



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
101 MARIETTA ST., N.W.  
ATLANTA, GEORGIA 30323

Report Nos.: 50-369/89-11 and 50-370/89-11

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

Facility Name: McGuire Nuclear Station Units 1 and 2

Docket Nos.: 50-369 and 50-370

License Nos.: NPF-9 and NPF-17

Inspection Conducted: March 30, 1989 - April 21, 1989

Inspector: *K. VanDoorn* 6/5/89  
K. VanDoorn, Senior Resident Inspector / Date Signed

Accompanying Inspectors:

T. Cooper, Reactor Inspector  
S. Vias, Reactor Inspector

Approved by: *M. B. Shymlock* 6/5/89  
M. B. Shymlock, Section Chief / Date Signed  
Division of Reactor Projects

SUMMARY

Scope: This routine unannounced inspection involved the areas of operations safety verification, surveillance testing, maintenance activities, and follow-up on previous inspection findings.

Results: In the areas inspected, one violation was identified (see paragraph 7.b.) involving three instances of temporary loss of the Residual Heat Removal system, on Unit 1. Procedural weaknesses contributed to two events and an inadequate drawing contributed to the other. System function was regained in a timely manner in each case. The unit was in mid-loop operation during the first of the three events. Several minor housekeeping discrepancies were also identified. (see paragraph 3.c.)

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*G. Addis, Superintendent of Station Services
- \*J. Boyle, Superintendent of Integrated Scheduling
- G. Gilbert, Superintendent of Technical Services
- \*T. Mathews, Site Design Engineering Manager
- \*T. McConnell, Plant Manager
- \*D. Murdock, McGuire Design Engineering, Division Manager
- W. Reeside, Operations Engineer
- \*M. Sample, Superintendent of Maintenance
- \*R. Sharp, Compliance Manager
- J. Snyder, Performance Engineer
- \*J. Silver, Unit 2 Operations Manager
- \*A. Sipe, McGuire Safety Review Group Chairman
- B. Travis, Superintendent of Operations
- R. White, Instrument and Electrical Engineer

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

\*Attended exit interview

### 2. Unresolved Items

An unresolved item (UNR) is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation. There were no unresolved items identified in this report.

### 3. Plant Operations (71707, 71710)

The inspection staff reviewed plant operations during the report period 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 during the reporting period included, but were not limited to, the turbine buildings, the auxiliary building, Units 1 and 2

electrical equipment rooms, Units 1 and 2 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. In addition the inspector conducted a detailed walkdown of the Diesel Air (VG) system on both units.

a. Unit 1 Operations

The unit was in mid-loop operation the entire period while testing and evaluation of steam generator (SG) tubes continued. Eddy Current testing had been completed at the end of the period, tube plugging was in progress and laboratory analysis continued of pulled tubes. The projected on-line date was May 5, 1989.

b. Unit 2 Operations

Unit 2 began the period at 100% power. On April 6, 1989 the unit was manually tripped due to the Main Feedwater Regulating Valve (FRV) to the C steam generator failing shut. The licensee identified a ruptured feedback bellows associated with the valve positioner as the cause of the valve failing shut. The ruptured bellows and bellows of the same age on other FRVs were replaced. The unit was back on-line on April 7. The bellows is a metal part and had not been included in the preventive maintenance program. The unit ended the period at 60% power for fuel conservation to support the upcoming refueling outage scheduled to begin July 5.

c. On April 4 the inspector noted that the distribution damper for the Control Room Ventilation Fan 2A was labeled "CR Vent Fan 2B Dis Damp CR OAD8". Also, the 2B fan damper was labeled "CR Vent Fan 2A Dis Damp CR OAD7". The licensee was notified and a followup inspection disclosed that the damper labels were corrected. Several minor housekeeping problems were noted in the Auxiliary Building which were passed on to the licensee for corrective action. Two compressed gas cylinders were noted which had the "Firm Removal Date" marked over and changed. The licensee indicated that this was not the intended way to change dates. A wooden lead shielding support was noted at column JJ56 on the 733-foot elevation with a housekeeping tag dated 10-6-86. Two scaffolds without scaffold or housekeeping tags were noted near the component cooling system on the 750-foot elevation. Also component cooling heat exchanger end covers were noted draped over piping and the heat exchangers horizontal surface.

d. On March 10, 1989, the licensee questioned operability of the Control Room Ventilation (VC/YC) system due to non-seismically qualified valve positioners on several YC and service water (RN) valves. The positioner is located between a qualified solenoid and the valve actuator. These valves fail open on a loss of air. The valves affected are 1YC54, 76, 113, 135, 148, 162, 176, 192, 204, 218, 232

and 246 and 1RN442, 445, 457 and 460. The licensee determined on April 6, 1989 that the affected valves may not fail open during a seismic event. A Justification for Continued Operation was documented and discussed with NRC on April 6, 1989. The licensee determined that sufficient time was available (30 minutes) to verify valve positions using non-licensed operators (NLOs) if an earthquake should occur. On April 7 the inspector physically observed the valves in question and verified appropriate instructions had been given to operations personnel. Since the valves were not all easily accessible and were on three different elevations the inspector verified that two NLOs had been assigned to the task. The inspector verified later that the requirement to check the valves had been incorporated into the earthquake procedure, RP/O/A/5700/07, Earthquake.

