NORTHEAST UTILITIES

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

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 665-5000

October 10, 1985

Docket No. 50-423
B11786

Director of Nuclear Reactor Regulation
Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

References: (1) Summary of Millstone Unit No. 3 Environmental Qualification of the Equipment Qualification Files for Millstone Unit No. 3, dated September 19, 1985.

Dear Mr. Youngblood:

Millstone Nuclear Power Station, Unit No. 3
Response to Staff's Concern Related to Containment Air Temperature

Enclosed is Northeast Nuclear Energy Company's response to the Staff concern related to the use of 90°F containment air temperature for aging purposes. If you have any questions regarding this submittal, please contact our licensing representative directly.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY
et. al.
BY NORTHEAST NUCLEAR ENERGY COMPANY
Their Agent

J. F. Opeka
J. F. Opeka
Senior Vice President

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

A048
1/1

STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me W. F. Fee, who being duly sworn, did state that he is Executive Vice President of Northeast Nuclear Energy Company, an Applicant herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Applicants herein and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Judith Sloan
Notary Public

My Commission Expires March 31, 1988

Attachment I

NRC Concern:

Provide justification for the use of 90°F inside containment for aging process as it relates to environmental qualification of electrical equipment.

NNECO Response:

A. Maintenance of Normal Operating Temperature at 90°F - Containment

The air recirculation portion of the containment ventilation is designed to maintain bulk air temperature in the containment during normal operation and loss of offsite power (FSAR Section 9.4.7.2.). The subsystem consists of three containment air recirculation coolers with an air distribution ductwork. Each unit cooler consists of one fan and six cooling coils. Performance characteristics are given in FSAR Table 9.4-9 and 9.4-10.

Each fan draws air across the cooling coil assembly and discharges the air to a common duct which distributes it through secondary ducts to different levels of the containment. During normal operation, two or three unit coolers operate. After a loss of offsite power, one or two unit coolers operate.

The cooling coils in each recirculation unit cooler assembly are served by the plant chilled water system at 45°F during normal plant operation and by the reactor plant component cooling water at 90°F after a loss of offsite power.

Two of the three containment air recirculation unit coolers are required to maintain the containment air bulk temperature of 90°F. If one unit fails, the remaining two units will maintain the temperature of 90°F during normal operation.

Units A and B are supplied with emergency power. During a loss of offsite power, these unit coolers can operate with emergency power maintaining an average temperature of the containment below 135°F. In this configuration, the 90°F reactor plant component cooling water provides the cooling medium to the unit coolers.

The chilled water system, which provides chilled water to the containment air recirculation unit coolers during normal operation consists of three 50-percent capacity self-contained chiller and circulating pumps along with piping, valves, and controls (FSAR Section 9.2.2.2.2.). Chiller heat is rejected to the reactor plant component cooling water system. Two mechanical refrigeration units and two chilled water circulating pumps provide the capacity to cool components served by the chilled water system. Heat loads and designs of the major components are shown in FSAR Tables 9.2-7 and 9.2-8 respectively. The mechanical refrigeration units are designed to produce a chilled water outlet temperature of 45°F. The third refrigeration unit and circulation pump provide a 50-percent standby capacity for the chilled water system.

The containment temperature is determined by evaluating the heat released from equipment at several air temperatures and matching the total heat releases to the heat removal capacities of the cooling coils at the same inlet air conditions.

Heat releases from vessels, piping, and equipment are calculated at maximum operating temperatures using appropriate heat transfer relationships. Heat releases from pipe and equipment supports are approximated by heat transfer relationships of external surfaces. The total heat release includes a factor of safety of 20% and an allowance for latent heat load and sensible heat load from leakage of 2 gpm of steam and 2 gpm of feed water.

B. Equipment Qualified Life - Containment

The qualified life of equipment located in Millstone Unit No. 3 containment is presently based on 90°F Normal Operating Temperature. This value (90°F) was used based on design conditions which have been identified in the FSAR Section 9.4.7.2.

Through the use of the Area Temperature Monitoring System the Millstone Unit No. 3 containment temperature will be tracked using a data logger. If the containment temperature becomes higher than the 90°F design condition value, the data logger will start to print out temperature above 90°F. The system will continue to print out the temperature until the 90°F value is re-established. However, if the 90°F temperature value cannot be re-established Engineering will review the higher stabilized temperature and change the equipment qualified life for that equipment which is located in the area affected by the higher temperature. The new qualified life will be shown on the SCEW sheet and the revised SCEW sheet will be submitted to the NRC.

C. Area Temperature Monitoring System

The purpose of this system is to monitor the area temperature of environmentally qualified instrumentation, to determine the instrument life expectancy based on data previously taken through qualification testing of all these instruments at the time they were purchased. This information will be used to determine when the instruments should be replaced.

