UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO A REQUEST FOR RELIEF

FROM ASME CODE SECTION XI REQUIREMENTS

NORTHEAST NUCLEAR ENERGY COMPANY, ET AL.

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3

DOCKET NO. 50-423

1.0 INTRODUCTION

The Technical Specifications for Millstone Unit 3 state that the inservice inspection and testing of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (ASME Code) and applicable Addenda as required by Title 10 of the Code of Federal Regulations (10 CFR), Part 50, Section 50.55a. Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (f) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The first 10-year inservice testing (IST) interval for Millstone Unit 3 began on April 24, 1986, and was scheduled to end on April 23, 1996. Because Millstone Unit 3 is currently in an extended outage, the ASME Code allows extensions of the 10-year interval. Northeast Nuclear Energy Company (the licensee) has documented its start date in a letter dated October 25, 1997, as "prior to entry into Mode 4." The second 10-year interval IST program for Millstone Unit 3 will be based on the requirements of the 1989 Edition of ASME Section XI that references the ASME Operations and Maintenance Standard OMa-1988, Part 6 for pumps and Part 10 for valves.

By letter dated March 3, 1998, the licensee submitted a one-time relief request from the check valve obturator movement requirements of OMa-1988, Part 10 (OM-10), Paragraph 4.3.2.4, which is referenced by the 1989 Edition of ASME Section XI, Subsection IWV, for the low pressure safety injection (SIL) accumulator outlet check valves 3SIL*V15, 3SIL*V17, 3SIL*V19, and 3SIL*V21. This relief request involves a modification to a relief request previously granted by the NRC, which stipulated adherence to the check valve inspection schedule in NRC Generic Letter (GL) 89-04, Position 2. The licensee has requested that Relief Request R-2 be effective from the date of authorization until the end of refueling outage 6 (RFO6). The licensee has proposed to extend the disassembly schedule of valve 3SIL*V15 from RFO5 to RFO6. The staff's evaluation of Relief Request R-2 is included in Section 3.0 of this safety evaluation (SE).

2.0 DISCUSSION

Component Identification

SIL Accumulator Outlet Check Valves 3SIL*V15, V17, V19, and V21, Code Class 1.

Code Requirement

OM-10, paragraph 4.3.2.4, as modified by GL 89-04, NRC Staff Position 2, "Alternative to Full Flow Testing of Check Valves," allows for disassembly and inspection to verify check valve operability.

Licensee's Code Relief Request

The licensee requested the following: (as stated)

> [P]ursuant to 10 CFR 50.55a(f)(5)(iii), NNECO [Northeast Nuclear Energy Company] hereby requests one time relief from the IST requirement of paragraph 4.3.2.4(c) of the OM-[10] Code as modified by Generic Letter (GL) 89-04, NRC Staff Position 2, "Alternative to Full Flow Testing of Check Valves." Relief is specifically requested from the Position 2 requirements for inspecting each valve within a six year period, and that once this is completed, the sequence of disassembly must be repeated unless extension of the interval can be justified.

Licensee's Basis for Requesting Relief

The licensee provided the following basis for the relief request: (as stated)

> Each of these valves have been disassembled, inspected and manually full stroke exercised in the previous refueling outages in accordance with Position 2 of GL 89-04 and as stipulated in approved relief request R-3 to Rev. 4 of the IST Program. Valve 3SIL*V15 was inspected in RF01, 3SIL*V17 in RFO2, 3SIL*V19 in RFO3, and 3SIL*V21 in RFO4. Inspection and manual exercising results for each valve showed them to be in excellent condition with no visible degradation and with full stroke capability. The sequence of disassembly and inspection was scheduled to be repeated in RFO5 (i.e., 3SIL*V15 was scheduled to be inspected), however, indications during operation identified valve 3SIL*V19 as potentially having increased back leakage. Valve 3SIL*V19 was substituted for 3SIL*V15 and was disassembled, inspected, and manually exercised in RF05. Inspection and manual exercising results for valve 3SIL*V19 showed it to be in excellent condition with no visible degradation and with full stroke capability.
>
> These valves are 10 inch Westinghouse swing check valves. A review of industry operating experience for this type of valve did not identify any failures of the valves to open on demand. These valves were evaluated, in response to INPO [Institute of Nuclear Power Operations] SOER 86-03, using "EPRI Applications Guidelines for Check Valves in Nuclear Power Plants." They were classified as priority 3 valves which specifies disassembly and inspection within a period of five fuel cycles.
>
> These valves cannot be full or part stroke exercised open during operation since the only flow path is from the SI [safety injection] accumulators to the vessel and accumulator pressure is insufficient to overcome RCS [reactor coolant system] pressure. The valves should not be exercised during cold shutdowns because

