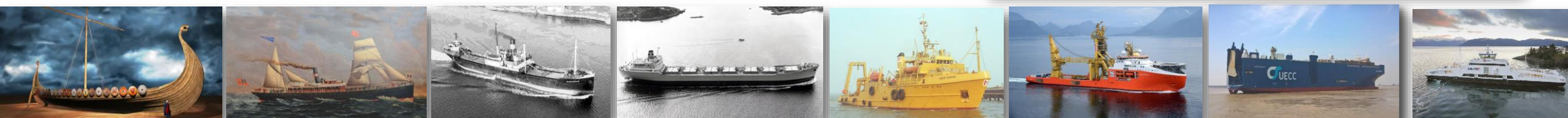


“Facilitating innovation – Autonomous ships”

Svein David Medhaug



Norway

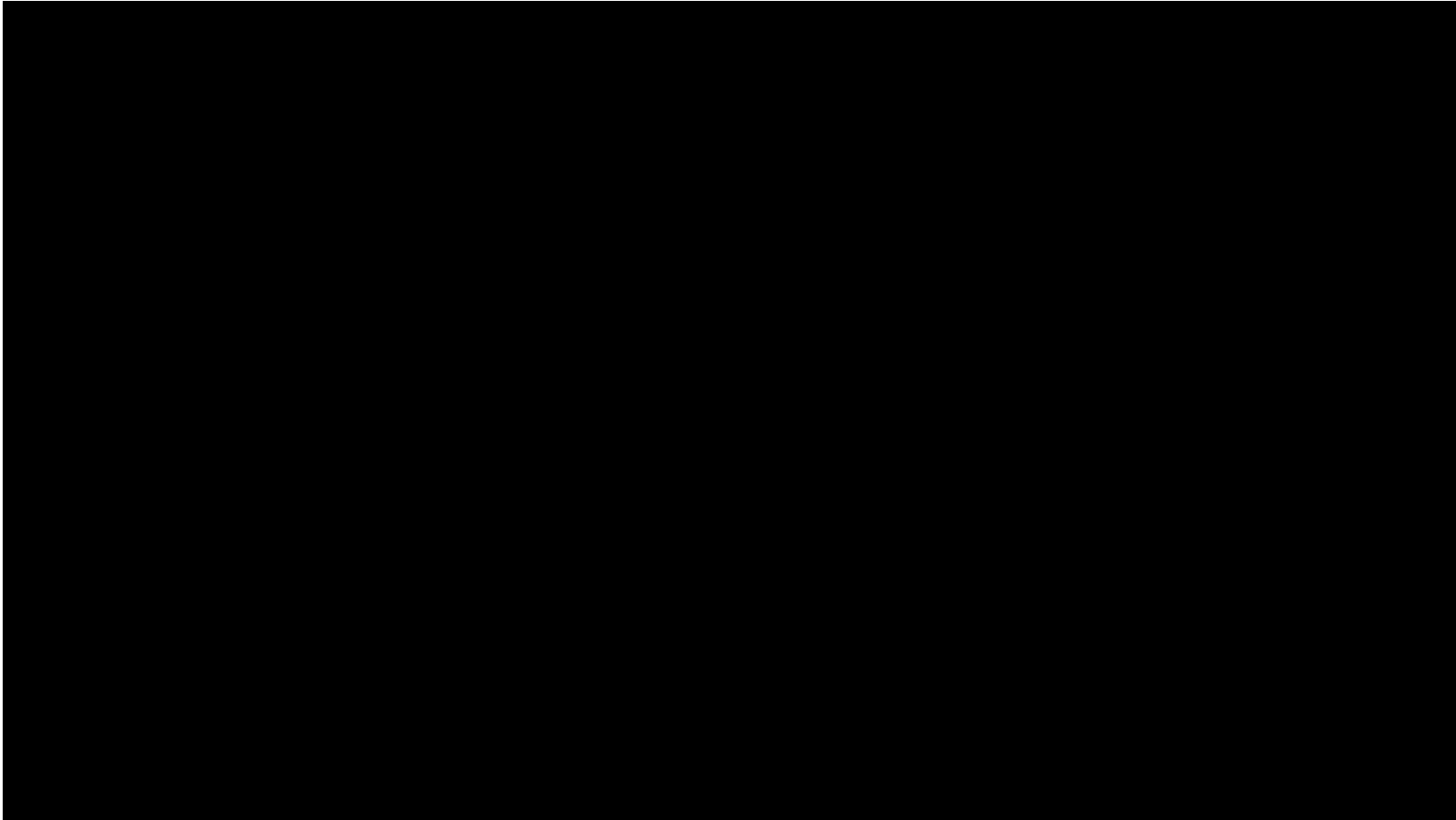


År 1000 År 1600 År 1850-80 År 1900 År 1912 År 1950 År 1970 År 1980 År 1990 År 2010 År 2015 År 2018





Why - Innovation and new technology





Why - Innovation and new technology

- Increased Poverty and Hunger
- Poor sanitary conditions
- Polluting transport chain
- Un-rational and inefficient transport systems and logistics
- Inefficient cities by the river or sea
- Pollution of air and water
- Safety og Life at Sea



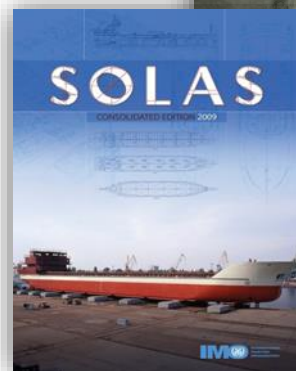
