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DUKE POWER

April 29, 1993

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 A Notice Of Violation
NRC Inspection Report 50-413/93-07 and 50-414/93-07

Attached is Duke Power's response to the Level IV violation cited in the Notice of Violation by subject Inspection report dated April 2, 1993.

Two (2) of the three examples cited by the violation involved a failure to follow procedures and the third example involved a failure to follow an Operations directive.

Very truly yours,

M.S. Tuckman

JLL/

Attachment

IE01

xc: S.D. Ebneter
Regional Administrator, Region II

R.E. Martin, ONRR

W.T. Orders
Senior Resident Inspector

DUKE POWER COMPANY
REPLY TO A NOTICE OF VIOLATION
413/414, 93-07-02

Technical Specification 6.8.1, Procedures and Programs, requires in part that written procedures be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory guide 1.33, Revision 2, February 1978, which includes calibration testing, filling the refueling cavity, and the responsibilities of reactor operators.

Instrumentation Procedure IP/2/A/3670/01B, Load Sequencer Timer Calibration, Steps 10.1.8 through 10.1.13, require that the 2B Diesel Generator Sequencer be placed in TEST (Step 10.1.10) prior to beginning timer calibrations which are detailed in enclosures to the procedure.

Operations Procedure OP/2/A/6200/13, Filling, Draining, and Purification of the Refueling Cavity, Enclosure 4.13, removal of Transfer Tube Blind Flange, requires that the Spent Fuel Pool transfer tube be drained of water prior to the removal of the transfer tube blind flange.

Operation Management Procedure (OMP) 1-8, Authority and Responsibility of Licensed Reactor Operators and Licensed Senior Reactor Operators, Sections 8.2.A.1 and 8.2.A.2, require that Senior Reactor Operators (SROs) shall keep themselves informed of the plant operating status, and shall control activities to insure safe, efficient operation of the unit.

Contrary to the above requirements:

A. On February 21, 1993, Instrumentation and Electrical personnel failed to follow IP/2/A/3670/01B, in that steps 10.1.8 through 10.1.13 were not completed prior to beginning actual sequencer timer calibrations. The failure to place the sequencer in TEST prior to beginning the timer calibrations caused an inadvertent actuation of the undervoltage relays on Unit 2 emergency bus 2ETB resulting in a B train blackout.

B. On February 9, 1993, OP/2/A/6200/13, Enclosure 4.13, was not performed prior to maintenance personnel opening the blind flange to the Unit 2 Spent Fuel Pool transfer tube. The failure to drain the Spent Fuel pool transfer tube resulted in the loss of 6000 gallons of Spent Fuel Pool inventory due to leakage past the Spent Fuel Pool isolation valve.

C. On January 30, 1993, the Unit 2 SROs were not knowledgeable of the unit status and failed to control activities to insure the safe and efficient operation of the unit, in that, during a pipe break transient in the Residual Heat Removal System, the SROs failed to validate or adequately monitor indications substantiating a leak inside containment, and repeatedly re-opened isolation valves resulting in a loss of reactor coolant into containment.

This is a Severity Level IV Violation.

RESPONSE:

EXAMPLE A: UNIT 2 ESSENTIAL AUXILIARY POWER SYSTEM BLACKOUT

Reason For Violation

This incident has been attributed to inadequate work practices in that the procedure was not properly followed. Procedure IP/2/A/3670/01B, Load Sequencer Timer Cal, steps 10.1.10 and 10.1.11 were missed which inadvertently actuated the Unit 2 Emergency Bus 2ETB undervoltage relays resulting in a Train B blackout. Prior to this event, delays in restoring control power to the sequencer could have contributed to this event. While waiting for the restoration of control power to the sequencer, the technician began to set-up the required test equipment. Once control power was restored, the technician continued performance of the procedure beyond the step that requires setting the TEST ACTUATE switch to the test position. Another contributing factor was that the TEST ACTUATE switch and the TEST ACTUATE lamp are on the outside of the sequencer cabinet door. With the cabinet door open during testing, both the switch and the lamp are out of view.

Corrective Actions Taken and Results Achieved

- On February 21, 1993, at 09:57, the blackout occurred and Control Room Operators immediately entered Abnormal Procedure AP/2/A/5500/07, Loss of Normal Power, to return Unit 2 Emergency Bus 2ETB to normal. At 12:30, Unit 2 Emergency Bus 2ETB was returned to normal.

- Immediately following the blackout, the Instrumentation and Electrical (IAE) personnel informed the Shift Supervisor of the cause of the inadvertent D/G 2B sequencer actuation. The Shift Supervisor initiated the removal of power from the D/G 2B sequencer.

