



UNITED STATES  
 NUCLEAR REGULATORY COMMISSION  
 REGION II  
 101 MARIETTA STREET, N.W.  
 ATLANTA, GEORGIA 30303

Report Nos.: 50-369/84-17 and 50-370/84-14

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 Nuclear Station Units 1 and 2

Inspection Dates: May 20 - June 20, 1984

Inspection at McGuire site near Charlotte, North Carolina

Inspectors: William T. Orders 8/10/84  
 W. T. Orders Date Signed

William T. Orders for 8/10/84  
 R. Pierson Date Signed

Approved by: V. L. Brownlee 8/10/84  
 V. L. Brownlee, Section Chief Date Signed  
 Division of Reactor Projects

SUMMARY

Areas Inspected

This routine, unannounced inspection involved 244 inspector-hours on site in the areas of operations safety verification, surveillance testing, maintenance activities and open items review.

Results

No violations or deviations were identified.

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## REPORT DETAILS

### 1. Persons Contacted

- \*M. McIntosh, Station Manager
- \*G. Cage, Superintendent of Operations
- E. Estep, Project Engineer
- M. Sample, Project Engineer
- \*D. Mendezoff, Licensing Engineer

Other licensee employees contacted included technicians, operators, mechanics, and security force members.

### 2. Exit Interview

The inspection scope and findings were summarized on June 22, 1984, with those persons indicated in paragraph 1 above. The specifics of the violations identified herein were presented to the licensee. The licensee acknowledged understanding of the issues but was unsure if the concerns as they relate to independent verification discussed herein were personnel errors or inadequate implementation of the independent verification program.

### 3. Licensee Action on Previous Inspection Findings

The details of certain actions as they pertain to the resolution of selected items of noncompliance, deviations and/or unresolved items are entailed in paragraph 12.

### 4. Unresolved Items

Unresolved items were not identified during this inspection.

### 5. Plant Operations

The inspector reviewed plant operations throughout the report period, May 20 - June 20 to verify conformance with regulatory requirements, Technical Specifications and administrative controls. Control room logs, shift supervisor 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 on day and night shifts.

Activities within the control rooms were monitored during all shifts and at shift changes. Actions and/or activities observed were conducted as prescribed in Section 3.1 of the Station Directives. The complement of licensee personnel on each shift met or exceeded the minimum required by Technical Specifications. Operators were responsive to plant annunciator alarms and appeared to be cognizant of plant conditions.

Plant tours were taken throughout the reporting period on a systematic basis. The areas toured include but are not limited to the following:

- Turbine Buildings
- Auxiliary Building
- Unit 1 and 2, Electrical
- Equipment Rooms
- Units 1 and 2, Cable
- Spreading Rooms
- Station Yard Zone
- within the protected area

During the plant tours, ongoing activities, housekeeping, security, equipment status and radiation control practices were observed.

McGuire Unit 1 began the reporting period operating at 100% power. This power level was maintained until Wednesday, May 23, when reactor power was reduced to 50% to facilitate repair of the "A" steam generator wide range level transmitter.

Following necessary repair, power was increased and maintained at 100% until June 2, 1984, when power was again reduced to 50%, to allow a turbine valve movement test. Following completion of this test, power was increased and maintained at or about 100% until 4:30 p.m. on June 6, 1984, when power was reduced to 90% to compensate for an axial flux deviation. At 5:56 p.m., the unit experienced a loss of the ITC electrical bus which powers the "C" loop reactor coolant (NC) pump. A reactor trip followed which initiated a turbine trip. All systems responded normally. The ITC electrical bus was lost due to an under voltage relay failure. Following repairs, the unit was restarted on June 7, 1984, entering Mode 2 at 12:42 p.m. and Mode 1 at 1:30 p.m. The generator was placed on line at 2:22 p.m. and the unit load was subsequently increased to 90%.

