Marine Maintenance Expo, Netherlands
Day 3 @ 14:00 8th June 2017

SET IN A SILVER SEA

Maritime nations & how UK manufacturing expertise is improving safety at sea in terms of the ungoverned space of fire safety

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- Introduction to fires at sea
- Overview of fire contents & protected space integrity
- Overview of IMO SOLAS FSS Code
- Overview of ISO 14520
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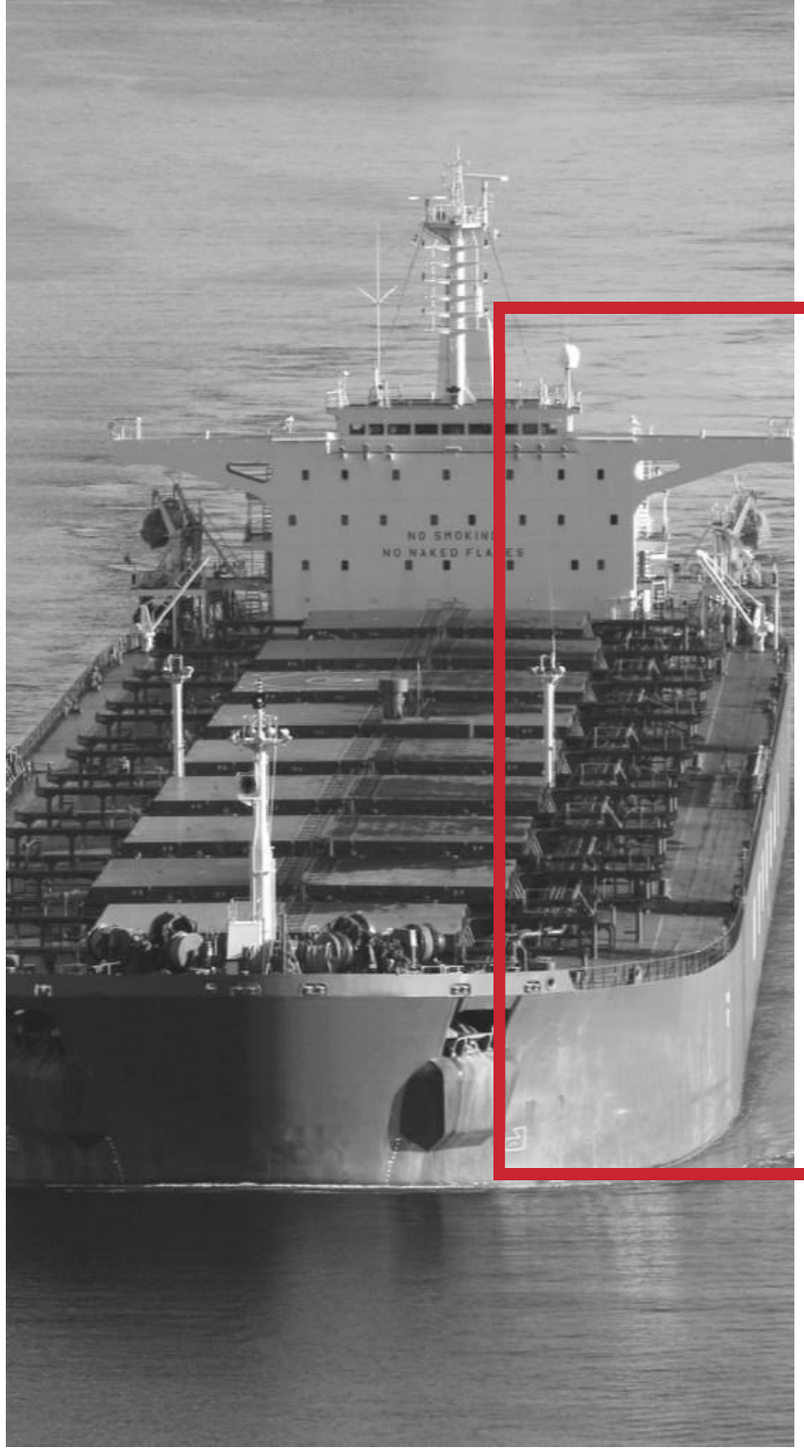
- Call for better on-board maintenance
- Checking contents, pipework, room integrity
- Ultrasonic technology improves testing
- Look forward to constant monitoring

