



Northern States Power Company

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10 CFR Part 2.201

August 27, 1990

H J Miller, Director  
Division of Reactor Safety  
US Nuclear Regulatory Commission  
799 Roosevelt Road  
Glen Ellyn, IL 60137

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

Response to NRC Inspection Report No. 50-263/90015 (DRS)  
Concerning a Notice of Violation and Open Item on Modification Control

In response to your letter dated July 26, 1990, which transmitted Inspection Report 50-263/90015, the following information is offered. Our response to the Notice of Violation is included in Attachment 1. Our response identifies that although the documentation of the reviews could be improved, all technical reviews were completed as required. Since all required technical reviews were completed, we respectfully request your reconsideration of this item as a violation. Attachment 2 contains our response to the Open Item referenced in paragraph 2.a.(2) of the inspection report.

Your letter also referred to weaknesses in the areas of 10 CFR Part 50, Section 50.59 evaluations, control of vendor supplied designs and possibly Post Maintenance Testing. We believe the corrective actions being taken as a result of the Notice of Violation and the Open Item are comprehensive and will improve these areas of weakness. Specifically, the planned training on preparation of 10 CFR 50.59 evaluations will improve their quality (Attachment 1, Corrective Actions to be Taken to Avoid Further Violations). The role of engineering staff review of design documents will be reviewed to address the weakness identified in control of vendor supplied designs (Attachment 2, Corrective Actions to be Taken to Avoid Further Violations, Item 4). The preparation of pre-operational test procedures will be reviewed to improve any weaknesses in Post Maintenance Testing.

Please contact us if you have any questions or wish further information concerning this matter.

Leon R. Eliason  
Vice President  
Nuclear Generation

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c: Regional Administrator, Region III, NRC  
Senior Resident Inspector, NRC  
NRR Project Manager, NRC  
G Charnoff

Attachments:

1. Response to Notice of Violation
2. Response to Open Item
3. Internal letter from Jim Devine to Cliff Bonneau dated May 24, 1989
4. Internal letter from J S Olson to Jim Devine dated May 31, 1989
5. Safety Evaluation for the Replacement of Feedwater Heaters 11A, 11B, 12A and 12B

ATTACHMENT 1

MONTICELLO NUCLEAR GENERATING PLANT

Response to Notice of Violation

Violation

10 CFR 50.59(b)(1) states, in part, that the licensee shall maintain records of changes in the facility ... and that these records must include a safety evaluation which provides the basis for the determination that the change does not involve an unreviewed safety question.

Contrary to the above, the safety evaluation for Modification 88Z013, "Replacement of Feedwater Heaters," did not document the basis for concluding that the Updated Final Safety Analysis Report (UFSAR) analyzed transients, "loss of feedwater heating" and "loss of a feedwater heater" were not impacted by this modification.

This is a Severity Level IV violation.

Explanation

The Northern States Power Company Uniform Modification process requires that the transient analysis be reviewed by the Nuclear Analysis Department when a modification affects the Reactor Data Package. The Reactor Data Package provides input data for transient analyses. On May 24, 1989, the project engineer for this modification sent a request to the Nuclear Analysis Department to review the effects of replacing the 11 and 12 feedwater heaters (See Attachment 3).

In a response dated May 31, 1989 (See Attachment 4), the Nuclear Analysis Department stated that the only feedwater information in the Reactor Data Package was the total feedwater flow rate and the temperature of the feedwater at the inlet to the reactor. Nuclear Analysis Department then concluded that neither of these values would change as a result of the heater replacement. The letter went on to state that the loss of a feedwater heater and the loss of all feedwater heating were two transients addressed in the Reload Safety Evaluation analysis. Nuclear Analysis Department again concluded that the new 11 and 12 heaters were bounded by the assumptions used for these transient analyses and would not result in the plant operating in an unanalyzed condition. This Nuclear Analysis Department letter had been placed in the project file for this modification. The project file is controlled, and items in this file are eventually microfilmed to provide a permanent record of the project.

On page two of the 10 CFR 50.59 evaluation for this modification, the author stated that Nuclear Analysis Department had reviewed the modification and had concluded that the modification did not affect the Reactor Data Package (See

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Attachment 5). This statement was based on the information presented in the May 31, 1989, Nuclear Analysis Department letter to the project engineer. By stating that the Reactor Data Package was unaffected by the modification, the author of the evaluation assumed that the loss of a feedwater heater and the loss of all feedwater heating transients were adequately documented. The 10 CFR 50.59 evaluation should have further explained that Nuclear Analysis Department had specifically reviewed these transients. Nuclear Analysis Department's May 31, 1989, letter should also have been referenced in the same manner that Nuclear Analysis Department's July 31, 1989, feedwater runout transient analysis letter was referenced on page three of the 10 CFR 50.59 evaluation.

