NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

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January 8, 1990

Docket No. 50-213
B13373
Re: License Condition 2.C.4

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

References:

1. D. L. Ziemann letter to W. G. Counsil, "Amendment No. 28 to Facility Operating License No. DPR-61, Haddam Neck Plant," dated October 3, 1978.

2. R. T. Carlson letter to W. G. Counsil, "Inspection No. 50-213/81-01, Haddam Neck Plant," dated February 4, 1981.

3. Licensee Event Report No. 88-005, "Cable Vault CO_2 System Inoperable," dated March 18, 1988.

Gentlemen:

Haddam Neck Plant
Proposed Modification--Cable Vault CO_2 System

In a letter dated October 3, 1978 (Reference 1), the NRC Staff issued to Connecticut Yankee Atomic Power Company (CYAPCO) Amendment No. 28 to Facility Operating License No. DPR-61 for the Haddam Neck Plant. This amendment added a license condition relating to the completion of facility modifications for fire protection at the Haddam Neck Plant. The fire protection license condition specified that CYAPCO was required to complete certain fire protection modifications identified in paragraphs 3.1.1 through 3.1.19 of the NRC's Fire Protection Safety Evaluation, dated October 3, 1978, and issued with Amendment No. 28.

These modifications included the upgrade of the containment cable vault CO_2 system from a manually actuated total flooding system to an automatically actuated system and the installation of a second set of high-pressure CO_2 cylinders to permit a second application of the extinguishing agent by manual actuation of the system.

On February 4, 1981, the NRC Staff issued Inspection Report No. 50-213/81-01 (Reference 2) as a result of a routine inspection conducted on January 5 through 9, 1981, at the Haddam Neck Plant. This inspection reviewed the fire protection modifications required by Amendment No. 28 and verified the

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modification of the CO_2 system in the cable vault was completed in accordance with the Fire Protection Safety Evaluation attached to Amendment No. 28.

As part of CYAPCO's continuing upgrade of fire protection systems conformance to current NFPA codes at the Haddam Neck Plant, CYAPCO is proposing to make modifications to the containment cable vault CO_2 system to address NFPA code provisions. This modification will change the design of the system as specified by the fire protection license condition and the 1978 Fire Protection Safety Evaluation. The modifications involve the addition of CO_2 agent for initial discharge and the provision of an extended discharge capability. Specifically, the method of CO_2 discharge will be modified such that the main CO_2 bank will discharge into only the lower level of the cable vault and the reserve bank will be converted to a primary supply to discharge automatically into the upper level of the cable vault. With the small discharge piping used, the upper supply will discharge for a longer period providing an extended discharge capability to the entire area. It is important to note that the NFPA codes do not require a connected reserve supply and that the NRC Staff has previously approved gaseous suppression system configurations not provided with a connected reserve. A more detailed description of this proposed modification is provided in Attachment 1.

As this proposed modification will impact the system design as recognized by the Haddam Neck Plant's fire protection license condition, CYAPCO is requesting NRC Staff approval of this modification and the resulting deviation from the NRC Staff's 1978 Fire Protection Safety Evaluation. If the NRC Staff finds the proposed modifications acceptable, CYAPCO will be submitting a request for a license amendment change in support of this proposed modification and a resulting FSAR change, as applicable.

Regarding our proposed schedule for this modification, we request NRC Staff review and concurrence at your earliest convenience.

We trust you will find this information satisfactory, and we remain available to discuss this with you at your convenience.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY

E. J. Mroczka
Senior Vice President

cc: W. T. Russell, Region I Administrator
A. B. Wang, NRC Project Manager, Haddam Neck Plant
J. T. Shedlosky, Senior Resident Inspector, Haddam Neck Plant

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Attachment 1

Haddam Neck Plant

Proposed Cable Vault CO_2 System Modifications

January 1990

Haddam Neck Plant
Proposed Cable Vault CO_2 System Modifications

Current Design

The upper and lower levels of the containment cable vault are protected by a CO_2 fire-extinguishing system. The CO_2 system is actuated by a smoke detection system.

The system consists of a main and reserve supply of CO_2. Each supply consists of a bank of 19 100-pound cylinders and provides flooding of the entire cable vault. Carbon dioxide is distributed through the area by two nozzles in the upper MCC area and six nozzles in the lower penetration area.

Upon actuation of any one of the four smoke detectors in the cable vault, the following events take place (some steps may be concurrent):

1. Signal is transmitted to the Pyrotronic high-voltage interface panel where the high voltage detector signal is converted to a lower voltage signal for transmitting to the FIRETEK system panel (also in the cable vault) and CY-FDS-2 (in the service building).

2. Upon receipt of a smoke detector actuation signal at the FIRETEK panel, an actuation signal is sent to either the two main or reserve cylinder bank electric discharge plugs (depending upon the position of the selector switch).