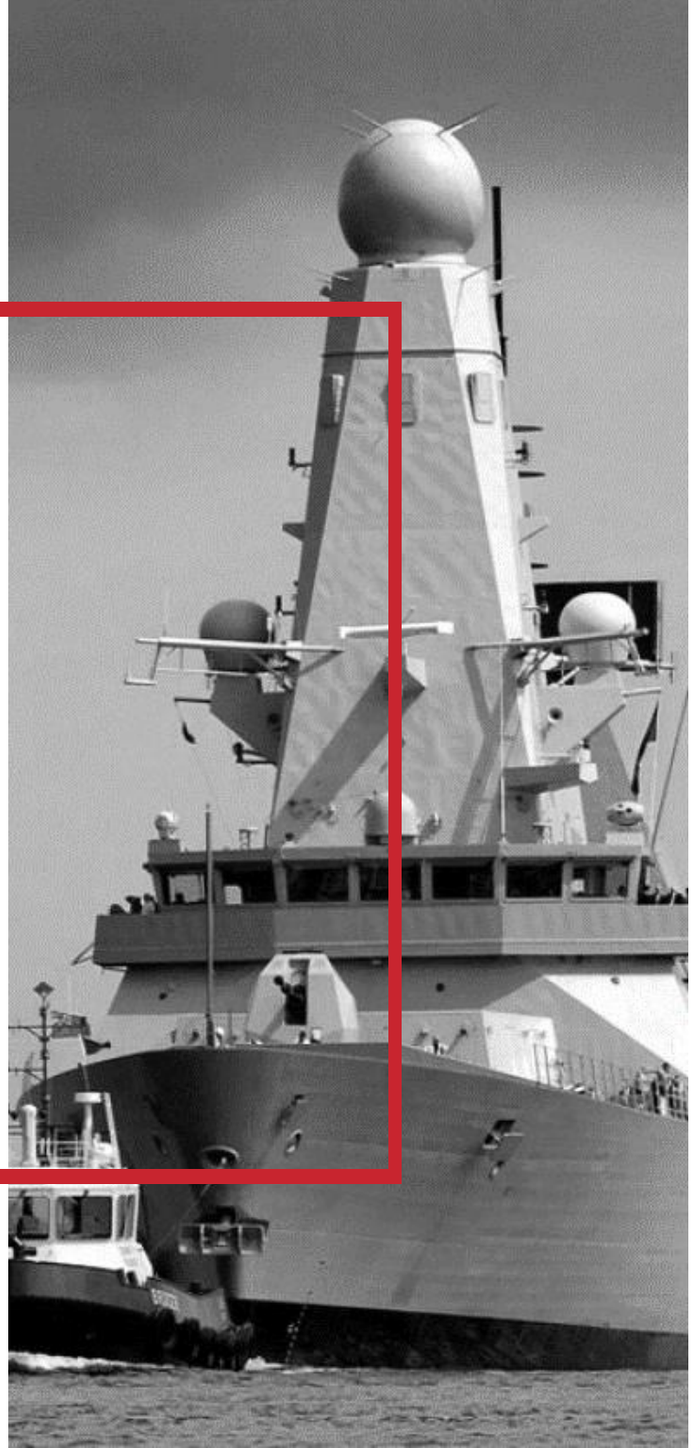


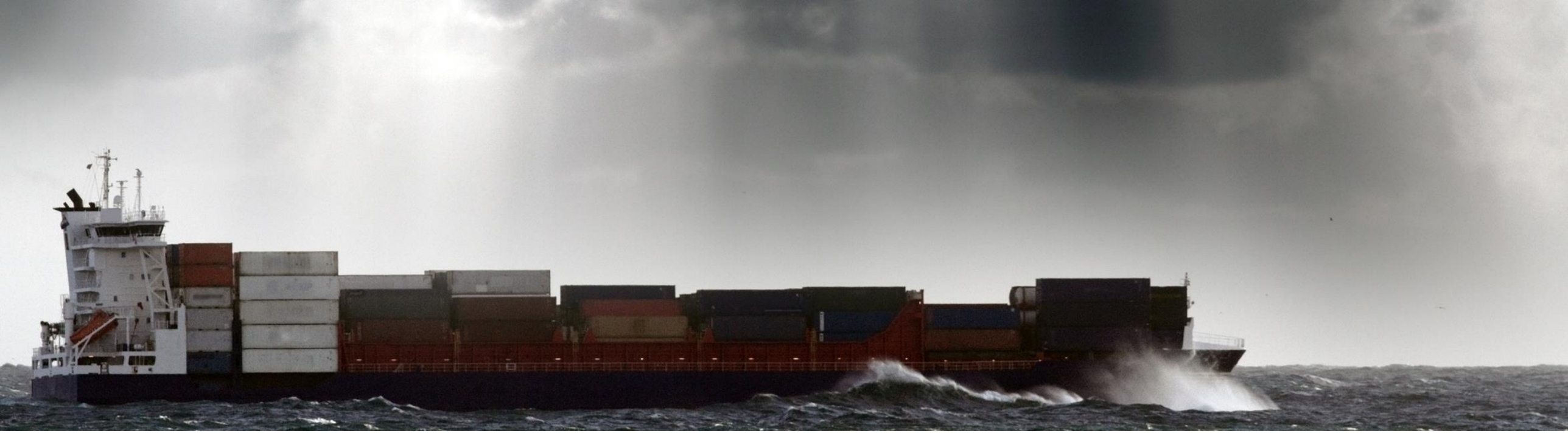
INTRODUCTION TO FIRES AT SEA

- How critical fire safety is for marine environments
- At sea each vessel & her crew are their own fire service
- Anecdotes abound of the risks and implications of fire at sea
- Current trending issue gaining awareness and recognition

FIRE CONTENTS & PROTECTED SPACE INTEGRITY

- Contents at the correct fill is essential to ensure the design concentration is delivered in order to extinguish the fire event
- Protect space integrity important to ensure that upon discharge, if the agent is not contained within the space, the fire may not be extinguished





IMO SOLAS FSS Code

- Chapter 5 2.1.1.3 Means shall be provided for the crew to safely check the quantity of the fire extinguishing medium in the containers
- IMO MSC Circular 1120, 7.3.2.6 Means should be provided to verify the liquid level in all the cylinders, either by weighing or using a liquid level detector
- Compliance is possible by ultrasonic technology, not by weighing
- Suggested this should be carried out in between the annual maintenance check whilst at sea by the crew instead of relying on the third party contractors once a year

ISO14520 FOR GASEOUS EXTINGUISHING SYSTEMS

