

February 24, 2003

Mr. J. A. Price
Site Vice President - Millstone
Dominion Nuclear Connecticut, Inc.
c/o Mr. David A. Smith
Rope Ferry Road
Waterford, CT 06385

SUBJECT: SAFETY EVALUATION FOR RELIEF REQUESTS V-6 AND V-7 ASSOCIATED WITH THIRD 10-YEAR INTERVAL OF THE INSERVICE TESTING PROGRAM, MILLSTONE POWER STATION, UNIT NO. 2 (TAC NOS. MB6482 AND MB6483)

Dear Mr. Price:

By letter dated October 7, 2002, as supplemented on December 10, 2002, you submitted Relief Requests V-6 and V-7 associated with the third 10-year interval of the inservice testing (IST) program for Millstone Power Station, Unit No. 2 (MP2). Your letters proposed alternatives to certain requirements of Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (the Code). Specifically, Relief Request V-6 proposed to extend the surveillance interval for seat leakage testing of Category A valves located in the High Pressure Safety Injection System, Containment Spray System, and Refueling Water Storage Tank System. Relief Request V-7, proposed to extend the surveillance interval for those pressure relief valves whose only overpressure function is to protect isolated components from fluid expansion caused by changes in fluid temperature. For Relief Request V-7, Code Case OMN-2, "Thermal Relief Valve Code Case, OM Code-1995, Appendix I" would be implemented for the affected pressure relief valves.

The Nuclear Regulatory Commission (NRC) staff has completed its review of the subject relief requests as documented in the enclosed Safety Evaluation (SE). The NRC staff's SE concludes that the proposed alternatives to the Code requirements described in Relief Requests V-6 and V-7 will provide an acceptable level of quality and safety. Therefore, the alternatives are authorized pursuant to Section 50.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations* (10 CFR 50.55a(a)(3)(i)) for the remainder of the third ten-year IST interval for MP2.

J. Price

-2-

However, the NRC is evaluating Code Case OMN-2 for possible endorsement through a regulatory guide. Relief Request V-7 is authorized, as stated above, until such time as the NRC staff's generic position on OMN-2 is issued. At that time, if you intend to continue implementing this code case, you must follow all provisions of OMN-2 with any limitations or conditions specified in the NRC staff endorsement.

Sincerely,

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure: Safety Evaluation

cc w/encl: See next page

J. Price

-2-

However, the NRC is evaluating Code Case OMN-2 for possible endorsement through a regulatory guide. Relief Request V-7 is authorized, as stated above, until such time as the NRC staff's generic position on OMN-2 is issued. At that time, if you intend to continue implementing this code case, you must follow all provisions of OMN-2 with any limitations or conditions specified in the NRC staff endorsement.

Sincerely,

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-336

Enclosure: Safety Evaluation

cc w/encl: See next page

DISTRIBUTION:

PUBLIC	REnnis	OGC
PDI-2 Reading	CRaynor	ACRS
SRichards	DTerao	HNieh
JClifford	SUnikewicz	BMcDermott, RGN-I

ACCESSION NUMBER: ML030550672

*See previous concurrence

OFFICE	PDI-2/PM	PDI-2/LA	EMEB/SC*	OGC	PDI-2/SC
NAME	REnnis	CRaynor	DTerao	RHoefling	JClifford
DATE	2/10/03	2/10/03	2 /7/03	2/19/03	2/21/03

OFFICIAL RECORD COPY

Millstone Power Station
Unit 2

cc:

Ms. L. M. Cuoco
Senior Counsel
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Edward L. Wilds, Jr., Ph.D.
Director, Division of Radiation
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Regional Administrator, Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

First Selectmen
Town of Waterford
15 Rope Ferry Road
Waterford, CT 06385

Charles Brinkman, Manager
Washington Nuclear Operations
ABB Combustion Engineering
12300 Twinbrook Pkwy, Suite 330
Rockville, MD 20852

Senior Resident Inspector
Millstone Power Station
c/o U.S. Nuclear Regulatory Commission
P.O. Box 513
Niantic, CT 06357

Mr. W. R. Matthews
Senior Vice President - Nuclear Operations
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Mr. P. J. Parulis
Manager - Nuclear Oversight
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Mr. D. A. Christian
Senior Vice President - Nuclear Operations
and Chief Nuclear Officer
Innsbrook Technical Center - 2SW
5000 Dominion Boulevard
Glen Allen, VA 23060

