



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
101 MARIETTA ST., N.W.  
ATLANTA, GEORGIA 30323

Report Nos.: 50-369/88-23 and 50-370/88-23

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: July 23, 1988 - August 19, 1988

Inspectors:	<u><i>W. Orders</i></u>	<u>9/6/88</u>
	W. Orders, Senior Resident Inspector	Date Signed
	<u><i>D. Nelson</i></u>	<u>9/6/88</u>
	D. Nelson, Resident Inspector	Date Signed
	<u><i>R. Croteau</i></u>	<u>9/6/88</u>
	R. Croteau, Resident Inspector	Date Signed
Approved by:	<u><i>T. A. Peebles</i></u>	<u>9-6-88</u>
	T. A. Peebles, Section Chief	Date
	Division of Reactor Projects	Initialed

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 for failure to follow procedure and for an inadequate procedure was identified (see paragraphs 4 and 8.) Two unresolved items were identified: one for followup on operators being unaware of the implementation of a modification which led to an ESF Actuation (paragraph 9) and one for followup on the Problem Investigation Report process (paragraph 4).

8809200209 880907  
PDR ADDCK 05000369  
Q PNU

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

J. Boyle, Superintendent of Integrated Scheduling  
\*B. Hamilton, Superintendent of Technical Services  
\*S. LeRoy, Licensing, General Office  
\*T. McConnell, Plant Manager  
W. Reeside, Operations Engineer  
\*M. Sample, Superintendent of Maintenance  
\*R. Sharp, Compliance Engineer  
\*J. Snyder, Performance Engineer  
B. Travis, Superintendent of Operations  
R. White, IAE 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. Two unresolved items were identified in this report and are discussed in paragraphs 4 and 9.

### 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.

a. Unit 1 Operations

Unit 1 operated at approximately 100 percent power with the exception of a turbine runback to 97 percent power on August 8, 1988, at 12:35 a.m.. Instrumentation and Electrical (IAE) personnel had placed channel 4 of the delta T instrument in test when the C loop delta T momentarily reached the overpower delta T set-point. C loop delta T has been reading higher than normal due to a problem with the C loop cold leg temperature RTD, which is reading low.

On August 19, 1988, while at 100 percent power, a card in the D steam generator water level control system failed and started to burn. Operators took manual control of the feedwater regulating valve on the D steam generator and recovered water level. The card fire was extinguished, however, an adjacent card controlling the feedwater regulating valve bypass valve, the card reader, and other wiring in the area were damaged. At the end of the inspection period the feedwater regulating valve to the D steam generator was being controlled in manual and the bypass valve was shut. Rapid operator response in this case prevented a reactor trip. The unit remained at 100 percent power.

b. Unit 2 Operations

On July 24, 1988, two ESF actuations occurred while in Mode 3 involving feedwater isolation (see paragraph 9 for details). Unit 2 was critical on July 26, 1988, at 7:00 a.m. following a refueling outage which started on May 27, 1988. The unit reached full power on July 31, 1988 at 3:40 p.m. At 7:20 p.m. on July 31, 1988, the unit was manually tripped from 100 percent power due to decreasing level in the 2A steam generator (S/G). A worker in the turbine building dropped a fan damaging a cable to a solenoid controlling air to the 2A S/G feedwater regulating valve 2CF-32. The loss of air caused 2CF-32 to shut isolating flow to the A steam generator. The cable was repaired and the unit was on line at 10:26 a.m. on August 1, 1988. On August 5, 1988, power was reduced to correct a high vibration problem on the turbine generator number 11 bearing. The unit was taken off line but reactor power was maintained at approximately 10 percent. The unit returned to full power operation on August 7, 1988.

