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ABB's Stepwise Approach to Autonomy by Viewing a Ship as System of Systems

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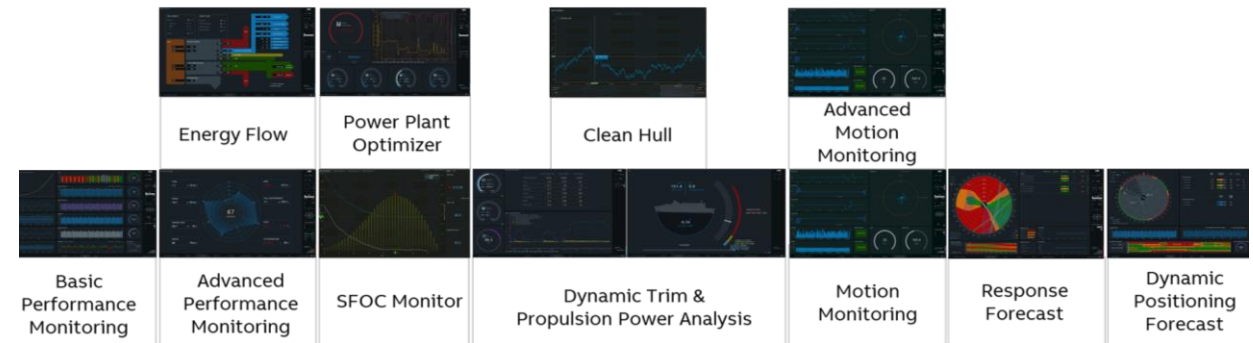
