

Fiber optic cable systems are specified as the superior solution for High Voltage Protection (HVP) interfaces in the following industry standards:

IEEE-80 IEEE Guide for Safety in AC Substation Grounding

“The introduction of fiber optics to isolate the substation communications terminal from the remote terminal can eliminate the transfer of high potentials. Fiber optics should be considered when potentials cannot be easily controlled by more conventional means. Refer to IEEE Std 487 for more detailed information.”

IEEE-367 Recommended Practice for Determining the Electric Power Station Ground Potential Rise and Induced Voltage From a Power Fault

“Fiber optics are increasingly being used for relaying communication systems. They can be used as an HV interface device at the power station, only through the ZOI, or for the complete route.”

IEEE-487 Recommended Practice for the Protection of Wire-Line Communication Facilities Serving Electric Supply Locations

“All-dielectric fiber optic cables are immune to induction and other electrical effects.”

“Fiber-optic terminal equipment is an electronic-based system that requires power for both the CFJ end equipment and the OEI end equipment. To preclude the possibility of bridging the isolation protection with a power supply or source, this equipment, installed within the ZOI, is designed to be powered from two isolated sources; i.e., via the cable pairs at the CFJ end and ac/dc rectifier with battery backup at the OEI end.”

IEEE-1590 Recommended Practice for the Electrical Protection of Communication Facilities Serving Electric Supply Locations Using Optical Fiber Systems

“Effective electrical protection of the telecommunications outside plant may be accomplished by using an all dielectric optical fiber cable to serve electrical supply locations.”

“Serving the BTS equipment at a high-voltage tower or pole site using an all-dielectric optical fiber cable, from an electrical protection perspective, provides the simplest and most reliable solution to a complex problem”

IEEE-1615 Recommended Practice for Network Communication in Electric Power Substations

“Fiber optic cable is immune to the type of induced electrical noise found in a substation.”

“If communications must continue uninterrupted during the electrical transients defined in IEEE 1613, then it is recommended that all communication links longer than 2 meters be fiber.”

Motorola R56 Standards and Guidelines for Communication Sites

“Whenever practical, metallic telecommunications/data lines should be eliminated from the facility. Metallic telecommunications/data lines provide a conductive path into the facility for lightning energy. Elimination of metallic telecommunications/data lines through the use of fiber optic cable (or other isolation device) provides isolation from lightning-induced ground potential rise (GPR) and lightning energy.”

“It is recommended to have a CO, Dispatch center, etc. served by fiber optic T-1, T-3, OC-3, and higher capacities. This provides additional lightning protection by removing the copper connection from the phone company to the switch and provides optical isolation from ground potential rises (surges) that can occur on the copper connections.”

BR 876-310-100 BT (Telcordia) Electrical Protection of Communication Facilities Serving Power Stations

“Given the right combination of circumstances, the use of carrier operating over optical fibers may be the most cost-effective engineering solution to the problem of providing and protecting power station services.”

Bellcore SR-3966, Electrical Protection Considerations for Serving Wireless Facilities at High Voltage Towers

“Serving the wireless site on HV towers with optical fiber is the simplest and the most reliable option from the electrical protection viewpoint.”

Summary

Because of the citations and recommendations listed above, the power industry has pulled a vast majority of their critical circuits off copper facilities and placed them on fiber optic systems. Over the last 25-30 years, fiber optic systems have become the engineering first choice for critical circuits of all types, offering superior performance and safety.

Additional Information

We appreciate your interest in referencing industry standards and constantly strive to provide information to help you make informed decisions concerning fiber optic technology and safety. Please call RLH Industries, Inc. with any questions or comments at 800-877-1672 or contact us by email at info@fiberopticlink.com.