

NSP

NORTHERN STATES POWER COMPANY

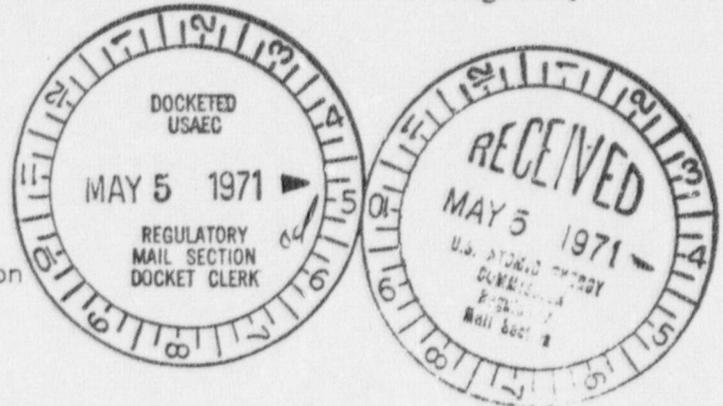
Minneapolis, Minnesota 55401

Regulatory

File Cy.

April 30, 1971

Dr. Peter A. Morris, Director
Division of Reactor Licensing
United States Atomic Energy Commission
Washington, D.C. 20545



Dear Dr. Morris:

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

Safety/Relief Valve Settings Exceeding 1080 PSIG

A condition occurred at the Monticello Nuclear Generating Plant which is reportable to your office in accordance with the provisions of Appendix A, Technical Specifications, of the Provisional Operating License DPR-22. The occurrence was classified as an Abnormal Occurrence as defined in Section I.A.1 of the Technical Specifications and requires reporting in accordance with Section 6.6.B.3 of the Specifications. The Region III Compliance Office has been notified in accordance with the requirements of Section 6.6.A of the Technical Specifications.

Summary Description of the Occurrence

Analysis of reactor pressure data recorded during the "Loss-of-Offsite-Power" test performed on April 22, 1971, indicated that the initiation setpoints of the four reactor coolant system safety/relief valves might be above the Technical Specification limit of 1080 psig. Calibration checks were performed on the pressure instrumentation and the settings of the safety/relief valves were tested under cold conditions, using nitrogen pressure. These checks and tests indicated that the settings of three valves were above 1095 psig. The other valve was set at about 1080 psig.

All four valves were adjusted to initiate at less than 1080 psig.

Detailed Description and Analysis

As part of the startup test program, a "Loss-of-Offsite-Power" test was performed at 25% of rated power. This test, as expected, resulted in a reactor pressure transient. The wide range pressure recorder in the control room indicated that reactor pressure had increased to 1087 psig within approximately 24 seconds following the test initiation. At this time safety/relief valve RV-2-71A opened, as indicated by a drop in pressure, a sharp increase in RV-2-71A discharge temperature and indication from an accelerometer mounted on the valve. Pressure was reduced to 1042 psig

8709250103 870921
PDR FOIA
MENZ87-111 PDR

8709250103 3pp 2160
2160

AV

within 8 seconds and the valve closed. During the next $3\frac{1}{2}$ minutes the pressure increased slowly to a peak value of 1100 psig, as indicated by the wide range recorder. The Disturbance Log, printed by the plant computer, showed a peak pressure of 1104 psig at this time. Then RV-2-71A opened a second time. Pressure was reduced to 1048 psig within 8 seconds. Pressure then slowly increased to a peak of 1067 psig followed by a steady decrease.

The indication that the second initiation had occurred at a pressure 13 psi above the first initiation was puzzling. Also, since none of the remaining valves had opened, it seemed that the settings of the remaining valves were even higher.

The first initiation at 1087 psig would not have been considered unusual by itself. The ASME code requires a setpoint tolerance of one percent. This means the valves could initiate as much as 11 psig above the nominal 1080 psig setting. Also, considering the various accuracy tolerances associated with the pressure instrumentation, the recorded pressure could be in error by up to ± 9 psig. Additional errors can occur due to recorder chart variations. Similarly, the computer Disturbance Log could be in error by up to ± 6.5 psig. Even considering all of these possible errors, it appeared that at least three valves were set substantially above 1080 psig. Further investigation was therefore considered necessary.

A calibration check of the recorder and the computer point was performed. At 1100 psig the recorder error was found to be + 5 psi and the computer error was found to be + 9 psi. Based on this calibration it appeared that the first initiation of RV-2-71A occurred at 1082 psig and the second initiation at 1095 psig.

The four safety/relief valves were inspected under the direction of the manufacturer's representative and the opening pressures of the first stage pilot valves were tested under ambient temperature conditions using nitrogen pressure. These tests and inspections showed the following:

- RV-2-71A: The setting was essentially correct.
- RV-2-71B: The setting of the setpoint adjustment nut was found to be correct. However, an improper length dowel pin was found to have compressed the setpoint adjusting spring beyond the proper setting when the bonnet cap which covers the adjustment nut was bolted in place. This caused the actual initiation pressure to be at least 1110 psig.
- RV-2-71C: The setting was found to be approximately 1100 psig.
- RV-2-71D: A slight leak in the first stage pilot valve made it impossible to accurately determine the setpoint without special test equipment. However, it can be inferred that the setting was probably greater than 1095 psig.

The observed 13 psi increase in setpoint for the second initiation of RV-2-71A is attributed to the effect of temperature on the valve actuating system. When a valve is initiated, flow through the upper portions of the valve mechanism apparently results in sufficient additional heating to affect a temporary setpoint increase. The manufacturers representative stated that an approximately 1% increase in setpoint would be expected as the valve is heated to normal operating temperature. This is confirmed by the results of the ambient temperature tests which showed the RV-2-71A opening point to be 1070 psig with nitrogen, whereas it had initially opened during the loss of power test at about 1082 psig.

Corrective Actions

The first stage pilot in RV-2-71D was repaired; the dowel pin in RV-2-71B was shortened to proper length; and all four valves were adjusted, at ambient temperature, to initiate at less than the equivalent of 1080 psig at normal operating temperature.

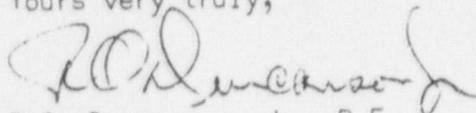
Conclusions

The manufacturers certification of pressure setting had been obtained for all four valves prior to initial plant operation. However, only one of the four valves was found to be properly set. Two valves were apparently not properly adjusted and one valve was affected by an improper length dowel pin.

There is reasonable confidence that the valves are presently set properly. The test gauge used to adjust the valve settings was compared with an accurate dead weight test set before and after making the adjustments.

During the remainder of the startup test program particular effort will be made to monitor the safety/relief valve performance during transient tests.

Yours very truly,



R.O. Duncanson, Jr., P.E.
Gen. Supt. of Power Plants-Mechanical
Chairman-Monticello Safety Audit Committee

ROD/MHC/caf