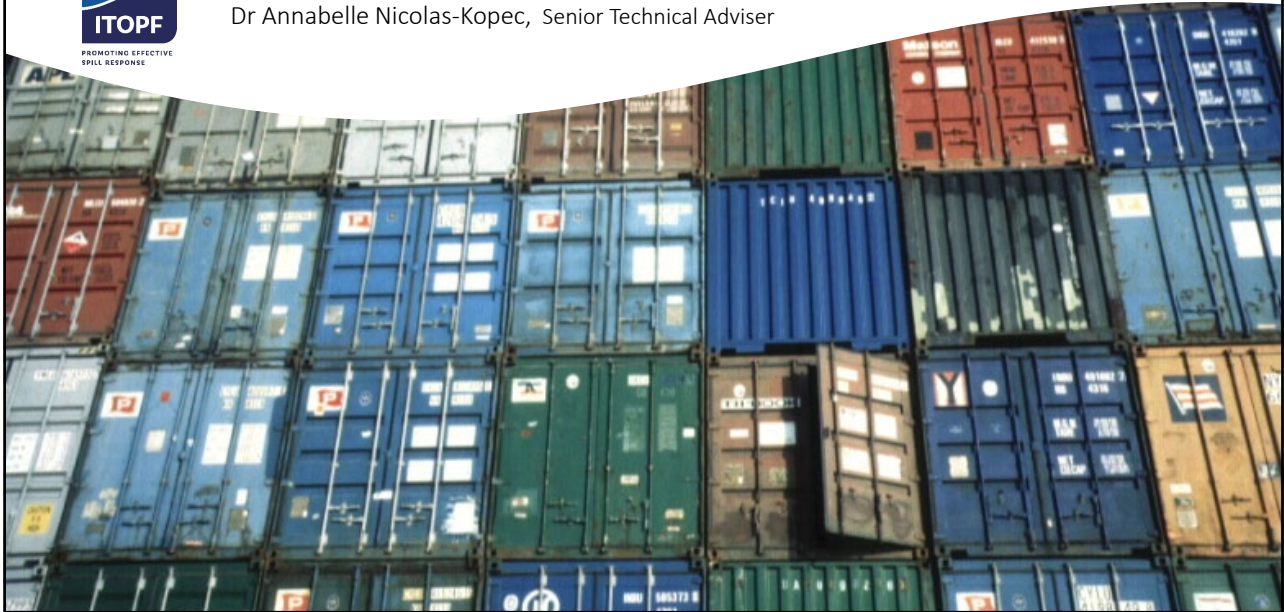




What's in the Box? ... Responding to DG container incidents

Dr Annabelle Nicolas-Kopec, Senior Technical Adviser



WHAT ARE DG?

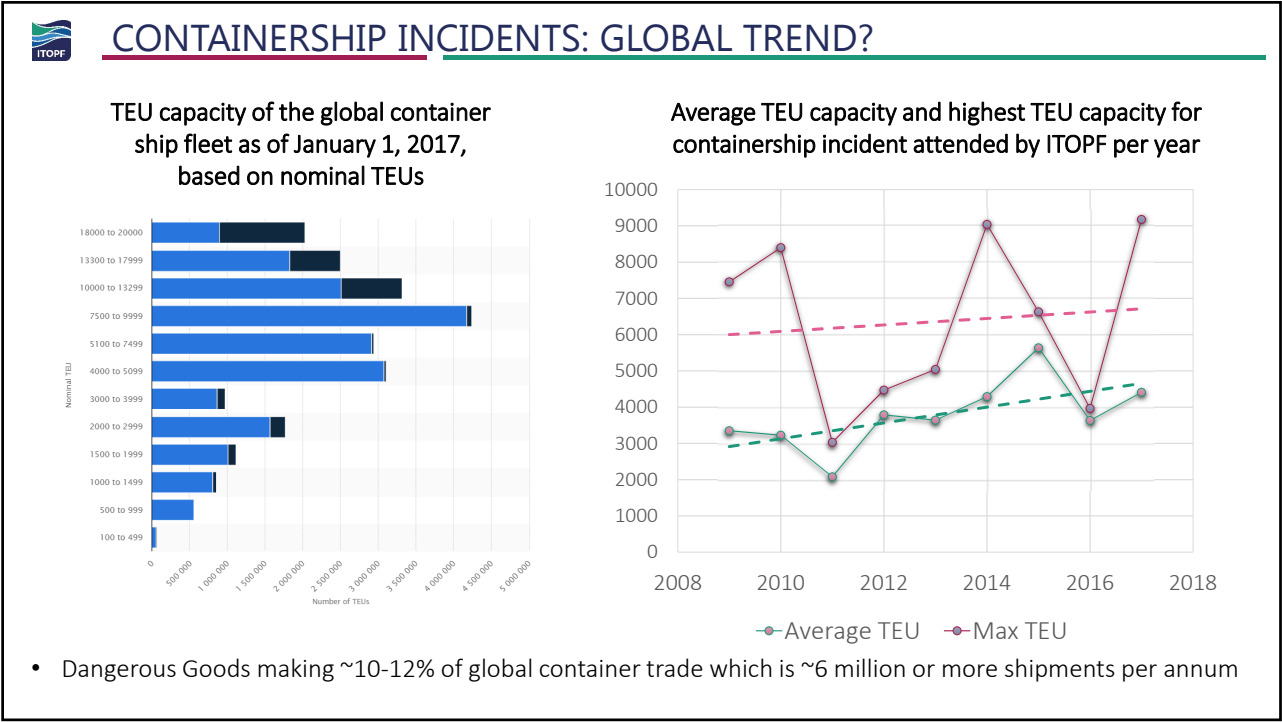
- MARPOL Annex 1
- MARPOL Annex 2
- IMSBC Code
- Liquid substance with FP<60C
- IGC Code
- IBC Code



