

# 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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July 24, 1981

Docket Nos. 50-213  
50-336  
A01590

Mr. Darrell G. Eisenhut, Director  
Division of Licensing  
Office of Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

- References:
- (1) D. G. Eisenhut letter to All Operating Pressurized Water Reactor Licensees, dated February 10, 1981.
  - (2) W. G. Council letter to D. M. Crutchfield, dated August 5, 1980.
  - (3) W. G. Council letter to D. M. Crutchfield, dated June 11, 1981.
  - (4) D. C. Switzer letter to K. R. Goller, dated February 5, 1975.
  - (5) W. G. Council letter to D. G. Eisenhut, dated October 31, 1980.
  - (6) D. M. Crutchfield letter to W. G. Council, dated July 1, 1981.
  - (7) W. G. Council letter to D. M. Crutchfield, dated December 30, 1980.

Gentlemen:

Haddam Neck Plant  
Millstone Nuclear Power Station, Unit No. 2  
Seismic Qualification of the Auxiliary Feedwater  
System - Generic Letter No. 81-14

In Reference (1), the NRC Staff requested the Connecticut Yankee Atomic Power Company (CYAPCO) and Northeast Nuclear Energy Company (NNECO) to provide information and perform certain actions to determine the extent to which the auxiliary feedwater systems at the Haddam Neck Plant and Millstone Unit No. 2 are seismically qualified.

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Pursuant to 10CFR50.54(f), the following information is hereby provided for the Haddam Neck Plant and Millstone Unit No. 2.

Haddam Neck Plant  
Response to Enclosure 1

- A. The auxiliary feedwater system at the Haddam Neck Plant is currently classified and maintained as a seismic Category I system to withstand a safe shutdown earthquake (SSE). The appropriate portions of this system have been included within the scope of I&E Bulletin Nos. 79-02, 79-04, 79-07, 79-14, and 80-11 as well as the D. G. Eisenhut letter of January 1, 1980 regarding seismic anchorage, rather than I&E Information Notice No. 80-21. Table 1 provides a more detailed listing of the seismic qualification status of the auxiliary feedwater system.

The auxiliary feedwater automatic initiation and control system required by Item II.E.1.2 of NUREG-0737 has been designed and is being installed as a safety-grade, seismic Category I system. Staff approval of the design is required prior to placing this scheme into operation upon completion of the installation.

- B. The Haddam Neck Plant, through its involvement in the Systematic Evaluation Program (SEP), is currently conducting a seismic re-evaluation program. A description of this program, including analysis methodologies and acceptance criteria, has been provided in References (2) and (3).
- C. This item is not applicable to the Haddam Neck Plant
- d. Although the auxiliary feedwater system at the Haddam Neck Plant is classified and maintained as a seismic Class I system, an alternate method of decay heat removal is available. The feed-and-bleed method of decay heat removal consists of feeding cool water directly to the reactor coolant system through the emergency core cooling system. This method is described more fully in References (4) and (5).

Response to Enclosure 2

As noted above, the auxiliary feedwater system at the Haddam Neck Plant is classified and maintained as a seismic Category I system. The original plant design did not conform to current seismic criteria and CYAPCO's ongoing SEP reviews are intended to confirm the seismic adequacy of the existing system. CYAPCO has therefore performed a walkdown of the auxiliary feedwater system as requested by Reference (1). This is in addition to the walkdowns performed in response to I&E Bulletin No. 79-14 and to efforts associated with the seismic reanalysis required by SEP Topic III-6. These walkdowns have been performed by individuals experienced in the analysis, design and evaluations of such structures, systems and components. The types of modifications resulting from previous walkdowns and engineering evaluations are documented in Reference (7). Components inspected during the system walkdown include:

- o Demineralized water storage tank (DWST) and anchorage.
- o Steam piping from the main steam lines to the auxiliary feedwater pump turbine.
- o Steam exhaust piping from auxiliary feedwater pump turbine to atmosphere.
- o Suction water piping from demineralized water storage tank to auxiliary feedwater pump.
- o Discharge water piping from auxiliary feedwater pump to feedwater piping.
- c Pipe supports for above piping runs.
- o Auxiliary feedwater pumps anchorage.
- o Level transmitters for demineralized water storage tanks and supports.
- o Pressure indication transmitters for auxiliary feedwater steam turbine and supports.
- o Auxiliary feedwater flow transmitters, and supports.
- o Conduit and tubing runs.

No major seismic related concerns which could potentially adversely affect the operability of the auxiliary feedwater system during a seismic event were identified during the walkdown. CYAPCO intends to modify certain sections of conduit and tubing runs in order to enhance their resistance to seismic events. These modifications are scheduled to be completed during the upcoming refueling outage. Deviations in the as-built configuration of the auxiliary feedwater piping from the original design, identified during the walkdowns required by I&E Bulletin No. 79-14, have been corrected.

CYAPCO has committed to perform a seismic reanalysis of the auxiliary feedwater system piping as part of SEP Topic III-6, as discussed above, and to implement any necessary backfits resulting from the reanalysis. CYAPCO also notes that safety-related cable trays and conduits are currently being evaluated in conjunction with the SEP Owners Group program being performed by URS Blume, Associates. The auxiliary feedwater system will be fully qualified seismically following completion of the reanalysis and any identified modifications.

Millstone Unit No. 2  
Response to Enclosure 1

- A. The auxiliary feedwater system at Millstone Unit No. 2 has been designed and constructed, and is maintained as a seismic Category I system to withstand an SSE. As such, the appropriate portions of the system have been included within the scope of I&E Bulletin Nos. 79-02, 79-04, 79-07, 79-14 and 80-11 and I&E Information Notice No. 80-21. The automatic initiation and control system is designed and has been installed as a safety grade, seismic Category I system. Staff approval of this design was provided in the Safety Evaluation supporting Amendment No. 63 to DPR-65. Table 2 provides a listing of the qualification status of the Millstone Unit No. 2 auxiliary feedwater system. The seismic qualification is consistent with the qualification of other safety-related systems at Millstone Unit No. 2.
- B. The components of the auxiliary feedwater system at Millstone Unit No. 2 are designed to the requirements specified for the Engineered Safety Features as described in Section 6.1 of the PSAR.

