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Autonomous ships

Is today's legal framework ready?

Herman Steen, partner

Shippingforum, 5 March 2019

Error in navigation algoritms

Apportionment of liability between the ships

No fault by shipowner = no liability for autonomous ship?

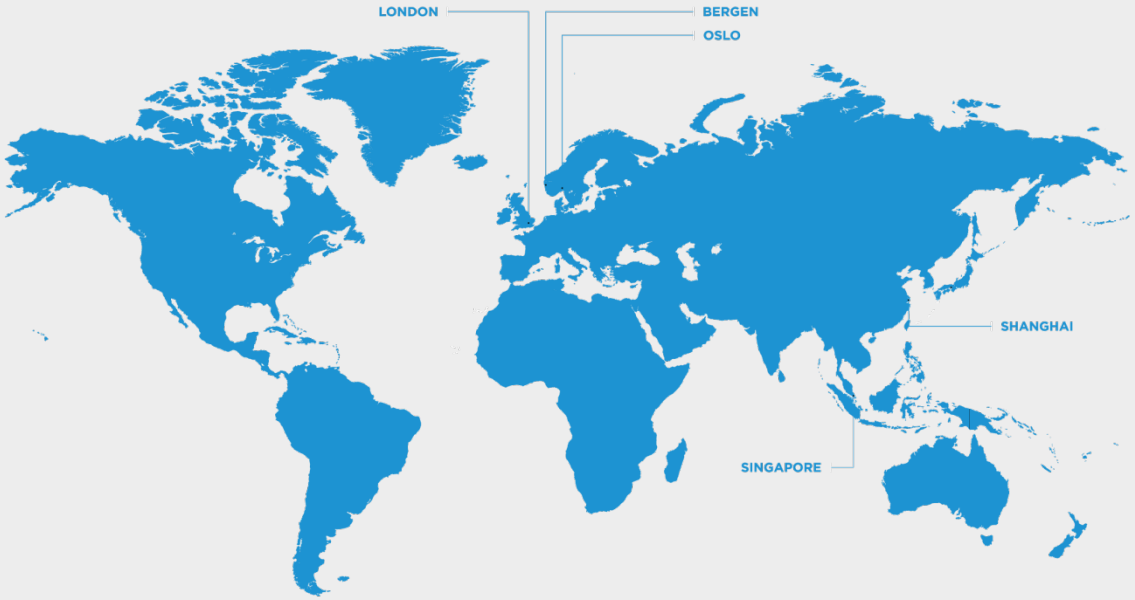
Insurance

Risks covered?

Cargo claims

Unseaworthy = shipowner liable?

About Wikborg Rein



330
EMPLOYEES

20
LANGUAGES

833
MNOK REVENUE / 2017

25
NATIONALITIES

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Shipping Offshore

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Integrated teams

> *Unparalleled reputation in all aspects of shipping law*
> – Legal 500

Charters and employment contracts

Project development

Advice and Regulations

Construction

When is this the new normal?

IMO's definition of levels of autonomy

MASS =
Maritime autonomous surface ship

1

Automated processes and decision support

(seafarers on board)

- Some operations automated
- At times unsupervised
- Seafarers available to take control
- Today: Auto pilot, ARPA, bridge controlled engine etc)

2

Remotely controlled

(seafarers on board)

- Controlled and operated from another location
- Seafarers available to take control
- Reduced manning

3

Remotely controlled

(no seafarers on board)

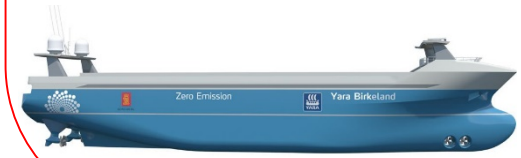
- Controlled and operated from another location
- No seafarers to take control

4

Fully autonomous ship

(no seafarers on board)

- The operating system of the ship is able to make decisions and determine actions by itself.

