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

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March 27, 1990

Docket No. 50-336
B13048
Re: 10CFR50.90

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

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2
Proposed Change to Technical Specifications
Seismic Restraints

Pursuant to 10CFR50.90, Northeast Nuclear Energy Company (NNECO) hereby proposes to amend its Operating License No. DPR-65 by incorporating the changes identified in Attachment 1 into the Technical Specifications of Millstone Unit No. 2.

Specifically, the proposed changes will add Sections 3/4.7.11 and 3/4.7.12 and their applicable BASES to the Technical Specifications. These sections will explicitly define the mechanical structural aspects of seismic qualification requirements for Millstone Unit No. 2 piping systems and provide the actions to be taken in the event that:

(1) A seismic restraint(s), other than a snubber, is found or rendered inoperable (Section 3/4.7.11).

(2) The seismic qualification of a safety-related piping system, component, or equipment is temporarily affected for a very short duration as a result of structural decoupling or an inoperable/inadequate component other than seismic restraint or snubber (Section 3/4.7.12).

BENEFITS OF PROPOSED CHANGES

The proposed changes explicitly delineate the operability requirements for maintaining full seismic qualification of piping systems. Currently, these requirements are implicit in the system operability criteria. They also provide guidance to be used by plant personnel to maintain and, if required, restore this qualification for plant piping systems required to satisfy a limiting condition for operation (LCO) in a manner that is consistent with plant operation. Specifically, seismic qualification related deficiencies discovered during plant inspections can be corrected in a well-defined manner thereby increasing plant safety and reliability. Similarly, an expedited repair/replacement of components on a seismically qualified system can be performed without cycling the plant through various modes of operation.

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By separating seismic qualification requirements from other system operability criteria, the proposed change more accurately prescribes what actions are appropriate for various deficiencies that may be encountered. We believe this proposed change to be consistent with NRC guidance to more clearly define and promptly address licensee actions when confronted with equipment that is potentially degraded or is questionable concerning potential nonconformance with regulations, codes and standards, or the licensing and/or design basis. One example of such guidance is a memorandum from the NRC Staff dated August 9, 1989.(1) With the issuance of the subject amendment, there will be a clear articulation of licensee requirements upon the discovery of degradation of seismic qualification.

DISCUSSION OF PROPOSED CHANGES TO TECHNICAL SPECIFICATIONS

The changes proposed herein affect certain aspects of the mechanical structural seismic qualification of Millstone Unit No. 2 piping systems. Millstone Unit No. 2 is designed to the safe shutdown earthquake (SSE) and operating bases earthquake (OBE) ground level excitation of 0.17 g and 0.09 g, respectively. The plant piping systems are designed in accordance with the Millstone Unit No. 2 FSAR, and architect-engineer design specification requirements and consider all credible loads and load combinations. The plant has implemented the provisions of I&E Bulletins 79-02 and 79-14.

Seismic Restraints Excluding Snubbers (Section 3/4.7.11)

Background Review (Section 3/4.7.11)

Snubbers, rigid struts, in-line anchors, and equipment anchors are some of the examples of restraints capable of resisting seismic or other dynamic loadings. While the rigid restraints resist all types of static and dynamic loadings, the snubbers provide no restraint to the movement of supported components for slowly applied static loads such as thermal expansion and dead weight.

The inoperability of snubbers is addressed by the provisions in Millstone Unit No. 2 Technical Specification (TS) Section 3/4.7.8. However, inoperability of seismic restraints other than snubbers, equally important to the seismic structural capability of a piping system, is not specifically addressed in the current Technical Specifications.

A new TS Section 3/4.7.11 is proposed to specifically address the operability of seismic restraints other than snubbers and to provide specific action(s)

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(1) J. G. Partlow memorandum for Assistant Directors, Project Director, Project Managers, Project Engineers, "Guidance on Licensee Actions That Should Be Taken When Equipment is Discovered to be Potentially Nonconforming," dated August 9, 1989.

required to be taken to restore operability. The proposed Action Statement provisions are similar to those presently existing for snubbers; namely, a 72-hour allowance to restore operability and a requirement to perform engineering evaluations to determine the impact on affected components' design capability for continued service.

