

News & Updates

Vol. 5 - January 2026

Introduction of this volume

Welcome to the fifth edition of the LH₂CRAFT newsletter.

During this period, the LH₂CRAFT consortium continued to make important progress towards the development of safe, efficient, and scalable solutions for the maritime transportation of liquid hydrogen. This edition reflects a particularly active phase of the project, bringing together major technical developments, safety assessments, scientific dissemination, public engagement, and strong collaboration across the consortium.

Partners advanced work on material testing under cryogenic conditions, the structural assessment of the membrane-type Cargo Containment System, the preliminary design of the LH₂ carrier, alternative containment-system integration, modular and scalable Handling, Distribution and Monitoring Subsystems, hydrogen propulsion interfaces, and system-level analysis of the Cargo Containment System. The project also achieved two important Approval in Principle milestones for the Cargo Containment System and the LH₂ Handling, Distribution and Monitoring Subsystems.

At the same time, LH₂CRAFT strengthened its visibility through conference participation, scientific publications, public engagement activities, a joint workshop on sustainable alternative marine fuels, and the 4th General

Assembly Meeting, hosted by the School of Naval Architecture and Marine Engineering of the National Technical University of Athens.

This issue brings together the key achievements from this period and highlights the project's continued contribution to the development of clean, safe, and sustainable maritime transport.

In This Issue

This edition brings together the latest technical developments, safety advances, scientific dissemination activities, public engagement initiatives, and consortium milestones achieved by LH₂CRAFT. It reflects the project's continued progress towards safe, efficient, and scalable solutions for liquid hydrogen storage and transportation at sea.

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LH₂CRAFT Aims and Objectives

LH₂CRAFT aims to deliver a safe, scalable, and economically viable containment system for liquid hydrogen (LH₂) storage onboard commercial vessels. At its core, the project is developing a membrane-type storage solution, with the goal of validating a 10ton prototype that meets both operational and regulatory requirements.

As the project enters its third year, LH₂CRAFT remains focused on:

- Advancing the detailed design and risk evaluation of LH₂ containment systems
- Supporting life cycle and sustainability assessments
- Ensuring modular scalability to meet diverse vessel types and capacities
- Aligning with regulatory frameworks and classification standards
- Facilitating knowledge exchange and cross-sector innovation through the Knowledge Hub

These objectives align with the EU's broader mission to accelerate maritime decarbonisation and establish global leadership in clean energy technologies for shipping.

New to the LH₂CRAFT project? Find out more about the project at: www.lh2craft.eu



Source: HD KSOE

LH₂CRAFT 4th General Assembly Meeting Held at the School of Naval Architecture and Marine Engineering -(NTUA)



LH₂CRAFT GA Meeting in Athens

The LH₂CRAFT consortium convened its 4th General Assembly Meeting on 26–27 November 2025 at the School of Naval Architecture and Marine Engineering of the National Technical University of Athens. Over two days, project partners came together for constructive discussions, technical exchange, and forward planning, with a strong focus on coordinating activities across all work packages and preparing for the next stages of the project.



LH₂CRAFT 4th General Assembly: Work Package Progress and Technical Discussions

During the meeting, partners reviewed progress achieved to date, assessed upcoming milestones, and discussed detailed technical developments related to the cargo containment system, insulation materials, design and manufacture of the small-scale test model, and prototype assembly. Presentations covered contributions from all work packages, alongside dedicated sessions for open discussion on engineering design, testing strategies, performance expectations, and system integration within the hydrogen marine storage system.

In parallel, the consortium held coordinated discussions on dissemination, communication, exploitation planning, and intellectual property strategy, reflecting the project's growing maturity and external engagement.



LH₂CRAFT 4th General Assembly: Work Package Progress and Technical Discussions

The consortium warmly thanks the School of Naval Architecture and Marine Engineering at NTUA for hosting the meeting and for the excellent organisation and hospitality. Special appreciation is extended to the academic

staff, researchers, and students who supported the meeting, contributed to the presentations, and guided partners through the laboratory facilities.

The meeting marked an important step in aligning the consortium's next activities, strengthening collaboration among partners, and advancing the research, testing, and system development needed to support safe and efficient liquid hydrogen transport.

[Read more](#)

Highlights from the SAFeCRAFT and LH₂CRAFT Workshop on Sustainable Alternative Marine Fuels

The SAFeCRAFT and LH₂CRAFT projects successfully co-organised a dedicated workshop on Sustainable Alternative Marine Fuels, hosted by the School of Naval Architecture and Marine Engineering at NTUA on 25 November 2025. The event brought together more than 80 participants from academia, industry, research organisations, and the wider maritime community.



