Xcel Energy®

Monticello Nuclear Generating Plant
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September 28, 2011

L-MT-11-055
10 CFR 50.55a(f)

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Monticello Nuclear Generating Plant
Docket 50-263
Renewed License No. DPR-22

Subject: 10CFR50.55a Requests Associated with the Fifth Inservice Testing Ten-Year Interval

Pursuant to 10 CFR 50.55a, "Codes and standards," paragraphs (a)(3)(i) and (a)(3)(ii), the Northern States Power Company, a Minnesota corporation (NSPM), doing business as Xcel Energy, the licensee for the Monticello Nuclear Generating Plant (MNGP), hereby requests NRC authorization of or granting of relief for the enclosed 10CFR50.55a requests associated with the Fifth Inservice Testing (IST) Interval for Monticello Nuclear Generating Plant (MNGP). This IST plan for the fifth ten-year interval begins September 1, 2012. The IST fifth ten-year interval is using the 2004 Edition, through 2006 Addenda of American Society of Mechanical Engineers (ASME) Operation and Maintenance (OM) Code, as the code of record.

Enclosure 1 contains the following pump related 10CFR50.55a requests. Proposed Alternative No. PR 01 requests authorization for an alternative means of determining Standby Liquid Control (SBLC) pump flow rate. Proposed Alternative No. PR 02 requests authorization for an alternative means of determining the instrument range requirements for testing of the Residual Heat Removal (RHR) pumps. Proposed Alternative No. PR 03 requests authorization for an alternative vibration alert limit for the High Pressure Coolant Injection (HPCI) pump. Proposed Alternative No. PR 04 requests authorization for an alternative means of determining the instrument range requirements for testing of the HPCI and Reactor Core Isolation Cooling pumps. Proposed Alternative No. PR 05 requests authorization for an alternative vibration testing range for the SBLC pumps. Proposed Alternative No. PR 06 requests authorization for an alternative method to assess HPCI pump performance and operational readiness through the use of reference pump curves per the guidelines provided in Code Case OMN-16. All of these proposed alternatives have previously been authorized by the NRC during the fourth ten-year IST interval for MNGP.

Enclosure 2 contains the following valve related 10CFR50.55a requests. Proposed Alternative No. VR 01 requests authorization for an alternative means of close testing the Control Rod Drive scram discharge header check valves. Relief Request No. VR 02 requests the NRC grant relief and impose an alternative requirement for stroke time testing and full stroke exercising of the RHR Service Water to RHR Heat Exchanger Flow Control Valves. Proposed Alternative No. VR 03 requests authorization to implement ASME Code Case OMN-1, Revision 1, for the stroke-time testing and the position verification testing of certain Motor-Operated Valves. All of these 10CFR50.55a requests have previously been authorized or granted by the NRC during the IST fourth ten-year interval for MNGP, with the exception of VR 03 which have been authorized for other NRC licensees.

NSPM requests the NRC authorize or grant relief in accordance with these 10CFR50.55a requests by September 1, 2012, to support implementation of the fifth ten-year IST interval. These 10CFR50.55a requests are proposed for the duration of the IST fifth ten-year interval.

This letter makes no new commitments and no revisions to existing commitments.

If you have any questions or require additional information, please contact Mr. Randy Rippy at 612-330-6911.

Sincerely,

Timothy J. O'Connor
Site Vice-President
Monticello Nuclear Generating Plant
Northern States Power Company-Minnesota

Enclosures (2)

cc: Administrator, Region III, USNRC
Project Manager, Monticello Nuclear Generating Plant, USNRC
Resident Inspector, Monticello Nuclear Generating Plant, USNRC

ENCLOSURE 1

PUMP RELATED 10CFR50.55a REQUESTS

PR 01 – ALTERNATIVE MEANS OF DETERMINING STANDBY LIQUID CONTROL PUMP FLOW RATE

PR 02 – ALTERNATIVE MEANS OF DETERMINING THE INSTRUMENT RANGE REQUIREMENTS FOR TESTING OF THE RESIDUAL HEAT REMOVAL PUMPS

PR 03 – ALTERNATIVE VIBRATION ALERT LIMIT FOR THE HIGH PRESSURE COOLANT INJECTION PUMP

PR 04 – ALTERNATIVE MEANS OF DETERMINING THE INSTRUMENT RANGE REQUIREMENTS FOR TESTING OF THE HIGH PRESSURE COOLANT INJECTION AND REACTOR CORE ISOLATION COOLING PUMPS

PR 05 – ALTERNATIVE VIBRATION TESTING RANGE FOR THE STANDBY LIQUID CONTROL PUMPS

PR 06 – ALTERNATIVE METHOD TO ASSESS HIGH PRESSURE COOLANT INJECTION PUMP PERFORMANCE THROUGH THE USE OF CODE CASE OMN-16

27 pages follow

10 CFR 50.55a REQUEST NUMBER – PR 01
SLC Pump Test Method

**Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(ii)
On the basis that compliance with the OM Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety**

1. ASME Code Component(s) Affected

P-203A and P-203B, Standby Liquid Control (SLC) Pumps (Class 2) (Group B)

Component/System Function
The design objective of the Group B SLC Pumps is to deliver a boron solution at a sufficient concentration to the reactor and bring it to a safe shutdown condition from full power in the event of failure of the withdrawn control rods to insert.

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through OMb Code-2006.

3. Applicable Code Requirement(s)

ISTB-3550, "Flow Rate", states in part, when measuring flow rate, a rate or quantity meter shall be installed in the pump test circuit. If a meter does not indicate the flow rate directly, the record shall include the method used to reduce the data.

ISTB-5300(a), "Duration of Tests (Positive Displacement Pumps"), ISTB-5300(a)(1), states in part, for the Comprehensive test, after pump conditions are stable as the system permits, each pump shall be run at least two minutes. At the end of this time at least one measurement or determination of each of the quantities required by Table ISTB-3000-1 shall be made and recorded.

4. Reason for Request

The Group B positive displacement SLC pumps are designed to pump a constant flow rate regardless of system resistance. The SLC system was not designed with a flow meter in the flow loop. The system was designed to be tested using a test tank where the change in level can be measured over time. This test methodology also limits the pump run time based on the size of the test tank. In addition, the installation of a larger test tank to facilitate pump testing would be a burden because of the design, fabrication, and installation changes that would be required.

The Code requirements to use flow rate instrumentation and a two-minute test duration for the Comprehensive pump test are considered a burden, which would result in a hardship without a corresponding increase in the level of quality or safety.

5. Proposed Alternative and Basis for Use

NSPM proposes to determine pump flow rate by measuring changes in tank level over time. After taking an initial pump volume measurement, an SLC pump will be started with suction from the demineralized water system and will discharge to the test tank. After at least two minutes of operation the pump will be stopped and the change in level over the measured time will be converted to flow rate by the following formula:

$$Q\ (GPM) = \Psi \Delta L\ (In) / \Delta t\ (Sec)$$

Where Ψ is a constant which reflects tank dimensions and unit conversions.

The test tank level will be set at approximately the same level at the beginning of each test to ensure repeatability. Use of the demineralized water system ensures a large volume source at a constant pressure for a stable testing environment. The vibration testing will be performed while recirculating an adequately filled test tank. Therefore, the duration of test code requirements for vibration testing will be met.

This proposed alternative is consistent with the guidelines provided in NUREG-1482, Revision 1, Section 5.5.2, "Use of Tank Level to Calculate Flow Rate for Positive Displacement Pumps".

Using the provisions of this relief request as an alternative to the test requirements specified in ISTB-3550 and ISTB-5300(a)(1) is an acceptable alternative method that provides reasonable assurance of operational readiness of SLC pumps P-203A and P-203B.

A plant IST instrument accuracy calculation determined that the accuracy of SLC flow measurement was better than 2% (approximately 1.4%). This calculation used the dimensions of the tank, the method of measuring the change in depth of water in the tank and the method of measuring time to evaluate accuracy by a square root of the sum of the squares method.

6. Duration of Proposed Alternative

The proposed alternative identified in this relief request shall be implemented during the Fifth Ten Year IST Interval beginning September 1, 2012.

7. Precedents

NRC Safety Evaluation for Monticello Nuclear Generating Plant, Relief Requests Relating to the Fourth 10-Year Interval Inservice Testing Program, Docket No. 50-263. (TAC No. 6807), July 17, 2003

10 CFR 50.55a REQUEST NUMBER – PR 02
RHR Instrumentation Range

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)
On the basis that compliance with the provides an acceptable level of quality and safety

1. ASME Code Component(s) Affected

P-202A/B/C/D, 11/12/13/14 Residual Heat Removal (RHR) Pumps (Class 2) (Group A)

P-109A/B/C/D, 11/12/13/14 Residual Heat Removal Service Water (RHRSW) Pumps (Class 3) (Group A)

Component/System Function
The Group A RHR pumps (P-202A/B/C/D) must operate to satisfy Low Pressure Coolant Injection and Containment Spray/Cooling requirements during post-accident conditions as well as performing a function during normal shutdown cooling.