complete or partial discharge of the accumulator tanks into the reactor vessel could result in low temperature over pressurization of the RCS. Disassembly and inspection requires the plant to be in a mid-loop configuration. The use of a freeze seal to allow disassembly and inspection under current plant shutdown conditions was evaluated and determined to not be viable due to system piping configuration and support locations.

Licensee's Proposed Alternative Examination

The licensee proposed the following: (as stated)

> Valves 3SIL*V15 and 3SIL*V17 will be partially disassembled, inspected and manually full stroke exercised during RFO6. This will return the valves to the correct sequence of disassembly. Valves 3SIL*V15, 3SIL *V17, 3SIL *V19 , and 3SIL *V21 will continue to be partially disassembled, inspected and manually full stroke exercised on a staggered sampling basis each refueling outage. During each disassembly, the valve internals will be inspected for structural soundness (no loose or corroded parts). In the event a disassembled valve's full stroke capability is questionable, additional valves will be disassembled until 100% of the valves identified in this group have been disassembled and inspected.

3.0 EVALUATION

The Code requires that the obturator of a check valve be exercised, either with flow or a mechanical exerciser, to its safety position. The Code states that, as an alternative, disassembly and inspection of check valves may be used every refueling outage to verify operability. Disassembly and inspection on a sampling basis is not addressed in OM-10. The NRC staff believes that check valve disassembly should not be used if testing with flow or a mechanical exerciser is practical.

Prior to the issuance of OM-10, the NRC issued GL 89-04, "Guidance on Acceptable Inservice Testing Programs." The staff established several positions regarding the testing of check valves using disassembly in Position 2 to GL 89-04, "Alternatives to Full Flow Testing of Check Valves." Position 2 states the following:

> When the licensee determines that it is burdensome to disassemble and inspect all applicable valves each refueling outage, a sample disassembly and inspection plan for groups of identical valves in similar applications may be employed.

Guidance in Position 2 further states:

> The sample disassembly and inspection program involves grouping similar valves and testing one valve in each group during each refueling outage...A different group is required to be disassembled, inspected, and manually full-stroke exercised at each successive refueling outage, until the entire group has been tested...Once this is completed, the sequence of disassembly must be repeated unless extension of the interval can be justified.

The licensee had been previously granted relief from the ASME Code to perform disassembly and inspection of the SIL accumulator outlet check valves provided it followed the guidance in

GL 89-04, Position 2. During operation prior to RFO5, it was noted that valve 3SIL*V19 appeared to be leaking. Valve 3SIL*V19 was inspected during RFO5 and found not to be in a degraded condition. The licensee did not recognize that valve 3SIL*V15 would also require disassembly and inspection to meet the guidance in GL 89-04, Position 2. Not disassembling and inspecting this valve prior to concluding RF05 would not be in accordance with the published NRC guidance and therefore would not satisfy the staff's basis for granting relief.

The licensee currently is in an extended outage with the plant expected to be placed in Mode 4 within the next couple of weeks. To disassemble and inspect this valve would require the licensee to operate the reactor in a mid-loop configuration, which would require the reactor vessel head to be removed and possibly off load the reactor core. Requiring the licensee to place the plant in this state would be a hardship without a compensating increase in the level of quality and safety in that the licensee has proposed an alternative that provides reasonable assurance that valve 3SIL*V15 is able to perform its safety function until the next refueling outage.

The licensee has proposed to disassemble and inspect valve 3SIL*V15 in RFO6; thus, extending the inspection interval of this valve one operating cycle. The licensee stated that valve 3SIL*V17 will also be disassembled and inspected in RFO6 and that the inspection cycle as specified in Position 2 would be restored. The licensee has indicated that each of these valves has been inspected at least once and they have been found to be in "excellent condition with no visible degradation and with full stroke capability." The licensee has also researched the industry failure history of these valves and found no failures of this valve to move to its open safety position.

