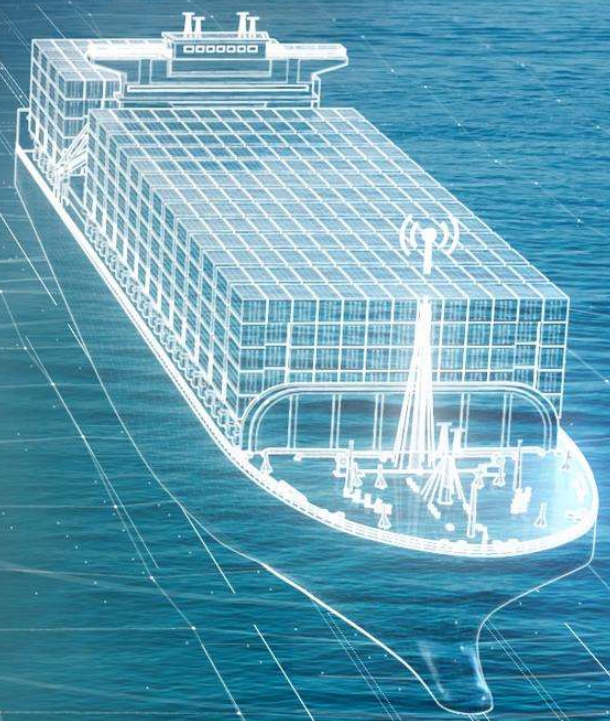
Hydrogen in the Maritime Industry

American Bureau of Shipping (ABS)



About ABS

The mission of ABS is to serve the public interest as well as the needs of our members and clients by promoting the security of life and property and preserving the natural environment

- Founded in 1862 by 9 U.S. marine insurance companies
- A Non-Profit Marine Classification Society
- No owners/shareholders, ABS Board of Directors are appointed from its Members
- ABS Members are the owners, operators, designers and builders of ships, offshore units and associated equipment
- ABS as a class society represents industry and helps:
  - Design
  - Construction
  - Operational maintenance
- Headquarters – Houston, Texas
- Employees: 4,000 globally, 1,300 U.S.
- 200 offices in 70 countries

Maritime Challenges and Opportunities

- **Ecosystem**
  - Maritime is a niche offtaker under Heavy Duty Transportation
  - Maritime transportation of H2 and H2-derived fuels may be a bigger priority than direct H2 use
  - Some early planning work may include maritime uses, but most early work will be on planning and permitting for H2 facilities
  - Delays and possible even political program funding challenges are not unlikely going forward – timing will be very difficult to predict.

- **Domestic Vessels**
  - Bulk hydrogen is not allowed to be carried in US waters (US Coast Guard's Marine Safety Manual for Carriage of Hazardous Materials, Chapter 3, Section B, Subpart 3; pg. F3-2)
  - Bulk Hydrogen need to be included in 46 CFR 154 – Safety Standards for Self-propelled Vessels Carrying Liquid Gases.

Hydrogen Products and Services

Publications

- **ABS *Requirements for Hydrogen Fueled Vessels***
  - Published **May 2023**
  - Notations:
  - **LFFS (FC-E – Hydrogen)**
  - **LFFS (FC-NE – Hydrogen)**
  - **LFFS (DFD – Hydrogen)**
  - **LFFS (SGF – Hydrogen**)
- **ABS *Requirements for LH2 Carriers***
  - Published **October 2023**
  - Notation: **Liquefied Hydrogen Carrier**
- **ABS Whitepaper for Offshore Production of Green Hydrogen**
  - Published **March 2023**
- **ABS Whitepaper for Hydrogen as Marine Fuel**
  - Published **May 2023**

New Technology Qualification / AIP

- **Rotoboost: AIP** for hydrogen production and use onboard
  - Completed June 2022
- **E1 Marine: NTQ** for the Hydrogen Generator using Methanol
  - Completed August 2022
- **KRISO** (Korea Research Institute of Ships & Ocean Engineering): **AIP** for the Design and Process Modules of Hydrogen Production Platform
  - Completed June 2023

Thank You

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