Reactor power was maintained at or below 90% due to limitations pursuant to axial flux deviation as discussed above. On June 14, power was increased to 95% following a core flux map facilitating the increase. The axial flux deviation problem is being researched both by the licensee and Westinghouse, attempting to justify the increase of reactor power to 100%. The unit completed the reporting period limited to 95% power pending resolution of the axial flux deviation problem.

McGuire Unit 2 began the reporting period operating at 100% power and maintained that power level until Friday, May 25, when a reactor trip occurred as a result of a full load reject test. The reactor trip was anticipated and all systems responded normally. The unit was maintained in Mode 3 throughout the Memorial Day weekend, allowing some secondary maintenance to be performed, was restarted on Monday, May 28, and reached criticality at 4:20 p.m. that afternoon. The generator was paralleled to the grid at 4:42 a.m. on Tuesday, May 29. Unit power was escalated to and maintained at or about 100% power until 8:20 p.m. on June 9, when power was reduced to 10<sup>-8</sup> amps in the intermediate range to allow repair of steam generator "A" blowdown valve 2BB-140. Following that repair the unit entered Mode 2 at 3:30 a.m. on June 10, Mode 1 at 11:02 a.m. and the generator was placed on line at 11:42 a.m. The unit was subsequently escalated to and remained at or about 100% throughout the remainder of the report period.

#### 6. Surveillance Testing

The surveillance tests categorized below were analyzed and/or witnessed by the inspector to ascertain procedural and performance adequacy.

The completed test procedures examined were analyzed for embodiment of the necessary test prerequisites, preparations, instructions, acceptance criteria and sufficiency of technical content.

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.

The selected procedures perused attested conformance with applicable Technical Specifications and procedural requirements, they appeared to have received the required administrative review and they apparently were performed within the surveillance frequency specified.

<u>PROCEDURE</u>	<u>TITLE</u>
PT-2-A-4601-03	Protective System Channel 3 Functional
PT-2-A-4208 01A	NS Pump 2A Performance Test
PT-2-A-4208 01B	NS Pump 2B Performance Test
PT-2-A-4252 07	CA Valve Stroking Test
TP-2-A-2650 06	
PT-0-A-4250 04G	Turbine Trip/Reactor Trip Functional
PT-2-A-4204 02	ND Valve Stroking Test
PT-2-A-4350 04A	D/G A Load Sequencer Test
PT-2-A-4350 04B	D/G B Load Sequencer Test

(cont'd)	<u>PROCEDURE</u>	<u>TITLE</u>
	PT-2-A-4252 01	T/D CA Pump Performance Test
	PT-2-A-4252 01B	M/D CA Pump B Performance Test
	PT-2-A-4450 04A	Hydrogen Recombiner Operability Test
	PT-2-A-4450 04B	Hydrogen Recombiner 2A and 2A Perf. Test
	PT-1-A-4209 01B	NV Pump B Performance Test
	PT-1-A-4206 01B	NI Pump B Performance Test
	PT-1-A-4206 01A	NI Pump A Performance Test
	PT-1-A-4252 01	T/D CA Pump Performance Test
	PT-1-A-4252 01A	M/D A CA Pump Performance Test
	PT-1-A-4252 01B	M/D B CA Pump Performance Test
	PT-1-A-4204 01B	ND Pump B Performance Test

7. Violation of Appendix R Requirements for CA

On November 19, 1980, the Commission published in the Federal Register a new Appendix R to 10 CFR Part 50 delineating certain fire protection requirements for nuclear power plants licensed to operate prior to January 1, 1979. By letter dated January 9, 1981, Duke Power committed to implement three provisions (Sections III.G, III.J, and III.O) identified in Appendix R as items to be backfitted. Subsequently, on March 31, 1983, the NRC issued McGuire Unit 2 License NPF-17 which contained condition 2.C(7) "Fire Protection Program" which stated that Duke Power Company shall meet the technical requirements of various sections of Appendix R, including Section III.G. Of these items, Section III.G.2.a, Fire Protection of Safe Shutdown Capability, requires "separation of cables and equipment and associated circuits or redundant trains by a fire barrier having a three-hour fire rating."

