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## **TOWER LINK**

### **-Concept of Reliable and High Speed Communication Network for Real Time Analysis of the Power System Including a Huge Number of DERs-**

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#### **Abstract**

Electric power utilities must keep power quality well and continue stable operation of the power systems even when numerous distributed energy resources (DERs), such as solar or wind power generation whose output fluctuates with weather conditions, are connected to power grid.

Acquiring multi-point synchronous sampling data within the power grid enables understanding of the grid conditions in detail and makes it possible to construct a power grid Digital Twin system which simulates an optimal power flow control and feeds back the simulated results into actual grid operations.

In order to properly collect such multi-point instantaneous values in the power grid and to realize appropriate power systems operation based on the Digital Twin system, a high-speed, highly reliable communication network is required. Existing conventional communication network for electric power systems, which consists of optical ground wire (OPGW), optical fiber cable, and fixed microwave radio systems, has some issues related to fault tolerance or data transmission rate. Therefore, we have developed the TOWER LINK concept, which combines all photonics network technology being able to eliminate communication delay time fluctuations with high-speed millimeter- and terahertz-wave wireless technology to construct mesh communication network, to address these issues, and have begun research to realize it.

In this presentation, an overview of the TOWER LINK concept is provided.