- Contents: 9.2.1.3 The storage container contents shall be checked at least every six months: a) Liquefied gases: for halocarbon agents, if a container shows a loss of agent in quantity of more than 5 % or a loss of pressure (adjusted for temperature) of more than 10 %, it shall be refilled or replaced.

- Room Integrity: 9.2.4.1 At least every 12 months it shall be determined whether boundary penetration or other changes to the protected enclosure have occurred that could affect leakage and extinguishant performance.

COMMON MISUNDERSTANDINGS

- Anecdotes abound about misunderstanding e.g. under-/over-filled cylinders, pressure gauges stuck in position due to humidity/mechanical fatigue, pipework freshly painted but with severe internal corrosion
- Examples:
  - August 2011 - Accidental CO_2 discharge on SD Nimble resulting in serious injury to a shore-based service engineer at HM Naval Base Faslane
  - September 2004 – Hong Kong - A Routine Inspection of the Fixed CO_2 Fire Extinguishing System that led to the Death of Four Officers
- Certification driving maintenance, not maintenance driving certification

- Regulation guides the direction taken by the free market
- ‘Price is king’
- Safe engineering must be rewarded
- New technology enables vessels to meet the spirit and letter of the regulations
- This technology can be embodied into the vessel’s ISM to enable better on-board maintenance

