



Northern States Power Company

Monticello Nuclear Generating Plant  
2807 West County Road 75  
Monticello, MN 55362

May 12, 2000

US Nuclear Regulatory Commission  
Attn: Document Control Desk  
Washington, DC 20555

10 CFR Part 50  
Section 50.90

MONTICELLO NUCLEAR GENERATING PLANT  
Docket No. 50-263 License No. DPR-22

License Amendment Request Dated May 12, 2000

Revise Safety/Relief Valve Bellows Leakage Detection System  
Test Frequency from Quarterly to Once per Operating Cycle

Attached is a request for a change in the Technical Specifications (TS), Appendix A of the Operating License for the Monticello Nuclear Generating Plant. This request is submitted in accordance with the provisions of 10 CFR Part 50, Section 50.90.

The purpose of this License Amendment Request is to revise Technical Specification (TS) section 4.6.E.1.d Safety/Relief Valve (SRV) bellows monitoring system test frequency from quarterly to once per operating cycle.

Exhibit A contains a description of the proposed changes, the reasons for requesting the changes, a Safety Evaluation, a Determination of No Significant Hazards Consideration and an Environmental Assessment. Exhibit B contains current Technical Specification pages marked up with the proposed change. Exhibit C contains revised Monticello Technical Specification pages.

This submittal does not contain any new NRC commitments and does not modify any prior commitments. Please contact Sam Shirey, Sr. Licensing Engineer, at (763) 295-1449 if you require additional information related to this request.

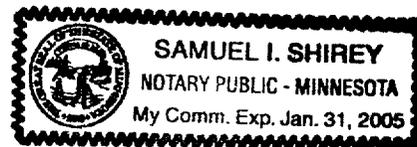
This letter contains no restricted or other defense information.

NSP requests a period of up to 45 days following receipt of this license amendment to implement the changes.

by Byron D. Day  
Byron D. Day  
Plant Manager  
Monticello Nuclear Generating Plant

On this 12<sup>th</sup> day of May, 2000 before me a notary public in and for said County, personally appeared Byron D. Day, Plant Manager, Monticello Nuclear Generating Plant, and being first duly sworn acknowledged that he is authorized to execute this document on behalf of Northern States Power Company, that he knows the contents thereof, and that to the best of his knowledge, information, and certifies under penalty of perjury that this document is true and correct.

Samuel I. Shirey  
Samuel I Shirey  
Notary Public - Minnesota  
Sherburne County  
My Commission Expires January 31, 2005



c: Regional Administrator-III, NRC  
NRR Project Manager, NRC  
Sr. Resident Inspector, NRC  
Minnesota Department of Commerce  
J Silberg, Esq.

Attachments: Exhibit A – Evaluation of Proposed Change to the Monticello Technical Specifications  
Exhibit B – Current Monticello Technical Specification Pages Marked Up With Proposed Change  
Exhibit C – Revised Monticello Technical Specification Pages

## EXHIBIT A

### Evaluation of Proposed Change to the Monticello Technical Specifications

License Amendment Request Dated May 12, 2000

#### Revise Safety/Relief Valve Bellows Leakage Detection System Test Frequency from Quarterly to Once per Operating Cycle

Pursuant to 10 CFR Part 50, section 50.90, Northern States Power Company hereby proposes to revise Monticello's Technical Specification (TS) section 4.6.E.1.d. from testing the Safety/Relief Valve (SRV) bellows monitoring system once every three months to once each operating cycle.

#### Reference

1. American Society of Mechanical Engineers Boiler & Pressure Vessel Code, 1968 Edition, Section III, Article 9, Requirement N-911.2(5).

#### Background

Monticello's reactor pressure vessel (RPV) is protected from overpressurization by eight, three stage Target Rock safety/relief valves (SRVs). Bellows leakage is monitored by a pressure sensor on each valve. As currently required by Monticello Technical Specification section 4.6.E.1.d, the bellows leak detection system (BLDS), which monitors integrity of the SRV bellows, is tested once every three months (quarterly).

TS sections 4.6.E.1.d states:

- d. The operability of the bellows monitoring system shall be demonstrated at least once every three months.*

In order to meet the quarterly surveillance requirement, each BLDS is equipped with three solenoid valves which permit the BLDS to be remotely pressurized with 100 psig N<sub>2</sub> during plant operation. However, performance of this surveillance or failure of the solenoid valves can make the associated SRV inoperable. Solenoid valve failure has occurred previously at Monticello and, in one instance, resulted in a plant shutdown. Approval of this license amendment will replace the quarterly testing requirement with a once each operating cycle test requirement, thus eliminating the need to test the BLDS online. Once per cycle testing would permit future removal of the solenoid valves and instrument N<sub>2</sub> intertie.

