



Loaded risk – dangerous cargoes and risk mitigation

IMCC 28 September 2017
Mark Russell, Vice President
Head of Cargo Claims

Danger : sea - ship - environment - cargo



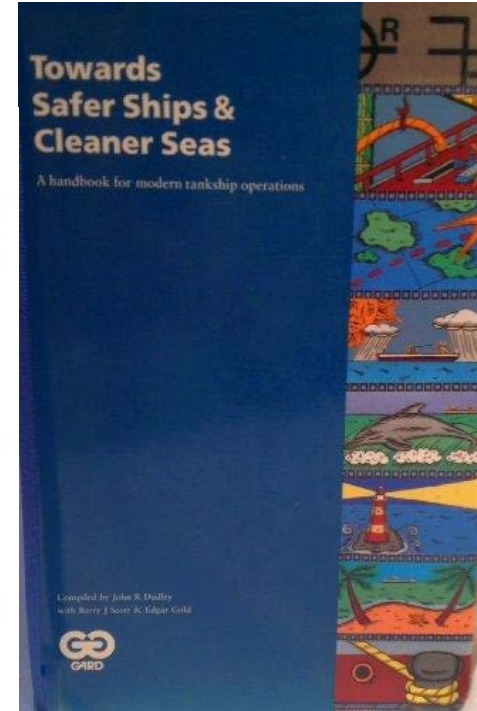
Dangerous liaisons

Thursday 16 March 2017, 00:01 by [Michael Grey](#)

There is every reason to believe that a very substantial number of the 36m boxes transported on the high seas contain undeclared dangerous goods



Flaminia shrouded in smoke: The vessel's mid-Atlantic fire killed four people.



Today's narrative – dangerous cargo

“Goods by their nature or character are, or reasonably appear likely to become, a danger to persons, property or the environment.”



Loaded risks – liquefaction & cargo fire

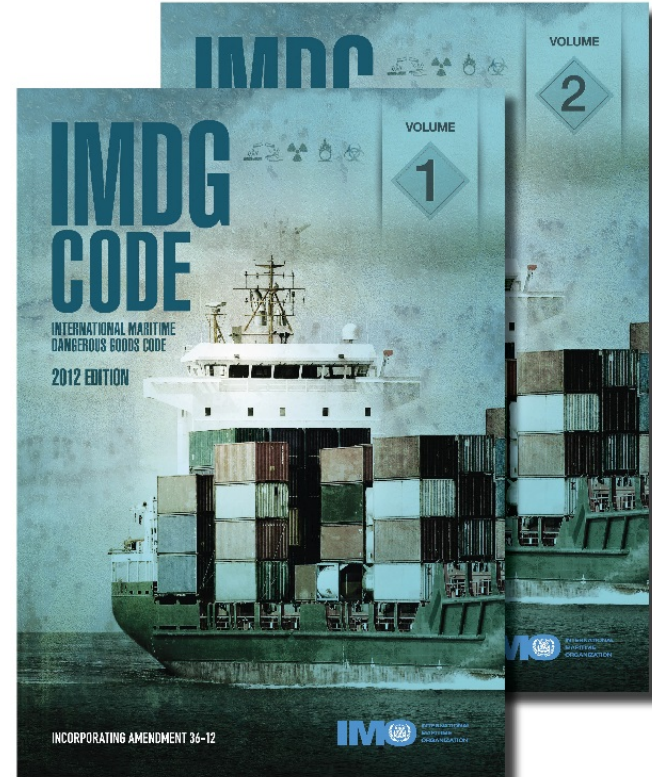
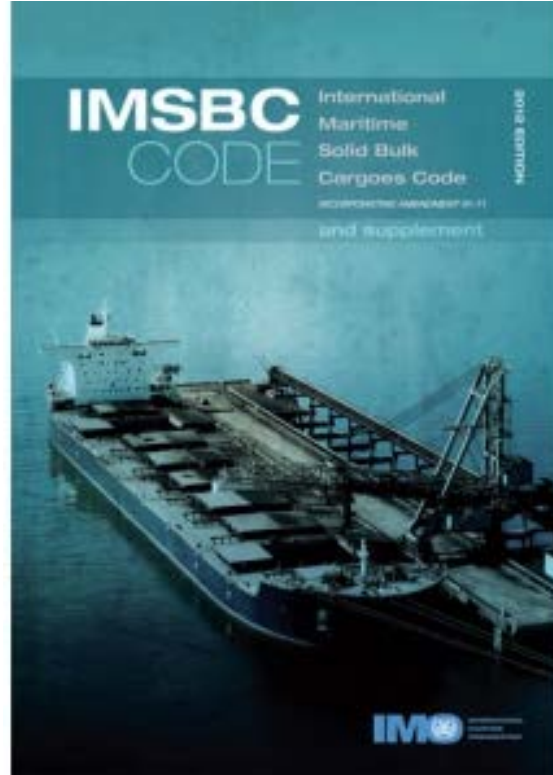
Loaded risk – dangerous cargoes and risk mitigation