The Group A RHRSW pumps (P-109A/B/C/D) are required to operate to remove the heat rejected by the residual heat removal system during normal shutdown and accident operations. The pumps must also supply a source of water for the RHR-RHR Service Water Intertie.

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through OMb Code-2006.

3. Applicable Code Requirement(s)

ISTB-3510(b)(1), "Range" states, "The full-scale range of each analog instrument shall be not greater than three times the reference value."

4. Reason for Request

Flow transmitters FT-10-111A, FT-10-111B, FT-10-97A, and FT-10-97B are each designed to indicate flow while two parallel pumps are operating (RHR or RHRSW). During In-Service testing, only one pump operates at a time. The resulting reference value of flow for one pump is less than one-third of the instrument's range. The installed flow transmitters have typically had an as-found accuracy of about 0.25% of full scale. In addition, the system is verified to have an as-found accuracy that is within 2% of the Code allowed reference value for analog instruments.

The current relevant data for the instruments is included in Table 4-1 as follows:

Table 4-1

Instrument	Pumps	Instrument Span (Range)	Equivalent Reference Value	Range to Reference Value Ratio
		RHR Pumps		
FT-10-111A	P-202A P-202C	4-20 mA	6.4 mA	(16/2.4) = 6.67
FT-10-111B	P-202B P-202D	4-20 mA	6.4 mA	(16/2.4) = 6.67
		RHRSW Pumps		
FT-10-97A	P-109A P-109C	10-50 mA	18.39 mA	(40/8.39) = 4.77
FT-10-97B	P-109B P-109D	10-50 mA	18.57 mA	(40/8.57) = 4.67

Transmitters FT-10-111A, FT-10-111B, and FT-10-97A output signals are read on a mV display with the pump test procedures specifying a reference target range that corresponds one to one mV to mA. The transmitter FT-10-97B output signal is converted from a 10-50 mA range to a 4-20mA range via FY-4105, RHR SERVICE WATER FLOW ISOL, and read on a mV display with the pump test procedures specifying a reference target range that corresponds one to one mV to mA of the converted signal range. The equivalent reference value is the center of this reference flow signal range and is in mA. Dividing the transmitter range by the equivalent reference mA value shows the instrument range to exceed the reference value by more than a factor of 3.

FY-4105 output equivalent reference value is 7.43 mA. Thus the range to reference value ratio is also (16/3.43) = 4.67 when taken at the FY-4105 output which is equivalent to the (40/8.57) = 4.67 at FT-10-97B output.

The installed flow transmitters typically have an as-found accuracy of 0.25 percent of full scale. In addition, the system is verified to have an as-found accuracy in accordance with paragraph ISTB-3510(a). ISTB-3510(a) requires that instrument accuracy be within the limits of Table 3510-1, which specifies an accuracy requirement of ±2% of full-scale for analog flow instruments. Paragraph ISTB-3510(b)(1) requires that the full-range of each analog instrument be not greater than three times the reference value. The combination of these two requirements (i.e., accuracy equal to ±2% of full-scale and full-scale being up to 3 times the reference value) yields a permissible inaccuracy of ±6% of the reference value.

Table 4-2 shows the ranges, reference values, range to reference value ratio, and calculated effective accuracies for instruments FT-10-111A/B and FT-10-

97A/B. The calculated effective instrument accuracies are much less than the Code required effective accuracy of ± 6 percent. Therefore, these instruments yield readings at least equivalent to the reading achieved from instruments that meet OM Code requirements (i.e., up to ± 6 percent) and, thus, provide an acceptable level of quality and safety. The effective accuracy of each instrument is provided in the following table.

Table 4-2

Instrument	Pump	Instrument Range	Reference Value	Range to Reference Value	Effective Accuracy with ±0.25% Instrument Accuracy
RHR Pumps					
FT-10-111A	P-202A P-202C	16 mA	(6.4-4)= 2.4 mA	(16/2.4)= 6.67	(6.67 x 0.25%)= **±1.67%**
FT-10-111B	P-202B P-202D	16 mA	(6.4-4)= 2.4 mA	(16/2.4)= 6.67	(6.67 x 0.25%)= **±1.67%**
RHRSW Pumps					
FT-10-97A	P-109A P-109C	40 mA	(18.39-10)= 8.39 mA	(40/8.39)= 4.77	(4.77 x 0.25%)= **±1.2%**
FT-10-97B	P-109B P-109D	40 mA	(18.57-10)= 8.57 mA	(40/8.57)= 4.67	(4.67 x 0.25%)= **±1.17%**

5. Proposed Alternative and Basis for Use

Use the existing station instruments to measure pump In-Service test parameters. Perform a loop check on the flow instrumentation for these systems that verifies the AS FOUND accuracy is within the 2% accuracy requirement given in Table ISTB 3510-1, Required Instrument Accuracy, and within the range required of 3 times the reference value of any RHR or RHRSW pump. This will be done as part of the routine calibration task.

Using the provisions of this relief request as an alternative to the requirements of ISTB-3510(b)(1) provides an acceptable level of quality and safety since their use yields a reading that is as at least equivalent to that achieved using instruments that meet the Code requirements as described in NUREG-1482, Rev.1, Section 5.5.1.

6. Duration of Proposed Alternative

The proposed alternative identified in this relief request shall be implemented during the Fifth Ten Year IST Interval beginning September 1, 2012.

7. Precedents

NRC Safety Evaluation for Monticello Nuclear Generating Plant, Relief Requests Relating to the Fourth 10-Year Interval Inservice Testing Program, Docket No. 50-263. (TAC No. MB6807), July 17, 2003

10 CFR 50.55a REQUEST NUMBER – PR 03
HPCI Pump Vibration

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(ii) On the basis that compliance with the OM Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety

1. ASME Code Component(s) Affected

P-209, High Pressure Coolant Injection (HPCI) Pump (Class 2) (Group B)

Component/System Function
The HPCI System is designed to pump water into the reactor vessel under loss-of-coolant conditions which do not result in rapid depressurization of the pressure vessel. The loss-of-coolant might be due to loss of reactor feedwater or to small line breaks which do not cause depressurization of the reactor vessel [Updated Safety Analysis Report 6.2.4].

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through OMb Code-2006.

3. Applicable Code Requirement(s)

Table ISTB-5121-1, "Centrifugal Pump Test Acceptance Criteria" imposes a vibration alert limit of > 0.325 in/Sec when performing a Comprehensive pump test.

ISTB-6200(a), "Alert Range" (Corrective Action) states in part, If the measured test parameter values fall within the alert range of Table ISTB-5121-1, the frequency of testing specified in ISTB-3400 shall be doubled until the cause of the deviation is determined and the condition corrected.

4. Reason for Request

The Monticello Nuclear Generating Plant (MNGP) Group B HPCI pump consists of a centrifugal main pump, a separate centrifugal booster pump, a speed reducing gear for the booster pump, and a Terry turbine steam driver. The Terry turbine and main pump operates during testing near 3590 RPM. The booster pump operates at a lower RPM due to the reducing gear. All these components are mounted horizontally along the same drive train. Therefore, there are four independently balanced and aligned rotating assemblies that are coupled together. As a result, the normal (baseline) vibration readings in the horizontal direction on the main pump is approximately 0.423 in/Sec. Application of a 0.325 in/Sec alert limit would require Northern States Power – Minnesota (NSPM) to enter accelerated test frequency each time the pump was tested because one or more of these points measured would exceed this limit.

NSPM has many years of In-Service test data showing that baseline vibrations at 0.423 in/Sec represent acceptable pump operation. NSPM has had these vibration levels analyzed by an engineering consultant that specializes in vibration analysis. The consultant's analysis shows that this pump can operate at vibration levels up to 0.700 in/Sec.

Component industry history was reviewed for this type of pump. No failures attributed to extended hours of pump operation at vibration levels exceeding 0.325 in/Sec were found. Implementing the alert limit of 0.325 in/Sec would require NSPM to constantly have the HPCI pump on accelerated test frequency. This would result in an annual comprehensive pump In-Service test instead of biennial. The intent of increased test frequency is to closely monitor a pump that is deteriorating from its baseline values. In this case, the pump is operating at its normal vibration range and no change would be seen. The additional annual test would require a significant amount of time and resources.

Modifying the system in an attempt to reduce the vibration levels, such as installing new shafts and impellers, are extremely expensive and may not reduce the vibration levels. Therefore, requiring an alert limit of 0.325 in/Sec on the HPCI pump is an extreme hardship without a compensating increase in public safety. An appropriate alert limit for these vibration data points is 0.500 in/Sec. This is based on previous test history, a review of industry data and the vibration analysis performed.