Mr. John Markowicz
Co-Chair
Nuclear Energy Advisory Council
9 Susan Terrace
Waterford, CT 06385

Mr. Evan W. Woollacott
Co-Chair
Nuclear Energy Advisory Council
128 Terry's Plain Road
Simsbury, CT 06070

Mr. D. A. Smith
Manager - Licensing
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Ms. Nancy Burton
147 Cross Highway
Redding Ridge, CT 00870

Mr. G. D. Hicks
Director - Nuclear Station Safety and Licensing
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Mr. S. E. Scace
Assistant to the Site Vice President
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Mr. A. J. Jordan, Jr.
Director - Nuclear Engineering
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

Mr. S. P. Sarver
Director - Nuclear Station Operations
and Maintenance
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
ASSOCIATED WITH REQUESTS FOR RELIEF FOR THE THIRD 10-YEAR INTERVAL
OF THE INSERVICE TESTING PROGRAM
DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION, UNIT NO. 2
DOCKET NO. 50-336

1.0 INTRODUCTION

By letter dated October 7, 2002, as supplemented on December 10, 2002, Dominion Nuclear Connecticut, Inc. (the licensee) submitted Relief Requests V-6 and V-7 associated with the third 10-year interval of the inservice testing (IST) program for Millstone Power Station, Unit No. 2 (MP2). The licensee proposed alternatives to certain requirements of Section XI of the American Society of Mechanical Engineers (ASME) *Boiler and Pressure Vessel Code* (the Code). Specifically, Relief Request V-6 proposed to extend the surveillance interval for seat leakage testing of Category A valves located in the High Pressure Safety Injection System, Containment Spray System, and Refueling Water Storage Tank System. Relief Request V-7, proposed to extend the surveillance interval for those pressure relief valves whose only overpressure function is to protect isolated components from fluid expansion caused by changes in fluid temperature. The MP2 third 10-year IST interval began on April 1, 1999, and is scheduled to end on March 31, 2009.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a, requires that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Code and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Nuclear Regulatory Commission (NRC) pursuant to paragraphs (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, a licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for the facility. Section 50.55a authorizes the NRC to approve alternatives to and grant relief from ASME Code requirements upon making the necessary findings. NRC guidance in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides acceptable alternatives to the ASME Code requirements. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

The MP2 IST program was developed in accordance with the requirements of the 1989 Edition

of the ASME Code, Section XI, which references the ASME/American National Standards Institute (ANSI) Operations and Maintenance (OM) Standards Part 1, Part 6 and Part 10 (OM-1, OM-6, and OM-10) for IST of safety and relief devices, pumps, and valves, respectively. The Code of record for MP2 is the 1987 OM Code with the 1988 Addendum.

The NRC's findings with respect to authorizing alternatives and granting or denying the IST program relief requests are given below.

3.0 TECHNICAL EVALUATION

3.1 Relief Request No. V-6

In Relief Request V-6, the licensee has proposed to extend the surveillance interval for seat leakage testing of Code Class 2, Category A valves located in the High Pressure Safety Injection System, Containment Spray System, and Refueling Water Storage Tank (RWST) System. The specific valves included in this relief request are as follows:

- 2-CS-14A/B
- 2-SI-459 (or 2-CS-050 and 2-CS-051, as an alternative barrier in this leakage path)
- 2-SI-460
- 2-SI-659
- 2-SI-660

These valves are required to close or remain closed to prevent back-leakage to the RWST during the recirculation phase of a loss-of-coolant accident (LOCA).

OM-1987, Part 10, paragraph 4.2.2.3 requires that Category A valves, which perform a function other than containment isolation, be seat leakage tested to verify their leak-tight integrity. Tests shall be conducted at least once every two (2) years.

3.1.1 Licensee's Basis for Requesting Relief

In their request for relief, the licensee states that testing of these specific valves involves the draining and processing of significant quantities of contaminated water (radwaste) and radiological exposure (approximately 50 millirem per person) to test personnel and that performance of these leak tests each refueling outage has a noticeable impact on outage schedule and resources.

Testing of 2-SI-460 requires a freeze seal be established on a six-inch pipe. This task requires significant planning and coordination to ensure that safe work conditions are maintained.

