
Transient Load Share Management of a Diesel Electric Hybrid Powertrain for Ship Propulsion

Sotiris K. Topaloglou

Laboratory of Marine Engineering (LME),
National Technical University of Athens,
Zografos, Greece
E-mail: s.topaloglou@gmail.com

George Papalambrou

Laboratory of Marine Engineering (LME),
National Technical University of Athens,
Zografos, Greece
E-mail: george.papalambrou@lme.ntua.gr

Konstantinos Bardis

Laboratory of Marine Engineering (LME),
National Technical University of Athens,
Zografos, Greece
E-mail: kwstasbardis@gmail.com

Nikolaos Kyrtatos

Laboratory of Marine Engineering (LME),
National Technical University of Athens,
Zografos, Greece
E-mail: nkyrt@lme.ntua.gr

Abstract:

In this paper, a transient load share methodology for a hybrid diesel electric marine propulsion system is presented. Aim of the system is the performance enhancement and reduction of gaseous emissions during low-load transient operation. The controlled variable is λ while the manipulated variable is the torque from the electric motor regulated by a frequency inverter.

The model for the λ behavior is based on experimental identification while λ values in feedback loop come from an actual and a virtual sensor, the later based on first principles modeling. A nominal model is used for the synthesis of a robust H_∞ controller for the controlled variable regulation.