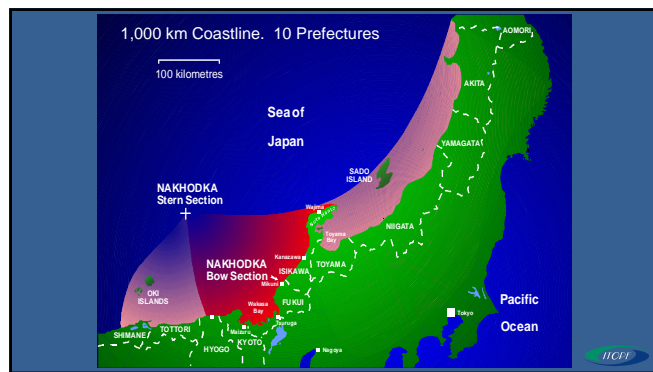
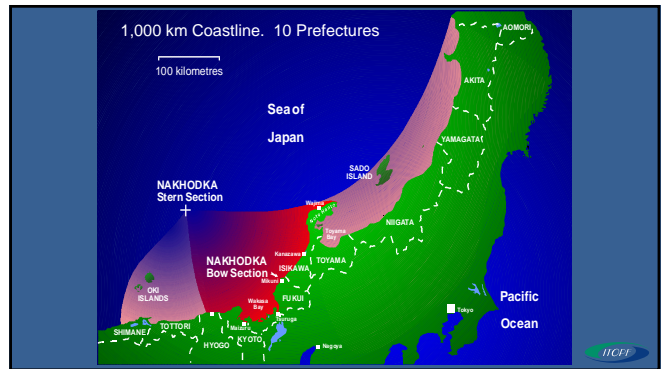
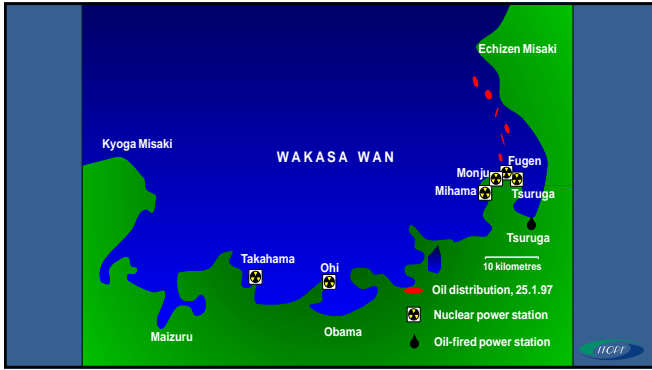
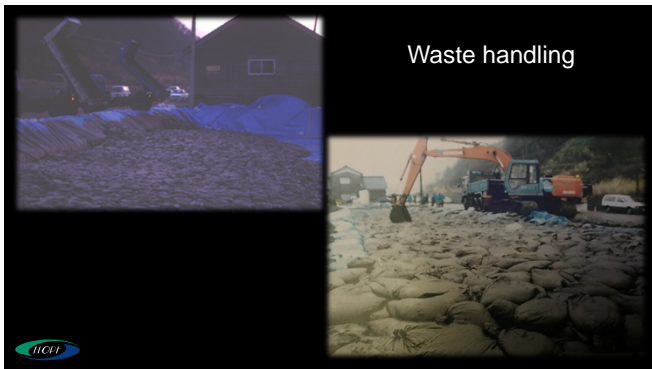


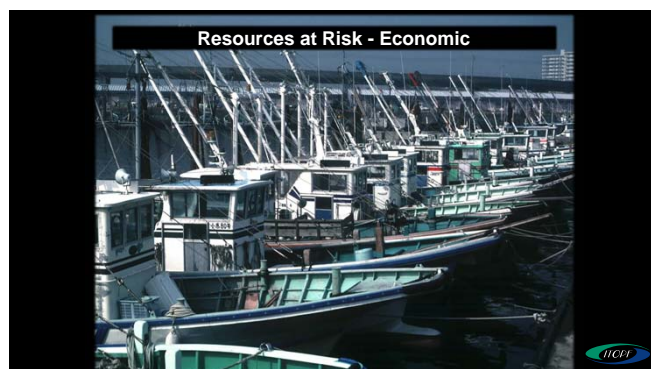
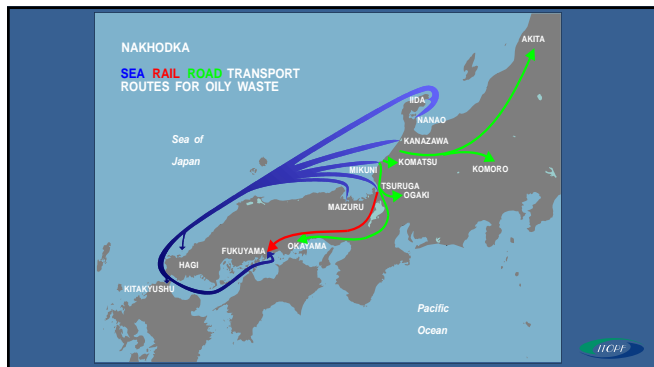
- ### NAKHODKA
- 2nd January 1997
  - 70 miles NE of Oki Islands, Sea of Japan
  - 13,159 GT, passing tanker - broke in two
  - Fuel oil as cargo
  - 6,200 tonnes spilled immediately
  - Proportion of 2,800 tonnes spilled from bow, which later stranded on shore at Mikuni
  - Sunken stern - original estimates were 3 -15m<sup>3</sup>/day leaking
  - 1,000km of coastline oiled, 10 Prefectures
  - Amongst most difficult oils to clean up
  - Potential to travel great distances
  - Can cause widespread contamination of coastlines, economic resources and the environment