Key messages

- Dangerous cargo incidents are increasingly likely and severe
- Risk mitigation is complex and deserves greater attention at a company and industry level
- Tackling cargo mis-declaration is a key challenge

Dangerous cargo incidents occur

Despite mandatory codes to manage the risks



Codes are not perfect

But they are not the real problem



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CCC.1/Circ.2
20 October 2015

CARRIAGE OF BAUXITE THAT MAY LIQUEFY

Pending the outcome of ongoing research, the Sub-Committee concluded that:

- .1 there is a need to raise awareness, despite the efforts to date made by the Member clubs of the International Group of P&I Clubs, of the possible dangers of liquefaction associated with carriage of bauxite;
- .2 the potential for bauxite to liquefy is not specifically addressed in the IMSBC Code, since it is only classified as Group C cargo;



Member Circular No. 7/2016

May 2016

New IG/CINS guidelines for the carriage of Calcium Hypochlorite in containers

Dear Sirs,

The International Group of P&I Clubs (IG) and the shipping line members of the Cargo Incident Notification System (CINS) have collaborated to produce a new set of guidelines for the carriage of Calcium Hypochlorite in containers. These new guidelines can essentially be considered "IMDG Code plus precautions" in that they include selected provisions from the IMDG Code plus additional precautions consistent with the science basis established in 1999 by consulting scientists advising the IG. These new guidelines replace the Frequently Asked Questions (FAQs) produced by the IG clubs in 2010.

What is the loaded risk ?

Severity	Medium	High	Critical
	Low	Medium	High
	Low	Low	Medium
Likelihood			



Risk – likelihood of liquefaction

INTERCARGO Bulk Carrier Casualty Report 2007-16 : “Cargo shift/liquefaction continues to be a great concern...11 casualties of cargo failure...8 bulk carriers carrying nickel ore (7 from Indonesia, 1 Philippines), 2 with Indian iron ore, 1 with Malaysian Bauxite”

Reported cause	Losses of life	Losses of ships	Likely root cause	Losses of ships
Cargo shift/liquefaction	102	11	Cargo failure	11
Collision	0	5	Machinery failure	1
			Unknown	4
Fire/explosion	16	3	Unknown	3
Flooding	27	12	Unknown	6
			Collision	1
			Machinery failure	2
			Weather	2
			Structural	1
Grounding	10	23	Machinery failure	6
			Navigation	5
			Unknown	9
			Weather	3
Structural	0	1	Unknown	0
			Collision	1
Unknown	55	5	Unknown	3
			Weather	1
			Machinery failure	1
TOTAL	210	60		60

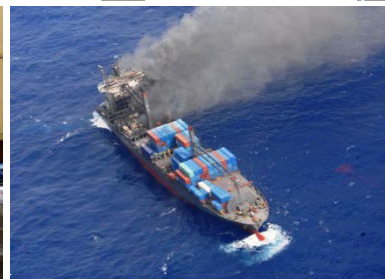
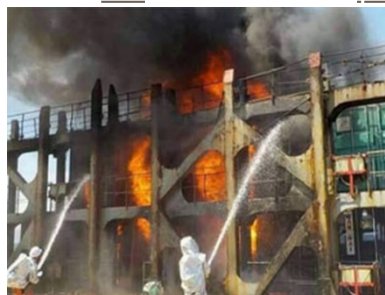


