



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-369/85-23 and 50-370/85-24

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

Docket Nos.: 50-369 and 50-370

License Nos.: NPF-9 and NPF-17

Facility Name: McGuire 1 and 2

Inspection Conducted: June 21 - July 20, 1985

Inspectors: William T. Orders
W. Orders, Senior Resident Inspector

8/13/85
Date Signed

William T. Orders for
R. Pierson, Resident Inspector

8/13/85
Date Signed

Approved by: Hugh G. Dance
Hugh G. Dance, Section Chief
Division of Reactor Projects

8/14/85
Date Signed

SUMMARY

Scope: This routine, unannounced inspection entailed 294 inspector-hours on site in the areas of operations, safety verification, surveillance testing and maintenance activities.

Results: Of the areas inspected three apparent violations were identified: Failure to perform surveillance testing, follow procedures and inadequate procedure, and promptly correct conditions adverse to quality.

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

T. McConnell, Plant Manager
G. Cage, Superintendent of Operations
*D. Raines, Superintendent of Maintenance
*B. Hamilton, Superintendent of Technical Services
*L. Weaver, Superintendent of Administration
*B. Travis, Superintendent of Integrated Scheduling
E. McCraw, License and Compliance Engineer
*D. Mendezoff, License and Compliance Engineer

Other licensee employees contacted included construction craftsmen, technicians, operators, mechanics, security force members, and office personnel.

2. Exit Interview

The inspection scope and findings were summarized on July 19, 1985, with those persons indicated in paragraph 1 above. Violations discussed in paragraph 6, 7 and 8 were identified. The licensee acknowledged understanding of the issues discussed. The licensee did not agree with the inspector's views with respect to the issuance of an NCI pertaining to cable separation criteria. Details are in paragraph 6. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during the inspection.

3. Licensee Action on Previous Enforcement Matters

Not reviewed during this inspection.

4. Unresolved Items

No unresolved items were identified during this report period.

5. Plant Operations

The inspection staff reviewed plant operations to verify conformance with applicable regulatory requirements. Control room logs, shift supervisors logs, shift turnover records and equipment removal and restoration records were routinely perused. Interviews were conducted with plant operations, maintenance, chemistry, health physics, and performance personnel.

Activities within the control room were monitored during shifts and at shift changes. Actions and/or activities observed were conducted as prescribed in applicable station administrative directives. The complement of licensed

personnel on each shift met or exceeded the minimum required by technical specifications.

Plant tours taken included but were not limited to the turbine buildings, auxiliary buildings, electrical equipment rooms, cable spreading rooms, and the station yard zone inside the protected area. During the plant tours, ongoing activities, housekeeping, security, equipment status and radiation control practices were observed.

Unit 1 began the report period in Mode 4 recovering from a refueling outage. The unit entered Mode 3, at 12:28 p.m. on June 21, and Mode 2 at 7:11 a.m., on June 24. The reactor reached criticality at 12:25 p.m. that afternoon. Following low power physics testing the unit entered Mode 1 at 3:23 a.m. on June 27th and was paralleled to the grid at 5:01 a.m. Initially power was limited to 50% due to mechanical binding in the "A" Main Feed Pump which had undergone major maintenance during the outage. Following correction of this problem the unit reached 100% power on July 8, 1985 and remained at or about that power level throughout the remainder of the reporting period.

Unit 2 began the report period in Mode 1 operating at 100% reactor power. This power was maintained until 3:52 p.m. on June 24, 1985 when a main feedwater isolation valve drifted closed which in turn caused a reactor trip on lo-lo steam generator level. During the recovery from this trip a two-inch bypass line around a main feedwater isolation valve failed. The trip recovery was delayed pending repair of the line. An evaluation of the feedwater line failure revealed that the line had cracked approximately 180 degrees along the top of the pipe near where it joins the main feedwater line at a rigid stanchion. Following modification of the stanchion to allow increased vertical travel and repair of the bypass feed line, the unit was restarted and reached criticality at 7:14 a.m. on June 27. Power was subsequently increased to 100% and was maintained at or about that power level until 6:11 a.m. on July 12 when the unit tripped on a phase differential induced main electrical generator trip followed by a turbine trip and reactor trip. This trip and subsequent outage are discussed in paragraph 9. The unit completed the reporting period in Mode 5.

6. Electrical Separation

On May 28, 1985, licensee quality control personnel reported the May 22 discovery of a violation of Unit 2 safety related cable separation criteria. The violation occurred because the electray (cable support tray) for certain train "B" safety related cable was disconnected from its supports and was laying on the "A" train cable tray below. The electray was apparently disconnected to facilitate the installation of a pipe hanger in December 1982, and was not reinstalled afterward. Unit 2 was in Mode 1 at 100% power at the time of this discovery. The unit had been at various power levels and modes prior to the discovery.

Chronology of Event

December 29, 1982 - Hanger 2MCARFH290 was installed.