### Modern Day Spill Response

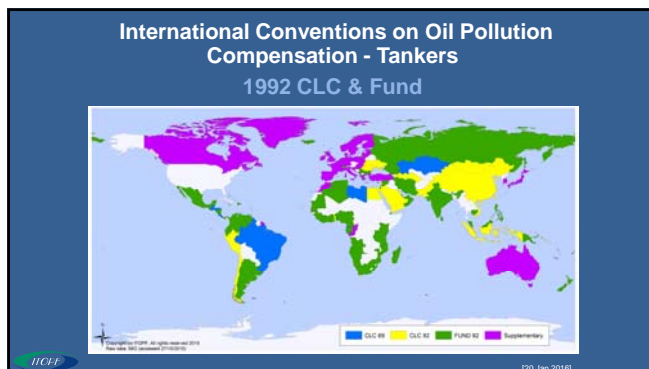
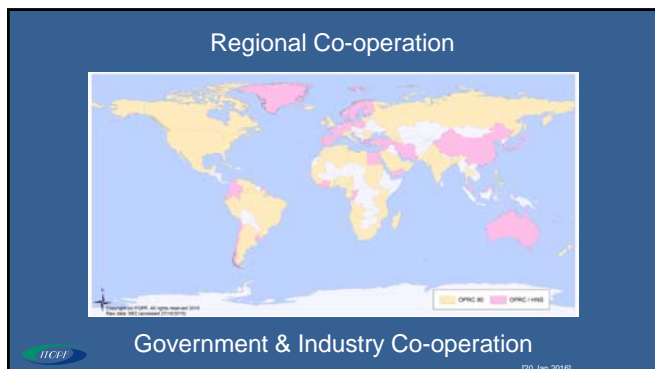
What has changed? What is in place now?

- General preparedness & response capabilities have increased
- Legal frameworks in place
- Defined roles & responsibilities
- Comprehensive, realistic contingency plans
- Risk assessment (most likely / worst scenarios)
- Appropriate equipment (maintained)
- Tiered response
- Regional agreements
- Trained & exercised
- Government & Industry partnerships
- Lessons Learned

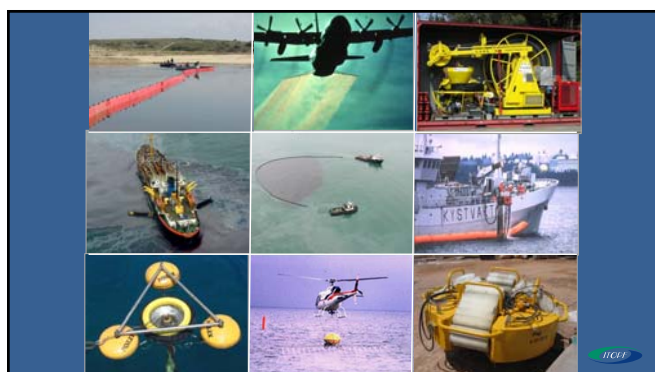
### International Convention on Oil Pollution Preparedness, Response and Cooperation