No violations or deviations were identified.

4. Surveillance Testing (61726)

Selected surveillance tests were analyzed and/or witnessed by the inspector to ascertain procedural and performance adequacy and conformance with applicable Technical Specifications.

Selected tests were witnessed to ascertain that current written approved procedures were available and in use, that test equipment in use was calibrated, that test prerequisites were met, that system restoration was completed and test results were adequate.

Detailed below are selected tests which were either reviewed or witnessed:

<u>PROCEDURE</u>	<u>EQUIPMENT/TEST</u>
TT/O/A/9100/301	Control Area Ventilation Restricted Intake Test

No violations or deviations were identified.

5. Maintenance Observations (62703)

The only maintenance activities reviewed during the period were regular discussions with licensee personnel regarding results and status of the 3G tube testing and evaluations. This review is continuing under NRC/NRR Materials Engineering Branch lead.

No violations or deviations were identified.

6. Licensee Event Report (LER) Followup (90712, 92700)

The following LERs were reviewed to determine whether reporting requirements have been met, the cause appears accurate, the corrective actions appear appropriate, generic applicability has been considered, and

whether the event is related to previous events. Selected LERs were chosen for more detailed followup in verifying the nature, impact, and cause of the event as well as corrective actions taken. These LER's are noted with an asterisk (\*). The following LER's are closed:

\*LER 369/88-37: Two Groups of Ice Baskets in the Unit 1 Ice Condenser Found to Weigh Below the Required Tech Spec Weight. The inspector reviewed periodic test results associated with this event.

LER 369/88-45, Rev. 1: Auxiliary Feedwater System Train B Inoperable due to Incorrectly Set Valve Travel Stop. The inspector reviewed this report for completeness. Verification of corrective actions will be accomplished through followup of Violation 369/88-33-09.

LER 369/89-03: Doghouse Water Level Feedwater Isolation Actuation Instrumentation for Unit 1 and 2 was not tested as required by Technical Specifications.

No violations or deviations were identified.

#### 7. Follow-up on Previous Inspection Findings (92701,92702)

The following previously identified items were reviewed to ascertain that the licensee's responses, where applicable, and licensee actions were in compliance with regulatory requirements and corrective actions have been completed. Selective verification included record review, observations, and discussions with licensee personnel.

- a. (Closed) Violation 369/87-41-04, Failure to follow procedures and failure to perform retest, resulted in inoperable ND pump miniflow valve. Both examples included in the violation were attributed to personnel error. The licensee has completed corrective action for the violation. The following items were reviewed:
  - o Counseling letter dated 12/2/87 to both of the technicians, stating the station policy on adherence to procedures.
  - o Process Procedure record ID No. TT/1/A/9100/206, Change No 1, dated 10/20/87, "Post modifications test procedure for 'lockout' relays 186A/1B and associated indicating lights." Section 13.13, added specific steps necessary to perform adequate verification of the lockout relay modifications.
  - o Revised PM/PT work request computer program for instruments 1&2MNDPG5050 and 1&2MNDPG5051 to reflect that the status is safety related and that there is the potential that the work could be a Technical Specification (TS) item.
  - o Station Directive (SD) 4.2.1 which was revised to include the directive stated in a memo from the station manager to all McGuire NPD employees, dated 10/27/87. After reviewing the memo

and then Station Directive 4.2.1., the inspector noted that SD 4.2.1 had been revised as stated but that the statements as stated in paragraphs (A) & (B), from the memo were not incorporated. This type of concern is discussed in further detail with other examples in Report 50-369,370/89-01.

- b. (Closed) Unresolved Item 369,370/88-33-02: Losses of RHR Requiring Further Followup. This item involved three losses of Residual Heat Removal System (ND) which occurred on Unit 1 which appeared to involve procedural or drawing weaknesses. The events were previously described as follows:

"On November 23, 1988 the licensee experienced a loss of the residual heat removal (ND) system for approximately 40 minutes. Reactor Coolant (NC) temperature increased approximately 25 degrees F. The unit was in Mode 6, Refueling. The event occurred while valve stroke timing Containment Spray (NS) valve 1NS-1B (NS pump 1B suction from containment sump). Apparently, ND pump 1B lost suction pressure due to inadequate system venting in the horizontal piping between valve 1NS-1B and valve 1NI-184 (reactor building sump to train 1B of ND and NS). Apparently the inrush of NS water into the voided containment sump piping forced air into the ND 1B pump suction and air bound the pump. The pump was tripped to avoid damage. Recovery consisted of cross-tying ND pump 1A to ND heat exchanger 1B, assuring fill and vent of the ND 1A sump and starting the 1A pump. Problems with venting the ND pump 1B casing delayed restart of 1B pump. The licensee checked both ND trains on both units and found significant amounts of air in some of the piping. The licensee is evaluating past ND operability for both units and is planning to add more controls on testing interfaces, to upgrade ND procedures and to evaluate the need for improved fill and vent practices and procedures.