**Exhibit A**  
Evaluation of Proposed Change to the Monticello Technical Specifications

---

Based on an NSP survey, BLDSs at BWRs with similar SRVs consist only of a pressure sensor with no solenoid valves and external pressurization source. In all cases, these plants only require surveillance testing once per operating cycle. ASME B&PV Code, Section III (Ref. 1), section N-911.4 (a) (4) requires SRVs with bellows be monitored "to reveal failure of the sensing element" but does not require testing of the monitoring system.

The BLDS has been very reliable. Therefore, it is requested to extend the test interval from once every three months to once every operating cycle.

**Description of Proposed Changes and Reasons for Changes**

**Page 127 (Specification):**

Revise section 4.6.E.1.d. to extend the test interval time from:

*"... at least once every three months"*

To:

*"... each operating cycle."*

**Page 151 (Bases):**

After "Article 9" add "Section N-911.4(a)(4)"

After "Nuclear Vessels" add "(1965 and 1968 editions)"

The purposes of this change are to avoid confusion with other code editions and facilitate location of Tech Spec bases information by clarifying the specific codes and sections of codes which Monticello is committed to. These clarifications do not, however, change NSP's commitment.

Revise:

*"Testing of this system quarterly provides assurance of bellows integrity."*

To:

*"Testing of this system once per cycle provides assurance of bellows integrity."*

This change reflects the test interval extension from once every three months to each operating cycle which will allow testing the BLDS only during refueling outages.

**Safety Evaluation**

The requirement of TS section 4.6.E.1.d to test the bellows leak detection system quarterly mandates the use of the BLDS test solenoids or requires a plant shutdown. When energized for the quarterly test, the solenoids direct 100 psig N<sub>2</sub> into the BLDS activating the system's pressure switch. During this test the SRV is inoperable since pressurizing the area around the bellows will effectively raise the SRV's setpoint out of its acceptance range. Leakage or failure of the solenoid valves can produce the same result. This has happened on two previous occasions at Monticello; one of which

**Exhibit A**  
**Evaluation of Proposed Change to the Monticello Technical Specifications**

---

caused two SRV's to simultaneously become inoperable, thereby forcing a Technical Specification required plant shutdown.

The purpose of the BLDS is to detect a failure of the SRV bellows. Cyclic testing provides adequate assurance that the BLDS will perform this function when required. The cyclic testing will not be changed as a result of this Tech Spec amendment. The cyclic testing presently performed checks that the BLDS pressure switch actuates within its setpoint acceptance band and verifies proper operation of the associated annunciator circuitry when the BLDS is pressurized to 100 psig. Over the last 5 plant cycles, the setpoints of the eight BLDS pressure switches have not drifted by more than 1 psi between tests, which has been acceptable. A margin of approximately 25 psi presently exists between the maximum allowable setpoint and the minimum pressure that must be detected by the BLDS for a bellows leak. The manufacturer of the pressure switches does not require that the switches be periodically exercised and has stated that the setpoint drift values presently observed should be unaffected by elimination of the quarterly testing. This was confirmed by another BWR that has the same BLDS pressure switch manufacturer and similar model number. The BLDS pressure switches for this BWR are only tested on a cyclic basis. They have had no problems with setpoint drift.

The quarterly PS testing currently performed is a qualitative check that is normally performed during plant operation. The test only verifies that its associated annunciator alarms when the BLDS is pressurized to 100 psig. Since 1977 and after 704 BLDS challenges performed during the quarterly tests, no failure of a BLDS pressure switch has occurred. However, the BLDS annunciator has failed to alarm in five instances when the BLDS was pressurized to 100 psig. All of these failures occurred during plant shutdowns. One was caused by failure of a BLDS test solenoid to open and the remaining failures were attributed to maintenance activities on the SRVs or BLDS components. The quarterly tests were performed in these cases prior to completion of the maintenance in order to meet surveillance schedule requirements or the quarterly test was performed in conjunction with post maintenance testing on the SRVs or BLDS. Failure of the solenoid valve to open would not have prevented the BLDS from performing its required function.

Had the above failures occurred during plant operation, then the self-actuation function of the associated SRV would have been declared inoperable. However, Monticello's Technical Specifications presently allow the self-actuation function of one SRV to be inoperable. In addition, the reactor overpressure analysis on which this Tech Spec requirement is based conservatively assumes the self-actuation function of three SRVs to be inoperable.

