



MARITIME

EFFICIENT CARGO HANDLING OPERATIONS IN OIL TANKERS

Thenamaris Ships Management Inc. and DNV GL establish a Joint Development Project (JDP) on the development of computer tools to monitor and improve the energy management of oil-tanker cargo handling operations.

Background

Cargo heating and cargo unloading are complex and energy intensive processes, bearing low efficiencies and dependence on varying trip and environmental conditions, different terminal constraints, onboard machinery condition and crew operational decisions. In 2011, DNV GL Maritime Research & Development Greece and Thenamaris Ships Management Inc. successfully initiated and completed a joint research project on improving cargo-oil discharge operations (CDO) for one Aframax tanker using DNV GL COSSMOS, our in-house platform for model-based analysis and optimization of ship machinery and energy systems. Since then, DNV GL has further developed the COSSMOS CDO module and is currently capable of

providing advanced services for monitoring, assessing, and improving CDO operations with respect to energy efficiency.

DNV GL contribution

Currently DNV GL is moving one step further by developing onboard decision support tools able to provide instant feedback on the operational performance, identify improvement potential and suggest real-time operation actions. Such tools will benefit from the simulation and optimization capabilities of DNV GL COSSMOS and the high-fidelity modelling of onboard machinery systems and components.



Project results

The JDP objectives are:

- To develop an onboard computer tool for performance monitoring and optimization of cargo discharge operations in tankers. The tool will provide real-time information to the crew on the energy efficiency of the operation and will display specific improvement actions.
- To develop a stand-alone COSSMOS module for cargo heating operations in tankers. The tool will provide assistance on the optimal heating schedule so that the cargo is maintained at the desired temperature range during sailing, and reaches the appropriate temperature at discharge port, while consuming the minimum amount of fuel.

The tools aim at:

- Supporting shipping companies' office and onboard crew in taking the best decisions to achieve tangible fuel savings.
- Understanding how important operational variables affect the systems' efficiency, thus contributing to competence and awareness increase of crew and operators.

Project steps

The project follows two tracks dedicated to the cargo discharge tool and cargo heating module, each including a set of tasks:

- Selection of case study vessels
- Problem setup and tool/module specification
- Measuring procedure setup and data gathering
- Computer tool and COSSMOS module development
- Onboard testing of the cargo discharge tool
- Simulation-based validation of the cargo heating module
- Operator's feedback

DNV GL COSSMOS

DNV GL COSSMOS (COMplex Ship Systems MODelling and Simulation) is a framework and computer platform implementation for dynamic modelling, simulation and optimisation of complex/integrated ship machinery systems with respect to energy efficiency, emissions, safety and costs.

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