

FROM: **Northern States Power Company**
Minneapolis, Minn. 55401
L.O. Mayer

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TO: **Dr. Peter A. Morris**

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Ltr rpt the failure of "D" Reactor Relief Valve on 9-28-71.....

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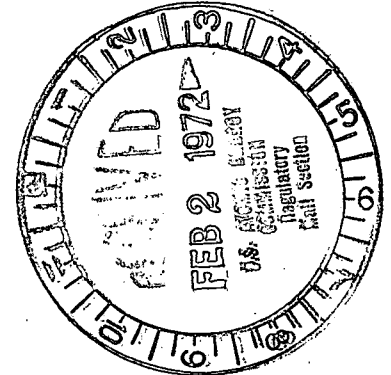
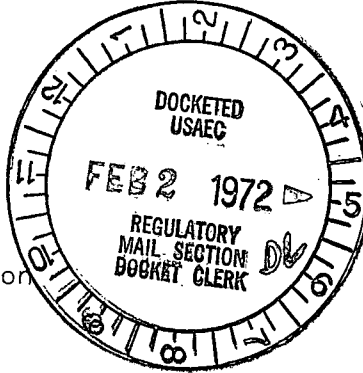
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NORTHERN STATES POWER COMPANY

Minneapolis, Minnesota 55401

January 28, 1972

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



Dear Dr. Morris:

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

Reset Failure of 'D' Reactor Safety/Relief Valve

This letter is being submitted for your information on the subject failure.

At 0125 hours on September 28, 1971 following a reactor scram and isolation, the 'D' safety/relief valve (one of four Target Rock safety/relief valves in the Monticello system) was manually actuated to maintain reactor pressure between 950 psig and 1050 psig as outlined in the plant operating procedures. On the second manual actuation the 'D' safety/relief valve failed to seat after the control switch was returned to the 'close' position. Reactor pressure continued to drop. The 'D' safety/relief valve was given another open and close signal, at which time the valve reseated.

The duration of the blowdown was estimated to be 37 seconds. The reactor pressure dropped from 1040 psig to 670 psig corresponding to a drop of approximately 50° F in saturation temperature.

Based on the following facts it was determined that reactor operation could safely continue.

1. The 'D' safety/relief valve is not part of the automatic pressure relief system which is required to be operable during power operation by the Technical Specifications.
2. Even if the 'D' relief valve was not operable, the three remaining safety/relief valves would provide adequate overpressure protection. (Reference Section 3.6.E of the Technical Specifications.)
3. Any of the other safety/relief valves could be used to manually control reactor pressure in the event of a reactor isolation.

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- 4. The vessel temperature transient was well within the technical specification requirement of 100° F averaged over a one hour period.

The handswitch for the 'D' safety/relief valve was tagged, instructing the control room operators to use one of the other safety/relief valves to manually control reactor pressure in the event of future reactor isolations. Plans were made to inspect the 'D' safety/relief valve at the earliest convenient opportunity. The reactor was made critical again at 2258 hours on September 28, 1971.

On November 12, 1971, the reactor was placed in the cold shutdown condition for plant maintenance activities. All of the work described in the remainder of this report was completed during the extended maintenance outage. During the week of November 14, 1971, plant maintenance personnel inspected the 'D' safety/relief valve to determine the cause of the earlier failure. The air actuator was removed and stroked using an air supply, the air solenoid was disassembled and inspected, and the second stage piston was checked for freedom of movement. No cause for the faulty valve operation could be determined.

New set pressure adjusting springs were installed in the four safety/relief valves. The new springs are made of type A286 alloy which is designed for high temperatures. This eliminates the possibility of set point drift due to spring relaxation at prolonged high temperature. During the week of December 13, 1971 a Target Rock representative was at the site to supervise the installation of the new set pressure adjusting springs. The as found and as left set point data for each of the valves was as follows:

	<u>Previous setting</u>	<u>As Found</u>	<u>As Left</u>
S/R Valve A	1060 psig	1072 psig	1067 psig
S/R Valve B	1068 psig	1070 psig	1068 psig
S/R Valve C	1063 psig	1080 psig * note	1067 psig
S/R Valve D	1068 psig	1080 psig * note	1068 psig

NOTE: Because of uncertainties found in the calibration of the pressure gauge during the test on the 'C' and 'D' safety/relief valves the exact as found pressure settings are not known. The as found settings were approximately 1080 psig.

The Target Rock representative was asked to give special attention to the 'D' safety/relief valve to identify a cause for the earlier reset failure. His inspection of the pilot valve assembly, the second stage piston, and the air actuator revealed no cause for the reset failure.

On January 12, 1972, the manual control circuit for the 'D' safety/relief valve was tested. Again, no abnormalities were discovered.

On January 17, 1972, the 'D' safety/relief valve was disassembled and the main valve piston assembly was inspected. The stem on the main disc was found to be severely galled and had to be forced out of its bushing. It is believed that the galled stem caused the valve to stick open on September 28th. On January 19, 1972, the 'C' safety/relief valve was disassembled and inspected. The stem on the main disc was also found to be lightly galled, however, it was found to be free in its bushing. Inspections of the remaining two safety/relief valves revealed

that the 'A' valve stem was scratched and the 'B' valve stem was lightly galled. The main disc stems in both the 'A' and 'B' safety/relief valves were found to be free in their bushings. A review of past operating history indicated the 'D' safety/relief valve had been actuated approximately 20 times whereas the remaining valves had been actuated approximately 4 times each. Further inspections revealed that the inside edges at the ends of the stellite stem bushings were not chamfered, which probably led to the galling action.

On January 23, new main discs were installed in four safety/relief valves. The new discs have stellite coated stems to make them more resistant to galling. Following a discussion with a Target Rock representative the inside edges of the stem bushings were also chamfered to reduce the possibility of shaving or galling the main disc stems. The above action should prevent similar problems in the future. During the forthcoming startup each of the safety/relief valves will be manually actuated at 150 psig reactor pressure to verify their operability.

Yours very truly,



L O Mayer, P. E.
Director-Nuclear Support Services

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