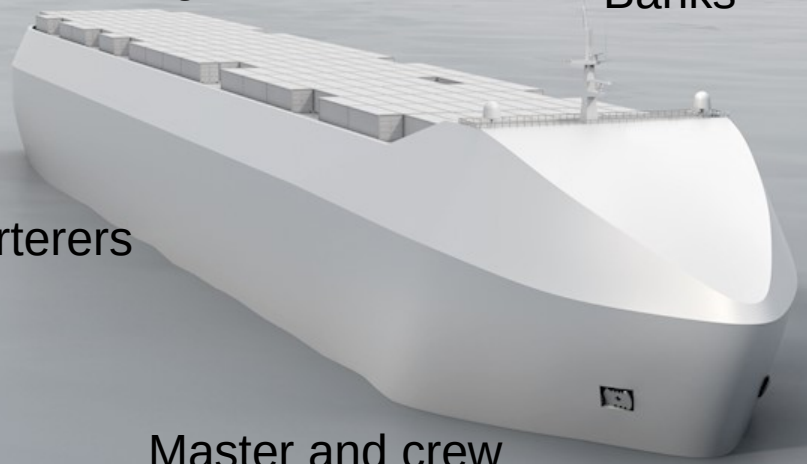


Increasing automation changes risk picture

- Most accidents caused by human error
- Increased autonomy expected to reduce level of risks and marine casualties
- BUT: Introduces new risks
  - Failure in technology
  - Limitations in technology
  - Unknown risks

Will affect all existing stakeholders

New players



Cargo interests

Banks

Shipowners

Managers

Insurers

Charterers

Coastal states

Master and crew

Flag states

Yards

International regulatory bodies (UN, IMO, EU etc)

Equipment suppliers

System suppliers (hardware + software)

Remote operators

Classification societies

Legal aspects

1) Regulatory requirements
   - Minimum manning, training
   - Seaworthiness
   - Classification
   - Standard and maintenance of systems
   - Etc
2) Roles and liabilities for stakeholders
   - Change in distribution of liability between existing stakeholders?
   - Shift in liability towards the new players?
3) Insurance

Relevant throughout vessel's life:

- Financing
- Shipbuilding contract
- Supplier contracts
- Management agreements
- Service and maintenance agreements
- Crewing/remote controlling
- Classification
- Contracts of carriage
- Cargo operations
- Casualties

A lot of stakeholders active, both in Norway and internationally

INAS International Network for Autonomous Ships

IGP&I International Group of P&I Clubs

CMI Comité Maritime International

NFAS Norsk Forum for Autonome Skip

West of England

SKULD

The Standard

SHIPOWNERS

The Swedish Club

STEAMSHIP MUTUAL

UK P&I CLUB

JAPAN P&I CLUB

gard

THE AMERICAN CLUB

NORTH

Britannia

The London P&I Club

IMO INTERNATIONAL MARITIME ORGANIZATION

IUMI International Union of Marine Insurance

BIMCO

DNV·GL

gard

Cefor The Nordic Association of Marine Insurers

SKULD

KYSTVERKET NORWEGIAN COASTAL ADMINISTRATION

massterly

Sjøfartsdirektoratet Norwegian Maritime Authority

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IMO takes first steps to address autonomous ships

Briefing: 08 25/05/2018

The International Maritime Organization (IMO) – the global regulatory body for international shipping - has commenced work to look into how safe, secure and environmentally sound Maritime Autonomous Surface Ships (MASS) operations may be addressed in IMO instruments.

The Organization's senior technical body, the Maritime Safety Committee (MSC), endorsed a framework for a regulatory scoping exercise, as work in progress, including preliminary definitions of MASS and degrees of autonomy, as well as a methodology for conducting the exercise and a plan of work.

For the purpose of the regulatory scoping exercise, "Maritime Autonomous Surface Ship (MASS)" is defined as a ship which, to a varying degree, can operate independently of human interaction.

To facilitate the progress of the regulatory scoping exercise, the degrees of autonomy are organized (non-hierarchically) as follows (it was noted that MASS could be operating at one or more degrees of autonomy for the duration of a single voyage):

- Ship with automated processes and decision support: Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated.
- Remotely controlled ship with seafarers on board: The ship is controlled and operated from another location, but seafarers are on board.
- Remotely controlled ship without seafarers on board: The ship is controlled and operated from another location. There are no seafarers on board.
- Fully autonomous ship: The operating system of the ship is able to make decisions and determine actions by itself.

