

**NORTHEAST UTILITIES**

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

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May 29, 1980

Docket Nos. 50-213  
50-245  
50-336  
 A00854  
 A00939

Director of Nuclear Reactor Regulation  
 Attn: Mr. Dennis M. Crutchfield, Chief  
       Operating Reactors Branch #5  
       Mr. Robert A. Clark, Chief  
       Operating Reactors Branch #3  
 U. S. Nuclear Regulatory Commission  
 Washington, D. C. 20555

- References:
- (1) D. L. Ziemann letter to W. G. Council dated October 3, 1978.
  - (2) D. L. Ziemann letter to W. G. Council dated September 26, 1978.
  - (3) R. Reid letter to W. G. Council dated September 19, 1978.
  - (4) D. L. Ziemann letter to W. G. Council dated February 22, 1980.
  - (5) R. Reid letter to W. G. Council dated April 4, 1980.
  - (6) W. G. Council letter to D. L. Ziemann and R. Reid dated July 31, 1979.
  - (7) W. G. Council letter to D. L. Ziemann and R. Reid dated October 9, 1979.
  - (8) W. G. Council letter to R. Reid dated November 21, 1979.
  - (9) W. G. Council letter to R. Reid dated December 12, 1979.
  - (10) W. G. Council letter to D. G. Eisenhower dated September 27, 1979.

Gentlemen:

Haddam Neck Plant  
 Millstone Nuclear Power Station, Unit Nos. 1 and 2  
Fire Protection

In References (1), (2), and (3), the NRC Staff issued the original Fire Protection Safety Evaluation Reports for the Haddam Neck Plant, Millstone Unit No. 1, and Millstone Unit No. 2, respectively. Subsequent to the many NRC site visits, telephone discussions, and review of docketed correspondence on the subject, the NRC Staff summarized its evaluation of the status of Connecticut Yankee Atomic Power Company's (CYAPCO) and Northeast Nuclear Energy Company's (NNECO) implementation of the SER commitments of References (1) and (3) in References (4) and (5). References (4) and (5) further requested a response to the identified open items or a meeting with the Staff. The latter alternative was mutually agreeable and the subject meeting took place in your offices on April 22, 1980. The NRC Staff verbally

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advised during the meeting that no open items remain regarding Reference (2); consequently, no letter similar to References (4) and (5) is anticipated by NNECO regarding Millstone Unit No. 1.

As stated during the meeting, CYAPCO and NNECO remain adamantly convinced that their previously documented and current plans are fully responsive to the original SER commitments. The open issues identified by the Staff are the result of new criteria, requirements, interpretations, or premature imposition of the Commission's proposed Appendix R to 10CFR50. As such, the purpose of this letter is to reaffirm the adequacy of current plans to satisfactorily fulfill the SER commitments and associated license conditions of References (1), (2), and (3).

#### Millstone Unit No. 2

##### NRC - SER Item 3.2.1 - Cable Spreading Area

##### NRC Concern

The licensee will conduct an evaluation to determine a suitable method to provide isolation, separation, or protection of redundant safety-related cables in the cable spreading area.

##### Response

The subject evaluation was conducted and documented in Reference (6). On August 31, 1979, the Staff conducted a site inspection for the purpose of reviewing the modifications proposed in Reference (6).

The original recommendation was to provide an automatic sprinkler system to protect all cable trays within a defined 60' x 90' area of the cabling spreading area. The system design called for branch lines to provide water protection by spraying perpendicular to the cable tray edges.

Staff review of the area and the proposed design resulted in changes to the overall design of the proposed sprinkler system. The new design, as verbally agreed upon, is considered "unique" in that it provides total protection by directing water spray between each individual tray. This is done through a system of branch drop lines and sprinkler nozzles which are placed directly between every cable tray run or cross-over area. This technique assures complete protection by placing the extinguishing agent directly above the hazard (cable). This technique also provides a water curtain barrier between the cable tray runs, thus, assuring that other cable trays would not be involved in the same fire.

