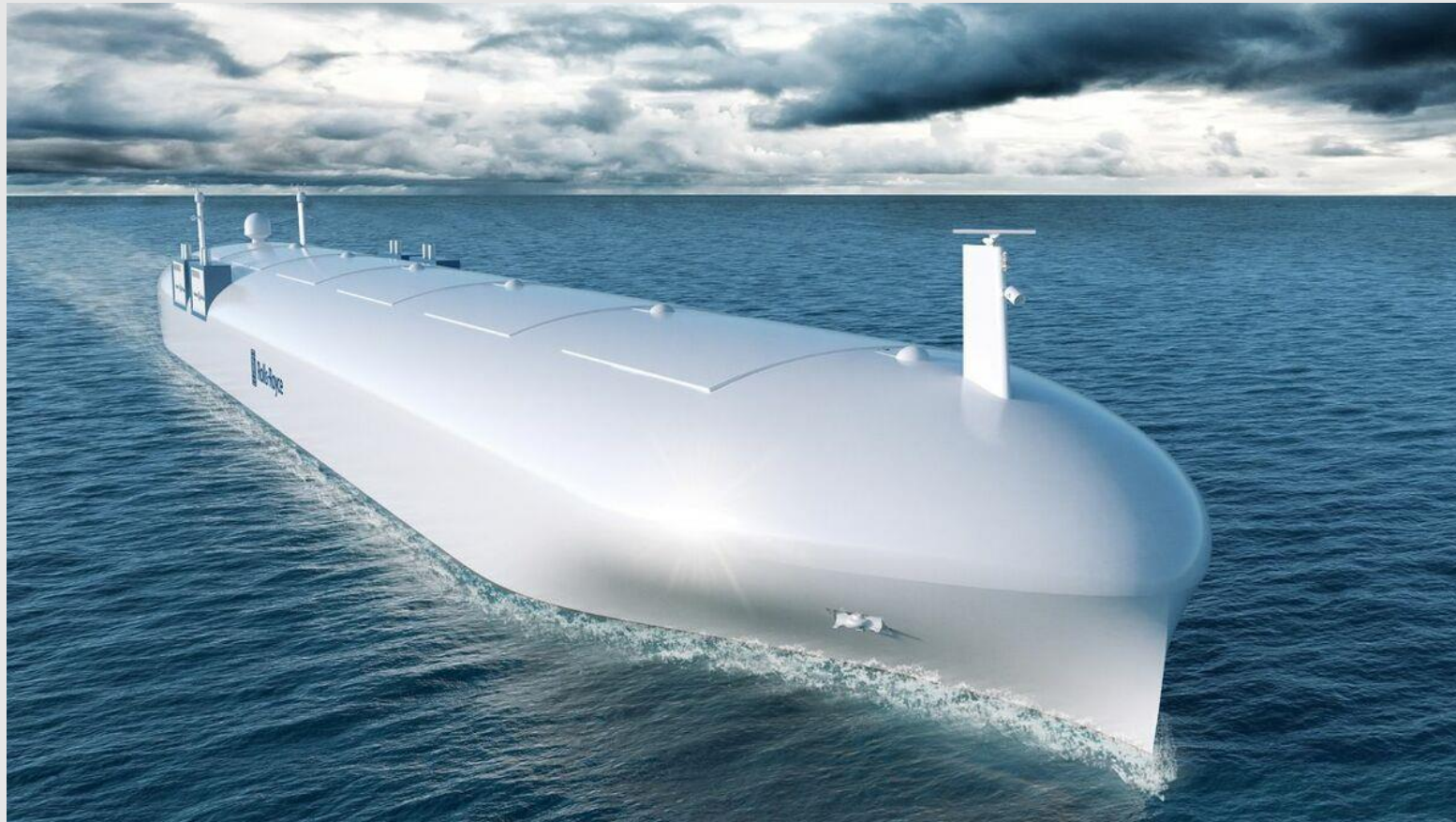


DISCOVERING THE STEPWISE APPROACH TO SMART AUTONOMY

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What comes to mind when talking about autonomous vessels?



Solutions
that offer decision support



Fully unmanned vessels

with various degrees of automation
of the vessel systems

The pursuit of autonomous operations is already leading to smarter systems that can enhance :

- the safety
- cost-efficiency
- environmental performance of today's vessels;

in practice,

- this means reducing collisions or incidents—especially in busy ports—assisting with docking
- saving fuel through optimised speed profiles
- reducing associated emissions

This is “SMART AUTONOMY”, a stepwise and commercially viable approach for your operations that can be applied today—as part of a longer journey towards an autonomous shipping future.