Why – The Maritime industry

Smart efficient environmental
shipping



Why – The Maritime industry

Safety Of Life At Sea - SOLAS



Source: Wikipedia





Innovation and new technology

Maritim Strategi



Hav Strategi





Innovation and new technology

- Environment
- Expertise
- R&D
- Innovation
- Blue growth
- International conditions
- UN's Sustainable Development Goals





SAFETY

FIRST

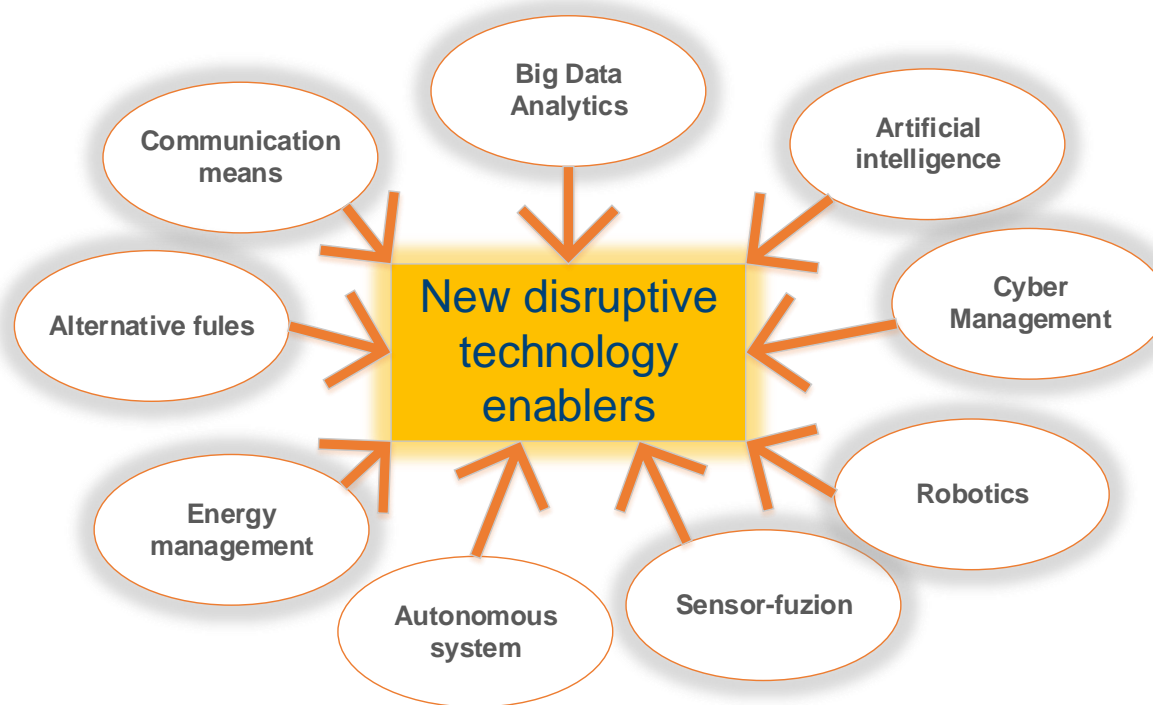


Efficiency

- Cost beneficial
- Integrated fuel consumption optimization
- Availability
 - Big Data
 - IoT at sea
- Continuity - 24/7 possibilities
 - Just in time arrival