HNS

IMDG Code







ITOPF

ISSUES AND IMPACTS OF DG SPILLS

ISSUES



Knowledge of the presence of DGs



Limited actions available for mitigation of spills from DGs


WHEREAS FOR OIL SPILLS...

- Different oil types, but some uniformity in properties & behaviour
- Established techniques for response at sea and on the shoreline
- Typical effects on marine environment and livelihoods well known


ITOPF

ISSUES AND IMPACTS OF DG SPILLS

ISSUES



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IMPACTS




HUMAN HEALTH

- Shock wave
- Fire
- Oxygen depletion
- Exposure to toxic HNS



ENVIRONMENT

- Toxicity
- Bioaccumulation
- Smothering
- Decomposition (anoxia, H2S)



SOCIO-ECONOMIC

- Fisheries
- Closure of beaches
- Tourism
- Exclusion zones

ITOPF Ltd

3



VARIETY OF DANGEROUS GOODS



Printed by agent : DANGEROUS CARGO DEPT

International Dangerous Cargo Manifest				export
MEDITERRANEAN SHIPPING COMPANY				
Vessel : MSC NAPOLI 27A	Port/Loading : ANTWERP	Nationality : UNITED KINGDOM	Off. nbr. : 6000601	
Port/Discharge : DUBAI				
Booking ref./Subref : 701DU0200079/1 MSCU6437930 - DV / 20 Stowage position : 210110				
ALCOHOLS, N.O.S. (contains 2-propanol 1-ethoxy), Liquid, CLASS 3 (3) UN1987, PG: III				
Flashpoint : 40°C, EmS-Fire / Spill : F-E, S-D				
80 drums(s) ~ 16074.0000 Kg.				
				MSC code : 39
				Emergency phone : + ITL +32 2 14554545
PF07057_IMDG v5.32				
Page 16 of 27				
Run: 16-MAR-12 09:53 AM				
(As required by SOLAS 74, chapter VII, regulation 4.5, MARPOL 73/78, annex III, regulation 4.3) and paragraph 5.4.3 of the IMDG Code)				
Agent : CMA CGM HEAD OFFICE Phone: Fax: E-Mail:				
Vessel : BARELI				
Voyage : NW512W				
Official no : 9237498				
Flag : SINGAPORE				
Call Sign : 9W5993				
Load Port : SHANGHAI				
ETD : 13-MAR-12				
Transit Port : JIANGYIN, FUJING, FUZHU				
Discharge Port : TENA				
Final Place of Delivery :				
Container No.	ISO Code	Booking No.	Part Load Booking No.	Stowage No.
CMAU1539494	2201	CNXL572891		
(1) Proper Shipping Name				
(2) Technical Name				
(3) Flash Point (°C)				
(4) Limited Quantity or Excepted Quantity				
(5) Marine Pollutant				
(6) Emergency Response Telephone Number				
(1) ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.				
(2) paraquat (SPRACQUAT SUPER)				
(3)				
(4)				
(5) Marine Pollutant				
(6) 233 1260013				
Approval Number: 20123005/0856				
CMAU1522491	2201	CNXL572891		
(1) ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.				
(2) paraquat (SPRACQUAT SUPER)				
(3)				
(4)				
(5) Marine Pollutant				
(6) 233 1260013				
Approval Number: 20123005/0856				
CMAU1543350	2201	CNXL572891		
(1) ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.				
(2) paraquat (SPRACQUAT SUPER)				
(3)				
(4)				
(5) Marine Pollutant				
(6) 233 1260013				
Approval Number: 20123005/0856				

