



Laboratory Safety Committee

Electrical Safety Subcommittee

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Determination of the Applicability of the National Electrical Safety Code (NESC ANSI-C2) to Medium and High Voltage Distribution at Fermilab

The installation, operation and maintenance of medium and high voltage AC electrical power distribution at Fermilab have long been conducted exclusively and effectively by the qualified persons of the FESS High Voltage Operations Group. This portion of Fermilab's AC distribution system is commonly considered to include the 345 kV and 13.8 kV transmission systems that are generally associated with a utility. This "utility" portion of the Fermilab system is considered to end at the "service point" where electrical power is connected to a structure or building.

The electrical safety related chapters of the Fermilab ES&H Manual (FESHM) do not specifically address procedures or practices that safeguard equipment and personnel related to this electrical utility at Fermilab. FESHM Chapter 5042 "AC Electrical Power Distribution System Safety" specifically addresses systems at the "customer" level operating between 50 and 600 VAC. The requirements of Chapter 5042 are distinguished "from those developed separately by FESS for higher voltage "utility" level systems at the Laboratory."

The scope of both the National Electric Code (NEC) NFPA 70 and NFPA 70E typically cover electrical installations beyond the service point. While some aspects of these standards can apply at the "utility" level, the National Electrical Safety Code is the more appropriate governing standard for utility power distribution. As detailed in the literature, the NESC standard "covers basic provisions for safeguarding of persons from hazards arising from the installation, operation, or maintenance of 1) conductors and equipment in electric supply stations, and 2) overhead and underground electric supply and communication lines. It also includes work rules for the construction, maintenance, and operation of electric supply and communication lines and equipment. The standard is applicable to the systems and equipment operated by utilities, or similar systems and equipment, of an industrial establishment or complex under the control of qualified persons."

As previously noted in Subcommittee discussions, the ESS as the local Authority Having Jurisdiction (AHJ) has the local authority to define the "utility" aspect of the Laboratory's AC Power Distribution System. In exercising this authority, the ESS as AHJ has determined that utility portion of Fermilab's AC distribution system includes the medium and high voltage AC electrical power equipment and transmission systems operating at nominal voltages of 13.8 kV to 345 kV. The ESS also has determined that the current version of the National Electrical Safety Code standard is the primary and best standard for the practical safeguarding of persons during the installation, operation, or maintenance of electric supply and communication lines and associated equipment associated with the "utility" portion of the Laboratory's AC Power Distribution System.