On November 29, 1988, while in cold shutdown, Unit 1 experienced a loss of ND when a train B blackout occurred. The blackout occurred when Operations closed the B train 6900 Volt Bus standby breaker which was in the test position for testing causing the normal breaker to open as designed. This action deenergized the B train including the operating ND pump and started the B train emergency diesel generator. Reactor coolant temperature increased 4 degrees F during the approximately seven minutes that the ND pump was not operating. LER 369/88-38 was submitted on this event.

The licensee assigned a cause of management deficiency to the event since the unit supervisor did not provide adequate written and/or verbal instructions to the operator for testing the standby breaker. A defective procedure was assigned as a contributing cause since OP/1/A/6350/08, "Operation of Station Breakers", did not contain precautions to alert operators of interlocks associated with the breakers to be tested. The licensee stated that a general precaution would be added to OP/1/A/6350/08 to review the effects of interlocks

prior to testing breakers. Also a caution would be added for the 6900 volt breakers to prevent this from recurring.

On December 1, 1988, while in cold shutdown, ND was lost again when ND-1B (reactor coolant system loop 1C to ND system containment isolation) closed. Licensee personnel were deenergizing a circuit associated with the Resistance Temperature Detector (RTD) modification when ND-1B closed on a simulated high pressure signal securing ND flow. ND-1B closed at 12:06 a.m., the ND pump was secured at 12:07 a.m. and ND flow was restored at 12:17 a.m. Plant temperature increased approximately 5 degrees during this time. Personnel involved had misread the drawing and did not realize that ND-1B would close."

The licensee conducted additional evaluation of the November 23 event. A concern was that air trapped in the lines downstream of either valves NI-184B or NI-185A could be drawn into the ND pumps if the valves were open at the start of a post accident recirculation. The analysis showed that water remaining in the Refueling Water Storage Tank (RWST) would provide enough pressure to push any air to the Containment Sump and not toward the ND pumps. The air would be dissipated through the sump before the RWST was isolated. The inspector reviewed this analysis. It does appear that procedural weaknesses contributed to the event in that adequate fill and vent was not required by PT/1 & 2/A/4200/08, NS System Valve Stroke Timing and further, there was no operations procedural guidance for filling and venting of specific systems other than the Reactor Coolant system. The Removal and Restoration procedure (OMP 2-17) is typically used for filling and venting.

The 39 minutes it took to place 1A train in service appears reasonable considering operations was assuring the train was adequately vented and closely monitoring temperature.

As described above, procedural inadequacies also contributed to the November 29 event.

Further evaluation of the December 1 event disclosed that a drawing (MCM-1399.03-0300-001) was not properly updated which resulted in a misinterpretation by Instrument and Electrical personnel.

The unit was in mid-loop operation during the first event. loops were full during the other events.

10 CFR 50, Appendix B, Criterion V requires that activities affecting quality be prescribed by documented instructions, procedures, or drawings appropriate to the circumstances. The above three examples are considered in the aggregate a violation of this criteria. This is Violation 369,370/89-11-01: Inadequate Procedures and Drawings Leading to Loss of Residual Heat Removal on Three Occasions.

- c. (Closed) Violation 369,370/88-33-05: Failure to Follow TS for Heatup and Cooldown. Corrective actions for this violation included appropriate training and procedural improvements which were described in the licensee response dated March 16, 1989 and in LER 370/87-20. The inspector verified completion of the corrective actions during the review described in Report 369,370/88-33 and, therefore, this item is closed.
- d. (Open) Inspector Followup Item 369,370/89-01-06: Written Guidance on Use of Procedures. The inspector discussed the licensee's progress in this area and reviewed Revision 7 of Operations Management Procedure 1-2: Use of Procedures. The General Statements of philosophy, which address the first concern described in Report 369,370/89-01, paragraph 11, have been reordered. In addition the new procedure now provides guidance for use of Abnormal and Emergency Procedures. Other concerns described in the previous report are not yet addressed. Therefore, this item remains open.

One violation was identified as described above.

#### 8. Exit Interview (30703)

The inspection findings identified below were summarized on April 21, 1989, with those persons indicated in paragraph 1 above. The following items were discussed in detail:

(Open) Violation 369,370/89-11-01: Inadequate Procedures and Drawings Leading to Loss of Residual Heat Removal on three occasions. (paragraph 7.b.)

The housekeeping comments described in paragraph 3.c.were also discussed.

The licensee representatives present offered no dissenting comments, nor did they identify as proprietary any of the information reviewed by the inspectors during the course of their inspection.