- January 7, 1983 - Hanger 2MCARFH290 was inspected by Quality Control.
- May 22, 1985 - QC Inspector found the cable tray unsupported. No corrective action was taken.
- May 28, 1985 - QC Inspector returned to the electray section and found it still in violation of cable separation criteria. Nonconforming Item (NCI) MC-729 written to have the deficiency corrected.
- Work request 65789IAE written to reinstall the electray section. The electray was reinstalled and cable separation was restored.

Analysis

McGuire Installation Specification, MGS-1390.01-00-0036, Electrical Separation Criteria, requires that redundant safety related cables located above each other, be maintained at least 18 inches apart. The electray in this incident is a four (4) inch tray containing cables which terminate at local safety related components as detailed below:

| Cable Number | Equipment |
|--------------|---|
| 2EMF-608 (R) | 2MISV5080 and 2MISV5582 (Process RAD Monitor Isolation.) |
| 2NI-601 (R) | 2NI-47A (Accumulator Nitrogen Supply Outside Containment Isolation) |
| 2NI-678 (Y) | 2NI-152B (SI Pump 2B Hot Leg Injection Header Isolation) |
| 2RV-510 (Y) | 2RV-152B (Auxiliary Building Ventilation System Return Isolation) |
| 2NS-521 (R) | 2NS-43A (ND Pump 2A Discharge Containment Isolation) |
| 2NS-514 (R) | 2NS-29A (NS Pump 2A Discharge Containment Isolation) |

Obviously the cable tray should have been reinstalled and reinspected subsequent to the hanger installation. The violation of the separation criteria will be carried as an Open Item pending completion of inspection of the area. (370/85-24-01). Also of concern to the inspector is the identification of the safety related equipment degradation by a QC inspector, the subsequent involvement of Instrument and Electrical (IAE) personnel, yet no prompt corrective action was taken.

Quality Control Procedure QCK-1, Revision 18, Control of Nonconforming Items, specifically requires in step 4.1 that any person discovering a nonconforming item or being informed of such an item, shall promptly

initiate Form QCK-1A, Nonconforming Item Report. Further, upon issuance of an NCI affecting an operating unit, the nonconformance is to be evaluated to determine its possible impact on continued safe operation of the unit.

The identification of the above degradation with no prompt corrective action taken, in the form of an NCI or otherwise, appears to be a violation of the procedural requirements. This aspect of the event was discussed with licensee management on July 19, 1985. The licensee stated that although they agree that prompt corrective action was not taken, they feel that an NCI was not required due to their definition of "prompt" as used on procedure QCK-1. The intent of the procedure is the fulfillment of the requirements of 10 CFR 50, Appendix B, Criteria XVI and is implemented by Duke Power Company Topical Report, Quality Assurance Program Duke-1-A, Amendment 7, Section 17.2.16. The latter requires that conditions adverse to quality be promptly identified and corrected and that the identification of the significant condition, the cause of the condition and the corrective action shall be documented and reported to appropriate levels of management. Inasmuch as this condition was identified by Quality Assurance one week before corrective action was initiated, the intent of Criterion XVI was not met. This is a violation (370/85-24-02). The licensee was cited for a Criterion XVI violation in report 50-369/85-06 and 50-370/85-06.

7. Source Range Neutron Flux Monitor

On May 7, 1985, while Unit 1 was in Mode 6 (refueling), the licensee began core alterations without having performed the required surveillance on the source range neutron flux monitors. Technical Specification 4.9.2 requires when the unit is in Mode 6, that each source range neutron flux monitor be demonstrated operable by the performance of an ANALOG CHANNEL OPERATIONAL TEST within 8 hours prior to the initial start of CORE ALTERATIONS, and an ANALOG CHANNEL OPERATIONAL TEST at least once per 7 days.

In this particular event, the analog channel operational test to be performed once per 7 days while in Mode 6 had not been performed within the 7 days preceding the unit's entering Mode 6 on May 1, 1985 moreover, the analog channel operational test required to be performed within 8 hours prior to start of core alterations which occurred on May 6, 1985 at 4:05 PM was not performed until the following day. Details of this event are documented in LER 369/85-14.

There are two significant issues associated with this event. First, a programmatic inadequacy with respect to the scheduling and performance of surveillance existed which allowed the unit to enter Mode 6 and initiate core alterations without having completed the required surveillance testing. This is a violation: Failure to perform required surveillance. (369/85-23-01). Second, on May 6, 1985, a shift supervisor signed the steps on Enclosure 13.1 of MP-1-A-7150-41, Control Rod Drive Shaft Latching and Unlatching, including step 6.5 which states that applicable surveillance requirements of 4.9.2 of TS 3.9.2 has been met. This, in turn, allowed core alterations to begin. The surveillance had not been performed. This constitutes a failure to follow procedure and a violation of TS 6.8.1

requiring procedural compliance. This example in conjunction with the examples detailed in paragraph 8 of this report collectively constitute a violation (369/85-23-02).

