



## PAPER NO.: 32

# HERCULES-B: The continuation of a major R&D effort towards the next – generation marine diesel engines

Mr. NIKOLAOS KYRTATOS, NATIONAL TECHNICAL UNIVERSITY, GREECE  
Mr. LARS HELLBERG, WARTSILA CORP., FINLAND  
Mr. CHRISTIAN POENSGEN, MAN DIESEL SE, GERMANY

**Abstract:** HERCULES-Beta is the second phase of the HERCULES programme, which was conceived in 2002 as a long-term strategic R&D plan. The project was initiated by Europe's two major engine manufacturers, Waertsilae Corporation and MAN Diesel and is jointly coordinated by ULEME EEIG.

HERCULES-Beta began on September 2008 with a budget of EUR 25 million and it is planned to run for 36 months. The project consortium has 32 participants, including engine-component suppliers, equipment manufacturers, universities, research institutions and shipping companies from 10 European countries. HERCULES-Beta comprises 56 subprojects and is funded by the European Commission's Framework Program 7 for R&D (FP7, Theme Transport).

The project's principal aim is to reduce marine diesel engine fuel consumption by 10% and to improve the efficiency of marine diesel propulsion systems to more than 60%, significantly reducing CO<sub>2</sub> emissions as a result. A further aim of the project is to target ultra-low exhaust emissions by eliminating 70% of NO<sub>x</sub> and 50% of particulates from marine engines by 2020.

The first phase of the HERCULES project concentrated on the development of tools (e.g., simulation software, measurement techniques, etc.) and the general investigation of potential avenues for reducing emissions and fuel consumption. Initially, the project established and operated prototypes. The results stemming from this indicate a great potential for significantly reducing fuel consumption and emissions and reaching the project's ambitious targets.

HERCULES-Beta directly builds on the findings of the first phase of the HERCULES project. The tools previously established are employed to more closely investigate, understand and ultimately optimise the engines. Both analytical investigations as well as prototypes will be refined, based on first-phase results, with the intention of achieving the ultra-low emission and fuel consumption targets. Finally, by carrying out field-tests on the prototypes developed in the first phase, information on the important effect of real-life boundary conditions will be gathered and analysed.

The paper presents the complex structure of the project, as well as some initial results.