The Maritime Safety Committee (MSC) endorsed a framework for a regulatory scoping exercise, as work in progress, including preliminary definitions of Maritime Autonomous Surface Ships (MASS) and degrees of autonomy, as well as a methodology for conducting the exercise and a plan of work.

As a first step, the scoping exercise will identify current provisions in an agreed list of IMO instruments and assess how they may or may not be applicable to ships with varying degrees of autonomy and/or whether they may preclude MASS operations.

As a second step, an analysis will be conducted to determine the most appropriate way of addressing MASS operations, taking into account, *inter alia*, the human element, technology and operational factors.

The MSC, which was meeting for its 99th session (16-25 May), established a correspondence group on MASS to test the framework of the regulatory scoping exercise agreed at the session and, in particular, the methodology, and report back to its next session, MSC 100 (3-7 December 2018).

The Correspondence Group will test the methodology by conducting an initial assessment of SOLAS regulation III/17-1 (Recovery of persons from the water), which requires all ships to have ship-specific plans and procedures for recovery of persons from the water; SOLAS regulation V/19.2 (Carriage requirements for carriage of shipborne navigational equipment and systems); and Load Lines regulation 10 (Information to be supplied to the master).

If time allows, it will also consider SOLAS regulations II-1/3-4 (Emergency towing arrangements and procedures) and V/22 (Navigation bridge visibility).

The Committee further invited interested Member States and international organizations to submit proposals related to the development of interim guidelines for MASS trials to its next session, MSC 100.

Treaties under consideration

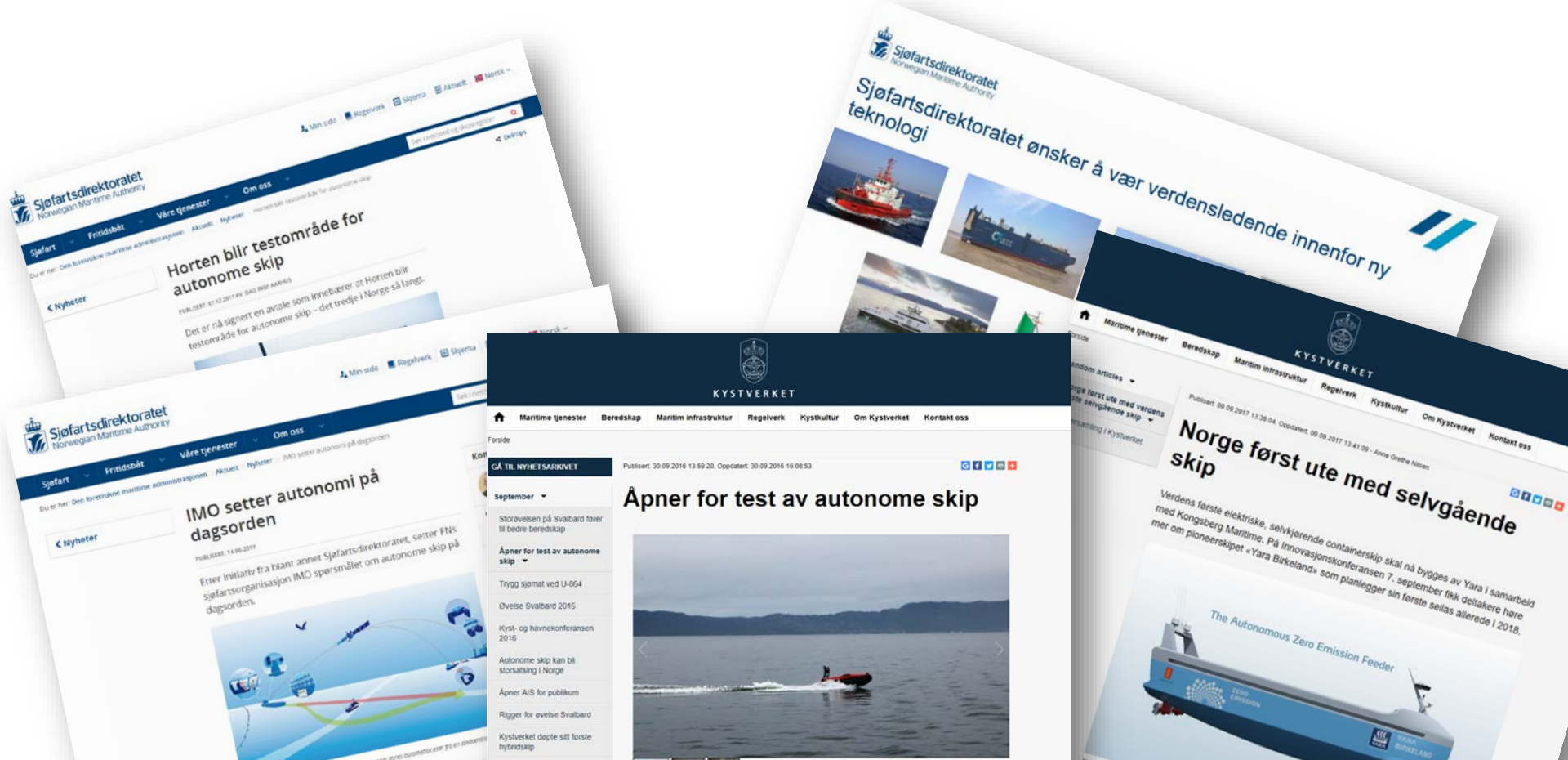
The list of instruments to be covered in the MSC's scoping exercise for MASS includes those covering safety (SOLAS); collision regulations (COLREG); loading and stability (Load Lines); training of seafarers and fishers (STCW, STCW-F); search and rescue (SAR); tonnage measurement (Tonnage Convention); and special

