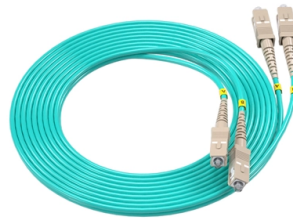


Application Scenarios of Temperature Measuring Optical Cables in Power Systems



Overview

The conclusions of this paper are summarized as follows: At the same radial position within the cable, the axial temperature difference measured by the fiber was much smaller than that of the thermocouple. The maximum temperature differences between the fibers and thermocouples at the segmental conductor center, insulation shield surface, and waterproof compound center were 4.9 °C, 3.2 °C, and 3.7 °C, respectively. The reason for the large differences was that the thermocouples were laid into the cable by manually drilling, and the actual radial position may be difficult to control accurately, while the laying environment of water for the cable may increase this effect. Therefore, the distributed optical fiber is more feasible and reliable for cable temperature measurement. To investigate the optimal radial-arranged-position of the optical fiber in the cross-linked polyethylene (XLPE) power cable, the fibers were arranged into three positions, including segmental conductor center, the insulation shield surface, and the waterproof compound center, respectively, and temperatures were measured based on the Brillouin optical time-domain reflectometry (BOTDR) technology while the thermocouples were arranged at the same positions mentioned above for comparison, respectively. Four cases of cable temperature rising experiments under the laying environments of duct and water were carried out. The conductor temperatures were calculated using the temperatures measured by the fibers at the insulation shield surface and waterproof compound center, and the difference. ••The temp...

Article Content

Power Cable Monitoring for Overheating

Optical fiber sensors can detect abnormal heating of power lines in cable trays and high voltage power cables in cable tunnels. They enable blind-spot-free monitoring—24 hours a day 365 days a ...

Application of Distributed Optical Fiber Temperature Measurement in ...

This paper studies a distributed optical fiber temperature measurement system using smart cables, which combines fiber Bragg grating arrays and multi-core commu

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Temperature Monitoring in Power Cables Monitoring System

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Application Research on Online Power Cable ...

Traditional thermocouple measurement fails to ensure real-time monitoring, risking cable operation. Leveraging Raman scattering principles, this ...

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