- Can include explosive, flammable, corrosive & toxic compounds
- Dangerous goods can be loaded in bulk or in packaged form
- Containers may have just one substance or have mixed loads
- All IMDG cargoes must be included in a separate manifest




IDENTIFYING DG – DG MANIFEST

- A Dangerous Cargo Manifest should be provided by shipowner or charterer
- Includes details of each cargo, its Proper Shipping Name, its hazards, the quantity, its state & the packaging
- Should also have information on the location of the cargo (stowage position)
- Documents can be very large (100's pages) and level of information can vary

Essential to obtain quickly

Printed by agent : DANGEROUS CARGO DEPT

International Dangerous Cargo Manifest				export
MEDITERRANEAN SHIPPING COMPANY				
Vessel : MSC NAPOLI 27A	Port/Loading : ANTWERP	Nationality : UNITED KINGDOM	Off. nbr. : 6000601	
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Booking ref./Subref : 701DU0200079/1 MSCU6437930 - DV / 20 Stowage position : 210110				
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80 drums(s) ~ 16074.0000 Kg.				
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PF07057_IMDG v5.32				
Page 16 of 27				
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(4)				
(5) Marine Pollutant				
(6) 233 1260013				
Approval Number: 20123005/0856				



PROCESSING THE DG CARGO MANIFEST

Analysis of Shipping Manifest and DG Manifest

Each DG entry need to be analysed with:



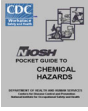

1- Products identification & quantity

2- Products characteristics

3- Fate, Behaviour & Hazards of products

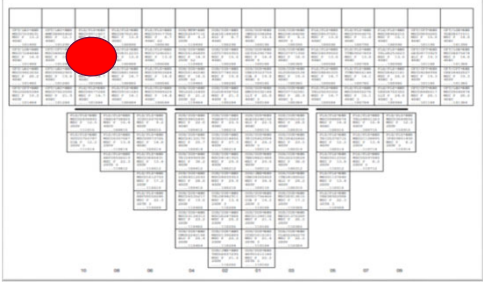
4- Sensitivities

- Cargo Manifest
- UN/CAS number
- MSDS
- Guidebooks
- Internet websites
- Guidebooks
- Software
- GESAMP
- Sensitivity database




Identification of missing containers

Cross-reference with stowage plan to confirm location of DG



Long and tedious process





PROCESSING THE DG CARGO MANIFEST


- SSL KOLKATA (DWT 13,760 T, TEU 1,114), 13th June 2018, off Sundarban biosphere reserve (India)
- 147 on deck lost, including 7 DG
- 310 under deck

457 entries

Position	Container No.	B/L No.	Cargo	Quantity	Unit	Remarks
0240002	HJMU1595483	HDMUNXAY1713961	Wall Paper, Water Bottle	830 CTNS	No	Burnt out wreckage remains/ remains on board
0120004	ZCSU2651275	GOSUSN8183593	Washing Machines	114 SETS	No	Burnt out wreckage remains/ remains on board
0290308	FCIU5540228	HDMUXGID3812902	Water Based Foundry Coatings	480 DRMS	No	Unit submerged/ remains on board
0160004	BSIU9539900	WHT1804396	Water Cooled Blow Pipe With Insulation	12 PKGS	No	Burnt out wreckage remains/ remains on board
0200286	CAJU9985					
0160484	DRYU9631					
0160604	TEMU7311					
0160382	CAJU7407900	HDMUXGID5004053A	Welding Rod Steel Pipes	120 PCS	No	na on board
0160504	FCIU9417090	HDMUXGID5004053A	Welding Rod Steel Pipes	297 PCS	No	Burnt out wreckage remains/ remains on board
0130008	BMOU2322224	HDMUBUIN4776307	Zinc Ingot LME Registered K2 Brand	150 BDL	No	Unit fire/heat/water affected/ remains on board
0110008	CAXU6913736	HDMUBUIN4776307	Zinc Ingot LME Registered K2 Brand	150 BDL	No	Unit fire/heat/water affected/ remains on board
0130604	DFSU2832826	HDMUBUIN4776307	Zinc Ingot LME Registered K2 Brand	150 BDL	No	Unit fire/heat/water affected/ remains on board
0190002	GLDU9826859	HDMUBUIN4776307	Zinc Ingot LME Registered K2 Brand	150 BDL	No	Unit fire/heat/water affected/ remains on board
0110406	TRHU1542469	HDMUBUIN4776307	Zinc Ingot LME Registered K2 Brand	150 BDL	No	Unit fire/heat/water affected/ remains on board

