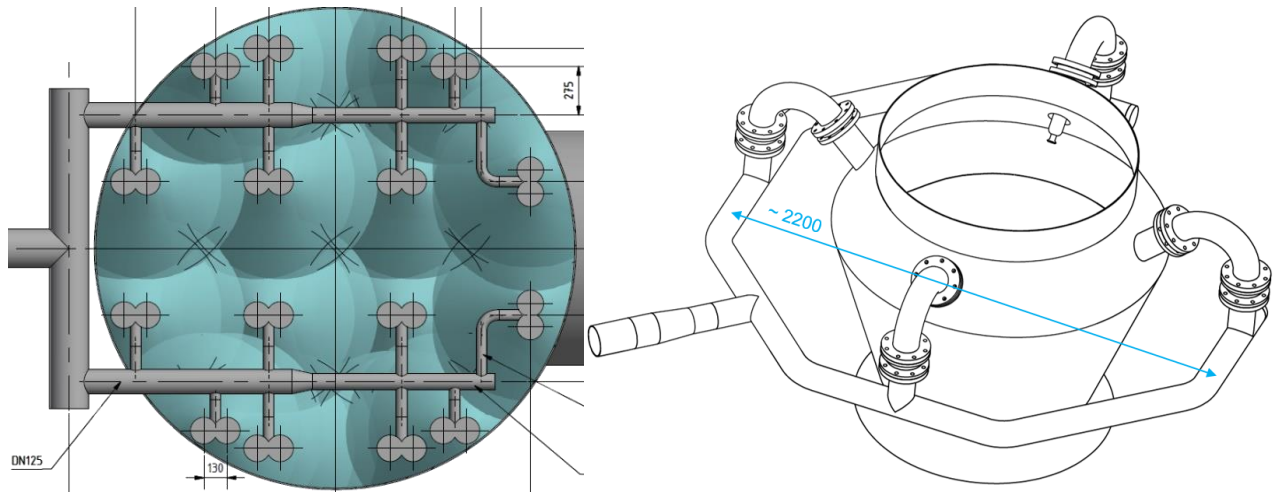


Client: ERC Technik GmbH

Project: Calculation of pressure losses in exhaust-gas system, reviewing the design of the existing scrubber for main engine refit

Services: Baseline study and basic engineering



General

On one of the ferries operated by Scandlines Deutschland GmbH, an engine fitted with a scrubber for the removal of SO₂ from the exhaust gas, is to be replaced by a larger engine.

For this purpose, the existing EGCS together with all exhaust-gas pipes, was recalculated in respect of the increased pressure losses and separation capacity of the scrubber.

Scope of services provided by T&N

The scope of services provided by T&N covered essentially the following points:

- Pressure losses were calculated for the existing system of exhaust gas pipes based on data for the installed engine
- For comparison, the pressure losses for the proposed replacement engine were calculated.
- Identification of measures to reduce pressure losses in the exhaust gas
- The existing scrubber was recalculated for a larger load range based on the changed operating conditions

- Various measures for conversion were described and calculated with a view to optimizing the existing scrubber, including
 - Rating of an upstream quench, including the geometry and dimensioning of the nozzles
 - Adaptation of the spraying levels and replacement of the nozzles while retaining the scrubber geometry to increase the separation capacity of the scrubber and to improve the part-load capacity
 - Design calculations for retrofitting a demister to prevent wet carry over from the funnel. The demister was designed with appropriate cleaning nozzles on both the inflow and outflow sides.
- Calculation of the volumes of scrubbing water required and the load-dependent NaOH-quantities (sodium hydroxide) to neutralize the scrubbing water in closed-loop operation.

Recommendation

Replacement of the engine and partial implementation of the measures are to be carried out in the course of 2019.