LH₂CRAFT and SAFeCRAFT Workshop in Athens participants

The workshop aimed to foster dialogue on the transition towards zero-emission maritime transport and to highlight the technological, regulatory, and operational challenges associated with the adoption of next-generation marine fuels. The strong attendance and active engagement demonstrated the growing interest and momentum across sectors in advancing safe and sustainable fuel solutions for the maritime industry.



LH₂CRAFT and SAFeCRAFT projects workshop collaboration

Presentations were delivered by experts from the projects and industry partners, addressing regulatory frameworks, sustainability approaches, and industry perspectives on alternative fuels. Discussions covered hydrogen, ammonia, methanol, Liquid Organic Hydrogen Carriers, safety considerations, tank design adaptations, sustainability drivers, and practical industry experiences.



LH₂CRAFT and SAFeCRAFT workshop presenters Mr Maccari, Prof. Fillipatos, Mr Papadakis and Mr Petousis

The workshop highlighted the strong alignment between SAFeCRAFT and LH₂CRAFT, reinforcing the value of collaboration between EU-funded initiatives working toward shared goals in maritime decarbonisation. The event served as a valuable platform for knowledge exchange, networking, and the identification of future avenues for joint activities.



LH₂CRAFT and SAFeCRAFT workshop highlights

The consortium warmly thanks the School of Naval Architecture and Marine Engineering at NTUA for hosting the event, as well as all speakers and participants for their valuable contributions.



LH₂CRAFT and SAFeCRAFT workshop presenters

[Read more](#)

Technical Developments

Tasks 3.3 and 3.4 | Advancing Material Testing for the LH₂ Cargo Containment System

The LH₂CRAFT consortium is progressing with the testing and assessment of the structural and insulation materials that will form the project's liquid hydrogen Cargo Containment System.

Under Task 3.3, led by the School of Naval Architecture and Marine Engineering-NTUA, the work focuses on stainless-steel materials expected to form the containment barriers, including 304/304L and 316/316L alloys. The testing programme assesses key properties such as strength, stiffness, fatigue behaviour, fracture toughness, thermal conductivity, and resistance to hydrogen embrittlement under cryogenic conditions. Both welded and unwelded specimens are being considered.

Significant progress has already been achieved. Deliverable D3.2 Part B has been formally issued following the incorporation of ABS comments, and the testing plan has been finalised. Stainless-steel plates from Korea have arrived at the School of Naval Architecture and Engineering-NTUA and are currently being tested, while welded specimens have also been received and are being machined. Tensile testing at room, low, and cryogenic temperatures has been completed, together with selected slow strain rate tests carried out by the School of Naval Architecture and Marine Engineering-NTUA, AAC, and IFAM for different pre-treatment conditions. Liquid hydrogen immersion testing at TUD confirmed no hydrogen uptake over a 15-day period through thermal desorption spectroscopy analysis, while an alternative cathodic hydrogen-charging procedure has also been approved by ABS. Current activities focus on hydrogen charging at the School of Naval Architecture and Marine Engineering-NTUA, processing the available test results, and preparing for fatigue testing.

In parallel, Task 3.4, led by Technische Universität Dresden, addresses the assessment and testing of candidate insulation materials and their bonded connections. The materials under consideration include polyurethane foams, vacuum insulation panels, materials used for boxing and modularising the insulation, and bonding solutions for attaching the insulation boxes to the ship's steel structure. The testing will evaluate mechanical strength, stiffness, fatigue cracking, thermal behaviour, and compatibility with liquid hydrogen.



Insulation materials testing

The current focus is on finalising the comprehensive test plans and preparing the candidate materials for testing under cryogenic conditions. This work will help determine whether the selected materials are suitable for the safe and long-term storage of liquid hydrogen onboard vessels.

[Read more](#)

Task 3.5 Structural Safety Assessment of the Membrane-Type LH₂ Cargo Containment System

Under Task 3.5, led by HD-KSOE, the LH2CRAFT project has carried out a comprehensive numerical assessment of the membrane-type Cargo Containment System (CCS) concept being developed for the future large-scale transportation of liquefied hydrogen.

Supporting the conceptual design phase, the study evaluated the thermal performance and structural integrity of key CCS components under representative operating conditions. A comprehensive finite element analysis programme covered standard insulation panels, corner panel arrangements, and membrane structural details.

The analyses considered the combined effects of cryogenic temperatures, vacuum conditions, cargo loading, ballast conditions, and hull deformation to assess the suitability of the proposed CCS architecture for liquid hydrogen service.

