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The Northeast Utilities System

MAY 26 2000

Docket No. 50-423
B18100

Re: 10 CFR 50.55a(a)(3)(i)
10 CFR 50.55a(f)(6)(i)
10 CFR 50.55a(f)(5)(iii)

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

Millstone Nuclear Power Station, Unit No. 3
Inservice Test Program
Request For Relief From ASME Section XI

Northeast Nuclear Energy Company (NNECO) hereby requests relief from the requirements of 10 CFR 50.55a(f) for performing the required testing for certain Class 2 and 3 components in accordance with the American Society of Mechanical Engineers (ASME) Code, Section XI for Millstone Unit No. 3.

Technical Specification 4.0.5 states that the Inservice Inspection and Testing of the ASME Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable addenda as required by 10 CFR 50.55a. 10 CFR 50.55a(a)(3) allows that alternatives to specific provisions of the Code may be used when approved by the Director, Office of Nuclear Reactor Regulation. Accordingly, pursuant to 10 CFR 50.55a(a)(3)(i) and 10 CFR 50.55a(f)(5)(iii), NNECO hereby requests relief as detailed in the Relief Requests provided in Attachments 1 through 6. The alternatives described herein are determined to provide a commensurate level of quality and safety as allowed under 10 CFR 50.55a(a)(3)(i)

It is requested that NRC approval be provided by December 31, 2000, to support timely implementation of these Relief Requests prior to the next planned refueling outage scheduled for February 2001.

There are no regulatory commitments contained within this letter.

A047

Should you have any questions regarding this matter, please contact Mr. David W. Dodson at (860) 447-1791, ext. 2346.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

Stephen E. Scace - Director
Nuclear Oversight and Regulatory Affairs

cc: See next page

Attachments:

1. Relief Request (R-3) for In-Service Testing Requirements - Service Water Supply Isolation to RSS Heat Exchangers
2. Relief Request (R-4) for In-Service Test Requirements - Manual Valves
3. Relief Request (R-5) for In-Service Test Requirements - Thermal Relief Valves
4. Relief Request (PR-3) for In-Service Test Requirements - Vibration Instruments
5. Relief Request (PR-4)for In-Service Test Requirements - Pump Digital Instrument Accuracy
6. Relief Request (PR-5) for In-Service Test Requirements - Pump Analysis As Corrective Action

cc: H. J. Miller, Region I Administrator
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3
A. C. Cerne, Senior Resident Inspector, Millstone Unit No. 3

Docket No. 50-423
B18100

Attachment 1

Millstone Nuclear Power Station, Unit No. 3

Relief Request for In-Service Testing Requirements
Service Water Supply Isolation to RSS Heat Exchangers

May 2000

Attachment 1

Relief Request for In-Service Testing Requirements
Service Water Supply Isolation to RSS Heat Exchangers

Relief Request: R-3

Valves: 3SWP*MOV54A, MOV54B, MOV54C, MOV54D

Category: B

Code Class: 3

Function: Automatically open on a CDA signal to allow flow to the containment recirculation coolers.

Test Requirement: Active category A and B valves shall be tested nominally every three months. (OM-10 paragraph 4.2.1.1).

Basis for Relief: Testing these valves is a complex evolution. It requires an interlock to be defeated to allow opening the valves without a CDA signal present. Entry into an LCO is required for the duration the jumper is installed to defeat the interlock. This makes one train of Recirculation Spray (RSS) and Service Water (SW) systems inoperable. When the valves are opened service water is introduced into the heat exchangers which is then required to be drained, the heat exchanger flushed with de-mineralized water and drained again. This process takes approximately 8-10 hours per heat exchanger (one valve). This results in accruing a significant amount of Maintenance Rule unavailability on the RSS system and additional time on the Service Water system.

The valves (3SWP*MOV54A-D) are interlocked with the Service Water to Reactor Building Component Cooling (CCP) supply isolation valves (3SWP*MOV50A/B). The interlocks are in place to prevent valve misalignment during normal operation. Based on the above, testing would normally be deferred to cold shutdown, however, defeating the interlock to allow testing has been evaluated and determined acceptable from plant risk with the plant in Mode 1 to support performance of RSS heat exchanger service water side flushes.