Drawing No. SK-MP1-FP-604-1, entitled "Fire Protection Concept for Cable Tray Concentrations" is enclosed to show the philosophy or technique of protection of cable tray concentrations. Drawing No. 3-1333SH is a detailed drawing depicting the design of the referenced sprinkler system. On this drawing, please note the number of sprinkler nozzles used (455) for this relatively small area. This clearly demonstrates the superiority of the design to assure effective control and extinguishment.

Automatic wet pipe sprinkler systems are considered the most effective, dependable, and reliable suppression system available for this type of hazard.

Branch Technical Position 9.5-1 has promoted the defense-in-depth concept of fire protection for nuclear power plants. In support of this approach to fire protection, the following additional fire protection features are provided to assure responsiveness to the Staff position.

(1) Manually Operated Deluge System

This system represents a completely redundant fire fighting system. An isolation valve will be installed in the main supply line to assure that isolating one system does not affect the other. Technical Specifications also provide added assurance as to the availability of both systems.

(2) IEEE-383 Cable

All cables can be classified as combustible, but cable qualified to IEEE-383 is considered to be fire retardant and, therefore, offers a passive fire protection feature.

(3) Hose Stations

Two hose stations will be installed to provide manual fire fighting capability. These hose stations will be equipped with two hundred feet (200') of one-inch (1") line to allow for flexibility in manual fire fighting.

(4) A Third Entrance Will Be Provided

A hatchway-type entrance has been provided as a third entrance area to the cable spreading area. This would allow more flexibility in responding to, or fighting, a cable spreading area fire.

The original SER identified an alternative involving isolation, separation, and protection of cables. All the above features, coupled with the "uniquely" designed sprinkler system, provide adequate assurance that a postulated fire will not result in undue risk to the health and safety of the public. Staff rejection of this concept will strongly imply that it is impossible to provide adequate passive and active fire protection features, i.e., the defense-in-depth approach, to provide adequate assurance that fire damage will not result in loss of shutdown capability. NNECO, therefore, reiterates its position that the above measures constitute resolution of the SER commitment.

NRC - SER Item 3.2.2 - Protection of Redundant Cable Trays

NRC Concern

The consequences of fire damage to systems required for safe shutdown will be determined where the physical separation of cables in the auxiliary building may not preclude damage to redundant safety-related systems. Fire retardant coating, automatic sprinklers, suitable fire barriers, or early warning detection will be provided to assure that fire damage does not result in a loss of shutdown capability where prompt action is not taken to suppress fires in these areas.

Response

An evaluation was conducted in the auxiliary building to determine cable tray and/or conduit routing in which (Z<sub>1</sub>) and (Z<sub>2</sub>) facilities were physically routed in close proximity or were involved in a cross-over. The results of this evaluation and proposed corrective action was documented to NRC in Reference (6).

Reference (6) listed ten (10) areas in which (Z<sub>1</sub>) and (Z<sub>2</sub>) cable trays and/or conduit were in close proximity to each other. The areas were reviewed individually and fire protection modifications were proposed to assure that a fire could not involve both facilities. Proposed modification included various combinations of detection, fire-rated barriers, cable tray covers, and sprinkler protection.

On August 31, 1979, the NRC conducted a special site inspection to review NNECO's proposed recommendations for SER Item 3.2.1 (Cable Spreading Area) and the subject SER Item 3.2.2. This site inspection and follow-up negotiations resulted in an agreement to provide certain combinations of fire protection modifications to satisfy the requirements of the Safety Evaluation Report. In fulfillment of verbal Staff requests, documentation was transmitted in References (7), (8), and (9) finalizing NNECO's intent to comply with NRC's specific requirements for the areas of concern.

Reference (5) states that three (3) of the ten (10) areas in question were found unacceptable. These areas were identified as follows:

- (1) Auxiliary Building -45' elevation  
Fire Zone 1-A, Col. F.8/H.2 and 16.6/17.2
- (2) Auxiliary Building 14'6" elevation  
Fire Zone A-24, Col. F.8/H.2 and 17.4
- (3) Auxiliary Building -5' elevation  
Fire Zone A-14, Col. F.8/H.2 and 18.1

Reference (5), Section 5.8.6, specifically states:

"Automatic sprinklers or suitable fire barriers will be provided to assure that fire damage does not result in a loss of shutdown capability where prompt action is not taken to suppress fires in these areas."