Risk – likelihood of fire / explosion

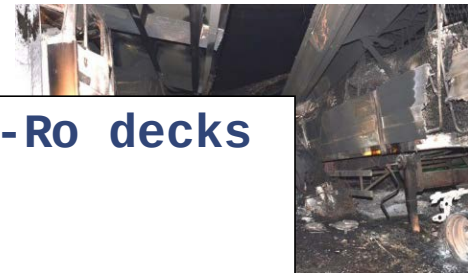
Industry looks for solutions as containership blaze tally rises

Concern grows among operators as seven boxship fires have been reported already this year, with misdeclared cargoes being blamed for many of them

October 23rd, 2015 00:00 GMT by Adam Corbett London
Published in **WEEKLY**



Risk – likelihood of fire/explosion



Enhancing fire safety on Ro-Ro decks
DNV report 20/06/16

2005-16

- *18 fires on Ro-Pax vessels*
- *9 fires on pure car/truck carriers*
- *8 fires on Ro-Ro vessels*

"In all cases, the fires were caused by the cargo (cars, trucks etc.) or the power connection between the reefer unit and vessel"



Risk – likelihood of fire/explosion



Risk – severity of harm

- Injury/death
- Claims & insurance cost
 - Ship damage/total loss, loss of use
 - Salvage, GA, wreck removal
 - Cargo
 - Time consuming/expensive litigation
 - Waste disposal
- Environmental impact
 - Wreckage, waste
- Increasing ship size
- Business impact

Cargo liquefaction kills 102 seafarers over past five years

Transport of potentially high-risk nickel ore cargoes remains a major concern for the industry, says Intercargo study



- 8000 m/t scrap
- 350 m/t “hazardous” waste
- 30,000 cbm contaminated FF water
- Total disposal cost over USD10m

Risk mitigation

- Risk characteristics
 - What's actually occurring?
 - Where?
 - When?
 - Why?
 - How - behaviour upon occurrence?
- Risk mitigation issues
 - Severity & likelihood
 - Control weaknesses
 - Risk transfer – insurance/counter-party?
 - Company and industry level



Cargo liquefaction & container fires

Common risk characteristics

- What's happening – cargo mis-declaration
- Where are risks highest - from Philippines & China
- When – occurring for some time and unlikely to change soon?
- How is behavior upon occurrence – fast and catastrophic

Cargo liquefaction

Mis-declaration

FLOW MOISTURE TEST OF CARGO

VESSEL NAME : XXXXXXXXXX
 LOADING PORT : KOLONODALE, INDONESIA
 DATE OF LOADING : XXXXXXXXXX
 CARGO GRADES : Nickel Ore
 LOADING QUANTITY : 56,800 WMT
 DATE OF TEST : XXXXXXXXXX

We hereby certify that we have carried out test on representative sample of the cargo to be loaded in MV. XXXXXXXXXX the following results have been determined as set out here under.

NO	DATE	DATA	RESULT	REMARK
01		MOISTURE CONTENT	31.00 %	
02		FLOW MOISTURE POINT	38.00 %	
03		TRANSPORTABLE MOISTURE LIMIT	34.25 %	

We further certify that all test procedures are adopted from the International Maritime Organization's Code of safe Practice for solid Bulk Cargoes.



“The reliability of the information provided on the cargo declaration, in particular the composition of cargo, the probability of liquefaction occurring is considered high”