#### Corrective Action Taken and Results Achieved

The 10 CFR 50.59 evaluation for Modification 88-013 was revised to specifically address the Nuclear Analysis Department reviews of the loss of a feedwater heater and the loss of all feedwater heating transients. The Nuclear Analysis Department letter was also clearly referenced.

#### Corrective Actions to be Taken to Avoid Further Violations

Adequate corrective action has been completed to assure that the loss of a feedwater heater and the loss of all feedwater heating transients have been properly analyzed and documented to preclude any unreviewed safety questions associated with this modification.

As an enhancement to the completed corrective action, training on the preparation of 10 CFR 50.59 evaluations will be conducted for all site engineers involved in the preparation of such evaluations. This action will be completed by December 31, 1990.

#### Date When Full Compliance Will be Achieved

Full compliance has been achieved.

ATTACHMENT 2

MONTICELLO NUCLEAR GENERATING PLANT

Response to Open Item from Inspection Report No. 263/90015

OPEN ITEM

Further details and final resolution of the issue of the EFT Toxic Chemical Modification engineering wiring errors is requested.

Further information is detailed in Licensee Event Report 90-006.

EXPLANATION

On June 25, 1990 at 1930, with the plant operating at 100% power, an Emergency Filtration Train (EFT) operability test was being performed to prove "B" division operability following restoration after a control logic short (see Licensee Event Report 90-005). As a part of the test, "A" division chlorine detector was tripped which resulted in the "B" division HI-HI RAD alarm annunciating and both divisions of the EFT actuating into Toxic Chemical mode. This result was unexpected since the automatic toxic chemical initiation requires actuation of both detector divisions. Subsequent investigation revealed a missing neutral wire on the optical isolator to the "B" division Toxic Chemical logic. The removal of this wire caused both divisions of the EFT to go into the Toxic Chemical mode when only the "A" division chlorine detector was tripped. The wire had been removed during a modification to "A" division radiation detector logic performed on June 6, 1990. The missing neutral wire was installed by modification procedure on June 29, 1990.

During the pre-operational test following installation of the neutral wire at 1200 on June 29, 1990, both divisions of the EFT System again initiated into the Toxic Chemical mode and the "B" division HI-HI RAD annunciated when the "A" train chlorine detector was tripped. An investigation into the cause of this event was initiated.

On June 29, 1990 at 1420, with the toxic chemical logic reset as part of the on-going investigation, the "A" train chlorine detector in the EFT System tripped due to a broken sensing tape, which resulted in initiation of the Toxic Chemical Mode of the EFT system in the same manner as previously described. This initiation resulted due to the effect of the engineering error which had not yet been corrected and which changed the initiation logic to non-coincident actuation.

Continuing investigation, on June 30 and July 1, 1990, revealed a missing wire in the ungrounded side of a 120 volt AC control circuit causing various relays in the Toxic Chemical and Radiation Detection logic to be energized through the "A" division chlorine detector contact. This missing wire simulated a "B" Train Chlorine Detector trip. A temporary jumper was installed and tested

per the plant Jumper/Bypass process and the EFT operability test was performed successfully on July 1, 1990. The system was declared operable at 1625 on July 1, 1990.

#### CAUSE

The root cause of this event was an engineering error made during modifications to the radiation detection logic installed on June 6 and June 12, 1990. The schematic drawings for this modification were correctly prepared by the consultant with the errors for both wires occurring when the consultant translated the schematics into connection diagrams. The connection diagrams were used in the field to perform the modification.

In accordance with the procedure for review of consultant design, electrical documents required to be reviewed by the Northern States Power (NSP) responsible engineer are schematics, one line drawings and I&C one line drawings. The design documents providing detailed drawings for installation such as connection diagrams are not required to be reviewed in detail by the responsible engineer, but are verified by the consultant through their approved QA program. A cursory review of the connection diagrams was performed by the responsible engineer at the plant site to identify major errors and verify completeness prior to installation.

