“SAFETY AND SECURITY IN THE AUTOMATED WORLD OF THE FUTURE”

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Autonomous shipping – what is needed if......
2018 development
IMO – Regulatory scoping exercise MASS
Legal, regulatory and insurance issues
Current and future projects
Industry initiatives
4th MASSRWG/ London 17.-18.1.2019
Autonomous shipping

Changes will be required to ship & maritime regulations as well as insurance terms if autonomous vessels are developed and introduced!
2018 has seen continued significant developments in the regulatory backdrop for Maritime Autonomous Surface Ships (MASS).

The Maritime Safety Committee (MSC 98) at IMO have now formed the MASS Working and Correspondence Groups who have started their scoping exercise work.

Meanwhile, the UK MAS Regulatory Working Group has released Version 2 of the UK Code of Practice in November 2018 which is now available at maritimeuk.org
The ninety-eighth session of the Maritime Safety Committee (MSC 98), agreed to work on a "Regulatory scoping exercise for the use of Maritime Autonomous Surface Ships (MASS)", with a target completion year of 2020.
MSC 98–100 (June 2017–December 2018)

- The need to take into consideration the human element and legal aspects
- Not a “drafting exercise”
- The work on MASS should be user-driven and not technology driven
- LEG 105 (April 2018) RSE with a target completion year of 2023 for LEG instruments.
- MSC to take a coordinating role.
The Maritime Safety Committee (MSC) completed its landmark 100th session, with progress in the regulatory scoping exercise on maritime autonomous surface ships;

The process of assessing IMO instruments to see how they may apply to ships with varying degrees of autonomy continued during the Maritime Safety Committee (MSC) 100th session.

Following testing of the methodology by a correspondence group, the MSC approved the framework and methodology for the regulatory scoping exercise on Maritime Autonomous Surface Ships (MASS).
For each instrument related to maritime safety and security, and for each degree of autonomy, provisions will be identified which:

- apply to MASS and prevent MASS operations; or
- apply to MASS and do not prevent MASS operations and require no actions; or
- apply to MASS and do not prevent MASS operations but may need to be amended or clarified, and/or may contain gaps; or
- have no application to MASS operations.
The degrees of autonomy identified for the purpose of the scoping exercise are:

- **Degree one**: Ship with automated processes and decision support: Seafarers are on board to operate and control shipboard systems and functions. Some operations may be automated and at times be unsupervised but with seafarers on board ready to take control.

- **Degree two**: Remotely controlled ship with seafarers on board: The ship is controlled and operated from another location. Seafarers are available on board to take control and to operate the shipboard systems and functions.

- **Degree three**: Remotely controlled ship without seafarers on board: The ship is controlled and operated from another location. There are no seafarers on board.

- **Degree four**: Fully autonomous ship: The operating system of the ship is able to make decisions and determine actions by itself.
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);
- Safe Containers (CSC); and
- special trade passenger ship instruments (SPACE STP, STP).
MSC 100TH SESSION

Development of guidelines on MASS trials

- The MSC noted provisional principles for the development of guidelines on MASS trials, discussed by a working group.
- The principles include ensuring that such guidelines should be generic and goal-based, and taking a precautionary approach to ensuring the safe, secure and environmentally sound operation of MASS.
- Interested parties were invited to submit proposals to the next session of the Committee, taking into account these principles.
Autonomous Vessels: Legal, Regulatory, and Insurance Issues
The Legal Landscape in 2018

➢ Courts have not considered issues involving unmanned/autonomous surface or subsurface vehicles.

➢ Recent (past five years) references to unmanned aircraft in U.S. cases: 43.

➢ Recent (past five years) references to unmanned surface/subsurface vehicles in U.S. cases: 0.

Implications:

➢ No clear guidance from the courts.

