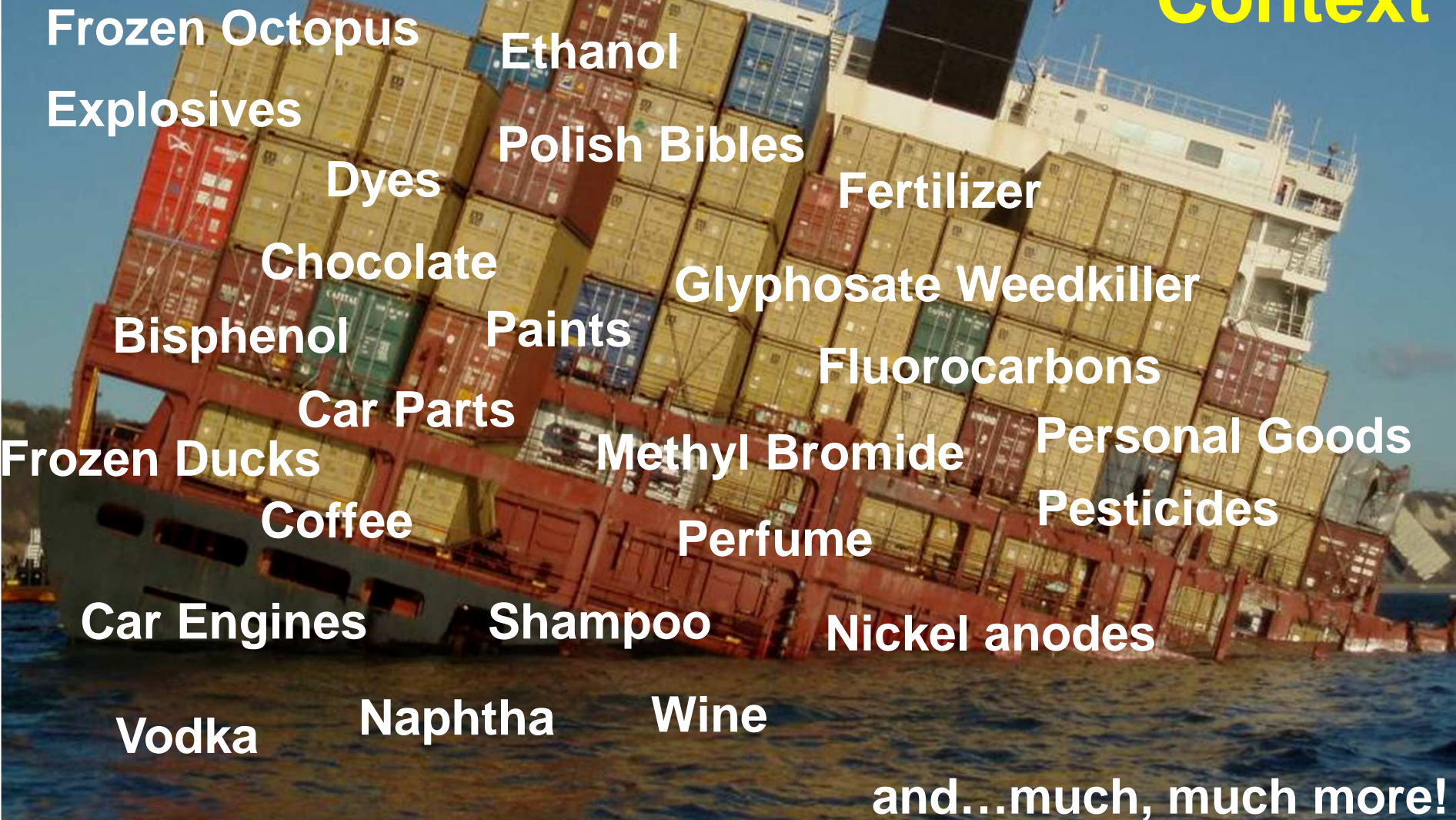


# Understanding Chemicals:

# Perception and Context



Frozen Octopus  
Explosives  
Ethanol  
Polish Bibles  
Dyes  
Fertilizer  
Chocolate  
Glyphosate Weedkiller  
Bisphenol  
Paints  
Fluorocarbons  
Car Parts  
Methyl Bromide  
Personal Goods  
Frozen Ducks  
Coffee  
Perfume  
Pesticides  
Car Engines  
Shampoo  
Nickel anodes  
Vodka  
Naphtha  
Wine  
and...much, much more!



