U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-263/90015(DRS)

Docket No. 50-263 License No. DPR-22

Licensee: Northern States Power Company
414 Nicollet Mall
Minneapolis, MN 55401

Facility Name: Monticello Nuclear Generating Station

Inspection At: Monticello, MN 55401

Inspection Conducted: June 25 through July 13, 1990

Inspector: R. A. Hasse 7/26/90
Date

Approved By: M. P. Phillips, Chief 7/26/90
Operational Programs Section Date

Inspection Summary

Inspection on June 25-July 13, 1990 (Report No. 50-263/90015(DRS)).
Areas Inspected: Routine, announced inspection of design changes and modifications. This inspection was conducted in accordance with Inspection Module 37700.
Results: One violation was identified during this inspection; a violation of 10 CFR Part 50, Section 50.59(b)(1), failure to document the basis for concluding no unreviewed safety question existed. The licensee showed strength in the control of temporary modifications and procurement activities. Weaknesses were identified in the areas of control of vendor supplied designs and 10 CFR 50.59 evaluations.

DETAILS

1. Persons Contacted

Northern States Power Company (NSP)

D. Antony, Plant Manager
B. Day, General Superintendent, Engineering and Radiation Protection
P. Johnson, Manager, Monticello Nuclear Projects Department (NPD)
D. Larsen, General Superintendent, Engineering (NPD)
D. Pedersen, Superintendent, Civil and Mechanical Engineering (NPD)

U.S. Nuclear Regulatory Commission (NRC)

*P. Moore, Resident Inspector
D. Schrum, Project Inspector

Other personnel were contacted as a matter of routine during the inspection.

*With this exception, all personnel listed attended the exit interview held on July 13, 1990.

2. Design Changes and Modifications

The inspector reviewed six permanent plant modifications and four temporary modifications to determine if they had been conducted in accordance with programmatic and regulatory requirements and if all technical issues had been adequately addressed.

a. Inspection Results

The results of the inspection are presented in the following paragraphs.

(1) Modification 88Z013, "Replacement of Feedwater Heaters 11A, B and 12 A, B."

This modification replaced feedwater heaters 11A, 11B, 12A, and 12B (LP and LIP heat exchangers). Eddy current testing and visual inspection had shown that the original heaters were badly eroded/corroded. The new heaters were fabricated of more erosion/corrosion resistant material (stainless steel). The design also provided for higher feedwater and extraction steam flow capabilities. Also, the level control instrumentation for heaters 12A and 12B was moved from the heater drain tanks to the heater shells.

The inspector reviewed the design description (design inputs and outputs), procurement package, installation procedures, engineering change requests (ECRs), post-modification tests, and the 10 CFR 50.59 evaluation. With the exception of the

10 CFR 50.59 evaluation, the inspector had no significant concerns with this modification. A relatively large number of ECRs (approximately 29) were written during the installation phase; however, considering the magnitude of the job and the difficulty in performing pre-installation walkdowns in some areas, this did not appear to be excessive.

The 10 CFR 50.59 evaluation presented considerable relevant discussion on the codes, standards, and work practices to be employed during the modification; however, it did suffer one weakness found in several of the evaluations for permanent modifications. The potential functional impacts were not well addressed. There are three UFSAR analyzed transients involving this system: (1) feedwater runout; (2) loss of a feedwater heater; and (3) loss of feedwater heating. Transients (1) and (3) can impact (are part of the basis for) the technical specification MCPR limits. Only the feedwater runout transient was addressed in the 10 CFR 50.59 evaluation. The failure to document the basis for concluding that the probability or consequences of occurrence of the other two transients were not impacted or that the margin of safety for the MCPR technical specification was not decreased is considered a violation of 10 CFR 50.59, Section (b)(1) (50-263/90015-01).

(2) Modification 90Z001, "EFT Toxic Chemical Modification"

The purpose of this modification was to modify the Emergency Filtration Train (EFT) logic, remove hardware associated with the unused portion of the toxic chemical detectors, and remove an unused radiation monitor. The EFT radiation trip logic was to be modified to provide a trip in both trains (divisions) of the EFT system when the sensor logic in one train initiates a trip.