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>
PT/2/A/4401/01B	Component Cooling Train 2B Performance Test
PT/2/A/4401/05A	Component Cooling Train 2A Heat Exchanger Performance Test
PT/2/A/4401/05B	Component Cooling Train 2B Heat Exchanger Performance Test
PT/1/B/4350/23A	Hydrogen Mitigation System Test
PT/2/A/4204/05	ND Valve Stroke Timing - Shutdown
PT/2/A/4206/02	NI Valve Stroke Timing - Quarterly
PT/2/A/4204/02	ND Valve Stroke Timing - Quarterly
PT/2/A/4209/02	NV Valve Stroke Timing - Quarterly
PT/2/A/4209/03	NV Valve Stroke Timing - Shutdown

On July 21, a Valve Stroke Timing (VST) test was conducted on Residual Heat Removal (ND) Valve 2ND58A, ND Heat Exchanger to Centrifugal Charging Pumps 2A and 2B Block valve. This normally closed valve separates the ND system from the suction piping of the Chemical and Volume Control (NV) and Safety Injection (NI) systems, and is used during the sump recirculation phase of a Loss of Coolant Accident to provide NV and NI suction from ND.

At the time of the test Unit 2 was in Mode 5 with reactor coolant (NC) system pressure at approximately 325 psig. ND train B was in operation in the normal residual heat removal mode and, therefore, also at approximately 325 psig. ND train A was idle, but pressurized from train B through the ND suction cross connect. The portions of the NV and NI systems downstream of 2ND58A have design pressures of 220 and 240 psig, respectively. When 2ND58A was opened, these portions of NV and NI were overpressurized to NC system pressure via ND. As a result of the overpressurization, a relief valve, 2NV229, set at 220 psig, lifted and a leak developed at the body-to-bonnet joint of valve 2NV1025, Volume Control Tank to Positive Displacement Pump Isolation. Subsequently, Duke Design Engineering conducted an Operability Evaluation and Justification for Continued Operation and found that the overpressurized systems were not overstressed and were considered operable.

The VST test was being conducted in accordance with McGuire procedure PT/2/A/4204/05, ND Valve Stroke Timing - Shutdown. This procedure did not contain any limits or precautions preventing the test from being conducted with pressure in excess of design pressure of the involved systems. The procedure did separate the two ND trains on the discharge side of the ND pumps, but left the ND pump suction side cross connect open, allowing full

pressure to remain on the idle A train to which 2ND58A is connected. The failure of the procedure to specify an upper pressure limit for conducting the test constitutes a violation of Tech Specs 6.8.1 for an inadequate procedure. (Violation 370/88-23-01)

The inspector reviewed other VST procedures for similar situations. Procedure PT/2/A/4206/02, NI Valve Stroke Timing - Quarterly, contained a deficiency in that the VST test of 2NI136B could overpressurize NI pump suction piping if ND pressure exceeded 240 psig at the time of the test. Similarly, no limits or precautions or prerequisite system conditions existed in the procedure to prevent the occurrence.

Operations initiated Problem Investigation Report (PIR) 2-M88-0187 documenting the overpressurization shortly after the occurrence on July 21, 1988. Subsequently, Compliance contacted Design Engineering and received a verbal operability determination on the same day, prior to the unit entering Mode 4. Compliance assigned corrective action on the PIR to Maintenance to repair the leak on NV1025, but did not require evaluation by Performance, the group responsible for the test. As a result, Proposed Resolution of Problem, as stated on the PIR, only involved repairing the leak. No corrective action addressing the root cause of the problem, the procedure inadequacy, was formally assigned. This situation became evident when the inspector began investigating the problem on August 16. Performance personnel stated that they recalled the overpressurization event, but acknowledged that no corrective action had been taken or investigation conducted because the PIR had not been received assigning such. Upon questioning by the inspector, corrective action was undertaken to address the root cause of the event. Compliance considers the inadequacy of the PIR to assign corrective action only to Maintenance to be an isolated occurrence. The NRC will further review the PIR process for any programmatic deficiencies that may be involved. This is identified as an Unresolved Item. (URI 369,370/88-23-03)

5. Maintenance Observations (62703)

Routine maintenance activities were reviewed 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, that equipment restoration was completed and maintenance results were adequate.