The results confirmed that the proposed insulation system can provide the required thermal protection while maintaining adequate structural reliability under the investigated loading scenarios. Particular attention was given to complex corner regions, where thermal and mechanical behaviour differs from that of standard flat panels. The assessment demonstrated that suitable structural arrangements can be achieved in these geometrically challenging areas while preserving the overall performance of the system.

Dedicated analyses were also conducted to investigate the structural behaviour of membrane corrugations under representative pressure-

loading conditions. These studies provided valuable engineering insight into the response of the membrane structure under extreme loading scenarios and supported the establishment of appropriate design margins for future development stages.

Overall, the results confirm the technical feasibility of the proposed membrane-type CCS concept and provide a quantitative engineering basis for subsequent detailed design activities, prototype construction, experimental validation, and future classification approval processes.

The deliverable represents an important milestone in the development of safe and efficient liquid hydrogen cargo containment technologies for next-generation hydrogen carriers.

[Read more](#)

T 4.1 Key Progress in Preliminary Vessel Design

Significant progress has been achieved in the development of the innovative liquid hydrogen (LH₂) carrier, marking another important milestone in the project's mission to enable safe, efficient, and sustainable hydrogen transportation by sea.

Building on the foundations established during the early stages of the project, the engineering teams successfully initiated the preliminary ship design process while incorporating insights from comprehensive risk and safety assessments. Preparatory activities, including dedicated hazard identification workshops and the completion of the high-level specifications for the Liquid Hydrogen Cargo Containment System (LH₂ -CCS), have ensured that safety and operational excellence remain central to the vessel's development.

The preliminary design leverages the proven characteristics of modern large-capacity LNG carriers while adapting them to meet the unique challenges associated with transporting liquid hydrogen. By combining established maritime engineering practices with the specific physical and technical characteristics of hydrogen, the project is creating a vessel concept capable of supporting the emerging clean energy economy.

A major focus during this reporting period has been the optimization of the vessel's principal dimensions and operating characteristics. Engineers investigated the possibility of reducing the ship's design draught, taking advantage of liquid hydrogen's substantially lower density compared with liquefied natural gas. Extensive simulation-

based modelling confirmed that this innovative approach is technically feasible while maintaining essential performance, structural integrity and safety standards.

Using advanced naval architecture software and 3-D modelling tools, the project team developed and refined a detailed virtual representation of the vessel. Comprehensive analyses examined hydrostatic performance, intact stability, visibility requirements, propeller immersion, and structural strength under a variety of operating conditions. The results demonstrated that the proposed design successfully accommodates the necessary modifications to the Cargo Containment System while satisfying key engineering requirements.



Figure 1. The developed 3D hull form of the LH2 carrier

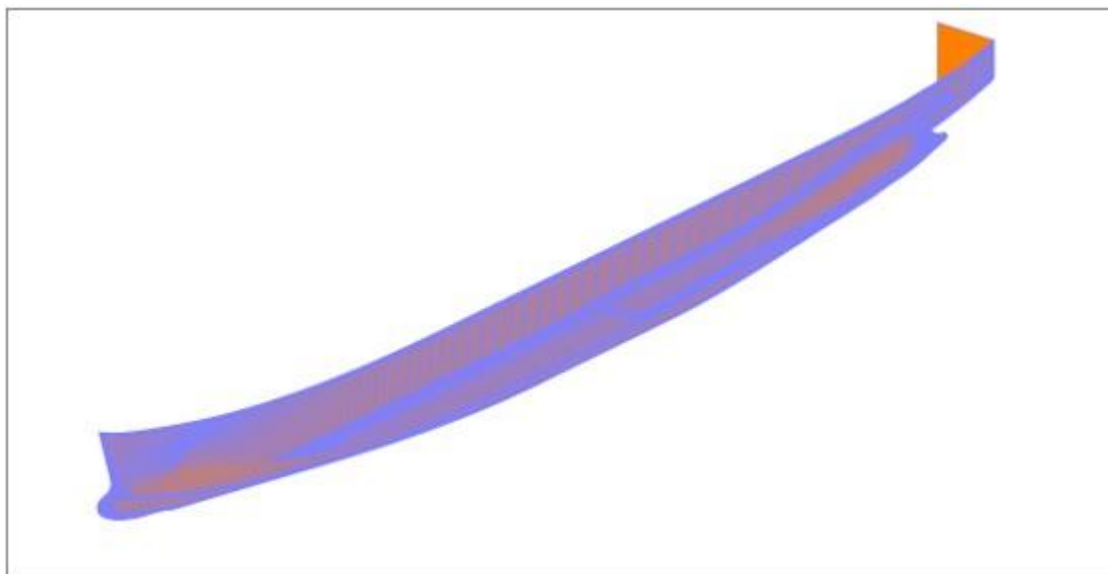


Figure 2. LH2 CCS for integration in the Hull design

The project has also integrated recommendations emerging from hazard identification activities directly into evolving engineering design. This proactive approach ensures that potential operational risks are addressed early in the development process, supporting the preparation of subsequent Hazard and Operability (HAZOP) studies and reinforcing the project's commitment to safety by design.