The post-modification testing was in progress during the inspection with some difficulties being encountered. It was the inspector's objective to determine the cause of these problems.

The design for this modification was provided by the licensee's A/E (Bechtel). The licensee apparently performed a detailed review of the logic diagram provided by the A/E and found them to be correct; however, only a cursory review was performed of the wiring diagrams. These contained at least two errors not identified during the licensee's review. These consisted of the failure to specify the installation of a "neutral" wire and one "hot wire."

These errors led to unsuccessful post-modification tests for the EFT "B" division. The modification to the "A" division

successfully passed its post-modification test; however, the licensee was reviewing this test to determine if it had been performed correctly.

The licensee had issued an ECR to correct the design deficiencies. In the interim, a temporary modification (bypass) had been installed and the EFT apparently successfully tested.

Further details and final resolution of this issue will be pursued as an open item (50-263/90015-02).

(3) Modification 87Z028, "ESW/EFTESW Crosstie"

This modification installed two crosstie lines between the emergency service water system (ESW) and the emergency filtration train emergency service water system (EFTESW). This was done to bypass a portion of the original ESW piping system which was normally stagnant and was badly corroded. The inspector reviewed the design, installation, and post-modification testing packages and the 10 CFR 50.59 evaluation.

The primary issue raised during this modification was the adequacy of the flow rates obtained to service the required loads. The A/E had reevaluated these loads to provide current requirements. The post-modification test indicted that a reasonable margin did exist above the minimum requirement.

The 10 CFR 50.59 evaluation focused primarily on the mechanics of the modification. There was little discussion of the system functional requirements. One area that could have used some discussion was the decrease in system capacity from original design (not entirely due to the modification). While this was discussed in the design package, the 10 CFR 50.59 evaluation only noted that the flow had been determined to be adequate. Some discussions relative to the original design margin and the revised requirements would have strengthened the evaluation considerably. The evaluation was marginally acceptable. The inspector had no other concerns.

(4) Modification 87M030 "Feedwater Control System Modification"

This modification replaced the feedwater flow transmitters, control station setpoint drums, removed temperature compensation of the narrow range level signals, and adiabatic expansion compensation of the steam flow signals. The purpose was to enhance the human factors aspects of the system and increase the accuracy of feedwater flow measurement and steam flow calculation.

The inspector reviewed the design, procurement and post-modification packages, and the 10 CFR 50.59 evaluation. The inspector had no concerns with this modification. The 10 CFR 50.59 evaluation and post-modification testing were adequate. No design concerns were identified.

(5) Alteration 89M005, "Replacement of APRM and Reactor Level Control System Records"

This modification was conducted under the licensee's "Alteration" program. To be conducted under this program, the modification must not involve a functional change, a change in quality level, or possess other aspects involving plant analysis or UFSAR descriptions.

The inspector verified that the criteria for a plant alteration had been met. The inspector's primary focus was then on the procurement process since the existing recorders (GEMAC 5000 series) were obsolete and were being replaced with Leeds and Northrup recorders.

The licensee did a thorough job of identifying critical characteristics of the recorders including accuracy, reliability, response time, and human factors aspects. Seismic and Regulatory Guide 1.97 aspects were also addressed. The inspector identified no concerns.

(6) Modification 89M087, "HPCI Venturi Replacement"

This modification replaced the HPCI venturi. The purpose of this venturi is for flow measurement to detect a HPCI steam supply line break. The old venturi was susceptible to IGSCC. The new venturi was fabricated of a material less susceptible to this phenomena.

The modification did not involve any basic functional change. The inspector focused on the procurement package and the post-modification testing.

The procurement was accomplished via the "verified supplier" approach. The fabricator was KWU of West Germany. The suppliers QA program was reviewed by a contractor to the licensee and identified deficiencies had been resolved. Licensee personnel also performed some source inspection during fabrication. The procurement process was complete and thorough. The post-modification testing was also complete. This included calibration of the venturi and comparison with the old venturi. Deviation from the original GE supplied steam flow vs. turbine BHP curves were also measured with acceptable results. The inspector identified no concerns with this modification.