For the three (3) areas documented as "unacceptable", NNECO has committed to providing a combination of active and passive fire protection features to assure safe shutdown capability.

The initially proposed modifications for the three areas involved the installation of ionization detectors and fire-rated barriers at the cable cross-over areas. The intent was that detection would provide early warning, fire brigade would respond for manual extinguishment, and the fire-rated barrier would assist by containing or preventing the spread of fire.

Final resolution on the three items was documented in Reference (8) as follows:

Fire Zone 1-A

Ionization detection was provided for the mezzanine area in question and an automatic wet pipe sprinkler system was proposed to provide active suppression.

Fire Zone A-24

Ionization detection was proposed and cable trays involved in the cross-over would be completely enclosed.

Fire Zone A-14

Ionization detection was proposed, fire-rated barriers will be installed, and the clothing storage rack will be relocated to minimize exposure.

The above measures provide the optimum combination of active and passive fire protection features (sprinklers, brigade response, detection, fire-rated barriers, etc.). NNECO concludes that the combination of these features provides adequate assurance that a fire in any one division will not affect its redundant division.

It is appropriate to consider all fire protection and prevention features in performing a realistic evaluation with respect to a fire involving redundant facilities. As a supplement to the proposed modifications, features such as conduit and IEEE-383 cable further mitigate the effects of a postulated fire. These features significantly contribute to preventing, restricting, and controlling the effects of a fire.

As a result of reviewing Reference (5), NNECO suggests that some of the information as presented is strongly misleading. Section 5.8.5 (Adequacy of Fire Protection) states:

- "(1) Hose stations in the auxiliary building do not have adequate reach to provide fire water coverage of all areas."
- "(2) In many areas clothing storage lockers present an exposure fire hazard to safety-related cables."
- "(3) Transient combustibles are inadequately controlled."
- "(4) The lack of fire detection prevents prompt response."

The above inaccurate wording apparently was a consideration in the classification of NNECO's proposed modifications as unacceptable.

With respect to this misleading information, the following corrections are offered for clarification.

- (1) All cable cross-over areas identified are within hose station coverage. Hose stations are scheduled to be installed for other areas of Millstone Unit No. 2 in accordance with SER Item 3.1.5.
- (2) Clothing storage lockers have been relocated in accordance with SER Item 3.1.15 and Reference (7).
- (3) Administrative controls have been established in accordance with SER Item 3.1.15.
- (4) Detection systems have been added throughout the auxiliary building per SER Item 3.1.1 as supplemented by References (6), (7), and (8).

With the above clarifications, the original design features and the fire protection modifications completed or in progress are sufficient for NNECO to conclude that the SER commitments are fulfilled and that adequate measures will be in effect to assure safe shutdown capability.

#### NRC - SER Item 3.2.3 - Smoke Detection System Tests

During the meeting of April 22, 1980, the Staff advised that guidelines/acceptance criteria were being developed and are expected to be available within the next several months. As such, NNECO concludes that it is appropriate to defer additional efforts in this regard until the guidelines are available. NNECO is committed to evaluate the new information, but it must be recognized at this time that completion of the bench testing requirement by the end of the 1980 refueling outage is no longer a license condition requirement. Additional time will be required to evaluate the guidelines, assess their practicality, and perform the tests.