Discussion (Section 3/4.7.11)

This proposed specification addresses inoperability of seismic restraints other than snubbers. Inoperability of a seismic restraint is similar to the inoperability of a snubber during a seismic or other dynamic event. For deadweight loading conditions, the effect of an inoperable restraint is appreciable only if the rigid restraint is in the vertical direction. For the thermal loading condition, the effects of an inoperable restraint are significant only if the rigid restraint is in close proximity of equipment. For seismic or other loadings, an inoperable restraint may cause redistribution of loads to adjacent supports and some increase in pipe stresses.

Unlike snubbers, however, rigid restraints are passive devices and have no active component. Thus, the likelihood of a rigid restraint malfunctioning is extremely remote. A restraint may be inoperable as a result of (1) missing restraint or improper anchorage, (2) damaged restraint or, (3) temporary removal to eliminate interferences and facilitate maintenance activities.

A restraint that is damaged or lacks adequate anchorage is still capable of providing some restraint. A restraint that is intentionally rendered inoperable to effect repairs or replacement is a temporary measure proposed to be allowed to exist only for a maximum period of 72 hours before action as provided in Technical Specifications must be taken. The allowance of 72 hours is consistent with that provided for inoperability of other safety-related equipment and inoperable snubbers. It is noteworthy that the safety significance of degrading the seismic qualification is significantly less than that associated with the inoperability of the equipment or systems.

The consequence of an inoperable seismic restraint is a slight increase in the probability of structural damage to the supported subsystem resulting from a seismic or other postulated event which initiates dynamic loads. Inoperability of a rigid restraint would not, however, in and by itself, result in failure of the piping system, components, or other safety-related systems that it is supporting. Additionally, there is less potential for damage to the supported system from malfunction of a rigid restraint during normal plant operation than from a locked-up snubber.

In order to provide additional assurance of seismic restraint operability, the in-service inspection program requires Classes 1, 2, 3, and metal containment (MC) component supports to be examined in accordance with ASME Section XI. Moreover, an engineering evaluation and satisfactory disposition of any adverse impact of an inoperable seismic restraint is required.

Thus, the proposed addition of the above seismic restraints, Section 3/4.7.11 to the Millstone Unit No. 2 Technical Specification, formalizes the Action Statement for inoperable seismic restraints in a manner similar to the existing snubber Technical Specifications. Such an action, coupled with the requirement for an engineering evaluation and the ASME Section XI in-service inspections, increases the probability of successful seismic restraint performance.

Seismic Qualification (Section 3/4.7.12)

Background Review (Section 3/4.7.12)

The seismic qualification of Millstone Unit No. 2 piping systems is assured by calculating the piping seismic response using the enveloped response spectra method and combining this result with other credible loads in accordance with the Design Specification and FSAR requirements. For analysis purposes, a piping system boundary is determined by terminal in-line anchors or equipment connections.

On an otherwise functional piping system, essential repairs or replacement of defective but isolable in-line components is not permissible because decoupling of a continuous piping system anywhere between terminal anchors would invalidate the seismic analysis and ASME Code stress compliance.

Thus, repair/replacement activity on these systems currently may require: (1) cycling the plant to an appropriate mode of operation where these repairs can be performed; (2) performing extensive stress analysis, design, and construction work to maintain full ASME Code compliance for the interim decoupled piping configurations; or (3) awaiting a scheduled plant shutdown for refueling or a forced plant shutdown.

Plant experience suggests that most essential repair/replacement activity can normally be completed within a very short duration.

Discussion (Section 3/4.7.12)

Short-term operability criteria considering seismic events are proposed to address the question of seismic qualification as it relates to structural decoupling necessary to replace degraded or defective components in a seismically qualified piping system. This may involve replacement of in-line components, such as pipe fittings, valves, etc., and as a result may require simultaneous use of Technical Specifications 3/4.7.8 (Snubbers) and 3/4.7.11 (Seismic restraints other than snubbers).