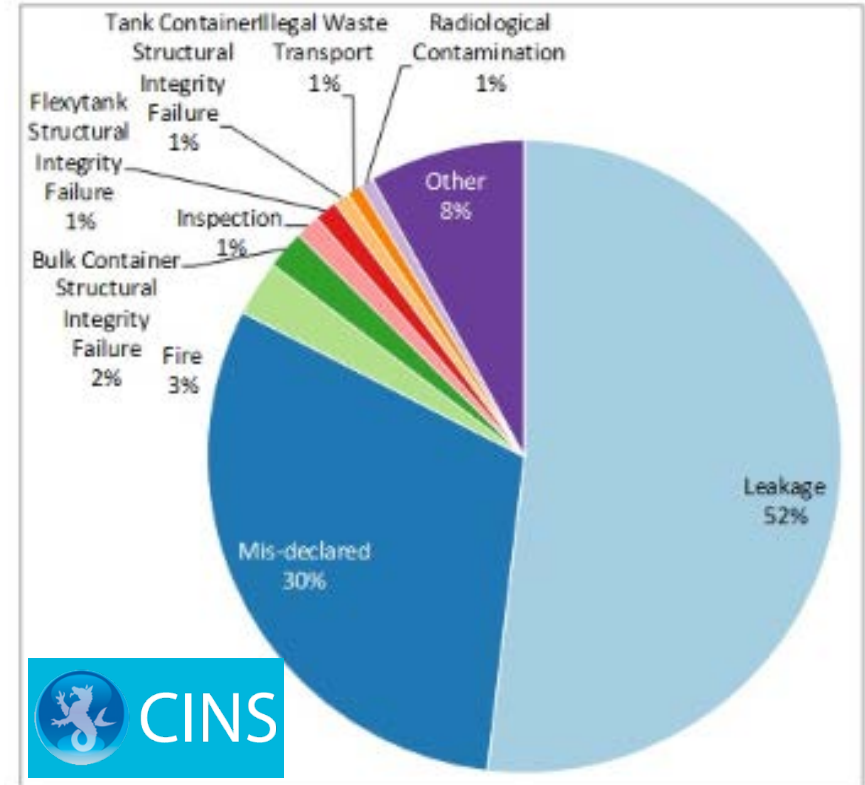
“Investigation into these incidents highlighted improper cargo information...”

Container fire/explosion

Mis-declaration



Chart 1: Analysis of Cargo Incident Type 2013 to 2015



Cargo Incident Notification System

Cargo mis-declaration

Lack of policing - carriers must protect themselves

Tianjin, August 2015
Over 165 people killed
Government report blamed illegally stored hazardous materials

"While the IMDG Code has been adopted by 172 countries...non-compliance feedback to the IMO is astonishingly low, with only 5 reports submitted last year"

Sector braces for new nickel ore exports

April 13th, 2017 14:41 GMT by Adam Corbett

Published in **CASUALTIES**

Warnings over the dangers of liquefaction are being made as the first ships to carry Indonesian nickel ore cargoes for nearly three years are fixed.



Container fires

Behaviour : fast and catastrophic

- **6 minutes**
- **20 minutes**
- **27 minutes**



Liquefaction

Behaviour : fast and catastrophic

"...the general alarm sounded ...the Chief Cook returned to his cabin to collect his lifejacket... while in his cabin he felt the vessel suddenly starting to roll ...He left his cabin...at this point... the vessel stopped rolling and adopted approximately a 45 degree list to starboard"



Cargo liquefaction & container fires

Common risk mitigation issues

- Weaknesses in tackling mis-declaration
- Being alert and prepared is vital
- Risk transfer pitfalls
- Are ships equipped to cope?
- Industry level

Weaknesses in tackling mis-declaration

Can-test “Complementary test ... for determining the possibility of liquefaction

Can test fail	14.8%	
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Method	FMP	TML
Flow table	11.7	10.5
Penetration	11.2	10.1
Proctor Fagerberg		10.3

“8.4.2. If samples remain dry following a can test, the moisture content of the material may still exceed the Transportable Moisture Limit (TML)”

Weaknesses in tackling mis-declaration

Container lines - banning is not a long term solution

IG/CINS Calcium Hypochlorite guidelines :

*"It is estimated that global production
...is about 400,000 tonnes per year*

*..there is an obvious desire to both
discourage mis-declaration by shippers and
to encourage shipping lines' confidence in
the carriage of properly declared Calcium
Hypochlorite under an acceptable method"*

Weaknesses in tackling mis-declaration

Container lines - sharing space

“[software]...scan[s] the booking environment in real-time to pick up potentially undeclared DG ...using known keywords and synonyms. The system reports approximately 1250 potential hits per day”

“New technologies... helping to build a shared online database portal for managing DG shipment data - critical in the current alliance and vessel/slot sharing environment where cargo may be booked with one carrier but moved by another”

Weaknesses in tackling mis-declaration

Container lines - sharing space



NO BOOKING



Line A



CONFIRMED

Line B



AF signs deal with Line X which cuts 10-15% off time to book containers. AF said the system worked similar to online flight portal Skyscanner with live prices for container lines that can be selected immediately



Mitigating container fire severity

Being alert & prepared is vital

"Firefighting is not the primary function of the crewmembers...for most crewmembers such a situation is a once-in-a-lifetime experience"

"The success of the fire-fighting effort was also attributed to a recent drill in which the crew members simulated a CH fire.."