Monticello has had two bellows leaks in 28 years of operations. Both leaks were from the same SRV bellows, but the source of the leak was not adequately located and repaired the first time. These leaks were detected by the BLDS and the affected SRV's

**Exhibit A**  
**Evaluation of Proposed Change to the Monticello Technical Specifications**

---

were declared inoperable. However, neither of these leaks was large enough to adversely affect the operation of the SRV. The SRVs would have been capable of performing all required self-actuation and automatic functions.

In summary, the cyclic testing provides adequate assurance that the BLDS will perform its function when required. Elimination of the quarterly test and corresponding reduction in switch exercising is expected to have no effect on pressure switch setpoint drift, which has been acceptable in the past. A large margin also exists between the switches maximum setpoint and the minimum pressure it is required to detect. Therefore, while not expected, an increase in setpoint drift would still be acceptable.

Numerous past quarterly tests demonstrated that the switches functioned properly under operating conditions. However, the increased assurance of BLDS functionality provided by the quarterly tests has been negligible and does not offset the detriments of the BLDS solenoids. Also, because of the margin in the reactor overpressure analysis and the low probability of one or more gross bellows leaks, failure of a BLDS would be inconsequential.

**No Significant Hazards Consideration**

The proposed amendment has been evaluated to determine whether it constitutes a significant hazards consideration as required by 10 CFR Part 50, section 50.91, using standards provided in section 50.92. This analysis is provided below:

The proposed amendment will not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed amendment will have no impact on the probability or consequences of an accident. The BLDS performs a monitoring function only and is not part of the reactor pressure boundary.

The reduced testing frequency for the leak detection monitoring function will have no impact on the ability of the pressure switch to detect a bellows failure or on the likelihood of bellows failure. Experience has shown the pressure switch to be reliable and capable of performing its function.

Reduction in test frequency to once per cycle will still provide periodic verification of pressure switch capability. Reduction in test frequency to once per cycle will reduce the number of times per cycle that SRV operability is impacted by the testing process. This will increase the probability that SRV's would be available to mitigate consequences of an accident.

The proposed amendment will not create the possibility of a new or different kind of accident from any accident previously analyzed.

**Exhibit A**  
**Evaluation of Proposed Change to the Monticello Technical Specifications**

---

The proposed amendment has the potential to improve reliability of the BLDS by removing a requirement which will allow removal of a failure path. A reduction in BLDS surveillance test frequency will not result in creation of a new or different kind of accident. The BLDS performs a monitoring function only. It can not cause an accident as it is not part of the reactor pressure boundary.

The proposed amendment will not involve a significant reduction in the margin of safety. Revising the requirement to test this system from quarterly to once per cycle will not reduce the margin of safety. The pressure switch and pressure boundary components of the BLDS are reliable and stable. Therefore, the proposed Technical Specification change does not involve a significant reduction in the margin of safety.

**Environmental Assessment**

Northern States Power has evaluated the proposed change and determined that:

1. The change does not involve a significant hazards consideration.
2. The change does not involve a significant change in the type or significant increase in the amounts of any effluent that may be released offsite.
3. The change does not involve a significant increase in individual or cumulative occupational radiation exposure.

Accordingly, the proposed change meets the eligibility criterion for categorical exclusion set forth in 10 CFR Part 51, Section 51.22(b), an environmental assessment of the proposed change is not required.

**Exhibit B**

**Current Monticello Technical Specification Pages Marked Up  
With Proposed Change**

**License Amendment Request Dated  
May 12, 2000**

Exhibit B consists of current Technical Specification pages marked up with the proposed change. The pages included in this exhibit are as listed below:

Pages

127  
151

### 3.0 LIMITING CONDITIONS FOR OPERATION

#### E. Safety/Relief Valves

1. During power operating conditions and whenever reactor coolant pressure is greater than 110 psig and temperature is greater than 345°F the safety valve function (self actuation) of seven safety/relief valves shall be operable (note: Low-Low Set and ADS requirements are located in Specification 3.2.H. and 3.5.A, respectively).
2. If Specification 3.6.E.1 is not met, initiate an orderly shutdown and have reactor coolant pressure and temperature reduced to 110 psig or less and 345°F or less within 24 hours.