New disruptive technology enablers



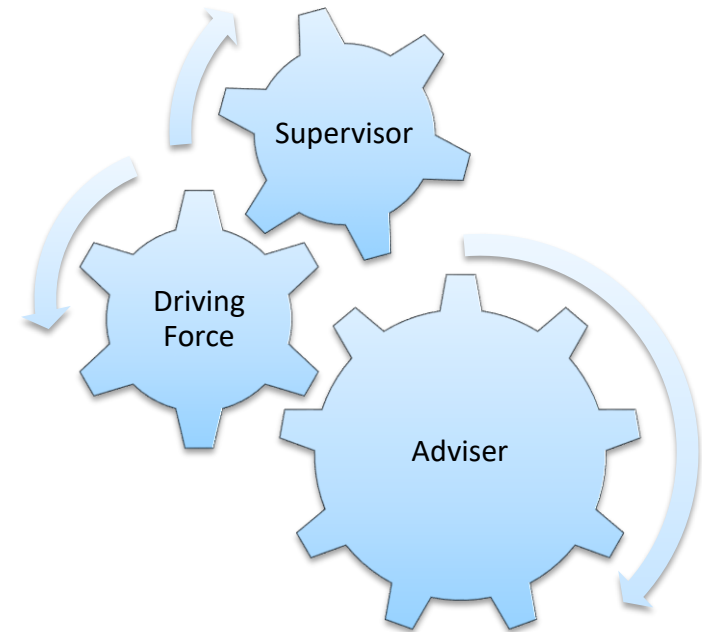
New disruptive technology towards new standard

- Facilitation
 - New technology
 - Innovation
 - Harmonization
 - Digitalization
- Open minded
 - “Out of the Box”



How – Facilitation

- Stimulate innovative thinking
- Coordinate and facilitate
- promoting new technology
- Collaborate
- Take initiative
- Participate





How – The Norwegian Model

Norway – The Norwegian Model

- “All inclusive”
- Tradition
- Dominant industry
- Collaboration within.
- Know-how
- Business model
- Long experience
- Resourcefulness