8. Inadvertant ESF Actuation

On July 12, 1985 at 9:00 a.m. Unit 2 was recovering from a reactor trip. Details of the reactor trip are entailed in paragraph 9. During the performance of PT/2/A/4600/56, Manual Reactor Trip Function Test, an inadvertent feedwater isolation occurred when the Control Room Operator performing the test did not hold the feedwater isolation resets as required prior to tripping reactor trip breaker 2B (Bypass Breaker). Holding the isolation resets prevents initiation of a low primary coolant system Tavg feedwater isolation on a manual reactor trip.

Procedure PT/2/A/4600/56 requires that the feedwater isolation reset be depressed while initiating a manual reactor trip. As stated previously, holding the isolation resets prevents initiation of a low primary coolant system Tavg feedwater isolation on a manual reactor trip. On this particular occasion both trains A and B of the manual reactor trip function had been successfully tested. However, at the conclusion of the test the operator decided to open and leave open reactor trip breaker 2B. He opened the breaker without depressing the feedwater isolation reset button resulting in the inadvertent feedwater isolation.

Later that afternoon at 2:36 p.m. during the performance of Unit 2 PT/O/A/4601/08A, SSPS Train "A" Periodic Test, an inadvertent feedwater isolation signal occurred when an IAE technician performing the surveillance failed to request that the control room operator deactivate P-4, Reactor Trip Permissive, prior to the reactor trip breaker being closed remotely. This resulted in the reactor trip breaker immediately tripping open, initiating a feedwater isolation. Procedure PT/O/A/4601/08A, did not address deactivation of the P-4 permissive prior to closing the reactor trip breaker. For that reason it appears that the procedure was inadequate in detail to support the accomplishment of the task.

TS 6.8.1.a required that current written approved procedures be established, implemented and maintained covering those surveillance tests required by Technical Specifications. Implicit in the provisions of these requirements is the requirement that the procedures embody sufficient detail to facilitate the successful accomplishment of the task.

Contrary to those requirements:

- a. On July 12, 1985, during the performance of a manual reactor trip surveillance test, PT-2-A-4600-56, Manual Reactor Trip Functional Test, was not followed in that the feedwater isolation reset switches were not depressed while tripping reactor trip breaker as required. This resulted in an inadvertent feedwater isolation.

- b. On July 12, 1985, during the performance of test PT-0-A-4601-08A, Solid State Protection System Train A, the procedure was inadequate in detail in that it did not require the deactivation of the P-4 permission prior to closing the reactor trip breaker. This resulted in an inadvertent feedwater isolation when reactor trip breaker A was closed, immediately tripped open and caused the feedwater isolation.

These two examples, coupled with the example in Paragraph 7, constitute a violation (370/85-23-03).

9. Reactor Trip of July 12, 1985

At 6:11 a.m. on July 12, Unit 2 tripped from 100% power. The initiating event was a phase differential main generator trip which was followed by a turbine trip and reactor trip. Followup evaluation by the licensee determined that extensive damage was done to the permanent magnet generator. The unit was cooled down to Mode 5 to allow other outstanding maintenance items to be completed during the outage. The permanent magnet generator was replaced, Lovejoy controls were placed on the main feed pumps, the Pressurizer PORV valves were repacked and some check valves were replaced in the auxiliary feed system.

10. Surveillance Testing

The surveillance tests categorized below were analyzed and/or witnessed by the inspector to ascertain procedural and performance adequacy and conformance with applicable technical specifications. The selected tests witnessed were examined to ascertain that current written approved procedures were available and in use, that test equipment in use was calibrated, that test prerequisites were met, system restoration completed and test results were adequate.

| | |
|-----------------|--|
| PT/2/A/4208/01B | Turbine Driven Auxiliary Feed Pump Test |
| PT/2/A/4200/01F | Lower Containment Personnel Lock Leak Rate Test |
| PT/2/A/4450/04A | Hydrogen Recombiner 2A and 2B Operability Test |
| PT/2/A/4600/56 | Manual Reactor Trip Functional Test |
| PT/0/A/4601/08A | SSPS Train A Periodic Test |

11. Maintenance

The maintenance activities categorized below were analyzed and/or witnessed by the resident inspection staff to ascertain procedural and performance adequacy and conformance with applicable technical specifications. The selected activities witnessed were examined to ascertain that where applicable, current written approved procedures were available and in use.

that prerequisites were met, equipment restoration completed and maintenance results were adequate.

| | |
|--------|---|
| 122955 | INI-80 Cold Leg Accumulator Check Valve |
| 85829 | INI-82 Cold Leg Accumulator Check Valve |
| 121842 | INI-67 Cold Leg Accumulator Check Valve |
| 121843 | INI-56 Cold Leg Accumulator Check Valve |

12. Licensee Event Reports (LER)

The following LER were reviewed to determine the adequacy of corrective actions, the implications pertaining to safety of operations, the applicable reporting requirements, and licensee review of the event. Based upon this review, the following LERs are closed:

Unit 1

85-21
85-20
85-17
85-15
85-09
85-04

Unit 2

85-11
85-12