➢ Existing cases provide imperfect analogies.
Digitalization continued to reshape the maritime industry in the year 2018 with a number of developments made in the autonomous and remotely operated ships.
IMO takes steps to address autonomous ships

➢ The International Maritime Organization (IMO) – the global regulatory body for international shipping – 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.
Current Projects

• **Svitzer Hermod**
  • Rolls Royce/Svitzer demonstration project
  • 28m long tug conducted remotely controlled maneuvers in Copenhagen harbor in November 2017
  • Controlled from remote operating center

• **Yara Birkeland**
  • 80m autonomous container ship
  • Due to be launched in 2019
  • Expected to operate autonomously by 2020 between three ports in southern Norway
Current Projects

World’s First Fully Autonomous Ferry Demonstrated

The car ferry Falco

Successfully Trials Of First Autonomous Unmanned Survey Vessel
Current Projects

Rolls-Royce Opens Autonomous Ship R&D Centre

Aker Arctic Demonstrates Autonomous Vessel In Model Tests
Current Projects

DNV GL Releases Autonomous And Remotely Operated Ship Guidelines

Wilhelmsen Ship Management Shapes Regulatory Framework In Autonomous Shipping
Current Projects

• Sea Machines Robotics - A.P. Moller-Maersk
  • Winter Palace ice-class containerships to trial perception and situational awareness technology
  • Installation of Light Detection and Ranging (LiDAR) and perception software to augment and upgrade transit operations.
FIRST COMMERCIAL INTERNATIONAL VOYAGE

Autonomous Vessels SEA-KIT docks in Belgium to complete first ever international commercial uncrewed transit
The boat was returning on Thursday with some Belgian beer.
Industry Initiatives

• USCG Navigation Safety Advisory Counsel (NAVSAC)
• UK Maritime Autonomous Systems Regulation Working Group (MASRWG)
• EU Safety and Regulations for European Unmanned Maritime Systems (SARUMS)
• CMI Interim Working Group on Unmanned Ships
• Association for Unmanned Vehicle Systems International (AUVSI) COLREGS Working Group and UMS Advocacy Committee
Industry Initiatives

• USCG: Unmanned Maritime Systems Best Practices
  • Safety and protection of the marine environment
  • Professionalism, standards, maintenance procedures

• NAVSAC: Unmanned Maritime Systems Best Practices

• UK Maritime & Coast Guard Agency: Autonomous Surface Ship Code of Practice

• Lloyd’s Register: Code for Unmanned Marine Systems

• CMI Working Group on Unmanned Ships: Regulatory Scoping Exercise For The Use Of Maritime Autonomous Surface Ships (Mass) submitted to IMO
  • Questionnaires to national maritime law associations
  • Analyze IMO conventions posing challenges to unmanned ships
Discussion topics covered

➢ Political aspect (UK centric)
➢ Operational/technical development and status at the moment
➢ Legal
➢ Training and Research
➢ Insurance
Political aspect (UK centric)

- UK Government very supportive to Maritime Sector
- UK Maritime strategy 2050 to published
- Target to be leading maritime nation
- More female in the sector
- Raising the profile of sector
- Promoting the sector overseas and international collaboration
- Ensuring the skill to fuel maritime ambition
Operational/technical development and status at the moment

- Technology advanced and ready for autonomy
- New innovations and implementation still needed
- More collaboration needed to boost innovations
Legal

- IMO MSC98 established MASS scoping exercise
- Regulatory legal questions → IMO MSC with supporting WGs
- Key legal considerations;
  - COLREG
  - Minimum manning/watchkeeping
  - Master or Person in charge
  - Environmental Protection
  - Contracts – Liability & Insurance
  - Construction & Design
  - Cyber security
  - Pilotage and VTS
- UK Code of Conduct Vers 2.0
- No uniform application under domestic legal framework
Training and Research

- Standards for training – NA
- STCW – NA
- UK CoC – Chapter 11
- Certification of MASS Operational Staff

Development of International Association for MASS operators??
- Sharing of best practice
- A generic MASS Operators Course
- Mentoring the young MASS operators

Research
- A lot of research still needed
- International collaboration and enhance of information essential
Insurance

Traditionally Club cover based on requirement for vessel supervised by FS
To ensure “unclassed/registered” MASS are assessed as suitable for entry, criteria assessed includes:

- Compliance with voluntary codes,
- Operational range and contracts
- Levels of autonomy to be utilized in the operation
- Experience of the company in operating MASS
- Standards the vessel has been built to
- Experience of the vessel builder
- Cyber security measures
Q & A

Thank you for your Attention!