Millstone committed to perform these flushes (LER 95-011-00, Letter MP-95-186) at specific times during the year to minimize the vulnerability from plantigrade attachment. The flushes are scheduled to minimize the potential for large mussel colony infestation of upstream piping and subsequent heat exchanger fouling. Ideally, the flushes would be performed in late spring and early fall. This testing, however, is less frequent than the Code specified quarterly testing. The Code does not identify any other frequency during power operation, only deferrals to cold shutdown or refuel are allowed.

Alternate Testing: These valves will be exercised nominally every six months during RSS heat exchanger service water side flushes. The 25% grace allowed for other Technical Specification surveillance will be allowed for this frequency to facilitate scheduling of the surveillance due to plant conditions or other constraints.

Docket No. 50-423
B18100

Attachment 2

Millstone Nuclear Power Station, Unit No. 3

Relief Request for In-Service Test Requirements
Manual Valves

May 2000

Attachment 2

Relief Request for In-Service Test Requirements
Manual Valves

Relief Request: R-4

Valves:

3CCP*V965	3FWA*V2	3QSS*V1
3CCP*V966	3FWA*V16	3QSS*V2
3CCP*V981	3FWA*V30	3QSS*V5
3CCP*V986	3FWA*V997	3QSS*V6
3CHS*V270	3FWA*V998	3RHS*FCV618
3CHS*V271	3FWA*V999	3RHS*FCV619
3CHS*V272	3HVC*AOV25	3RHS*MV8701B
3CHS*V273	3HVC*AOV26	3RHS*MV8702A
3CHS*V291		

Category: A/B

Code Class: 2/3

Function: Valves 3CCP*V965, V966, V981 & V986 are closed to prevent diversion of flow (through failed Radiation monitor piping or to CCE or CCI surge tanks) in the event fail closed AOV fails open due to spurious actuation under adverse environmental conditions and during a seismic event.

Valves 3CHS*V270, V271, V272 & V273 are repositioned to provide seal flow in the event 3CHS*HCV182 fails to operate properly and provide a borated water flow path during a Safety Grade Cold Shutdown.

Valve 3CHS*V291 is opened to cross-tie BAT tanks to meet Technical Specification emergency boration requirements.

Valves 3FWA*V2, V16, V30, V997, V998 & V999 are closed to provide moderate energy line break (MELB) isolation of a pipe "break" (crack) in the auxiliary feedwater system piping downstream of De-aerated Water Storage Tank (DWST) suction line isolations in the Engineered Safety Features (ESF) building.

Valves 3HVC*AOV25 & AOV26 are opened manually following an accident to provide an outside air source to the control room.

Valves 3QSS*V1, V2, V5 & V6 are closed to provide MELB isolation of a pipe "break" (crack) in quench spray system piping between suction line isolations and discharge isolations.

Valves 3RHS*FCV618 & FCV619 are closed manually following a loss of air to divert water through the RHR heat exchanger for reactor cooling.

Valves 3RHS*MOV8701B & MOV8702A are opened manually for long term cooling during a safety grade cold shutdown with Loss Of Power (LOP).

Test Requirement: Active category A and B valves shall be tested nominally every three months. (OM-10 paragraph 4.2.1.1).

Basis For Relief: The Chemical and Volume Control (CHS), Reactor Building Component Cooling (CCP) and Auxiliary Feedwater (FWA) system valves are manual valves. Except for the charging system valves, these valves are normally open and are closed if necessary to prevent loss of system inventory. The charging valves are closed/opened as necessary to allow flow in the event power operated valve 3CHS*MOV182 fails. Valve 3CHS*V291 is opened to cross-tie BAT tanks to meet Technical Specification emergency boration requirements.

The above valves are not normally operated during power operation except for surveillance testing, though some are used as maintenance isolations. The predominant degradation and failure mechanisms (motor failures, electrical failures, switch settings, etc) associated with power operated valves (MOVs, AOVs) do not exist for these manual valves. Testing these valves on a quarterly frequency solely to meet the requirements of ASME/ANSI 1987, OMa 1988 Addenda, does not provide any added value. Quarterly testing is unnecessary for detecting degradation of manual valves and does not decrease the potential for a component failure. The valves have been successfully tested per the Code since startup in June of 1998. There have not been any failures in any components ability to perform its safety function. The proposed alternate testing will provide a comparable level of quality and safety as the current Code required testing.

