Several regulations that aim to minimise the environmental impact of sulphur emissions from maritime vessels have been recently adopted or will soon be ratified. An exhaust gas cleaning system can help to ensure compliance with these requirements, but installing such a system can be a time-consuming and challenging project that requires extensive modification work. Wärtsilä Services support you throughout the lifecycle of the project by providing world-class engineering capabilities, minimising risk, and keeping downtime and project management costs to a minimum.

**A SOLUTION TAILORED TO YOUR NEEDS**

Wärtsilä’s SO\textsubscript{X} Scrubber retrofit services are developed in close cooperation with each individual customer – from the very first enquiry until the system is successfully delivered and in operation. This enables us to identify the unique requirements for each project and validate the solutions at the conclusion of each phase. After the project has been completed, Wärtsilä’s global services network is there to support you throughout the lifecycle of your vessel.

The main phases of a retrofit project are:

- Initial phase including information gathering and technology selection
- Feasibility and concept engineering
- Basic engineering, project planning and contractor selection
- Detailed engineering and procurement
- Construction and installation
- Approvals and commissioning

**KEY BENEFITS**

- Ensure high-quality installation and regulatory compliance with minimised downtime and risk
- Enjoy peace of mind from a solution tailored to your needs – project scope can vary from a simple equipment delivery to a complete turnkey solution
- Reduce project management costs with Wärtsilä as a single point of contact for coordinating with equipment providers, yards, engineering companies and class or flag societies
PROJECT MANAGEMENT

Initial phase
- Information collection: ship details and operating profile
- Price indications (previous projects)
- Technology selection

Front End Engineering & Design (FEED)
- Ship survey
- Equipment configuration
- Concept/GA interfacing verifications
- CAPEX/OPEX estimations
- Project outline
- Technical feasibility report

Basic engineering, project planning and contractor selection
- Preliminary approvals
- 3D scanning
- Final project plan
- Subcontractor selection
- Offer and contract for supply

Detailed engineering and procurement
- Detailed mechanical and electrical engineering
- Procurement
- Drawing approvals

Construction and installation
- Equipment delivery for prefabrication/installation
- Prefabrication
- Installation works and site management

Commissioning and approvals
- Flag/class
- Commissioning
- Crew training
- Handover
- Start of lifecycle support

Warranty
- Warranty
- Lifecycle support

LIFECYCLE SUPPORT

WHY CHOOSE WÄRTSILÄ?
We are a technology leader with a proven track record of successfully delivering turnkey retrofit projects for leading global ship owners. The scope of supply can be tailored according to your needs, ranging from equipment only, with or without engineering, to a full retrofit EPC delivery. An in-depth vessel survey by our experts followed by a comprehensive technical feasibility study assures optimal integration of the scrubber system. Our tailored approach to retrofit projects minimises the risk and downtime, while our global network enables us to support you throughout the lifecycle of your vessel.

CORE COMPETENCIES
- Product knowledge
- Regulatory and class requirement expertise
- Engineering resources
- Project management
- Procurement
- Site management and supervision
- Commissioning
- Crew training
- Lifecycle support

REFERENCES

Wärtsilä hybrid scrubber system supports TT-Line’s Green Ship strategy
Wärtsilä retrofitted TT-Line’s M/S Robin Hood RoPax ferry with four hybrid scrubber systems as a full turnkey project. The systems reduce harmful SOx and particulate emissions, ensuring the ferry complies with current and future emissions regulations.

Cutting fuel costs and emissions for Finnlines
One of the world’s largest operators of RoRo vessels, Finnlines, relies on Wärtsilä scrubbers to ensure compliance with existing and future SOx emission regulations. Thanks to these systems, its vessels can run on less costly HFO while still complying with environmental requirements.