Regulatory requirements being addressed

IMO's Maritime Safety Committee – approved regulatory scoping exercise 7 December 2018

- Existing regulations assume master and crew on board
- Identify need for:
  - Develop interpretations
  - Amend existing instruments
  - Develop new instruments
- Instruments covered in scoping exercise include:
  - Safety (SOLAS)
  - Collision regulations (COLREG)
  - Loading and stability (Load Lines)
  - Training of seafarers (STCW)
  - Search and rescue (SAR)
  - Tonnage measurement (Tonnage Convention)
  - Safe Containers (CSC)
  - Special trade passenger ship instruments (SPACE STP, STP)

Easier on national level – Norway in front



Shipowner

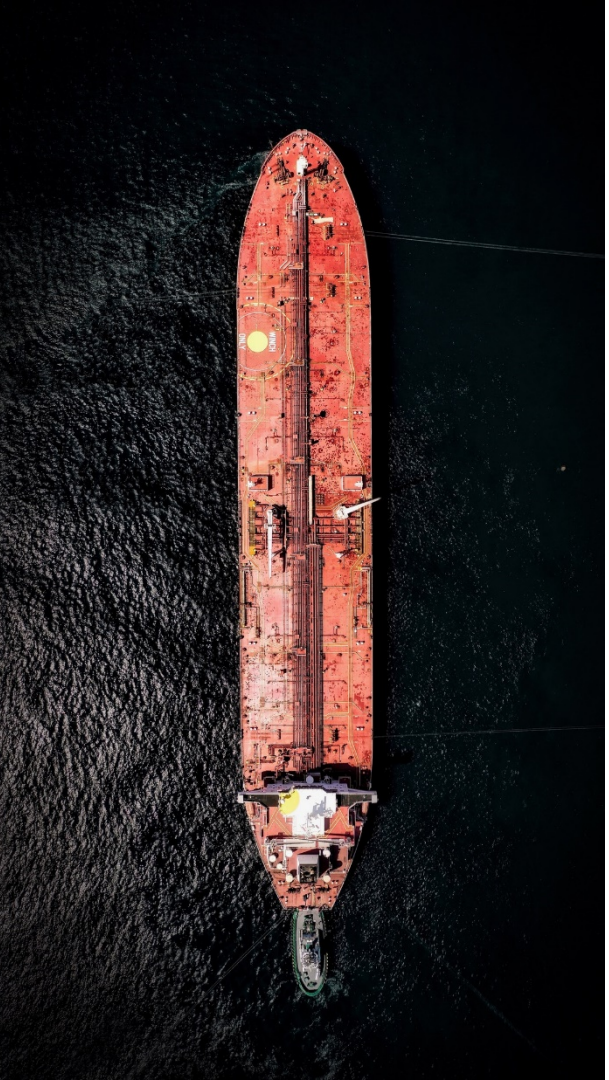
Liability

- Generally fault-based
- If incident caused by error in navigation algorithms
- Will the shipowner be liable for new players?
- Global limitation of liability
  - Limit broken if privity:
    - "*personal act or omission, committed with the intent to cause such loss, or recklessly and with knowledge that such loss would probably result*"

Shipowner

Strict liability?

