



Northeast  
Nuclear Energy

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The Northeast Utilities System

SEP 28 1998

Docket No. 50-336

B17417

Re: 10CFR50.90

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

Millstone Nuclear Power Station, Unit No. 2  
License Amendment Request - Unreviewed Safety Question  
Proposed Revision to Final Safety Analysis Report  
Wire, Cable and Raceway Facilities - Separation

Northeast Nuclear Energy Company (NNECO) has determined that the separation requirement in Millstone Unit No. 2 Final Safety Analysis Report (FSAR) of six inches, which is applied to redundant vital cables, internal wiring of redundant vital circuits and associated devices, involves an unreviewed safety question (USQ). This requirement was implemented in section 8.7.3.1 of the FSAR as 10CFR50.59 changes using a safety evaluation (SE) which erroneously concluded that a reduction in electrical separation criteria was not an unreviewed safety question.<sup>(1)</sup> Therefore, per 10CFR50.59(c), NNECO requests the NRC review and approve these changes to the FSAR through an amendment to Operating License DPR-65, pursuant to 10CFR50.90.

For the change proposed herein, NNECO has concluded that there may be a minimal increase in the probability of occurrence of a malfunction of equipment important to safety. NNECO is aware of the Commission's direction<sup>(2)</sup> to initiate an expedited rulemaking to clarify and modify 10CFR50.59. The modified rule would allow plant design changes evaluated as having "minimal" increase in the probability of occurrence of a malfunction of equipment to be implemented without prior NRC approval. Using the proposed new criteria (as we understand them), NNECO would have concluded that this change did not involve an unreviewed safety question.

(1) E. V. Imbro, Nuclear Regulatory Commission, to M. L. Bowling, "Notice of Violation and Safety Functional Inspection of Millstone Unit 2 (NRC Inspection Report No. 50-336/98-202)," dated June 11, 1998.

(2) NRC Memorandum to L. Joseph Callan from John C. Hoyle, Staff Requirements: SECY-97-205 - Integration and Evaluation of Results from Recent Lessons-learned Reviews, dated March 24, 1998.

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Attachment 1 provides a discussion of the proposed changes. Attachment 2 provides the safety Summary and the Significant Hazard Consideration. Attachment 3 provides the FSAR pages with the previously implemented 10CFR50.59 changes indicated.

#### Environmental Considerations

NNECO has reviewed the proposed License Amendment Request against the criteria of 10CFR51.22 for environmental considerations. The proposed changes were previously implemented as 10CFR50.59 changes to FSAR section 8.7.3.1 using a SE which erroneously concluded that a reduction in electrical separation criteria was not an unreviewed safety question. However, these changes will not significantly increase the type and amounts of effluents that may be released offsite. In addition, this amendment request will not significantly increase individual or cumulative occupational radiation exposures. Therefore, NNECO has determined the proposed changes will not have a significant effect on the quality of the human environment.

#### Conclusions

The separation requirement of six inches was implemented in section 8.7.3.1 of the FSAR as 10CFR50.59 changes using a SE which failed to fully consider the effect of reduction in separation on increasing the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the FSAR. NNECO reevaluated the previously implemented changes to FSAR section 8.7.3.1 and determined that the separation requirement of six inches in control boards and panels involves an unreviewed safety question. However, NNECO has concluded that the proposed changes are safe.

The proposed changes do not involve a significant impact on public health and safety (see the Safety Summary provided in Attachment 1) and do not involve a Significant Hazards Consideration pursuant to the provisions of 10CFR50.92 (see the Significant Hazards Consideration provided in Attachment 2).

#### Plant Operations Review Committee and Nuclear Safety Assessment Board

The Plant Operations Review Committee and Nuclear Safety Assessment Board have reviewed and concurred with the determinations.

#### Schedule

We request issuance at your earliest convenience, with the amendment to be implemented within 60 days of issuance.

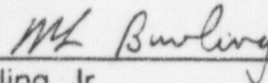
State Notification

In accordance with 10CFR50.91(b), a copy of this License Amendment Request is being provided to the State of Connecticut.

If you should have any questions on the above, please contact Mr. Ravi Joshi at (860) 440-2080.