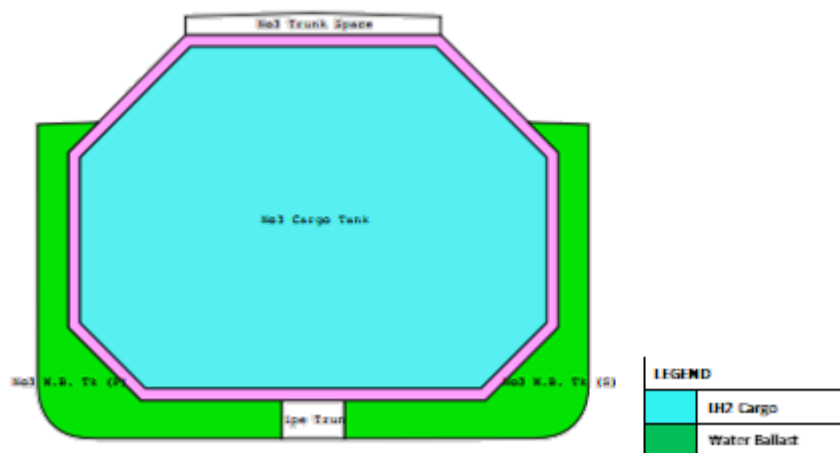


Figure 3. Cargo Tank Arrangement midship section

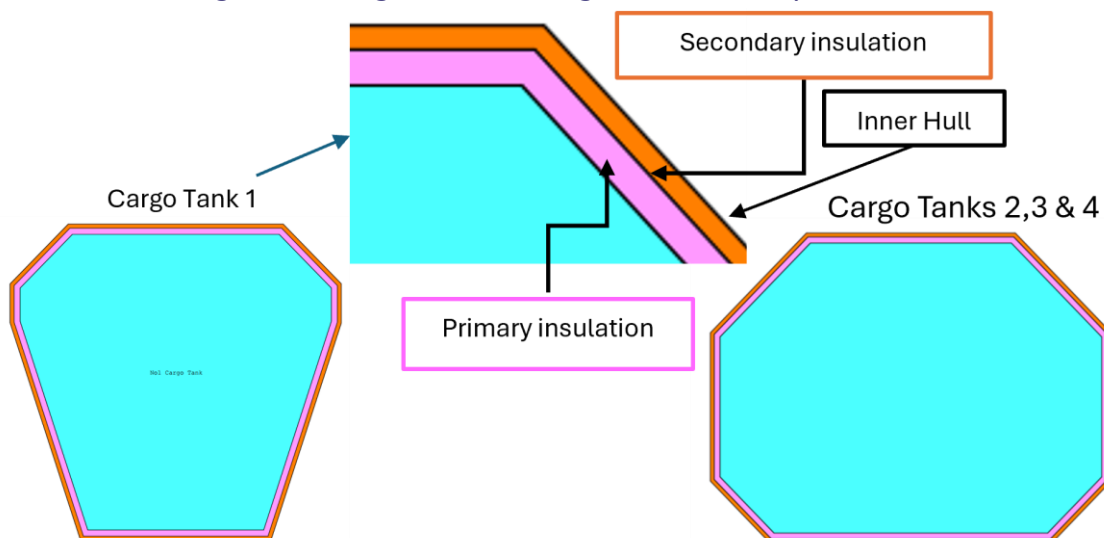


Figure 4. LH2-Cargo containment system representation

Attention is now focused on refining the propulsion system to ensure optimal performance under the revised vessel configuration. The associated partners of the project are conducting an extended assessment to identify the most suitable propeller solution capable of maintaining service speed, evaluating compatibility with the existing main engine, achieving the required propeller immersion, and

supporting efficient operations while accounting for boil-off gas management.

Through these achievements, the project continues to demonstrate how innovative engineering, rigorous safety analysis, and advanced digital design can come together to pave the way for the next generation of Hydrogen Transportation in the Maritime Sector.