For the train-specific valves, 2-CS-14A and B, testing each outage involves significant tagging and unavailability of both trains of RWST supply. MP2 refueling outages are scheduled to focus work on the out-of-service train, while protecting the other (in service) train thus maintaining adequate shutdown risk safety margins. The proposed relief for 2-CS-14A and B would result in testing being performed only on the out-of-service train, minimizing work on the protected train.

The valves identified in this relief request function as a system during the sump recirculation

phase of a LOCA to prevent backflow into the RWST and, thus, limit the potential for release of radioactivity from the containment environment to the atmosphere. The RWST is a vented tank open to the outside atmosphere. The total allowed leakage limit and, thus, the assumed release from this combination of valves is based on the calculated site boundary dose limits and control room habitability limits. Individual leak rates of the valves can vary, as long as the total back leakage, from this system of valves, into the RWST is maintained within the assumed calculation limits.

3.1.2 Alternative Testing

In lieu of testing every two years, the licensee has proposed that the train-specific valves, 2-CS-14A and 2-CS-14B, be tested once every other refueling outage. One of the two valves will be tested at each refueling outage, supporting the "train-specific refueling" philosophy currently utilized at MP2. The test frequency will be increased to once each refueling outage if the administrative leakage limit is exceeded, and will be maintained until two (2) successive passing tests are recorded.

For the valves which are not train-specific, 2-SI-459 (or 2-CS-050 and 2-CS-051 as an alternative), 2-SI-460, 2-SI-659 and 2-SI-660, the test frequency will be extended from once every refueling outage to at least once every 60 months. This proposed time frame will allow each valve to be tested once every third refueling outage.

Testing frequency will be reduced to once every 30 months upon failure of administrative leakage limits for any individual valve, and will be maintained until two (2) successive passing tests are recorded.

3.1.3 Evaluation

The licensee states that administrative leakage limits have been calculated for each valve. They also state that the calculation of leak rates for 2-CS-14A and B concluded that the valves could leak at the rate of their administrative limits for the short period they are required following an accident, without contamination ever reaching the RWST and that the remaining valves could coincidentally leak at their administrative limits for 30 days post accident, without exceeding 10 CFR 100 or General Design Criteria (GDC) 19 limits. These calculations and subsequent conclusions and administrative limits were not reviewed as part of this effort. The administrative limits and actual leakage test results for the past three (3) tests are as follows:

Valve	Administrative Limit	1998 Measured Leakage	2000 Measured Leakage	2002 Measured Leakage
2-CS-14A	7 gpm	0.714 gpm	0.6 gpm	0.8 gpm
2-CS-14B	7 gpm	0	0	0.1 gpm
2-CS-050	0.01 gpm	0.00007 gpm	0.00005 gpm	see note
2-CS-051	0.01 gpm	0.0001 gpm	0.00012 gpm	see note
2-SI-459	0.02 gpm	see note	see note	0.0017 gpm
2-SI-460	0.05 gpm	0	0.0008 gpm	0
2-SI-659	0.12 gpm	0.0016 gpm	0.007 gpm	0.024 gpm
2-SI-660	0.12 gpm	0.0035 gpm	0.016 gpm	0.027 gpm

Note: 2-CS-050/051 are two parallel valves in series with 2-SI-459. Both valves were historically tested in lieu of testing of 2-SI-459. In the future, 2-SI-459 will be the normally tested valve in this path, with the ability to test 2-CS-050 and 2-CS-051 maintained as an alternative.

Valves 2-CS-14A/B are 18-inch swing check valves in the outlet of the RWST. The licensee states that they are disassembled and inspected for IST exercising on a sampling frequency of one valve each refueling outage and that no discrepancies have ever been noted in these inspections, dating back to 1992. These valves prevent back leakage to the RWST for the short period of time during the sump recirculation phase of an accident when containment pressure could exceed the head of the RWST. Procedurally, the RWST outlet line motor-operated valves 2-CS-13.1A and 2-CS-13.1B are closed after the sump suction valves open on a sump recirculation actuation signal (SRAS), thereby minimizing the potential for leakage past 2-CS-14A/B.

Valves 2-CS-050, 2-CS-051, 2-SI-459, and 2-SI-460 are manual valves which are locked closed during plant operation, and are not subject to mechanisms which cause increased leakage.

Valves 2-SI-659 and 2-SI-660 are air-operated globe valves installed in series, but tested individually.