The maritime cluster

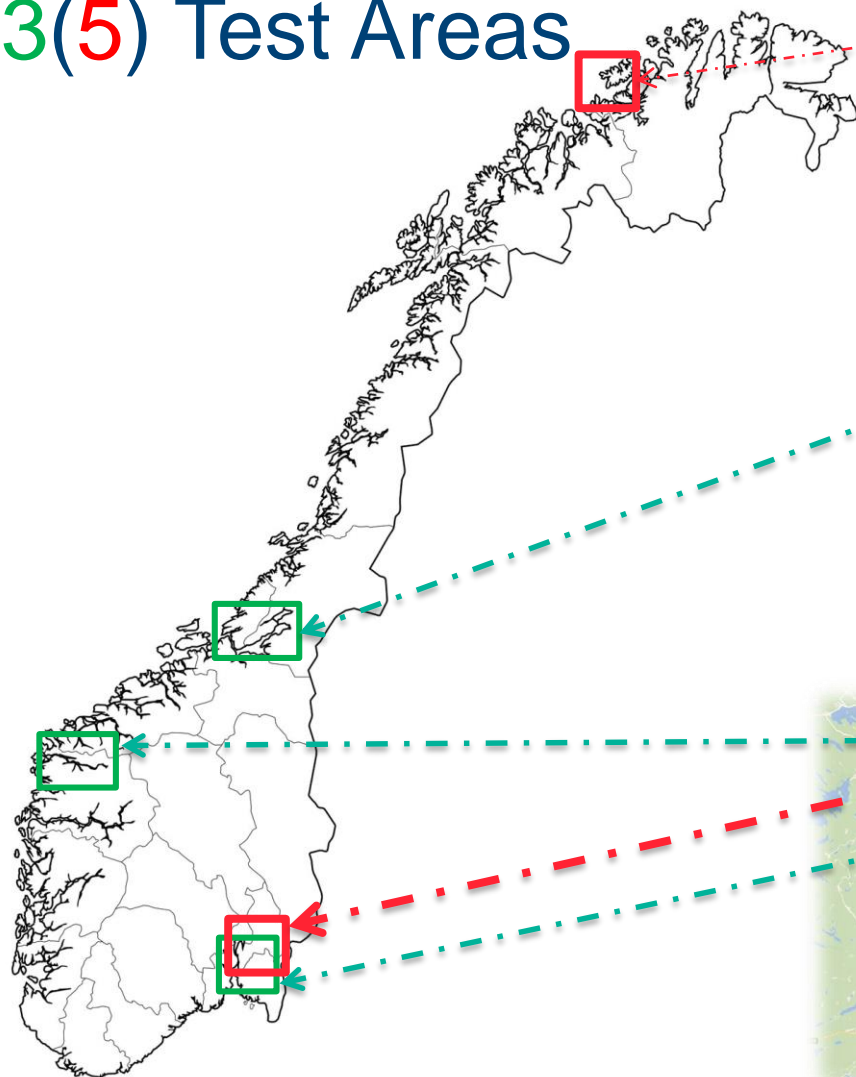
- *ship-owners,*
- *shipyards,*
- *equipment manufacturers,*
- *naval architects,*
- *classification societies,*
- *research and education centers,*
- *national authorities,*
- *local port authorities and*
- *seafarer organisations,*
- *shipbrokers,*
- *maritime software producers,*
- *marine underwriters,*
- *ship-finance houses*
- *freight-forwarding and*
- *logistics companies.*

How – The Norwegian Model

Use the unique and transform it to an arena of development for sustainable maritime industry.



3(5) Test Areas



Tromsø



Trondheims Fjorden



Oslo

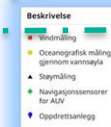
Horten

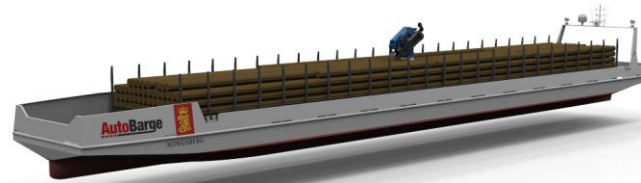
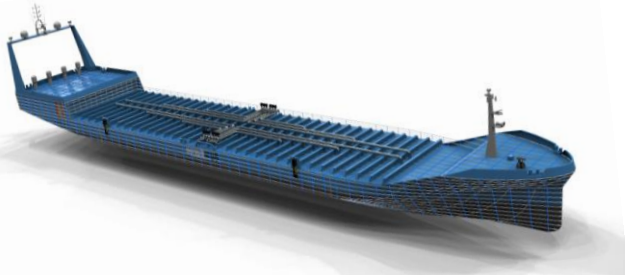
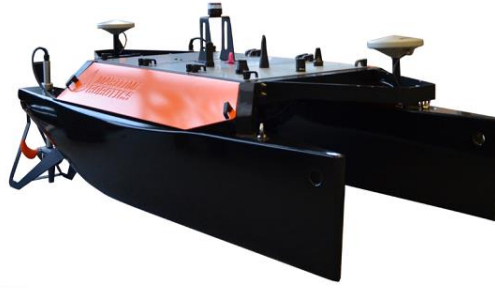