# Chemical tanker

IEVOLI SUN

English Channel

October 2000



# Chemical Bulker



**MV TYPHOON  
CHRISTMAS ISLAND  
JANUARY 2012**



# Containership: MSC NAPOLI – Lyme Bay



# Containership: MSC NAPOLI – Lyme Bay

## Context dependant

- To assist ops a traffic light system was implemented
  - based on human/eco toxicity and physical properties
- This system evolved as incident progressed

What is the nastiest chemical on board?



# Perceptions

- All chemicals are hazardous to something
- When the NAPOLI manifest was released the following Newspaper article appeared



**ECHO EXCLUSIVE**

# Toxic cargo

N-phosphonomethylglycine, dimethyl sulphide, epichlorohydrin, profenofos solution, phosphorus, propaquizafop, polystyrene beads, epoxyresin, carbendazim, trimethylaluminium, fluazifop, toluene disocyanate, methyl bromide, phosphorus pentasulphide, nonylphenol, methidathion and solventnaphtha, flavours, fragrances, acrylonitrile, dodecyl mercaptan, perchloric acid, dichlorobenzene, solvent naphtha/butoxyethanol, acrylamide solution, naphtha and resin solution, naphtha petroleum, triaryl phosphate isopropylated, butylene, mixed cargo organic peroxide, fluorocarbon, toluene, isodecyl phosphate, ammonium bifluoride, hydrogen peroxide, acetic acid, acrylic acid, mixed flammable solvents, tetrachloroethylene, cyclosiloxane, battery acid, dichloroisopropyl, polyoxypropyleneamine, methyl methacrylate, ethylene diamine, diphenylamine, chloroethanol, methylal, peroxide, alrbag inflators plus other car mixed dangerous goods, polycarboxylic acid, tert butyl



hydroperoxide, ethoxpropanol, heptane, alrbag inflators, trichloroethylene, phosphoric acid, car pyrotechnics, dioxadodecane diamine, extracts flavouring, potassium hydroxide plus isopropanool, organic peroxide, pyrotechnic articles, iron, manganese and copper sulphate, resin solution, ammonium/potassium nitrate, perfumery products, ethanol, caustic alkali, pot silicate soln, nickel and copper salts, aerosols, corrosive solid sodium metasilicate, paint, zinc alkyl dithiophosphate, barium nitrate, flavours, fragrances, resorcinol, trisodium silicate, long chain alkylamine, triphenyl-phosphate, cyclosiloxane, mixed alkaline corrosives, mixed epoxy, corrosive solid magurea phosphate, metal sulphides (1% copper), resin solution, limited quality paint, batteries alkali, limited quantity aerosols plus liquids, Isopropanol, flavours, fragrances, disinfectant, hexamethylindanopyran, ethylhexyl nitrate, perfume flavours (ethanol based)

Air bag inflators

Paint

Aerosols

**...all of these hazardous chemicals were stored on the grounded MSC Napoli. Full story on pages 4&5**

Stowage (slot) Position e.g. 410810

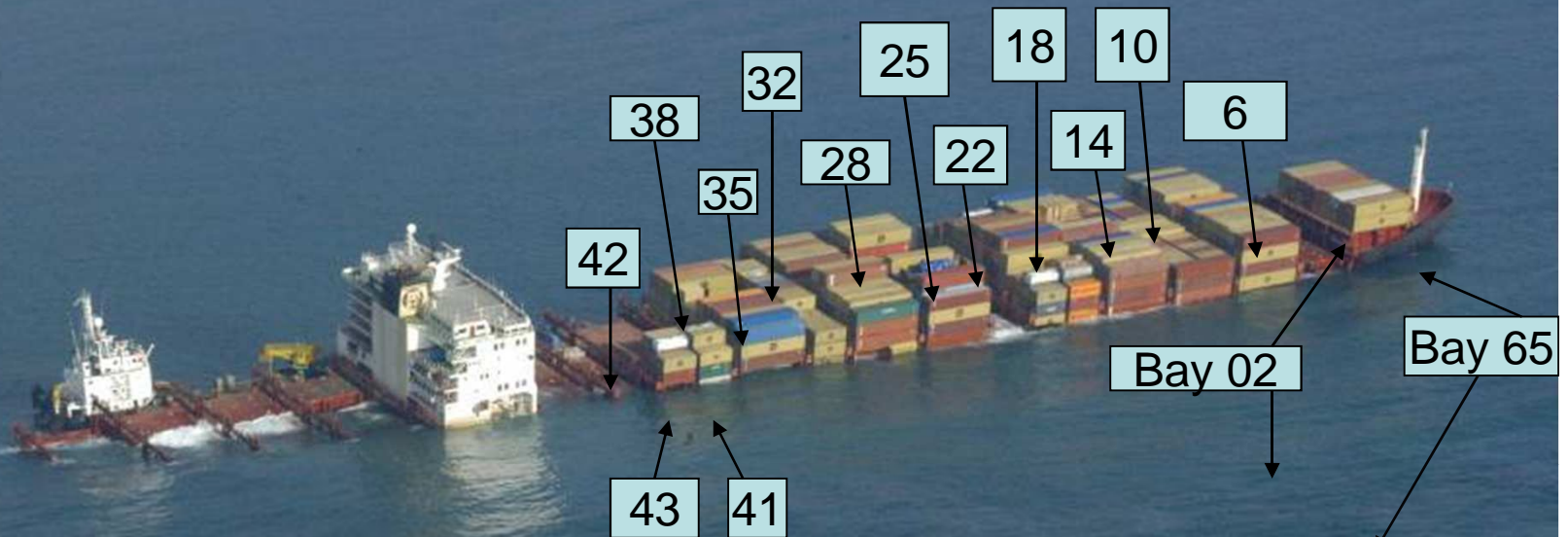
Even bay numbers e.g. 42 = 40ft container