This Technical Specification applies to seismically qualified ASME Classes 2/3 and ANSI B31.1 systems. ASME Class 1 systems, buried piping systems, and containment penetrations are excluded so that their seismic qualification is not affected by the proposed change.

Structural decoupling is proposed to be undertaken only for those Class 2/3 and ANSI B31.1 systems that are either redundant and isolable or unneeded in the prevailing plant mode of operation. However, if a system is governed by Technical Specifications and unavailable as a result of structural decoupling, all actions shall be governed by that system's Technical Specifications.

Prior to decoupling, an engineering evaluation is required to provide assurance that the decoupled piping system meets applicable code requirements for dead weight, pressure, and thermal loadings and is reviewed for potential seismic interaction concerns. This engineering evaluation recognizes the fact that seismic inertia loads do not cause failure of above ground piping that is supported for dead weight and reviewed for excessive anchor movements and seismic interaction.

The time for which a subsystem can exist in a seismically unqualified state is proposed to be limited to a maximum of 24 hours for Class 2 systems and 72 hours for Class 3 and B31.1 systems. It should be noted that the LCO times allowed for the proposed Technical Specifications are consistent with those allowed for other safety-related equipment. Provided below are examples of safety-related equipment and their associated LCO ACTION times allowed to restore their operability:

Millstone
Unit No. 2

Tech. Spec. Sec.	Equipment	LCO Action Time
3.1.2.4	Charging Pumps	48 hours
3.4.3	Power-Operated Relief Valves	8 hours
3.5.2	Safety Injection Pumps	48 hours
3.6.2	Containment Spray System	7 days
3.7.1.2	Auxiliary Feedwater Pump	72 hours
3.7.1.5	Main Steam Isolation Valves	4-8 hours
3.7.8	Snubbers	72 hours

The additional risk posed by the proposed Technical Specification is minimized by excluding all ASME Class 1 piping systems and by imposing a 24 or 72 hour restriction that an ASME class 2 or 3 system can remain in a reduced level of seismic structural qualification. This risk is further diminished by the fact that the above ground welded steel piping has exhibited remarkable reserve margins to failure when subjected to seismic loadings as documented in EPRI/NRC piping integrity tests and earthquake plant experience data base reports. With strict controls and limitations placed on the application of this Technical Specification, it is believed that the so-called "reduced seismic qualification" system will be able to perform its intended function during an SSE. It is further believed that a temporary reduction in full structural seismic qualification status of an affected subsystem is an acceptable short-term risk considering the increased probability of successful system performance and plant safety as a result of the repairs.

The use of this proposed change will be limited to essential repairs to Class 2/3 and applicable B31.1 systems to be performed in a controlled manner over an extremely short period of time. Unwarranted plant transients induced by forced shutdowns and equipment restarts to effect essential repairs can thus be avoided. The benefits of increased plant reliability, reduced challenges to safety systems, and a successful system performance during and following a potential future seismic event outweigh the increased short term risk.

SIGNIFICANT HAZARDS CONSIDERATION

The proposed additions to Millstone Unit No. 2 Technical Specifications have been reviewed in accordance with the criteria of 10CFR50.92. NNECO has determined that the changes do not involve a significant hazards consideration. Specifically, it has been concluded that the proposed changes do not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

   The proposed changes will allow continued plant operation with a safety system or component not fully seismically qualified (stress Code compliance aspects only) for a longer period of time, in some cases, than is allowed by the existing Technical Specification operability requirements. However, this increase in time may only be used when the system remains otherwise OPERABLE and functional in all other respects. Thus, the system will still be fully capable of functioning as assumed to mitigate all design basis events which would challenge the system other than a seismic event, within the limitations and ACTION requirements of the existing system-specific Technical Specifications. Therefore, the probability and consequences of all design basis events other than the safe shutdown earthquake remain unchanged from what is currently assumed in the design basis.