[Read more](#)

Task 4.4 | Exploring Alternative LH₂ Cargo Containment Solutions for Different Ships

During this phase of the project, Task 4.4, led by HYDRUS, examined how alternative liquid hydrogen Cargo Containment System solutions can be incorporated into different types of ships and adapted to their specific operational needs.

The work considers several practical factors, including the size of the containment system, the type of vessel, the intended route, and whether liquid hydrogen will be transported as cargo or used as a marine fuel. The aim is to identify suitable approaches for integrating different storage solutions into ship hulls across a range of maritime applications.

The project has assessed several vessel categories, including tankers, bulk carriers, container ships, RoPax vessels, and double-ended ferries.

Different containment technologies have also been examined, including Type A tanks, Type C tanks, and membrane systems, to determine suitable integration options for each application.

c	Vessel Type	Approach	LH ₂ use	Potential Consumers	Containment type	Project Synergy
1	LH ₂ Carrier	NB	Cargo & Fuel (via BOG exploitation)	DF 2-S M/E [propulsion power]	Membrane type	LH ₂ CRAFT
2	LH ₂ Carrier (Qmax size)	NB	Cargo & Fuel (via BOG exploitation)	DF 4-S ICE Genset [electricity]	Membrane type & Type C [Double walled vacuum insulated]	LH ₂ CRAFT and <u>SAFeCRAFT</u>
3	SSS Tanker (incl. bunkering vessels)	Retrofit	Cargo	N/A	Type C [Double walled vacuum insulated]	N/A
4A	SSS Bulk carrier	Retrofit	Fuel	DF 4-S ICE Genset [electricity]		<u>SAFeCRAFT</u>
4B	OG Bulk carrier	NB	Fuel	DF 2-S M/E [propulsion power]	Type A [Prismatic tank]	<u>SAFeCRAFT</u>
5A	Container	Retrofit	Fuel	Fuel Cells + Batteries [electricity]	Type C [Double walled vacuum insulated]	<u>SAFeCRAFT</u>
5B	Container	NB	Fuel	DF 2-S M/E [propulsion power]	Type A [Prismatic tank]	<u>SAFeCRAFT</u>
6	Ro-Pax	Retrofit	Fuel	DF 4-S ICE Genset [electricity]	Type C [Double walled vacuum insulated]	<u>SAFeCRAFT</u>
7	Double Ended Ferry	Retrofit	Fuel	DF 4-S ICE Genset [propulsion power]		<u>SAFeCRAFT</u>

Figure 5. Desktop studies roadmap

This work supports the development of adaptable shipdesign solutions that can respond to different vessel sizes, operating profiles, routes, and commercial requirements while maintaining safety and

efficiency. Knowledge exchange with related research initiatives, including NH3CRAFT and SAFeCRAFT, has also supported the consideration of alternative design approaches.

By project Month 36, drawings had been completed for Cases 4A, 6, and 7. These cases involve liquid hydrogen stored in Type C tanks and used as fuel in dual-fuel, fourstroke engines for either ship propulsion or electricity generation.

[Read more](#)

Task 5.4 | Designing Modular and Scalable HDMSS Solutions for Future Vessels

As part of the LH₂CRAFT project, Task 5.4, led by the School of Naval Architecture and Marine Engineering at NTUA, is advancing the development of modular and scalable design features for the LH₂ Handling, Distribution and Monitoring Subsystems (HDMSS). The objective is to ensure that the system can be adapted to a wide range of vessel types and sizes, supporting both newbuild and retrofitting projects beyond the LH₂ carrier developed in WP4.

Building on the work carried out in WP5, the task evaluates key design principles, workflow parameters, and limitations against representative vessel cases defined in Task 2.4, addressing the use of liquid hydrogen as both fuel and cargo. For cargo-related applications, the analysis considers different containment solutions, including Type A, Type B, Type C, and membrane tanks installed on deep-sea and short-sea vessels. When LH₂ is used as fuel, the focus shifts to cargo

and passenger ships equipped with fuel cells or auxiliary generator engines.

A dedicated gap analysis will compare the HDMSS design developed in Task 5.1 with alternative Cargo Containment System concepts. This analysis will help identify design differences or confirm whether the LH₂ HDMSS workflow can serve as a reference baseline, contributing to the harmonisation and standardisation of LH₂ system design in maritime applications.

Through this work, Task 5.4 is developing a practical blueprint for modular and scalable HDMSS solutions, supporting ship designers, classification societies, and operators in adopting safe, flexible, and efficient LH₂ technologies for future maritime vessels.

