K. SAFETY INFORMATION K-1

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K.1 COMPLIANCE WITH APPLICABLE CODES AND STANDARDS

The projects' overhead transmission line facilities and any underground line variation would be constructed in full compliance with the standards of the National Electrical Safety Code (NESC), the Institute of Electrical and Electronic Engineers (IEEE), the American National Standards Institute (ANSI), good utility practice, and DPUC regulations covering the method and manner of high voltage line construction. Should the line experience a short circuit, high speed protective relaying would immediately remove the line from service, thereby protecting the public as well as the transmission line, associated substation equipment and the transmission system.

K.1.1 Emergency Operations and Shutdown

Should one of the lines experience an insulation or conductor failure, high-speed protective relaying would immediately remove the line from service, thereby protecting the public and the line. Should equipment at the substations experience a failure, protective relaying would immediately remove the equipment from service, thereby protecting the public and the equipment within the substations.

Protective relaying equipment is incorporated into the project design to automatically detect abnormal system conditions and send a protective trip signal to the respective circuit breaker(s) at each end of a line to isolate the faulted section of the transmission system. The protective relaying schemes include fully redundant primary and backup equipment so that an outage of one scheme does not require the portion of the transmission system being monitored by the protective relaying equipment to be removed from service.

Fiber optic strands would be installed within the lightning shield wires above the overhead line and in separate conduits for underground line construction. These provide a robust and reliable communications path for the protection systems. Additionally, the overhead transmission line facilities may also provide for electronic communications between substations using signals impressed upon the overhead conductors ("carrier signal") to support protective relaying and operations (*Note: a carrier signal generally does not work on underground cables because the capacitance is too high*).

Fire/smoke detection systems would be installed within the new control and relay enclosure at North Bloomfield Substation. If fire or smoke is detected, these systems automatically activate an alarm at Connecticut Valley Electric Exchange (CONVEX), thereby allowing system operators to take appropriate action. Control and relay enclosures are equipped with fire extinguishers.

The new autotransformer at North Bloomfield Substation would have an insulating fluid that would require a secondary containment system for fluid leaks or spills. The secondary containment system will conform to Northeast Utilities Design and Application Standard SUB047.004.

K.1.2 Fire Suppression Technology

Fire/smoke detection systems are already in place at the North Bloomfield Substation. In the event that fire or smoke is detected, these fire/smoke detection systems would automatically activate an alarm at CONVEX, and the system operators then would take the appropriate action. The control and relay enclosures at each substation are equipped with fire extinguishers.

The new protective relaying and associated equipment within the substations, along with a Supervisory Control and Data Acquisition (SCADA) system for remote control and equipment monitoring, will be housed in the 345/115-kV Relay & Control Enclosure. The 345/115-kV Relay & Control enclosure will have smoke detectors installed which would be monitored from a remote location.

K.2 ELECTRIC AND MAGNETIC FIELDS

Electric and magnetic fields (EMF) are two forms of energy that surround an electrical device. Transmission lines are sources of EMF, as are other substantial components of electric power infrastructure, ranging from transformers at substations to the wiring and appliances in a home. Any piece of machinery run by electricity can be a source of EMF.

To address a range of concerns regarding potential health risks from exposure to transmission line EMF, in December of 2007, the Council issued a policy document entitled "*Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines in Connecticut*" (BMPs). This document summarized the latest information regarding scientific knowledge and consensus on EMF health concerns, and it adopted policies concerning the reduction of magnetic fields (MF) associated with proposed new transmission lines.

In the BMPs, the Council recognized "that a causal link between power-line MF exposure and demonstrated health effects has not been established, even after much scientific investigation in the U.S. and abroad," and that "timely additional research is unlikely to prove the safety of power-line MF to the satisfaction of all." Accordingly, the Council decided "to continue its cautious approach to transmission line siting that has guided its Best Management Practices since 1993." As the CSC states in its BMPs "this continuing policy is based on the Council's recognition of and agreement with conclusions shared by a wide range of public health consensus groups, and also, in part, on a review which the Council commissioned as to the weight of scientific evidence regarding possible links between power-line MF and adverse health effects. Under this policy, the Council will continue to advocate the use of effective no-cost and low-cost technologies and management techniques on a project-specific basis to reduce MF exposure to the public while allowing for the development of efficient and cost-effective electrical transmission projects.

Pursuant to this policy, the Council's BMPs "require an applicant proposing to build an overhead electric transmission line to develop and present a Field Management Design Plan that identifies measures to reduce magnetic field levels that would otherwise occur along an electric transmission right-of-way, particularly where the line will be "adjacent to residential areas, public or private schools, licensed child day-care facilities, licensed youth camps, or public playgrounds.

The BMPs also require transmission line applicants to present calculations of magnetic fields under pre-project and post-project conditions, assuming the use of different transmission line design alternatives. The purpose of this requirement is to "allow for an evaluation of how MF levels differ between alternative power line configurations," so that the Council can direct the applicant to "achieve reduced MF levels when possible through practical design changes." However, the reduction of magnetic fields is only one of the factors that the Council will consider in approving particular line designs. Others include "cost, system reliability, aesthetics, and environmental quality."

In addition to specific information about a proposed transmission line, the Council considers certain general EMF information in the course of a proceeding on a transmission line application, including "evidence of any new developments in scientific research addressing MF and public health effects or changes in scientific consensus group positions regarding MF." Accordingly, CL&P commissioned an independent expert to prepare a report concerning any such developments, which is provided as part of Section O of this Application. See Appendix O-6, *EMF and Health: Review and Update of the Scientific Research December 2007 – June 2008*. All of the EMF information required by the BMP, including a Field Management Design Plan, is provided in Section O of this Application.