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DUKE POWER

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

Subject: Catawba Nuclear Station
Dockets 50-413 and 50-414
Reply to Notice of Violation (NOV)
Inspection Report 50-413, 414/96-13

Attached is Duke Power Company's response to the three (3) Level IV violations cited in Inspection Report 50-413, 414/96-13, dated October 7, 1996. These violations were identified during inspections conducted between July 28, 1996, through September 7, 1996.

If there are any questions concerning this response, please contact K. E. Nicholson at (803) 831-3237.

Sincerely,

W. R. McCollum, Jr.

\KEN:RESP96.13

xc: S. D. Ebneter, Regional Administrator
P. S. Tam, ONRR
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CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
413, 414/96-13-02

Notice of Violation

Technical Specifications 6.8.1 requires that written procedures be established, implemented, and maintained covering the activities in Appendix A of Regulatory Guide (RG) 1.33, revision 2. As referenced, this includes procedures for operation of the shutdown cooling system and for the performance of surveillance tests. Implicit in this requirement is the stipulation that the procedures be adequate for the circumstances.

1. *Contrary to the above, on August 4, 1996, procedure OP/2/A/6200/04, Residual Heat Removal System, Retype #13, was inadequate in that it established conditions that resulted in the failure of Valve 2ND-53, residual heat removal (RHR) heat exchanger 2B inlet isolation valve. As a result, train B of the residual heat removal system was inoperable during unit shutdown from Mode 4 to Mode 5 and remained inoperable from 10:00 a.m. on August 4, 1996, until 4:00 p.m. on August 7, 1996.*

2. *Contrary to the above, on August 14, 1996, procedure PT/1/A/4700/14, Auxiliary Shutdown Panel 1B Functional Test, Retype #0, Enclosure 13.9, Control Room/Auto Closure of 1NI-65B and 1NI-88B, was inadequate in that it directed plant personnel to energize a relay during Auxiliary Safeguards Panel testing that caused unanticipated safety-related component actuations. As a result, discharge flow was isolated to a portion of the Nuclear Service Water System that was supporting a liquid radioactive waste release.*

This is a Severity Level IV violation (Supplement I).

1. Reason for Violation - Example A1

Duke Power acknowledges this example of the violation. A change was implemented to the start up of the RHR system procedure. This change was in response to a Westinghouse Technical Bulletin that addressed an industry wide problem of RHR pump covers warping when put through rapid temperature transients. The bulletin suggested a RHR pump step temperature change of ambient to 235° F, and a heat up rate of 100° an hour. An optional procedure enclosure was written to allow Operations to slowly warm the RHR pumps if circumstances allowed. On two occasions this optional enclosure was run with the RHR Hx inlet isolation valve (2ND53) closed. The first occasion on Unit 1 also had a change that was not made on Unit 2 due to Operations' concerns regarding parameter monitoring during the pump casing warm-up. The second occasion resulted in this event. Valve 2ND53 is a manual gate valve that suffered a stem to disc failure when the valve was reopened following the heat up of ND Pump 2B.

Operations procedures have not previously required the operation of the RHR Hx inlet isolation valves and this procedure required the logging of the RHR train in TSAIL while valve 2ND53 was closed. However, clarification is noted that the Technical Specification for RHR was not violated. At all times while 2ND53 was closed, both intentionally and when failed, the associated train of RHR was not required to be operable. Loops were filled and Steam Generators available for heat transfer as allowed by Tech Spec 3.4.1.4.1. The RHR train with its isolation valve closed was entered into Technical Specification Action Item Logbook (TSAIL) for tracking purposes, not because it was required operable in the current configuration with loops filled.

2. Corrective Actions Taken and Results Achieved

The procedure enclosure used to slowly warm the RHR pump that requires the closing of the RHR Hx inlet valves was removed until further investigation of this event was completed. No impact to the pump is expected since this addition to the procedure was developed as an enhancement.

A subsequent review of the torque required to fail the valve in this scenario was conducted and the results indicate that the torque which could be reasonably be applied by an

operator, with approved assist devices, could exceed the torque required to cause a stem to disc failure.

Therefore, the most probable cause of the failure is pressure locking of the valve disc. A review with Engineering and Operations personnel involved concluded that potential for pressure locking was not considered in the review of the procedure change associated with RHR Pump preheating. The difference in piping routing between Units may have been a contributing cause for Unit 1 not experiencing the same problem during the June Unit 1 shutdown.

When the valve 2ND53 was repaired, it was provided with a drilled hole in the upstream disc to preclude further pressure locking concerns. This modification will be considered for corresponding valves on other RHR trains prior to implementation of any future warming procedure if the isolation valves are to be closed during the warm-up. This valve has no function other than isolating the heat exchanger, so there is no adverse impact of this modification on RHR System operation.

3. Corrective Action to be Taken to Avoid Future Violations

Engineering has determined that pressure locking/thermal binding considerations should not be limited to the active, motor operated gate valves which were the subject of Generic Letter 95-02. This event will be used as an example for review of the possible effect of procedure changes on pressure locking/thermal binding effects on manual valves.