There are thirteen areas on Millstone Unit No. 3 that will require area temperature monitoring.

Aux. Bldg.	Fuel Bldg.	Turbine Bldg.
Containment	Fuel Vault	Yard
Intake	H2 Recombiner	Control Bldg.
Diesel Bldg.	Main Steam Bldg.	
E.S.F. Bldg.	Service Bldg.	

This data will be obtained through the use of Resistance Temperature Detectors (R.T.D.'s) of which there is thus far a total of 109 being used to cover the areas noted above.

These R.T.D.s are supplied by OMEGA and are a 200 ohm platinum 3 wire type temperature sensing element.

Locations for R.T.D.'s were chosen to satisfy the environmental qualifications of equipment while taking into consideration the plant layout. In cases where an environmental zone was separated by walls or other barriers, R.T.D.'s were placed on both sides of the barrier. Some areas which were too large to be monitored by one R.T.D. have multiple R.T.D.'s distributed throughout the zone. In cases where the environmental zone covered more than one floor, the flooring material (i.e., steel grating, concrete, etc...) was taken into consideration when choosing the specific location. R.T.D.'s were positioned distant from HVAC vents in order to provide accurate readings. Cable tray mountings were chosen when they were in a convenient location and easily accessible. Wall mounted R.T.D.'s were chosen when a cable tray did not pass through an environmental zone or other factors made it more feasible to mount the R.T.D. on the wall. The prime considerations when placing the R.T.D.'s in each environmental zone included: central location, equipment to be environmentally qualified, easy accessibility, present cable runs, and plant layout. The datalogger will be located in the Rod Control area of the Auxiliary Building elevation 45'-6", 10' south of column 51.3, 10' east of DWLN F.3, facing north.

TABLE 9.2-7

CHILLED WATER SYSTEM
HEAT LOADS AND FLOW RATES

Component	Flow (gpm)	Heat Load (Btu/hr)	
Refueling water coolers (2)	400(1)	289,200 (6,252,000)(2)	8
Potentially contaminated air air-conditioning unit	120	601,400	8
Clean air air-conditioning unit	110	536,000	8
Motor control center and rod control area air-conditioning units (2)	190(1)	1,020,000	
Reactor coolant pump motors (4)	880	4,200,000	
CRDM shroud coolers (2)	880	3,700,000	
Containment air recirculation coolers (3)	996	8,525,000	
Neutron shield tank coolers (2)	80	210,000	
Containment instrument air compressors (2)	12.2	43,360	8
Process vent cooler	30	147,800	8
Total	3,698.2	19,272,760	

NOTES:

1. Only one unit supplied at a time
2. Cooldown from 110°F

TABLE 9.2-8

CHILLED WATER SYSTEM
MAJOR COMPONENT DESIGN DATA

Chilled Water Circulating Pumps	
Number	3
Design Pressure (psig)	150
Design temperature (°F)	300
Design capacity (gpm)	2,100
Chilled Water Surge Tank	
Number	1
Design pressure (psig)	20
Design temperature (°F)	200
Design capacity (gal)	860
Mechanical Refrigeration Units (chillers)	
Number	3
Capacity at specified conditions (tons)	938 each
Evaporator	
Chilled water temperature, inlet/outlet(°F)	55/45
Chilled water flow (gpm)	2,100
Condenser	
Water temperature, inlet/outlet(°F)	95/105.5
Water flow (gpm)	2,700
Refrigerant charge	
Type	R-12
Weight (lb)	3,400

TABLE 9.4-9

CONTAINMENT AIR RECIRCULATION SYSTEM PRINCIPAL COMPONENTS DESIGN AND APPROXIMATE PARAMETERS

Components	Design Parameters
Containment Air Recirculation Units	
Quantity	3
Number of cooling coils per unit	6
Number of fans per unit	1
Fan capacity	143,500 cfm each with 3 fans in use
Cooling media during normal operation	Chilled Water
Cooling media during loss of power	Component cooling water
Normal Fan	
Total pressure head (in wg)	6.0
Motor (hp)	250

TABLE 9.4-10

CONTAINMENT AIR RECIRCULATION SYSTEM
OPERATION MODES AND APPROXIMATE DESIGN CONDITIONS
OF AIR RECIRCULATION FAN COOLERS

Mode of Operation	Containment Temperature (°F)	No. of Units in Operation	Single Unit Capacity (cfm)	Single Unit Capacity (Btu/hr)	Total Capacity (cfm)	Total Capacity (Btu/hr)
Normal	85	3	143,500	2,995,000	430,500	8,250,000
	90	2	176,000	3,025,000	352,000	7,650,000
Loss of offsite power	140	1	203,000	4,500,000	203,000	4,500,000