

National Academies of Sciences Marine Board – Spring Meeting

# Unmanned Surface Vessels – Legal Perspective



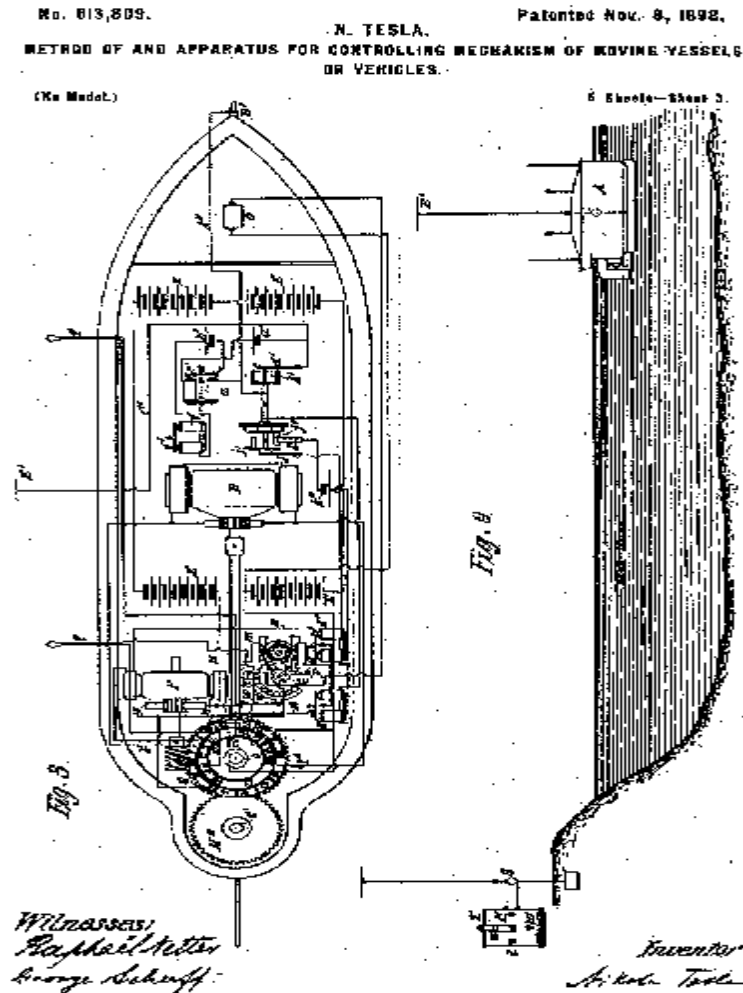
Washington, DC

May 25, 2017

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The information contained herein is abridged and summarized from numerous sources, the accuracy and completeness of which cannot be assured. This should not be construed as legal advice or opinion and is not a substitute for the advice of counsel.

# Nikola Tesla: November 8th, 1898 patent for “Method of and apparatus for controlling mechanism of moving vessels or vehicles”



Courtesy of: U.S. Patent office, [http://www.mcnikolatesla.hr/wp-content/uploads/bsk-pdf-manager/89\\_00613809.PDF](http://www.mcnikolatesla.hr/wp-content/uploads/bsk-pdf-manager/89_00613809.PDF)

# Levels of Automation in Navigation

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- Manual navigation of merchant ships
- Automatic Course Steering (Autopilot)
- Decision-support
- Remotely operated navigation
- Remote monitoring
- Partial autonomy
- Fully autonomous



Courtesy of Kongsberg, <https://www.km.kongsberg.com/ks/web/nokbg0238.nsf/!AllWeb/98A8C576AEFC85AFC125811A0037F6C4?OpenDocument>

# Legal Landscape

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- Courts have not considered USV issues
- References to USV in U.S. cases (past 5 yrs): 0
- Implications:
  - No clear guidance from the courts
  - Existing cases provide imperfect analogies

# Key Legal Instruments

- International Regulations for Preventing Collisions at Sea (**COLREGS**)
- International Convention for the Prevention of Pollution from Ships (**MARPOL**)
- International Convention for the Safety of Life at Sea (**SOLAS**)
- International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (**STCW**)
- Other maritime laws, rules and conventions as applicable

# What is a Vessel or Ship?

## No universally accepted definition

- 1 U.S.C. §3: “Every description of watercraft *or other artificial contrivance* used, or capable of being used, as a means of transportation on water.”
- COLREGS: “Every description of watercraft, *including non-displacement craft and seaplanes*, used or capable of being used as a means of transportation on water.”
- SUA Convention (ship=any vessel, floating craft)
- MARPOL (ship=any vessel, floating craft)

# Key Legal Considerations

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- “Vessel” – definitions
- Minimum Manning requirements
- Watchkeeping
- Rendering assistance
- Master or Person-in-charge
- “Seafarer”
- Piracy
- Environmental response



# Key Legal Considerations – cont.

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- Navigation Rules
  - Look-out
  - Lights and Shapes Requirements
  - Sound and Light Signals
- Collision Prevention
  - Determine the Risk of Collision
  - Actions to Avoid Collision
- Design – if requires manually operated
- Products Liability

# Limitation Of Liability: The Legal Regime

- Shipowner's Limitation of Liability Act
- Vessel owner may limit its liability in a maritime casualty (cargo damage, collision, personal injury or death) to the post-casualty value of the vessel, plus pending freight.

