

## 5.2 Marine automation modernizations and energy efficiency

ABB has decades of experience and highly specialized expertise in designing automation retrofits and upgrading solutions for any size of Marine application project, for smarter vessels and rigs.

The modernization package includes everything required to achieve the completion of the upgrade project faster and more effectively, from the first ship audit to the project's final delivery. Our technical competences guarantee the completion of the plant's modernization process, reducing the operation downtime to a minimum.

Based on our powerful automation platform System 800xA, marine industry customers can reap the benefits of safer, more reliable and energy efficient operation of vessels, with a lower environmental impact.

### **Maximum solution flexibility**

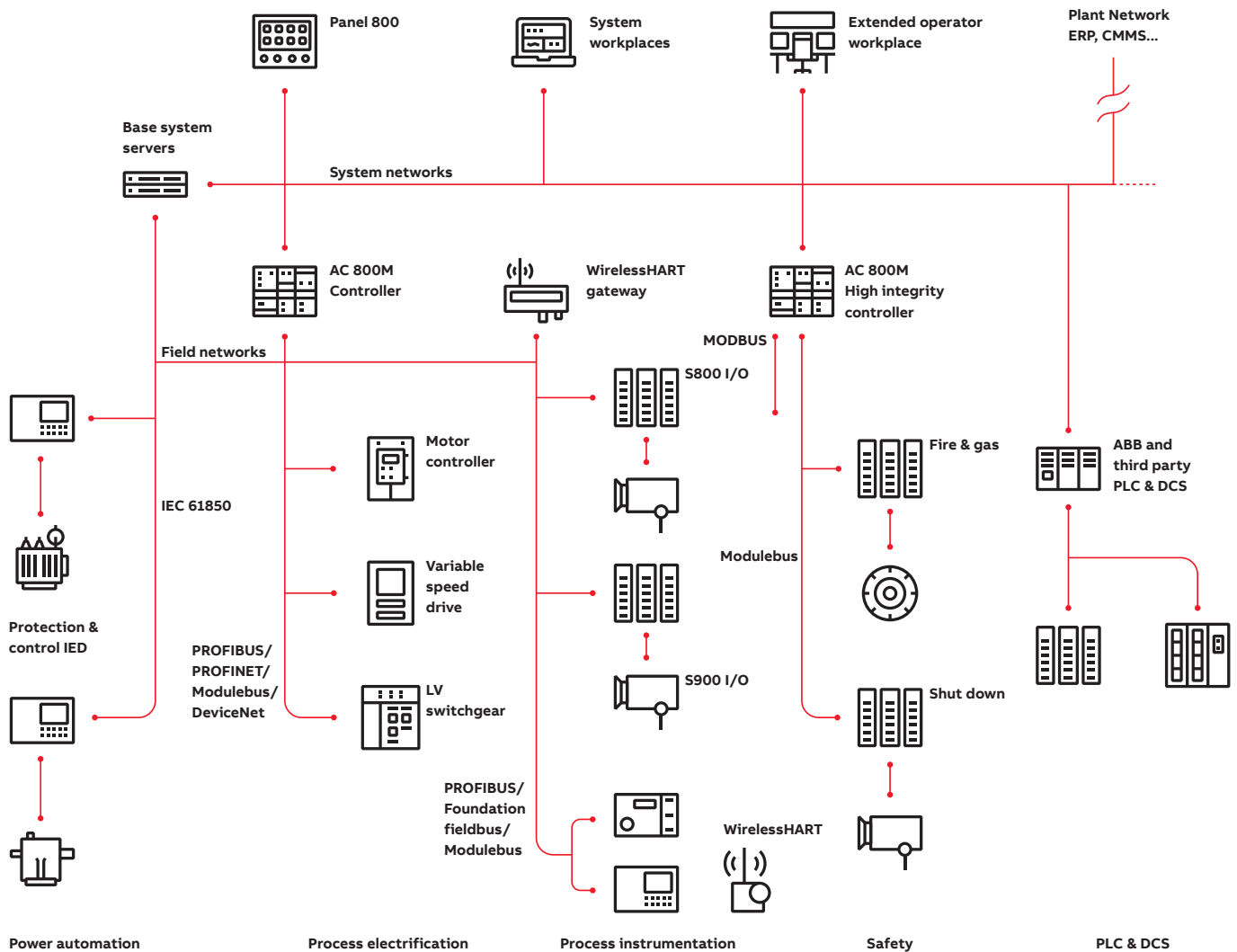
- Device integration based on open standards
- Seamless control applications, including safety
- Reduced system footprint based on a single system
- Single plant interface, integrated operation and maintenance

### **System 800xA – state-of-the-art technology with a global presence**

System 800xA is ABB's extended automation system, with thousands of installations already performed worldwide. 800xA facilitates a single-system approach to vessel automation, encompassing all control and monitoring functions onboard a ship – including those normally handled by separate dedicated systems. Tight integration means that one and the same system can cater for operations, engineering, asset management, safety, information and power management solutions, depending on the scope of the retrofit. Investments and operational costs are reduced, while the versatility and flexibility of System 800xA meets each ship or rig's unique requirements.