On May 18, 1984, while reviewing equipment installation to satisfy Appendix R requirements, the licensee identified a nonconforming condition. This involved the location of Unit 2 auxiliary feedwater pump suction isolation valves 2CA-161C and 2CA-162C, designed to open automatically and align a long term source of water supply to the suction of the Turbine Driven Auxiliary Feedwater Pump (TDAFP) in case of a fire in the adjacent Motor Driven Auxiliary Feedwater Pump (MDAFP) room. The problem was that these valves and associated cables are located in the MDAFP room such that a fire which damages the MDAFP's could also potentially damage the subject valve operators and/or associated cables, thus eliminating the capability for automatic realignment. This was reported to NRC Region II on July 18, 1984, pursuant to License Section 2.F. A similar condition does not exist on Unit 1 because these valves are located in the TDAFP Room on that unit.

For corrective action, the licensee has committed to wrapping valves 2CA-161C and 2CA-162C and its associated cables in a one hour fire insulating blanket. Cable wrapping in conjunction with the automatic suppression system meets the alternate means of ensuring that one of the redundant trains is free of fire damage as given in Appendix R Section III.G.2.C. Cables will be rerouted to shorten their lengths in the MDAFP room and to facilitate installation of the blankets. These actions are to be completed by August 1, 1984.

The licensee's failure to meet the requirement of Appendix R, Section III.G.2.a constitutes a violation of license condition NPF-17 2.C(7). However, because the NRC enforcement policy is designed to encourage licensee initiative for self-identification and correction of problems, and the violation meets all of the criteria set forth in the enforcement policy, a Notice of Violation will not be issued.

8. Environmental Qualification of Valve Operators

On June 8, 1984, it was reported from the Catawba facility that some "T" shaped drain plugs had not been installed in certain Limatorque valve operators. The drains plugs allow condensate to drain from the operator that may accumulate there during accident conditions.

On June 14, 1984, it was determined that a similar situation existed at the McGuire facility. The affected valves were identified as follows:

INSIDE CONTAINMENT

Unit 1	1VX1A, 1VX2B, 1NI431B, 1VI362A
Unit 2	2VX1A, 2VXX2B, 2KC424B, 2NC54A 2NC196A, 2NI430A, 2NI431B, 2VI362A

INSIDE DOGHOUSE

Unit 1	1CA38B, 1CA50B, 1CA54A, 1CA66A
Unit 2	2CA38B, 2CA50B, 2CA54A, 2CA66A

The drain plugs were installed on all of the above valve operators except for valve 2KC424B which was found to have a commercial grade operator, and is discussed in more detail below.

The Limatorque valve operators reportedly to be environmentally qualified were equipped with "T" shaped drilled hole drain plugs. Thus, the found installed configuration (i.e., operators equipped with solid drain plugs), negated the qualification of those components and rendered them technically inoperable.

Following the identification of these valve operators installed with wrong drain plugs, the licensee expanded their inspection of other valve operators. As a result, two component cooling water system valves, 2KC424B and 2KC425A were identified to be installed with commercial grade actuators instead of required Class 1E operators. These valves are located on the return side of the non-essential header for component cooling water and are designed to isolate on a high-high containment pressure signal. The ability of these two active containment isolation valves to perform their intended function is questionable not only from the environmental qualification viewpoint, but also because the capabilities of these valve operators is unknown, inasmuch as they are commercial grade quality.

Failure to install appropriate drain plugs in the Limitorque operators was apparently caused from a lack of instructions provided by the vendor. The installation of component cooling system valves, 2KC424B and 2KC425A with commercial grade operators appears to have been attributed from an ineffective quality control during receipt inspection of subject components. The licensee was to have verified item conformance with receiving requirements, but apparently failed to do so because the licensee's purchase order number A82778 dated January 21, 1974, specified requirements for components important to nuclear safety (i.e., Class 1E operators equipped with safety-grade valves).