Odd bay numbers e.g. 43, 41 = 20ft container

Horizontal position e.g. 08 – even port, odd starboard

Vertical position e.g. 10 – 02 – 16 below deck

84 – 94 above deck



MSC Napoli 09.00 on 7<sup>th</sup> Feb 2007





# NAPOLI - Toxic cargo ?



... all these  
“hazardous”  
chemicals  
were stored  
on the  
grounded  
MSC Napoli

# Potential effects of some of the items on the DG manifest

- Methyl bromide – toxic gas, used as fumigant, modelling indicated instantaneous release would affect 5km from MSC Napoli
- Glyphosate – weedkiller
- Isopropanol – 120 ml toxic to humans by ingestion
- Nonylphenol – persistent pollutant
- Perchloric acid – corrosive and oxidising



# Risk Assessment

- 159 cargo transport units (CTU) loaded with DG
- CTU – freight containers and portable tanks
- Containment system – packaging or tank
- Packaging loaded and secured in container

# Risk Assessment

- For operational reasons, cargo sub-divided into three categories of risk and colour coded:
  - 1 = Toxic to humans and environment and public perception - RED
  - 2 = Intermediate - BLUE
  - 3 = Retail/consumer products - GREEN
- Type and specification of containment system (drum, tank etc)
- Quantity and concentration of substance



# Risk Assessment

- Methyl bromide packaged in 100 kg UN approved cylinders



- Likelihood of 1 release = same as normal usage
- Likelihood of simultaneous release – very, very low

# Risk Assessment

- Glyphosate – container in flooded hold and is water soluble, packaging not water resistant
- Kinetics of dissolution process and toxicity of chemical were examined
- Conclusion although quantity large risk to environment low



# **Risk Assessment**

- Isopropanol and Nonylphenol
- DG Manifest information indicates 100% concentration
- Safety sheet and supplier information indicated concentrations were 2.5% and low respectively
- Nonylphenol concentration given in commercial confidence
- Perchloric acid - 4 x 2.5L

# Risk Assessment

- A number of flammable materials onboard
- However, salvors onboard, fire would be detected at early stage also salvage vessels with fire fighting capabilities on station
- Hence risk from fire was low

# Summary

- No single source of in-depth cargo information from “ship”
- Based on manifest alone cannot make accurate statement on risks
- Information management – dissemination and presentation of information is key:– who to, and to help others involved understand issue and actual risks

## All about

- Perception of:-
  - Quantity
  - Type of HNS
  - Concentration
  - Location



# THE Sun



WIN  
**£50,000**  
ROLLOVER  
GAMECARD INSIDE  
SEE PAGE 16

Wednesday, August 25, 1999

30p

THOUGHT: THERE GOES YOUR NO CLAIMS SCHEME

## LINER SMASHES INTO FREIGHTER IN CHANNEL



# OH SHIP!

*A huge dent scars the bow of luxury liner Norwegian Dream at Dover docks after it slammed into a cargo ship in the English Channel yesterday. The 2,600 on board feared a Titanic-style disaster but amazingly, there were no serious injuries. Full story — Pages 4 and 5*