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United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Serial No.: 05-047A
LR/RJG R0
Docket Nos.: 50-336
50-423
License Nos.: DPR-65
NPF-49

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNITS 2 AND 3
ADDITIONAL INFORMATION IN SUPPORT OF
LICENSE RENEWAL APPLICATIONS

The Nuclear Regulatory Commission requested additional information as a result of audits conducted during November 15-16, 2004 of the Aging Management Programs and Aging Management Reviews. This additional information in support of the Millstone Power Station Units 2 and 3 License Renewal Applications is being submitted as an attachment to this letter.

Should you have any questions regarding this letter, please contact Mr. William D. Corbin, Director, Nuclear Projects, Dominion Resources Services, Inc., at (804) 273-2365.

Very truly yours,

E. S. Grecheck
Vice President – Nuclear Support Services

Attachment:

Additional Information in Support of Applications for Renewed Operating Licenses

Commitments made in this letter: None.

A106

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Serial No. 05-047A
Docket Nos.: 50-336/423
Additional Information In Support Of
License Renewal Applications

Attachment

**Additional Information in Support of
Applications for Renewed Operating Licenses**

Millstone Power Station Units 2 & 3

The following additional information, in support of the Millstone Power Station Units 2 and 3 License Renewal Applications (LRAs), is provided as a result of audits of the Aging Management Programs (AMPs) and Aging Management Reviews (AMRs):

Audit Item 193 (Fuse Holder Metallic Clips)

7.1.7.4-1 In a letter dated March 10, 2003, the NRC forwarded to the Nuclear Energy Institute (NEI) and Union of Concerned Scientists an interim staff guidance (ISG)-5 on the identification and treatment of electrical fuse holders for license renewal (ADAMS Accession Number ML030690512). The staff position indicated that fuse holders should be scoped, screened, and included in the AMR in the same manner as terminal blocks and other types of electrical connections that are currently being treated in the process. This position only applies to fuse holders that are not part of a larger assembly such as switchgear, power supplies, power inverters, battery chargers, circuit boards, etc. Fuse holders in these types of active components would be considered to be parts of the larger assembly and not subject to an AMR.

Operating experience as discussed in NUREG-1760 (Aging Assessment of Safety-Related Fuses Used in Low- and Medium-Voltage Applications in Nuclear Power Plants) identified that aging stressors such as vibration, thermal cycling, electrical transients, mechanical stress, fatigue, corrosion, chemical contamination, or oxidation of the connections surfaces can result in fuse holder failure. Visual inspection, alone, may not be sufficient to detect the aging effects from fatigue, mechanical stress, vibration, or corrosion on the metallic clamps of the fuse holders. Other methods of aging detection may be necessary.

The applicant committed (in Table A6.0-1, License Renewal Commitments, Commitment Number 6) to evaluate external fuse holders before the beginning of the extended period of operation for possible aging effects. The applicant also referred AMP B2.1.8, Electrical Cables and Connectors Not Subject to 10 CFR 50.49 Environmental Qualification Requirement as the applicable AMP. This AMP does not address the aging effects from fatigue, mechanical stress, or vibration on the metallic portions of fuse holders.

Provide an AMP of metallic portion of fuse holders as part of the application or provide justification of why an AMP is not required for Millstone 2 and 3.

Dominion Response:

A scoping and screening review has been performed to identify fuse holders that meet the requirements delineated in ISG-5, Identification and Treatment of Electrical Fuse Holders for License Renewal. For Millstone Units 2 and 3, the review identified fuse

holders that are not a part of a larger active assembly and that support intended functions under 10CFR54.4(a)(1) and (a)(2), and therefore are subject to aging management review. The aging management review performed for these fuse holders concluded that there are no aging effects that require management. The following information describes the scoping, screening, and aging management review performed for these fuse holders.

Scoping and Screening Process

Millstone Units 2 and 3 fuse holders were identified through plant walkdowns and a review of the Millstone Master Equipment List, electrical drawings, and electrical specifications. Fuse holders that were located within larger active assemblies were subsequently eliminated from further consideration per the requirements of ISG-5. Active components were determined based on the guidance contained in NUREG-1800.

The fuse holders installed in safety related (SR) fuse panels were included in scope in accordance with 10CFR54.4(a)(1) and were determined to be subject to aging management review. Of the remaining fuse holders, a number of non-safety related fuse holders that do not perform an intended function in accordance with 10CFR54.4(a)(2) were identified based on an electrical circuit review and were not included in the scope of license renewal. The remaining non-safety related fuse holders were included in scope and subject to aging management review.