This constitutes a violation of Appendix B, Criterion VII, Control of Purchased Material, Equipment, and Services.

Regional Action: On July 18, 1984, a preliminary enforcement panel met in the NRC Region II office to discuss the safety significance and enforceability of the above event. The panel considered the following:

- (1) The violation was identified by the licensee at the first opportunity.
- (2) The violation was promptly reported.
- (3) Adequate corrective measures were being established and implemented.
- (4) Corrective actions for previous violations could not have prevented this occurrence.
- (5) Safety significance was minimal.

Based on the above considerations, the panel concluded that the violation would not be cited based on 10 CFR 2 Appendix C.

On a separate matter, the inspector reviewed the licensee's implementation of equipment environmental qualification requirements as facilitated through license condition 2.C(7) for Unit 1 and 2.C(6) for Unit 2. The environmental qualification requirements are entailed in NUREG-0588 and 10 CFR 50.49. The implementation time frame and commitments/agreements made pertaining thereto, are addressed in NRC/licensee correspondence. Pending completion of this review, this matter will be carried as an Inspector Followup Item (50-369/84-17-01 and 50-370/84-14-01).

#### 9. Manual Reactor Trip Surveillance Deficiency

At 2:00 p.m. on Friday, May 25, McGuire Unit 2 began a planned maintenance outage by performing a full load reject test. The results of that test have been evaluated by the licensee and are reportedly acceptable. The Regional staff will analyze the results of said test in future inspection.

The unit was maintained in Mode 3 throughout the outage. Following the completion of the scheduled maintenance activities, the unit achieved criticality at 4:20 p.m. on May 28.

A license condition 2.C.12.C, Table 1, Item 3 requires that the licensee perform a functional test of the manual reactor trip function from the control room prior to each startup if not completed within past seven days. This functional test was not performed prior to the startup of May 28.

An evaluation of the event revealed that the requirement to perform the functional test had been incorporated into the unit startup procedure, OP-2-A6100-01, Step 9 of Enclosure 4.1, as a Mode 4 requirement. In this particular instance, the unit was maintained at Mode 3 throughout the shutdown, the requirement was not entailed elsewhere in the startup procedure, therefore was not performed.

The procedure was subsequently changed incorporating the requirement as a Mode 2 prerequisite, which should preclude recurrence.

The incident is attributable to an inadequate procedure as explained above. Therefore, the requirement and intent of Technical Specification 6.8.1.a was violated as well as license condition 2.C.12.C. However, inasmuch as the NRC advocates licensee identification and correction of deficiencies, pursuant to the provisions of 10 CFR 2, Appendix C, IV. A., a Notice of Violation will not be issued.

10. Flux Map Computer Code

On May 24, 1984, it was reported to the NRC that a computer code, "CORE," a product of Shanstron Nuclear Associates, was found to be in error on May 22. The code was reportedly used by D. C. Cook and McGuire Units 1 and 2 to perform incore flux mapping.

Subsequent discussions with the nuclear engineering staff of McGuire revealed that the code is currently not in use at McGuire but would be employed on McGuire Unit 2 Cycle 2. The code has been corrected and should pose no problems.

11. Failure To Implement Independent Verification During Safety Related Maintenance

On the afternoon of May 29, 1984, McGuire Units 1 and 2 were operating at approximately 100% power. While performing a Nuclear Station Modification (NSM) to repair leakby and to reorient Unit 2 valves 2NC 49 and 2NC 50, the Pressure Relief Tank (PRT) to shutdown waste gas decay tank (SDWGDT) line sample vessel isolation valves, a maintenance crew cut into the incorrect lines and removed Unit 1 valves INC49 and INC50 instead of Unit 2. These valves perform the same function on Unit 1 that 2NC49 and 2NC50 perform on Unit 2. All valves are in the Recycle Monitor Tank (RMT) room in the Auxiliary Building on the 716 foot elevation.