"Further attempts at penetrating the container were made...placing fire nozzles inside and eventually containing the fire"

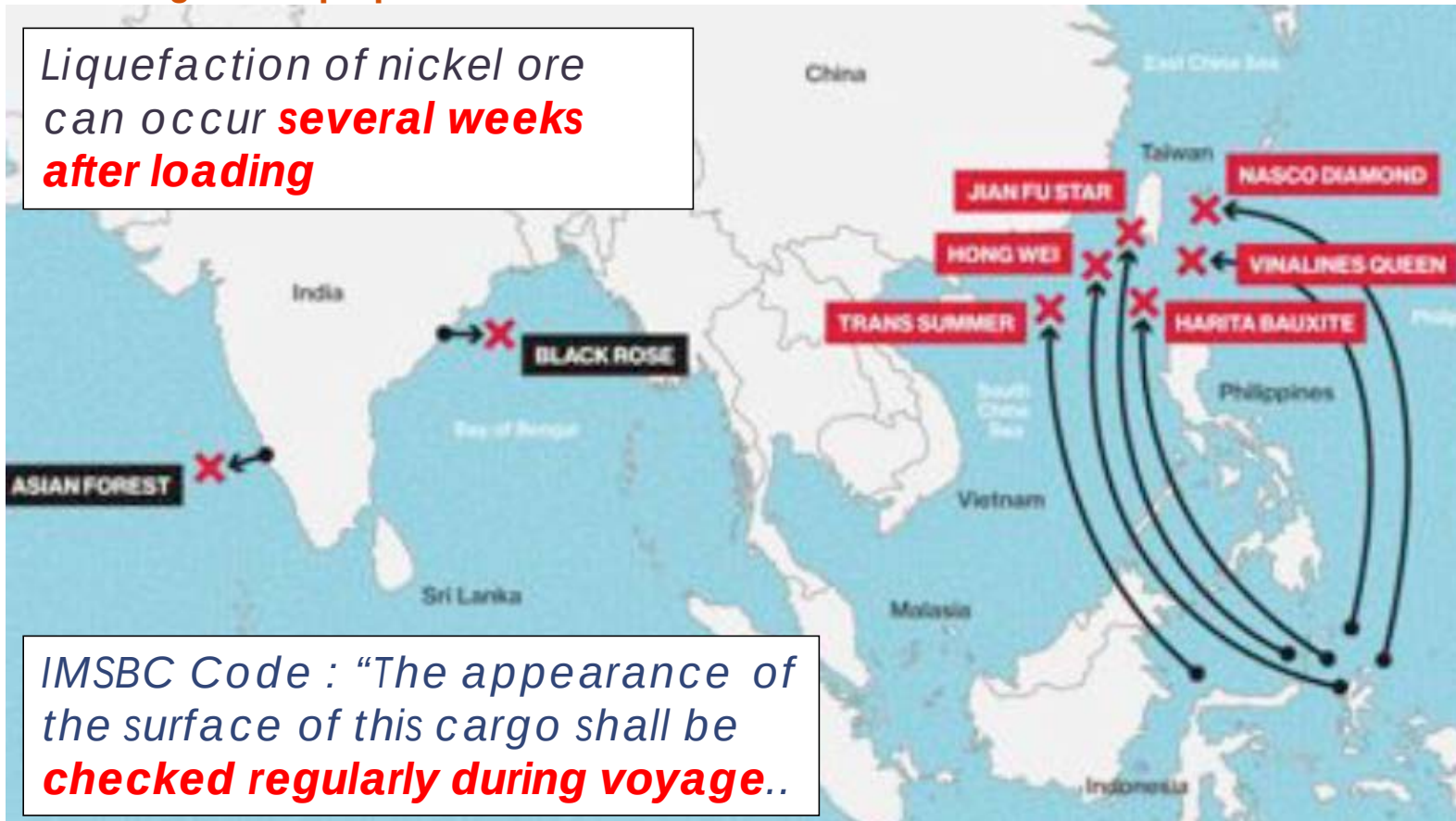
"No specific training in the use of container firefighting equipment is included in the mandatory shore-based crew training"