The Quench Spray (QSS) system valves are also manual valves. These valves are normally open and are closed if necessary to prevent loss of system inventory. These valves are not operated during power operation except for surveillance testing and

3QSS*V2 and V6 are used as maintenance isolations. As stated above for the other valves, the predominant degradation and failure mechanisms associated with power operated valves do not exist for these manual valves and quarterly testing is unnecessary for detecting degradation. These valves have been tested per the Code since startup in June of 1998. The valves have been evaluated for adverse conditions. Valves 3QSS*V1 and V5 are outside and maintenance history has shown the environment to be harsh (winter conditions). Per the proposed alternate testing, these two valves will be tested once each refuel. A maintenance work history review did not identify any problems with valves 3QSS*V2 and V6. The proposed alternate testing will provide a comparable level of quality and safety as the current Code required testing.

The Residual Heat Removal (RHS) and Control Room Ventilation (HVC) system valves are power operated valves whose power operated function in one direction is not credited in an accident. That function is performed by manual operation. These valves are exercised and stroke timed using this non credited power on either a quarterly or cold shutdown frequency. This testing ensures there are no mechanical problems that would prevent a successful manual exercise when needed. The proposed alternate testing is adequate for detecting any other degradation that may not be identified during the normal stroking and provides a comparable level of quality and safety as the current Code required testing.

Additionally, the proposed alternate testing for all of these valves complies with ASME OMa 1999 Addenda to ASME OM 1998 Code, paragraph ISTC-3540 for full stroke exercising of manual valves.

Alternate Testing: Manually full stroke exercise the valves at least once every five years. Where adverse conditions are determined to exist, the testing frequency will be increased up to once a refuel. This determination of adverse conditions[1] and the increased test frequency will be documented in the Record of Tests.

[1] Harsh environment, lubricant hardening, corrosive or sediment laden fluids, or degraded valve components are examples of adverse conditions.

Docket No. 50-423
B18100

Attachment 3

Millstone Nuclear Power Station, Unit No. 3

Relief Request for In-Service Test Requirements
Thermal Relief Valves

May 2000

Attachment 3

Relief Request for In-Service Test Requirements
Thermal Relief Valves

Relief Request: R-5

Valves:

3CCE*RV40A	3CCP*RV59B	3SWP*RV92B
3CCE*RV40B	3CCP*RV64A	3SWP*RV93A
3CCE*RV43A	3CCP*RV64B	3SWP*RV93B
3CCE*RV43B	3SFC*RV52A	3SWP*RV94A
3CCE*RV43C	3SFC*RV52B	3SWP*RV94B
3CCI*RV31A	3SWP*RV89A	3SWP*RV94C
3CCI*RV31B	3SWP*RV89B	3SWP*RV94D
3CCI*RV36A	3SWP*RV90A	3SWP*RV96A
3CCI*RV36B	3SWP*RV90B	3SWP*RV96B
3CCP*RV239A	3SWP*RV91A	3SWP*RV132A
3CCP*RV239B	3SWP*RV91B	3SWP*RV132B
3CCP*RV59A	3SWP*RV92A	

Category: C

Code Class: 3

Function: Provide overpressure protection to protect isolated components from fluid expansion caused by changes in fluid temperature.

Test Requirement: Class 2 and 3 pressure relief devices shall be tested once every 10 years with a minimum of 20% of the valves tested within any 48 months. For valves not meeting the acceptance criteria, additional valves shall be tested. (OM 1987 Part 1, paragraph 1.3.4.1(a), (b), (c), (d), (e)).

Basis For Relief: 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 function 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 relief valves was performed as part of the design basis verification. 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 the 1987 code which ensures that each of these valves will be adequately tested.

Alternate Testing: Implement the requirements of Code Case OMN-2 "Thermal Relief Valve Code Case, OM code-1995, Appendix I." Pressure relief valves whose only overpressure protection 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, Millstone Unit 3 may replace these devices every ten years unless performance data indicates more frequent replacement is needed to assure device function.

Attachment 4

Millstone Nuclear Power Station, Unit No. 3

Relief Request for In-Service Test Requirements
Vibration Instruments

May 2000

Attachment 4

Relief Request for In-Service Test Requirements
Vibration Instruments

Relief Request: PR-3

System: Service Water

Pumps: 3SWP*P1A, P1B, P1C, P1D

Code Class: 3

Function: Provide the required flow at the necessary head to the service water headers.