5. Proposed Alternative and Basis for Use

A vibration alert limit of 0.500 in/Sec will be used for the pump horizontal vibration data points. The Table ISTB-5121-1 required action limit of 0.700 in/Sec will be adhered to.

NSPM's evaluation of the historical HPCI pump vibration data, shows that HPCI pump P-209 normally runs at elevated vibration levels and has not experienced any failure to date. Requiring NSPM to meet the OM Code requirements by increasing the frequency of MNGP HPCI pump testing would result in hardship without a compensating increase in the level of quality and safety. This is because of the additional testing that would need to be performed on a pump that adequately operates at elevated vibration levels.

Using the provisions of this relief request as an alternative to the test requirements specified in Table ISTB-5121-1 and ISTB-6200(a) is an acceptable alternative method that provides reasonable assurance of operational readiness of HPCI pump P-209.

6. Duration of Proposed Alternative

The proposed alternative identified in this relief request shall be implemented during the Fifth Ten Year IST Interval beginning September 1, 2012.

7. Precedents

NRC Safety Evaluation for Monticello Nuclear Generating Plant, Relief Requests Relating to the Fourth 10-Year Interval Inservice Testing Program, Docket No. 50-263. (TAC No. MB6807), July 17, 2003.

10 CFR 50.55a REQUEST NUMBER – PR 04
HPCI/RCIC Instrumentation Range

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)
On the basis that the proposed alternative provides an acceptable level of quality and safety

1. ASME Code Component(s) Affected

P-209, High Pressure Coolant Injection (HPCI) Pump (Class 2) (Group B)
P-207, Reactor Core Isolation Cooling (RCIC) Pump (Class 2) (Group B)

Component/System Function
The HPCI System is designed to pump water into the reactor vessel under loss-of-coolant conditions which do not result in rapid depressurization of the pressure vessel. The loss-of-coolant might be due to loss of reactor feedwater or to small line breaks which do not cause depressurization of the reactor vessel [Updated Safety Analysis Report (USAR) 6.2.4].

The RCIC System consists of a turbine-driven pump unit capable of delivering makeup water to the reactor vessel during the unlikely event feedwater is isolated from the vessel. [USAR 10.2.5].

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through OMb Code-2006.

3. Applicable Code Requirement(s)

ISTB-3510(b)(1), "Range" states, "The full-scale range of each analog instrument shall be not greater than three times the reference value."

4. Reason for Request

The differential pressure for the HPCI and RCIC pumps is determined by subtracting the indicated suction pressure from the indicated discharge pressure. The HPCI pump suction pressure is read in the Control Room from instrument PI-23-116, which is sent a 10 to 50 mA signal from local transmitter PT-23-100. The RCIC pump suction pressure is read locally from instrument PI-13-66. The current instrument ranges exceed three times the current reference values. The relevant data for the instruments is included in Table 4-1 as follows:

Table 4-1

Instrument	Pump	Instrument Range	Reference Value	Range to Reference Value Ratio
PI-23-116 (Note 1)	P-209	30" Hg – 100 psi	33.7 psi	114.7/33.7=3.4
PT-23-100 (Note 2)	P-209	10 – 50 mA	11.8 mA*	40/11.8=3.4
PI-13-66 (Note 1)	P-207	30" Hg – 100 psi	33.7 psi	114.7/33.7=3.4

* 21.8 mA equates to 11.8 mA on the 40 mA span

NOTE 1: The vacuum range for the pressure indicators was converted to PSI for determining the ratio. 30" HG Vacuum = 14.7 PSI; thus the range = 100 + 14.7 PSI. The same principle was applied to the reference value. With a reference value of 19 PSI indicated on the instrument, the reference value used for the ratio determination is 19 + 14.7 = 33.7 PSI.

NOTE 2: The pressure transmitter has a 10 to 50 mA range, or a span of 40 mA. The ratio for this instrument must be determined by reducing the reference value to its value on the 40 mA span.

Paragraph ISTB-3510(a) requires that instrument accuracy be within the limits of Table 3510-1, which specifies an accuracy requirement of ±2% of full-scale for analog flow instruments. Paragraph ISTB- 3510(b)(1) requires that the full-scale range of each analog instrument be not greater than three times the reference value. The combination of the two requirements (i.e., accuracy equal to ±2% of full-scale and full scale being up to 3 times the reference value) yields a permissible inaccuracy of ±6% of the reference value.

Group B Tests: In accordance with ISTB-3510(b)(1) Northern States Power – Minnesota (NSPM) proposes to apply three times the reference value for determination of the OM Code equivalent range for the instruments. The ± 2% Code required instrument accuracy (see ISTB-3510(a)) for the Group B test is determined from this Code equivalent range as described in Table 4-2 below:

Table 4-2

Instrument	Reference Value	Code Equivalent Range	2% of Code Equivalent Range
PI-23-116	33.7 psi	3 x 33.7 = 101 psi	± 2 psi
PT-23-100*	21.8 mA	3 x 11.8 = 35.4 mA	± 0.7 mA
PI-13-66	33.7 psi	3 x 33.7 = 101 psi	± 2 psi

* 21.8 mA equates to 11.8 mA on the 40 mA span

4. Reason for Request (Cont)

The current instrument calibration tolerances are ± 2 psi for the pressure indicators and ± 0.7 mA for the pressure transmitter. The as-found data in the calibration history for these instruments shows that they have been consistently well within these current code equivalent tolerances.

Comprehensive Tests: The full scale range of pressure transmitter PT-23-100 is approximately 3.4 times the reference value, which is greater than the ISTB-3510(b)(1) requirement of three times the reference value.

Therefore, NSPM proposes that the instrument accuracy requirements of ISTB-3510(a) be demonstrated by determining the loop accuracy using both temporary and in-plant installed instrumentation (PT-23-100). The as-found data in the calibration history for these instruments shows that they have consistently been well within the OM Code equivalent tolerances.

5. Proposed Alternative and Basis for Use

NSPM's proposed alternatives to the OM Code requirements of paragraph ISTB-3510(b)(1) as described in the following.

Group B Tests: NSPM will calibrate instruments PI-23-116, PT-23-100, and PI-13-66 to ± 2 percent of the OM Code equivalent range for Group B tests. The Code equivalent range will be calculated by multiplying the current test parameter reference value by three.

Comprehensive Tests: NSPM will demonstrate the instrument accuracy requirements of paragraph ISTB-3510(a) by determining the loop accuracy using both temporary and in-plant installed instrumentation (PT-23-100).

Using the provisions of this relief request as an alternative to the requirements of ISTB-3510(b)(1) provides an acceptable level of quality and safety since their use yields a reading that is as at least equivalent to that achieved using instruments that meet the Code requirements as described in NUREG-1482, Rev.1, Section 5.5.1.

6. Duration of Proposed Alternative

The proposed alternative identified in this relief request shall be implemented during the Fifth Ten Year IST Interval beginning September 1, 2012.

7. Precedents

NRC Safety Evaluation for Monticello Nuclear Generating Plant, Relief Requests Relating to the Fourth 10-Year Interval Inservice Testing Program, Docket No. 50-263. (TAC No. MB6807), July 17, 2003

10 CFR 50.55a REQUEST NUMBER – PR 05
SLC Pump Vibration Frequency Response Range

**Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(ii)
On the basis that compliance with the OM Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety**

1. ASME Code Component(s) Affected

P-203A and P-203B, Standby Liquid Control Pumps (SLC) (Class 2) (Group B)

Component/System Function
The design objective of the SLC Pumps is to deliver a boron solution at a sufficient concentration to the reactor and bring it to a safe shutdown condition from full power in the event of failure of the withdrawn control rods to insert.

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through OMb Code-2006.

3. Applicable Code Requirement(s)

ISTB-3510(e); "General, Frequency Response Range"; states, "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."

4. Reason for Request

The nominal shaft rotational speed of the SLC pumps is 280 RPM, which is equivalent to approximately 4.7 Hz. Based on this frequency and ISTB-3510(e), the required frequency response range of instruments used for measuring pump vibration is to be 1.56 to 1000 Hz. Procurement and calibration of instruments to cover this range to the lower extreme (1.56 Hz) is impractical due to the limited number of vendors supplying such equipment (and replacement parts), the level of equipment sophistication and the difficulty of the instruments to meet the required accuracy at low frequencies.

These pumps are of a simplified reciprocating (piston) positive displacement design with rolling element bearings, Model Number TD-60, manufactured by Union Pump Corporation. Union Pump Corporation has performed an evaluation of the pump design and has determined that there is no probable sub-synchronous failure modes associated with these pumps under normal operating conditions. Furthermore, there are no known failure mechanisms that would be revealed by vibration at frequencies below those related to shaft speed (4.7 Hz.).