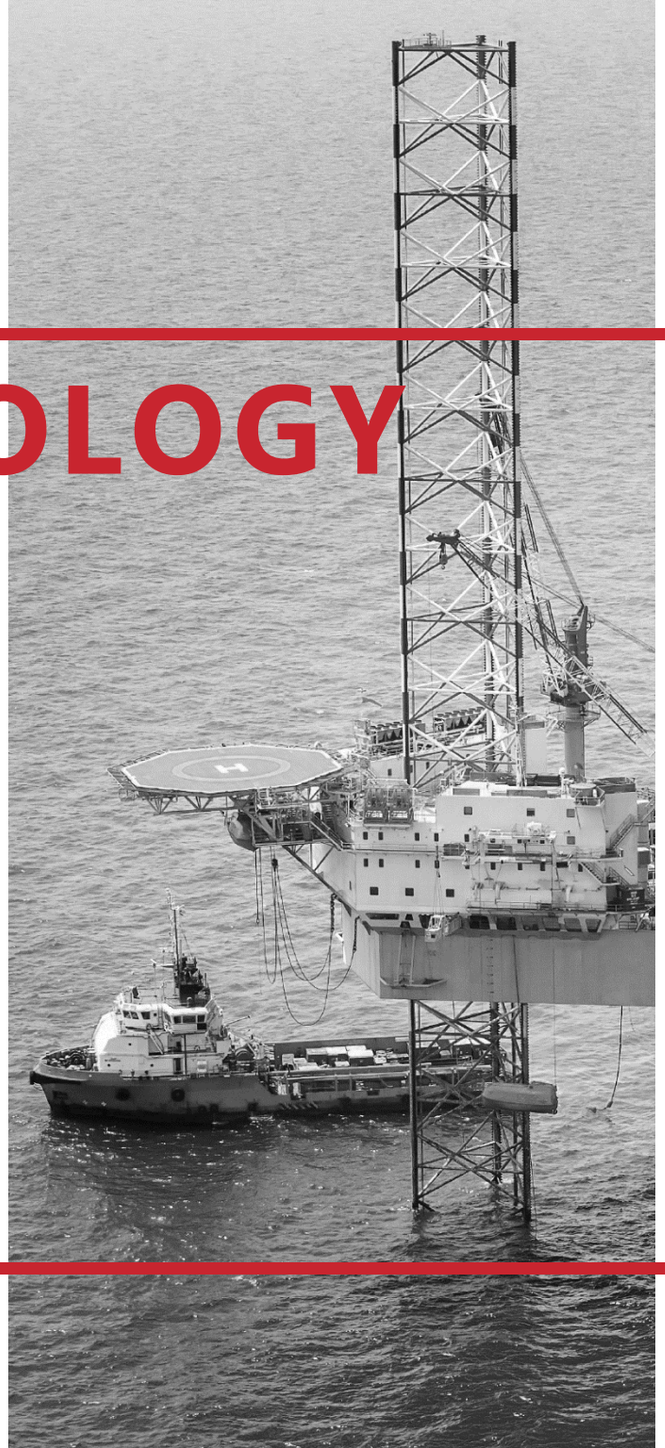
CALLING FOR BETTER ON-BOARD MAINTENANCE

CHECKING CONTENTS, PIPEWORK & ROOM INTEGRITY

- A holistic approach to fire safety
- Answering the common misunderstandings of how to deal with loss of system integrity: leaks, corrosion, obstructions

ULTRASONIC TECHNOLOGY IMPROVES TESTING

- Ultrasonic technology is versatile, accurate, effective and easy to use
- E.g. 15 mins to weigh 1 cylinder with 2 personnel vs.
  30 secs to use Portalevel® MAX to test 1 cylinder with 1 personnel
- Alerting crew and shore-based teams will enable quicker reactions to errors and improved condition monitoring
- Benefiting safety at sea and overall business continuity



LOOK FORWARD: TO CONSTANT MONITORING

- This will enable asset management integrity and data analytics
- Ultrasound has potential to dramatically enhance:
  - Fire Fighting System Operability
  - Room Integrity Monitoring
- Scientific understanding is critical for future Safeship® solutions

CURRENT TECHNOLOGY

A. Watertight & Room Integrity

Hatch Covers, Multiple Cable Transits, Watertight Doors

Portascanner™ Watertight

Permascanner™ Hi-Life Generator

B. Fire Suppression Systems

Liquid Level Indicators

Portalevel™ MAX Marine

Portamarine™

C. Pipework Integrity

Pipework and Hull Plate Corrosion Testing with Thickness Gauges

Portagauge™ 3

Portagauge™ 4

D. Condition Monitoring

Flow Rate

Portasonic™

Monitoring Rotating Machinery

Portamonitor ™

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Thank you
Q&A

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