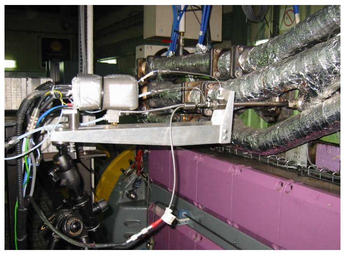
RESEARCH IN EMISSION MEASUREMENTS

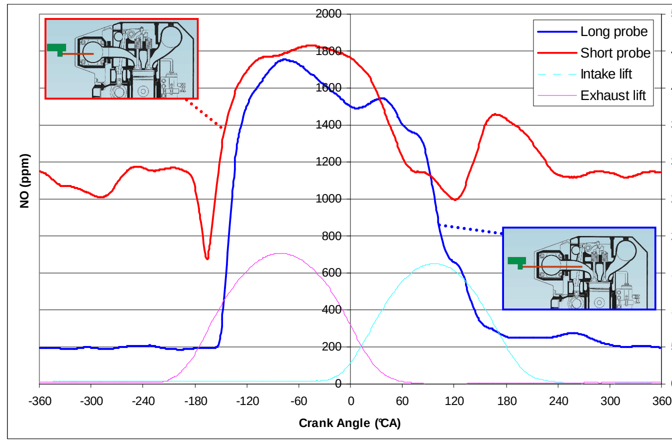
for Emissions reduction and improved Fuel Consumption

• NOx measurements

An Ultra fast sampling system was developed to allow measurements of NOx inside the exhaust port of a marine diesel engine. Such measurement can provide the NOx variations within one engine cycle, from a specific engine cylinder. This information can be used for the optimisation of the combustion system.



Development of sampling system for Ultra-fast NOx measurements



Comparison of NOx measurements from a marine diesel engine, performed in the exhaust port (long probe) and in the exhaust manifold (standard probe)

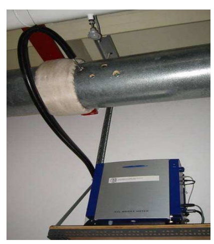
• Opacity measurements

"Smokey" vessel

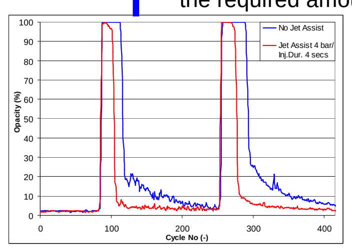
Controller for optimising air injection operating parameters

Development of a closed-loop control system for compressed air injection, directly in the intake manifold of a marine diesel engine. The objective was to reduce opacity and fuel consumption during transient engine loading. The control system uses real time emission measurements and other performance parameters to regulate the required amount of extra air.

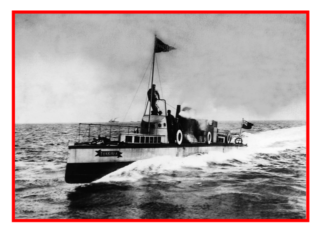
Development of Air Injection System



Measurements with Opacity analyser

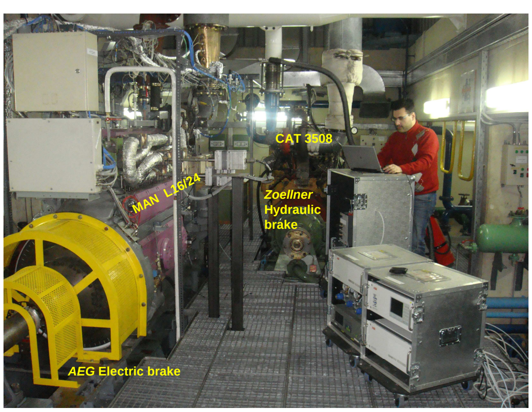


Emission measurement results



"Clean" vessel

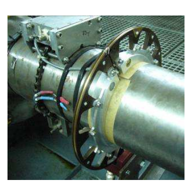
• Engine Performance measurements

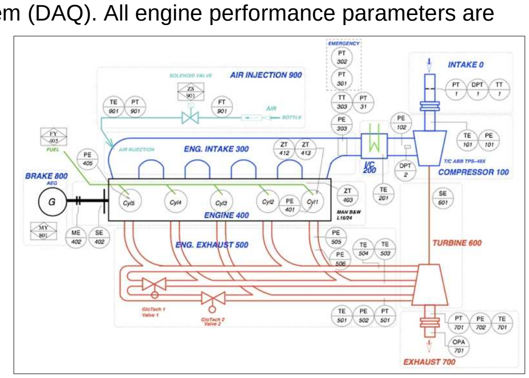


LME engine Test Bed with MAN L16/24 and Caterpillar engines

The test engines are equipped with pressure, temperature, flow and torque sensors in order to monitor performance. The output from each sensor is recorded, stored and post-processed by a Data Acquisition System (DAQ). All engine performance parameters are recorded simultaneously with the emission measurements.

This is required by the legislation to allow for the accurate analysis of the emissions recorded.





Layout of sensors and actuators on the research marine engine

Contact : Prof. N.P. Kyrtatos, Director, Laboratory of Marine Engineering, National Technical University of Athens, **nkyrt@lme.ntua.gr**

Laboratory of Marine Engineering: www.lme.ntua.gr