

# 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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May 15, 1984

Docket No. 50-423  
B11188

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

Reference: (1) B. J. Youngblood to W. G. Council, Draft SER for Millstone Nuclear Power Station, Unit 3, dated February 24, 1984.

Dear Mr. Youngblood:

Millstone Nuclear Power Station, Unit No. 3  
NRC-Equipment Qualification Branch (EQB), Review Meeting

A meeting was held between the NRC-EQB (Seismic and Dynamic Qualification Section), Northeast Nuclear Energy Company, Stone & Webster and Westinghouse in Bethesda, Maryland on May 9, 1984 to discuss ten (10) Draft SER open items contained in Reference (1). A status of each open item was noted as defined by one of the following three categories:

Closed - No further NNECO input or action is needed to resolve the NRC concern.

Confirmatory - NNECO must provide the requested information on the Millstone 3 docket, either by a letter or FSAR amendment.

Open - No resolution possible at this time, NNECO to address.

Attachment I provides the status of those Draft SER open items. The attached responses (Attachment II) to Draft SER open items formalize our commitment given orally at the meeting. All additional information to confirmatory items and open items (Attachment I) will be provided to the NRC by June 8, 1984. Also a response to Draft SER open items EQB-7 and EQB-12 will be submitted to the NRC by June 8, 1984.

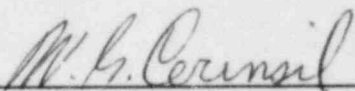
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If there are any questions, please contact our licensing representative directly.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY ET AL  
By Northeast Nuclear Energy Company  
Their Agent

  
\_\_\_\_\_  
W. G. Council  
Senior Vice President

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

Then personally appeared before me W. G. Council, who being duly sworn, did state that he is Senior 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.

  
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Notary Public

My Commission Expires March 31, 1988

## ATTACHMENT I

Status of the NRC-EQB (Seismic and Dynamic Qualification Section)  
Draft SER Open Items Discussed at the Meeting  
with the NRC-EQB on May 9, 1984

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<u>Item No.</u>	<u>Description</u>	<u>Status</u>
EQB-1	Description of Seismic Qualification Program in FSAR	Open
EQB-2	As-Built Mounting Condition	Confirmatory
EQB-3	Piping Loads Transmitted to Pump and Valve Bodies	Open
EQB-4	Aging and Sequential Testing	Confirmatory
EQB-5	Westinghouse Generically Qualified Equipment	Closed
EQB-6	Qualification Using Single Axis and/or Frequency Test	Closed
EQB-9	Design Criteria for Pump and Valve Internal Parts	Open
EQB-10	Equipment to be Tested in Operational Condition	Confirmatory
EQB-13	Aging	Confirmatory
EQB-14	Independent Qualification Versus Assembly Qualification	Confirmatory

## Attachment II

### Responses to Draft SER Open Items

<u>Item No.</u>	<u>Description</u>
EQB-1	Description of Seismic Qualification Program in FSAR
EQB-2	As-Built Mounting Condition
EQB-3	Piping Loads Transmitted to Pump and Valve Bodies
EQB-4	Aging and Sequential Testing
EQB-5	Westinghouse Generically Qualified Equipment
EQB-6	Qualification Using Single Axis and/or Frequency Test
EQB-9	Design Criteria for Pump and Valve Internal Parts
EQB-10	Equipment to be Tested in Operational Condition
EQB-13	Aging
EQB-14	Independent Qualification Versus Assembly Qualification

Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-1 Description of Seismic Qualification Program in FSAR (Draft SER Section 3.10.1)

The applicant should describe their seismic qualification program for NSSS safety related mechanical equipment in the FSAR.

Response (5/84)

NSSS safety-related mechanical equipment is qualified by analysis and a combination of analysis and testing. The analysis methods used by Westinghouse are described in FSAR Sections 3.7 and 3.9. In addition, WCAP-9714, which has been approved by the staff, describes the NSSS (Westinghouse) seismic qualification methodology for both mechanical and electrical equipment. A description of the qualification of active valves utilizing a combination of testing and analysis is provided in FSAR Section 3.9.3.

Status (5/84)

Open

Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-2 As-Built Mounting Condition (Draft SER Section 3.10.1)

The applicant needs to clarify how the as-built mounting condition is determined to be equivalent to that used in qualification and how the RRS at the mounting location is determined to equal or exceed that used in qualification.