Ratified by 103 States

120 Jan 2016









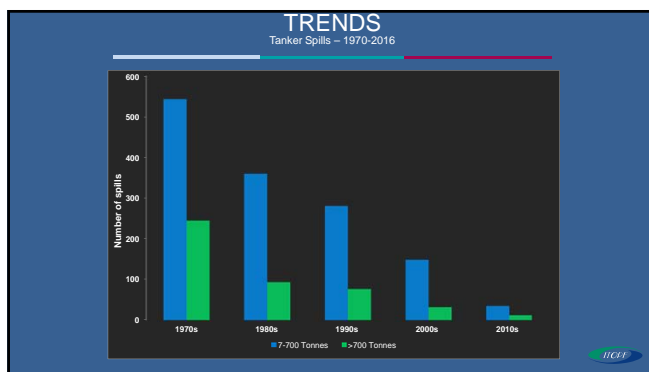
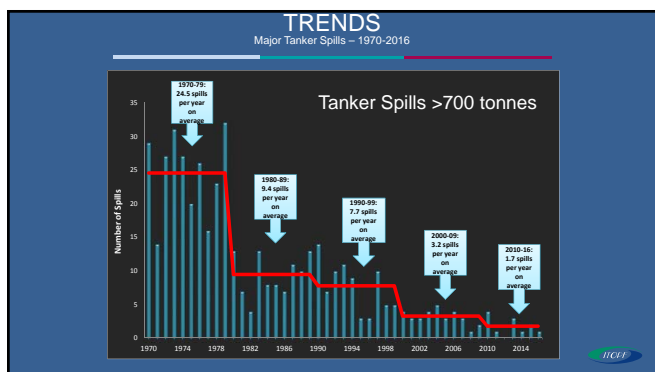
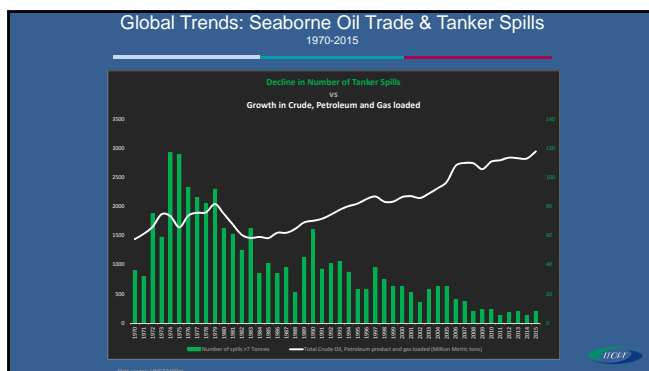
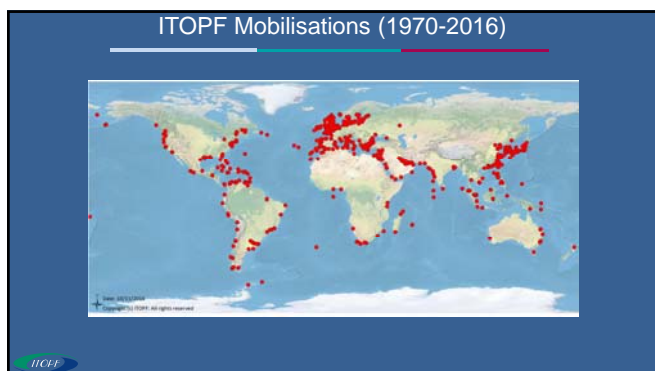
- ### Modern Day Spill Response
- What has changed? What is in place now?
- International Convention & legislation to ensure good practice
  - Response strategies – largely unchanged
    - C&R, dispersant use, protective booming, shoreline clean up
  - Continued incremental improvements
    - 4<sup>th</sup> generation dispersants – ever evolving
    - Remote sensing – satellite and airborne devices
  - A lot achieved. Room for improvement
    - Not global preparedness. Need to maintain and improve.
  - Budgetary cycles - Improvements and erosions – crisis drive
- ITOPF logo

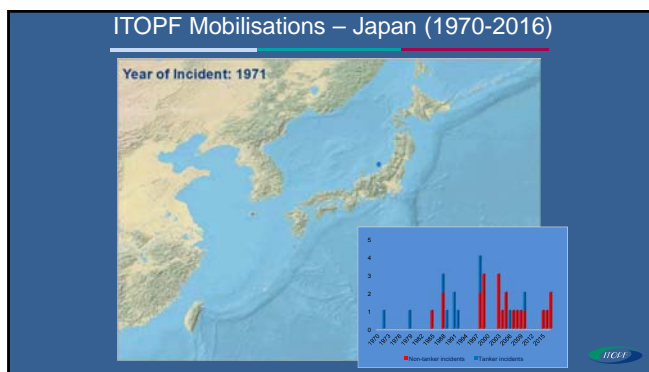
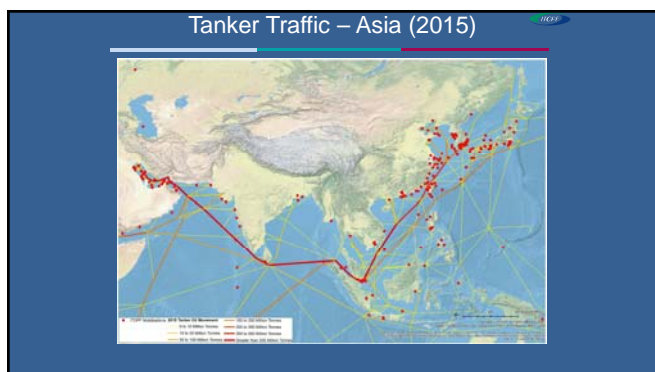
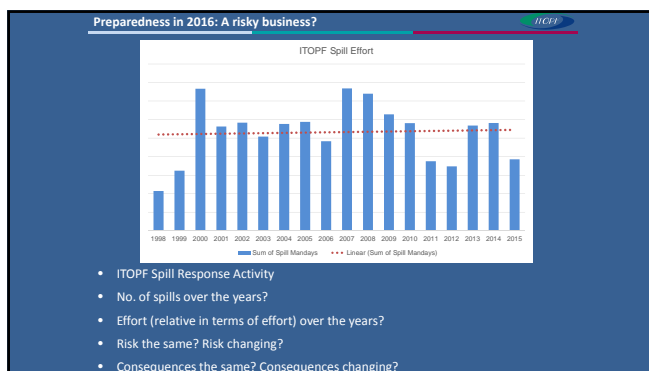
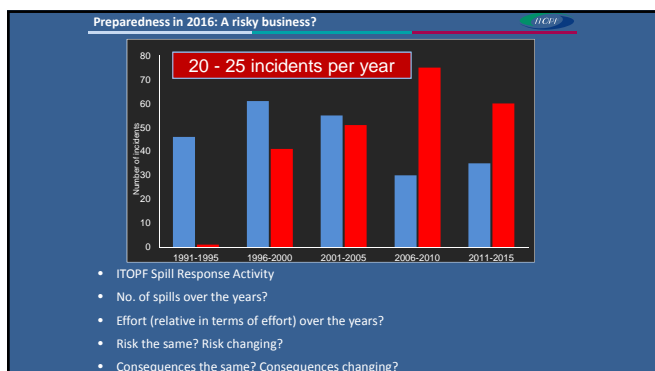
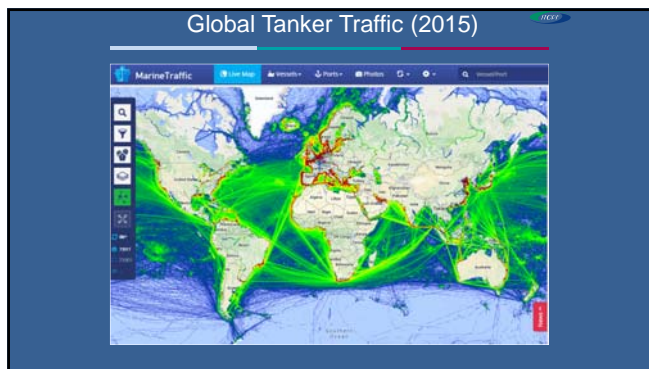
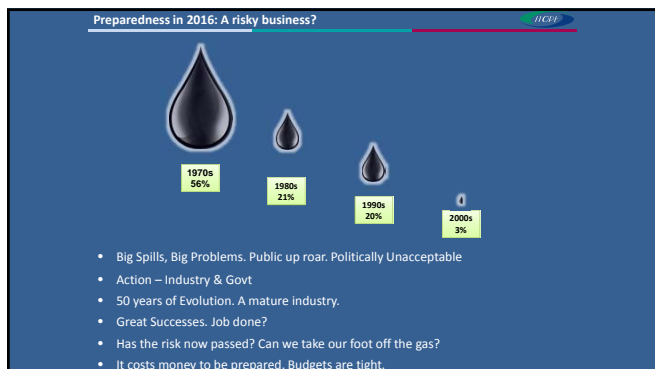


