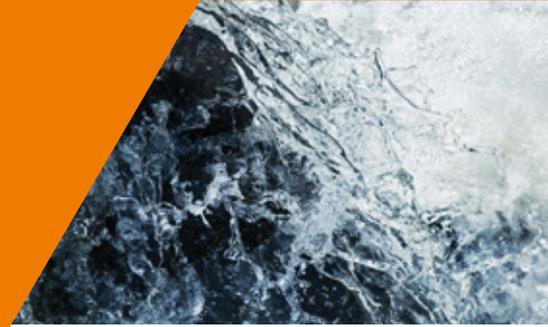


Wärtsilä SO_x Scrubber retrofit services



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_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						LIFECYCLE SUPPORT
Initial phase	Front End Engineering & Design (FEED)	Basic engineering, project planning and contractor selection	Detailed engineering and procurement	Construction and installation	Commissioning and approvals	Warranty
<ul style="list-style-type: none"> Information collection: ship details and operating profile Price indications (previous projects) Technology selection 	<ul style="list-style-type: none"> Ship survey Equipment configuration Concept/GA interfacing verifications CAPEX/OPEX estimates Project outline Technical feasibility report 	<ul style="list-style-type: none"> Preliminary approvals 3D scanning Final project plan Subcontractor selection Offer and contract for supply 	<ul style="list-style-type: none"> Detailed mechanical and electrical engineering Procurement Drawing approvals 	<ul style="list-style-type: none"> Equipment delivery for prefabrication/installation Prefabrication Installation works and site management 	<ul style="list-style-type: none"> Flag/class Commissioning Crew training Handover Start of lifecycle support 	<ul style="list-style-type: none"> Warranty 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 SO_x 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 SO_x emission regulations. Thanks to these systems, its vessels can run on less costly HFO while still complying with environmental requirements.