Aging Management Review

An aging management review was performed for the fuse holders identified above (including both the insulation material and the metallic clips). The fuse holders that were subject to aging management review are associated with low-voltage circuits and are mounted on fuse panels that are installed in gasketed enclosures located indoors.

ISG-5 identifies that an aging management program would be required for the aging stressors of fatigue, mechanical stress, vibration, chemical contamination, and corrosion, if these stressors are applicable for fuse holders subject to aging management review.

The non-metallic insulation material of the fuse holders was previously evaluated and found to have no aging effects requiring management. The insulation material is identified in LRA Table 3.6.2-1 as the "Insulation" commodity group with "Inorganic Materials" as the material and "air" as the environment.

The aging stressors identified in ISG-5 have been evaluated for fuse holder metallic clips and the following is a summary of the aging management review results.

Fatigue

NUREG-1760, "Aging Assessment of Safety-Related Fuses Used in Low- and Medium-Voltage Applications in Nuclear Power Plants", states that fatigue of fuse holders can typically occur due to elevated temperature, mechanical stress, and repeated insertion and removal of fuses. NUREG-1760 further states that fuse failures resulting from thermal cycling are associated with the fuse element, and not the fuse holder.

The fuse holders requiring aging management review are located indoors in a mild environment. There are no significant sources of heat in close proximity to the fuse holders such that elevated temperatures are not expected. Therefore, fatigue due to elevated temperature was determined not to require management for these fuse holders.

Fatigue related to mechanical stress and/or repeated insertion and removal is evaluated under Mechanical Stress.

Mechanical Stress

For the fuse holders subject to aging management review, the fuses are not routinely removed and reinserted into the fuse clips. With the exception of one panel of fuse holders (described below), the fuse holders are comprised of a block assembly of two or three fuses (i.e., two or three sets of fuse clips on a removable block). The removable block assembly permits interruption of the circuit for testing or isolation without removal of the fuses from the fuse holder metallic clips. The block assembly fuses are only removed from the fuse clips during fuse replacement. There is one exception to the above design. There is one fuse panel where the fuse holders consist of a base insulating material with attached fuse clips. The fuses for this configuration are also only removed during fuse replacement with circuit isolation performed by other devices in the circuit. Therefore, these fuse clips are not subject to repeated manipulation, which could lead to mechanical fatigue.

Mechanical stress resulting from electrical faults and transients is not considered a credible aging mechanism since electrical faults are infrequent and random in nature. Stresses resulting from electrical faults and transients are mitigated by fast acting circuit protective devices.

Therefore, no aging management is required for mechanical stress.

Vibration

The fuse holders subject to aging management review are located in fuse panels. These panels are not mounted on rotating equipment or in close enough proximity to

rotating equipment to be affected by vibration. Therefore, no aging effects related to vibration require management.

Chemical Contamination/Corrosion

The fuse panels containing fuse holders that are subject to aging management review consist of gasketed enclosures that are located indoors. The fuse holders are not subjected to moisture or chemicals inside the panel enclosures that would provide a corrosive environment. Therefore, chemical contamination and corrosion do not require management for these fuse holders.

Conclusion

The results of the aging management review are summarized in the LRA supplemental Tables 3.6.2-1a for Unit 2 and Unit 3, below. The aging management review for fuse holders concludes that there are no aging effects that require management. These aging management review results are supported by a Millstone operating experience review which did not identify any age related degradation for the fuse holders meeting the requirements of ISG-5.

As a result of this review of fuse holders, the commitment described in LRA Table A6.0-1, Item 6 is completed.

Millstone Unit 2 LRA

Table 3.6.2-1a: Electrical Components – Cables and Connectors – Aging Management Evaluation

Commodity Group	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Conductors (fuse holder clips)	CE	Metal	Air	None	None			G, 5

Notes

- Fuse holder clips have been evaluated for the effects of fatigue, mechanical stress, vibration, and chemical contamination/corrosion in accordance with ISG-5.

Millstone Unit 3 LRA

Table 3.6.2-1a: Electrical Components – Cables and Connectors – Aging Management Evaluation

Structural Member	Intended Function(s)	Material	Environment	Aging Effect Requiring Management	Aging Management Programs	NUREG-1801 Volume 2 Item	Table 1 Item	Notes
Conductors (fuse holder clips)	CE	Metal	Air	None	None			G, 6

Notes

- Fuse holder clips have been evaluated for the effects of fatigue, mechanical stress, vibration, and chemical contamination/corrosion in accordance with ISG-5.