- ### ITOPF R&D AWARD
- 
- To improve knowledge and understanding of issues related to accidental marine pollution
  - To provide up to £50,000 to fund R&D projects that are original, innovative and relevant to shipping & the environment
  - Deadline for 2018 ITOPF R&D Award: 31<sup>st</sup> December 2017 (see [www.itopf.com](http://www.itopf.com))
- ITOPF logo

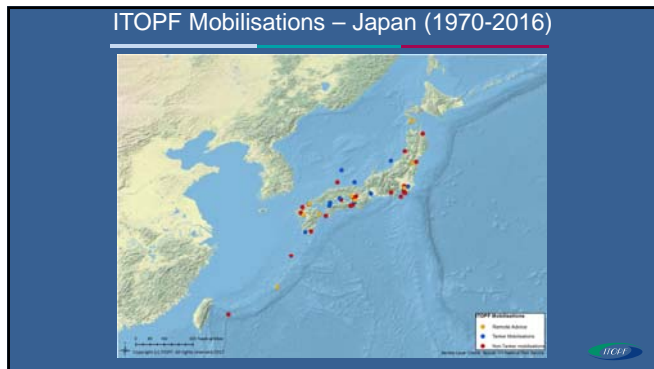
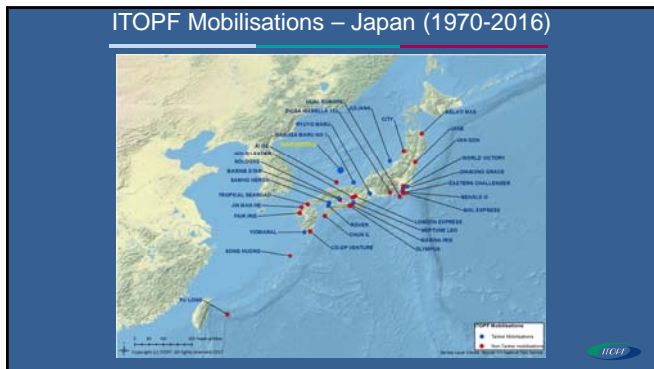
### R&D AWARDS

 <p><b>2012 - FishHealth</b> Development of a methodology for an assessment of fish health and research into the impact of chemically dispersed oil on marine fish</p>	 <p><b>2013 - SLAM</b> Development of a novel 'back-pack' system to track rehabilitated oiled birds without compromising their well-being.</p>
 <p><b>2014 - FAMERR</b> Determination of realistic spill profiles for chemicals to improve decision-making for spills in different geographic areas and seasons.</p>	 <p><b>2015 - University of Washington</b> Study to identify and assess emerging risks from marine transportation.</p>
 <p><b>2016 - Rosdam</b> A feasibility study to investigate the detection capability of hyperspectral imaging technology (HSI) for oil spillages in ice-affected waters</p>	 <p><b>2017 R&amp;D Award</b> Deadline for receipt of applications for the 2017 Award is <b>31<sup>st</sup> December 2016</b>.</p>





