

Press Release

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Dominating Carbon Neutral Era through New Liquid Carbon Dioxide (LCO2) Carrier Development

- Preemptive Joint Development by POSCO, HMD, KSOE, LR & Liberian Registry

- To meet the maritime industry's needs for Large scale LCO2 Carriers to meet the demands of increased global carbon storage and utilization technology

POSCO, Hyundai Mipo Dockyard, Korea Shipbuilding & Offshore Engineering, Lloyd's Register and the Liberian International Ship & Corporate Registry jointly develop Liquid Carbon Dioxide(LCO2) Carriers to preoccupy carbon neutral market according to the transition to the hydrogen age.

At POSCO Center in Seoul, on August 27, a business agreement to jointly develop Liquid Carbon Dioxide (LCO2) Carriers was signed by delegations from HMD (Mr. Young-Jun Nam, Executive VP), LR (Mr. Young-Doo Kim, North East Asia TSO Manager), KSOE (Mr. Sang-Beom Shin, Senior VP), the Liberian Registry (Mr. Jung Sik Kim, Managing Director of Korea office) and POSCO (Mr. Sang-Chul Kim, Head of Energy and Shipbuilding Materials Marketing office).

Through this MOU, POSCO develops new steel material and relevant technology for storage tank, which are core technologies for the large size of LCO2 carrier, and HMD & KSOE develop the ship design and the necessary welding and processing technology for the ship construction. In addition, LR reviews and revises the relevant classification rules of the certification for the new steel materials and approves for the basic design of the ship and also, the Liberian flag State is in charge of all flag State approval procedures such as establishment of ship registration regulations and acceptance of ports entry.

With the global trend of carbon neutrality and the transition to ESG based hydrogen age in the future, the needs for technologies related to carbon dioxide capture, storage and recycling is growing. In particular, according to a report by the International Energy Agency in 2020, up to 40 million tons of CO2 is captured annually, and most of it is permanently stored in the geological formations or re-injected into oil wells to improve oil recovery. And the Global CCS Research Institute analyzed 90 scenarios of how much carbon dioxide should be captured and stored to reach net-zero emission. It was found that the capacity should reach 3.6 giga tons per year. Therefore, today, the global CCUS facility's capture capacity is only about 40 mega tons, so it is expected that the carbon zero goal will be realized only when the carbon dioxide capture and storage capacity is increased by about 100 times. However, there are still no international standards, guidelines and certifications for the large size of liquefied carbon dioxide carriers for transporting carbon dioxide to storage facilities, from materials to ship construction.

Through this agreement, the participating companies will develop the large size of CO2 carriers over 20,000 CBM (Cubic Meter) step by step by 2025, and at the same time, develop international standards

such as steel materials development, establishment & revision of necessary rules & regulations for ship construction and operation and further, to provide direction for the future. In addition, it is expected to create new demand in the future by building a barrier to entry through the preemptive joint development of the large size of CO2 carriers and filing patent applications for steel materials and technologies used.

In particular, POSCO develops the new steel materials that can withstand the low temperature and high pressure required by the large size of CO2 storage tanks, as well as welding materials and application technologies. HMD and KSOE are in charge of designing & manufacturing of the carriers, so it is meaningful in that 100% localized technology in Korea will be applied from steel material development and shipbuilding.

Mr. Sang-Cheol Kim, Head of POSCO's Energy and Shipbuilding Materials Marketing office said, "As a leading eco-friendly material company, POSCO strives to practice its corporate citizenship management philosophy to achieve a carbon-neutral society. In particular, through this joint development work, we expect to preoccupy the carbon-neutral market by developing new materials for the development of the large-scale CO2 carriers through close collaboration with customers and participating companies, and supporting technology for using steel materials."

Mr. Yong-Jun Nam, Executive VP of HMD said, "Through this practical research and development, all participating companies will be able to solidify their position as market leaders in the new market of the liquefied carbon dioxide carriers."

Mr. Young-Doo Kim, North East Asia TSO Manager of LR said, "This joint development is very meaningful as decarbonization technology innovation is also required in the shipbuilding and shipping industry to reduce global greenhouse gas emissions."

Mr. Alfonso Castillero, Chief Operating Officer of Liberian International Ship & Corporate Registry said, "This is a very important project for the entire maritime industry, as this type of vessel will be an important part toward the successful implementation of upcoming maritime environmental and emissions regulations. The industry needs to be forward looking and focused on leveraging technology to ensure that our industry continues to be as modern, safe, and efficient as possible. This project is a major step in this direction. We are proud to be the flag State administration included with these wonderful and professional partners."

- The Liberian Registry has a long-established track record of combining the highest standards of safety for vessels and crews with the highest levels of responsive and innovative service to owners. Moreover, it has a well-deserved reputation for supporting international legislation designed to maintain and improve the safety and effectiveness of the shipping industry and protection of the marine environment. www.liscr.com

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