

**Research and development of  
SCR technology  
using low speed engine**

JAPAN

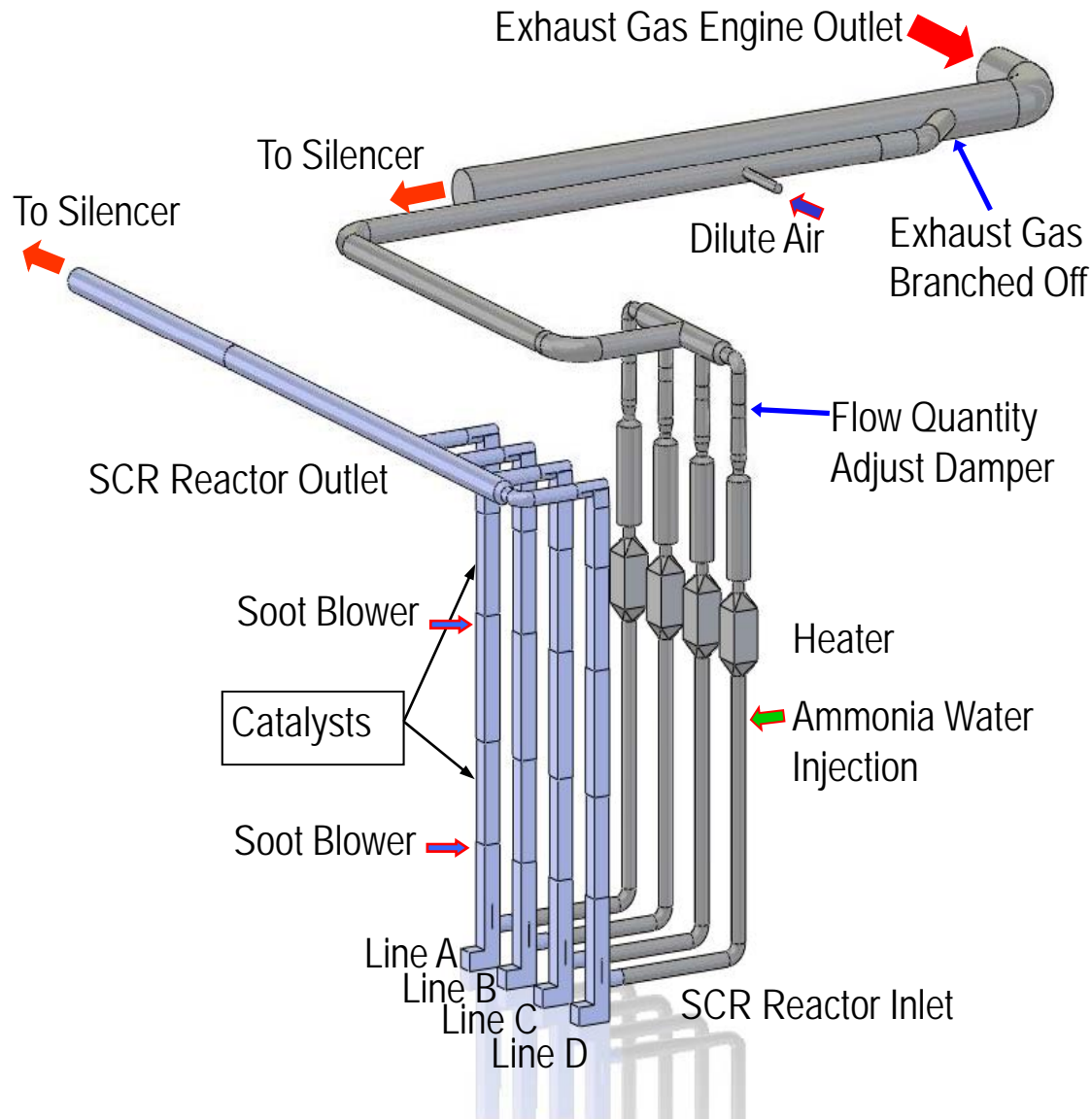
## Objective & Outline

- Laboratory test of exhaust gas denitration with low-speed rotation engine was conducted. In this test, Urea and Ammonia was used as reductant.

Participants of this project:

- Mitsubishi Heavy Industries
- Tokyo University of Marine Science and Technology
- National Maritime Research Institute
- Akasaka Diesel Limited
- Sakai Chemical Industry Co., Ltd.