NRC - SER Item 3.2.4 - Cable Fire Barrier Penetration Test Data

In Reference (5), the Staff stated that the certifications provided on the cable fire barrier penetrations were adequate except for the question of potential effect on performance of differential pressure. NNECO's additional review has determined that certain aspects of the ASTM-E119 Fire Endurance Test, to which the penetrations are qualified, do in fact address this concern. The Endurance Test includes the provision for a hose stream test. During this test, 75 gpm of water is delivered to the fire exposed surface of the penetration seal at 75 psi through a 1.5 inch nozzle at a distance of ten feet. These conditions were maintained for 90 seconds, with no adverse affects observed on the penetrations. The differential pressure resulting from these conditions is significantly more severe than the maximum pressure differential a fire barrier is expected to experience at Millstone Unit No. 2. It is recognized that a hose stream test does not simulate precisely the conditions which may result from a fire with respect to differential pressure, but the conservatisms inherent in the test as well as the successful qualification of the penetrations to the other provisions of ASTM-E119 provide adequate assurance that the penetrations installed at Millstone Unit No. 2 will perform their design function in the event of a fire.

NRC - SER Item 3.2.5 - Reactor Coolant Pump Lube Oil Fire Hazard

The Staff is currently stating that NNECO's design is unacceptable in that neither the lube oil system nor the oil collection system has been demonstrated to be seismically qualified. NNECO acknowledges the validity of this concern, and is, therefore, committed to design the oil collection system to withstand an SSE, such that it will remain capable of collecting any leakage which may occur, or to seismically qualify the lube oil system. NNECO was not advised of this requirement until receipt of Reference (5), which was dated April 4, 1980. This date is some 18 months after issuance of Reference (3), which contains the requirement to complete the installation prior to the end of the 1980 refueling outage. Therefore, it is not appropriate to impose this requirement as a 1980 license condition. NNECO is committed to install the system during the outage in accordance with Reference (3), and will attempt to seismically qualify either the lube oil system or the collection system. However, if this is not feasible, the seismic qualification portion of the effort will be deferred to the next outage of sufficient duration, but no later than the 1981 refueling outage.

NRC - SER Item 6.0 - Administration Controls

NNECO's position remains as stated in Reference (10), to which the Staff has never responded.

Haddam Neck Plant

CYAPCO's position on the SER Items listed below are identical to those presented by NNECO.

- (1) SER Item 3.2.2 - Smoke Detection System Tests.
- (2) SER Item 3.2.3 - Cable Fire Barrier Penetration Test Data.
- (3) SER Item 3.1.18 - RCP Oil Collection System.

NRC - SER Item 3.1.4 - Hose Stations (Additional Feed From Yard Loop)

The Staff requirement of Reference (4) was not previously documented and, therefore, is not subject to the 1980 refueling outage license condition. CYAPCO hereby agrees to provide the additional feed with adequate isolation valving to preclude single break from affecting both ring headers. It is our current intention to complete the modification by November 1, 1980. It is not practical to complete the modification during the current refueling outage as the underground lines requiring modification are currently beneath trailers brought in to support other outage activities.

In the sense that Reference (4) was intended to be a compendium of unresolved issues, CYAPCO notes that neither Enclosure 1 nor Enclosure 4 address Section 6.0 of Reference (1), Administrative Controls. Your written concurrence with the provisions of Reference (10) would, therefore, be most appreciated.

CYAPCO also finds it disturbing that in Reference (4) the Staff has provided new requirements, as indicated in the Enclosure 1 footnote, "\* The licensee has not been notified of this position previously", at this late date. The SER commitments were agreed upon and issued some 18 months ago, and now the Staff has issued "new positions" requiring completion by the originally agreed upon date. CYAPCO and NNECO remain fully committed to respond to whatever is required to ensure continued safe operation of their facilities, but the above issues are judged to be an abuse of that commitment.

