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Mitsubishi Electric Receives Order for Frequency Converter Station that Stabilizes Power Grid across Different Frequencies

Will help ensure stable power supplies across Japan by facilitating interconnection between the country's 50Hz and 60Hz networks

TOKYO, October 2, 2023 – [Mitsubishi Electric Corporation](https://www.mitsubishielectric.com) (TOKYO: 6503) has been awarded a contract by J-Power Transmission Network Co., Ltd. to supply a 300MW Voltage Source Converter (VSC) High Voltage Direct Current (HVDC) Transmission for the Shin-Sakuma Frequency Converter Station in Hamamatsu, Shizuoka prefecture. The system is expected to be in service by the end of March 2028.

In the wake of the 2011 Great East Japan Earthquake, the Organization for Cross-regional Coordination of Transmission Operators, Japan has undertaken wide-area servicing of power transmission lines in order to achieve more stable and efficient power supplies across Japan.

Electricity in Japan is supplied at two different frequencies; principally 50Hz in Eastern Japan and 60Hz in Western Japan. Since grids operating at different frequencies cannot be directly connected, frequency converter stations are required to exchange power between the two regions. The aim of this project is to enhance interconnectivity between them through the construction of a new 50/60Hz frequency conversion station on their border, part of the improvements being made to Japan's wide-area grid.

Mitsubishi Electric proposed a frequency converter station using VSC HVDC power transmission incorporating the latest generation of modular multi-level converters (MMCs) incorporating static synchronous compensator (STATCOM) technology. Modular multi-level converters utilize extremely efficient, high-performance, high-capacity insulated gate bipolar transistors (IGBTs), allowing more compact converter stations. The resulting high reliability and unique control technology were key factors in the awarding of this contract, and implementation of this project will help facilitate the interchange of power between Eastern and Western Japan.

Initiatives aimed at achieving carbon neutrality are accelerating around the world, and with the expansion in the use of renewable energy, there is a need for the development of high-capacity DC transmission facilities and stable power supplies. Mitsubishi Electric will continue to help improve the stability and efficiency of power systems in Japan and worldwide, aiming to create comfortable societies with access to safe and reliable supplies of electricity.

Product Features

Mitsubishi Electric's high-capacity MMCs equipped with IGBTs enable harmonic filter-less operation and help reduce power loss in frequency conversion equipment; they also allow converter stations to be more compact.

- The MMCs use the company's proprietary switching control technology and the system analysis derived from its experience of deploying STATCOM technology in power grids to suppress the generation of harmonics, obviating the need for harmonic filters.
- The latest MMCs are equipped with Mitsubishi Electric's high-performance, high-capacity IGBTs (6.5kV/1.0kA) which have a proven track record in Japan and overseas of reducing power loss at frequency converter stations.
- The application of harmonic filter-less MMCs equipped with high-performance, high-capacity IGBTs in self-excited frequency conversion equipment will reduce the footprint of the converter and enable more compact frequency converter stations.

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About Mitsubishi Electric Corporation

With more than 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better." The company recorded a revenue of 5,003.6 billion yen (U.S.\$ 37.3 billion*) in the fiscal year ended March 31, 2023. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥134=U.S.\$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2023