Always need to check not only the DG manifest but also the rest of the cargo manifest due to possibility of misdeclaration






MISDECLARATION

- More than a third of DG boxes are marked incorrectly.
- Between 2014-2017, Gard has been involved in 13 container cargo fire cases of some significance. Almost all of them were associated with cargo being misdeclared. Six cases involved calcium hypochlorite.
- Calcium hypochlorite naturally decomposes and emitting heat. Poor packaging, proximity to heat sources increases the rate of decomposition and can lead to explosion.

➡ The IG P&I Clubs and the carrier members of the CINS produced a new set of guidelines for the carriage of calcium hypochlorite


- 21% have other defects (weight, quality of packaging...)





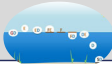
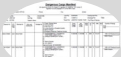
Gard

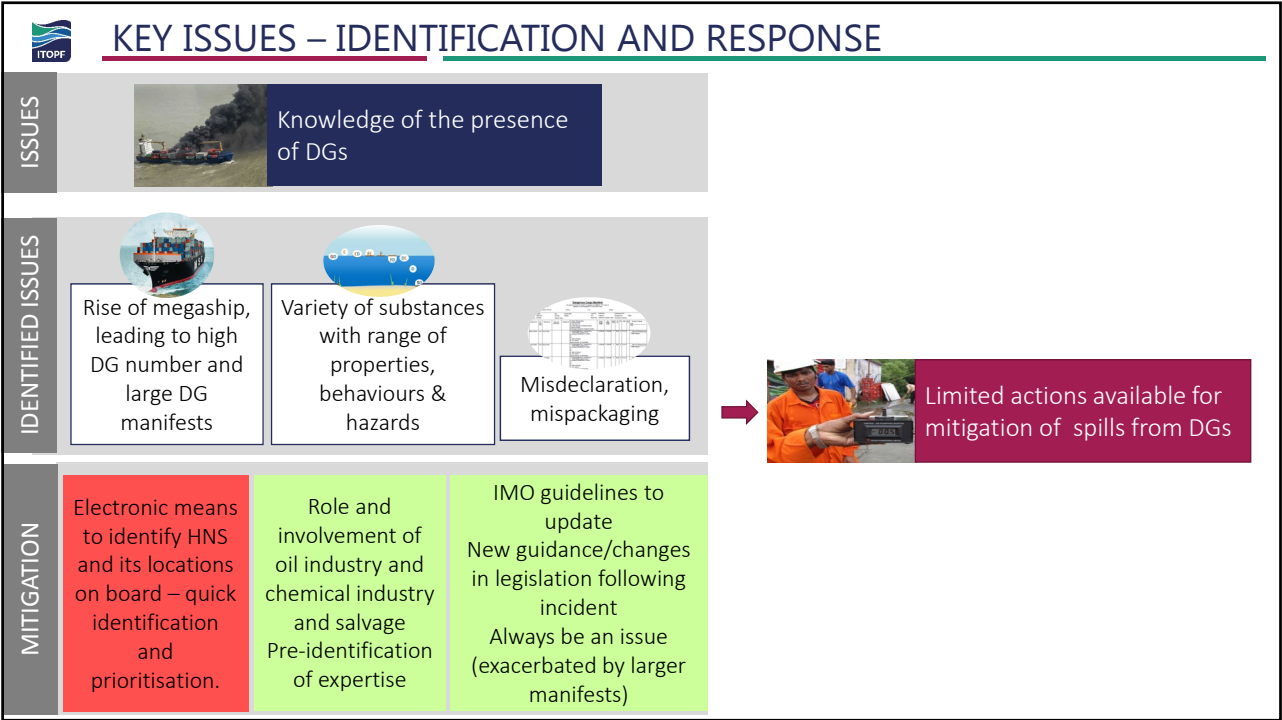
Major issue in case of fire

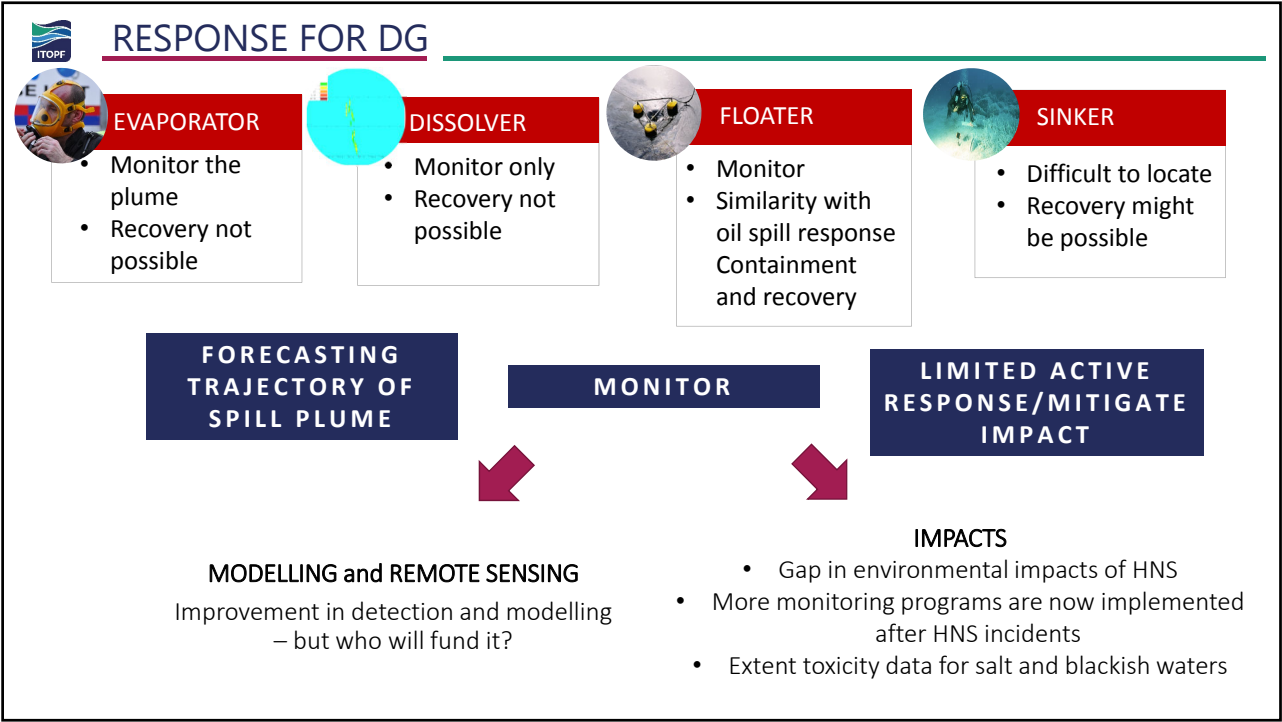
Crew/ responders do not know the best way to extinguish cargo fire or to might put their lives in jeopardy by not having a proper knowledge of the hazards



KEY ISSUES – IDENTIFICATION AND RESPONSE

ISSUES	 <p>Knowledge of the presence of DGs</p>
IDENTIFIED ISSUES	<div><p>Rise of megaship, leading to high DG number and large DG manifests</p></div> <div><p>Variety of substances with range of properties, behaviours & hazards</p></div> <div><p>Misdeclaration, mispackaging</p></div>
MITIGATION	<div>Electronic means to identify HNS and its locations on board – quick identification and prioritisation.</div> <div>Role and involvement of oil industry and chemical industry and salvage Pre-identification of expertise</div> <div>IMO guidelines to update New guidance/changes in legislation following incident Always be an issue (exacerbated by larger manifests)</div>







MSC CHITRA, MUMBAI, INDIA, AUGUST 2010

- 2,600 MT of IFO 380 on board
- Estimated 800 MT released
- 1,300 containers on board (31 with dangerous goods)
- ~300 containers lost (13 dangerous good)