75% of shipping insurance losses are caused by human error, equivalent to **\$1.6BN**

Safety: The safety record for the maritime industry is approximately 20 times worse than the average onshore worker and about five times worse than the construction industry (Shell Zero Incident report 2019)

Human error: 75 % of shipping insurance losses, equivalent to USD 1.6 billion, are caused by human error. Reasons: poor visibility, inclement weather, fatigue resulting from long hours and insufficient rest, the nature of the working environment onboard vessels and poor leadership both onboard and ashore (Allianz Global Corporate & Speciality 2018)

Crew challenges: a pressing concern among many is finding enough qualified seafarers, especially officers, with the necessary skills to operate vessels at the high levels of efficiency desired today (BIMCO manpower report 2018)

Decarbonisation: In 2018 the International Maritime Organisation (IMO) imposed a target to reduce greenhouse gas emissions from the global shipping fleet by at least 50 % by 2050 compared to 2008 levels, with the aim of achieving full decarbonisation by the end of the century

Cyber Security concerns

How smart autonomy can help solve today's shipping challenges?

“Smart Autonomy,” means moving towards autonomous operations in the future, by finding targeted autonomous solutions that solve specific problems today.



Increased safety through improved situational awareness and better control, for example collision detection and avoidance



Reduced OpEx and CO₂ emissions through fuel savings due to, for example, just-in-time arrival at ports, optimum speed profiles and reduced need for onboard energy consumption



Resilient and predictable **operations**



More efficient **asset use**, less downtime, and reduced human-caused disturbances



More efficient use of **human capabilities**



Co-evolution of the operational and regulatory environment

Naturally, automation is a key enabler for autonomous solutions.
This alone is not enough.

In order to make autonomous systems a reality, three broad capability areas and enablers are critical.



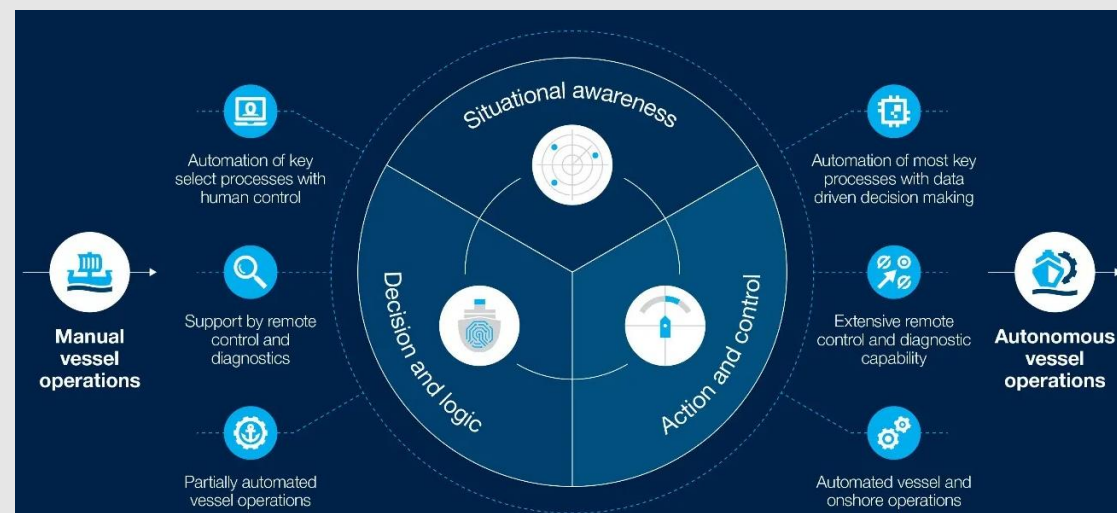
Situational awareness



Decision making and logic



Action and control



Lloyd's Register definition



IMO's view

- Degree 1: Vessel with automated processes and decision support for onboard crew
- Degree 2: Remote controlled vessel with seafarers onboard
- Degree 3: Remotely controlled vessels without seafarers on board
- Degree 4: Fully autonomous vessel that can make and execute all needed decisions

Advanced Assistance Systems

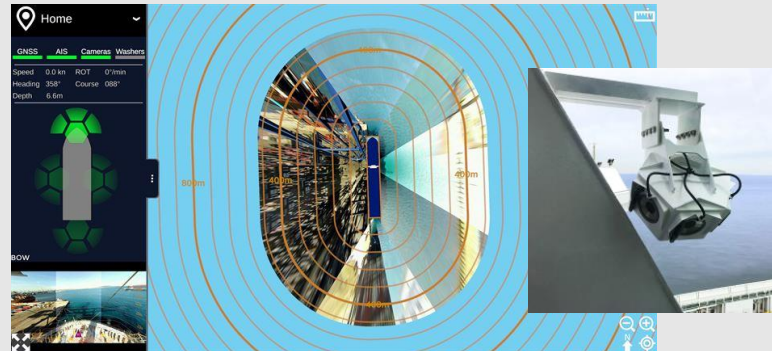
➤ Smart Sensors



- Advanced laser, radar, and camera technology
- **Sensors portfolio** brings together technologies that assist the crew with challenging manoeuvres or entering busy ports

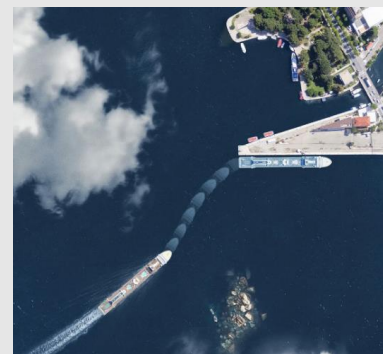
➤ SPECS

Smart Panoramic Edge Camera System



- 360° situational awareness in real time and improves safety
- **Bird Eye view** used for docking & manoeuvres

