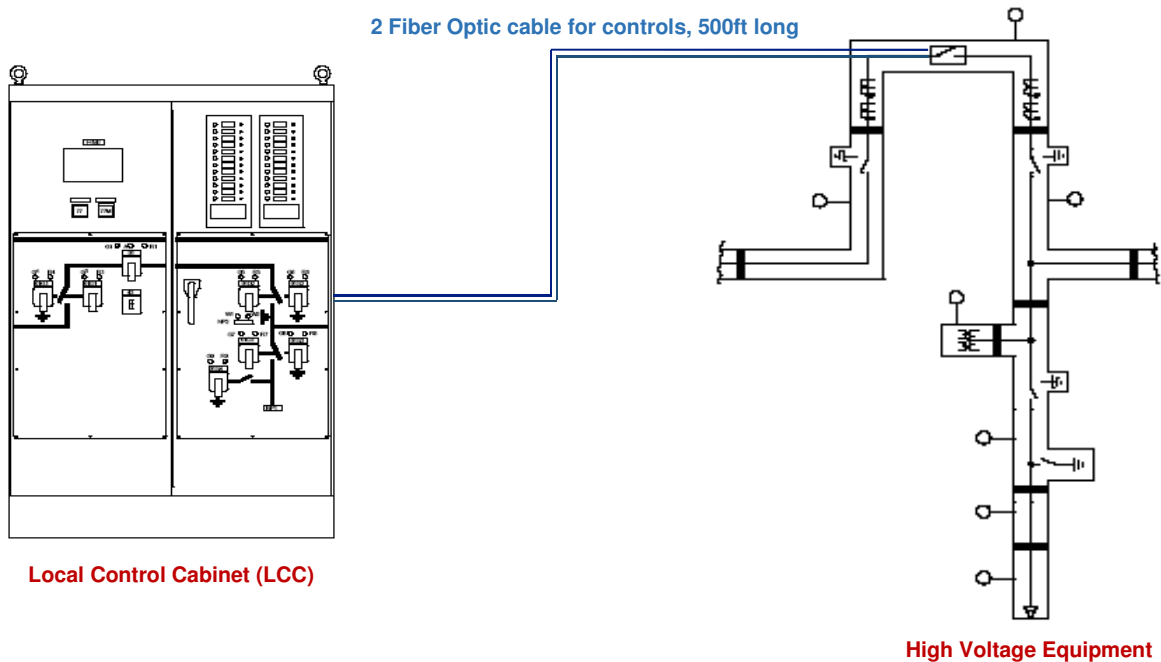


## FIBER OPTICS INTERFACE CONTROL OF HIGH VOLTAGE EQUIPMENT

Phoenix Electric is sponsoring a Capstone Project which would define, design and replace the control operation of high voltage equipment from our normal electrical control cabinets. New ideas would be analyzed, evaluated and implemented that would replace normal Electrical control wires with fiber optic systems. Cost evaluation would also be a consideration.

The goals would be to begin a fiber optic interface control that would be cost effective, functionally equivalent and reliable in comparison to electrical control, and finally electromagnetically immune to outside electromagnetic influences which will be defined.



We specialize in developing custom products, systems and solutions for the power transmission and distribution industry.

Phoenix Electric custom-engineers control, protection, and interlocking systems for leading medium- and high-voltage gas insulated switchgear manufacturers worldwide. These systems provide a reliable, user-friendly control interface for SF6 gas-insulated switchgear and generator/transmission power circuit breakers in accordance with ANSI/NEMA requirements. Control systems range in size and complexity from relatively small motor control equipment to large complex substation control and protection installations.

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All control philosophies and interlocking protocols conform to US utility standards and procedures for safe, reliable operation. Controls are manufactured using only readily available heavy-duty UL-listed components. Provided with the controls, complete ANSI drawings facilitate installation, commissioning, testing, maintenance, and troubleshooting.

The present issue is that copper wires are vulnerable to Electro Magnetic Interference (EMI). The interference in signal transmission or reception caused by the radiation of electrical and magnetic fields. While fiber optic cable can be immune to EMI or RFI caused by equipment/material failure or terrorism attack. Fiber optic cable is extremely durable and provides very reliable signal. Fiber does not conduct electricity because its core is made of glass. In glass, optical attenuation is much less than the attenuation of electrical signals in copper. Fiber can be immersed in water without affect and it can be used in much harsher conditions, power plants, as it is less susceptible to fluctuation in temperature than copper cables. It does not radiate signals and is almost impossible to be tampered with without the system getting corrupted, unlike copper cables Fiber optics offer an unrivaled level of security. Fiber optic cable is also much safer to install and maintain because it is non-conductive. Copper cable attracts lightning, heavier and harder to maneuver inside conduits and cable trays.

Engineering requirement for our project will be composed of two electrical engineers. The electrical engineers must be familiar with designing analog and/or digital circuits, testing and debugging electrical circuitry, this will require the use of such lab equipment as oscilloscopes, multi-meters, and soldering tools along with being able to understand data sheets. Students taking the Fiber Optics courses ELE401/402 will be preferred.

Proper application of fiber optic technology will lead to highly secure system. Engineers will choose proper products, design and install an appropriate fiber optic cable system, test components selected and ensure that system is immune to any interferences.

Phoenix Electric Corporation's vision is to be the recognized leader in the electric power industry for providing customized solutions tailored to specific customer transmission and distribution requirements, backed by unwavering client service.

For more information please contact us.

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