# Test Rig of SCR System



- Denitration Equipment:  
(Line A, B,C,D)

Length 165mm, Width 165mm,  
Height 4490mm

- Soot Blower :

Air Mass Flow of  $6.8\text{m}^3\text{N}/\text{min}$  for  
each catalyst

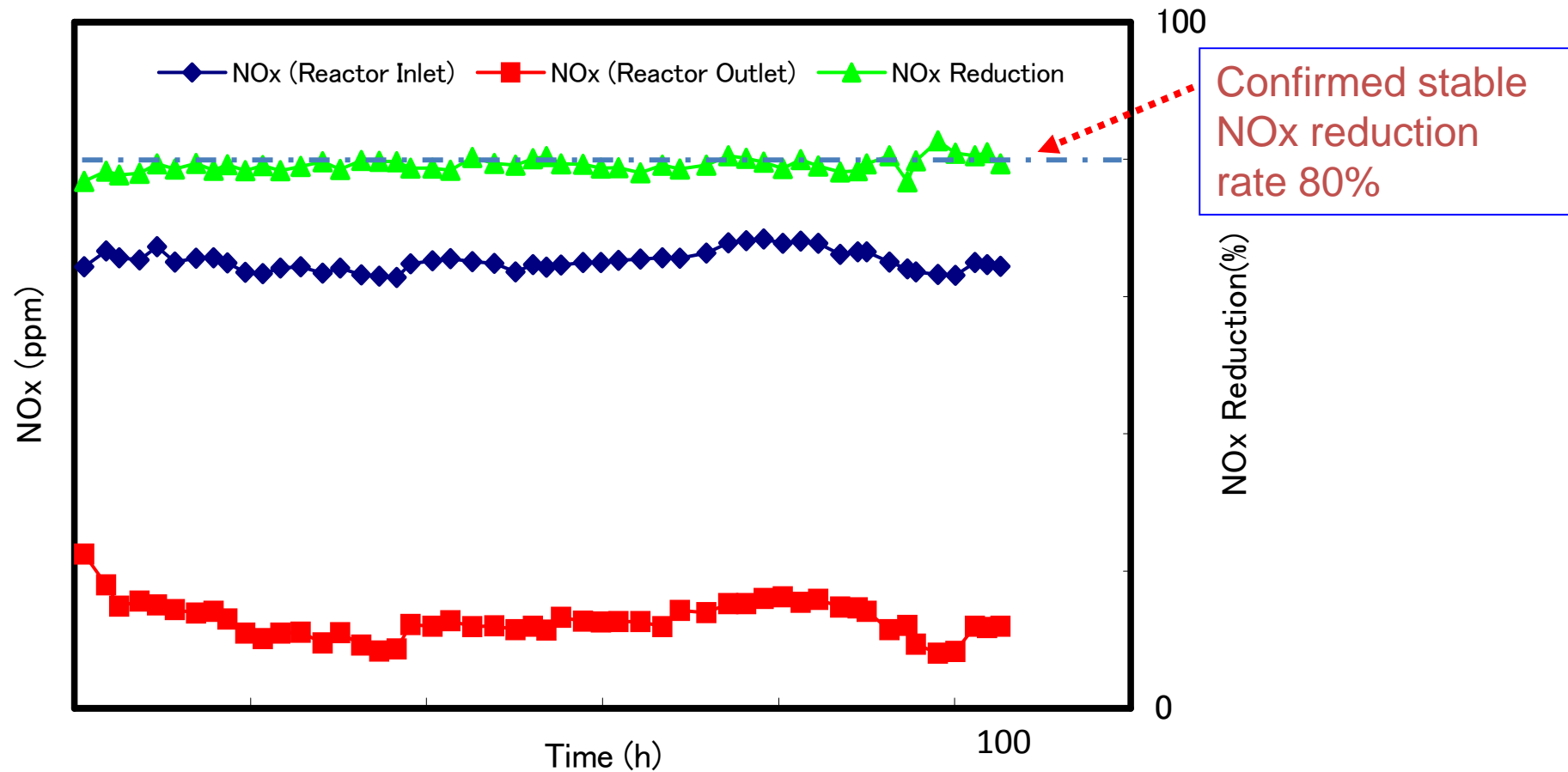
- Heater :

$200\text{V} \times 3\phi$ 、60Hz、15kW

- Reductant Pump :

Diaphragm fixed quantity type,  
25 milliliter per minute, 0.3MPaG

# SCR developments; Test result (Lab test)



SV number set at 6500(1/h) in this laboratory test.

# SCR Performance

- Higher denitration performance was observed at higher exhaust temperature.
- As reductant, Urea has slightly lower performance than that of Ammonia.
- No nozzle blockage and sediment such as cyanuric acid on exhaust gas pipe and catalyst was observed during the laboratory test.
- At the exhaust gas temperature of 300 degrees Celsius, no decline of denitration performance was observed.
- At the exhaust gas temperature of 250-280 degrees Celsius, slight dust adherence on catalyst was observed, and there was little decline in denitration performance.
- At the exhaust gas temperature of 230 degrees Celsius, adherence of dust and ammonia on catalyst was observed, and decline of denitration performance was observed.