WP2 - Multi-layer digital platform development and implementation

D2.3: NEMOSHIP digital platform implementation and validation report- 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. To help achieve this ambition, NEMOSHIP will develop a 1 MWh modular and standardised battery energy storage solution that is able to exploit heterogeneous storage units and a cloud-based digital platform to enable data-driven, optimised and safe exploitation. The project will demonstrate the maturity of these innovations at TRL 7 for hybrid ships as well as their adaptability towards fully electric ships.

The present deliverable is part of WP2 which focuses on the multi-layer digital platform development and implementation. The NEMOSHIP Digital Platform is a comprehensive solution that integrates real-world operational data with advanced simulation tools, enabling the assessment and optimization of both conventional and innovative vessel propulsion strategies.

The present deliverable relates to Task 2.3 and aims to extend the virtual platform as a cloud facility for use in a cyber-secured environment between the NEMOSHIP partners and demonstration vessels. By providing a cyber-secured cloud infrastructure, the platform empowers stakeholders to securely exchange data and implement optimization strategies.

The platform's key components include the User Interface application, API Gateway, Optimization module, Digital Twin module, and Data Storage module. These modules work together to deliver data-driven insights, facilitate real-time data exchange, and support simulation-based validation and optimization. The NEMOSHIP Digital Platform caters to both real and virtual use cases, including the integration of two real vessels (Le Commandant Charcot and Normand Drott) and two virtual use cases (fully electric battery vessel and hybrid fuel cell-battery vessel).

The platform offers modules for historical trip analysis, future trip battery usage optimization, and current vessel battery usage optimization, providing comprehensive energy management and optimization capabilities. To ensure the platform's continued

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evolution and enhancement, a future development roadmap has been outlined. The implementation of the NEMOSHIP Digital Platform represents a significant step towards digital transformation in the maritime industry, empowering stakeholders with data-driven insights and optimization tools to improve energy efficiency and support sustainable vessel operations.