- The sequencer latch circuit for Control Room Ventilation System (VC) Train B was still initiated as a result of the blackout when attempting to place the Control Room Ventilation System (VC) Train A in service on February 22, 1993, at 9:50. The Control Room Operators reset the D/G 2B sequencer latch circuit to place VC System Train A in service by 10:10.

- On February 22, 1993, a discussion between the IAE technicians involved and their supervision was held to review the sequence of events and to determine effective preventative measures.

- On March 8, 1993, both units' Load Sequencer Timer Calibration procedures were revised to ensure that the TEST ACTUATE switch is properly manipulated.

Corrective Actions To Be Taken To Avoid Further Violations

- The IAE Load Sequencer Timer Calibration procedures for both units will be revised to improve human factor aspects of the procedure by October 1, 1993.

- The following recommendations will be implemented by May 31, 1993:

  1) During the performance of the procedure, the IAE technician was coordinating the timer calibration, with the assisting engineer more or less involved with the "hands-on" activities of the calibration. A communication will be issued to encourage those assigned to assist in the performance of a procedure to become more involved with the coordination of the procedure rather than just the associated "hands-on" activities.

  2) Issue and make available Post-it Brand Tape Flags for IAE technician use in procedures as desired, to assist in keeping one's place in the procedure during breaks or distractions in the work process.

- An evaluation will be performed to install a caution sign inside the sequencer cabinet to caution Timer Calibration technicians to observe the TEST ACTUATE switch and light indications on the cabinet door prior to the start of sequencer testing by October 1, 1993.

- Procedure AP/2/A/5500/07, Case 2, will be revised to include resetting the sequencer latch circuit by June 30, 1993. During the blackout, the Control Room Operators entered Case 2, Loss of Normal Power and D/G, of abnormal procedure AP/2/A/5500/07, Loss of Normal Power. However, Case 2 did not have a step to reset the sequencer latch circuit for the Control Room Ventilation (VC) System following the inadvertent sequencer initiation. Case 1, Loss of Normal Power, of AP/2/A/5500/07 has the step to reset the sequencer latch.

Date Of Full Compliance

Duke Power is now in full compliance.

EXAMPLE B: FUEL TRANSFER TUBE BLIND FLANGE LEAK

Reason For Violation

This incident has been attributed to deficient written communication. The Mechanical Maintenance procedure (MP/0/A/7150/25) which was used to remove the Fuel Transfer Tube blind flange, did not provide adequate guidance to ensure the performance of the Operations procedure (OP/2/A/6200/13, Draining, Filling and Purification of the Refueling Cavity, Enclosure 4.13, Removal of Transfer Tube Blind Flange) as a prerequisite to flange removal. The Operations procedure essentially ensures no leakage past the Spent Fuel Pool Cooling Water Transfer Canal Isolation valve seat (2KF-122) which isolates the Fuel Transfer Canal from the Fuel Transfer Tube.

A contributing cause of this incident is deficient verbal communication/ coordination. Operations and the Fuel Handling Crew did not effectively coordinate when valve 2KF-122 should be closed. Also, it was not clear if a dry inspection of the valve should be performed.

Procedures for operating 2KF-122 require that only 110 turns be used to close the valve so as to not damage the valve and ensure the valve seats properly. Keeping count of the exact number of turns used when closing the valve is difficult and allows room for error when closing the valve.

Corrective Actions Taken and Results Achieved

- On February 8, 1993, at 14:00, Mechanical Maintenance personnel began removing the Fuel Transfer Tube blind flange. At 14:40, while loosening the last four bolts on the flange, water began spraying from the flange sealing area. It was determined that apparently 2KF-122 was not properly seated and the flange bolts were re-tightened in an effort to secure the leak. However, tightening the bolts did not secure the leak.

- Control Room Operators immediately entered abnormal procedure AP/2/A/5500/26, Loss of Refueling Canal or Spent Fuel Pool Level.

- At approximately 15:00, an Operator was dispatched to ensure valve 2KF-122 was fully closed. The Operator verified that 2KF-122 was fully closed, in that no further turns in the closed direction could be accomplished. Radiation Protection conducted an orderly evacuation of lower containment.

- At approximately 15:15, the Fuel Handling Crew installed the Spent Fuel Pool weir gate in the Fuel Transfer Canal to maintain adequate Spent Fuel Pool level.

- At approximately 15:22, after verifying installation of the weir gate, Operations slightly opened 2KF-122 then re-closed to assure the valve had fully seated. The valve required more turns to close than to open, indicating the valve had previously not seated properly. Blind flange leakage subsequently stopped. The Fuel Transfer Canal area was pumped down to allow stroking and inspection of valve 2KF-122. No problems were found.

- The "Special Instructions" section of the red tag computer program was revised to reference the Operations procedure OP/2/A/6200/14, Enclosure 4.13.

- Both units' pre-defined work orders for Spent Fuel Transfer Tube blind flange removal in the Work Management database was revised to identify the need to perform the Operations procedure OP/2/A/6200/13, Enclosure 4.13 prior to flange removal.