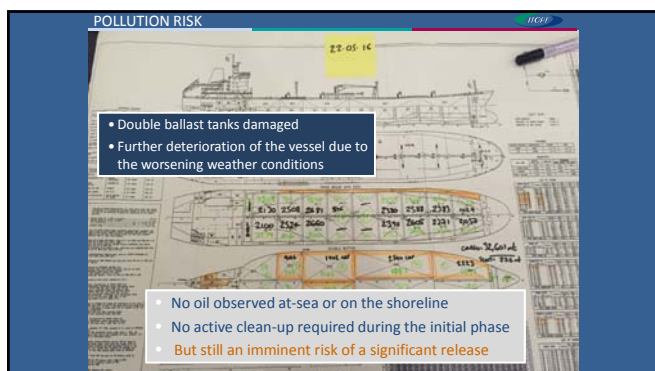




Date of Incident	Name of ship	Location	Nature of Incident	GT	DWT	P & I Club	Product	Spill
10 Jan 2016	CITY	Sakata port, Japan	Grounding	4,399	7,201	Innosuisse	IFO & MCO	123 MT
14 Jan 2016	FU LONG	Ishigaki Island, Japan	Sinking	5,007	8,523	Eagle Ocean Marine	IFO	7 800 logs
19 Jan 2016	EAGLE KANGAR	Puerto Pils, Venezuela	Eggt. failure	60,379	107,481	Gard	Crude	30-50 MP
22 Jan 2016	DUMUN	Singapore Strait	Collision	32,316	58,700	American	Skull	20 MP
29 Feb 2016	NEW MYKONOS	Faux Cap, Madagascar	Grounding	81,152	161,121	American	Coal	156,000 MT
8 Mar 2016	TS TAIPEI	Taipei, Taiwan	Grounding	15,487	20,615	Swedish	IFO 380, HFO	100 MP
13 Mar 2016	ISTRA ACE	Port of Los Angeles, USA	Eggt. failure	41,000	12,200	North	HFO	400 litres
8 May 2016	MSC ALEXA	Tema Port, Ghana	Disabling	42,907	59,855	North	IFO 380, HFO	7.20 MT
14 May 2016	POC WAROS	Quinto Bay, Chile	Loading error	40,896	72,929	Gard	Crude	7.16 MT
17 May 2016	SITAM ANJA	Isla de Lubu, Uruguay	Grounding	28,927	44,851	Skud	Crude	0
17 Jun 2016	BENITA	Mauritius	Grounding	24,953	44,183	London	IFO 380	100 litres
01 Aug 2016	SHAO SHAN 5	Santos, Brazil	Bunkering	41,342	75,700	Shipservice	IFO 380	100 litres
07 Aug 2016	TOBA	Santos, Brazil	Bunkering	160,068	310,389	WUE	IFO 380	100 litres
13 Aug 2016	NGOC SON	Fuairuonai Island, Maldives	Grounding	4,095	6,549	Shippers	Crude	5 MT
25 Aug 2016	TRIDENT STAR	Tanjung Pelepas, Johor, Malaysia	Loading	3,177	4,999	Shippers	IFO 600	40 MT
24 Sept 2016	BUROOS	Veracruz, Mexico	Explosion	25,400	-	North	-	0
06 Oct 2016	MSC PATRICIA	Sines, Portugal	Operations	40,465	-	WUE	IFO 500	5 MT
16 Dec 2016	ISS CARTATA	China	Bunkering	19,207	31,946	Japan	IFO 380	40 MT
18 Dec 2016	LADY TUNA	Izmir, Turkey	Grounding	4,936	4,867	Standard	IFO 180	3.75 MT
24 Dec 2016	CABRERA	Greece	Grounding	4,244	5,553	Brit. Ins.	IFO 180/MCO	70 MT
03 Jan 2017	APL DENVER / WAN HA 301	Johor, Malaysia	Collision	43,271	55,612	WUE	IFO 500	7 < 300 MT
24 Jan 2017	VIKTOR BAKAEV	Singapore	Collision	66,856	118,175	Skud	IFO 380	2.165 MT

• 1 Explosion • 1 Sinking • 3 Collisions • 7 Groundings (32%) • 9 Operational (41%)





**PREVIOUS INCIDENT**

- Crude oil tanker SAN JORGE ran aground on an uncharted rock 19 nautical miles from Punta del Este on 8<sup>th</sup> February 1997
- ~ 5,200 MT spilled
- Death of ~ 4,500 pups and 160 adult fur seals on Isla de Lobos

