

Nebraska Public Power District

CNSS876103

October 1, 1987

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Mr. R. D. Martin U. S. Nuclear Regulatory Commission Region IV 611 Ryan Plaza Drive Suite 1000 Arlington, Texas 76011

Subject: Turbine Bypass Valve EH Fluid Leak Problem

Dear Mr. Martin:

Attached please find a summary description of the subject problems experienced at Cooper Nuclear Station on September 20 through 23, 1987. Enclosed with the attached summary are pertinent documents which served as the basis for our proceedings.

Please contact me if you should require further information regarding this subject. We do appreciate the responsiveness and openness exhibited by NRC during our pursuit of successful resolution of the problems.

Sincerely,

R. Horn

Division Manager of Nuclear Operations

GRH:ya

Attachments

cc: W. O. Long (NRC) NRC Resident Inspector

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TURBINE BYPASS VALVE NUMBER 3 EH FLUID LEAK SUMMARY

At 11:55 PM, Sunday night, September 20, 1987, an alarm (Main TG EH Fluid Reservoir Level Abnormal) was received in the Control Room. The level in the tank was checked and found to be indicating 5/8 full, which corresponds to the setting for the low level alarm. An investigation into the apparent loss of EH fluid was immediately initiated (The Shift Supervisor recalled tank level previously being recorded at 3/4 full) and, at 12:13 AM, September 21, approximately 20 minutes after receipt of the alarm, a leak, estimated as a 1/8" stream, from Turbine Bypass Valve Number 3 was observed. The leakage appeared to be coming from the point where the valve actuator was bolted to the valve body and was thought to be due to failure of an O-ring seal. At the time of discovery, the plant was in operation at approximately 78 percent power with net electrical output of 600 MWe.

A review of the Turbine Building Station Operator (Non-licensed Auxiliary Operator) log sheet was conducted to confirm the Shift Supervisor's recollection of the tank level during the prior two weeks as being 3/4 full and to determine when data reflecting a tank level decrease had been recorded. It was ascertained that the tank level, which had been 3/4 full, had apparently begun to decrease during the early morning hours of the previous day (September 20), when turbine valve testing in accordance with Surveillance Procedure 6.1.7, Main Turbine Stop Valve Closure and Steam Valve Functional Test, had been conducted. Exercising of the three (3) Turbine Bypass Valves is included in this test. At the time, all three were determined to be operating properly. However, subsequent to performance of the test, based upon recorded tank levels, the observed EH fluid leak apparently developed.

CNS Management personnel were contacted and apprised of the situation. Appropriate engineering, maintenance, and station management personnel traveled to the site to further inspect the reported problem, evaluate the corrective action options available, and determine the preferred course of action to be taken. The determination made during the early morning hours was to maintain the plant in operation at steady state conditions, solici technical assistance from Westinghouse, the turbine generator manufacturer, with regard to isolation/repair of the leak and to contact General Electric regarding relevant NSSS and licensing issues associated with Turbine Bypass Valve operation/operability.

Following further investigations and evaluations by on-site management and engineering personnel as well as technical input from Westinghouse and General Electric, a more specific action plan evolved as follows:

 Maintain plant operation in a steady state condition and attempt to isolate the EH fluid leak by closing the supply valve to the Bypass Valve operator. Assuming the leak could be stopped by isolation valve closure and that any required changes to core thermal limits as a result of one Bypass Valve being inoperable were minimal, continue with normal plant operation. CNSS876103 . Attachment Page 2 of 3

- 2) If isolation of hydraulic oil to the valve actuator could not be achieved or if severe core thermal limits would be imposed by making the valve inoperable, reduce power to approximately 25% where radiological dose rates would be acceptable and attempt to repair the leak.
- 3) If the repair noted in 2 above with the turbine in operation could not be satisfactorily completed, reduce load further, remove the turbine from service and complete the required repair effort.

Based upon preliminary information received from General Electric (Enclosure 1) regarding NSSS considerations associated with bypass valve operation, CNS Management elected to maintain the plant in operation and attempt to stop the leakage by closing the EH fluid isolation valves to the bypass valve operator. This course of action was reviewed during telephone conversations with NRC management personnel (the CNS Project Manager and Region IV Management personnel) early in the afternoon during which a description of the bypass valve problem was provided and the General Electric concerns/limitations were discussed. Attached as Enclosures 2 and 3 are summaries of the conversations conducted with Mr. W. O. Long, Project Manager and Messrs. Jaudon, Westerman, and Gagliardo of Region IV.

Subsequently, a SORC meeting was convened at 3:00 PM to review a Plant Temporary Modification (PTM 87-054) to isolate EH fluid to Bypass Valve Number 3. The PTM as well as the minutes of the meeting (S87-097, September 21, 1987) are attached as Enclosures 4 and 5. As noted in the SORC meeting minutes:

- Special Order 87-04 was issued, directing MCPR limits be administratively controlled to greater than or equal to 1.35.
- A temporary change to Surveillance Procedure 6.2.4.1, Daily Surveillance Log (Technical Specifications), was processed reflecting the revised MCPR limit.
- MCPR limits in the process computer were revised to reflect the new value.
- General Electric Company confirmed that the turbine stop valve closure 25 percent scram block was not affected by the single inoperable bypass valve.

At 6:06 PM, EH fluid to Bypass Valve Number 3 was isolated by closure of TGF-V-60 which successfully stopped the leak.

On September 23, 1987, General Electric forwarded an evaluation summary which was developed based upon the formal computer analysis noted in the minutes of SORC Meeting S87-097. A SORC meeting was convened at 4:00 PM to review the document. Attached as Enclosure 6 are the minutes of the meeting (S87-098, September 23, 1987) to which is appended the General Electric document (Turbine Bypass Valve Out-Of-Service Evaluation Summary, DRF B21-00378, dated September 23, 1987). As noted in the minutes, SORC concurred with the General

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Electric evaluation and further directed that Items 1 through 3, preceding, be updated to reflect the revised MCPR limit of 1.26.

Currently, plant operation is continuing with MCPR being administratively limited to a valve greater than or equal to 1.26. This operational restriction is documented in Special Order 87-04 Revision 1, attached as Enclosure 7. Preparations are being made to repair the Turbine Bypass Valve EH fluid leak during the refueling outage which is currently scheduled to commence February 26, 1988.