Grenlands Fjorden



Stor Fjorden





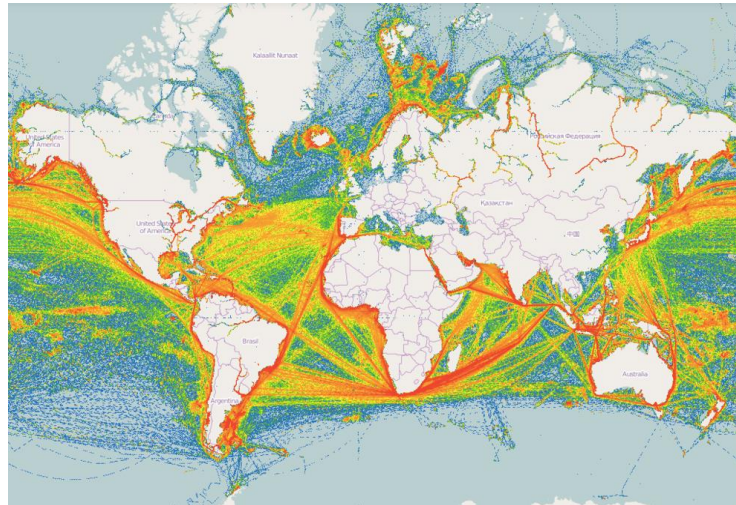
Interim legislation framework

New framework, regulation and instruction must be a result in something that will give us something better – An “improvement”



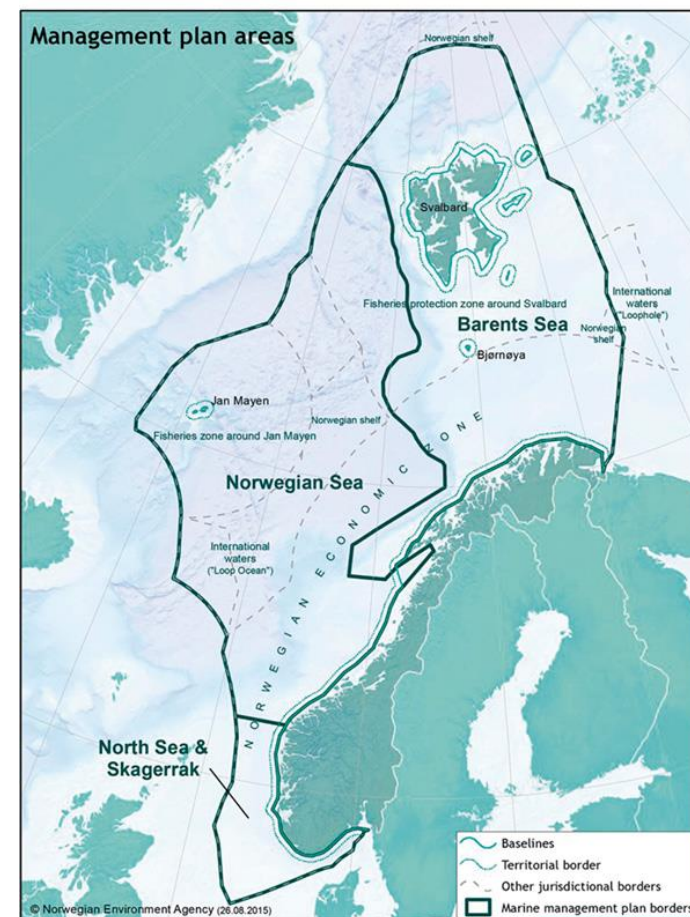
How to reach the goal...

- National engagement
- International adjustments



How to reach the goal.

- Finalizing a national approach, showing the world how to do it.
 - National engagement
 - National legislations
 - Restrictions and exemptions
 - Approval of equivalents
 - Circulars and Instructions
 - Class rules
 - Guidance
 - Implemented national regulations





How to reach the goal..

- Working in parallel with national achievements towards an international legislation regime
- International adjustments
 - International legislation
 - Bilateral agreements between coastal administrations
- IMO
 - Finalizing scoping exercise
 - Defining maritime autonomy



International Labour
Organisation





How to reach the goal...

- Joint action
- Harmonizing class rules and legislation
- Combined effort for the benefit of innovation and new sustainable technology
- Take advantage of the edge and the lead of the Norwegian model and maritime industry
- The Key factor is cooperation