Based upon the absence of a credible failure mode, no useful information is obtained by testing below the 4 Hz frequency nor will any indication of pump degradation be masked by instrumentation unable to collect data below this frequency. The requirement to measure vibration with instruments with response to 1/3 shaft speed comes from the need to detect oil whip or oil whirl associated with journal bearings. In the case of these pumps, there are no journal bearings to create these phenomena, thus satisfying the Code requirements of ISTB-3510(e) would serve no significant purpose. The significant modes of vibration, with respect to equipment monitoring, are as follows:

- <u>1-Times Crankshaft Speed</u> - An increase in vibration at this frequency may be an indication of rubbing between a single crankshaft cheek and rod end, cavitations at a single valve or coupling misalignment.
- <u>2-Times Crankshaft Speed</u> - An increase in vibration at this frequency may be an indication of looseness at a single rod bearing or crosshead pin, a loose valve seat in the fluid cylinder, a loose plunger/crosshead stub connection or coupling misalignment.
- <u>Other Multiples of Shaft Speed</u> - An increase in vibration at other frequencies may be an indication of cavitation at several valves, looseness at multiple locations or bearing degradation.

On March 2, 2006 the NRC in a request for additional information to Florida Power and Light (FPL) Energy (licensee for the Duane Arnold Energy Center (DAEC)) indicated that new technologies that would make detection of low frequency shaft rotation were available to licensees. In the FPL Energy response, dated May 8, 2006 (ADAMS Accession No. ML061430462) the licensee demonstrated that the 1/3 turning speed for the DAEC SLC pump was lower (1.33 Hz) than a previous licensee who could use the improved instrumentation. In addition, FPL Energy demonstrated that even with additional signal filtering the integration from acceleration to velocity would create a slope that would prevent obtaining reliable data at frequencies this low. The integration creates a "ski slope" on the low end, so that at the Code-required low-end frequencies for the DAEC SLC pumps, the data is corrupted by the ski slope and the data would be unreliable. The NRC granted approval of the relief request in a letter dated July 21, 2006 (Reference 1).

The DAEC approval is applicable to the MNGPs SLC pump which has a 1/3 turning speed of 1.56 Hz. Further, other knowlegable industry IST program personnel indicated that currently available instrumentation would not provide data that is reliable for monitoring of speeds at this low value. Finally, if transducers were obtained that can be reliably calibrated down to 1Hz, the errors received by the other meter and cabling electronic errors would continue to be above 5% at these low values. The NRC previously approved this request for the MNGP IST 4th ten-year interval (Reference 2).

Based on the foregoing discussion, it is clear that monitoring pump vibration within the frequency range of 4 to 1000 Hz will provide adequate information for evaluating pump condition and ensuring continued reliability with respect to the pumps' function.

5. Proposed Alternative and Basis for Use

Vibration levels of the SLC Pumps will be measured in accordance with the applicable portions of Subsection ISTB with the exception of the lower frequency response limit for the instrumentation listed in Paragraph ISTB-3510(e). The frequency response range for vibration measurement for the SLC pumps shall be 4 to1000 Hz.

Using the provisions of this 10CFR50.55a request as an alternative to the test requirements specified in ISTB-3510(e) is an acceptable alternative method that provides reasonable assurance of operational readiness of SLC pumps P-203A and P-203B.

6. Duration of Proposed Alternative

The proposed alternative identified in this relief request shall be implemented during the Fifth Ten Year IST Interval beginning September 1, 2012.

7. Precedents

1. NRC Safety Evaluation for Monticello Nuclear Generating Plant, Relief Requests Relating to the Fourth 10-Year Interval Inservice Testing Program, Docket No. 50-263. (TAC No. MB6807), July 17, 2003
2. NRC Safety Evaluation for Duane Arnold Energy Center, Relief Requests Related to the Fourth 10-Year Interval Inservice Testing program (TAC Nos. MC8713, MC8784 and MC8785), July 21, 2006

8. References

1. Letter from L. Raghavan (NRC) to Gary Van Middlesworth (DAEC), "Subject: Duane Arnold Energy Center – Relief Requests Related to the Fourth 10-Year Interval Inservice Testing (IST) program (TAC Nos. MC8713, MC8784 and MC8785), dated July 21, 2006. (ADAMS Accession No. ML061870011)
2. Letter from L. Raghavan (NRC) to David Wilson (NMC), Subject: Monticello Nuclear Generating Plant – Evaluation of Relief Request Nos. PR-01, Pr-02, PR-03, PR-04, PR-05 and VR-02 Related to the Fourth 10-Year Interval Inservice Testing Program (TAC No. MB6807), dated July 17, 2003. (ADAMS Accession No. ML031700209)

10 CFR 50.55a REQUEST NUMBER – PR 06
HPCI Pump Testing Utilizing Pump Curves

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)
On the basis that the proposed alternative provides an acceptable level of quality and safety.

1. ASME Code Component(s) Affected

P-209, High Pressure Coolant Injection (HPCI) Pump (Class 2) (Group B)

Component/System Function
The HPCI System is designed to pump water into the reactor vessel under loss-of-coolant conditions which do not result in rapid depressurization of the pressure vessel. The loss-of-coolant might be due to loss of reactor feedwater or to small line breaks which do not cause depressurization of the reactor vessel [Updated Safety Analysis Report (USAR) 6.2.4].

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through OMb Code-2006.

3. Applicable Code Requirement(s)

ISTB-5122, "Group B Test Procedure" (Centrifugal Pumps)

ISTB-5122(a), states in part, the pump shall be operated at a speed adjusted to the reference point (± 1 percent).

ISTB-5122(c), specifies system resistance may be varied as necessary to achieve the reference point.

ISTB-5123, "Comprehensive Test Procedure" (Centrifugal Pumps)

ISTB-5123(a), states in part, The pump shall be operated at a speed adjusted to the reference point (± 1 percent).

ISTB-5123(b), states in part, the resistance of the system shall be varied until the flow rate equals the reference point. The differential pressure shall then be determined and compared to its reference value.

4. Reason for Request

In order to perform accurate trending and data analysis, the use of an accurate reference value is very important. The complexities of the flow control system used for HPCI makes it difficult to exactly duplicate the reference points. Additionally, iterative manipulation of the control system equipment to refine the hydraulic and speed parameters contributes additional wear to system components. As alternative testing is allowed under the provisions of 10 CFR 50.55a, MNGP Northern States Power – Minnesota (NSPM) proposes an alternative test method for the Comprehensive and Group B HPCI pump test, as required by ASME OM Code, Subsection ISTB.

5. Proposed Alternative and Basis for Use

As stated in NUREG-1482, Rev 1, Section 5.2, some system designs do not allow for testing at a single reference point or a set of reference points. In such cases, it may be necessary to plot pump curves to use as the basis for variable reference points. Code Case OMN-16, "Use of Pump Curves for Testing," is included in the issuance of ASME Code OMb-2006. This Code Case has not been accepted by NRC staff for inclusion in NRC Regulatory Guide (RG) 1.192; "Operation and Maintenance Code Case Acceptability, ASME OM Code"; however, Code Case OMN-9 "Use of Pump Curves for Testing" has been conditionally accepted by NRC staff for inclusion in RG 1.192. The conditions imposed on OMN-9 as stated in RG 1.192 have been incorporated into OMN-16. In addition, Code applicability for the use of OMN-16 includes OM Code-2004 with Addenda through OMb-2006 which is the fifth interval Code of Record for the MNGP IST Program.

As an alternative to the testing requirements of ISTB-5122 and ISTB-5123, NSPM will assess pump performance and operational readiness through the use of reference pump curves per the guidelines provided in Code Case OMN-16. Flow rate and pump differential pressure will be measured during inservice testing in the as found condition of the system and compared to an established reference curve. The following elements will be used in the development of the reference pump curves:

During Comprehensive and Quarterly HPCI Pump Testing, pump differential pressure and flow rate will be evaluated using a reference point derived from a pump curve. Figure 1 and Figure 2 provide the representative graph which NSPM proposes to use for Quarterly and Comprehensive Testing, respectively. The reference point test pump curve will be restricted to an operating range that is representative of accident conditions, or conservative conditions that are the most sensitive indicator of pump degradation. Appropriate upper and lower acceptance criteria limits for differential pressure will be established for the Required Action and Alert range limits, as applicable, for Group B (Quarterly) and Comprehensive testing.

These limits will be scalar multiples of the reference pump curve . For determination of whether the In-service Testing (IST) Acceptance Criteria is met, Table 1 and Table 2 are proposed to be used to analyze the data. These acceptance criteria satisfy the requirements specified in Code Case OMN-16, paragraph 16-6200(a) “Alert Range” and paragraph 16-6200(b) “Required Action Range”.

NSPM will follow the stipulations established by Pump Relief Request PR-03, “HPCI Pump Vibration” for the Vibration Alert Levels and Code established limits for the Action Required Levels over the reference value curve range for Comprehensive testing.

