

# MARITIME LEGAL CONSIDERATIONS

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Conference 2019

# KEY LEGAL CONSIDERATIONS



- ADVANCED AUTOMATION IN VESSELS – A BROAD BASED LEGAL PERSPECTIVE
- GOING FROM CONCEPT TO PRACTICAL APPLICATION

# WHY MASS?

IF THERE ARE COMMERCIAL ADVANTAGES OR SOCIETAL BENEFITS, INNOVATION WILL ADVANCE



- Human errors cause most marine casualties - presupposed
- Innovation and Progress
- Safer + Easier + More Efficient
- “Job Elevator” not Job Killer
- Autonomous ≠ Un-manned
- Augment On-Board Capabilities
- Blue technology and alternate propulsion/fuels trends
- Curb surface transportation congestion & environmental impacts
- Energy conservation & beliefs in societal responsibility
- “Sustainable maritime development” (Gard)



# LEGAL QUESTIONS - INVESTMENT IN MASS

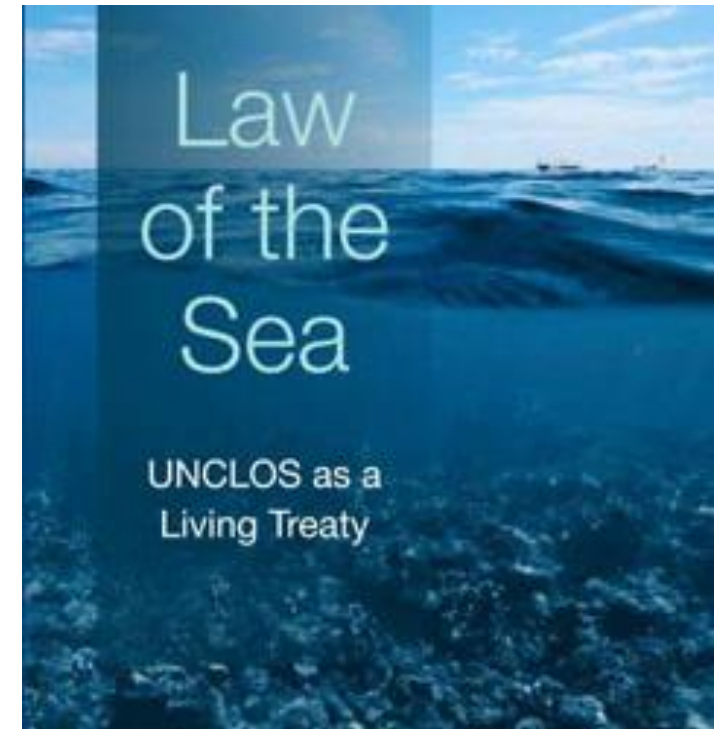


- Advanced automation is inevitable, only the extent to which it will be incorporated is in question.
- Human remains in the loop – onboard or ashore
  
- What legal questions are stifling investment?
- What legal answers are driving investment?
- How do we operate under the current legal regime?
- Will society accept MASS and AI?
  - Consider airlines as example
  - Cultural acceptance
- Still more questions than answers since no precedent



# KEY LEGAL CONSIDERATIONS

- Rules of the Road/COLREGS
- “Vessel” – defined?
- Collision Avoidance
- Minimum Manning/Watchkeeping
- Master or Person-in-charge
- “Seafarer” – Role in future/onshore
- Environmental Protection
- Contracts - Liability & Insurance
- Construction & Design
- Cyber-security
- Pilotage and VTS



# WHY THE LEGAL ISSUES MATTER



- Who is assessing the legal issues and why?
- Each have legal priorities, interests, and/or risk:
  - Regulator – Domestic or International
  - Flag State
  - P&I Club/Marine Insurer
  - Classification Society
  - IT Developer/Programmer
  - Owner/Operator/Charterer
  - Litigator
  - Shipyard
  - Military/Government
  - Academia

# KEY LEGAL RISKS BEING ASSESSED



- Regulatory legal questions being managed by IMO MSC with support of legal workgroups and academia – expect years before new regulations, if any
- Changing risk landscape – unmanned ships not contemplated
- Impact on insurance premiums and cover
- Role of remote operators
- Cybersecurity risks
- Liabilities – product, strict, fault-based (AI and collisions)
- Contract issues (seaworthiness, charterparties, carriage goods)