Historical leak-test results for each of these valves, as tabulated above, show measured leakages far below MP2 administrative limits for three consecutive tests over a period of four years. Measured leakages are, in most cases, an order of magnitude less than the administrative limit. The previous testing and test data supports the conclusion that it is reasonable to extend the time period between tests. The proposed actions, upon exceeding an administrative limit, are reasonable and provide assurance that the subject valves will be able to perform their intended functions.

3.1.4 Conclusion

On the basis of the above discussion, the staff finds that authorizing the proposed alternative provides an acceptable level of quality and safety. Therefore, Relief Request V-6 is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

3.2 Relief Request No. V-7

In Relief Request V-7, the licensee has requested relief from the ASME Code Class 2 and 3 pressure relief valve test frequency requirements of ASME OM 1987, Part 1 (OM-1), Paragraphs 1.3.4.1(a), 1.3.4.1(b), 1.3.4.1(c), 1.3.4.1(d), and 1.3.4.1(e), for the relief valves listed below.

The licensee proposes to implement Code Case OMN-2, "Thermal Relief Valve Code Case, OM Code-1995, Appendix I," which allows either testing or replacement of certain relief valves every ten years. The following table lists the components affected by this relief request:

Component ID	Component ID	Component ID	Component ID	Component ID	Component ID
2-SI-430	2-RB-303A	2-RB-309	2-RB-318	2-RB-328	2-RB-336
2-SI-431	2-RB-303B	2-RB-310	2-RB-320	2-RB-329	2-RB-337
2-SW-189	2-RB-303C	2-RB-311	2-RB-321	2-RB-330	2-RB-338
2-SW-190	2-RB-304	2-RB-312	2-RB-322	2-RB-331	2-RB-339
2-SW-191	2-RB-305	2-RB-313	2-RB-324	2-RB-332	2-RB-340
2-SW-92A	2-RB-306	2-RB-314	2-RB-325	2-RB-333	2-RB-341
2-SW-92B	2-RB-307	2-RB-315	2-RB-326	2-RB-334	2-RB-342
2-SW-92C	2-RB-308	2-RB-316	2-RB-327	2-RB-335	2-RB-343
					2-RB-344

3.2.1 Licensee's Basis For Requesting Relief

In its request for relief, the licensee states that thermal relief valves are potentially challenged during train or component shutdowns when the component is isolated. Since these trains or components are not providing a safety function while they are isolated, the thermal relief valves have limited safety significance during this condition. While these components or trains are in service, the thermal relief safety is to remain closed as part of the system pressure boundary. This function is periodically verified during normal operation or system flow testing.

A review of applicable MP2 relief valves was performed by the licensee as part of the facility design basis verification project. Valves performing only a thermal relief function have been identified. Failure of these valves to relieve an overpressure condition has minimal safety significance. The proposed testing provides the same test frequency as OM-1, which ensures

that each of these valves will be adequately tested.

3.2.2 Alternative Testing

The licensee has proposed to implement the requirements of ASME Code Case OMN-2 "Thermal Relief Valve Code Case, OM Code-1995, Appendix I." Testing of pressure relief valves whose only function is to protect isolated components from fluid expansion caused by changes in fluid temperature shall be performed once every ten years on each device unless performance data indicates more frequent testing is needed to assure device function. In lieu of testing, MP2 may replace these devices every ten years unless performance data indicates more frequent replacement is needed to assure device function.

3.2.3 Evaluation

OM-10, paragraph 1.1, requires pressure relief devices that protect systems or portions of systems that perform a required function in shutting down a reactor to the cold shutdown condition, maintaining the reactor in a cold shutdown condition, or mitigating the consequences of an accident, to be included within the scope of IST. OM-10, paragraph 4.3.1, requires that safety and relief valve tests shall be conducted in accordance with OM-1. The requirements for the test frequency of ASME Code Class 2 and 3 pressure relief devices are included in paragraph 1.3.4.1. The requirements include: (1) paragraph 1.3.4.1(a) which includes specific test frequency requirements for the initial ten-year period; (2) paragraph 1.3.4.1(b) which specifies that all valves of each type shall be tested in each subsequent ten-year period with a minimum of 20 percent of the valves tested within any 48-month period which have not been previously tested, if such valves exist; (3) paragraph 1.3.4.1(c) which specifies requirements with pretested valves; (4) paragraph 1.3.4.1(d) which specifies acceptance criteria for the tested valves; and (5) paragraph 1.3.4.1(e) which specifies the required sample expansion if the tested valves do not meet the acceptance criteria.