# Limitation Of Liability: The Legal Regime

- Accident must be outside owners “privity or knowledge.”
  - Negligence not that of a corporate officer, manager or superintendent
- Owner must demonstrate:
  - No prior knowledge of **unseaworthiness**
  - The exercise of **reasonable diligence**
- “An owner must avail himself of whatever means of knowledge are reasonably necessary to prevent conditions likely to cause losses.”

# Industry Organizations



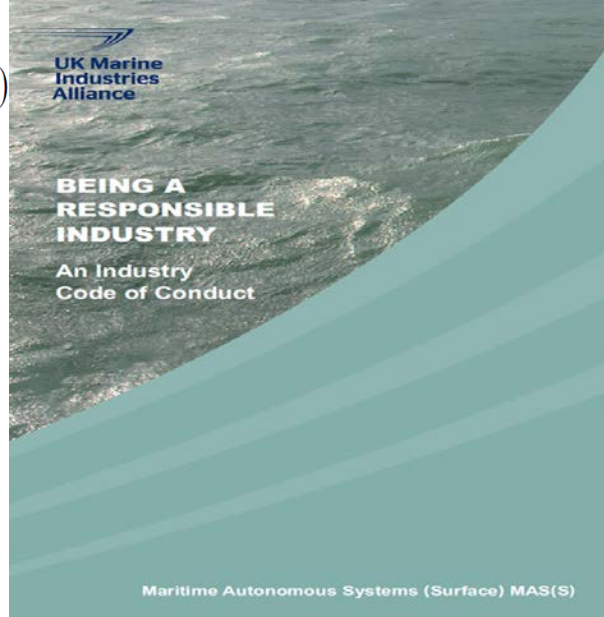
- Navigation Safety Advisory Counsel (NAVSAC)
- UK Maritime Autonomous Systems Regulation Working Group (MASRWG)
- EU Safety and Regulations for European Unmanned Maritime Systems (SARUMS)

**Resolution 16-01**

(Supersedes Resolution #13-05)

(Introduced as Task Statement #15-01)

**Unmanned Maritime Systems Best Practices**



Maritime &  
Coastguard  
Agency



**THE MARITIME AUTONOMOUS SURFACE SHIPS  
CODE OF PRACTICE**

**A Voluntary Code**



Working together  
for a safer world

**ShipRight  
Design and Construction**

Additional Design Procedures

LR Code for Unmanned Marine Systems

February 2017



Working together  
for a safer world



**E**

MARITIME SAFETY COMMITTEE  
98th session  
Agenda item 20

MSC 98/20/2  
27 February 2017  
Original: ENGLISH

**WORK PROGRAMME**

**Maritime Autonomous Surface Ships  
Proposal for a regulatory scoping exercise**

**Submitted by Denmark, Estonia, Finland, Japan, the Netherlands,  
Norway, the Republic of Korea, the United Kingdom and the United States**

**SUMMARY**

**Executive summary:** The use of Maritime Autonomous Surface Ships (MASS) creates the need for a regulatory framework for such ships and their interaction and co-existence with manned ships. This document invites the Committee to undertake a regulatory scoping exercise to establish the extent of the need to amend the regulatory framework to enable the safe, secure and environmental operation of MASS within the existing IMO instruments.

**Strategic direction:** 5.2 and 5.4

**High-level action:** 5.2.1, 5.2.2, 5.2.4 and 5.4.1

**Output:** No related provisions

**Action to be taken:** Paragraph 25

**Related document:** MSC 95/INF.20

Cyber-enabled ships

ShipRight procedure – autonomous ships

First edition, July 2016

# Trondheimsfjord

- Extensive area in Northern Norway designated as an official test bed for autonomous shipping
- Collaborative: government and industry
- No other such test sites of this kind in the world (commercial shipping)



# Industry questions

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- Persistent surveillance with video and radar feedback to a land base
- Launch and recover an aerial drone via an unmanned vessel
- Launch and control an ROV from an unmanned vessel
- Guidance on use approval – COTP? CGHQ?

# Industry challenges

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- Definitions – uniformity
- Practical application
- Standards – common and equivalent
- Domestic and International agreement
- Legal – case law undeveloped
- Education and raising awareness
- Lack of designated testing site
- Insurance Coverage
- Cybersecurity



# Questions?



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