**SUMMARY OF ITOPF INVOLVEMENT**

Mobilisation from the beginning of the incident

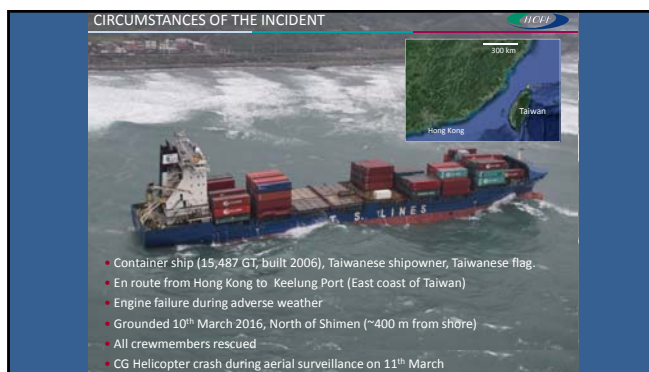
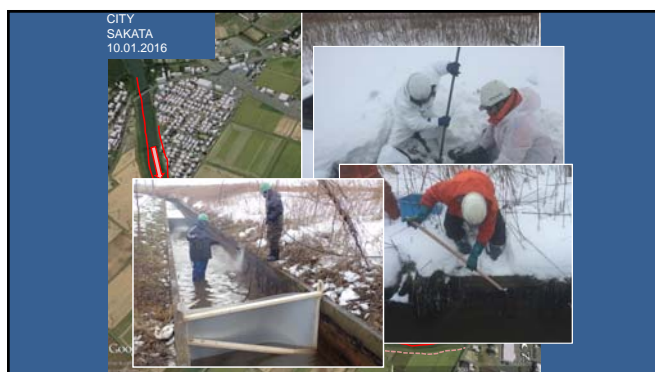
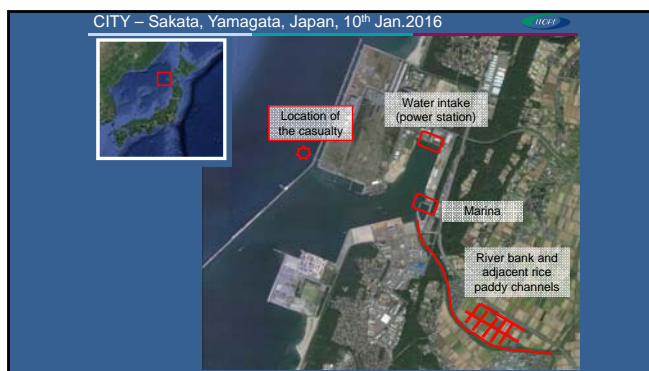
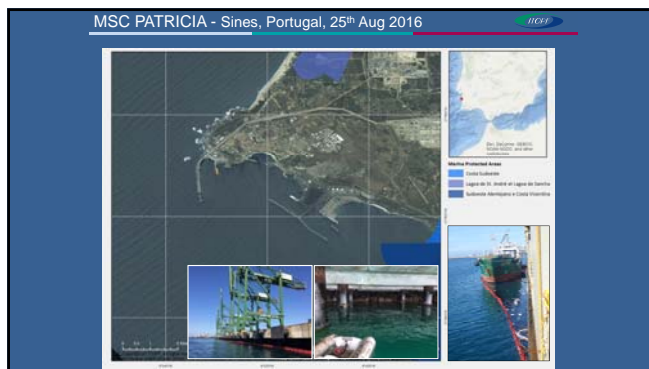
- Assessed the severity of the incident and determine the extent of the contamination
- Identified sensitive resources at risk
- Provided information regarding the properties, behaviour and potential effects of pollutants
- Drafted pollution response plans for the Authorities, salvors and OSRO (contingency measures)
- Provided comments on response costs
- Developed contingency planning arrangements before and after the bunker removal for the Authorities
- Monitoring of pollution (at-sea and shoreline surveys) and resources mobilised during and after the lightering and refloating
- Monitoring of the demobilisation of spill response resources



Oil tanker PGC IKAROS (40,690 GT)  
 Released unknown quantity of slurry oil during loading operation  
 Port of Quintero, Chile  
 14.05.2016  
 A sinker (viscosity: 7.8 centistokes at 100°C; specific gravity 1.04g/cm<sup>3</sup>, API 4.5)

**TRIDENT STAR - Tanjung Pelepas, Malaysia, 25<sup>th</sup> Aug 2016**

**TRIDENT STAR - Tanjung Pelepas, Malaysia, 25<sup>th</sup> Aug 2016**



### CIRCUMSTANCES OF THE INCIDENT

**CLASSIFICATION OF DANGEROUS GOODS**

Class	Division	Name
1	1.1	Explosives, very explosive
1	1.2	Explosives, explosive
1	1.3	Explosives, less sensitive
1	1.4	Explosives, extremely low explosive
1	1.5	Explosives, very low explosive
1	1.6	Explosives, extremely insensitive to initiation
2	2.1	Flammable gases
2	2.2	Non-flammable, non-toxic gases
2	2.3	Toxic gases
3	3	Flammable liquids
4	4.1	Flammable solids
4	4.2	Flammable liquids, solid
4	4.3	Flammable solids, liquid
5	5.1	Oxidizing
5	5.2	Toxic
6	6.1	Toxic
6	6.2	Infectious
7	7	Radioactive
8	8	Corrosive
9	9	Other dangerous goods

- Stress fractures in the hull
- Cargo holds 2, 3 and 4 flooded with oily water
- Laden with:
  - 610 containers, including 9 DG containers (1 x class 5, 3 x class 8 and 5 x class 9)
  - 411 m<sup>3</sup> of IFO 380
  - 48 m<sup>3</sup> of MDO
  - 52 m<sup>3</sup> of lube and other oils

### Sensitive Resources

### Sensitive Resources

### Sensitive Resources

### Previous Incident – MORNING SUN

- Panamanian-registered car carrier (14,663GT; built 1982)
- Ran aground in heavy weather on the 10<sup>th</sup> November 2008
- Unconfirmed quantity of oil was released (probably between 100-200 tonnes)
- Main oiling was confined to a stretch of shoreline approximately 800 m long adjacent to the grounding site


### Initial Oiling ~ 1-2 M<sup>3</sup>

Initial Contingency Planning & Response




- Collection of oily debris
- Preventive measure: debris and driftwood moved above the high water mark
- Wiping oiled rocks with sorbent materials
- Boom on standby at Fuki, Shimen and Caoli fishing ports

Initial Contingency Planning & Response



- Boom deployed at Taipower #1 Nuclear Power Plant Water Intake
- Cold high pressure washing of pebbles and cobbles
- Flushing of fine sediment areas (oil up to 15 cm deep)
- Work force = 20 to 30 people