The licensee has proposed to implement the requirements of Code Case OMN-2 "Thermal Relief Valve Code Case, OM Code-1995, Appendix I." Thermal relief valves are defined in the code case as relief valves whose only overpressure protection function is to protect isolated components from fluid expansion caused by changes in fluid temperature. In lieu of the testing requirements of ASME OM Code-1995, Appendix I, paragraphs 1.3.5(a), 1.3.5(b), and 1.3.5(c), relief valves which are considered to be thermal relief valves may be replaced once every ten years, unless performance data indicates more frequent replacement is needed to assure device function. Paragraph 1.3.5(a) requires that each ASME Code Class 2 and 3 relief valve be tested every ten years with a minimum of 20 percent of the valves tested within any 48-month period which have not been previously tested. Paragraph 1.3.5(b) specifies requirements for replacing valves with pretested valves. Paragraph 1.3.5(c) establishes requirements for test acceptance criteria and requirements for testing additional valves.

Code Case OMN-2 was intended to be used at facilities where the licensees' inservice testing programs were developed in accordance with ASME OM Code-1995. It does not appear that it was intended to be used with the licensees' current Code of record. The Code case was published in the 1998 addenda of the Code which is now incorporated by reference in 10 CFR 50.55a. Two issues need to be addressed in order to authorize the alternative: (1) the acceptability of Code Case OMN-2 to the NRC; and (2) the applicability of the Code case to be used with OM-1. With regard to acceptability of the Code case, the staff reviewed activities of the Code Committee related to the development of this Code case. In making their determination to reduce the testing requirements for thermal relief valves, the Code Committee performed a review of the Nuclear Plant Reliability Data System (NPRDS) database to assess the quantity and type of thermal relief valve failures. The Code Committee determined that the failure rates of thermal relief valves are limited. The Code Committee concluded that the low number of failure rates support the ten-year test or replacement frequency and the elimination of sample expansion if the failures were discovered during testing. In its evaluation of the Code case, the NRC has concluded that there are no conditions associated with the proposed testing for thermal relief valves.

With regard to the acceptability of applying this Code case to OM-1, as opposed to OM Code-1995, Appendix I, the staff compared the requirements of both Code editions. Thermal relief valves are not separately defined in either Code edition. They currently fall within the requirements of ASME Code Class 2 and 3 relief valves of both Code editions as described above. In comparing the two Code editions, the OM Code-1995, Appendix I, requirements represent a relaxation of OM-1 requirements in the following areas: (1) elimination of the specific testing schedule for relief valves in the first ten-year interval; and (2) elimination of the requirement to repair or replace all valves which exceed their stamp set pressure by three percent or greater. The remaining requirements between the two Codes are technically identical.

The NRC staff evaluation of Code Case OMN-2 finds that it allows relaxation of testing requirements for relief valves identified as thermal reliefs. The evaluation did not identify any limitations or modifications necessary for the acceptability of this Code case to be used in conjunction with the OM Code-1995, Appendix I. In addition, OM Code-1995, Appendix I, includes relaxations of certain requirements in the OM-1 standard. Thermal relief valves are not defined in either Appendix I or OM-1. No related requirements have been identified in either OM Code-1995 or OM-1 that would be related to thermal relief valves. Therefore, the staff finds that no conflicts exist in applying Code Case OMN-2 to the OM-1 standard. On this basis, the staff finds that the licensee's alternative provides an acceptable level of quality and safety.

3.2.4 Conclusion

On the basis of the above discussion, the staff finds that authorizing the proposed alternative provides an acceptable level of quality and safety. Therefore, Relief Request V-7 is authorized pursuant to 10 CFR 50.55a(a)(3)(i). However, the NRC is evaluating Code Case OMN-2 for possible endorsement through a regulatory guide. Relief Request V-7 is authorized, as stated above, until such time as the NRC staff's generic position on OMN-2 is issued. At that time, if the licensee intends to continue implementing this code case, the licensee must follow all provisions of OMN-2 with any limitations or conditions specified in the NRC staff endorsement.

4.0 CONCLUSION

The staff concludes that the licensee's proposed alternatives in Relief Requests V-6 and V-7 are authorized pursuant to 10 CFR 50.55(a)(3)(i) on the basis that the alternatives provide an acceptable level of quality and safety. The alternatives in Relief Requests V-6 and V-7 are authorized for the remainder of the third ten-year IST interval for MP2.

Principal Contributor: S. Unikewicz

Date: February 24, 2003