

Ship Failure Management System (S²FMS)

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Abstract

This paper reports on the development of a diesel engine mathematical model and a suite of computer simulation programs developed by The Centre for Factories of the Future (C4FF) in the UK which would allow the effects of various design and operational changes to be reliably and accurately predicted with the ultimate aim of producing cleaner engines and/or more efficient power units. The model has been tested against the experimental results of the Paxman engine at Newcastle University and earlier against the Atlas engine at Ricardo, Brighton, UK. The predicted results and the experimental data are in good agreement. The development lead to the design of a novel Variable Geometry Diesel Engine, known as RZ, deployed in almost all diesel engines worldwide.

The simulation programs are being reviewed as part of an EU funded Leonardo project known as SURPASS (www.surpass.pro) in collaboration with universities of Satakunta in Finland and SzcZecin in Poland. The intention is to transform them into a suite of programs to monitor engine running condition and report on any malfunction. If the engine is not a cause of the problem then several additional routines are developed to check the integrity of the supporting automated systems such as the hydraulic circuitry, pneumatic circuitry and electrical drives including the instrumentation and control devices and systems.

The purposes of the proposed project is use the C4FF diesel engine model and SURPASS review and develop a Ship Failure Management System and apply it in an actual ship, test it and assess its performance. Specific reference will be made to RZ Engine and how higher torque back-up are feasible for given design and size of engine.