NEMOSHIP

WP3 - Modular BESS design, integration and testing

D3.2: Battery modules characterisation results - 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.

In the NEMOSHIP project, batteries of the 1 MWh modular BESS mentioned above are provided by project partner Corvus. Corvus Energy is the world's leading supplier of safe, innovative, and reliable zero-emission solutions for all segments in the maritime industry.

The present report relates to WP3 – Modular BESS design, integration and testing.

This document is the second deliverable of this WP and is titled "Battery modules characterisation results".

The objective of this deliverable is to collect, report and show Corvus marine energy storage batteries test results at the cell and module levels. The purpose is to confirm compliance with design requirements in the maritime field.

Moreover, data obtained will be used for the battery models of the NEMOSHIP digital twins developed in WP2. To perform this testing activity Corvus sent several cells and modules of some of their battery products to assess these in Cidetec facilities.

First, calorimetric tests have been carried out to obtain the heat capacity at cell level. Additionally, thermal runaway tests were also carried out in the calorimeter to calculate the characteristic venting rate.

Secondly, different experimental matrix tests were defined for the characterization tests at different temperatures for extracting charge/discharge capacities, loading voltage curves, and temperature increase at different C-rates and ambient temperatures.

Finally, profile and pulse tests for impedance characterization at different ambient temperatures were also carried out at module level. All the tests were carried out successfully and the results were correct and as expected. Among others, the cell test results are useful to extract the model parameters required to build detailed equivalent circuit models.

Co-funded by the European Union

The NEMOSHIP project has received funding from the European Union's Horizon Europe Research andInnovation programme under grant agreement No 101096324. Views and opinions expressed are howeverthose of the author(s) only and do not necessarily reflect those of the European Union or or the EuropeanClimate, Infrastructure and Environment Executive Agency. Neither the European Union nor the grantingauthority can be held responsible for them.