### **Integrated safety system saves space and reduces training needs**

System 800xA improves availability while increasing the overall operational efficiency of a vessel, by providing a common environment for process control, safety supervision, power management and propulsion control. Within this environment, System 800xA offers a complete Safety Instrumented System (SIS) solution, complying with the IEC 61508 and IEC 61511 standards and covering not only the logic solver, but also entire safety loops, including field instruments, central controllers and field actuators.



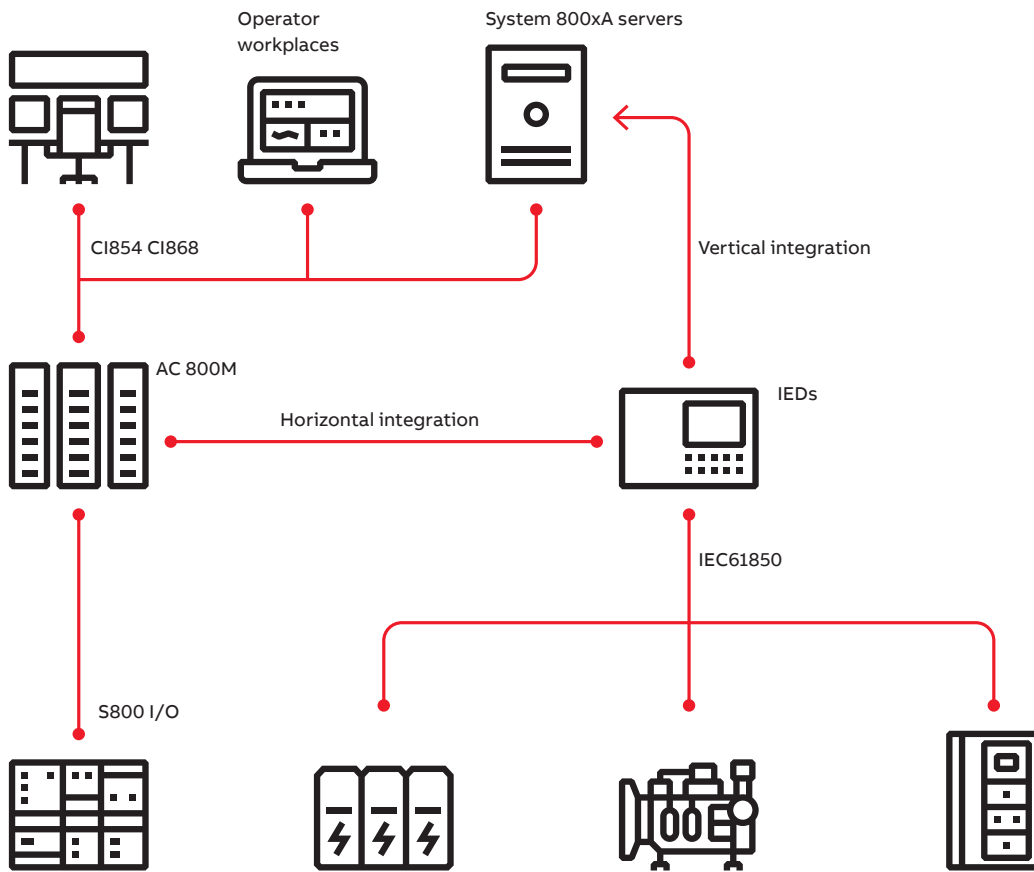
ABB's system platform provides a common environment for vessel process control, safety supervision, PMS and propulsion control

**Integration of electrical equipment increases uptime and overall energy efficiency**

ABB is leading the trend in integrating process automation and power management systems. System 800xA is fully compliant with the IEC 61850 standard, enabling the integration of process control, electrical systems, power generation and distribution into one and the same system, on the same vessel. This creates savings throughout the system lifecycle, thanks to a smaller footprint, lower power consumption and a reduced risk of blackouts.

