

Duke Power Company
Catawba Nuclear Generation Department
4800 Concord Road
York, SC 29745

M.S. TUCKMAN
Vice President
(803)831-3205 Office
(803)831-3426 FAX



DUKE POWER

May 27, 1993

Director, Office of Enforcement
U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Catawba Nuclear Station
Docket Nos. 50-413 and 50-414
Reply To Notice Of Violation
Enforcement Action 93-054

Please find attached Duke Power's response to the Level III violation cited in the Notice of Violation and Proposed Imposition of Civil Penalty dated April 30, 1993. Enclosed is Duke Power's check in the amount of Seventy-Five Thousand Dollars (\$75,000). This amount constitutes payment in full of the imposed civil penalty.

The violation involves failure to maintain the required availability of two independent Nuclear Service Water System loops. Duke Power management recognizes the importance of identifying and correcting the root cause of component failures to assure the availability of systems required for the safe operation of Catawba Nuclear Station. The corrective actions planned to avoid further violations in this area will be fully evaluated for implementation at all of the Duke nuclear stations.

I declare under penalty of perjury that the statements set forth herein are true and correct to the best of my knowledge.

Very truly yours,

M.S. Tuckman

M.S. Tuckman

JLL/

Attachment

9306080009 930527
PDR ADOCK 05000413
G PDR

Printed on recycled paper

*W/Check # 131711
\$75,000
IE/4
11*

U.S. Nuclear Regulatory Commission
May 27, 1993
Page 2

xc: S.D. Et neter
Regional Administrator, Region II

R.E. Martin, ONRR

R.J. Freudenberg
Senior Resident Inspector

**DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
ENFORCEMENT ACTION 93-054**

Technical Specification 3.7.4, Nuclear Service Water System, requires, in part, that at least two independent Nuclear Service Water (RN) System loops shall be operable when both units are in Modes 1, 2, 3, or 4, with each loop containing two operable Nuclear Service Water pumps, associated diesel generators and flowpaths.

Contrary to the above, both loops of the Nuclear Service Water System were inoperable from August 1992 through February 25, 1993, due to three of the four RN pump discharge valves being unable to open against the pump discharge pressure due to incorrect torque switch settings. This resulted in both units being operated for an extended period of time in Modes 1, 2, 3, or 4 without the required two operable flowpaths.

This is a Severity Level III Violation.
Civil Penalty - \$75,000.

RESPONSE:

1. Admission Or Denial Of Violation

Duke Power admits the violation.

2. Reason For Violation

The reason for this violation is two-fold.

- A) An analytical model, which is based on industry accepted standards and was procured through the vendor, was used in accordance with the Catawba Nuclear Station (CNS) Generic Letter 89-10 Program on the Unit 1 Nuclear Service Water (RN) pump discharge valves (1RN-28A and 1RN-38B) to determine torque setpoints for the valve actuators during the 1992 Unit 1 outage (1EOC6). When the valves were subjected to full differential pressure, they failed to go to their safety position (cpen). Several factors used in the equations of the model appear to be non-conservative for the valves installed in these particular applications.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
ENFORCEMENT ACTION 93-054

- B) Failure of the Unit 2 RN pump discharge valves (2RN-28A, 2RN-38B) to open has been attributed to a lack of detailed information in the motor operated valves (MOVs) torque switch setup procedure (IP/O/A/3820/04). The procedure enclosure (11.1) which provided a diagram of the actuator torque switch did not specify which adjustment screw was for the "open" or "close" setting and the switch does not include a clear label to indicate "open" or "close". The technician could have mistaken these two settings during the torque switch adjustments in July, 1989.

3. Corrective Actions Taken And Results Achieved

- A) - By February 26, 1993, 00:30 hours, the Unit 1 RN pump discharge valves (1RN-28A and 1RN-38B) were positioned to 20 degrees open, successfully tested with the RN header downstream of the valve depressurized, and restored to operable status.
- On February 27, 1993, the Unit 2 RN Pump Discharge valves (2RN-28A and 2RN-38B) were restored to operable status. The following actions were taken upon return of the Unit 2 RN valves to operable status to assess implications for other valves applicable to the guidance of Generic Letter 89-10:
- 1) Differential pressure testing was performed on Unit 1 RN Pump Discharge valves 1RN-28A and 1RN-38B to measure unseating and dynamic torque loads under flow and pressure conditions. The unseating and dynamic torque loads were higher than predicted by the manufacturer sizing calculations for the valves.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
ENFORCEMENT ACTION 93-054

- 2) Differential pressure testing was performed on the "as found" torque switch setting (1.5 "open") position of valve 2RN-28A with the header depressurized. Test results concluded that this valve would have been capable of proper operation with the torque switch setting of 1.5 with the header depressurized, and thus considered operable since start-up.
- 3) Engineering evaluations have determined that the apparent inadequacies of the torque requirement equations associated with these specific failures are limited to the Basic-In-Flow (BIF) butterfly valve. Accordingly, the torque switch settings on all BIF butterfly valves in CNS Generic Letter 89-10 Program applications were reviewed as follows:

- BIF BUTTERFLY VALVES, WITH A SAFETY
FUNCTION TO OPEN

The BIF butterfly valves in the CNS Generic Letter 89-10 Program that have not been analyzed and diagnostically set-up were verified to have their torque switch setting positioned to the maximum allowable position, as allowed by the vendor.