The primary water source for the auxiliary feedwater system is the condensate storage tank. The seismic design of the tank and its enclosure along with the system piping ensures that this water source will be available following a design basis seismic event or the occurrence of any credible event involving external phenomenon.

- C. This item is not applicable to Millstone Unit No. 2.
- D. This item is not applicable to Millstone Unit No. 2.

Response to Enclosure 2

A walkdown of the auxiliary feedwater system piping was performed in response to I&E Bulletin No. 79-14. In addition, NNECO opted to complete a walkdown of this system to further increase the confidence in the availability of the system following an SSE. This walkdown included mechanical and electrical equipment, piping, cable trays, and conduit.

The auxiliary feedwater system piping walkdown and analysis, performed in accordance with I&E Bulletin No. 79-14, identified forty three (43) supports requiring modifications. Thirty Five (35) modifications have been completed with the remaining eight (8) scheduled for completion by the end of the upcoming 1981 refueling outage.

No major seismic related concerns which could potentially affect the operability of the auxiliary feedwater system during a seismic event were identified during the system walkdown. All mechanical and electrical equipment, cabling and conduit were determined to be securely attached and adequately supported to provide for substantial resistance to seismically induced movement.

In summary, the auxiliary feedwater systems at both the Haddam Neck Plant and Millstone Unit No. 2 are currently maintained and classified as seismic Category I. The auxiliary feedwater system at the Haddam Neck Plant is being reanalyzed as part of Topic III-6 of the SEP, Seismic Reanalysis. Safety related cable trays and conduits are currently being evaluated in conjunction with the SEP Owners Group. Upon completion of these efforts, the auxiliary feedwater system at the Haddam Neck Plant will be fully qualified seismically. Alternate decay heat removal schemes are available as described above.

The auxiliary feedwater system at Millstone Unit No. 2 was designed and constructed and is maintained as a seismic Category I system. The walkdown and reanalysis completed as part of I&E Bulletin No. 79-14 ensures that the as-built auxiliary feedwater system conforms to the original requirements for a seismic Category I system.

It has been determined, from the auxiliary feedwater system walkdowns at both the Haddam Neck Plant and Millstone Unit No. 2, conducted in accordance with Reference (1), that all components of the systems are securely attached and adequately supported to provide for substantial resistance to seismically induced movement.

Based on the information presented herein, CYAPCO and NNECO conclude that the current designs of the auxiliary feedwater systems at the Haddam Neck Plant and Millstone Unit No. 2, ensure adequate decay heat removal capability following a seismic event.

We trust you find this information responsive to the Reference (1) requests.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY  
NORTHEAST NUCLEAR ENERGY COMPANY

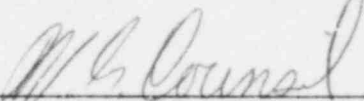
  
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W. G. Council  
Senior Vice President



Table 1

HADDAM NECK PLANT  
CLASSIFICATION OF AUXILIARY FEEDWATER SYSTEM

Components/Sub-System	Quality Group		Seismic	
	R.G. 1.26	Plant Design	R.G. 1.29	Plant Design
<u>Auxiliary Feedwater System</u>				
<u>(AFS)</u>				
Turbine Driven Pumps (2) (a)	ASME III CL3	Industry Code	Category 1	0.17 g
System Piping	ASME III CL3	ASA B31.1	Category 1	0.17 g
System Valves	ASME III CL3	ASA B31.1	Category 1	0.17 g
Deminerlized Water Storage Tanks	ASME III CL3	ASA B96	Category 1	0.17 g
Primary Water Storage Tank	ASME III CL3	ASA B96	Category 1	0.03 g
Transfer Pumps	ASME III CL3	Industry Code	Category 1	0.03 g
Power Supplies			Category 1	
Initiation and Control (b) System			Category 1	
Structures supporting or housing safety related AFW system items		Being reanalyzed as part of SEP Topic III-6 Status discussed in Reference (3)		

- (a) Does not include the non-safety-related motor driven pump; however, evaluations are in progress in accordance with the requests of Reference (6).
- (b) Safety grade initiation and control scheme to be installed by end of 1981 refueling outage - Requires NRC approval prior to implementation.



MILLSTONE UNIT NO. 2  
CLASSIFICATION OF AUXILIARY FEEDWATER SYSTEM

Components/Sub-System	Quality Group		Seismic	
	R.G. 1.26	Plant Design	R.G. 1.29	Plant Design
<u>Auxiliary Feedwater System</u> (AFS)				
Turbine and Electric Pumps	ASME III CL3	**	Category 1	0.17g
System Piping	ASME III CL3	ANSI B31.1*/ B31.7 CLII	Category 1	3.0 g
System Valves/Actuators	ASME III CL3	ASA B31.1*	Category 1	3.0 g
Condensate Storage Tank			Tank Non-Category 1 Barrier Which Ensures Min. Level Category 1	
Initiation and Control System			Category 1	
Power Supplies			Category 1	
Structures Supporting or Housing <u>Safety Related AFW System Items</u>			Class 1 (FSAR Section 5)	

\* Plus seismic analysis, random radiography of butt welds and base material identification and ASME III CL2 where a containment boundary is involved.

Normal environment 120°F, 100% humidity.

\*\* ASME Section VIII & IX  
Standards of the Hydraulic Institute