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NAUTILUS

D2.1 – Delta Analysis – Comparison of different technologies

Project Acronym:	Nautilus
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Project coordinator:	Dr. Asif Ansar, Deutsches Zentrum für Luft – und Raumfahrt (DLR)
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Deliverable D2.1 –Delta Analysis – Comparison of different technologies

Short summary:	Comparison of key components (fuel cell and battery), systems and hybrid systems for onboard power supply with key technological indicators
Due date:	31/12/2020
WP, leader:	MAN
Authors:	Ligang Wang (EPFL) with the support of SP, TUD and MAN

Dissemination Level

PU	Public	☐
PP	Restricted to other programme participants (including the Commission Services)	☐
RE	Restricted to a group specified by the consortium (including the Commission Services)	☐
CO	Confidential, only for members of the consortium (including the Commission Services)	☒

Document history

Version	Date	Name	Chapters edited	Reason for change
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1 Introduction

This report is to compare different energy conversion technologies and their hybridization supporting the onboard power supply of cruise ships. Existing individual technologies like proton exchange membrane fuel cell (PEMFC), solid oxide fuel cell (SOFC) and battery (BAT) are considered and their hybridization is investigated. The results are based on previous projects, literature research, partner experience, cruise ships in-service and under construction. The advantages and disadvantages of different technologies have been compared in different aspects.

For various SOFC, PEMFC and BAT products that have been commercially available or are about to begin mass manufacturing, the data are collected from their website publication, literature, and recent authoritative conferences, e.g., European Fuel Cell Forum. Their performances have been compared in the aspects of power capacity, power density, efficiency and lifetime. As for the vessels based on FC-BAT hybrid power system, the advantages and the disadvantages of ships with different power systems are elaborated with information collected from the literature.

Section 2 introduces and compares the power supply technologies, including SOFC, PEMFC and BAT. Section 3 introduces and compares different FC-BAT hybrid power systems for maritime application. Section 4 concludes this deliverable.

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