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.

The following LERs are considered closed:

LER 369/87-03  
 LER 369/87-04  
 LER 369/86-16  
 LER 369/87-09  
 LER 369/87-14  
 LER 369/87-19  
 LER 369/87-17  
 LER 369/87-20  
 LER 369/87-21  
 LER 369/87-35  
 LER 369/87-36  
 LER 369/88-03  
 LER 369/88-05  
 LER 369/88-06  
 LER 370/87-11  
 LER 370/87-12  
 LER 370/87-15  
 LER 370/87-19  
 LER 370/87-21  
 LER 370/87-22

7. Follow-up on Previous Inspection Findings (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.

(Closed) Violation 369/86-28-06, Inoperable Unit 1 Safety Valve. Corrective actions have been taken and regional NRC inspectors have found present test methods acceptable

(Closed) Violation 369, 370/87-04-01, Train B Containment Spray and Train A SSPS Removed From Service Simultaneously. Corrective actions have been taken and a supplemental response was submitted due to a concern raised in Inspection Report 369, 370/88-12.

(Closed) Violation 370/86-35-03, Failure to Properly Implement Procedures During A Startup Causing A Spill. The licensee denied the violation as written in that they did not agree that the cause of the spill was a failure to follow procedure. The licensee believed the cause of the problem was an inadequate procedure which has now been changed to more clearly specify what actions are required. It is clear that the operator



could have prevented the spill, however, the procedure was deficient. A violation of NRC requirements did occur and corrective actions for this specific instance have been taken.

(Closed) Unresolved Item 369/86-35-04, Resolve Adequacy of Temporary Modification Safety Evaluation on KC Surge Tank Manway Covers. A permanent modification has been implemented and this item is considered closed.

(Closed) Violation 369, 370/87-04-02, Failure To Control Removal and Restoration of Containment Air Return Fan Curbing Sections. The procedure has been revised to control removal and restoration of the curbing sections.

#### 8. Testing of the Turbine Driven Auxiliary Feedwater Pump Turbine

After heat up following the Unit 2 refueling outage the licensee discovered that SA-48, one of the two steam admission valves to the turbine driven auxiliary feedwater (TDCA) pump, was leaking and the TDCA pump was rotating at 400 rpm. The licensee cycled the valve in an attempt to seat it but the valve would not seat properly. The licensee considered the TDCA pump operable and intended to allow the pump to continue to operate at 400 rpm until the plant returned to power operation and then repair SA-48. The inspectors pointed out that IE information notice 86-14 documented a similar occurrence at Crystal River in which the same type of TDCA pump tripped on overspeed when auto started from 160 rpm due to a leaking valve. The licensee stated that their previous experience in this area indicated that the TDCA pump would not trip on overspeed. In order to prove operability the licensee committed to simulating an auto start with the turbine initially rotating at 400 rpm. The TDCA pump was started on July 27, 1988, in accordance with OP/2/A/6250/02, Auxiliary Feedwater System, with the TDCA pump initially rotating at 400 rpm. Step 2.5 of the procedure directed the operator to set the TDCA pump speed controller to zero, start the pump, and raise the speed. After the operator set the TDCA pump speed controller to zero the inspectors pointed out that this start did not simulate an automatic start therefore the evolution would not test the ability of the governor to prevent an overspeed trip when starting from 400 rpm. The operator agreed, placed the speed control at full speed, and ran the test with satisfactory results.