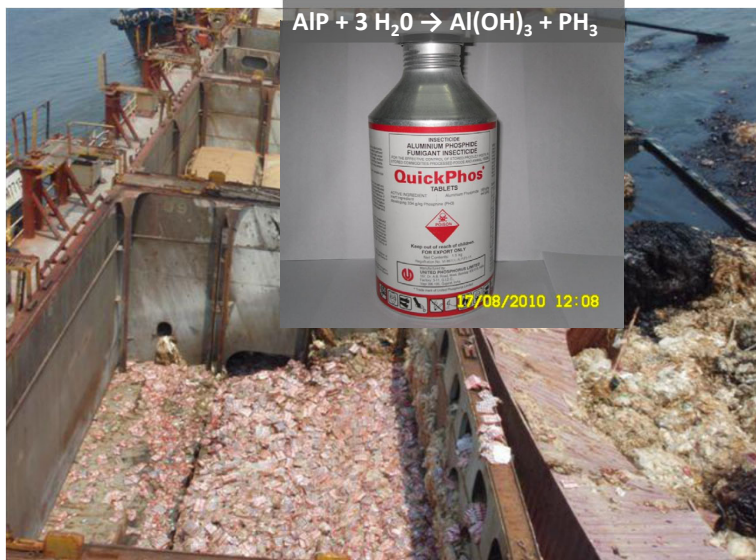


SMIT Salvage



PUBLIC HEALTH ISSUES

- During salvage, container with Aluminium Phosphide broke open and contents lost to hull/sea
- Contained 4,200 kg AIP: 2,800 x 1.5kg canisters
- Reports received of oiled canisters coming ashore



SAFETY MEASURES

Oil Spill Response

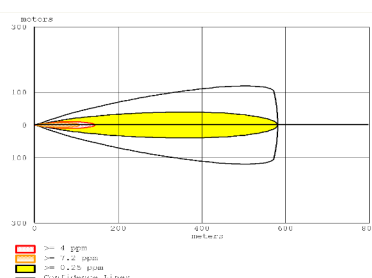
MSC CHITRA
India
24th August 2010

MSC CHITRA SHORELINE RESPONSE

Mumbai, India

DANGEROUS GOODS RISK ASSESSMENT

Distribution List
ITOPF / MSC



- Air modelling (NCEC) – one broken canister and the whole container load; for workers close to wreck (salvors and fishermen), general public (Vessel 500m from Mumbai city), and for shoreline workers
- Full risk assessment written for all Dangerous Goods and the different shoreline clean up techniques used
- United Phosphorus arrived on site and provided assistance to responders
- Daily sweeps undertaken by MSC and United Phosphorus for all suspicious bottle/canisters – stored in airtight steel box and removed to UP facility for disposal
- Air monitoring undertaken daily before/during work at high risk sites



CONTAMINATION FROM DG CONTAINERS



- Overboard containers increased risk of damage to containers & difficulty of recovery
- Risk of exposure to dangerous goods leaking from containers



- Rarely only HNS pollution: combine with bunker fuel
- All cargoes become hazardous waste when mixed with oil
- Different type of response: Oil, oiled debris and HNS, done usually by the same personnel (oil spill responders), with no or little training for HNS...



- Complicates shoreline clean-up & handling/disposal of waste
- Amount of waste can be very high
- Need of segregation




BARELI, FUQING, CHINA, MARCH 2012

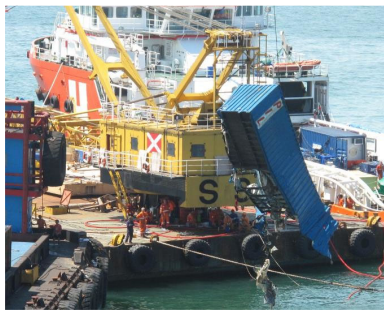





- Containership (2004; 35,881 GT; 3,100 TEU) ran aground on approach to Fuzhou
- Broke her back amidships with a release of bunkers & containers overboard
- 1,190 m³ HFO onboard + 1,397 containers (101 with dangerous goods)
- Estimated release of ≤100 MT HFO & 165 containers (80 with Dangerous Goods)
- ITOPF Technical Advisers on site in Fuzhou from 17th March until 12th May









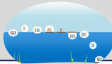
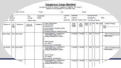


