

Blue INNOship

Project name:

Blue INNOship project no. 13:

*Selective Catalytic Reduction of NOx
on ships*

Project participants:

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Short project description

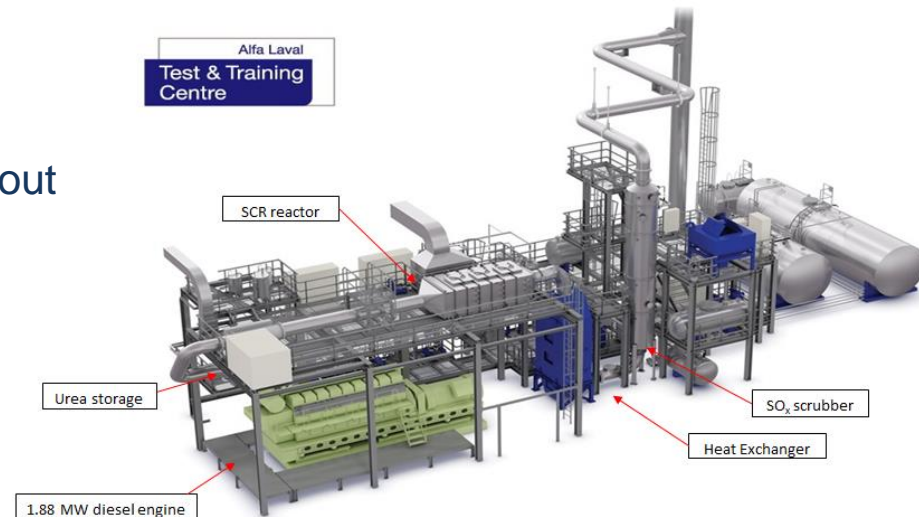
An optimal SCR technology solution for bunker oil (high sulfur) fuelled ships
Control of unwanted (SO_3) and fouling species (ammonium bisulphate)
Optimal high pressure performance

Technology Readiness Level								
1	2	3	4	5	6	7	8	9
			X					

Key features & findings

What key features or findings would you like to highlight from your project work until now?

1. First results from test campaigns at Alfa Laval's pilot plant on AS/ABS condensation using a newly developed probe. Both ammonium sulphate (extraction of probe during engine operation) and ammonium bisulphate (extraction after engine shutdown) were observed. This indicates formation of the less harmful ammonium sulphate during operation.
2. Literature survey on SO_2 oxidation and NO_x reduction (SCR) as well as ammonium bisulfate (ABS) and ammonium sulfate (AS) formation in maritime systems.
3. Three experimental setups to study SO_2 oxidation, SCR kinetics and ABS/AS chemistry have been commissioned and initial tests carried out
4. Work on a TCO model by the industrial partners has been initiated to discriminate between process options



Project challenges and solutions

What challenges have the project team experienced and solved ?

1. Challenges in performing large scale pilot experiments as well as in their interpretation. It was therefore decided to perform additional more well-controlled ABS/AS deposition experiments at DTU
2. SO₂/SO₃ detection and system mass balance - Multiple tests with the controlled condensation method versus FTIR in a DTU pilot plant

Why should you buy our solution?

What makes your solution the preferable one compared to other available solutions?

1. Value proposition for SCR + Scrubber (high sulphur fuel case)

Compliance with IMO SO_x and Tier III NO_x regulation

Cost competitive NO_x control solution, especially for low NECA shipping routes

Technology proven for marine vessel using low to medium sulphur fuels

Improved opacity of scrubber waters and reduced H₂SO₄ in the stack (blue plume).