The vibration data (see Figure 3 through Figure 6) from the test was reviewed and no adverse correlation was evident between flow rate and vibration at the nominal reference point speed. Therefore, NSPM will not establish new vibration reference values and related allowable limits over the reference value curve at this time.

If future requirements necessitate the need for re-generation of a new pump reference curve, NSPM will obtain vibration readings across the expected operating test range of the pump.

The alternative testing described above provides an acceptable level of quality and safety because the method will provide increased accuracy in trending and data analysis. Since the methodology utilized is consistent with the NRC staff guidance provided in NUREG-1482, Rev.1, Section 5.2 and Code Case OMN-16 it will provide reasonable assurance of pump operational readiness.

6. Duration of Proposed Alternative

The proposed alternative identified in this relief request shall be implemented during the Fifth Ten Year IST Interval beginning September 1, 2012.

7. Precedents

NRC Safety Evaluation for Monticello Nuclear Generating Plant, Evaluation of Relief Request PR-06 Relating to the Fourth 10-Year Interval Inservice Testing Program, Docket No. 50-263. (TAC No. MB9550), August 7, 2003.

10 CFR 50.55a REQUEST NUMBER – PR 06
HPCI Pump Testing Utilizing Pump Curves

Attachments:

Table 1 – "HPCI Pump Group B Quarterly Test Acceptance Criteria"
Table 2 – "HPCI Pump Comprehensive Test Acceptance Criteria"
Figure 1 – "HPCI P-209 Group B Quarterly Testing Limits"
Figure 2 – "HPCI P-209 Comprehensive Testing Limits"
Figures 3 through Figure 6 – "HPCI Vibration Comparison over Reference Curve Flow Range"

10 CFR 50.55a REQUEST NUMBER – PR 06
HPCI Pump Testing Utilizing Pump Curves

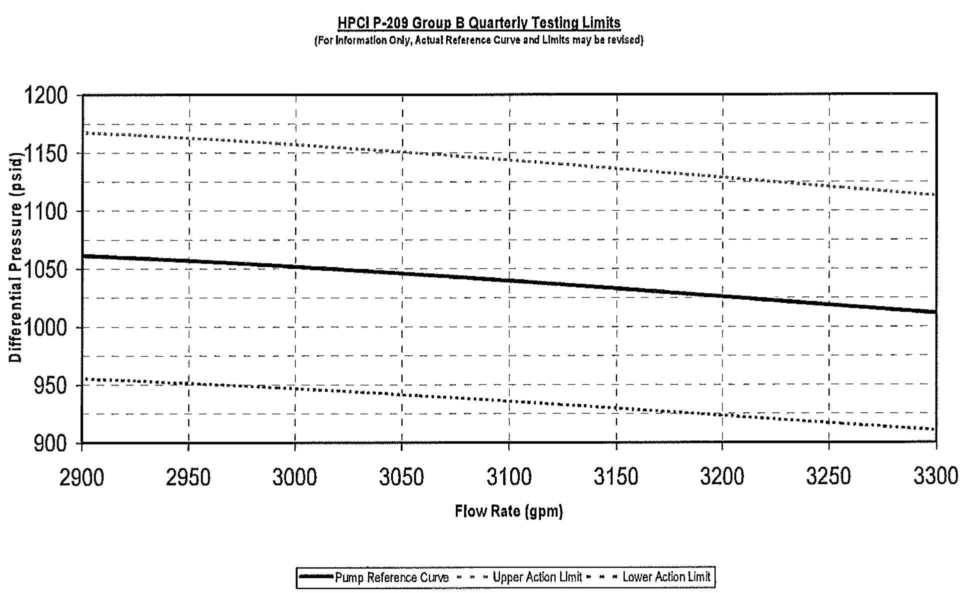
HPC Pump Group B Quarterly Test Acceptance Criteria

(For Information Only, actual data may change during 5th IST Interval)

Table 1

Pump Flow Reference Point (gpm)	Pump Diff Press Reference Value (psid)	Group B Quarterly Test	
		Upper Required Action Range (> psid)	Lower Required Action Range (< psid)
2900	1061.4	1167.5	955.3
2950	1057.0	1162.7	951.3
3000	1051.9	1157.0	946.8
3050	1046.0	1150.6	941.4
3100	1039.7	1143.6	935.8
3150	1032.9	1136.1	929.7
3200	1025.9	1128.4	923.4
3250	1018.8	1120.6	917.0
3300	1011.6	1112.7	910.5

Figure 1



10 CFR 50.55a REQUEST NUMBER – PR 06
HPCI Pump Testing Utilizing Pump Curves

HPC Pump Comprehensive Test Acceptance Criteria

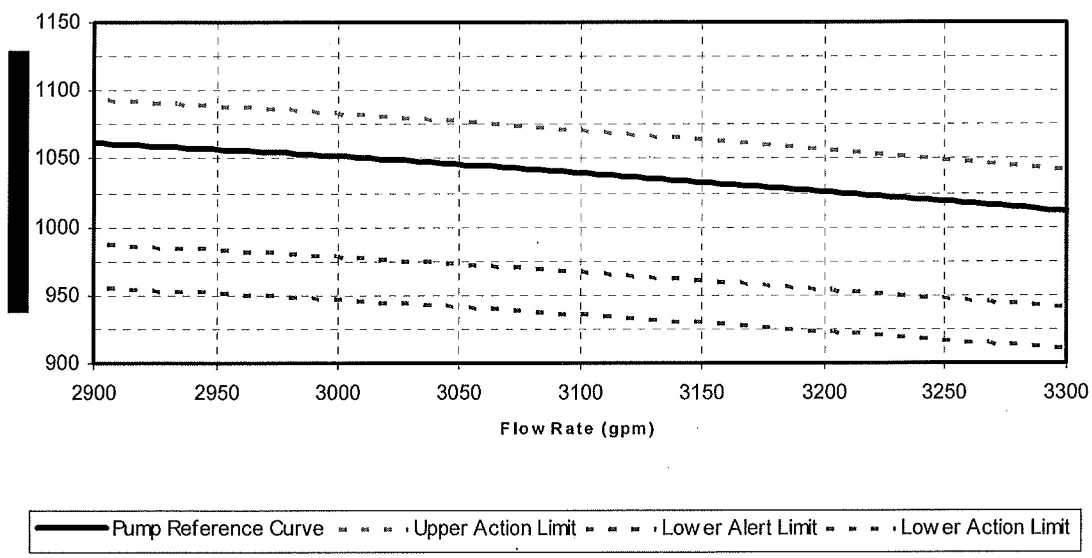
(For Information Only, actual data may change during 5th IST Interval)

Table 2

Pump Flow Reference Point (gpm)	Pump Diff Press Reference Value (psid)	Comprehensive Test		
		Upper Required Action Range (> psid)	Lower Alert Range (< psid)	Lower Required Action Range (< psid)
2900	1061.4	1093.2	987.2	955.3
2950	1057.0	1088.7	983.1	951.3
3000	1051.9	1083.4	978.3	946.8
3050	1046.0	1077.3	972.8	941.4
3100	1039.7	1070.8	967.0	935.8
3150	1032.9	1063.8	960.6	929.7
3200	1025.9	1056.6	954.1	923.4
3250	1018.8	1049.3	947.5	917.0
3300	1011.6	1041.9	940.8	910.5

Figure 2

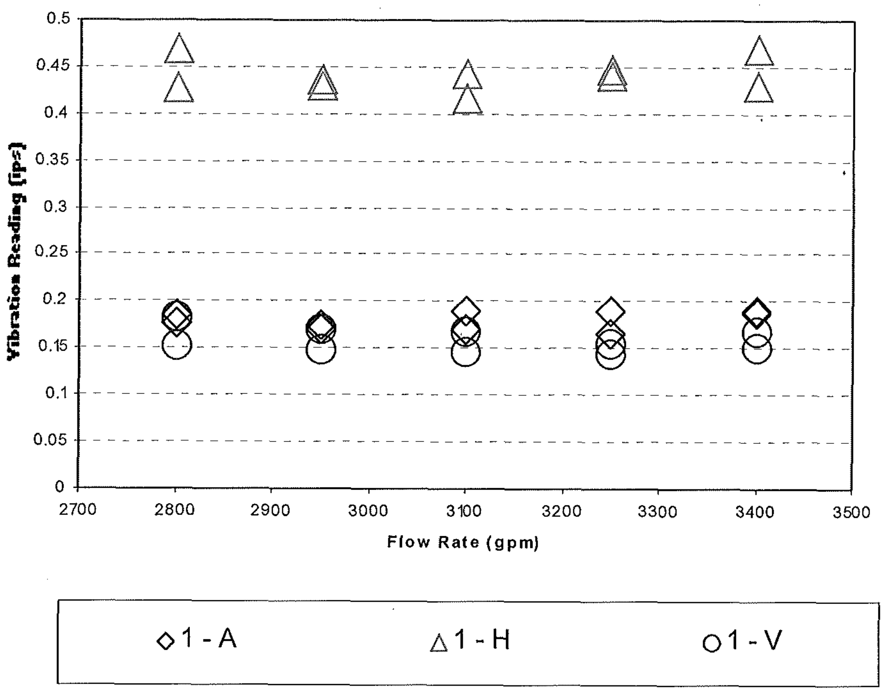
HPCI P-209 Comprehensive Testing Limits
(For Information Only, Actual Reference Curve and Limits may be revised)