Corrective Actions To Be Taken To Avoid Further Violations

- Mechanical Maintenance will revise flange removal procedure MP/0/A/7150/25 to include a sign-off which verifies performance of Operations procedure (OP/1&2/6200/13, Enclosure 4.13), prior to flange removal, by July 1, 1993.

- Operations will coordinate efforts with the Fuel Handling Crew, Mechanical Maintenance and Component Engineering to determine when to close, dry inspect and red tag valves 1/2KF-122. Mechanical Maintenance will ensure these actions are included as steps in "Section III" of the appropriate pre-defined work order by July 1, 1993.

- Component Engineering will evaluate the feasibility of attaching a counting device to the handwheel of both units' KF-122 valves by July 1, 1993.

- Upon entry into abnormal procedure AP/2/A/5500/26, Loss of Refueling Canal or Spent Fuel Pool Level, it was identified that the procedure's compensatory action to consider installation of the Spent Fuel Pool weir gate upon loss of Spent Fuel Pool level was not considered. Operations will revise this procedure to initiate consideration of the installation of the Spent Fuel Pool weir gate as a response to the loss of Spent Fuel Pool level by June 1, 1993.

Date Of Full Compliance

Duke Power is now in full compliance.

EXAMPLE C: RESIDUAL HEAT REMOVAL SYSTEM TRANSIENT

Reason For Violation

This incident has been attributed to failure to follow procedures/ directives which require that Senior Reactor Operators stay informed of the plant operating status. During the event, the Control Room Operators were focused on determining whether or not the Residual Heat Removal System (ND) suction line relief to the Pressurizer Relief Tank had re-closed, as opposed to appropriately expanding their focus to include Control Room indications which could have aided in the discovery of a leak in containment.

Corrective Actions Taken and Results Achieved

- On February 1, 1993, an Engineering/ Operations partnership was formed to investigate and provide a detailed analysis of the event. This analysis included a determination that ND Train 2B was not subjected to a similar transient. The results of this analysis was provided to all Shift Supervisors for review and discussion with their shift operating personnel.

- On February 1, 1993, Duke Power personnel performed a field visual inspection of the fracture surfaces of the failed section of piping at 40X magnification. This inspection indicated that the fracture followed the socket weld fusion line at the OD surface and propagated through the base material to the ID surface. The pipe did not appear to be bottomed in the socket. No weld defects were noted on the fracture surfaces.

- On February 1, 1993, a review of the piping analysis was performed to verify load stress in the area of the piping failure. This review revealed stress levels and conditions to be very low.

- On February 2, 1993, work orders to inspect ND suction and mini-flow piping hangers and supports were completed.

- On February 4, 1993, work orders to perform non-destructive testing on Unit 2 ND vent line welds (24 welds) were completed. On March 17, 1993, work orders to perform non-destructive testing on Unit 1 ND vent line welds (6 welds) were completed. These tests found no rejectable indications.

- On March 4, 1993, The B&W metallurgical report was received which confirmed that the main fracture was caused by high cycle fatigue.

- On March 10, 1993, vibration testing was performed on the ND piping which failed, with the ND System throttled to a very low flow rate in compliance with Reactor Coolant System (NC) midloop level requirements, to assess vibration levels. Later, vibration testing was performed at full ND System flow following NC System Fill and Vent, thus the piping vibration was measured over a full range of flows. These tests indicated no vibration levels capable of causing fatigue to the piping.

- On March 18, 1993, a follow-up discussion of this event was conducted during a Shift Supervisors' meeting with emphasis on troubleshooting skill/ techniques.

- On March 23, 1993, the work order issued to replace the relief valve to the Pressurizer Relief Tank (2ND-3) was completed. This replacement was necessary due to seat damage to the relief valve incurred as a result of the transient, however this relief valve may have been a source of vibration causing fatigue to the piping.

- On March 31, 1993, Unit 2 Operations procedure for placing the ND System in service was revised to provide guidance for a more controlled, methodical pressurization of the ND suction piping. The same Unit 1 procedure was revised April 13, 1993.

DUKE POWER COMPANY
REPLY TO A NOTICE OF VIOLATION
413/414, 93-07-02

Corrective Actions To Be Taken To Avoid Further Violations

- An evaluation of all relevant information gathered from this event will be performed in an attempt to further determine the cause of vibration and subsequent fatigue of the vent line piping by August 1, 1993.

- Operator Training will include this incident in the Residual Heat Removal lesson plan, and review it in Operational Proficiency with Licensed Operators. Additionally, a Simulator exercise guide will be developed and incorporated into the hot license preparatory program. These actions will be completed by October 1, 1993.

Date Of Full Compliance

Duke Power is now in full compliance.