Casualty - Bunker Removal



Debunkering

- 24 m<sup>3</sup> MDO and lube oil
- 295 m<sup>3</sup> of the 411 m<sup>3</sup> of IFO 380
- Efforts hampered by adverse weather and deterioration of the vessel
- Jack-up barge demobbed

Deterioration of Vessel – 24<sup>th</sup> March, broke back



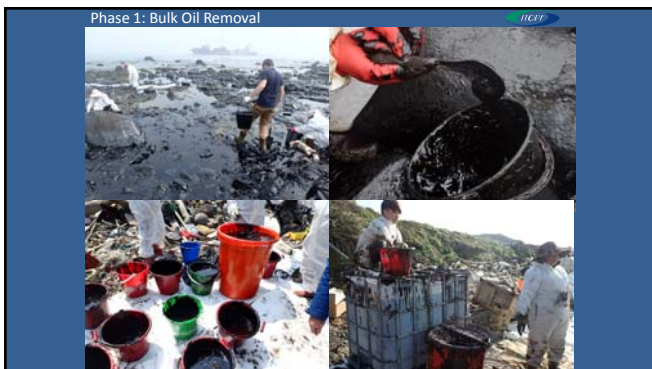
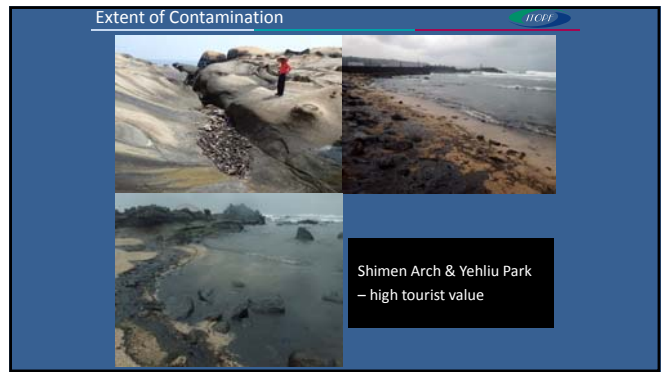
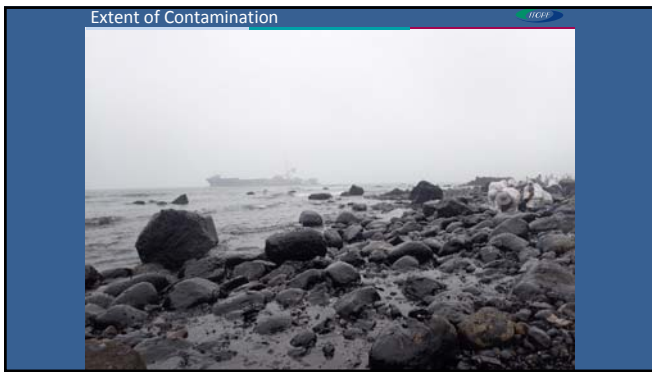
Deterioration of Vessel



Deterioration of the Vessel



- 24<sup>th</sup> March – estimated further 15 tonnes HFO out
- 25<sup>th</sup> March – 5 empty containers overboard
- 27<sup>th</sup> March – hatch cover punctured fuel tanks
- 28<sup>th</sup> March – New estimates of 100 tonnes lost
- Oil lifted from shoreline – contamination spreading





MSC ALEXA - Tema Port, Ghana, 28<sup>th</sup> May 2016

**TEMA PORT**

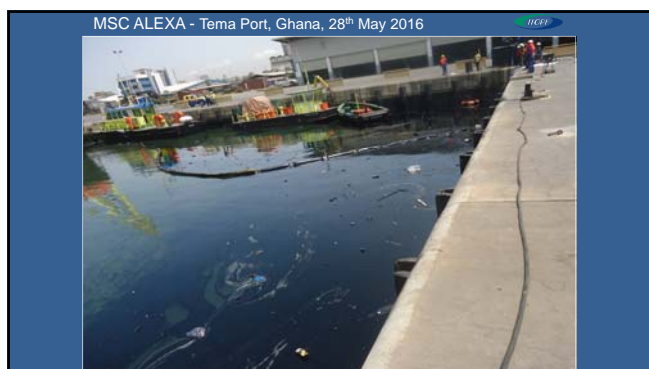
- International commercial port
- Busiest port in Ghana
- (approx. 15 vessels / day)

**MSC ALEXA**

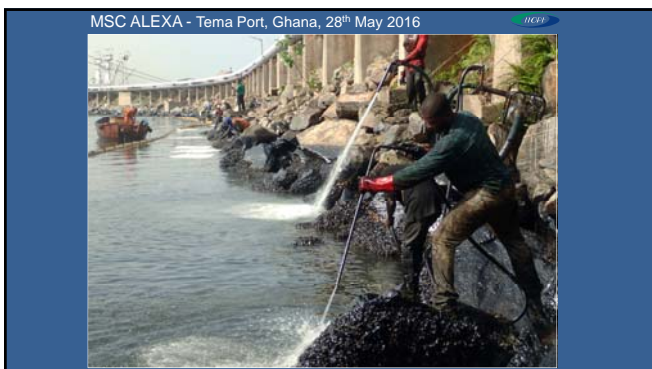
- 42,307 GT
- Max. TEU: 3,301

**SPILL**

- Unknown Qty / Unknown Oil
- Contaminated ballast water
- Est. 10-20 m<sup>3</sup> / IFO 380