Additionally, this event will be related to Westinghouse and INPO to alert other utilities to the possible effects of warming the residual heat removal pump as recommended in the Westinghouse Technical Bulletin.

Problem Investigation Process (PIP) 2-C96-2003 will be the tracking document for corrective actions for this issue.

4. Date of Full Compliance

Duke Power Company is now in full compliance.

1. **Reason for Violation - Example A2**

Duke Power acknowledges the violation. The procedure was inadequate in that unanticipated valve actuations occurred during the performance of the test. Although it was recognized in other parts of the procedure that this valve actuation would occur during ASP transfer, this caution was not incorporated into this particular section that was being performed. This omission should have been detected during both the procedure preparation and review.

2. **Corrective Actions Taken and Results Achieved**

The Nuclear Service Water (RN) System was restored to its proper alignment.

The A and B Train procedures were immediately independently reviewed prior to any further use of the procedures.

Both the preparer and reviewer were counseled on proper preparation and review of procedures.

3. **Corrective Action to be Taken to Avoid Future Violations**

Both procedures will have the corrections made prior to any further use. These changes will be made by March 1, 1997 to preclude a repeat of this occurrence.

4. **Date of Full Compliance**

Duke Power is now in full compliance.

CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
413, 414/96-13-04

Notice of Violation

10 CFR 50 Appendix B, Criterion III, Design Control, requires that design bases shall be adequately translated into specifications and that measures shall be established for verifying or checking the adequacy of design. Measures shall also be established for the selection and review for suitability of application of equipment that is essential to the safety-related functions of components.

1. *Contrary to the above, review of suitability of equipment that is essential to the safety-related functions of components was inadequate for its application in that on August 22, 1996, the NRC identified that the nameplate rating of solenoid valves required for the safety-related function of the Unit 1 and 2 main steam isolation valves was less than the maximum instrument air system design pressure. This resulted in the unrecognized potential to degrade the ability of the main steam isolation valves to close in the event of an instrument air system malfunction.*

2. *Contrary to the above, design bases were not adequately translated into specifications and the design adequacy was not properly verified in that August 12, 1996, design input errors were identified in the Standby Shutdown System Make-Up Pump (SMUP) suction pulsation dampener design function engineering analysis. Calculation 1223.04-00-0009, Unit 1 and 2 SMUP Sizing, dated November 1, 1994, which resulted in the incorrect conclusion that the SMUP was operable for the 72 hour period analyzed for a Standby Shutdown System event.*

This is a Severity Level IV violation (Supplement I).

1. **Reason for Violation - Example B1**

Duke Power Company acknowledges this violation. The root cause of this violation is attributed to the fact that these solenoid valves are part of a manufacturer assembly (Main Steam Isolation Valve and operator) that was specified as a whole component. The specification was concerned with main valve operator sizing which is based on minimum air pressure available and not maximum. The manifold assembly which includes the solenoid valves is qualified to a much higher pressure, 175 psig, structurally. The operating limit for the solenoid valves was not recognized in the documentation from the manufacturer. For other solenoid valve applications, Duke generally specifies and applies its own solenoid valves as separate components and flow diagram design conditions are used for these applications.

2. **Corrective Actions Taken and Results Achieved**

The Unit 1 solenoid valves were all replaced with new models that have a stronger spring and will operate at higher differential pressures. Sufficient quantities of new solenoid valves were bought for both Catawba units.

For Unit 2, the manufacturer confirmed via fax that operation of the entire manifold assembly above 120 psig is acceptable. Mod CE-8227 has been generated to add this documentation to the vendor manuals for the MSIVs for future documentation purposes. Work orders have been written to change out the Unit 2 solenoid valves at the earliest opportunity that plant conditions permit or no later than 2EOC8 refueling outage.

Additionally, all 16 of the old solenoid valves from Unit 1 and two new replacement solenoids were tested to show that they would operate satisfactorily with Instrument Air (VI) pressures equal to or greater than the relief valve setpoint of 115 psig. The results of the testing are as follows:

DP Testing of Old MSIV Solenoid Valves Performed 09/03/96

Solenoids from Unit 1 MSIVs	Pressure Limit
1	145
2	122
3	156
4	148
5	200 *
6	137
7	142
8	164
9	156
10	162
11	163
12	148
13	145
14	136
15	135
16	148

New Solenoids with Stronger Springs

1	300+
2	300+

* This solenoid had a bad seat leak causing its operating limit to increase.

All of the old solenoids, including the solenoids from valve 1SM1 functioned properly at pressures above 120 psig.

Testing was completed and the qualification letter was received from the manufacturer.

This information was shared with McGuire.

3. Corrective Action to be Taken to Avoid Future Violations

Unit 2 solenoids will be replaced no later than the next refueling outage, 2EOC8, which is scheduled to begin 03/97.

4. Date of Full Compliance

Duke Power Company is now in full compliance.

1. Reason for Violation - Example B2

Duke Power Company acknowledges this violation. This violation occurred due to inadequate design information being available within the calculation (CNC-1223.04-00-0009) to evaluate component operability when additional non-conservative assumptions were brought to light. Therefore, operability of the Standby Shutdown System Makeup Pump (SMUP) Suction Pulsation Damper could not be assured without additional design verification.

