

To all members of the press

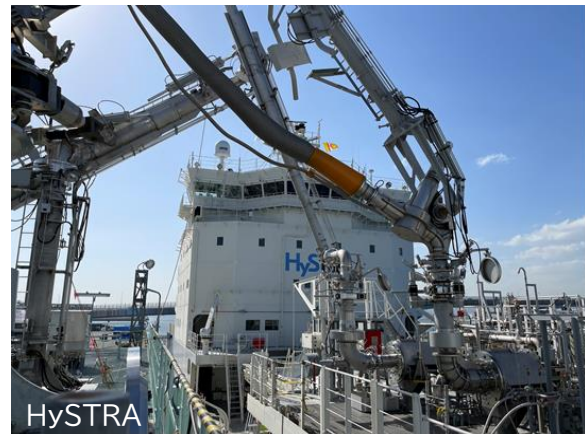
April 28, 2023
Tokyo Boeki Holdings Corporation

TB Global Technologies The World First Success !

loading and unloading of tubular steel loading arms for liquefied hydrogen

Tokyo Boeki Holdings Corporation (27F, 2-2-1 Kyobashi Edogrand, Chuo-ku, Tokyo; President: Hideshige Tsubouchi) and its group company, TB Global Technologies Ltd, (TBG), has succeeded in the loading and unloading of the tubular steel loading arms for liquefied hydrogen, which was developed in corporation with Kawasaki Heavy Industries, Ltd.

At the Kobe Hydrogen Terminal (Hy touch Kobe/HySTRA), the first loading and unloading of liquefied hydrogen was successfully completed on February 24, 2023 and March 4, 2023, respectively, using a steel pipe LA (bore diameter: 6") for liquefied hydrogen. This is the world's first successful loading and unloading of liquefied hydrogen using a steel-tube LA.



Loading arm for liquefied hydrogen in tubular steel being connected to a tanker.

The development of a steel-tube LA for liquefied hydrogen is considered essential for the construction of a supply chain for a future carbon-neutral society, and was initiated in FY2014 as one of the R&D themes of the Strategic Innovation Program (SIP) of the Cabinet Office.

To handle liquefied hydrogen (-253°C), which is even lower than LNG (-162°C), existing low-temperature technology alone was not enough. TBG has applied the vacuum double-walled pipe structure to the entire LA wetted pipe, and has taken measures against heat input and heat transfer in the swivel joints and ERS. The swivel joints and ERS have measures against heat input and heat transfer, and the current design specifications and structure have been achieved through repeated

trials and errors, including compatibility tests of sealing materials and tests with actual liquefied hydrogen solutions.

After five years of SIP project, the prototype passed the test in FY2018, was installed and delivered to the Kobe Hydrogen Station (Hy touch Kobe/HySTRA) in FY2022, and has now successfully completed its first loading and unloading. This is truly an accomplishment achieved by overcoming the challenges of unknown basic research and development.

We are pleased to share our achievement with all members concerned, HySTRA, who has promoted and implemented the Liquefied Hydrogen Supply Chain Demonstration Project; Kawasaki Heavy Industries, our joint development company; JAXA, who provided technical guidance on liquefied hydrogen technology and cooperation in the test base; and our partner companies who took on the challenge of new production together. TBG will continue to develop stable supplies of clean energy for a sustainable society.

TB Global Technologies Corporation HP <https://www.tbgtech.co.jp/>

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About Tokyo Boeki Group



Tokyo Boeki Group consists of Tokyo Boeki Holdings Corporation (27F, 2-2-1 Kyobashi Edoguran, Chuo-ku, Tokyo; President: Shusuke Tsubouchi), a holding company, and 14 operating companies, 15 in total, both domestic and overseas, which are with rich individuality.

We aim to become a group that continues to provide new value to the world by synergistically enhancing the presence and competitiveness of the entire group while each group company conducts independent corporate activities, based on the "spirit of management participated by all" as the core value, which is the common spirit of the group.

Tokyo Boeki Group will continue to innovate under a free and vigorous culture, without fear of change, and contribute to the realization and sustainability of a better society in which all stakeholders can lead safe and secure lives, economies, and social activities.

<https://www.tokyo-boeki.co.jp/>