### 4.0 SURVEILLANCE REQUIREMENTS

#### E. Safety/Relief Valves

1.
  - a. Safety/relief valves shall be tested or replaced each refueling outage pursuant to Specification 4.15.B. The nominal self-actuation setpoints are specified in Section 2.4.B.
  - b. At least two of the safety/relief valves shall be disassembled and inspected each refueling outage.
  - c. The integrity of the safety/relief valve bellows shall be continuously monitored.
  - d. The operability of the bellows monitoring system shall be demonstrated ~~at least once every three months.~~
2. Low-Low Set Logic surveillance shall be performed in accordance with Table 4.2.1.

each operating cycle.

, Section N-911.4(a)(4)

(1965 and 1968 editions)

Bases 3.6/4.6 (Continued):

The safety/relief valves have two functions; 1) over-pressure relief (self-actuation by high pressure), and 2) Depressurization/Pressure Control (using air actuators to open the valves via ADS, Low-Low Set system, or manual operation). The Low-Low Set and ADS functions are discussed further in Sections 3.2 and 3.5.

The safety function is performed by the same safety/relief valve with self-actuated integral bellows and pilot valve causing main valve operation. Article 9 of the ASME Pressure Vessel Code Section III Nuclear Vessels requires that these bellows be monitored for failure since this would defeat the safety function of the safety/relief valve.

Provision also has been made to detect failure of the bellows monitoring system. Testing of this system ~~quarterly~~ provides assurance of bellows integrity.

When the setpoint is being bench checked, it is prudent to disassemble one of the safety/relief valves to examine for crud buildup, bending of certain actuator members or other signs of possible deterioration.

Low-Low Set Logic has been provided on three non-Automatic Pressure Relief System valves. This logic is discussed in detail in the Section 3.2 Bases. This logic, through pressure sensing instrumentation, reduces the opening setpoint and increases the blowdown range of the three selected valves following a scram to eliminate the discharge line water leg clearing loads resulting from multiple valve openings.

I. Deleted

once per cycle

## **Exhibit C**

Revised Monticello Technical Specification Pages

**License Amendment Request Dated  
May 12, 2000**

Exhibit C consists of revised Technical Specification pages that incorporate the proposed change. The pages included in this exhibit are as listed below:

### Pages

127

151

### 3.0 LIMITING CONDITIONS FOR OPERATION

#### E. Safety/Relief Valves

1. During power operating conditions and whenever reactor coolant pressure is greater than 110 psig and temperature is greater than 345°F the safety valve function (self actuation) of seven safety/relief valves shall be operable (note: Low-Low Set and ADS requirements are located in Specification 3.2.H. and 3.5.A, respectively).
2. If Specification 3.6.E.1 is not met, initiate an orderly shutdown and have reactor coolant pressure and temperature reduced to 110 psig or less and 345°F or less within 24 hours.

### 4.0 SURVEILLANCE REQUIREMENTS

#### E. Safety/Relief Valves

1.
  - a. Safety/relief valves shall be tested or replaced each refueling outage pursuant to Specification 4.15.B. The nominal self-actuation setpoints are specified in Section 2.4.B.
  - b. At least two of the safety/relief valves shall be disassembled and inspected each refueling outage.
  - c. The integrity of the safety/relief valve bellows shall be continuously monitored.
  - d. The operability of the bellows monitoring system shall be demonstrated each operating cycle.
2. Low-Low Set Logic surveillance shall be performed in accordance with Table 4.2.1.

Bases 3.6/4.6 (Continued):

The safety/relief valves have two functions; 1) over-pressure relief (self-actuation by high pressure), and 2) Depressurization/Pressure Control (using air actuators to open the valves via ADS, Low-Low Set system, or manual operation). The Low-Low Set and ADS functions are discussed further in Sections 3.2 and 3.5.

The safety function is performed by the same safety/relief valve with self-actuated integral bellows and pilot valve causing main valve operation. Article 9, Section N-911.4(a)(4) of the ASME Pressure Vessel Code Section III Nuclear Vessels (1965 and 1968 editions) requires that these bellows be monitored for failure since this would defeat the safety function of the safety/relief valve.

Provision also has been made to detect failure of the bellows monitoring system. Testing of this system once per cycle provides assurance of bellows integrity.

When the setpoint is being bench checked, it is prudent to disassemble one of the safety/relief valves to examine for crud buildup, bending of certain actuator members or other signs of possible deterioration.

Low-Low Set Logic has been provided on three non-Automatic Pressure Relief System valves. This logic is discussed in detail in the Section 3.2 Bases. This logic, through pressure sensing instrumentation, reduces the opening setpoint and increases the blowdown range of the three selected valves following a scram to eliminate the discharge line water leg clearing loads resulting from multiple valve openings.

I. Deleted