Very truly yours

NORTHEAST NUCLEAR ENERGY COMPANY



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M. L. Bowling, Jr.  
Recovery Officer - Technical Services

Sworn to and subscribed before me

this 28 day of September, 1998

  
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Notary Public

My Commission expires LORETTA F. GOODSON  
NOTARY PUBLIC  
**Commission Expires November 30, 2001**

Attachments

cc: H. J. Miller, Region I Administrator  
D. G. McDonald, Jr., NRC Senior Project Manager, Millstone Unit No. 2  
D. P. Beaulieu, Senior Resident Inspector, Millstone Unit No. 2  
E. V. Imbro, Director, Millstone ICAVP Inspections

Director  
Bureau of Air Management  
Monitoring and Radiation Division  
Department of Environmental Protection  
79 Elm Street  
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Attachment 1

Millstone Nuclear Power Station, Unit No. 2  
License Amendment Request - Unreviewed Safety Question  
Proposed Revision to Final Safety Analysis Report  
Section 8.7.3.1 - Wire, Cable and Raceway Facilities - Separation  
Discussion of Changes

September 1998

**License Amendment Request - Unreviewed Safety Question  
Proposed Revision to Final Safety Analysis Report  
Wire, Cable and Raceway Facilities - Separation  
Discussion of Changes**

Introduction

Northeast Nuclear Energy Company (NNECO) has determined that the separation requirement in Millstone Unit No. 2 Final Safety Analysis Report (FSAR), of six inches which is applied to redundant vital cables, internal wiring of redundant vital circuits and associated devices involves an unreviewed safety question (USQ). This requirement was implemented as 10CFR50.59 changes to FSAR section 8.7.3.1 using a safety evaluation (SE) which erroneously concluded that a reduction in electrical separation criteria was not an unreviewed safety question. Therefore, per 10CFR50.59(c), NNECO requests the NRC review and approve these changes to the FSAR through an amendment to Operating License DPR-65, pursuant to 10CFR50.90.

Background

In 1997, NNECO issued a Design Change Record (DCR) to revise sections 2.4.2, and 2.4.6 of Specification SP-M2-EE-0016, "Electrical Separation Specification - Millstone Unit 2," Rev. 0. Specification SP-M2-EE-0016, Rev. 0, requires 12 inches separation between redundant wires/devices located in control panels, and does not address current industry standard regarding separation inside control panels. The DCR was issued to change the minimum separation between redundant wires/devices located in control panels to 6 inches. The 6 inches minimum separation distance is based on IEEE standard 384-1981,<sup>(1)</sup> sections 6.6.2 and 6.6.5, and IEEE standard 420-1982,<sup>(2)</sup> sections 4.3.1, 4.3.2, and 4.3.3. The DCR included SE No. S2-EV-97-0018, Rev. 1, dated September 8, 1997, which concluded that these changes did not involve an unreviewed safety question. This 6 inches minimum separation distance requirement was also implemented as 10CFR50.59 changes to FSAR Section 8.7.3.1 using the same safety evaluation.

On March 2 through April 3, 1998, the staff of the U. S. Nuclear Regulatory Commission (NRC), Office of Nuclear Reactor Regulation, Special Projects Office (SPO), performed a safety system functional inspection (SSFI) of the Millstone Unit 2 reactor building closed cooling water (RBCCW) system. In addition, the team reviewed the functions of important attendant and interfacing systems including the service water

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<sup>(1)</sup> IEEE standard 384-1981, "Standard Criteria for Independence of Class 1E Equipment and Circuits."

<sup>(2)</sup> IEEE standard 420-1982, "Design Standards and Qualification of class 1E Control Boards, panels, and Racks Used in Nuclear Power Generating Stations."

system and electrical systems. One of the violations identified in the inspection report<sup>(3)</sup> (violation H), stated that:

"NRC 'Safety Evaluation of Millstone Point Nuclear Power Station,' dated May 10, 1974, Section 7.10, approved 12 inches as the electrical cable separation criteria in panels.

FSAR Section 8.7.3.1 described the same separation criteria.

Contrary to the above, a safety evaluation erroneously concluded that a reduction in the plant-wide electrical separation criteria was not an unreviewed safety question. Design Change Record (DCR) M2-96-68, 'Electrical Separation Specification - Millstone Unit 2,' Rev 0, dated September 8, 1997, revised SP-M2-EE-0016, Rev. 0, dated September 9, 1996. The change reduced the electrical cable separation criteria from 12 to 6 inches in cabinets. The DCR included a Safety Evaluation No. S2-EV-97-0018, Rev. 1, dated September 8, 1997, which concluded that there was not an unreviewed safety question. The reduction in separation could increase the probability of a previously evaluated malfunction of equipment."

The separation requirement of six inches was implemented in section 8.7.3.1 of the FSAR as 10CFR50.59 changes using the same SE which failed to fully consider the effect of reduction in separation on increasing the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the FSAR. NNECO reevaluated the previously implemented changes to the FSAR and determined that the separation requirement of six inches in control boards and panels involves an unreviewed safety question. However, NNECO has concluded that the proposed changes are safe.

#### Design and Licensing Bases

The redundant vital wires/devices affected by the changes in specification SP-M2-EE-0016, Rev. 0 and FSAR Section 8.7.3.1 are located inside control panels which offer a high degree of physical protection for the redundant vital wires/devices. Access to the interior of control panels is controlled thereby minimizing the potential for wire damage through abrasion, crimping, or snagging.