Response (5/84)

The applicant's policy is to provide equipment anchorage in accordance with that delineated on the vendor's production drawings. It is the vendor's responsibility to assure consistency of anchorage details between these production drawings and the seismic qualification report. Exceptions to the requirements of the production drawing are reconciled with the seismic qualification report by SWEC and/or the vendor in accordance with project procedures.

Equipment location is specified prior to seismic qualification RRS applicable to each piece of equipment or an enveloping RRS for equipment types with multiple locations is provided for the qualification test or analysis. The final report for site specific qualification is reviewed for compliance with the input requirements. Generically qualified equipment is reviewed against RRS applicable to the location specified for the equipment.

Status (5/84)

Confirmatory



Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-3 Piping Loads Transmitted to Pump and Valve Bodies (Draft SER Section 3.10.1)

The applicant needs to clarify how the conservative restrictions placed on allowable piping loads transmitted to the pump and valve bodies for NSSS supplied items have been demonstrated not to cause detrimental deflections of the active components. The applicant should also clarify how this issue is resolved for BOP equipment.

Response (5/84)

Pump and valve operability programs are described in FSAR Sections 3.9B.3.2 and 3.9N.3.2.

For both BOP and NSSS pumps, the methodology for assuring mechanical operability is the same. This is described with justification in FSAR Section 3.9B.3.2.1.

FSAR Sections 3.9B.3.2.2 and 3.9N.3.2.2 describe in detail methods of assuring valve operator operability. As indicated in FSAR Section 3.9B.3.1.2, fluid boundary component design, including valve bodies, is assured to be within elastic limits. Elastic design of valves and attached piping plus the random, short duration, cyclic nature of seismic and dynamic loading assures no loss of function.

Status (5/84)

Open

Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-4 Aging and Sequential Testing (Draft SER Section 3.10.1)

Although the applicant has committed to follow the requirements and recommendations of IEEE 344-1975 and Regulatory Guide 1.100, the methods for handling aging and sequential testing in the seismic qualification of both electrical and mechanical equipment should be clarified. In addition, the applicant should commit to establish a maintenance and surveillance program to maintain equipment in a qualified status throughout the life of the plant.

Response (5/84)

For electrical equipment, the guidelines provided in IEEE 323-1974 and IEEE 344-1975 were followed during the qualification program. Seismic testing was performed in the aged condition. If the vendor indicates that items must be serviced or replaced on a routine basis to maintain a qualified status for the qualified life, the preventative maintenance program will ensure that the appropriate refurbishment is performed.

For mechanical equipment, the Standard Review Plan (SRP) Section 3.10, II.1.c states that for plants whose construction permit SER was issued prior to July 1, 1974 (Millstone Unit No. 3 CP SER was issued in March, 1974) the seismic and dynamic testing portion of the overall qualification need not be performed in its proper sequence as indicated in Section 6 of IEEE 323-1974. The seismic and operability qualification programs implemented for Millstone Unit No. 3, as described in FSAR Sections 3.7 and 3.9 provide adequate assurance of proper equipment performance under all required conditions. The inservice inspection program together with the preventative maintenance program which includes vendors recommendations, ensures that equipment vulnerable to deterioration is identified and serviced in a controlled manner.

Status (5/84)

Confirmatory



Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-5 Westinghouse Generically Qualified Equipment (Draft SER Section 3.10.1)

The applicant should clarify how Westinghouse generically qualified equipment is verified as being applicable to Millstone Unit No. 3.

Response (5/84)

The Westinghouse Equipment Qualification Data Package (EQDP) for Millstone Unit No. 3 equipment is reviewed for compliance to Millstone Unit No. 3 requirements. This includes review of applicability of methodology and assurance that generic seismic inputs, either static accelerations or RRS, envelope site specific requirements.

Status (5/84)

Closed

Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-6 Qualification Using Single Axis and/or Frequency Test (Draft SER Section 3.10.1)

In cases where equipment was qualified by using single axis and/or single frequency testing, the equipment should be identified and in each case the justification for the use of these procedures should be given.

Response (5/84)

The Seismic Category I Mechanical and Electrical Equipment list will identify the equipment which is qualified by single axis and/or frequency testing. As part of the general seismic qualification requirement, justification of the use of single axis/frequency testing must be, and is, contained in the equipment Seismic Qualification Report. For NSSS equipment the use of single axis/frequency testing is justified in WCAP 9750, 9714 and 8587.

Status (5/84)

Closed

Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-9 Design Criteria for Pump and Valve Internal Parts (Draft SER Section 3.10.2)

The applicant did not provide the design criteria for pump and valve internal parts, such as valve discs and pump shafts. A review of qualification documents is necessary to determine whether the pump and valve internals are adequately qualified.