**Human interfaces for faster and easier decision-making**

On any vessel, in order to make quick, safe and intelligent decisions, the people in charge of operations need access to all of the relevant information. System 800xA's ability to integrate a vessel's various systems into a single operator environment promotes collaboration and lays the foundation for operational excellence. All information is available in one place – regardless of its place or system of origin – and is easy to retrieve through intuitive navigation. This is invaluable in critical situations.



— Fully integrated solution, compliant with IEC61850.

**Safeguarding your investment and assets**

For maritime customers, being able to preserve investments in hardware, engineering and intellectual property is paramount. System 800xA helps control lifecycle costs, while adding new features and technology to existing installations on the vessel. Predictive maintenance is the key to avoiding unplanned downtime. As the assets on the vessel themselves – motors, switchgears, valves etc. – become smarter, System 800xA can use the related data to supervise and predict when maintenance is needed. This enables operators and maintenance personnel to know when and what action to take. Of course, ABB also ensures the secure supply of spare parts.

**Automation and power integration**

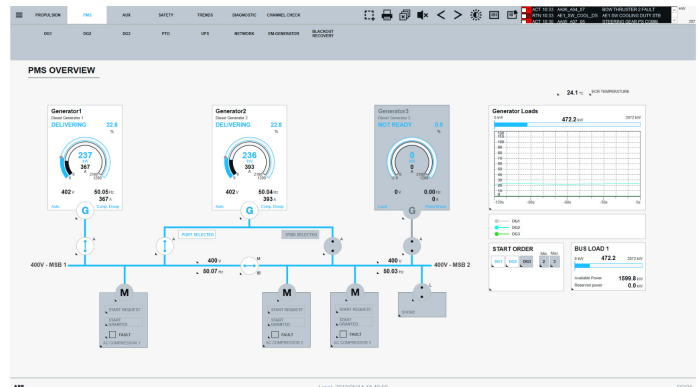
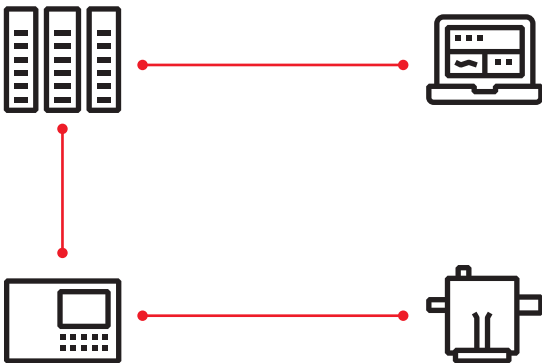
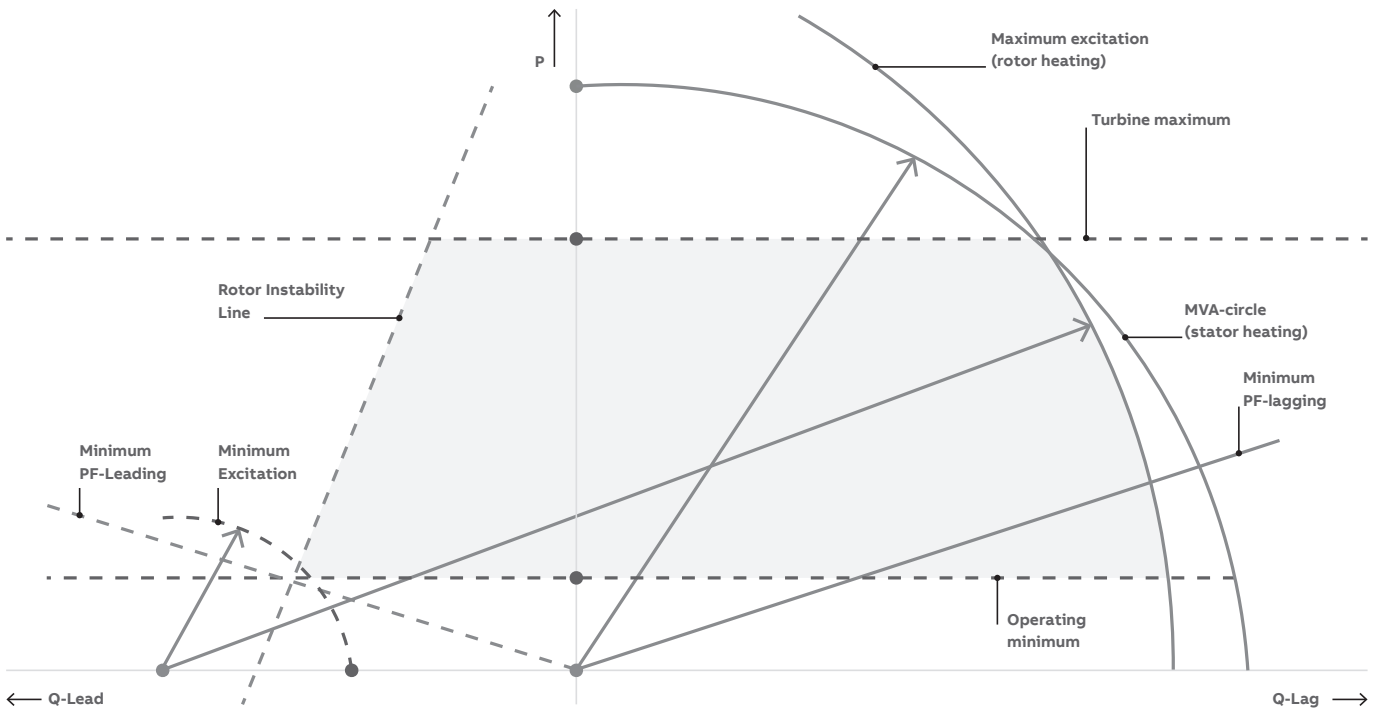
- Unified integration of all plant equipment
- Automation and Power solutions from ABB – optimized tight integration with ABB Marine electrical deliveries
- Essential to optimal and safe operation of the electric power plant and prime movers
- Advanced functions for blackout prevention, through fast load reduction and load shedding (e.g. related to electrical propulsion)
- Optimized footprint by utilizing direct and safe bus communication to ABB protection devices (e.g. IEC61850)
- Can be fully integrated with the IAS, using the same hardware platform while providing the operating crew with the same operational principles and look-and-feel (HMI)