Although the Unit 1 PRT to SDWGDT line was slightly pressurized with nitrogen to provide a nitrogen blanket on the PRT, the maintenance personnel did not realize that they had removed the valves from the incorrect unit. At this point pressure in the Unit 1 PRT began to decrease. A PRT low pressure alarm was received in the Control Room at 3:11 p.m. Control Room personnel attempted to increase pressure in the PRT and noted in the Reactor Operator Log that pressure in the PRT was not responding correctly. At 4:45 p.m., the problem was determined to be the cut line resulting from the removal of INC49 and INC50. The cut was isolated by closing INC53B, the Unit 1 N2 to PRT control isolation, and 1GN45, the Unit 1 PRT N2 supply isolation.

In assessing this incident, the following was noted.

- a. The Nuclear Station Work Requests requesting the check and repair of 2NC49 and 2NC50, Work Request Nos. 36115 and 36116, correctly described the valves as safety related.
- b. The correct valves were tagged and isolated pursuant to Unit 2 procedure OP/O/A/6100/09, Removal and Restoration (R&R) of Station Equipment.
- c. Prior to removal, independent verification that the correct component had been identified did not take place.
- d. The maintenance procedures referenced by the work requests 36115 and 36116, MP/O/A/7600/06 and MP/O/B/7650/09, did not address independent verification requirements prior to removal of equipment. Maintenance Procedure MP/O/A/7600/06 provides a method of disassembly and reassembly of Kerotest - Type Globe Valves. This procedure only stipulates that the, "Valve shall be properly isolated, drained and tagged." The purpose of Maintenance Procedure MP/O/B/7650/09 is to ensure that fire prevention practices are followed in areas where cutting, welding and open flame operations are in progress. No considerations involving independent verification prior to removal are mentioned, nor performed.

Station Directive 4.2.2, Independent Verification Requirements, in Item 3.1 requires independent verification "for removal and return to service of systems and components which affect the performance of safety related systems." In addition Item 3.2(d) of the same directive requires that "Prior to beginning maintenance on any applicable component independent verification that the correct component has been identified is required."

T.S. 6.8.1 requires that current approved procedures be established, implemented and maintained covering maintenance that can affect the performance of safety-related equipment and that these procedures should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to circumstances.

Per the Nuclear Station Work Request the valves were identified as safety-related equipment yet nowhere was independent verification specifically required to ensure that the correct components were being removed.

The forgoing constitutes a repeat violation of independent verification requirements. You are referred to inspection report 50-369/83-39 and 50-370/83-46 and enforcement conference held on October 19, 1983.

Inasmuch as the reply to that report/violations containing those corrective actions to be taken to preclude recurrence have not been received at the end of this report period. This item of noncompliance will be held in abeyance.

## 12. Open Items Review

The following items, entailing in part licensee event reports, violations, inspector followup items and unresolved items were reviewed in order to determine the adequacy of corrective actions, the implications as they pertain to safety of operations, the applicable reporting requirements, and licensee review of the event.

This cursory review was performed based on the chronological sort of the items and the safety significance pertaining thereto.

Based upon the results of this review, the items are herewith closed.

UNIT 1, DOCKET 50-369

<u>ITEM NUMBER</u>	<u>ITEM NUMBER</u>
LER81-18	LER81-88
LER81-22	LER81-96
LER81-35	LER81-110
LER81-36	LER81-112
LER81-37	LER81-113
LER81-46	LER81-118
LER81-49	LER81-124
LER81-57	LER81-129
LER81-61	LER81-131
LER81-66	NRE81-146
LER81-71	LER81-148
LER81-74	LER81-149
LER81-78	LER81-153
LER81-80	LER81-154
LER81-83	LER81-161
LER81-85	LER81-162
LER81-86	LER81-190
LER81-87	NRE81-01

ITEM NUMBER

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UNIT 2, DOCKET 50-370

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80-05-07  
80-14-10  
81-33-05  
82-12-01  
82-12-02