3. When the discharge plugs fire, two of the CO_2 cylinder valves are opened to pressurize a portion of the CO_2 manifold (four cylinders total).

4. Time-delay unit starts to time out.

5. The cable vault supply and discharge fans are tripped and the supply air damper closes.

6. An alarm signal is transmitted to Fire Detection Panel CY-FDS-2.

7. CO_2 is routed to pressure-operated siren in lower level of cable vault to warn of impending CO_2 discharge into the rooms.

8. After the time-delay unit times out at 60 seconds, the integral time-delay unit valve opens to release CO_2 to the balance of the discharge manifold and opens the remaining CO_2 bottles and discharges CO_2 into the cable vault.

The system is provided with an auxiliary panel outside the cable vault to provide the following controls and indications:

1. Green "System Activated" light which is illuminated when the power is available and the system abort switch is in the normal position.

2. Red "System Deactivated" light which is illuminated when the abort switch is placed in the "Abort" position.

3. Amber lights which illuminate to indicate if either their respective main or reserve stop valves are closed.

4. Main/reserve selector switch to select which CO_2 cylinder bank is to be actuated.

A backup battery power supply is provided for use in actuating the system in the event normal AC power to the FIRETEK panel is lost.

Proposed Modification

This project entails the installation of additional CO_2 cylinders and increasing the distribution feed piping and the change out of the 8 distribution nozzles for the purpose of providing more CO_2 fire suppression agent into the containment cable vault at a faster rate than the originally designed system. In addition, the method of CO_2 discharge will be modified such that the main CO_2 bank will discharge to the lower level while the second bank (called reserve bank) discharges into the upper level of the cable vault. This modification will provide an extended discharge capability by discharging both CO_2 banks and will eliminate the second/reserve discharge capability. This change will also require new activators be installed and removal of the existing mechanical time delays.

This change will allow more CO_2 to be supplied to the cable vault at a faster rate as required to meet the design requirements for a total flooding CO_2 fire suppression system including an extended discharge capability to provide for a 20-minute hold of the CO_2 concentration. The modification will provide a greater volume of CO_2 and increase the feed pipe and nozzle size such that the CO_2 gets distributed throughout the room faster. This modification converts the reserve bank to the primary supply for the upper section of the cable. The main bank will be modified to discharge in the lower level only.

Method of Change

The method for detecting and controlling fire in the containment cable vault will remain virtually unchanged. However, to enhance the system's capabilities, the following modification will be performed:

1. Installation of 6 additional 100-pound pressure cylinders filled with CO_2. Three cylinders will be installed on the main bank with the remaining three cylinders installed on the reserve bank. This will provide additional CO_2 in the cable vault during a system discharge.

2. Modify system logic such that both main and reserve banks fire (discharge) at the same time. This will also change the terminology associated with the two cylinder banks. The main bank will provide CO_2 to the lower area of the cable vault and be labeled as the "lower" bank. The reserve bank will provide CO_2 to the upper level of the vault and be labeled as the "upper" bank.

3. Modify distribution piping such that the "lower" bank feeds the lower level only. The "upper" bank will be piped separately using 3/4-inch pipe to feed the upper level.

4. Increase the distribution feed pipe size from 1 inch to 1 1/4 inches from the lower bank (old manifold) to the first existing tee. (This tee will be eliminated such that main feed will be to the lower level only.) This will provide a faster discharge, allowing the CO_2 to enter the area quicker.

5. Installation of a wintergreen scent such that CO_2 can be detected if present in the air.

6. Change out the distribution nozzles to nozzles with different orifice sizes. This will provide for a quicker increase of CO_2 concentration to meet the 2-minute concentration requirements.

7. Change tank activation devices and install "Automan" activation panel (including activation tubes).

8. Addition of cylinder brackets.

9. Eliminate the mechanical time delay, and replace with electronic time delay controlled from the main actuation panel.

10. Replace discharge hoses and test cylinders (pressure test) as necessary.

11. Removal of old CO_2 horn and associated piping.

The existing CO_2 system has been declared inoperable while these modifications are being performed and appropriate compensatory measures in accordance with the technical specifications are in place. After this modification is complete, a full discharge test will be conducted to ensure an adequate amount of CO_2 is discharged into the cable vault in the required time frame; i.e., 30 percent concentration within 2 minutes and a 50 percent concentration at 7 minutes to hold for 20 minutes. This concentration will ensure that any fire occurring in the cable vault will be extinguished and ensure more than ample time for fire brigade response. Additionally, because this change will result in the removal of the connected reserve bank, after any system discharge the system will be considered inoperable and compensatory actions in accordance with the applicable technical specifications will be instituted until such time as the CO_2 banks are recharged and the system declared operable.