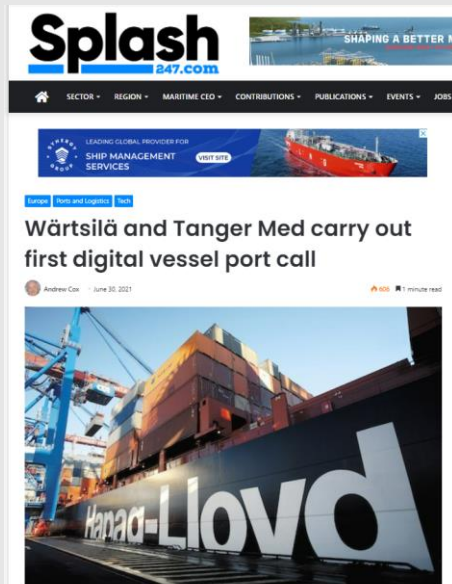
➤ Smart Move suite



- Various tools for automated capabilities to assist the crew with manoeuvres (docking and undocking, harbour entry etc.)
- **Advanced motion prediction** provides the operator with a complete overview of the vessel's movement
- **The software automatically controls the full manoeuvring of the vessel**

Port Call Optimization

➤ Navi-Port



- The first commercially available digital platform that connects a ship's navigation system to the port
- **Just-in-time arrivals**
- Navi-Port facilitates accurate arrival times between ports and ships, enabling vessels to adjust speed to achieve just-in-time arrival automatically

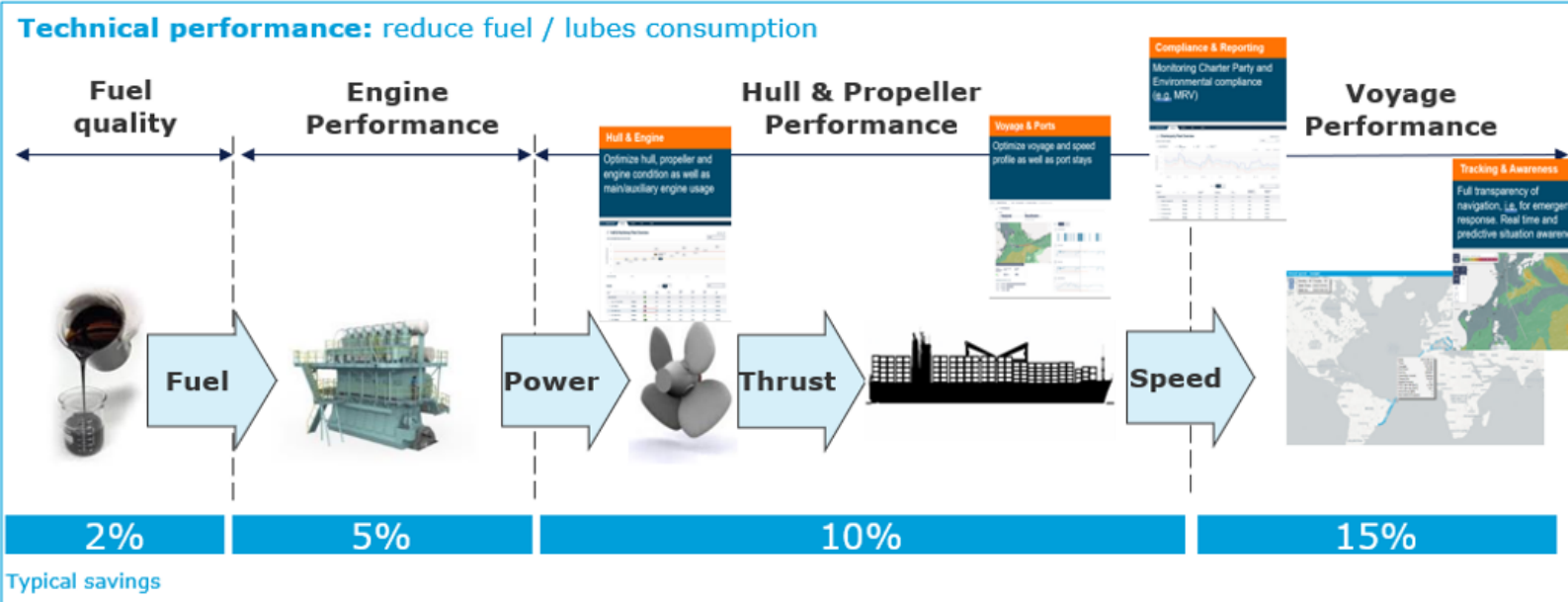


Fleet Optimization and Safety

➤ **FOS platform** (Fleet Operations Solutions)

Performance management comprises commercial, technical and environmental performance

Commercial performance: Keep CP consumptions / speeds or claim if not



Environmental performance: fulfil mandatory (EU-MRV, IMO DCS) or voluntary standards (ESI, CCWG)

THANK YOU



WÄRTSILÄ