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## **Mitsubishi Electric to Begin Operating High-voltage Direct Current Verification Facility**

*Will launch global business for voltage-source converters based on HVDC system*

**TOKYO, November 13, 2018** – [Mitsubishi Electric Corporation](http://www.mitsubishielectric.com) (TOKYO: 6503) announced today that a high-voltage direct current (HVDC) verification facility that the company has built at its Transmission & Distribution Systems Center in Amagasaki, Japan will launch operation on November 26. The new verification facility will support the company's entry into the global market for voltage-source converters systems (VSCs). Mitsubishi Electric is targeting more than 50 billion yen (approx. US\$ 450 million) in global orders for HVDC-Diamond<sup>®</sup> systems by 2020.



Mitsubishi Electric's new HVDC verification facility

HVDC systems help to reduce CO<sub>2</sub> emissions by enabling the efficient integration and expanded use of renewable energies, including photovoltaic and offshore wind power. Mitsubishi Electric estimates that the global market for HVDC systems was worth about 770 billion yen (approx. US\$ 7 billion) in 2017 and is expected to grow by approximately 6 percent per annum. There are two types of HVDC systems—VSC systems and line-commutated converter (LCC) systems—of which the former does not require an external power source for commutation and the latter does. VSC-based HVDC systems are expected to attract greater demand because they require fewer conditions for connecting transmission lines.

Mitsubishi Electric is launching its VSC-based HVDC business to meet needs in the global market for modern power systems. Through its new verification facility, the company will offer highly reliable systems through verifying function and operation performance including a fault on the AC network and DC network with actual scale.

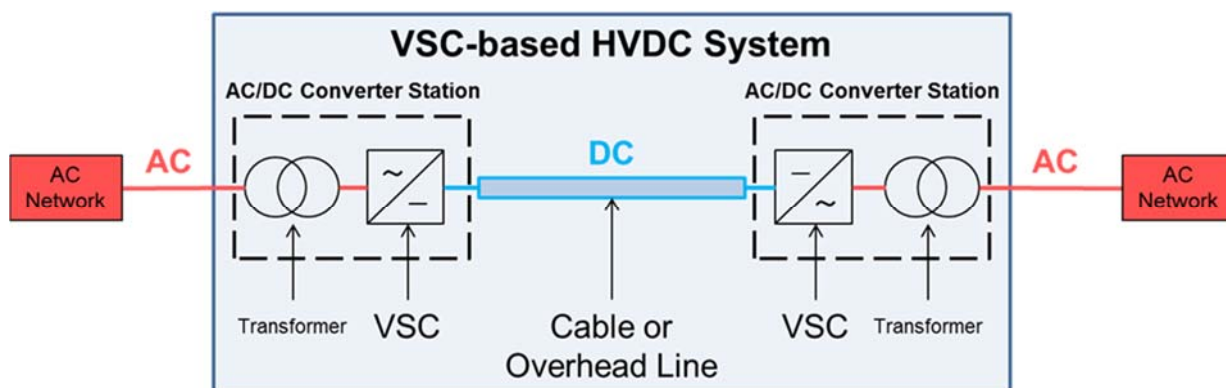
**New HVDC Verification Facility**

Location	8-1-1 Tsukaguchi Honmachi, Amagasaki, Hyogo Prefecture, Japan
Building Area	1,217.6 square meters (approx. 13,450 square feet)
Floor Space	1,767.8 square meters (approx. 18,300 square feet)
Structure	Two-story steel-frame
Start of Operation	November 26, 2018
Products	50MW VSC-based Back-to-Back System*
Main Facility	Converter, Control and protection, AC equipment

\*transfers energy between two converters in the same location

**About Mitsubishi Electric’s VSC HVDC-Diamond® System**

VSC-based HVDC systems consist of multiple AC/DC converter stations and DC connectors including cables or overhead lines. HVDC-Diamond® systems encompass equipment and technologies for the converter station and control and protection systems governing the HVDC system.



Example of VSC-based HVDC Configuration  
(simplified schematic above may vary from actual system configurations)

**Main Features of HVDC-Diamond®**

- 1) ***High reliability achieved with high-speed control and protection systems***
  - Optimized control functions and hardware configurations comply with system requirements for stable, continuous operation even during AC network failures, such as during lightning strikes.
  - High-speed protection systems guard all equipment from current overloads during DC network failures.
- 2) ***Reduced size, lower cost and expanded transmission capacity achieved with Mitsubishi Electric high-capacity power electronics***
  - Mitsubishi Electric’s high-voltage insulated-gate bipolar transistors (HVIGBTs) with high voltage insulation and high current rating reduce the number of VSC sub-modules required and thereby help to reduce converter station size and lower costs.
  - Parallel connection of power devices in each sub-module enables flexible designs to accommodate a wide range of power transmission capacities.

*HVDC-Diamond is a registered trademark of Mitsubishi Electric Corporation.*

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**About Mitsubishi Electric Corporation**

With nearly 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. Embracing the spirit of its corporate statement, Changes for the Better, and its environmental statement, Eco Changes, Mitsubishi Electric endeavors to be a global, leading green company, enriching society with technology. The company recorded consolidated group sales of 4,444.4 billion yen (in accordance with IFRS; US\$ 41.9 billion\*) in the fiscal year ended March 31, 2018. For more information visit:

[www.MitsubishiElectric.com](http://www.MitsubishiElectric.com)

\*At an exchange rate of 106 yen to the US dollar, the rate given by the Tokyo Foreign Exchange Market on March 31, 2018