   The only design basis event which is potentially affected by the proposed changes is a seismic event. A seismic event during the time period in which the new Technical Specifications are utilized could result in a small increase in the probability of failure of a safety system due to the reduced level of seismic stress qualification. As a result, the probability of a failure resulting from a seismic event could be different than previously assumed. Such a failure would potentially increase the consequences of the design basis seismic event. However, the increase in the failure probability is judged to be insignificant for two reasons.

   First, the time that a safety system would be allowed to be in a reduced level of seismic qualification is limited to 24 or 72 hours, depending on the specific system affected, before the system would have to be declared inoperable and the existing system-specific ACTION statement invoked. Further, the reactor coolant pressure boundary and the containment

penetrations are specifically excluded from the scope of the proposed change.

Given that the allowable ACTION times in the existing Technical Specifications implicitly account for the total risk associated with the occurrence of all events (e.g. - LOCA, steamline break, etc.) that could challenge the system during the time the system in inoperable, and that the risk of a specific event (i.e., seismic) is but one contributor to the total risk and allowable outage time, it follows that if only one parameter is of concern (seismic qualification) then a longer allowed outage time can be justified. The acceptability of the proposed change is based in part on this fact, since it specifically requires that the system be maintained "otherwise operable and functional" and thus capable of adequately responding as assumed to all design basis events other than an earthquake.

Secondly, the lack of demonstrated seismic qualification does not necessarily imply that piping will fail during a seismic event. In fact, there is substantial evidence that indicates the piping will not fail. EPRI piping integrity tests and a large seismic experience data base show that above ground welded piping supported for deadweight is capable of withstanding earthquakes of magnitudes three times larger than the Millstone Unit No. 2 design basis earthquake. As stated in the proposed basis for the new LCOs, an evaluation is required to ensure that the piping system remains qualified for deadweight, pressure, temperature, and design loadings other than seismic and is reviewed for potential seismic interaction. This requirement provides substantial confidence that a seismic event will not result in failure of the piping system even though qualification cannot be explicitly demonstrated.

A probabilistic risk assessment of the proposed change was performed in order to estimate the impact on plant safety. The order of magnitude quantification determined the probability of a seismic event which could challenge plant safety systems concurrent with seismic restraints INOPERABLE on one system and random failure of the redundant system. A major assumption is that one train of equipment could still perform its intended function during an SSE. The results indicate the change is acceptable and would impact the core melt frequency by less than 10^{-7}/yr.

Based on the above, it is concluded that although the proposed changes could result in a small increase in the probability of failure of a safety system, this increase will not significantly affect plant response and therefore will not have a significant impact on the consequences of the SSE or of any other accident.

2. Create the possibility of a new or different kind of accident.

As discussed above, the proposed changes involve no impact on the plant response to any design basis event other than a seismic event. By

requiring that the applicable system Technical Specification not be violated, the proposed change does not impact the Single Failure Criterion (SFC) requirements. Thus, the proposed change does not create the possibility of a new or different kind of accident from any previously analyzed. The change decreases the short term seismic structural qualification of an affected piping subsystem. Since steps will be taken to eliminate excessive seismic unrestrained movement and interaction while the LCO is in effect, the principal causes of failure due to seismic earthquake loading are eliminated. With respect to earthquakes, the change in failure probability of safety systems is low and has been determined to be not significant for the reasons discussed above. Since the decreased seismic capability is short term and adequate measures for reducing potential seismic failure are provided, no new accident scenarios need be considered. Additionally, the failure modes associated with the change represent no new unanalyzed accident. Therefore, since overall plant response is essentially unchanged, there can be no new or different kind of accident.

3. Involve a significant reduction in a margin of safety.

The proposed change provides for short term operability criteria considering seismic events. By excluding building structures, ASME Code Class 1 equipment, components and systems, and containment penetrations from the proposed short term operability criteria, the protective boundaries are not impacted.

