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LH_2CRAFT - SAFE AND EFFICIENT MARINE TRANSPORTATION OF LIQUID HYDROGEN

CALL: HORIZON-JTI-CLEANH2-2022-2

PROJECT NUMBER: 101111972

DELIVERABLE D9.2

AIP OF THE LH2 HDMSS

Work package	Related task(s)	Dissemination level	Document nature	Estimated delivery date
WP9	T9.2	Public	Document, report	12.12.2025

Lead author(s)	Contributing partner(s)	Reviewer(s)
Tsoukas Konstantinos (ABS)	(RINA), (UOS), (NTUA), (HYD), (UPAT), (TUD)	HyunChul Kim (KSOE) Nikoletta Trivyza (RINA)

DOCUMENT HISTORY

Version	Date	Author|Editor|Reviewer	Description
V0.1	09/12/2025	Tsoukas Konstantinos (ABS)	Initial version
V0.2	10/12/2025	HyunChul Kim (HD KSOE)	Review of document from KSOE
V0.3	11/12/2025	Nikoletta Trivyza	Review of document from RINA
V1.0	12/12/2025	Tsoukas Konstantinos (ABS)	Incorporation of reviewers' comments – Final version of deliverable

EXECUTIVE SUMMARY

This report contains the review letter issued following the review of the submitted documentation for the LH2 handling, distribution and monitoring subsystems (HDMSS). Due to confidentiality matters, the comment sheets are not included in this report but are only shared with the involved partners / designers of the systems.

Clean Hydrogen Partnership
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1 INTRODUCTION

LH2CRAFT aims to develop next-generation, sustainable, and safe solutions for large-scale liquid hydrogen (LH_2) storage and long-distance transport for commercial vessels. As part of the LH2CRAFT project, ABS has reviewed drawings and documentation from the designers of the LH2 handling, distribution and monitoring subsystems, in accordance with the ABS Rules and Requirements, and relevant international regulations, as specified in the Review Letter included in Section 2.

The purpose of the review for "Approval in Principle" is to investigate the feasibility of the conceptual design and identify any major deficiencies that would prove problematic in a full ABS review of the design for classification.

2 REVIEW LETTER

Electronically published by ABS Piraeus.
Reference WO0359349, dated 12-Dec-2025

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Work Order – WO0359349
Engineering Design Process for the LH2CRAFT
HDMSS Auxiliary Systems
Approval in Principle for LH2CRAFT Project

Attention: Mr. Astrinos Papadakis, Hydrus Engineering (WCN: 402013)

The documents shown in the attached list are reviewed in accordance with the applicable requirements of the following:

- ABS Rules for Alternative Arrangements, Novel Concepts and New Technologies, 2024
- ABS Rules for Building and Classing Marine Vessel Rules, 2023
- ABS Requirements for Liquefied Hydrogen Carriers, 2023
- ABS Requirements for Hydrogen Fueled Vessels, 2023
- IMO International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)
- IMO Resolution MSC.565(108) – Revised Interim Recommendations for Carriage of Liquified Hydrogen in Bulk
- IMO CCC 11/WP.9, Annex 1, Draft Amendments to Revised Interim Recommendations for Carriage of Liquefied Hydrogen in Bulk

Please note our review is based on the following conditions:

1. Our review of the drawings in the attached list is for "Approval in Principle". The purpose of the review for "Approval in Principle" is to investigate the feasibility of the conceptual design and identify any major deficiencies that would prove problematic in a full ABS review of the design for classification. The proposed design concept is acceptable in principle.

2. Please be advised that our review is based on a general overview of the concept design rather than a detailed analysis and note that the final detailed design will need to be verified against the Rules, Guides and Statutory Guidelines or Regulations at the time of construction.

3. It should also be noted that our review at this time in no way precludes any further amendments and comments which may be deemed necessary during the review for final approval.

4. Please note that in this instance, ABS is not acting on behalf of any Flag State or Coastal State Authority since there is no specific agreement or delegation in place.

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Figure 1. ABS review letter for the approval in principle of the LH2 HDMSS Concept (1/3)

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5. It is noted that the submitted electrical drawings (i.e., one-line diagrams and alarm and monitoring connection diagrams) are preliminary (i.e., details of electric cables, protective devices are not included, certification of equipment, etc.) and accordingly, review of these drawings is not covered by this assessment. Vessel's specific details are to be submitted during the review of the final approval.

6. The vessel's specific details (e.g., fire safety plan, general arrangement plan, interconnection of the systems associated with LH_2 piping systems with the vessel's systems, etc.) are not covered by this assessment. Vessel's specific details are to be submitted during the review of the final approval.

Based on our review, a list of comments generated during the review has been compiled and is enclosed herewith as Appendix 2 for your information. This document suggests areas of further engineering that we would expect to be addressed during the next design stage and do not require a response in this stage.

For any clarifications, contact Mr. Konstantinos Tsoukas at +30-2109441136 or ktsoukas@eagle.org, or Mr. Evangelos Kourtis at +30 210 9441142 or EKourtis@eagle.org.

Very truly yours,

Pier Carazzai
Vice President of Engineering

Electronically Signed by: Anastasios Dionysatos

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1, Sachtouri Street & Poseidonos Avenue | Kallithea, GR-176 74 Greece

Figure 2. ABS review letter for the approval in principle of the LH2 HDMSS Concept (2/3)

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Appendix 1: Drawing List

Drawing No.	Rev. No.	Title	Status
LH2CRAFT-GD-02	00	Hazardous Area Plan (*)	Reviewed
LH2CRAFT-GD-03	00	Preliminary Fire Plan (*)	Reviewed
LH2CRAFT-HDMSS-04	00	Piping and Instrumentation Diagrams	Reviewed
LH2CRAFT-HDMSS-13	00	Fire and Gas Detection System	Reviewed
LH2CRAFT-GD-01	-	General Arrangement (*)	Reviewed
LH2CRAFT-HDMSS-01	00	Process Flow Diagrams (PFD)	Reviewed
LH2CRAFT-HDMSS-02	00	System Schematics	Reviewed
LH2CRAFT-HDMSS-03	0.1	Preliminary Material Specification for the HDMSS	Reviewed
LH2CRAFT-HDMSS-05	02	Cargo Operation Modes	Filed by ABS for Reference Only
LH2CRAFT-HDMSS-12	00	Preliminary ESD and Safety Systems	Reviewed
LH2CRAFT-HO-01	1.0	Preliminary Operation Manual	Filed by ABS for Reference Only
LH2CRAFT-RA-01	1.0	LH2CRAFT Risk Assessment Plan	Filed by ABS for Reference Only
LH2CRAFT-HDMSS-11	00	Wiring Diagram of Alarm and Monitoring Connection Diagram	Filed by ABS for Reference Only
LH2CRAFT-HDMSS-10	00	Preliminary Electric One-Line Diagrams	Filed by ABS for Reference Only
-	-	Appendix – List of Drawings/ Documentation Index for the HDMSS	Filed by ABS for Reference Only

Electronic copies of the documents, appropriately stamped, are available in the ABS MyFreedom™ Client Portal.

(*): Our review of these drawings is limited only to the specific parts associated / affected by the installation of LH_2 systems.

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Figure 3. ABS review letter for the approval in principle of the LH2 HDMSS Concept (3/3)

3 CONCLUSION

Upon completion of the review the submitted documentation relevant to the HDMSS, submitted by Messrs Hydrus Engineering, the ABS letter with Work Order No: WO0359349 dated 12 December 2025 was issued. This includes the list of submitted drawings as well as their stamping status and the list of conditions.

The proposed design concept is in principle acceptable.