(7) Temporary Modifications (Bypasses)

The inspector reviewed the licensee's program for controlling temporary modifications (called bypasses by the licensee). The program provided good control of these modifications. They were reviewed by the operations committee every 3 months for continued applicability and plans for resolution. A review of outstanding modifications indicated an average age of three months with the oldest being six months. The 10 CFR 50.59 evaluations were complete and generally of better quality than those reviewed for permanent modifications. This resulted from a much better functional description of the modification and the relevant functional requirements. There was still some weakness in relating these requirements to UFSAR transient analyses.

The inspector reviewed a sample of four temporary modifications in detail. While all were properly conducted, the inspector was concerned that all involved correcting deficiencies in vendor supplied designs. These modifications involved:

(a) Eliminate the torque bypass function of torus outboard valves MO-2006 and MO-2007 due to undersized operators (sized by vendor). These valves should close under full system flow. The post-modification test failed to determine whether this was the case.

(b) Block ducting to the Emergency Response Facility (ERF) and the return ductwork to the EFT. This was necessary since the existing configuration could allow contaminated air to be discharged into the control room on a single failure of non-safety related equipment. This was a design analysis deficiency not detected during design review. It would not necessarily be identified during post-modification testing.

(c) Block pressurizing air to the Technical Support Center (TSC) when one EFT unit fails. When such a failure occurs, a failure of the non-safety related ductwork to the TSC could prohibit adequate pressurization of the control room.

(d) Correction of design deficiencies discussed in paragraph 2.a.(2) above (EFT toxic chemical modification).

The licensee concurred with the inspector's concern relative to vendor supplied designs and indicated they were evaluating potential actions in this area.

b. Conclusions

Based on the observations made during this inspection, the inspector reached the following conclusions:

(1) The licensee had an effective program for controlling temporary modifications.

(2) The licensee showed a particular strength in the procurement process.

(3) The licensee's 10 CFR 50.59 evaluations varied in quality. The most significant weakness was the failure to explicitly address impact on the UFSAR safety analyses. Another weakness, relative primarily to mechanical modifications, was the failure to thoroughly address the functional aspects of the modifications and relate them to the functional requirements of the system.

(4) The licensee should assess its post-modification testing program. The post-modification tests explicitly reviewed by the inspector during this inspection were adequate; however, the failure to identify the undersized operators on valves MO-2006 and MO-2007 was an obvious post-modification testing deficiency. The licensee refers to post-modification testing as pre-operational testing. This could lead to a focus on system operability rather than verification that design objectives had been met.

(5) There were indications that the licensee was not providing adequate review and/or testing of vendor supplied designs (reference EFT modifications and torus discharge valve undersizing).

3. Quality Verification Effectiveness (QVE)

The inspector reviewed two audits performed by Nuclear Operations QA covering the modification program. The audits were explicitly (by objective) programmatic in nature. The conclusions from a programmatic aspect were not at variance with the inspector's assessment except for the 10 CFR 50.59 evaluations. The audit conclusion was that the basis for conclusions were well documented. Since the modifications reviewed during the audit were different than those reviewed by the inspector, no conclusions can be drawn from this discrepancy. One very positive aspect of one audit was the review of maintenance activities for activities that actually involved a modification. One example of such a modification was identified and resolved.

One positive aspect of the licensee's QVE was the apparently pro-active nature of the operations committee. During the inspector's review of various documents, it was apparent that this committee asked pertinent

questions and obtained responsible answers. This was somewhat offset by their approval of not fully adequate or weak 10 CFR 50.59 evaluations.

Based on the inspector's observations, the QA audits could use more technical depth (although this is based on a limited review of past audits).

4. Open Items

Open items are matters which have been discussed with the licensee which will be reviewed further by the inspectors, and which involve some action on the part of the NRC or licensee or both. An open item disclosed during the inspection is discussed in Paragraph 2.a.(2).

5. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on July 13, 1990, and summarized the purpose, scope and findings of the inspection. The licensee stated that the inspector had no access to proprietary information.