- Will strict liability be more common?
  1) Similar to non-staturory strict liability for hazardous activities on land?
  2) Similar to IMO liability conventions for wreck removal, oil pollution, hazardous cargo?
     - Strict liability
     - Channeling liability to shipowner
     - Insurance obligation + certificates
     - Direct action
     - Funds similar to IOPC and HNS?



Shipowner

Apportionment of collision liability

- 1910 Collision Convention
  - Fault-based – precludes strict liability
    - *"If two or more vessels are in fault the <u>liability</u> of each vessel is <u>in proportion to the degree of the faults</u> respectively committed."*
  - Traditionally – negligence by the crew – <u>human element</u>
  - If cause is <u>malfunctioning</u> of systems – interpreted to be "*fault*"?
  - Can faults of "*vessels*" be interpreted to include:
    - Faults by on-shore operators?
    - Faults by system suppliers?

Shipowner

Collision Regulations

- COLREGs (Convention on the International Regulations for Preventing Collisions at Sea 1972)
- Can MASS comply?
  - Obligations resting on "*vessel*"
  - May be preprogrammed in algorithms
  - Lookout by MASS?
    - Rule 5: *"at all times maintain a proper <u>look-out</u> by <u>sight</u> and <u>hearing</u> (…) so as to make a <u>full appraisal</u> of the situation and of the risk of collision."*
    - By sensors and algorithms?
  - But "*safe speed*" and "*<u>good seamanship</u>*"?
- VHF communication?
- AIS identification?
- Ethical questions – trolley problem

Shipowner

Cargo liability

- Current regimes – Hague and Hague-Visby Rules
  - Error in navigation (or management) exception from liability?
    - Errors in algorithms
    - Errors by system suppliers
    - Errors by remote operators
  - Fire exception?
  - Seaworthiness?
    - Errors in updating software
- Charterparties – freedom of contract – wordings will be adapted

System suppliers

- Expected to become more involved
- Flag state and class requirements
- Liability exposure
  - Contractual liability toward yards and shipowners
  - Product liability towards third parties?
  - Global limitation of liability?
  - Insurance?
- Jurisdiction, choice of law, enforcement?

Remote operators

- Role
- Regulatory requirements will be needed
- Contractual liability towards shipowner
- Recourse
- Insurances
- Invoke global limitation of liability?
- Jurisdiction, choice of law, enforcement?

Insurance

- Believed that insurance will be available
  - Question of understanding and pricing the risk
- Classification
- Existing wordings for P&I, hull and machinery and war risk insurance
- Availability of operational data
- Recourse claims

IGP&I International Group of P&I Clubs

gard

SKULD

Cefor The Nordic Association of Marine Insurers

The Swedish Club

CODAN

NORWEGIAN HULL CLUB

DEN NORSKE KRIGSFORSIKRING FOR SKIB GJENSIDIG FORENING
The Norwegian Shipowners' Mutual War Risks Insurance Association