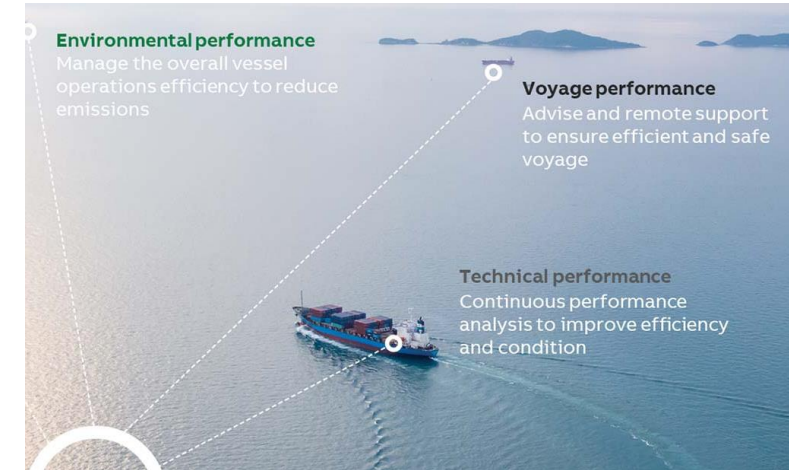
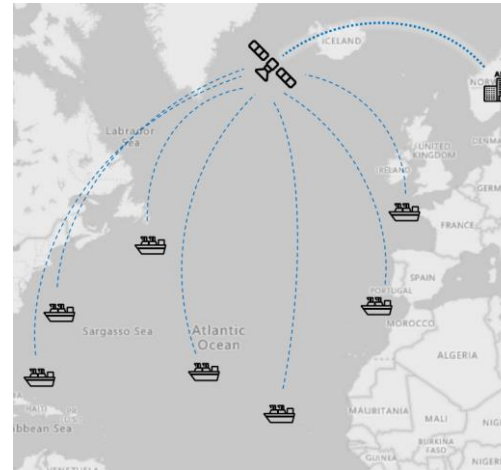
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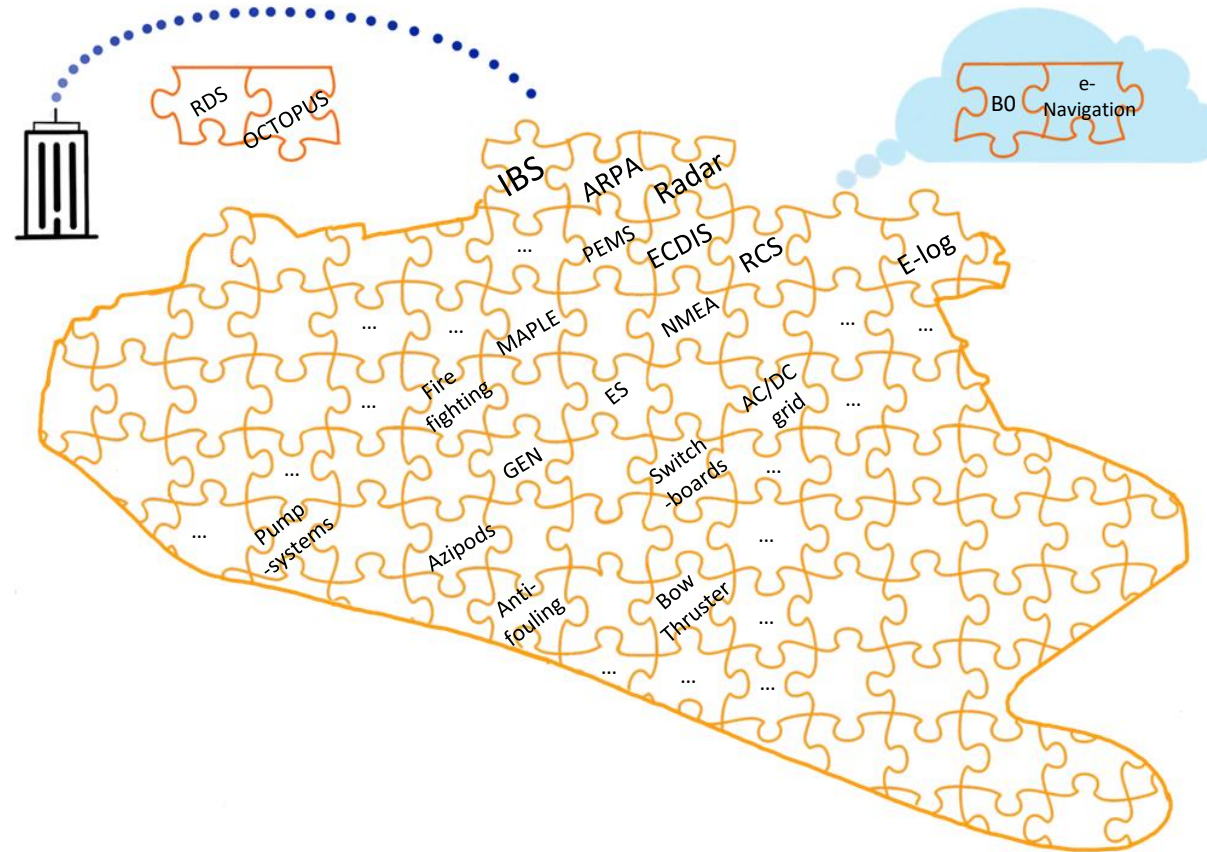
ABB's Digital Solutions

