WP5 - Modular 1.5 MWh BESS demonstration and optimisation for the Solstad retrofitted hybrid vessel

D5.2: Report on preparation of the integration and the interfaces on the vessel - Public Summary:

The ambition of the NEMOSHIP project is to develop, test and demonstrate innovative technologies, methodologies and guidelines to accelerate large BESS deployment and optimal exploitation toward 2030 on both hybrid and fully electric configurations.

This report is part of WP5, “Modular 1.5 MWh BESS demonstration and optimisation for the Solstad retrofitted hybrid vessel”.

This report presents the preparation and implementation steps for integrating a modular battery energy storage system (BESS) into the offshore vessel Normand Drott. Normand Drott is an anchor handling tug supply vessel built in 2010 and is designed to handle demanding offshore tasks. The BESS installed as part of the NEMOSHIP project is a heterogeneous system made of high-power and high-energy batteries which will be piloted by control algorithms developed in WP4 and called BPMS (Battery Power Management System). The conversion involved repurposing an existing fuel tank into a battery hybrid room, installing a containerised battery unit, and integrating supporting electrical and mechanical systems.

Key activities presented in this report include:

- Structural modifications to accommodate battery and power equipment.

- Installation of fire safety systems and ventilation in compliance with maritime regulations.

- Electrical integration of battery modules and power skids, including cable planning and electromagnetic compatibility measures.

- Development of a digital twin model using Simcenter Amesim to simulate vessel performance, optimise energy usage, and support predictive maintenance.

The digital twin incorporates real-world operational data and weather conditions to simulate realistic scenarios. Control systems were implemented to manage propulsion modes, generator operations, and battery power distribution. The model was calibrated using representative vessel data and validated through simulation of typical offshore operations. This deliverable contributes to the broader NEMOSHIP objective of enabling safe and efficient electrification of maritime vessels, supporting the transition toward zero-emission waterborne transport.

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