

March 30, 2004

Mr. David A. Christian
Senior Vice President
and Chief Nuclear Officer
Dominion Nuclear Connecticut, Inc.
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION, UNIT 1 - EXEMPTION FROM CERTAIN
REQUIREMENTS OF 10 CFR PART 140 (TAC NO. MA6658)

Dear Mr. Christian:

The Commission has issued the enclosed exemption from certain requirements of 10 CFR 140.11 for the Millstone Power Station, Unit 1. This exemption is in response to Northeast Nuclear Energy Company's application dated September 28, 1999, as supplemented by letters dated March 2, 2000, and your letter of November 6, 2003. The exemption was requested to allow Northeast Nuclear Energy Company to discontinue maintaining secondary financial protection beyond the primary layer of offsite financial protection for the Millstone Power Station, Unit 1. Subsequent to the exemption request, Millstone Power Station, Unit 1's license was transferred to Dominion Nuclear Connecticut, Inc. The basis for this request is that the potential risk to public health and safety is substantially reduced because of the permanently shutdown and defueled status of Unit 1.

Consistent with this action, we are enclosing four (4) copies of Amendment No. 21 to Indemnity Agreement No. B-39. Please have all parties sign all the copies and return one to this office.

A copy of the exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

/RAI

Drew Holland, Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-245

Enclosures: 1. Exemption
2. Indemnity Agreement No. B-39 (4)

cc w/encls: See next page

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NRR-048

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION, UNIT 1
DOCKET NO. 50-245
EXEMPTION

1.0 BACKGROUND

Dominion Nuclear Connecticut, Inc. (the licensee) is the holder of Facility Operating License No. DPR-21, which authorizes the licensee to possess the Millstone Power Station, Unit 1. The license states, in part, that the facility is subject to all the rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (the Commission or NRC) now or hereafter in effect.

The facility consists of a boiling water reactor located at the licensee's site in Waterford, Connecticut. The facility is permanently shut down and defueled and the licensee is no longer authorized to operate or place fuel in the reactor.

2.0 REQUEST/ACTION

Section 140.11(a)(4) of 10 CFR Part 140 requires a reactor with a rated capacity of 100,000 electrical kilowatts or more to maintain primary liability insurance of \$300 million¹ and to participate in a secondary insurance pool. All operating reactor sites carry \$300 million in primary insurance coverage. All decommissioning plants except Millstone Power Station Unit 1 have been allowed to discontinue the secondary insurance coverage. Single unit

¹At the time that Northeast Nuclear Energy Company requested the exemption from secondary financial protection the requirement for primary insurance coverage was \$200 million. The regulation now requires \$300 million in primary coverage.

decommissioning plants without operating reactors on the same site have been allowed to reduce their primary insurance coverage to \$100 million. When Millstone Unit 1 receives its exemption it will still be covered by \$300 million in primary insurance because two other operating reactors exist on the same site.

By letter dated September 28, 1999, as supplemented by a letter dated March 2, 2000, Northeast Nuclear Energy Company requested an exemption from 10 CFR 140.11(a)(4). Dominion Nuclear Connecticut, Inc., which assumed operating authority for Millstone Unit 1 in March 2001, provided a supplementary letter dated November 6, 2003. The licensee requested to withdraw from participation in the secondary insurance pool.

3.0 DISCUSSION

The NRC may grant exemptions from the requirements of 10 CFR Part 140 of the regulations which, pursuant to 10 CFR 140.8, are authorized by law and are otherwise in the public interest. The underlying purpose of Section 140.11 is to provide sufficient liability insurance to ensure funding for claims resulting from a nuclear incident or a precautionary evacuation.

The financial protection limits of 10 CFR 140.11 were established to require a licensee to maintain sufficient insurance to cover the costs of a nuclear accident at an operating reactor. Although the risk of an accident at an operating reactor is very low, the consequences can be large, in part due to the high temperature and pressure of the reactor coolant system, as well as the inventory of radionuclides. In a permanently shutdown and defueled reactor facility, the possibility of accidents involving the reactor and its systems, structures and components, is eliminated. Further reductions in risk occur because (1) the decay heat from spent fuel decreases over time, which reduces the amount of cooling required to prevent the spent fuel from heating up to a temperature that could compromise the ability of the fuel cladding to retain

fission products; and (2) the relatively short-lived radionuclides contained in the spent fuel, particularly volatile components such as iodine and noble gases, decay away, thus reducing the inventory of radioactive materials that are readily dispersible and transportable in air.

Although the risk and consequences of a radiological release decline substantially after a plant permanently defuels its reactor, they are not completely eliminated. There are potential onsite and offsite radiological consequences that could be associated with the onsite storage of the spent fuel in the spent fuel pool (SFP). In addition, a site may contain an inventory of radioactive liquids, activated reactor components, and contaminated materials. For purposes of modifying the amount of insurance coverage maintained by a power reactor licensee, the potential consequences, despite very low risk, are an appropriate consideration.