Items found during the investigation include:

- Use of non-conservative flow rates in the design verification when SMUP flow rate tests indicated higher flows.
- Use of an uncorrected Standard Atmospheric Pressure in the Pump Suction calculation for actual Site elevation.
- Spent Fuel Pool boil-off from decay heat of the spent fuel was not considered in the Spent Fuel Pool Analysis input.
- An incorrect pump speed was used in determining the acceleration head term.
- The potential for flashing in a suction piping high point was not addressed nor was avoidance assured in the calculation.
- The damper charging procedure did not establish the vendor required 0 psig conditions when damper charging evolutions were conducted. A static head of process fluid was actually present which was not previously considered in the damper charging design.

2. Corrective Actions Taken and Results Achieved

Compensatory Actions to assure continued Operability of Unit 2 were implemented without credit being taken for the system enhancing capability of the suction pulsation damper until such time as the design verification could be completed. These restrictions included maintaining a lower Spent Fuel Pool maximum temperature through enhanced Operations surveillance. Unit 1 return to operation from refueling outage 1EOC9 was restricted until satisfactory resolution of the design verification was completed.

Vendor assistance was obtained to completely evaluate the design of the suction pulsation damper and its applicability to the Catawba system design.

Additional investigation of the SMUP design was undertaken to assure proper conformance to the design basis of the system. Additional problems were identified and resolved during this review which resulted in both conservatisms and additional non-conservatisms required to be included in the calculation design verification.

The final calculations confirmed that the suction pulsation damper was still qualified to operate in all system conditions encountered in the design with its current Nitrogen charge pressure. The System remained both Past and Currently Operable with the existing suction pulsation damper design configuration.

Additional design restrictions were added to better link the calculation to the Spent Fuel Pool design calculations to assure continued design conformance in the future.

Annunciator responses associated with Spent Fuel Pool temperature and level were upgraded to better define their link to SMUP operability.

3. Corrective Action to be Taken to Avoid Future Violations

No additional corrective actions beyond those listed in Section 2. above have been identified.

4. Date of Full Compliance

Duke Power Company is now in full compliance.

CATAWBA NUCLEAR STATION
REPLY TO NOTICE OF VIOLATION
413, 414/96-12-05

Notice of Violation

Technical Specification 6.8.1 requires that written procedures be established, implemented, and maintained covering the activities recommended in Appendix A of Regulatory Guide (RG) 1.33, revision 2. As referenced, this includes radiation protection procedures for access control to radiation areas.

Radiation Protective Directive No. II-1, Radiation Area Access and Monitoring Devices, Section 3.0, Regulatory and Administrative Requirements, requires all personnel who enter the Radiation Control Area shall be issued and required to wear Thermoluminescent Dosimeters when in this area. Additionally, a body burden analysis and General Employee Training shall have been completed prior to the issuance of dosimetry, or a documented waiver from he Radiation Protection Manager shall be obtained.

1. *Contrary to the above, on July 19, 1996, an individual entered the Radiologically Controlled Area of the facility without a Thermoluminescent Dosimeter, a body burden analysis, or General Employee Training. Waivers of the body burden analysis and the General Employee Training were not obtained from the Radiation Protection Manager.*

This is a Severity Level IV violation (Supplement I).

1. Reason for Violation

Duke Power Company acknowledges this violation. A vendor employed by Duke Power Company failed to follow Radiation Control Area (RCA) access requirements when escorting a visitor into the RCA. The visitor did not receive Radiation Worker Training or a body burden analysis and did not obtain a waiver from the Radiation Protection Manager. In addition, the visitor was not provided a Thermoluminescent dosimeter. The vendor had not escorted visitors into the plant for several years and relied on memory of access requirements and assumptions when determining equipment and controls needed to bring the visitor into the RCA.

2. Corrective Actions Taken and Results Achieved

The vendor was counseled on Duke Power Company RCA entry requirements and tools to use to prevent human performance errors.

Radiation Worker Training has been updated to include dosimetry requirements for RCA and RCZ entries.

Signs stating dosimetry requirements were posted at entries to RCA to alert workers to RCA dosimetry requirements. Signs are intended to be temporary and will remain until the majority of radiation workers have cycled through the updated annual Radiation Worker Training.

Dosimetry requirements for RCA access were communicated to all site personnel through a weekly 'Teamnotes' electronic communication.

Visitor Access Program and Radiation Protection Program have been linked to ensure escorts adequately understand RCA entry requirements by adding a statement to the Visitor Security Access Form stating that visitors shall not enter the RCA without approval from Radiation Protection personnel. An escort must read and sign the Visitor Security Access Form prior to escorting a visitor into the plant.

Security personnel will ensure a visitor's request for access to the plant is work-related prior to completing a Visitor Security Access Form and authorizing plant access. A question asking the reason for plant access was added to the Security Check-list which is completed prior to issuing a visitor security badge.

3. Corrective Action to be Taken to Avoid Future Violations

No additional corrective actions beyond those listed in Section 2. above have been identified.

4. Date of Full Compliance

Duke Power Company is now in full compliance.