"The CO2 system failed...resulting in a near-explosion...which presented a serious risk to the crew ... Another consequence was that very little CO2 actually reached the cargo hold"

Mitigating liquefaction severity

Being alert & prepared is vital

Liquefaction of nickel ore can occur **several weeks after loading**



IMSBC Code : “The appearance of the surface of this cargo shall be **checked regularly during voyage..**

Not leaving it too late to bring in experts



Place of refuge - NIMBY - NHYSB



Risk transfer pitfalls

Insurance

IG circular 2010 : Indonesia and the Philippines - Safe Carriage of Nickel Ore Cargoes

Consequences of a Member's failure to comply with the Code

All of the Group Clubs have similar Rules which in essence exclude cover for liabilities, costs and expenses arising from unsafe or unduly hazardous voyages

Liquefaction - An Update Gard News 2012 : "Members are at significantly greater risk of prejudicing cover if... the Member loads unsafe cargo from a country where there is a history of unreliable shippers' certificates, doing so solely on the basis of 'can tests' and without independent sampling and analysis"

Risk transfer pitfalls

Indemnity claims against shippers/charterers

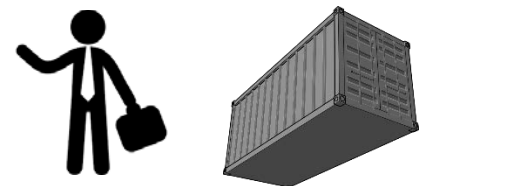
Use Bimco SBCL clause, not something like this :

*CARGOES TO BE LOADED / TESTED THROUGH THE METHOD OF CAN
TEST ONLY. ONCE CARGOES HAVE BEEN LOADED ON BOARD, THE
SAME SHOULD BE TREATED TO HAVE BEEN ACCEPTED AS SAFE
CARGOES BY OWNERS AND SHOULD NOT BE FURTHER
SAMPLED/TESTED.*

*“We conclude that, on the facts of this case, both the
Owners and the master knew that this particular cargo
was dangerous but nevertheless consented to its
carriage”*

Risk transfer complexity

Vessel providing Line ships mis-declared container – fire defence?



336 DRUMS IN TOTAL
1X20ST CONTAINER SAID TO CONTAIN:
ORGANIC SURFACE

CONFIRMED

Line B



Line A



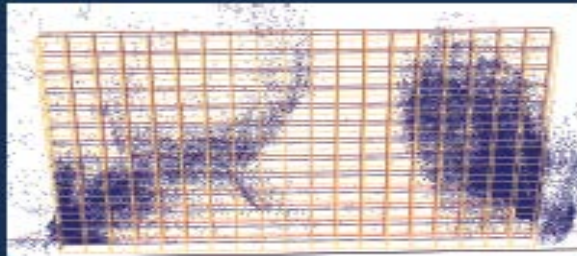
CLAIM

DUE DILIGENCE

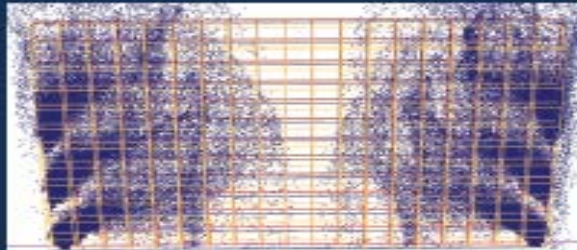
Ships equipped to cope?

Containership fires

Two monitors at the deck edge,
on the deck



Six monitors at the deck edge,
differing vertical positioning



ABS 2016 FOC Guide :

“When ABS discussed the 2014 SOLAS amendments for fire fighting arrangements on all new ships constructed on or after 1/1/16 with owners and operators of container ships, it was clear that the SOLAS requirements may not be adequate for today’s larger container carriers”

Ships equipped to cope?

Huge quantities of water in large ore carriers



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Risk mitigation at an industry level

- Port state policing - shipper prosecutions?
- The role of terminals in preventing unsafe shipments?
- More flag state accident reports & inspection campaigns?
- Cost differential & bureaucracy for DG vs benign cargoes?
- Carrier culture : desire to carry vs desire to avoid unsafe cargo?