Test Requirement: The frequency response range of the vibration measuring transducers and their readout system shall be from one-third minimum pump shaft rotational speed to at least 1000 Hz. (OM-6 paragraph 4.6.1.6).

Basis For Relief: Millstone is transitioning from the TEC 1330 VLF SmartMeter to the ENTEK/IRD dataPAC 1500 vibration data collector due to Y2K issues with the TEC 1330 meter. The TEC 1330 meter is no longer being manufactured and technical support is being phased out. The vendor recommended the dataPAC 1500 as a suitable replacement for the TEC 1330 meter.

Vibration personnel detected large errors in overall vibration measurement results when field validation testing the dataPAC 1500 data collectors. Investigation revealed that the dataPAC 1500 uses the entire meter's frequency response range (i.e., 0.36 Hz to 75.3 KHz) in calculating and displaying overall vibration results (called magnitude readings) whereas the TEC 1330 meter calculates overall vibration based on user specified upper and lower frequency limits. The TEC 1330 meter frequency response range was setup for ~4.0 Hz to 1000 Hz. Integration noise is created by processing the input signal from the accelerometer, which affects the lower response range. The integration noise is reduced in the dataPAC 1500 by filtering the vibration input signal through a 5.3 Hz high pass filter to obtain repeatable overall vibration data. This results in the lower bound of the Code-required frequency response range not being met. The TEC 1330 meter used a special algorithm in the data collector to subtract integration noise from the vibration measurement.

The service water pumps are vertical line shaft turbine pumps with the same constant running speed of 885 rpm (equivalent to 14.7 Hz). Compliance with paragraph 4.6.1.6 would require using vibration instrumentation with a frequency response range of 4.9 Hz to at least 1000 Hz for these pumps.

Vibration instrumentation with a frequency response range from 5.3 Hz to 1000 Hz for monitoring vibration of the service water pumps is acceptable because:

- Overall vibration data would still contain vibration components from 0.36 Hz to 75.3 KHz but vibration amplitudes at frequencies below 5.3 Hz would be attenuated. The amount of attenuation for a particular frequency below 5.3 Hz is dependent on the high pass filter's characteristics. Inputting a known signal amplitude at 4.9 Hz into the dataPAC 1500 resulted in its amplitude being reduced to only 85% of its original value. Spectral vibration data collected using the 5.3 Hz high pass filter would still provide observable and trendable vibration data that would indicate developing mechanical faults down to 4.9 Hz.

- Millstone has not identified any potential mechanical faults for the service water pumps below 6 Hz. The credible mechanical faults below pump running speed on these vertical line shaft pumps are structural resonance at the system's reed natural frequencies and pump shaft whirl. Millstone has identified the reed natural frequencies of these service water pumps to lie between 6 Hz and pump running speed. Non-IST required pump shaft measurements using a shaft stick or proximity probe are required to confirm pump shaft whirl. Millstone routinely collects and trends vertical pump line shaft vibration data primarily to trend line shaft bearing wear and has never identified subsychronous shaft vibration (shaft whirl) on their service water pumps.

- Overall vibration limits are only one indicator of component condition and may miss some mechanical faults entirely. Spectral vibration analysis is much more sensitive than overall vibration in detecting mechanical faults. Vibration analysts use spectral data to extract and trend vibration data from various frequency bands that were defined to detect particular machine faults for each specific machine type. Spectral analysis results in additional and earlier warning of degrading component conditions due to the capability to trend and alarm on multiple frequency bands and individual frequencies. Spectral vibration analysis techniques are used at Millstone on all IST components.

- The 1/3 running speed to 1000 Hz minimum frequency response range requirement does not apply well to slow speed machinery. Incorporating vibration frequency down to 1/3 running speed results in integration noise corrupting the overall vibration results on slow speed machinery. Overall vibration is excessively high unless the integration noise is reduced by high pass filtering the vibration input signal or by using special algorithms in data collectors to subtract integration noise from the vibration measurement.

  Many vibration standards segregate rotating equipment into various rotational speed categories (i.e., running speed above or below 600 RPM, speed range from 10 to 200 REV/S), machinery type classifications (i.e., turbines, pumps, compressors, fans, centrifugal, reciprocating, overhung rotor, etc.) and machinery support methods (i.e., hard or soft mounted) prior to specifying allowable vibration limits. This allows for more appropriate limits to be applied to the different types of equipment that optimize detection of credible mechanical faults.