Some highlights of our offering

- **ABB Ability Marine Pilot Control** – One system for all operational needs that simplifies and optimizes ship control
- Keppel tug - a technology demonstrators showing **autonomous collision avoidance and remote control**
- **Remote Diagnostics Systems (RDS)** for propulsion, switchboards, power and energy management systems, conditions-based monitoring
- **OVERSEA-** ABB and Wallenius Marine have established a joint service for fleet support an integration of shore side services in on board operations
- **OCTOPUS-** A platform of software modules complemented by advanced analytical services.



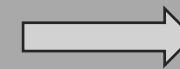
A Ship is a System of Systems



The increased complexity of integrated systems requires

- 1) more shore-based support services
- 2) understanding of the user experience to ensure safe operations

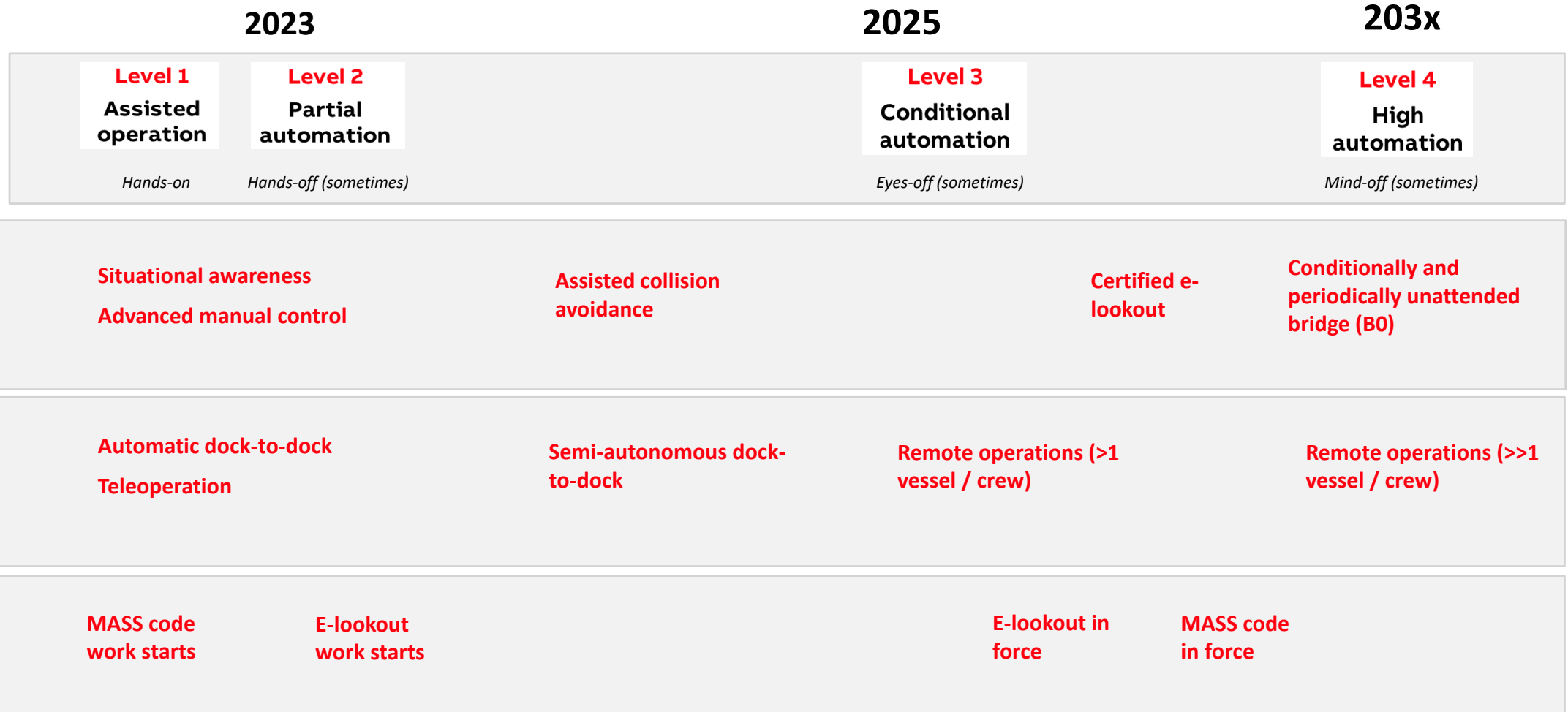
Technology



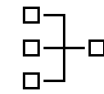
Operational
Concepts

Projection of market adoption pathways

Deep sea and short distance vessels



Key takeaways



The technology development evolves system by system. A ship needs to be viewed as:
“A system of systems”



As a maritime industry, we need to come together and agree on the same definitions



Autonomous technology has come a long way we still have a quite a road ahead to reach large-scale commercial applications



The increasing complexity of the integrated systems requires a focus on user experience to ensure safe and effective operations



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