Hybrid media utilization with optical fiber and radio communication technologies for smart grid

Shun Morimura
Central Research Institute of Electric Power Industry, Tokyo, Japan

Keywords : smart grid, passive optical network, wireless LAN, radio-on-fiber

Abstract

Communication networks for smart grid should have and hold connectivity to a vast number of terminals, high reliability, and availability for various communication applications. On the other hand, because communication media such as radio wave or optical fiber have advantages and disadvantages respectively, the communication networks for smart grid should be realized by combining these heterogeneous media appropriately. Thus, our laboratory has proposed a hybrid network configuration with combination of passive optical network (PON) and multi-hop function of wireless LAN, and is constructing an experimental environment at Akagi Testing Center in Gunma prefecture, Japan.

In addition, we also have proposed an integrated media communication as a future technology, which combines PON and the Radio-on-Fiber technique. Radio signals for smart grid applications can be multiplexed to existing access PON easily. By utilizing the integrated media technology, communication networks for smart grid can be extended promptly at low cost.