

BNL Line Crew Line - 2

Generic Procedures and Line Isolation Practice for 600 Volts and Above

The Laboratory Electrical Safety Committee (LESC) concludes that work by the BNL Line Crew would be more safely and effectively accomplished when following line isolating rules of the National Electrical Safety Code. In particular, the LESL determines that work requirements applying to the Line Crew include (1) permitting use by the BNL Line Crew of a generic work permit for isolating a line in BNL Ranges C and D, (2) permitting testing the line for isolation using lineman's tools and techniques, and (3) application of protective grounds using a hot stick upon verification that a line is de-energized through using proximity tools not involving direct contact with the line.

Discussion

Work on power systems for electrical transmission and distribution is much more hazardous than work on utilization systems. The tools and techniques are different, also, with work following rules of the National Electrical Safety Code (NEC) rather than NFPA requirements applying at low voltage (voltages below 600-volts). Under Section 1, Para. 011, NEC rules cover work practices employed by an electric supply utility, and "similar systems under the control of qualified persons, such as those associated with an industrial complex or utility interactive system." The distinction between these systems is blurred when significant power levels are involved, with work practices on low voltage systems tending to follow those on high voltage systems when multi-megawatt levels are involved. Such work practices typically involve performing tasks at a distance using insulated "hot sticks" and applying protective grounds before work on conductors, and performing these tasks while wearing appropriate PPE based on a flash hazard analysis.

As discussed in the BNL Line Crew - 1 interpretation by the LESL, certain work areas and jurisdictions of the BNL Line Crew are similar to that of a utility. Accordingly, the LESL recognizes that certain requirements applying to work electrical work throughout the balance of the Laboratory should be modified when work is performed by the Line Crew on equipment exclusively under their control. These modified requirements do not grant license to work in an uncontrolled manner. Rather, they acknowledge that work practices under the National Electrical Safety Code are more appropriate for the Line Crew work than practices applying to low-voltage systems.

Specifically, lockout/tagout on low voltage systems involves confirming a no-voltage condition through measuring by direct contact while using appropriate PPE. Work then proceeds under lockout/tagout with no further personal protection. In contrast, lack of voltage is confirmed on high-voltage systems using a proximity detector on the end of a hot stick, followed by using the

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hot stick for application of protective grounding before work is permitted. Reasons for using these techniques include the fact that power levels are often so high that no amount of personal protective gear will permit a worker to get close enough to apply meter leads directly to line conductors. Such work is routinely performed by the line crew and should be permitted under a generic procedure.

The LESC, as the Laboratory Authority Having Jurisdiction in electrical matters, and having thoroughly considered all issues related to this matter, concludes that work by the BNL Line Crew would be more safely and effectively accomplished when following line isolating rules of the National Electrical Code. In particular, the LESC determines that the Line Crew requirements include (1) permitting use by the BNL Line Crew of a generic work permit for isolating a line in BNL Ranges C and D, (2) permitting testing the line for isolation using lineman's tools and techniques, and (3) application of protective grounds using a hot stick upon verification that a line is de-energized through using proximity tools not involving direct contact with the line.

The LESC further believes that this instrument provides the *necessary and sufficient* documentation regarding this issue. This record of decision is *necessary* to support the unique work practices to be used by the line crew. It is *sufficient* to provide the required documentation without necessitating changes to BNL electrical safety standards. Including these work practices in generally-applicable BNL standards could lead to misinterpretation by the unique workforce, with the possible result of unqualified persons performing unsafe practices.