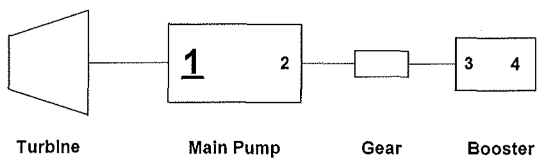


10 CFR 50.55a REQUEST NUMBER – PR 06
HPCI Pump Testing Utilizing Pump Curves

Figure 3

HPCI Vibration Comparision over Reference Curve Flow Range (2.12.03 Test)

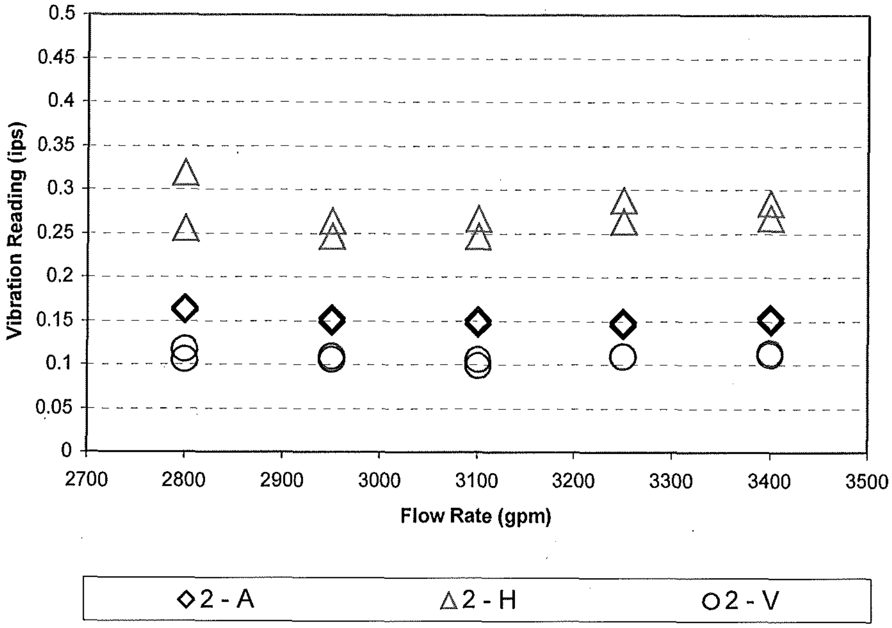


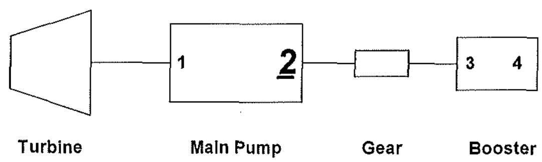


10 CFR 50.55a REQUEST NUMBER – PR 06
HPCI Pump Testing Utilizing Pump Curves

Figure 4

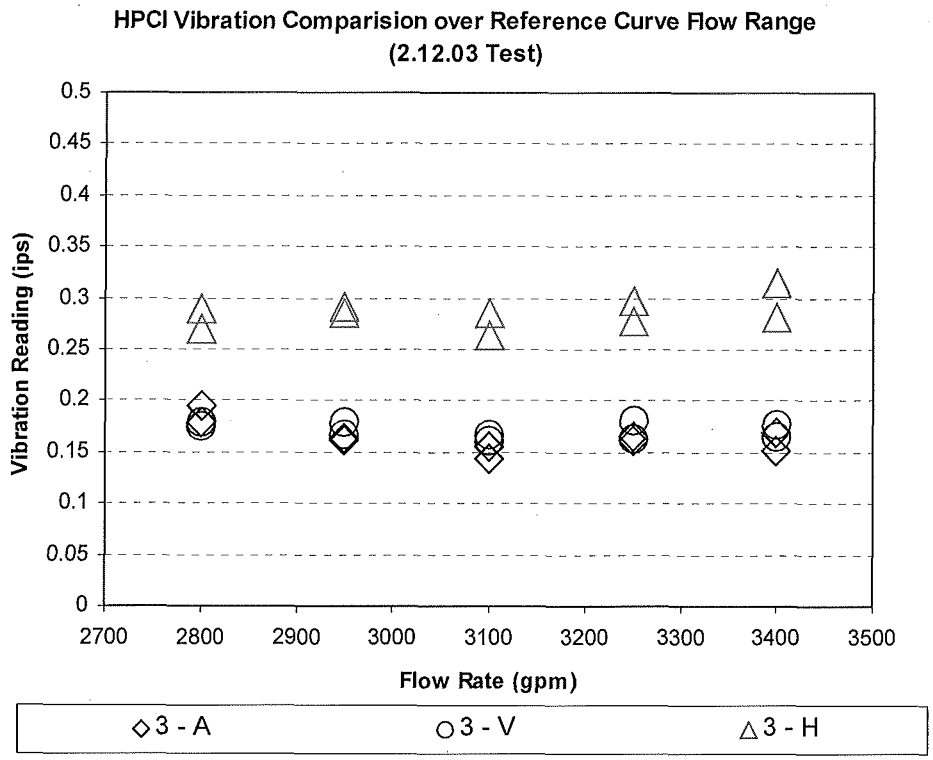
HPCI Vibration Comparision over Reference Curve Flow Range (2.12.03 Test)

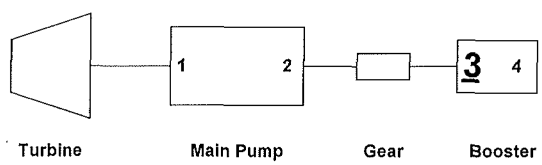




10 CFR 50.55a REQUEST NUMBER – PR 06
HPCI Pump Testing Utilizing Pump Curves

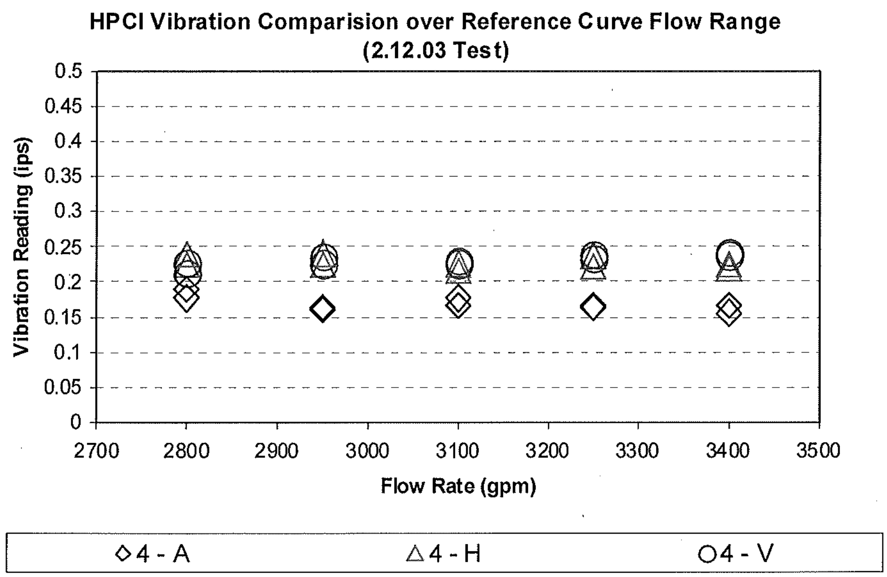
Figure 5

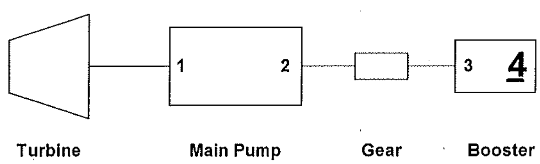




10 CFR 50.55a REQUEST NUMBER – PR 06
HPCI Pump Testing Utilizing Pump Curves

Figure 6





ENCLOSURE 2

VALVE RELATED 10CFR50.55a REQUESTS

VR 01 – ALTERNATIVE MEANS OF CLOSE TESTING THE CONTROL ROD DRIVE SCRAM DISCHARGE HEADER CHECK VALVES

VR 02 – ALTERNATIVE REQUIREMENT FOR STROKE TIME TESTING AND FULL STROKE EXERCISING OF THE RHR SERVICE WATER TO RHR HEAT EXCHANGER FLOW CONTROL VALVES

VR 03 – IMPLEMENT ASME CODE CASE OMN-1, REVISION 1, FOR THE STROKE-TIME TESTING AND THE POSITION VERIFICATION TESTING OF CERTAIN MOTOR-OPERATED VALVES

11 pages follow

10 CFR 50.55a REQUEST NUMBER – VR 01
Closure Testing of Scram Discharge Header Check Valves CRD-114 (Typical of 121 Valves)

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i) On the basis that the proposed alternative provides an acceptable level of quality and safety

1. ASME Code Component(s) Affected

CRD-114, Scram Discharge Header Checks Valves (Typical 121 valves, one per Hydraulic Control Unit (HCU) (Class 2)

Component/System Function
These check valves are required to open during a reactor scram, providing a flow path for the exhaust water from the Control Rod Drives (CRDs) to the Scram Discharge Volume. The check valves have no safety function in the closed direction.

