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Sumitomo Electric Industries, Ltd.

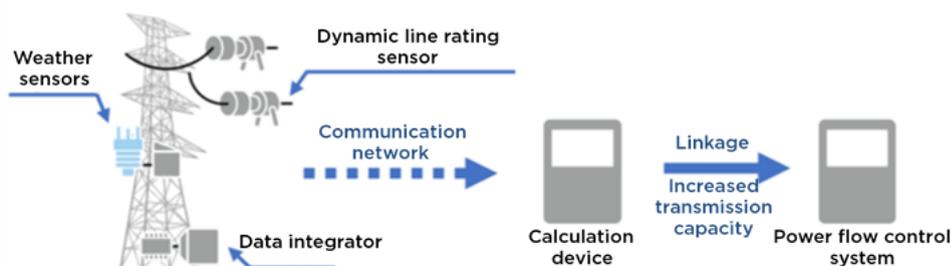
Sumitomo Electric and Hokkaido Electric Power Network Jointly Start Demonstration Test for Introduction of Dynamic Line Rating System

As a project to expand the introduction of renewable energy, in November 2022, Sumitomo Electric Industries, Ltd. and Hokkaido Electric Power Network, Inc. jointly started a demonstration test for the introduction of a dynamic line rating system in the Wakkanai area.

With the expansion of renewable energy, there is a growing need to increase the transmission capacity of the power grid. However, considering the large amount of cost and time required to replace or expand transmission lines, it is important to make effective use of the existing power grid.

For this reason, the dynamic line rating (DLR) system is attracting a lot of attention. This system is designed to measure in real time and dynamically calculate the transmission line temperature and current value, which affect the transmission capacity (the amount of electricity that can flow through the transmission line). By introducing this system to overhead transmission lines, it is expected to become possible to constantly monitor changes in the transmission capacity of the lines due to weather conditions and operate the existing power grid effectively according to the changes.

Sumitomo Electric will conduct a winter season demonstration test for the introduction of DLR systems into the power grid operated by Hokkaido Electric Power Network. The Company will also carry out tests to demonstrate the interconnection between this system and a power flow control system, which is designed to constantly monitor the electric power flow at existing power transmission and distribution facilities and control the power station not to exceed their capacity, aiming for effective use of renewable energy sources.



Configuration of the DLR system for the demonstration test

Outline of the demonstration test

Purposes	Confirmation of stable operation of equipment, data measurement, allowable current prediction, etc.
Period	November 2022 to October 2023 (scheduled)
Location	Wakkanai area (Sensors have been installed on three transmission towers.)
Sumitomo Electric products	DLR system (DLR sensor, weather sensors, data integrator, calculation device)

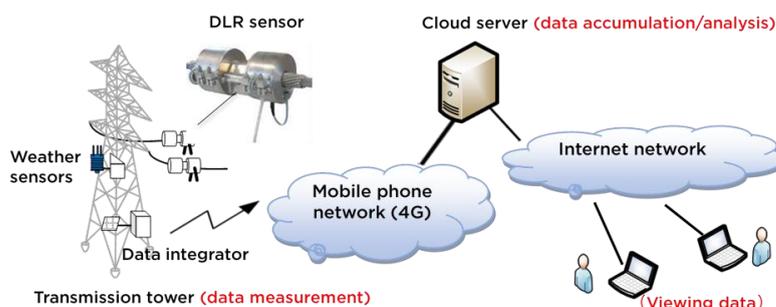
Technical features of Sumitomo Electric DLR system

(1) Sensing technology: A thermocouple is used as a temperature sensor to directly measure the conductor temperature. By installing the thermocouple away from the housing and armor rod, the temperature and current of the overhead line can be accurately measured. In addition, weather sensors (wind sensor, thermometer, and pyranometer) are installed on transmission towers to observe the weather in real time.

(2) Data transmission technology: A 920 MHz band private wireless network is formed between sensors. The radio system has a frequency hopping capability with a maximum hopping count of 50 hops. Data from the sensors is collected by the data integrator and transmitted to the cloud server through a closed mobile phone network. Thus, data can be transmitted to the office via the cloud server from anywhere as long as only the data integrator is within the mobile phone coverage area.

(3) Power supply to the equipment: The DLR sensor is powered by the current flowing through the overhead line. Therefore, there is no need to stop power transmission for battery replacement or other maintenance work, and the equipment can work without a dedicated power source.

(4) High weather resistance: The DLR sensor uses parts with long service life and high resistance to high temperature. The circuit board is waterproofed with silicone resin, and the housing is made of the same aluminum as that for overhead lines. In addition, it has a separate cylinder structure, which prevents corona discharge and is easy to handle, to ensure stable operation in harsh environments.



Basic configuration of Sumitomo Electric DLR system

News Release



Sumitomo Electric will verify the reliability of its products and services through this long-term demonstration test conducted jointly with Hokkaido Electric Power Network and continue to work toward the realization of a decarbonized society.