For the duration of the LCO, the proposed change does lower the margin of safety slightly for seismic events as a result of an inoperable seismic support or a structurally decoupled piping subsystem. However, piping integrity tests[2] and seismic experience data base[3] show that the above-ground welded piping designed for pressure and supported for deadweight is capable of withstanding earthquakes of magnitudes three times larger than the Millstone Unit No. 2 design basis earthquake. Thus, for the short duration, the lowered margin of safety does not in any way imply a failure for the affected piping which has seismic restraints in addition to the required deadweight restraints.

The Commission has provided guidance concerning the application of standards in 10CFR50.92 by providing certain examples (51FR7751, March 6, 1986) of

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(2) EPRI NP-3916, Final Report, "High Amplitude Dynamic Tests of Prototypical Nuclear Piping System," dated February 1985.

(3) EPRI NP-5617, Final Report, Volumes 1 and 2, "Recommended Piping Seismic-Adequacy Criteria Based on Performance During and After Earthquakes," dated January 1988.

amendments that are considered not likely to involve a significant hazards consideration. The changes proposed herein most closely resemble example (vi), a change which either may result in some increase to the probability or consequences of a previously analyzed accident or may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria in the Standard Review Plan; e.g., a change resulting from the application of a small refinement of a previously used calculational model or design method. The proposed changes provide seismic qualification requirements and specify actions to be taken to maintain this qualification. The proposed LCO allows essential maintenance to be performed on systems and components without declaring those systems inoperable, yet maintains control over the length of time the unqualified condition is in effect. A precedent exists in the Technical Specifications of Millstone Unit No. 2, as well as all other operating plants, for allowing system and/or components to be in a reduced qualification status for limited periods of time as specified by the action statement accompanying an LCO. Thus, although allowing remedial action to be taken on a system and/or component without declaring it inoperable carries a certain amount of risk, the LCO action time allowed provides for a reasonable and realistic period of time, following which the plant is required to be placed in a mode or condition for which the LCO no longer applies.

The Millstone Unit No. 2 Nuclear Review Board has reviewed and approved the attached proposed revision and has concurred with the above determinations.

With regard to the priority the Staff may assign to this request, we acknowledge the absence of an immediate crisis situation. However, we believe there are compelling reasons to conduct a review of this proposal in the near term. First, the NRC Staff has expressed concern that operability issues be kept in mind with regard to both deficiencies discovered during USI A-46, "Seismic Qualification of Equipment in Operating Plants," walkdowns and to equipment deliberately taken out of service. Having seismic qualification Technical Specifications in place prior to the walkdowns will be useful as operability questions have the potential to arise during the resolution of USI A-46. NNECO believes this proposed amendment is responsive to our mutual desire to have a well-defined, technically defensible course of action planned and in place, in anticipation of equipment deficiencies or maintenance evolutions expected to recur. Second, the Region I Staff and NNECO have been devoting increasing attention of late to the issue of appropriate resolution of potentially deficient components or systems. With the issuance of this amendment, there would be a clear, technically defensible course of action to follow in the event that seismic qualification degradation occurs. From that perspective, we respectfully request that due consideration be given to this proposal at your earliest convenience.

Following submittal of this proposed Technical Specification request, we would be receptive to participating in a meeting with the Staff to further explain our proposal, or answer any questions the Staff may have.

In accordance with 10CFR50.91(b), we are providing the State of Connecticut with a copy of this proposed amendment application.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

E. J. Mroczka
Senior Vice President

cc: W. T. Russell, Region I Administrator
G. S. Vissing, NRC Project Manager, Millstone Unit Nos. 2
W. J. Raymond, Senior Resident Inspector, Millstone Unit Nos. 1, 2, and 3
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Mr. Kevin McCarthy
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STATE OF CONNECTICUT)
) ss. Berlin
COUNTY OF HARTFORD)

Then personally appeared before me, E. J. Mroczka, who being duly sworn, did state that he is Senior Vice President of Northeast Nuclear Energy Company, a Licensee herein, that he is authorized to execute and file the foregoing information in the name and on behalf of the Licensee herein, and that the statements contained in said information are true and correct to the best of his knowledge and belief.

Notary Public
My Commission Expires March 31, 1993