Wires used inside control panels meet the IEEE standard 383 flame test section as a minimum and circuits are protected by circuit breakers, fuses, or other fault limiting devices; thus the probability of a fire due to wiring over current or short circuit is negligible. Wiring inside control panels is used for control and indication; and generally carry currents which do not generate appreciable heat. Control panels are

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<sup>(3)</sup> E. V. Imbro, Nuclear Regulatory Commission, to M. L. Bowling, "Notice of Violation and Safety Functional Inspection of Millstone Unit 2 (NRC Inspection Report No. 50-336/98-202)," dated June 11, 1998.

located in environments which maintain acceptable temperatures within the control panels. Thus damage to wires/devices due to fire or overheating are negligible.

The licensing basis for the separation requirement inside control boards and panels is contained in section 7.10 of NRC SER, dated May 10, 1974<sup>(4)</sup> which states in part that,

"The applicant has also stated that at least 12 inches of air separation has been maintained in the control boards and panels, or noncombustible barriers or conduit were provided" and, "we conclude that the applicants cable separation criteria and emergency power equipment are acceptable."

Changing the minimum separation between redundant vital wires/devices inside control panels from 12" to 6" will still provide acceptable separation to provide independence between redundant vital wires/devices in accordance with IEEE standard 384-1981, sections 6.6.2 and 6.6.5, and IEEE standard 420-1982, sections 4.3.1, 4.3.2, and 4.3.3 which have been endorsed by the NRC in Regulatory Guide 1.75<sup>(5)</sup>.

Prior to September of 1997 the FSAR stated in Section 8.7.3.1 that,

"Redundant vital cables terminate on terminal blocks at least twelve inches apart. Internal wiring of redundant vital circuits, and any associated devices, is separated twelve inches. Where the minimum spatial separation of twelve inches is not feasible, noncombustible barriers or conduit are used to provide separation."

and,

"The barriers are properly supported for structural strength, and extended from top to bottom and front to back to a depth which provides a minimum of twelve inches separation between channels."

The FSAR currently states in Section 8.7.3.1 that,

"Redundant vital cables terminate on terminal blocks at least six inches apart. Internal wiring of redundant vital circuits, and any associated devices, is separated by a minimum of six inches. Where the minimum spatial separation of six inches is not feasible, noncombustible barriers or conduit are used to provide separation."

and,

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<sup>(4)</sup> Safety Evaluation by the Directorate of Licensing, U. S. Atomic Energy Commission in the matter of The Connecticut Light and Power Company, The Hartford Electric Light Company, Western Massachusetts Electric Company, Millstone Point Company, Millstone Nuclear Power Station, Unit 2, Docket No. 50-336, dated May 10, 1974, Section 7.10, "Cable Separation Criteria for Protection and Emergency Power Systems."

<sup>(5)</sup> Regulatory Guide 1.75, "Physical Independence of Electrical Systems."

"The barriers are properly supported for structural strength, and extended from top to bottom and front to back to a depth which provides a minimum of six inches separation between channels."

The changes of cable separation requirement, from twelve inches to six inches in the FSAR, were implemented as 10CFR50.59 changes using a SE which erroneously concluded that a reduction in the electrical separation criteria was not an unreviewed safety question.

Description of Proposed change

NNECO requests the NRC review and approve, through an amendment to Operating License DPR-65 pursuant to 10CFR50.90, the separation requirement of six inches in Millstone Unit No. 2 FSAR which is applied to redundant vital cables, internal wiring of redundant vital circuits, and associated devices. This requirement was implemented as a 10CFR50.59 change to FSAR section 8.7.3.1 using a SE which erroneously concluded that a reduction in electrical separation criteria was not an unreviewed safety question. The six inch limit is in accordance with current industry standards that have been endorsed by the NRC. The six inch separation criteria provides adequate protection such that independence between redundant vital wires/devices is maintained. Attachment 3 provides the FSAR section 8.7.3.1 pages with the previously implemented 10CFR50.59 changes indicated.



Docket No. 50-336  
B17417

Attachment 2

Millstone Nuclear Power Station, Unit No. 2  
License Amendment Request - Unreviewed Safety Question  
Proposed Revision to Final Safety Analysis Report  
Section 8.7.3.1 - Wire, Cable and Raceway Facilities - Separation  
Safety Summary and Significant Hazards Consideration

September 1998

**License Amendment Request - Unreviewed Safety Question  
Proposed Revision to Final Safety Analysis Report  
Wire, Cable and Raceway Facilities - Separation  
Safety Summary and Significant Hazards Consideration**

