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JGC Corporation
Yokogawa Electric Corporation

JGC and Yokogawa Team up to Develop Lunar Plant Control System That Will Support Ultra-remote Communications

JGC Corporation and Yokogawa Electric Corporation (TOKYO: 6841) announce the signing of an agreement on November 15 to jointly develop a control system that will support the ultra-remote communications required for the operation of plants on the lunar surface.

Initiatives aimed at exploring and developing the moon are already underway in many countries. For example, the Artemis project, a US-led manned lunar exploration program, is proceeding in partnership with 32 countries, including Japan (as of December 4, 2023). In addition, the Japan Aerospace Exploration Agency (JAXA) is considering a concept for a plant that will utilize water resources on the moon to produce hydrogen and oxygen for use by spacecraft and manned facilities. Considering the possibility that such a plant might be built on the lunar surface, JGC and Yokogawa have decided to leverage their technology and experience in terrestrial plant operation, remote monitoring, and control to research and develop the core underlying technology for a control system that will support communications at extreme distances.

The construction of such a system, which will be located at a ground station and integrate the communications, process control, and operation monitoring for a plant on the lunar surface, will need to take into account constraints such as the communication delay between the earth and the moon. This joint development will make use of JGC's know-how of energy plant control/operations and knowledge gained through the conduct of lunar plant studies, and Yokogawa's remote monitoring and control technology. The two companies plan to quickly move ahead with the design and construction of experimental equipment that can simulate these delays, then complete by the end of 2024 a study that will identify an optimal solution for a control system that will be capable of handling ultra-remote communications.

This joint development project will also look at whether this system can be utilized for plants and other facilities here on Earth. The separation of the heart of the control system (the controller that executes the control logic) from the equipment installed in the plant makes it possible to remotely control these plant facilities, giving plant owners greater flexibility in production planning and simplifying the task of plant maintenance.

JGC is actively engaged in lunar development activities. In April 2021, the company entered into an agreement with JAXA to collaborate in a conceptual study of a plant on the lunar surface that will produce propellants, and in November 2021 joined a lunar development project that is being conducted under the Japanese government's Stardust program.

Yokogawa has positioned space as a new business area that it will explore, and in July 2021 launched a dedicated

organization to develop the space business. In July 2023, Yokogawa and JAXA began a proof-of-concept study of a water pipe network monitoring solution that uses data from the ALOS-2 satellite, and the company is working on a wide range of business opportunities that will utilize space infrastructure for existing businesses.

About JGC

Through the execution of engineering, procurement and construction (EPC) projects, JGC delivers a variety of plants and facilities that support the clients' businesses. We have executed more than 20,000 projects in 80 countries around the world, and built up a high level of trust with clients worldwide. In the energy transition business, JGC's activities cover all aspects of oil and natural gas exploration and development from upstream to downstream. We have achieved a top global position in technological capabilities and results for LNG plants in particular. JGC leverages its engineering technologies and project management capabilities cultivated in the energy transition business to execute projects in the field of infrastructure, such as power plants, nonferrous metals, pharmaceuticals plants, and hospitals, both in Japan and abroad.

For more information, please visit <https://www.jgc.com/en/>

About Yokogawa

Yokogawa provides advanced solutions in the areas of measurement, control, and information to customers across a broad range of industries, including energy, chemicals, materials, pharmaceuticals, and food.

Yokogawa addresses customer issues regarding the optimization of production, assets, and the supply chain with the effective application of digital technologies, enabling the transition to autonomous operations.

Founded in Tokyo in 1915, Yokogawa continues to work toward a sustainable society through its 17,000+ employees in a global network of 129 companies spanning 60 countries.

For more information, visit www.yokogawa.com.

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Media contacts

JGC Holdings Corporation

Corporate Communications Group, Group Strategic Planning & Management Development Department

Webmaster@jgc.com

Yokogawa Electric Corporation

PR Section, Integrated Communications Center, Marketing HQ

yokogawa-pr@cs.jp.yokogawa.com