The procedure, however, was not changed as required by Station Directive 4.2. The operator, at the direction of the Shift Supervisor, noted on the cover sheet of the procedure that the TDCA pump was started with the controller at the max position but did not process the required change to the procedure prior to or after performance of the OP. Station Directive requires that a change of this type be processed as a major procedure change including extensive review and approval by two qualified reviewers at least one of whom holds a Senior Reactor Operator license. Operations Management Procedure (OMP) 1-2, Use of Procedures, paragraph 7.1.G provides guidelines on what actions should be taken when a specific step

in a procedure does not have to be performed. This OMP allows a step to be marked "N/A" by a supervisor that holds an SRO license, however, in the case described above the step could not be marked "N/A" since the step included starting the TDCA pump. The OMP was not strictly adhered to in this instance and the licensee is conducting training on OMP 1-2. The failure to make the procedure change in accordance with Station Directive 4.2 and meet the requirements of OMP 1-2 is identified as a second example of a violation of TS 6.8.1. (370/88-23-01)

#### 9. Feedwater Isolation Events

On July 24, 1988, at 5:40 p.m., a Unit 2 ESF actuation (feedwater isolation) occurred when the low Tave setpoint was reached with the reactor trip breakers open while in Mode 3. At the time, maintenance personnel were preparing to apply leak sealant to stop a leak on a main steam drain valve, 2SM-63. The valve had been closed to replace the air supply solenoid with a straight line of tubing to maintain the valve shut (air to shut/spring open) for the application of sealant. Once the air line was disconnected and the valve was opened, the personnel left the area for twenty to twenty five minutes to obtain additional fittings that were required. During this time the primary plant cooled down from 557 degree F to 553 degree F low Tave setpoint causing the feedwater isolation.

The low Tave setpoint had recently been decreased to the low-low Tave valve (553 degree F) through a Nuclear Station Modification (NSM). It appears that operations personnel were not trained on the NSM so they were unaware of the fact that a feedwater isolation would occur at 553 degree F. This item is identified as an Unresolved Item (URI 370/88-23-02) pending completion of the licensee's investigation. The licensee stated that an operations person will be assigned September 1, 1988, to review NSMs for operational considerations and training of operators prior to implementation.

At 8:30 p.m. on July 24, 1988, another feedwater isolation occurred while in Mode 3. IAE personnel were testing Channel 1 of the reactor protection system when a signal comparator card on Channel III failed causing the isolation. The card was subsequently replaced.

#### 10. Diesel Generator Waiver of Compliance

In a telephone call on July 15, 1988, and letters dated July 15 and 19, 1988, Duke informed NRC staff that it is not possible to comply with the current McGuire Technical Specification (TS) 4.8.1.1.2.e.6)c). This surveillance TS requires all but three automatic diesel generator (DG) trips to be automatically bypassed during simulation of a loss-of-offsite power in conjunction with an engineered safety features actuation test signal. This TS can not be met as presently written because, in fact, there are four DG trips not automatically bypassed in the design rather than three. Similarly, there are two breaker trips not automatically



bypassed rather than the one presently recognized in the TS. Duke requested that the TS be corrected on an emergency basis to avoid all diesels being declared inoperable and the attendant requirement for shutdown and extended refueling outage for McGuire Units 1 and 2 respectively.

NRC staff reviewed Duke's evaluation and the justification provided in their letter regarding the DG operability. They agree that the time overcurrent diesel generator protective trip and the generator differential breaker trip should not be automatically bypassed when conducting the above cited surveillance test. NRC staff granted a temporary waiver of compliance for the above TS. This waiver of compliance was in effect through July 22, 1988, while the processing of the emergency TS change was processed.

Licensee amendments 90 to NPF-9 and 71 to NPF-17 were issued on July 22, 1988 changing the TS requirements.

#### 11. Exit Interview (30703)

The inspection findings identified below were summarized on August 19, 1988, with those persons indicated in paragraph 1 above. The following items were discussed in detail:

(OPEN) Violation 370/88-23-01, Failure to Follow Procedures/ Inadequate Procedures (paragraphs 4 and 8).

(OPEN) Unresolved Item 370/88-23-02, Follow up on operators being unaware of The Implementation of A Modification which led to an ESF Actuation (paragraph 9).

(OPEN) Unresolved Item 369,370/88-23-03, Follow up on PIR Process to ensure corrective actions identified (paragraph 4).

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.