Insurance

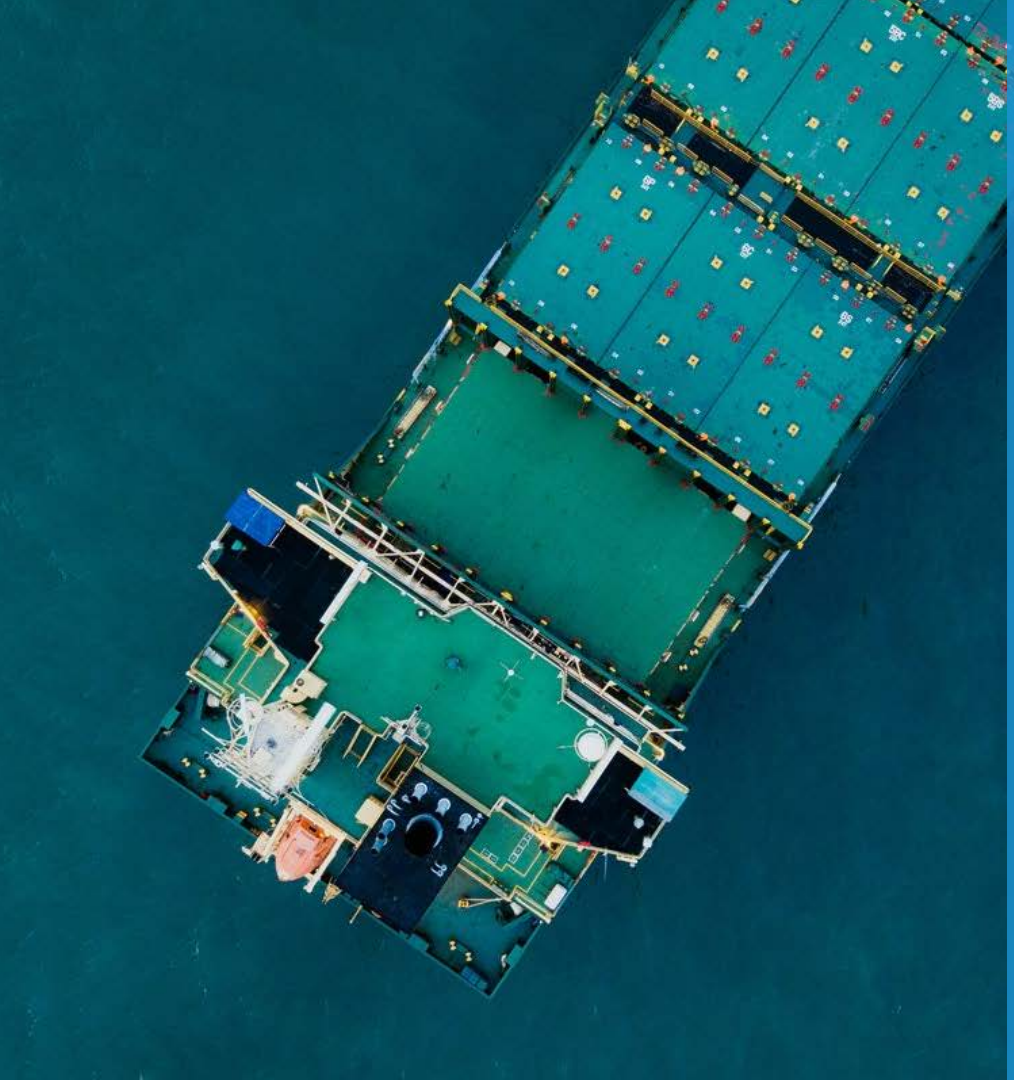
- Cyber risks
  - Most disruptive risk
  - Position under existing insurances
  - Extreme damage potential
  - Risk mitigation crucial
  - Insufficient cyber risk management
    - Unseaworthy = no insurance cover?

Criminal liability

- Will criminal liability still be relevant?
- Enforcement with unknown remote controller in foreign jurisdiction?
- Example "Full City"
  - Grounding outside Langesund, oil spill
  - Captain and third officer charged for pollution, notice failure etc
  - "House arrest" for four months (passports)
  - Captain 6 months suspended, third officer acquitted
- More corporate criminal liability?

Pilotage

- Need for pilots on board (no crew on board)?
- Pilots in their own control rooms?
- Already now control functions being directed from land-based control rooms, ex. VTS
- Development towards air traffic control system?



Salvage

- More challenging w/o crew?
  - Blackout mid-Atlantic
  - Grounding + water ingress
- New requirements for salvage contingencies?
  - Standby crew to be deployed?
  - Standby agreements with existing salvage companies?
  - Salvage contingency provided by coastal and flag states?
    - Financed by fund similar to IOPC/HNS funds?

The future

- *"Is today's legal framework ready?"* – NO!
- Stakeholders moving fast
- As usual regulations coming after
- Limited national trade possible today
- *International* trade?
  - Need international regulations
  - IMO and EU will be important regulators
  - Seems to be support for finding solutions

Thank you for your attention!

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