Safety Summary

This license amendment request deals with the separation requirement of six inches, in Millstone Unit No. 2 Final Safety Analysis Report (FSAR), which is applied to redundant vital cables, internal wiring of redundant vital circuits and associated devices. The separation requirement of six inches was implemented in section 8.7.3.1 of the FSAR as 10CFR50.59 changes using a safety evaluation (SE) which failed to fully consider the effect of reduction in separation on increasing the probability of occurrence of a malfunction of equipment important to safety previously evaluated in the FSAR. Northeast Nuclear Energy Company (NNECO) reevaluated the previously implemented changes to FSAR section 8.7.3.1 and determined that the separation requirement of six inches in control boards and panels involves an unreviewed safety question (USQ). The six inch limit is in accordance with current industry standards that have been endorsed by the NRC. The six inch separation criteria provides adequate protection such that independence between redundant vital wires/devices is maintained. Therefore, NNECO has concluded that the proposed changes are safe. Attachment 3 provides FSAR section 8.7.3.1 pages with the previously implemented 10CFR50.59 changes indicated.

Significant Hazards Consideration

In accordance with 10CFR50.92, NNECO has reviewed the proposed changes and has concluded that they do not involve a Significant Hazards Consideration (SHC). The basis for this conclusion is that the three criteria of 10CFR50.92(c) are not compromised. The proposed changes do not involve an SHC because the changes would not:

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

The FSAR changes reduce the minimum allowable separation between redundant vital wires/devices of different channels from twelve inches to six inches. Reducing the physical separation between wires/devices does not in itself increase the probability of any credible event that would challenge circuit operability since the wire/device characteristics have not changed and there is no change in the circuit the wires/devices are in. The probability that an accident could occur due to the change in separation is not increased since the remaining separation will still prevent adverse channel interactions (i.e. short circuit, etc.). The six inch standard is acceptable in accordance with IEEE

standard 384-1981,<sup>(1)</sup> sections 6.6.2 and 6.6.5, and IEEE standard 420-1982,<sup>(2)</sup> sections 4.3.1, 4.3.2, and 4.3.3 which have been endorsed by the NRC in Regulatory Guide 1.75.<sup>(3)</sup> Therefore, these changes will not significantly increase the probability or consequences of an accident previously evaluated.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated.

The FSAR changes reduce the minimum allowable separation between redundant vital wires/devices of different channels from twelve inches to six inches. The new minimum allowable separation will not introduce any new or unanalyzed failure modes of equipment or systems, and does not change the configuration of the plant. These changes will not require any new or unusual operator actions, alter the way any structure, system, or component functions and do not alter the manner in which the plant is operated. Therefore, there are no new or different types of failures of systems or equipment important to safety which could cause a new or different type of accident from any accident previously evaluated.

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

The FSAR changes reduce the minimum allowable separation between redundant vital wires/devices of different channels from twelve inches to six inches. The probability that a single wire/device failure could cause the failure of redundant vital channels may be increased. However, the new minimum allowed separation has been found acceptable by IEEE standard 384-1981, sections 6.6.2 and 6.6.5, and IEEE standard 420-1982, sections 4.3.1, 4.3.2, and 4.3.3 which have been endorsed by the NRC in Regulatory Guide 1.75. The new minimum allowed separation does not change any plant equipment configuration, does not change the functionality of any equipment, and does not change any operating setpoints. This change does not alter the acceptance limits of the safety parameters of the accident analyses stated in the FSAR. No new analysis assumptions are required based on this change (e.g. common-cause failures). Therefore, there is no impact on the margin of safety.

The NRC has provided guidance concerning the application of standards in 10CFR50.92 by providing certain examples (March 6, 1986, 51 FR 7751) of amendments that are considered not likely to involve an SHC. The changes proposed herein to reduce the minimum allowable separation between redundant vital

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<sup>(1)</sup> IEEE standard 384-1981, "Standard Criteria for Independence of Class 1E Equipment and Circuits."

<sup>(2)</sup> IEEE standard 420-1982, "Design Standards and Qualification of class 1E Control Boards, panels, and Racks Used in Nuclear Power Generating Stations."

<sup>(3)</sup> Regulatory Guide 1.75, "Physical Independence of Electrical Systems."

wires/devices of different channels from twelve inches to six inches are not covered by any specific example.

As described above, this License Amendment Request does not involve a significant increase in the probability of an accident previously evaluated, does not involve a significant increase in the consequences of an accident previously evaluated, does not create the possibility of a new or different kind of accident from any accident previously evaluated, and does not result in a significant reduction in a margin of safety. Therefore, NNECO has concluded that the proposed changes do not involve an SHC.

Attachment 3

Millstone Nuclear Power Station, Unit No. 2  
License Amendment Request - Unreviewed Safety Question  
Proposed Revision to Final Safety Analysis Report  
Section 8.7.3.1 - Wire, Cable and Raceway Facilities - Separation  
FSAR Pages

September 1998