**BENITA – Le Bouchon, Mauritius, 16<sup>th</sup> June 2016**

**Bulk carrier on ballast:**

- 145 MT HFO and 19 MT Diesel

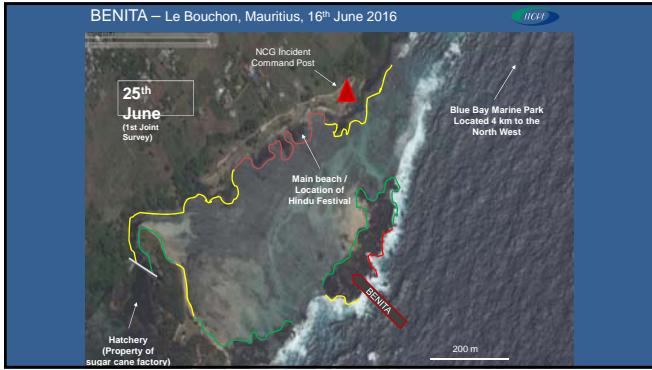
**Estimated initial release following grounding (16<sup>th</sup> – 20<sup>th</sup> June):**

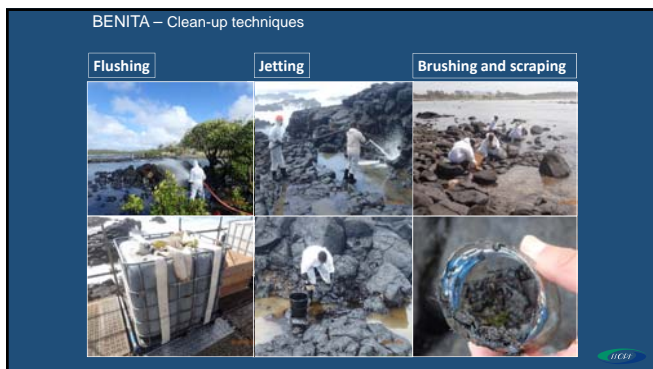
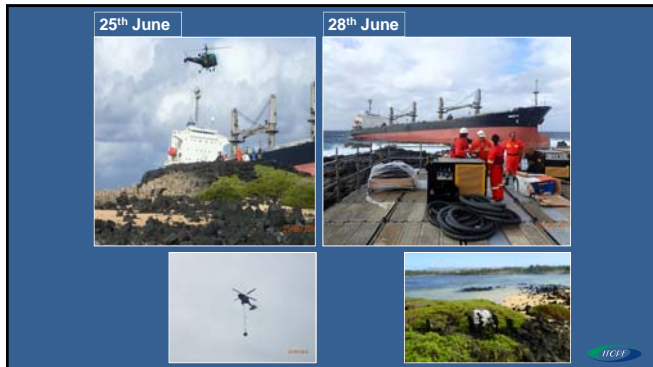
- 10-15 MT of HFO
- No diesel spilled at sea

**Estimated 2<sup>nd</sup> release due to re-pressurisation of cargo holds (22<sup>nd</sup> – 24<sup>th</sup> July):**

- Approximately 10 MT
- Small quantity was released during refloating (<1MT)

 An aerial photograph of the ship BENITA grounded on a rocky reef. The ship is partially submerged, and the surrounding water is dark, indicating a spill. Red arrows point to the ship's location.



### Modern Day Spill Response

- Looking Back - Historical trends (1967 –1997 - 2017)
- 50 Years of Spill Response
- Preparedness & Compensation Conventions
- Lessons learned
- Focus for the future. SEEing Forwards

### Modern Day Spill Response


- Preparedness
- Effectively passing on the lessons of the past
- Responding to changing expectations
- Investment in collaborative R&D
- Bunker fuel moving to LNG / other fuels?

### ITOPF work in the Arctic

- ITOPF's "Oil Spills in Cold Climates" released in Spring 2016
- Greenland, Exercise in Nuuk
- Arctic survival training organised for ITOPF staff



**ITOPF**



**Richard H. Johnson**  
 Technical Director

1. NOT FOR PROFIT
2. SHIPPING INDUSTRY FUNDED
3. PROMOTE EFFECTIVE SPILL RESPONSE
4. OBJECTIVE TECHNICAL ADVICE ON SITE
5. FIVE CORE SERVICES

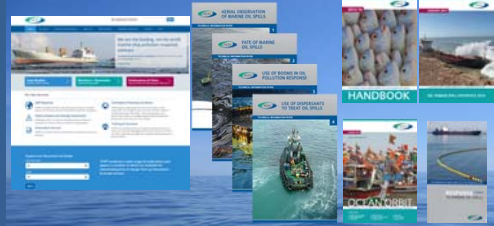
**ITOPF: Promoting Effective Spill Response (Five core services)**





**Richard H. Johnson**  
 Technical Director

1. SPILL RESPONSE (OIL & HNS)
2. CLAIMS ANALYSIS & DAMAGE ASSESSMENT
3. CONTINGENCY PLANNING & ADVISORY WORK
4. TRAINING & EDUCATION
5. TECHNICAL INFORMATION

**INFORMATION SERVICES**




- Website & WebGIS - [www.itopf.com](http://www.itopf.com)
- ITOPF publications (e.g. TIPS Series – 9 languages)
- Databases with spill statistics
- Comprehensive technical library



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