A contributing cause to this event was the inadequacy of the modification pre-operational test performed on June 14, 1990, following modification to the radiation monitor logic. The test procedure did not verify the operation of the toxic chemical detection logic since it was thought that only the radiation detection logic was being affected. It therefore failed to detect the missing wires.

#### SIGNIFICANCE

Due to the wiring errors, the EFT System was in a more conservative condition than required. Design intent requires detection of chlorine by both divisions of detectors to initiate a toxic trip.

While there were no direct safety consequences from this event, it represents an undesirable unplanned Engineered Safety Function actuation. Such events should be minimized to reduce equipment wear and maintain operational control.

The event could not have had more severe consequences regardless of initial conditions.

The "B" train was available, however, it was conservatively considered inoperable for six days while the investigation was being conducted. Final results of the investigation indicated that none of the described engineering errors adversely affected system operability.

CORRECTIVE ACTIONS TAKEN AND RESULTS ACHIEVED

- 1) After discovery of the missing ungrounded wire, a temporary jumper was installed and tested per the plant Jumper/Bypass process.
- 2) The design error was discussed with the consultant and revised connection diagrams were prepared.

CORRECTIVE ACTIONS TO BE TAKEN TO AVOID FURTHER EVENTS

- 1) A modification procedure will be prepared to install a permanent wire after review of EFT pre-operational tests is complete.
- 2) No further EFT modification work will be done until all pre-operational test procedures have been re-reviewed for adequacy of testing on all components affected by the modifications.
- 3) This event will be included in technical staff continuing training. The need to include pre-operational testing for all components either directly or indirectly affected by a modification will be stressed.
- 4) The role of the engineering staff in review of design documents and writing pre-operational test procedures will be investigated. Specifically, the need for Northern States Power Company engineering staff to carefully and thoroughly review the output from consultants will be examined.
- 5) Corporate Quality Assurance will discuss the engineering errors with the consultant and will follow up on any corrective actions.

ATTACHMENT 3

MONTICELLO NUCLEAR GENERATING PLANT

Internal letter from Jim Devine to Cliff Bonneau dated May 24, 1989



I N T E R O F F I C E   M E M O R A N D U M

Date: 24-May-1989 10:47am CST  
From: Jim Devine  
DEVINEJ  
Dept: NE&C  
Tel No: 612-295-1612

TO: CLIFF BONNEAU

( PAPER MAIL )

Subject: Feedwater Heater Replacement

Cliff,

During the 1989 Outage at Monticello we will be replacing the 11 and 12 feedwater heaters. The new heaters were designed to have a 5% increase in capacity. This may affect the Monticello Reactor Data Package, so I am sending you copies of the existing and new Feedwater Heater Data Sheets for your review. I'm not sure if this is all you need for your review, so if you have a problem please call me at ext. 1612. Roger Anderson said you would prepare a letter for me stating the results of your review, which I will include in the Modification Package.

Thank you very much,

Jim Devine  
Assistant Project Engineer  
NE&C

ATTACHMENT 4

MONTICELLO NUCLEAR GENERATING PLANT

Internal letter from J S Olson to Jim Devine dated May 31, 1989

Date May 31, 1989

Location INT4

From J S Olson, Engineer II

Location Monticello Plant

To J M Devine, Sr Mechanical Engineer

## Subject Feedwater Heater Replacement

In response to your memo to Cliff Bonneau regarding the replacement of feedwater heaters 11 and 12, the Monticello reactor data package (RDP) has been reviewed. The only feedwater information in the RDP is the total feedwater flow rate and the temperature of the feedwater at the inlet of the reactor vessel. Neither of these values changes as a result of the new 11 and 12 feedwater heater design.

Beginning with Cycle 15 (Reload 14), the nuclear analysis department (NAD) will be performing the reload safety evaluation (RSE) for Monticello. The loss of a single feedwater heater and the loss of all feedwater heaters are two of the events analyzed as part of the RSE. NAD assumes the loss of a single feedwater heater results in a 100 degree fahrenheit decrease in the feedwater temperature at the core inlet. NAD assumes the loss of all feedwater heaters results in a 275 degree fahrenheit decrease in the feedwater temperature at the core inlet. The new 11 and 12 feedwater heater designs are bounded by the assumptions used by NAD for the RSE analysis and do not result in the plant operating in an unanalyzed condition. If you have any questions, please call me at ext. 2099.



J S. Olson

cc: R O Anderson  
C A Bonneau  
D E Larsen