By letter dated March 2, 2000, the licensee submitted an analysis of the heatup characteristics of the spent fuel in the absence of SFP water inventory. The licensee concluded that air cooling of the fuel would be sufficient to maintain the integrity of the fuel cladding. The staff independently evaluated the licensee's analysis and found it to be acceptable.

The above analyses established that air cooling was adequate in the normal storage configuration, but events could change the configuration of stored fuel or otherwise degrade the effectiveness of cooling. This potential was addressed in NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," which concluded that the probability of fuel uncover is very low, and the probability of a random event that substantially reconfigures stored fuel such that cooling becomes inadequate is much lower still. Even with inadequate cooling, NUREG-1738 presented data indicating that fuel with over 5 years' decay time would require over 24 hours of complete adiabatic conditions (obstructed air flow) to reach temperatures associated with rapid cladding oxidation and release of fission products. The staff considers these conclusions applicable to Millstone Unit 1 since its spent

fuel has been decaying since November 1995. A partial drain-down of the SFP could interfere with natural convection heat transfer and lead to a heatup of the spent fuel. However, if this were to occur, sufficient time is available for the licensee to take compensatory actions (such as refilling the SFP or spraying water on the spent fuel) thereby restoring necessary cooling. The staff judges that the analyses in NUREG-1738 are conservative and that there will be sufficient time for reasonable compensatory action for this small likelihood event.

The NUREG-1738 study did not evaluate the risk from malevolent acts. With regard to physical protection, the Millstone Unit 1 SFP is located within the overall Millstone site protected area (PA) which also contains operating Millstone Units 2 and 3. The licensee maintains a protective strategy for Units 2 and 3 that is in compliance with the requirements of 10 CFR 73.55 and interim compensatory measures issued by Order on February 25, 2002. By virtue of its location in the overall Millstone site PA (including Units 2 and 3), the Unit 1 SFP is accorded the substantial protection provided by the licensee's compliance with the Unit 2 and 3 requirements.

Based on insights from NUREG-1738 and other SFP analyses, the probability of a zirconium fire involving the Millstone Power Station, Unit 1 spent fuel is expected to be very low and well within the Commission's safety goals. The staff considers that the significant age of the spent fuel (over eight years), improved security measures at the site and the location of two operating reactors at the same site significantly reduce the risk of a spent fuel accident/incident at the Millstone Power Station Unit 1. For this reason, an accident/incident involving the spent fuel resulting in a large offsite release or the need to evacuate a large portion of the local population has a very low likelihood. Additionally, the fuel at Millstone Power Station, Unit 1 has decayed in excess of eight years, substantially reducing the potential offsite consequences of fuel damage. The potential consequences continue to decrease as time passes.

A licensee's liability for offsite costs may be significant due to lawsuits alleging damages from offsite releases. An appropriate level of financial liability coverage is needed to account for potential judgments and settlements and to protect the Federal government from indemnity claims. The staff believes that the Commission's requirement to maintain the \$300 million in primary offsite financial protection at the Millstone site is sufficient for this purpose.

In a letter from the Executive Director for Operations to the Chairman of the Advisory Committee on Reactor Safeguards (ACRS) dated September 17, 2001, post-shutdown insurance requirements for decommissioning nuclear power plants were addressed. The staff and the ACRS agreed that onsite and offsite insurance coverage can be substantially reduced shortly after a facility permanently shuts down. The ACRS also accepted the staff's assessment that the primary insurance level be reduced to \$100 million (the Millstone site maintains a primary insurance level of \$300 million because of the two operating units) and that decommissioning licensees be released from participation in the secondary insurance pool.

The staff has completed its review of the licensee's request to withdraw from participation in the secondary insurance pool. On the basis of its review, the staff finds that the risk from random events associated with the spent fuel stored in the Millstone Power Station, Unit 1 SFP is very low and well within the Commission's safety goals. Additionally, the staff believes that the security measures already implemented for the Millstone site (collectively for Millstone Units 1, 2 and 3) including supplemental requirements issued by Order on February 25, 2002, provide reasonable assurance of protection against radiological sabotage and adequate protection of public health and safety and the common defense and security. Therefore, the licensee's proposed protection limits (i.e., \$300 million in primary insurance coverage) will provide sufficient insurance to recover from limiting hypothetical events, if they

occur, and the underlying purpose of the regulation will not be adversely affected by the reduction in insurance coverage.

4.0 CONCLUSION

Accordingly, the Commission has determined that, pursuant to 10 CFR 140.8, an exemption to withdraw from the secondary insurance pool for offsite liability insurance is authorized by law and is otherwise in the public interest. Therefore, the Commission hereby grants Dominion Nuclear Connecticut, Inc., an exemption as described above from the secondary insurance requirements of 10 CFR Part 140.11(a)(4) for the Millstone Power Station, Unit 1.

Pursuant to 10 CFR 51.32, the Commission has determined that this exemption will not have a significant effect on the quality of the human environment (65 FR 42038).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 30th day of March 2004.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Eric J. Leeds, Deputy Director
Division of Licensing Project Management
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Millstone Power Station Unit 1

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