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through OMb Code-2006.

3. Applicable Code Requirement(s)

ISTC-3510, "Exercise Test Frequency", requires active Category C check valves to be exercised nominally every 3 months. If exercising every 3 months is not possible then exercising shall be performed during cold shutdowns or refueling outages as permitted by ISTC-3522, "Category C Check Valves".

ISTC-3522, "Category C Check Valves", states in part, that each check valve exercise test shall include open and close tests.

ISTC-5221(a)(2), "Valve Obturator Movement", requires check valves that have a safety function in only the open direction shall be exercised by initiating flow and observing that the obturator has traveled either the full open position or to the position required to perform its intended safety function(s), and verify closure.

4. Reason for Request

The subject check valves, CRD-114 (scram discharge header check valves), are simple ball-check design. There are no internal parts in the check valves that are susceptible to rapid degradation and sudden failure. In addition, the control rods are infrequently scrammed and these valves are thus subjected to few stress/wear cycles. It is not practical to perform the close exercise test on-line.

Furthermore, the valves are welded into the line and it is not practicable to perform a disassembly and inspection of each valve in accordance with ISTC-5221(c). There is no provision for routine access for direct visual examination of the ball and body seats or for indirect examination of internals using remote viewing aides such as a boroscope. In order to observe that the obturator has traveled would require a complete disassembly and inspection of the check valve, and an additional valve would require disassembly.

NUREG-1482, Rev.1, Section 4.4.6 "Testing Individual Scram Valves for Control Rods in Boiling-Water Reactors" provides an approved alternative. NUREG-1482 requires that those ASME Code Class valves that must change position to provide the scram function should be included in the IST Program and be tested in accordance with the requirements of ISTC except where relief has been granted in a previously issued Safety Evaluation. Bi-directional exercise testing of check valves is required by the 1996 Addenda to the ASME Code (and later editions and addenda).

NUREG-1482, Rev.1, Section 4.4.6 further states in part:

> "The control rod drive system valves that perform an active safety function in scramming the reactor are the scram discharge volume vent and drain valves, the scram inlet and outlet valves, the scram discharge header check valves, the charging water header check valves, and the cooling water header check valves. With the exception of the scram discharge volume vent and drain valves, exercising the other valves quarterly during power operations could result in the rapid insertion of one or more control rods.
>
> For those control rod drive system valves where testing could result in the rapid insertion of one or more control rods, the rod scram test frequency identified in the facility TS may be used as the valve testing frequency to minimize rapid reactivity transients and wear of the control rod drive mechanisms. The alternate test frequency should be clearly stated and documented in the IST Program."

The proper operation of these check valves is demonstrated during scram time testing. During scram time testing, scram insertion time is measured for each CRD. Monticello Nuclear Generating Plant's (MNGPs) Technical Specification (TS) 3.1.4 provides a specific time for individual CRD scram insertion. If a particular CRD's scram insertion time is less than the specified time, the above check valves are functioning properly.

MNGPs TS surveillance requirement (SR) 3.1.4.1 requires verification that each control rod scram time is within the limits of TS Table 3.1.4-1 with reactor steam dome pressure ≥800 psig prior to exceeding 40% Rated Thermal Power (RTP) after each reactor shutdown ≥120 days.

MNGP TS SR 3.1.4.2 requires verification, for a representative sample, that each tested control rod scram time is within the limits of TS Table 3.1.4-1 with reactor steam dome pressure ≥800 psig each 200 days cumulative operation in Mode 1.

The Scram Discharge Header Check Valves have a safety function to open. This valve (CRD-114) must open to provide a flow path from the overpiston area of the control rod drive to the scram discharge header during a scram. This check valve's closed function is to prevent backflow from the scram discharge volume (SDV) to the overpiston area of the drive when a Scram is reset. Flow from the CRD to the SDV occurs throughout the entire scram stroke of the control rod and continues until volume pressure equals reactor vessel pressure. There would normally be no demand for check valve closure until after the rod is fully inserted and latched. Additionally, any condition that would require check valve closure would prevent further control rod insertion regardless of the position of this check valve. Therefore, failure of the scram outlet check valves to close would not prevent the system from performing its safety function.

5. Proposed Alternative and Basis for Use

Northern States Power - Minnesota (NSPM) considers that the proper operation of each of these check valves is demonstrated during scram time testing where each drive scram insertion time is measured. As previously discussed, MNGP TS 3.1.4 provides a specific time for CRD scram insertion. If a particular scram insertion time is less than the specified time scram, then the related valves are functioning properly. The successful scram time of a CRD also represents the successful full stroke exercising of these check valves (CRD-114). NSPM proposes to perform testing of the CRD scram discharge header check valves consistent with the alternative testing provided in NUREG-1482, Rev.1, Section 4.4.6. Therefore, the closed function of the scram discharge header check valves would not be tested as required by ISTC-3522.

Using the provisions of this relief request as an alternative to the test requirements specified in ISTC-3510, ISTC-3522 and ISTC-5221(a)(2) is an acceptable alternative method of detecting degradation of the check valves and provides an acceptable level of quality and safety for determining the check valves are functioning properly.

6. Duration of Proposed Alternative

The proposed alternative identified in this relief request shall be implemented during the Fifth Ten Year IST Interval beginning September 1, 2012.

7. Precedents

NRC Safety Evaluation for Monticello Nuclear Generating Plant, Relief Request No. VR-01 Relating to the Fourth 10-Year Interval Inservice Testing Program, Docket No. 50-263. (TAC No. MB9736), December 10, 2003

10 CFR 50.55a REQUEST NUMBER VR 02

RHRSW Flow Control Valve Exercising

Proposed Alternative In Accordance with 10CFR50.55a(f)(5)(iii) for the NRC to Grant Relief and Impose an Alternative Requirement in Accordance with 10CFR50.55a(f)(6)(i) On the basis that compliance with the ASME OM Code requirements are impractical for MNGP

1. **ASME Code Component(s) Affected**

CV-1728, RHR Service Water to RHR Heat Exchanger Flow Control Valve (Class 3)

CV-1729, RHR Service Water to RHR Heat Exchanger Flow Control Valve (Class 3)

Component/System Function
These valves must open to the throttled position to provide a flow path from the Residual Heat Removal (RHR) Service Water (RHRSW) system to the RHR heat exchanger tube side during normal shutdown cooling or containment spray/cooling mode.

2. **Applicable Code Edition and Addenda**

ASME OM Code-2004 Edition, with Addenda through OMb Code-2006.

3. **Applicable Code Requirement(s)**

ISTC-3510, "Exercise Test Frequency", requires active Category B valves to be exercised nominally every 3 months. If exercising every 3 months is not possible then exercising shall be performed during cold shutdowns or refueling outages as permitted by ISTC-3520.

ISTC-5130, "Pneumatically Operated Valves"

ISTC-5131, "Valve Stroke Testing," requires active valves to have their stroke times measured when exercised in accordance with ISTC-3500 and limiting values to be specified by the Owner.

ISTC-5132, "Stroke Time Acceptance Criteria," requires test results to be compared to the reference values established in accordance with ISTC-3320.

ISTC-5133, "Stroke Test Corrective Action," requires valves that exceed their limiting values of full stroke time to be immediately declared inoperable (ISTC-5133(a). In addition, ISTC-5133(b) requires valves with measured stroke times that do not meet the acceptance criteria of ISTC-5132 shall be immediately retested or declared inoperable.

4. Impracticality of Compliance

ISTC-5131 requires that a limiting value of full stroke time be established for a power operated valve and that the stroke time be measured whenever such a valve is full stroke tested. Performing full stroke time testing or full stroke exercising of these valves is impractical based on the control scheme design of the valves, adverse plant impact, and the functional requirements of the valves.

ISTC-2000 defines the *full-stroke time* as the time interval from initiation of the actuating signal to the indication of the end of the operating stroke. The control scheme design of these valves does not receive an actuation signal (neither by manual hand switch nor by automatic logic) to stroke to the position required to fulfill their safety function.