Collaboration = Success

Challenges – with Autonomy

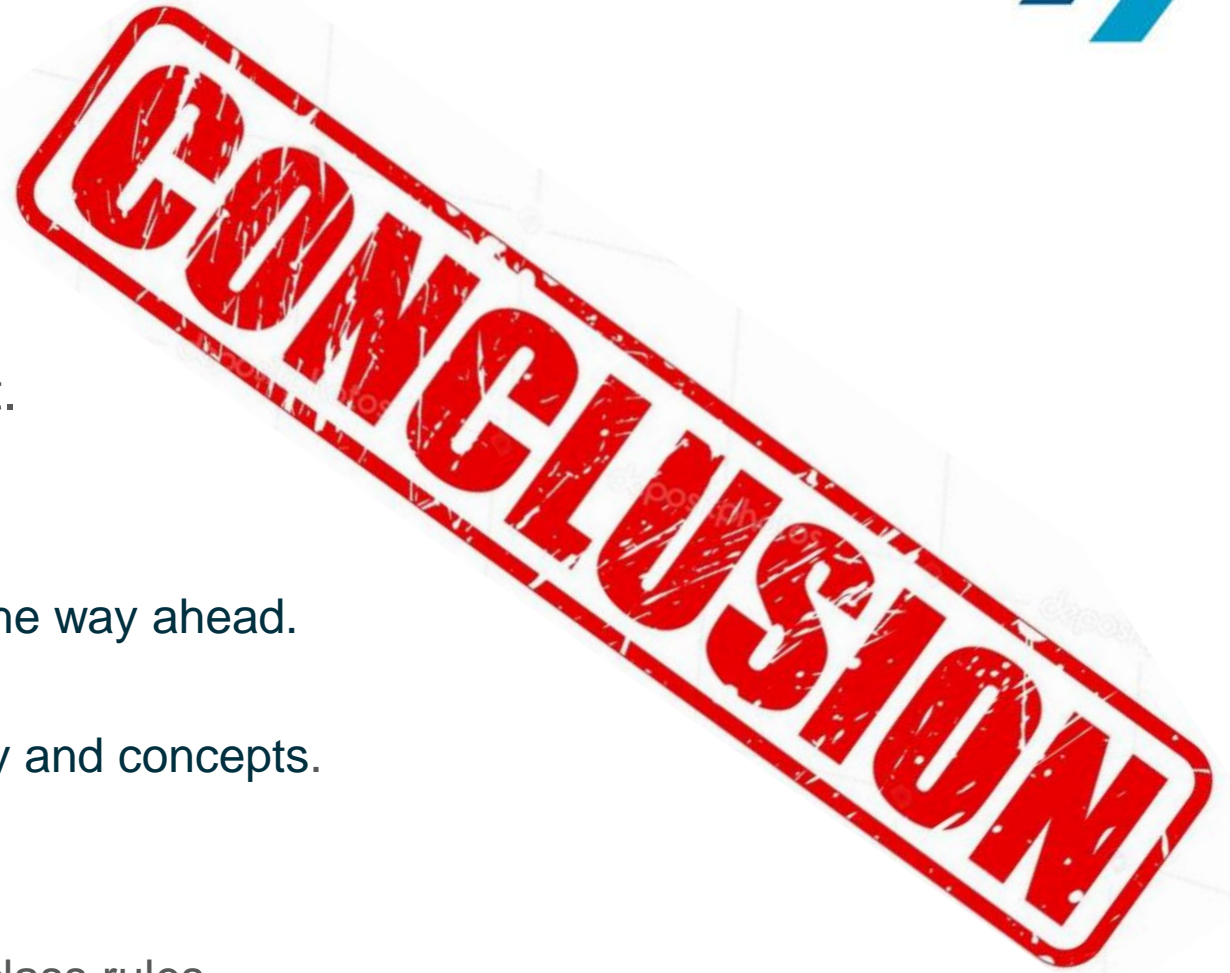
- Legislations
 - COLREG
 - Interoperability and interaction with other vessels
 - 1978 STCW Convention and Code
 - Training and standards
 - UNCLOS
 - Liability and responsibility
- Radio Spectrum
 - Frequencies/ ITU (WRC)
 - Bandwidth/ Coverage
- Responsibility, Liability and Insurance.
 - Master, owner..
- Geographical restrictions.
 - National vs. international
- Technical
 - Artificial Intelligence, weather limitation, accept criteria



Conclusion

The Goal is Not Autonomy!, but;

- Safety, security, efficiency and environment.
- The industry need to;
 - find a common ground, define and decide the way ahead.
 - Dedicated areas of testing
 - Norway will promote sustainable technology and concepts.
- Cooperation is of grate essential, and;
 - Harmonization of instruction from flag and class rules





Thank you for your attention!

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