# FIRST STEPS IN THE MASS LEGAL DISCUSSION



- TYPE (of “vessel” or watercraft)
- DEGREE (of autonomy)
- LOCATION (of operations)



# TYPE – COMMERCIAL



# TYPE - PUBLIC VESSELS AND WARSHIPS

INEVITABLE DEVELOPMENT – SUBJECT TO SAME COLREGS/RULES OF THE ROAD



- If MASS “vessel” or “ship”:
  - Entitled to certain navigational rights
  - Subject to international legal regimes
  - Immunities
  - Belligerent rights
- “Warships” – UNCLOS Art. 29 “...a ship belonging to the armed forces of a State ... under the command of an officer...and **manned by a crew....**”
- San Remo Manual on International Law Applicable to Armed Conflicts at Sea
  - Sec. V.13.g: warship means a ship...**under the command of an officer...**

# DEGREE OF AUTONOMY

IMO'S MARITIME SAFETY COMMITTEE (AS OF MSC 100)



- **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.

# LOCATION (INTERNATIONAL)

- International Regulations for Preventing Collisions at Sea (COLREGS)
  - Rule 1: “all vessels”
  - Rule 2: “nothing exonerates” (human in loop)
  - Rule 5: “lookout”
  - Rule 6: “safe speed”
  - Rule 8: “collision avoidance”
  - Rule 18: “responsibilities between vessels”
  - Part C & D: Lights/Shapes/Sound Signals
- Prevention Pollution from Ships (MARPOL)
- Safety of Life at Sea (SOLAS)
- Standards Training, Certification & Watchkeeping Seafarers (STCW)



# LOCATION (DOMESTIC AND REGIONAL)

- No uniform application under domestic legal framework
- Territorial Seas and inland waters
- Barriers to implementation - focus on domestic and regional opportunities within legal rubric in near term
- Leverage existing authorities to ensure safe operation of autonomous technology

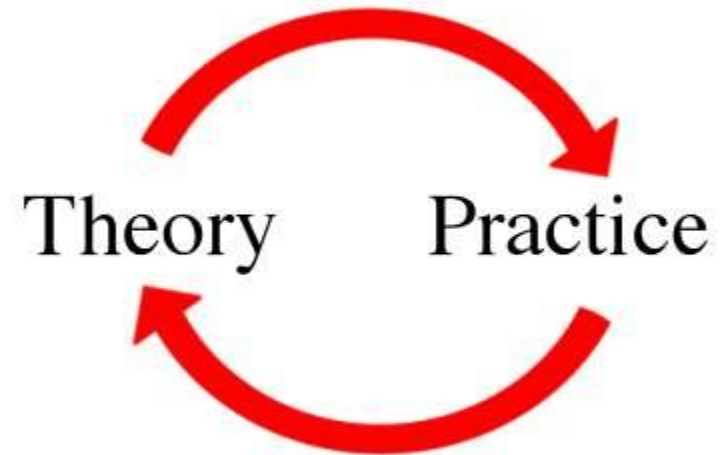


# LEGAL REVIEW ENDEAVOURS (MASS)



- IMO Legal Committee (LEG)
- Comité Maritime International (CMI)
- International Union of Marine Insurance (IUMI)
- Association Mondiale de Dispatcheurs (AMD)/ International Association of Average Adjusters
- Maritime autonomous surface ships - Zooming in on civil liability and insurance (CORE Advokatfirma/Cefor – joint final report Dec. 2018)
- American Bar Association – Admiralty and Maritime Law Committee
- Academia

# HOW IS INDUSTRY MOVING FROM THEORY TO PRACTICE UNDER CURRENT LEGAL REGIME?





# NORWAY – LEADING THE WAY

- Norwegian Forum for Autonomous Ships
- YARA BIRKELAND – construction underway (enter service ~2020)
- ASKO - planning to develop autonomous, zero-emissions container ships
- NORLED – tested successfully port to port autonomous sailing
- MAMIME - world's first Maritime 5G communication project
- KONGSBERG - coordinates EU-Funded Project to Enable Autonomous Navigation in Close Proximity



**NFAS** Norwegian Forum for  
Autonomous Ships

# SHORT SEA SHUTTLE CONCEPTS

SAMSKIP - AUTONOMOUS, ZERO-EMISSIONS CONTAINER SHIPS



- Award of €6 million of Norwegian government money to Project SeaShuttle to take forward development of two all-electric ships slated to connect Poland, Swedish west coast ports and the Oslo fjord.
- Seashuttle is one of six initiatives included in 'PILOT-E', a €100 million-plus scheme