[Read more](#)

Task 5.3 | Exploring Hydrogen Interfaces for Marine Propulsion

Within the LH₂CRAFT project, Task 5.3, Assessment of Main Propulsion Unit Interface, led by the School of Naval Architecture and Marine Engineering at NTUA, focuses on investigating the application of hydrogen as a fuel for marine propulsion systems.

The scope of Task 5.3 extends beyond hydrogen storage, examining current trends in the use of liquid hydrogen and compressed gaseous hydrogen across a range of propulsion technologies. These include internal combustion engines, fuel cells, and other eligible propulsion concepts relevant to maritime applications. The task explores the operational characteristics and technical challenges associated with these systems, their interfaces with auxiliary equipment, and their current and emerging use within the maritime sector.

In addition, the task considers alternative hydrogen carriers, such as Liquid Organic Hydrogen Carriers, evaluating their potential applicability and integration within marine propulsion systems.

The assessment is carried out in line with the Technological Readiness Level of each propulsion solution and is based on a comprehensive review of available literature and industry sources. The findings will be documented in Deliverable D5.2, Main Propulsion Unit Interface.

Through this work, LH₂CRAFT contributes to a clearer understanding of how hydrogen-based propulsion systems can be safely and effectively integrated into future maritime vessels.

[Read more](#)

Tasks 9.1 and 9.2 | Approval in Principle for the LH₂CRAFT CCS and HDMSS

LH₂CRAFT has reached an important technical milestone with the completion of the Approval in Principle activities for both the project's Cargo Containment System (CCS) and its Liquid Hydrogen Handling, Distribution and Monitoring Subsystems (HDMSS).

Under Task 9.1, Deliverable D9.1 presents the ABS review letter issued for the LH₂CRAFT Cargo Containment System concept following the assessment of the submitted drawings and technical documentation. The review confirms that the proposed CCS concept is considered in principle feasible, marking an important step forward in the development of safe and efficient solutions for large-scale liquid hydrogen storage and long-distance marine transportation.

The ABS assessment covered key documentation, including the system description, the provisional general arrangement of the CCS, insulation-space operating principles, structural and fatigue analyses, and the material test plan. The review was carried out against relevant ABS requirements, marine vessel rules, the IGC Code, and IMO interim recommendations for the carriage of liquefied hydrogen in bulk.

The Approval in Principle represents a concept-level assessment. The next stage will include addressing the remaining comments, reviewing additional documentation, and evaluating test results to support the continued development of the CCS concept.

Electronically published by ABS Piraeus.
Reference WO0361208, dated 08-Dec-2025

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**Work Order – WO0361208
Engineering Design Process for the LH2 CCS Concept
Approval in Principle for LH2CRAFT Project**

Attention: HD KSOE (HD KOREA SHIPBUILDING & OFFSHORE ENGINEERING) (WCN: 491131)

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

- ABS Requirements for Liquefied Hydrogen Carriers, 2023
- ABS Rules for Building and Classing Marine Vessel Rules, 2023
- International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk, as amended (IGC Code)
- IMO Resolution MSC.565(108) – 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 in principle feasible.

2. Please be advised that our review is based on a general overview of the concept.

*ABS Snapshot from the Approval in Principle review letter for the LH₂CRAFT
Cargo Containment System concept.*

Under Task 9.2, Deliverable D9.2 presents the ABS review letter issued following the assessment of the documentation submitted for the LH₂CRAFT HDMSS concept. The review confirms that the proposed design concept is considered in principle acceptable, supporting the project's progress towards safe and efficient liquid hydrogen storage and transport solutions.

Together, these Approval in Principle achievements provide important independent recognition of the project's design approach and establish a strong basis for the next stages of technical development, testing, and validation.



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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 Liquefied 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.

ABS Snapshot from the Approval in Principle review letter for the LH₂CRAFT Handling, Distribution and Monitoring Subsystems concept.

Together, these Approval in Principle achievements provide important independent recognition of the project's design approach and establish a strong basis for the next stages of technical development, testing, and validation.

[Read more](#)

Safety and Risk Assessment

Task 8.5 Advancing Safety in LH₂ Transport: Developing Guidelines for Cargo Containment Systems

As part of the LH₂CRAFT project, Bureau Veritas is leading Task 8.5, Development of Safety Assessment Guidelines and Recommendations for Cargo Containment System Design and Integration. This work focuses on the development of comprehensive safety guidelines addressing the specific challenges associated with the storage and transport of liquid hydrogen at sea.