RHRSW valves CV-1728 and CV-1729 are air operated control valves on the outlet line of the RHRSW side of the "A" and "B" RHR heat exchangers, respectively. These control valves maintain a differential pressure between the RHRSW process stream and the RHR process stream during RHRSW system operation. The valves are controlled by a positioner, which is controlled by a differential pressure-indicating controller (DPIC). The DPIC senses pressure on the RHRSW discharge line and the RHR inlet line to the RHR heat exchanger. The desired differential pressure control point, and thus the desired valve position for system flow, is manually set by the operator. The valve positioner modulates the valve position as necessary to maintain this control point. Stroke time testing or full stroke exercising of these valves on quarterly basis is not consistent with the design of the valve's control scheme and is not in the interest of plant safety.

These valves are interlocked to receive a closed signal when the RHRSW pumps are de-energized. This interlock is provided to ensure that system water inventory is not lost during system shutdown. Stroke time testing or full stroke exercising of valves CV-1728 and CV-1729 when the RHRSW pumps are de-energized would result in the loss of liquid fill for a significant portion of the RHRSW system as well as require the bypassing of an interlock designed to minimize the potential for water hammer. Such testing increases the possibility of an adverse water hammer during startup of the RHRSW system as well as requires filling and venting of the system following the stroke time testing. In addition to the adverse impact on plant operation, such testing results in causing system or component damage.

Stroke time testing or full stroke exercising of the valves during RHRSW pump operation negates the loss of system fill concern; however, this testing would also have an adverse impact on plant safety and equipment integrity. Stroke time testing or full stroke exercising during pump operation would require the valves to be initially in the closed position during pump operation. Establishing the initial test conditions of a closed valve during pump operation would result in an undesirable deadheading of the pump. Subsequent opening of the valves to perform stroke time testing or full stroke exercising will result in pump runout if a single RHRSW pump is in operation, an undesirable condition which adversely impacts pump integrity and performance. The pump runout concern can be addressed by stroke timing the valve open during operation of both RHRSW pumps; however, this exacerbates the pump deadheading concerns and would result in undesirable transients on the system and could cause system or component damage.

5. <u>Burden Caused By Compliance:</u>

Proper stroke time testing or full stroke exercising would require the plant to modify the control logic of the valves. The activity associated with performing this modification is not offset by an increase in public safety. The proposed alternative testing is an effective means to ensure the valves perform their safety function and is consistent with other valve category test requirements, such as check valve exercising. By extension, if stroke time testing is not performed, the requirement of ISTC-5132 for establishing stroke time acceptance criteria is impractical. Similarly, if there are no stroke time limits applicable, then the requirement of ISTC-5133 for corrective action when stroke time limits are exceeded is not applicable when performing Code required testing.

ISTC-3530 provides for demonstrating the necessary valve disk movement by observing indirect evidence (such as changes in system pressure, flow rate, level, or temperature), which reflect stem or disk position. The most representative test of the capability of valves CV-1728 and CV-1729 to perform their intended function is performed during In-Service testing of the RHRSW pumps. Quarterly testing of the RHRSW pumps verifies the capability of the valves to operate properly to pass the maximum required accident flow as well as the valve position necessary to achieve required flow conditions. In addition, Per ISTC-5131(d) any abnormality or erratic action shall be recorded and an evaluation shall be made regarding need for corrective action. Testing of the valves in this manner demonstrates valve performance capability and provides a means to monitor for valve degradation. It should be noted that these valves are within the scope of the Monticello Nuclear Generating Plant (MNGP) Air Operated Valve (AOV) Program. As such, the valves receive diagnostic testing per the AOV Program.

Using the provisions of this relief request as an alternative to the requirements of ISTC-3510 and 5130 provides a reasonable alternative to the Code requirements. Based on the determination that the proposed alternative provides reasonable assurance of the valves' operational readiness and is an acceptable alternative method of detecting degradation, Northern States Power – Minnesota (NSPM) requests that relief be granted pursuant to 10CFR50.55a(f)(6)(i).

7. Duration of Proposed Alternative

The proposed alternative identified in this relief request shall be implemented during the Fifth Ten Year IST Interval beginning September 1, 2012.

8. Precedents

NRC Safety Evaluation for Monticello Nuclear Generating Plant, Relief Requests Relating to the Fourth 10-Year Interval Inservice Testing Program, Docket No. 50-263. (TAC No. MB6807), July 17, 2003

10 CFR 50.55a REQUEST NUMBER – VR 03
Use of Code Case OMN-1, Revision 1, on Various Motor Operated Valves

Proposed Alternative In Accordance with 10CFR50.55a(a)(3)(i)
On the basis that the proposed alternative provides an acceptable level of quality and safety

1. ASME Code Component(s) Affected

Certain motor-operated valve assemblies currently included in the Monticello Nuclear Generating Plant (MNGP) Motor-Operated Valve (MOV) Program.

Component/System Function
The applicable motor operated valves are required to perform a specific function in shutting down the reactor to a safe shutdown condition, maintaining a safe shutdown condition or in mitigating the consequences of an accident.

2. Applicable Code Edition and Addenda

ASME OM Code-2004 Edition, with Addenda through OMb Code-2006

3. Applicable Code Requirement(s)

ISTA-3130, "Application of Code Cases", ISTA-3130(b) states, "Code Cases shall be applicable to the edition and addenda specified in the test plan."

ISTC-5120, "Motor-Operated Valves", ISTC-5121(a) states, "Active valves shall have their stroke times measured when exercised in accordance with ISTC-3500."

ISTC-3700, "Position Indication Verification", states in part: Valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve position is accurately indicated.

4. Reason for Request

NUREG-1482, Rev.1, Section 4.2.5 states in part: As an alternative to MOV stroke-time testing, ASME developed Code Case OMN-1 Rev 0, "Alternative Rules for Preservice and Inservice Testing of Certain Electric Motor-Operated Valve Assemblies in LWR Power Plants" which provides periodic exercising and diagnostic testing for use in assessing the operational readiness of MOVs. Section 4.2.5 recommends that the licensees implement ASME Code Case OMN-1 Rev 0 as accepted by the NRC (with certain conditions) in the regulations or Regulatory Guide (RG) 1.192, as an alternative to the stroke-time testing provisions in the ASME Code for MOVs. RG 1.192 allows licensees to implement ASME Code Case OMN-1, Revision 0, (in accordance with the provisions in the RG) as an alternative to the Code provisions for MOV stroke-time testing in the ASME OM Code 1995 Edition through 2000 Addenda.

The Code of Record for MNGP Fifth 10-Year IST Interval is OM Code-2004 Edition with Addenda through OMb Code-2006.

5. Proposed Alternative and Basis for Use

Pursuant to the guidelines provided in NUREG-1482, Rev.1, Section 4.2.5, and the conditions stated in RG 1.192, NSPM proposes to implement Code Case OMN-1, Revision 1, in lieu of the stroke-time provisions specified in ISTC-5120 for MOVs as well as the position verification testing in ISTC-3700.

There are no significant differences between the version of Code Case OMN-1 that is in the 1999 Addenda of the OM Code currently approved for use in RG 1.192, Revision 0 and the Revision 1 of the Code Case (OMN-1-1) in 2009 Edition of the OM Code.

The use of Code Case OMN-1-1 by a licensee permits licensees to replace stroke time and position verification testing of MOVs with a program of exercising MOVs every refueling outage and diagnostically testing on longer intervals.

The proposed alternative is considered to be acceptable because Code Case OMN-1-1 provides a superior method than the stroke-timing method required by the OM code for assessing the operational readiness of MOVs.

Using the provisions of this relief request as an alternative to the MOV stroke-time testing requirements of ISTC-5120 and position indication verification of ISTC-3700 provide an acceptable level of quality for determination of valve operational readiness. Code Case OMN-1-1 should be considered acceptable for use with ASME OM Code-2004 Edition with Addenda through OMb Code-2006 as the Code of Record.

6. Duration of Proposed Alternative

The proposed alternative identified in this relief request shall be implemented during the Fifth Ten Year IST Interval beginning September 1, 2012.

7. Precedents

1. NRC Safety Evaluation for Beaver Valley Power Station, Unit 2, Docket No. 50-412. Regarding the Third 10-Year Interval Inservice Testing Program Relief Requests (TAC Nos. MD5595 – MD5604), February 14, 2008. (ADAMS Accession No. ML080140299)

2. NRC Safety Evaluation for South Texas Project, Unit 1 and 2, Docket No. 50-498 and 50-499. Regarding the Third 10-Year Inservice Testing Program Interval (TAC Nos. ME3515, ME3516, ME3517, ME3518, ME3520, ME3521 and ME3522), September 2, 2010. (ADAMS Accession No. ML102150077)