# U.S. PROJECTS – GAINING GROUND

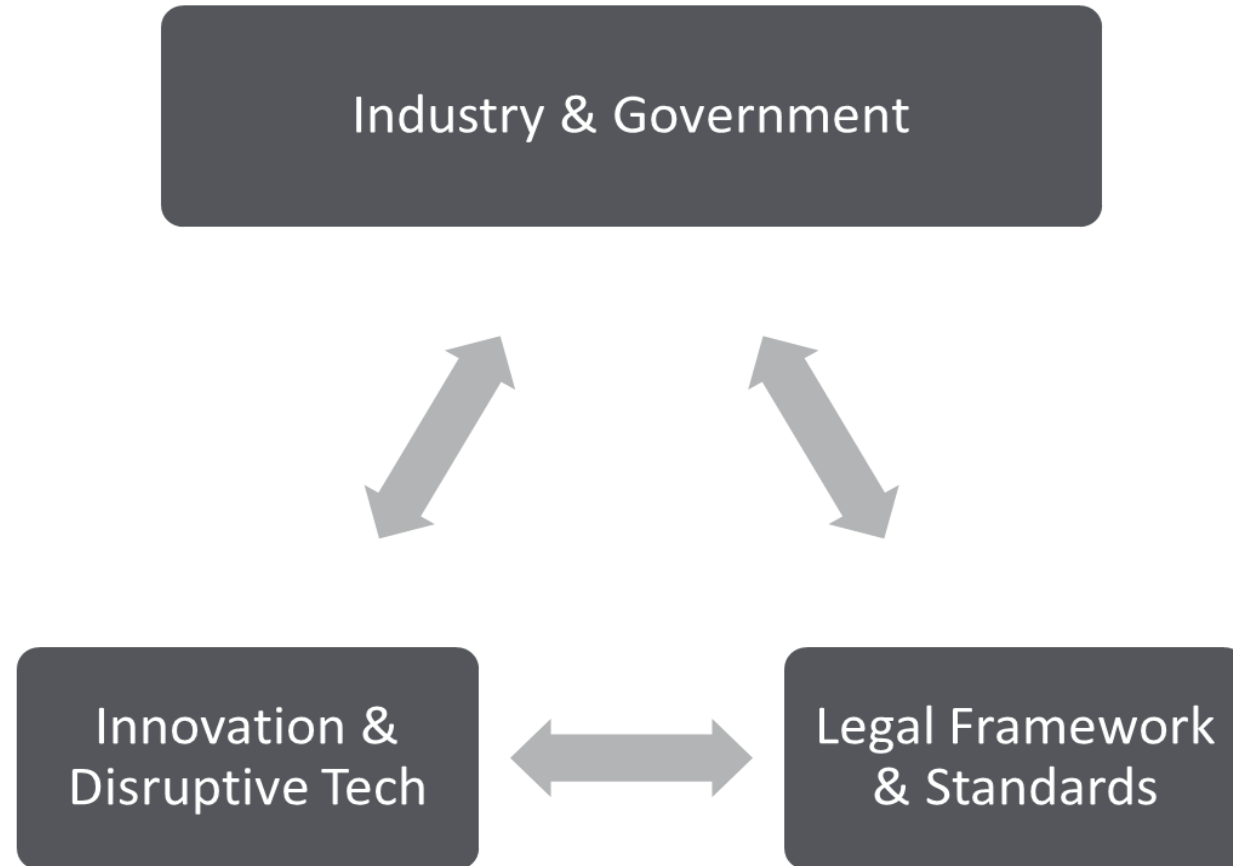


- 1973: GPS project launched in the United States
- +50 years: Key IMO participant for policy development
- SpaceX
- SMR + Maersk (SMR also raised USD10 mil Series A funding)
- Shone + CMA CGM
- Buffalo Automation (Great Lakes)
- US Navy – Project Overlord and Sea Hunter
- National Academies of Sciences - Marine Board
- Association for Unmanned Vehicle Systems International
- NOAA unmanned systems
- "Blue Technology"

# SHORT SEA SHIPPING IN U.S.



# SUCCESS TRIANGLE FOR MASS DEVELOPMENT



# QUESTIONS



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