Response (5/84)

As indicated in FSAR Section 3.9B.3.2.1 pump shaft qualification is deflection sensitive. Pump design and qualification assure maintenance of rotor/casing clearance under all loadings. If deflection is not governing, shaft stress is limited, at the manufacturer's discretion, to good design practice considering other design parameters such as design life and fatigue limits. In no case, however, does this exceed yield strength.

Valve discs are qualified by hydrostatic test (See MEB Q210.38).

Status (5/84)

Open

NRC Letter: December 5, 1983

Question No. Q210.38 (Section 3.9.3)

Valves discs are considered part of the pressure boundary and as such should have allowable stress limits. Provide these limits for our review.

Response:

BOF Scope

Class 1 valve discs are designed such that the primary membrane stress intensity will not exceed  $S_m$  and the primary bending stress intensity will not exceed  $1.5 S_m$  (NE-3546.2).

Class 2 and 3 valves are designed to ASME III. Structural integrity of the disc is assured by hydrostatic testing.

NSSS SCOPE

Westinghouse also considers valve discs as part of the pressure boundary. The valve discs are designed to the same pressure boundary code limits as those valves in which they are contained.

Specifically, stress limits for Class 1 valves (and discs) are contained in FSAR Table 3.9N-3. Stress limits for Class 2 and 3 valves (and discs) are contained in FSAR Table 3.9N-8.

Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-10 Equipment to be Tested in Operational Condition (Draft SER Section 3.10.2)

SRP 3.10, Paragraph II.1.a(2) indicates that equipment should be tested in the operational condition, that is, normal plant loadings should be superimposed on seismic and dynamic loads, including thermal, flow induced loads and degraded flow conditions. The FSAR should clearly indicate how this requirement is met.

Response (5/84)

Pumps are qualified per FSAR Section 3.9B.3.2.1 considering all loading conditions. Qualification analysis includes pump operating and seismic loads plus system loads from attached piping which includes thermal and flow induced loads.

Degraded flow conditions per SRP 3.10 Section II.1.a(2) are considered inapplicable by maintenance of system cleanliness. Trash racks and a series of screens with increasing fineness are provided for the containment sumps in accordance with Regulatory Guide 1.82. The service water pumps employ traveling screens to remove debris from the pump intake area. These devices are considered to provide a level of system cleanliness sufficient to ensure pump operability.

Valves are qualified per FSAR Section 3.9B.3.2.2. Active safety-related valves are installed in ASME III piping systems designed for all loading conditions, including fluid dynamic events. These systems are designed to maintain valve accelerations under all dynamic events (seismic and fluid transient) within qualified levels. (Refer to EQB-3).

Status (5/84)

Confirmatory

Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-13 Aging (Draft SER Section 3.10.2)

Clarification of how aging was incorporated in the qualification process should be contained in the FSAR. In addition, the applicant should commit to establish a maintenance and surveillance program to maintain equipment in a qualified status throughout the life of the plant.

Response (5/84)

There are currently no definitive guidelines for aging of mechanical equipment other than those found in the ASME Section III code for design margins under various service conditions. The seismic and operability programs implemented for Millstone Unit No. 3, as described in FSAR Sections 3.7 and 3.9, which describe the methods used to comply with the ASME Code provide adequate assurance of proper equipment performance under all required conditions.

The inservice inspection program in conjunction with the preventative maintenance program which includes vendors recommendations, ensures that equipment vulnerable to deterioration is identified and serviced in a controlled manner.

Status (5/84)

Confirmatory



Millstone Unit No. 3

Open Items

Equipment Qualification Branch

EQB-14 Independent Qualification Versus  
Assembly Qualification (Draft SER Section 3.10.2)

Further justification of the independent qualification of pumps, valves, prime movers and actuators versus their assembly qualification is also required.

Response (5/84)

Pumps have been qualified, by detailed stress analysis per the provisions of Regulatory Guide 1.48, as composite structure including both pump and prime mover (motor). Separate additional qualification of motors has been done by test to assure operability in the environmentally aged condition to meet the requirements of NUREG-0588.

Similarly valves are qualified by analysis as a composite including both valve body and operator. Static valve operability tests are performed with the operator mounted to the body and the body pressurized. Separate additional testing of operators has been done in the aged condition to assure no loss of function from environmental exposure.

Status (5/84)

Confirmatory