We trust you find the above information sufficient to comprehend our positions.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY  
NORTHEAST NUCLEAR ENERGY COMPANY

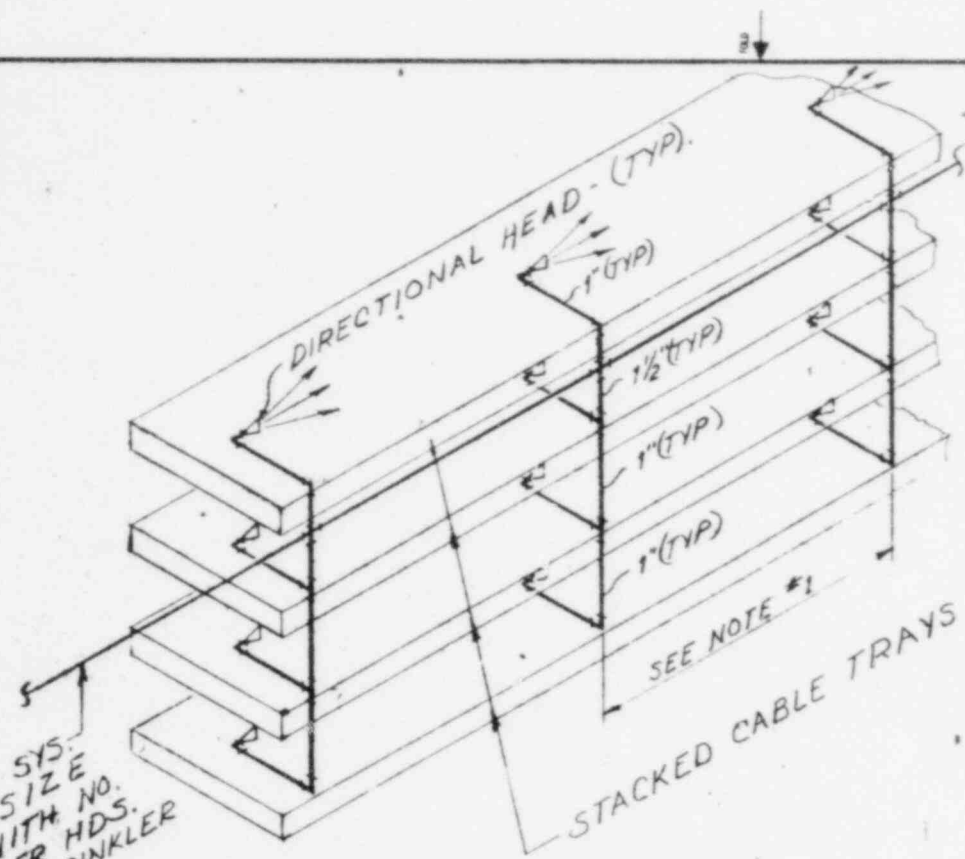
W. G. Council  
W. G. Council  
Vice President

By: W. F. Fee  
W. F. Fee  
Vice President

Attachment



SPRINKLER SYS. HEADER - SIZE VARIES WITH NO. OF SPRINKLER HDS. (WET PIPE SPRINKLER SYSTEM).



NOTES:

- 1) DISTANCE BETWEEN BRANCH LINES  $\approx 10'-0"$ . VARIES WITH SPR. HEAD COVERAGE AREA.
- 2) BRANCH LINES SHALL BE POSITIONED AS CLOSE TO CABLE TRAYS AS POSSIBLE.
- 3) GRINNELL TYPE EA-1 IS THE INTENDED SPRINKLER HEAD FOR THIS APPLICATION
- 4) THIS PIPING ARRANGEMENT IS TYPICAL OF ALL CABLE CONCENTRATION AREAS. INDIVIDUAL PIPE RUNS, MAY VARY SLIGHTLY TO ACCOMMODATE ACTUAL PLANT ARRANGEMENT.

REVISIONS DURING CONSTRUCTION	P.A.#
ISSUED FOR INFORMATION ONLY - NOT FOR CONSTRUCTION	

		NORTHEAST UTILITIES SERVICE CO.	
		FOR NORTHEAST NUCLEAR ENERGY CO.	
TITLE FIRE PROTECTION CONCEPT FOR CABLE TRAY CONCENTRATIONS			
BY SAH	CHKD JNG	APP ddd	APP
DATE 5/12/79	DATE 5/14/79	DATE 5/14/79	DATE
SCALE NONE		DWG NO. SK-MPI-FP604-1	
P.A.#	NO.	DATE	REVISIONS
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