NEMOSHIP

WP1 - Experiences learnt and requirements

D1.5: Requirements to develop NEMOSHIP digital platform - 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 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.

This report focuses on the NEMOSHIP digital platform that takes advantage of the vast amount of data coming from previously installed BESS and from the Solstad and Ponant demonstration vessels throughout the four years of the project. It will implement a secure cloud infrastructure that enables bidirectional data exchanges with the ships and, as much as possible, with existing third-party software. This deliverable is part of WP1 (“Experiences learnt and requirements”) which lays down a foundation for NEMOSHIP project.

More specifically, this report is part of Task 1.5 which is titled “Requirements to develop NEMOSHIP digital platform”. Drawing on the previous deliverables of WP1, the present report provides an overview of maritime digital platform specifications, analysing its key components, functionality, and requirements. It also examines state-of-the-art existing platforms such as MarESS and Marorka. Some key components and functionality of the digital platform are discussed, including cloud storage, third-party applications, digital twin simulation models, and user interfaces. A high-level data flow and output data for ship crew and onshore personnel are also outlined.

The creation, management, and synchronisation of digital twins are explored, emphasising the importance of real-time updates to ensure accurate data representation. Potential applications are underscored to demonstrate the unique and innovative functionalities offered by the digital platform, in contrast with similar software solutions. The need for a secure architecture is highlighted and the possible integration ways of the digital platform with existing software on demo vessels, such as Marorka, is examined to enable data exchange and interoperability.

The importance of testing and validation is also emphasised, and a global methodology for unit testing, system testing, and user acceptance testing is presented. Validation approaches for performance, cybersecurity, and regulatory compliance, along with the testing environment and documentation are also briefly presented.

In addition, the report scrutinizes the challenges and opportunities presented by the implementation of a maritime digital platform. It underscores the importance of reliable, timely

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and secure data transmission, especially in remote sea areas where connectivity can be problematic. The report proposes possible solutions and strategies to these challenges, setting the foundation for a sustainable, efficient, and secure digital transformation in the maritime industry.

The report concludes by highlighting the significance of collaboration with software providers, system integrators, and maritime technology experts to ensure seamless integration and data exchange. It emphasises the need for comprehensive testing, validation, and adherence to cybersecurity measures to achieve an efficient and secure maritime digital platform. Further, the report underscores the potential of digital transformation in the maritime industry, opening up new horizons for operational efficiency, data-driven decision making, and enhanced safety measures. As the industry evolves, harnessing these digital capabilities will become increasingly crucial.

The maritime digital platform, with its advanced features and functionalities, is poised to revolutionise maritime operations, provided that its implementation is approached strategically. This involves considering both the technological intricacies of the platform and the human factors involved in its operation. Collaborative efforts across various stakeholders, rigorous validation processes, and a commitment to cybersecurity are crucial for unlocking the full potential of this digital solution, ultimately leading to a more resilient and efficient maritime industry.