

PRESS RELEASE

Multi-sector Collaboration to Advance Maritime Energy Technology

Papenburg, March 17, 2023 – A ground-breaking research project involving Freudenberg e-Power Systems, the MEYER WERFT shipyard and Royal Caribbean Group is underway to develop a completely new fuel cell system tailored to the maritime sector. This has been a multi-year project aiming to create a maritime fuel cell system of an unprecedented scale, which will power Royal Caribbean Group's Nova class ships and represent a significant step toward achieving a net zero newbuild. At completion of the project, the fuel cell installation is intended to cover the full hotel load of a ship and allow for zero local emissions in port.

What has posed a considerable challenge, however, is the process to reform liquefied natural gas (LNG) to usable hydrogen at scale for a shipboard environment, which has delayed the onboard implementation of the project. The partners expect the first maritime demonstrator system will be completed later this year as work continues toward the full-scale application.

The undertaking of this complex project represents an evolution of how energy is generated and distributed on board, paving the way for a more innovative and sustainable future. The project has achieved important successes to evolve the use of fuel cells, including the approval of the maritime safety concept.

"We are bringing the best minds together to develop fuel cells at scale for the cruise industry by piloting the application on a Nova class ship and expect to complete the necessary approvals in line with IMO regulations later this year," said Thomas Weigend, Managing Director of MEYER WERFT.

“The strategic cooperation between Royal Caribbean, MEYER WERFT and Freudenberg e-Power Systems is groundbreaking for emissions reduction in the cruise industry. The combination of fuel cells providing high efficiency and a long lifetime with Freudenberg’s very powerful battery systems is tailored to the high demands of the maritime sector,” said Dr. Max Kley, CEO of Freudenberg e-Power Systems.

“Innovation is in our DNA and as pioneers in this industry, we comprehend the challenges that come with future proofing any new technology. To ensure seamless functionality and operability, the integration of this complex system in our ships is critical. Collaborations such as advance our sustainability journey and, together with MEYER WERFT and Freudenberg, we remain committed to supporting the continued research and development of this cutting-edge technology,” said Harri Kulovaara, Executive Vice President, Maritime for Royal Caribbean Group.

Currently under construction in Papenburg, Germany, Silver Nova is set to become one of the most sustainable cruise ships when she enters service in summer 2023.

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MEYER WERFT:

Founded in 1795 and based in Papenburg, MEYER WERFT GmbH & Co. KG is owned by the seventh generation of the Meyer family. The company, rich in tradition, employs more than 3,500 people. MEYER WERFT's extensive production program includes a wide variety of ship types, from cruise ships to gas tankers and research vessels to car and passenger ferries. In 2021, MEYER WERFT has announced its intention to build mega yachts as well. In order to survive in the global competition, the production facilities have been continuously improved and expanded. Today, MEYER WERFT has the most modern facilities in shipbuilding. For more information, visit www.meyerwerft.de.

About Freudenberg e-Power Systems

Freudenberg e-Power Systems is one of the world's leading suppliers of emission-neutral energy systems for heavy-duty applications. With its experience and expertise in battery and fuel cell technology, the company offers tailor-made solutions, in particular combined systems, for sustainable and economical e-mobility. With over 700 employees, Freudenberg e-Power Systems supports its customers from application development through to production, commissioning and service.

Royal Caribbean Group:

Royal Caribbean Group (NYSE: RCL) is one of the leading cruise companies in the world with a global fleet of 64 ships traveling to approximately 1,000 destinations around the world. Royal Caribbean Group is the owner and operator of three award winning cruise brands: Royal Caribbean International, Celebrity Cruises, and Silversea Cruises and it is also a 50% owner of a joint venture that operates TUI Cruises and Hapag-Lloyd Cruises. Together, the brands have an additional 10 ships on order as of December 31, 2022.

Learn more at www.royalcaribbeangroup.com or www.rclinvestor.com.