The guidelines are being developed on the basis of a Formal Safety Assessment initiated by the University of Strathclyde, which provides the foundation of the project's safety framework. The transport of LH₂ introduces novel technologies, including new cargo containment system designs, and involves specific risks linked to its extremely low temperature, wide flammability and explosivity range, and low minimum ignition energy.

The Formal Safety Assessment includes a risk analysis study, the identification of operational hazards, and a quantitative risk analysis. These activities are intended to support the development of a robust methodology and actionable safety recommendations for the integration of cargo containment systems in hydrogen-fuelled vessels.

Through this task, LH₂CRAFT aims to contribute to the safe and sustainable deployment of LH₂ technologies in maritime transport, supporting designers, classification societies, and operators in addressing safety challenges associated with future hydrogen shipping.

[Read more](#)

Scientific Dissemination and Safety Research: Highlights from IMAM 2025

LH₂CRAFT partners contributed to IMAM 2025, the 20th International Congress of the International Maritime Association of the Mediterranean, held in Crete, Greece, from 28 September to 3 October 2025. The conference provided an important platform for presenting recent project research related to liquid hydrogen safety, containment technologies, material performance, and design considerations for future LH₂ carriers.

Enhancing Safety in LH₂ Shipping: New Insights into Hydrogen Dispersion and Vent Mast Design.

At IMAM 2025, Dr Injun Yang from the University of Strathclyde presented key findings from the LH₂CRAFT project in a presentation entitled *“Hydrogen Dispersion and Safety Assessment of Vent Mast Releases on an LH₂ Carrier in the LH₂CRAFT Project.”*



Dr Injun Yang from University of Strathclyde presenting at IMAM 2025

The presentation focused on the dispersion behaviour of hydrogen released through vent masts on liquefied hydrogen carriers. By combining computational fluid dynamics simulations with analytical modelling, the study assessed potential safety implications under different operational and environmental conditions. The analysis examined hydrogen-cloud formation, dilution patterns, and interactions with the surrounding atmosphere.

The research proposed an enhanced methodology for defining hazardous zones and establishing safe separation distances, offering valuable input for the safety assessment and design of LH₂ carriers. These findings represent an important contribution to LH₂CRAFT's broader objective of strengthening safety frameworks for hydrogen-powered maritime transport.

Conducted by Dr Injun Yang and Dr Hayoung Jang from the University of Strathclyde, this work supports the development of a comprehensive safety framework for future LH₂ ship operations and design standards, contributing to the transition towards cleaner, safer, and more sustainable marine energy systems.



Dr Yang and Dr Jang from University of Strathclyde presenting their paper at IMAM 2025

[Read more](#)

The School of Naval Architecture and Marine Engineering NTUA Presents Key Research on LH₂ Containment Materials at IMAM 2025

Members of the School of Naval Architecture and Marine Engineering of the National Technical University of Athens (NTUA) actively participated in IMAM 2025, presenting research on materials and technologies for liquid hydrogen containment systems.



Members from the School of Naval Architecture and Marine Engineering -NTUA participating at IMAM 2025

These contributions highlight NTUA's strong involvement in the LH₂CRAFT project, which focuses on the development of safe, efficient, and scalable containment solutions for hydrogen-powered vessels.

The NTUA presentations at IMAM 2025 included:

A review of material behaviour at cryogenic conditions towards their application in membrane-type LH₂ cargo containment systems, Authors: Stavroula Maritsa, Thodoris Mavrozoumis, Efstathios Platypodis, Anna Zervaki, Nicholas Tsouvalis.

Liquid hydrogen cargo containment systems: A focus on metallic barrier materials, Authors: Stavroula Maritsa, Ioannis Tzanetos, Maciej Szczerba, Magdalena Bieda, Joanna Wojewoda-Budka, Anna D. Zervaki.



Ms. Stavroula Maritsa presenting at IMAM 2025

Gaps in international codes and standards regarding material requirements and testing in cryogenic conditions for liquid hydrogen containment systems, Authors: Thodoris Mavrozoumis, Stavroula Maritsa, Anna D. Zervaki, Nicholas Tsouvalis.

The research addressed material performance at cryogenic temperatures, metallic barrier applications, and regulatory and standardisation challenges, all of which are critical aspects for the safe design and certification of LH₂ cargo containment systems.



Mr. Thodoris Mavrozoumis presenting at IMAM 2025

Together, these studies contribute to strengthening the scientific and technical foundation for next-generation hydrogen carriers, directly supporting LH₂CRAFT's mission to advance safe and sustainable hydrogen technologies for maritime transport.