The BIF butterfly valves in the program that have been analyzed and diagnostically set-up have successfully passed differential pressure testing with sufficient margin.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
ENFORCEMENT ACTION 93-054

BIF BUTTERFLY VALVES WITH A SAFETY
FUNCTION TO CLOSE

The BIF butterfly valves in the CNS Generic Letter 89-10 Program with a safety function to close have been analyzed as adequate based on review of their required operating conditions and the fact that process flow tends to assist closure of these valves.

Review of previous differential pressure test data further supports this conclusion of flow assistance during valve closure.

Furthermore, all remaining CNS butterfly valves in the Generic Letter 89-10 Program have been evaluated with the following results:

FISHER POSI-SEAL BUTTERFLY VALVES

Out-of-plant independent differential pressure testing of the Fisher Posi-Seal butterfly valve design, which comprises a large portion of the CNS Generic Letter 89-10 Program butterfly valve population, has demonstrated that the sizing equations and factors are adequate.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
ENFORCEMENT ACTION 93-054

- ALLIS-CHALMERS BUTTERFLY VALVES

The torque switch settings for the Allis-Chalmers butterfly valves in the CNS Generic Letter 89-10 Program have been evaluated and are considered adequate. Those with the safety function to close are required to operate against relatively low differential pressure conditions (generally < 5 PSID). Those with a safety function to open have their open torque switch set to the maximum setting, as allowed by the vendor.

- FISHER MARSHALLTOWN BUTTERFLY VALVES

The Fisher Marshalltown butterfly valves in the program, which are installed in air systems, stroke under low differential pressure conditions (generally < 5 PSID) and are therefore determined to be adequate because of the absence of significant differential pressure requirements above their normal static operating requirements.

- On March 20, 1993, valve 2RN-38B was removed and replaced with a new valve of different design and manufacturer. The new valve was a Fisher/Posi-Seal butterfly valve and was installed to permit further testing and evaluation on one of the BIF valves used in this application. The Posi-Seal valve was successfully tested under full differential pressure conditions and test data results were found to be acceptable.

**DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
ENFORCEMENT ACTION 93-054**

- B) - On February 27, 1993, it was discovered that the open-to closed and closed-to-open torque switch settings for valves 2RN-28A and 2RN-38B were reversed. Subsequent investigation determined that the set-up reversal may have occurred in 1989. These valves were adjusted to the maximum torque switch setting of 3.0, were successfully tested with the header downstream of the valves depressurized, and subsequently declared operable.
- The procedure for MOV torque switch set-up (IP/O/A/3820/04) was verified to have been revised in 1991 to provide additional detailed guidance, including graphics for torque switch identification and set-up.
- Due to the implications of the reversed torque switch settings on the Unit 2 RN pump discharge valves (2RN-28A and 2RN-38B), an assessment was performed to determine which other valves could exhibit operational problems due to a similar reversal. This review concluded that all valves in the Generic Letter 89-10 Program, subject to this concern, have been adjusted at some point following revision to the torque switch setting procedure in 1991. This eliminated any further concern caused by the reversed torque switch settings.

4. Corrective Actions To Be Taken To Avoid Further Violations

- Consider valve operational history during MOV analysis calculations:
 - Revise MOV Review Specification by September 1, 1993.
- Conduct testing on the original BIF butterfly valve that was installed in application 2RN-38B:
 - Validation of assumptions and determination of the root cause for the higher than expected operating torques by October 1, 1993.

**DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
ENFORCEMENT ACTION 93-054**

- **Evaluate the appropriateness and Use of Turbulence Factors on MOV Review Calculations:**
 - Follow, support and review the Electric Power Research Institute (EPRI) butterfly valve torque analysis and operating behavior study by June 1, 1994,
 - Conduct and conclude the Butterfly Valve Differential Pressure Testing Project with Fisher Controls - North Stonington (Posi-Seal) by June 1, 1994.
- **Determine the long-term disposition of the RN Pump Discharge Valves:**
 - Review valve test data for continued degraded performance and prioritize consequences of seat leakage to determine if replacement valves are required (pending findings of the root cause effort) by February 1, 1994.
 - Continued operability of the remaining three original RN pump discharge valves will be verified periodically by demonstrating their ability to open under full differential pressure, until completion of the determination for valve replacements.
- **Re-evaluate the CNS Generic Letter 89-10 differential pressure testing plan:**
 - Study the CNS Generic Letter 89-10 population and make revisions to the test candidate list as work progresses (team in place and functioning).

5. **Date Of Full Compliance**

Duke Power is now in full compliance.