CONTAINER STORAGE, PROCESSING AND DISPOSAL




- Type of equipment required is huge, not only for salvage but for processing too
- The logistics : a huge area is required to for decontamination, repackaging, and storage , are football pitch size, that need to be available for period of months
- Not to forget the waste treatment process after that.
- A fully-trained HAZMAT team should coordinate the operation
- Correct PPE should be worn at all times (e.g. liquid tight suits & SCBA)
- Goods are typically re-packed or sent for treatment and disposal



KEY ISSUES – IDENTIFICATION AND RESPONSE

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IDENTIFIED ISSUES	<div><p>Rise of megaship, leading to high DG number and large DG manifests</p></div> <div><p>Variety of substances with range of properties, behaviours & hazards</p></div> <div><p>Misdeclaration, mispackaging</p></div> <div><p>Large area needed for process and repackaging</p><p>Low level of training</p></div> <div><p>Limited detection and monitoring capability</p><p>Lack of understanding of the impact</p></div>				
MITIGATION	<p>Electronic means to identify HNS and its locations on board – quick identification and prioritisation.</p>	<p>Role and involvement of oil industry and chemical industry and salvage</p> <p>Pre-identification of expertise</p>	<p>IMO guidelines to update</p> <p>New guidance/changes in legislation following incident</p> <p>Always be an issue (exacerbated by larger manifests)</p>	<p>Pre-identify temporary storage areas, waste disposal sites, availability of expertise/ equipment/ specialised contractors</p> <p>Increase training</p> <p>See IMO modules for training HNS responders</p>	<p>Funding more R&D research and promote environmental monitoring studies during and after an incident</p> <p>Pre-identification of expertise</p>



CONCLUSION ON RESPONSE TO DG INCIDENT

GROWTH IN CONTAINER SHIPPING

Increased risk? HNS issues? Lengthy salvage/responses?

IMPACTS OF HNS SPILLS

Human health, environment and socio-economic


MONITORING AND RESPONSE OF HNS


Use of adequate equipment, trained personal

PREPAREDNESS

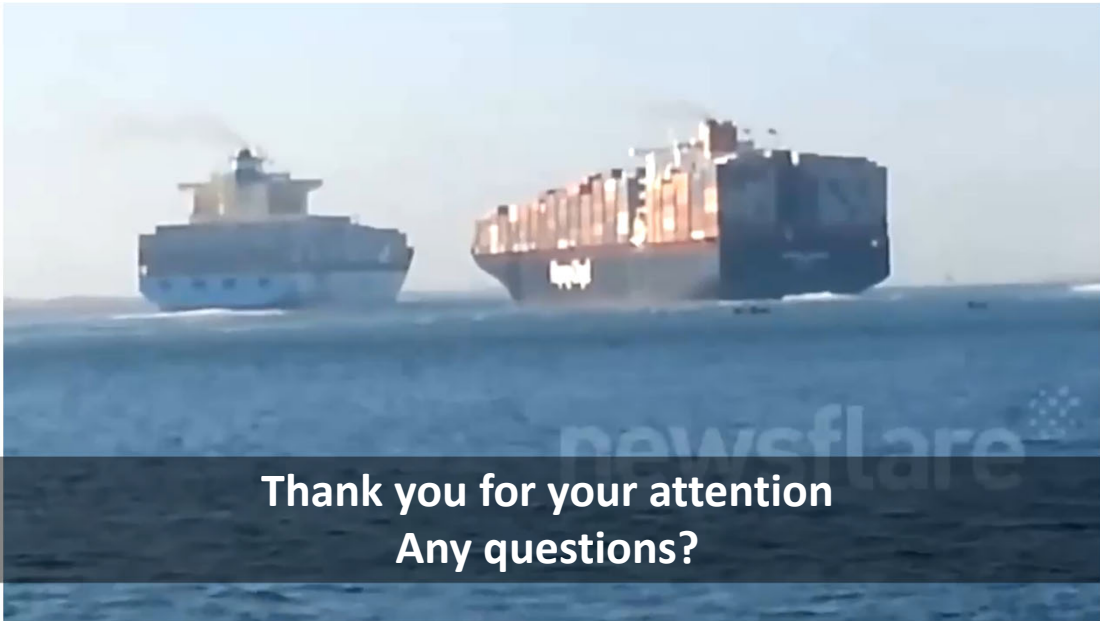
USE OF TECHNICAL EXPERTS

R&D





DOUBLE TROUBLE...



Thank you for your attention

Any questions?



Thank you for your attention
Any questions?

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