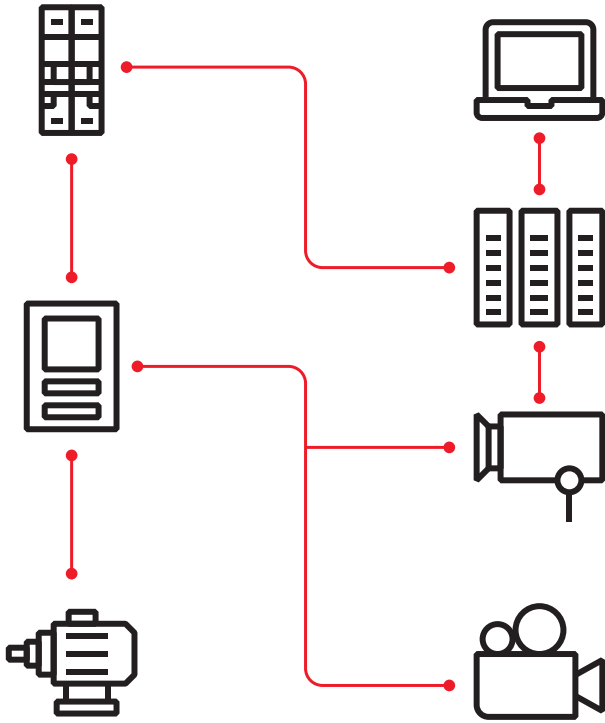
**Complete energy-efficiency retrofit packages**

ABB provides specialized solutions and services for energy efficiency projects onboard vessels. These bring remarkable energy savings. This represents a fast track to savings, with an average lead time of a few months from initial on-board surveys to when savings kick in. Energy efficiency plays the key role in CO2 emission reductions, accounting for up to 53% of such reductions.

Asset Management

In pump and fan applications on-board vessels, use of VFD can cut the energy consumption for such applications by as much as 60%.





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Energy efficiency  
together with variable  
frequency drives

**Benefits for the ship owner**

- Systems run closer to peak efficiency, reducing waste and consumption
- Higher output and quality per unit of energy used
- Ability to manage environmental impact
- Maximize Investment Protection
- Turnkey Projects, one vendor takes full responsibility for the total solution (control application design, implementation, installation, commissioning and process optimization)
- Minimize plant re-wiring and re-documentation costs
- Modular solutions allowing customers to decide when to evolve
- Plant-wide Operator Effectiveness, cost effective operation with fewer operators
- Reduced maintenance costs
- Improved power control and availability
- Added value solutions with newest technology options:
  - Extended range of Connectivity and Field buses (Profibus, Profinet, IEC-61850, HART, etc.),

- Alarm Management and Audit Trail
- Full Integration between Automation and Electrical Power Plant
- Remote Connectivity
- Advanced Diagnostics and Advisory solutions
- Asset Management Optimizations

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