Alternate Testing: The instrumentation used to measure pump vibration will have a frequency response range from 5.3 Hz to at least 1000 Hz.

Attachment 5

Millstone Nuclear Power Station, Unit No. 3

Relief Request for In-Service Test Requirements
Pump Digital Instrument Accuracy

May 2000

Attachment 5

Relief Request for In-Service Test Requirements
Pump Digital Instrument Accuracy

Relief Request: PR-4

System: Various

Pumps: All IST Pumps

Code Class: 2/3

Function: Provide the required flow at the necessary head to the associated system header.

Test Requirement: Digital instruments shall be selected such that the reference value shall not exceed 70% of the calibrated range of the instrument (OM-6, paragraph 4.6.1.2(b)).

Basis For Relief: The intent of the restrictions on the instrument calibration range is to ensure a specific accuracy is maintained for all acceptable test values, i.e. within 2% of indicated values. The basis for requiring reference values to be less than or equal to 70% of the calibrated range of the instrument is unclear. For a digital instrument, calibrated in accordance with ASME OM Code requirements, an instrument reading at 80% of the calibrated range would be equally valid for IST use as an instrument reading at 60% of the calibrated range. Both test readings would be within 2% accuracy of the indicated value.

Since the ASME OM Code requirements allow pump test values within a maximum of +/- 10% of the reference value, to be considered acceptable, a limit of 90% of the reference value would ensure all possible pump test results are meeting the accuracy requirements of the Code.

Additionally, the ASME OM Code Committee has approved Code Case OMN-6, "Alternate Rules for Digital Instruments," which identifies that digital instruments may be selected such that the reference value does not exceed 90% of the calibrated range of the instrument. This Code Case applies to ASME OM Code-1990 Edition through ASME OMb Code-1997 Addenda.

Alternate Testing: Select digital instruments for IST pumps such that the reference value does not exceed 90% of the calibrated range of the instrument.

Docket No. 50-423
B18100

Attachment 6

Millstone Nuclear Power Station, Unit No. 3

Relief Request for In-Service Test Requirements
Pump Analysis As Corrective Action

May 2000

Attachment 6

Relief Request for In-Service Test Requirements
Pump Analysis As Corrective Action

Relief Request: PR-5

System: Various

Pumps: All IST pumps

Code Class: 2/3

Function: Provide the required flow at the necessary head to the associated system header.

Test Requirement: Deviations fall within the alert range of Table 3, the frequency of testing specified in paragraph 5.1 shall be doubled until the cause of the deviation is determined and the condition corrected. If deviations fall within the required action range of Table 3, the pump shall be declared inoperable until the cause of the deviation has been determined and the condition corrected (OM-6, paragraph 6.1.).

Basis For Relief: By allowing an analysis of the pump's overall performance, premature maintenance of a pump that is subject to normal and gradual degradation over time or other test anomalies can be avoided provided the pump can be determined to be fully capable of reliably performing its intended safety function. The 1995 Edition of the ASME OM Code provides an alternative corrective action should a pump's performance enter the required action range. Paragraph 6.2.2 permits an analysis of the pump's performance and establishment of new reference values.

By adopting the 1995 ASME Code requirements, for this specific instance, the frequency of pump maintenance, with concurrent equipment outage and applicable LCO time, can be reduced with little or no adverse affect on plant safety as determined by the acceptance of the 1996 addenda of the ASME Code.

Additionally, inclusion in this relief of pumps that are in the alert range will avoid unnecessary and more frequent testing of pumps, which can contribute to overall pump degradation. Also the challenges to safety systems due to a plant shutdown can be avoided for pumps in the alert range when tested in Cold

Shutdown provided the pump's overall safety function can still be met.

This proposed alternate test is consistent with the response to question 3.3.2 in the Summary of Public Workshop on Inspection Procedure 73756.

Alternate Testing: When a pump's test parameters fall within either the alert or required action ranges and the pump's overall performance has been determined to be acceptable by analysis, a new set of reference values may be established. The supporting analysis will include verification of the pump's operational readiness and the pumps continued performance in between testing intervals. The pump's analysis will address both component and system level evaluations of operational readiness, a description of the cause of the change in pump performance, an evaluation of all trends indicated by the data and an evaluation of applicable maintenance performed on the pump. This analysis will be documented in the record of tests.