The extension of inspection intervals for check valves is currently allowed in Position 2 in cases of extreme hardship. In NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants," the response to Question 19 in Appendix A states that operation at mid-level of the reactor coolant loops may be considered extreme hardship. The proposed alternative of a one-time test extension of valve 3SIL*V15 provides reasonable assurance of operational readiness because the licensee has (1) inspected all valves in the group on a staggered basis and has found the valves to be in excellent condition; (2) determined that this particular valve has not had any failures to move to its open safety function; and (3) committed to inspect valves 3SIL*V15 and 3SIL*V17 during RFO6.

4.0 CONCLUSION

The staff concludes that pursuant to 10 CFR 50.55a(a)(3)(ii), the proposed alternative to the check valve obturator movement requirements of OM-10, Paragraph 4.3.2.4, for the SIL accumulator outlet check valves 3SIL*V15, 3SIL*V17, 3SIL*V19, and 3SIL*V21 is authorized in that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. This alternative is authorized until the end of RFO6.

Principle Contributors: Jim Andersen
Joseph Colaccino

Date: March 13, 1998

cc:

Lillian M. Cuoco, Esquire
Senior Nuclear Counsel
Northeast Utilities Service Company
P. O. Box 270
Hartford, CT 06141-0270

Mr. Kevin T. A. McCarthy, Director
Monitoring and Radiation Division
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
Hall of Records
200 Boston Post Road
Waterford, CT 06385

Mr. Wayne D. Lanning
Deputy Director of Inspections
Special Projects Office
475 Allendale Road
King of Prussia, PA 19406-1415

Mr. M. H. Brothers
Vice President - Operations
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

Mr. M. R. Scully, Executive Director
Connecticut Municipal Electric
Energy Cooperative
30 Stott Avenue
Norwich, CT 06360

Mr. David Amerine
Vice President - Nuclear Engineering
and Support
Northeast Utilities Service Company
P. O. Box 128
Waterford, CT 06385

Mr. William D. Meinert
Nuclear Engineer
Massachusetts Municipal Wholesale
Electric Company
P.O. Box 426
Ludlow, MA 01056

Joseph R. Egan, Esquire
Egan & Associates, P.C.
2300 N Street, NW
Washington, DC 20037

Mr. F. C. Rothen
Vice President - Work Services
Northeast Utilities Service Company
P. O. Box 128
Waterford, CT 06385

Ernest C. Hadley, Esquire
1040 B Main Street
P.O. Box 549
West Wareham, MA 02576

Mr. John Buckingham
Department of Public Utility Control
Electric Unit
10 Liberty Square
New Britain, CT 06051

Mr. James S. Robinson, Manager
Nuclear Investments and Administration
New England Power Company
25 Research Drive
Westborough, MA 01582

Mr. D. M. Goebel
Vice President - Nuclear Oversight
Northeast Utilities Service Company
P. O. Box 128
Waterford, CT 06385

Deborah Katz, President
Citizens Awareness Network
P.O. Box 83
Shelburne Falls, MA 03170

cc:

Mr. Allan Johanson, Assistant Director
Office of Policy and Management
Policy Development and Planning
Division
450 Capitol Avenue - MS# 52ERN
P. O. Box 341441
Hartford, CT 06134-1441

Citizens Regulatory Commission
ATTN: Ms. Susan Perry Luxton
180 Great Neck Road
Waterford, CT 06385

The Honorable Terry Concannon
Nuclear Energy Advisory Council
Room 4035
Legislative Office Building
Capitol Avenue
Hartford, CT 06106

Legislative Office Building
Captiol Avenue
Hartford, CT 06106

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

Little Harbor Consultants, Inc.
Millstone - ITPOP Project Office
P.O. Box 0630
Niantic, CT 06357-0630

Mr. B. D. Kenyon
Chief Nuclear Officer - Millstone
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

Mr. Daniel L. Curry
Project Director
Parsons Power Group Inc.
2675 Morgantown Road
Reading, PA 19607

Mr. Don Schopfer
Verification Team Manager
Sargent & Lundy
55 E. Monroe Street
Chicago, IL 60603

Mr. J. P. McElwain
Vice President (Acting) - Millstone 3
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

Mr. G. D. Hicks
Unit Director - Millstone Unit 3
Northeast Nuclear Energy Company
P.O. Box 128
Waterford, CT 06385

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