[Read more](#)

Inspiring the Next Generation at the European Researcher's Night: NTUA Showcases the Future of Hydrogen Shipping

The School of Naval Architecture and Marine Engineering of the National Technical University of Athens participated in this year's European Researcher's Night, engaging visitors through interactive exhibits and innovative insights into the future of sustainable maritime transport.



Members from the School of Naval Architecture and Marine Engineering -NTUA participating at the European Researcher's Night 2025

Within the framework of the EU-funded LH₂CRAFT project, the School of Naval Architecture and Marine Engineering NTUA presented key aspects of its ongoing research on material testing and provided a comprehensive overview of the design principles behind liquid hydrogen carrier vessels. The presentations offered visitors a unique opportunity to explore how advanced engineering approaches and

emerging technologies are shaping the decarbonisation of the maritime sector.

The School of Naval Architecture and Marine Engineering NTUA exhibit attracted strong interest from students, researchers, and the general public, sparking lively discussions on the role of hydrogen technologies and innovative ship design in supporting Europe's transition towards zero-emission shipping.



Highlights from the European Researcher's Night 2025 at the School of Naval Architecture and Marine Engineering -NTUA

The consortium extends its sincere thanks to the organisers of the European Researchers' Night, the student volunteers, and all visitors who contributed their curiosity, enthusiasm, and insightful questions throughout the event.

The School of Naval Architecture and Marine Engineering NTUA's participation reflects the university's long-standing commitment to research excellence, innovation, and sustainability in marine engineering, as well as its mission to inspire and educate the next

generation of engineers driving the transformation of the maritime industry.

[Read more](#)

From Our Partners

Visit to the School of Naval Architecture and Marine Engineering at NTUA

During the LH₂CRAFT General Assembly meeting, consortium partners had the opportunity to visit the School of Naval Architecture and Marine Engineering at the National Technical University of Athens. The visit offered an in-depth look at one of Europe's leading environments for maritime education, hands-on learning, and applied research.

The School stands out for its strong integration of theoretical excellence and practical engineering experience, an approach clearly reflected in the wide range of laboratories, workshops, and large-scale testing facilities explored during the visit.

The tour began in School of Naval Architecture and Marine Engineering - NTUA's expansive industrial halls, where students gain direct exposure to shipbuilding structures, composite hull forms, prototype models, and historical maritime machinery. These spaces highlight the School's long-standing contribution to the advancement of naval architecture and marine engineering.



Visit at the School of Naval Architecture and Marine Engineering - NTUA industrial halls

A key highlight was the towing tank facility, where ship models are tested under realistic hydrodynamic conditions. This infrastructure

plays a central role in advanced research on resistance, seakeeping, and hull optimisation, supporting both academic research and industrial applications.



Visit at the School of Naval Architecture and Marine Engineering - NTUA towing tank facility

The consortium also visited the School of Naval Architecture and Marine Engineering - NTUA's engine laboratories, featuring fully instrumented propulsion setups used for research and education. Participants gained insight into modern propulsion and engine performance analysis, including exhaust systems, fuel injection lines, cooling circuits, and advanced monitoring equipment.



Visit at the School of Naval Architecture and Marine Engineering - NTUA engine laboratories

The School's strong expertise in materials engineering was showcased during visits to the Shipbuilding Technology Laboratory, where students and researchers work hands-on with metallographic specimen preparation, corrosion testing, hardness and microhardness testing, optical and advanced microscopy, scanning electron microscopy, welding facilities, non-destructive testing methods, composite materials, and structural integrity analysis.



Visit at the School of Naval Architecture and Marine Engineering - NTUA Shipbuilding Technology Laboratory

The visit also included demonstrations of large mechanical testing machines and strain monitoring systems, used to analyse material response, structural reliability, and component behaviour under real operational loads. Finally, the consortium visited the robotics laboratory, where industrial automation systems for manufacturing, inspection, and shipyard applications were presented.



Visit at the School of Naval Architecture and Marine Engineering - NTUA robotics laboratory

Overall, the visit highlighted the pivotal role of the School of Naval Architecture and Marine Engineering at NTUA in shaping the next generation of maritime engineers and strengthening research, development, and innovation across the European maritime sector.

The consortium extends its sincere appreciation to the academic staff, researchers, and students of the School of Naval Architecture and Marine Engineering - NTUA for their warm hospitality and for providing such a comprehensive insight into the School's impressive teaching and research activities.



Members of the School of Naval Architecture and Mechanical Engineering - NTUA

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