



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

Report Nos.: 50-369/88-26 and 50-370/88-26

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 1 and 2

Inspection Conducted: August 20 - September 23, 1988

Inspectors:	<u><i>K. VanDoorn</i></u>	<u>10/12/88</u>
	K. VanDoorn, Senior Resident Inspector	Date Signed
	<u><i>W. Orders</i></u>	<u>10/12/88</u>
	W. Orders, Senior Resident Inspector	Date Signed
	<u><i>D. Nelson</i></u>	<u>10/12/88</u>
	D. Nelson, Resident Inspector	Date Signed
	<u><i>R. Croteau</i></u>	<u>10/12/88</u>
	R. Croteau, Resident Inspector	Date Signed
Approved by:	<u><i>T. A. Peebles</i></u>	<u>10-12-88</u>
	T. A. Peebles, 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 licensee identified violation was identified involving inadequate fire barrier penetrations. (see paragraph 8).

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REPORT DETAILS

1. Persons Contacted

Licensee Employees

J. Boyle, Superintendent of Integrated Scheduling
*B. Hamilton, Superintendent of Technical Services
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. 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.

a. Unit 1 Operations

The unit operated at approximately 100 percent power until September 17, when power was reduced to 95 percent to perform turbine acceptance testing. The testing was done to determine the performance of new rotors installed in the previous outage. The unit returned to 100 percent power on September 20. As of September 23, 1988, Unit 1 had been on line 93 days.

b. Unit 2 Operations

Unit 2 operated at approximately 100 percent power until September 18 when power was reduced to 92 percent due to decreased demand on the grid. The unit returned to 100 percent power later the same day.

During performance of the 2B emergency diesel generator performance test PT/2/A/4350/02B, Diesel Generator 2B Operability, on September 15, 1988, the diesel generator fuel oil booster pump did not start. The breaker to the pump was found open. The breaker is located in the diesel generator room and has a knife type handle which may have been bumped open. There had been painting activities in the diesel room recently. The pump had last been run on September 8, 1988, therefore, the breaker may have been open for up to 7 days.

When operations discovered that the pump would not run the diesel was declared inoperable and a problem investigation report was initiated. The licensee subsequently started the diesel without the fuel oil booster pump running to determine if the diesel would start in the required time. The diesel started and ran satisfactorily without the fuel oil booster pump.

The fuel oil booster pump draws a suction on the fuel oil day tank and discharges to the suction of the engine driven fuel oil pump. FSAR section 9.5.4.2 states that the fuel oil booster pump is provided to assist the engine driven pump in providing fuel oil prior to getting up to speed. The licensee stated that since the engine got up to speed and voltage in the required time without the fuel oil booster pump the diesel met its intended function. The inspectors will continue to evaluate the licensee's actions in this area.

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.

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

<u>Procedure</u>	<u>Equipment/Test</u>
PT/1/A/4401/05B	Component Cooling Train 1B Heat Exchanger Performance Test
PT/2/A/4208/01A	Containment Spray Pump 2A Performance Test
PT/2/A/4401/02	Component Cooling Valve Stroke Timing - Quarterly
PT/2/A/4350/02B	Diesel Generator 2B Operability

As part of corrective actions taken in response to an NRC violation in 1987 (see inspection report 87-46) the licensee installed an on line differential pressure (d/p) monitoring system to monitor component cooling heat exchanger (KC HX) performance by measuring service water (RN) side d/p. Design Engineering had previously calculated the maximum allowable heat exchanger differential pressure allowed (8.8 psid) to meet the design basis of the system. The on line monitoring system was being used to trend performance of the heat exchangers to determine when testing was required and not to determine operability since the monitoring system was not in the calibration program. The on line system was being monitored daily by performance personnel on week-day mornings until a station modification is made to have the system feed into the Operator Aid Computer.

On Monday September 12, 1988, the licensee discovered that three of the four KC HXs were well above the operability differential pressure based on the uncalibrated on line monitoring system. The fourth KC HX was out of service so the differential pressure could not be determined. The differential pressures had been well within the limits when read on Friday September 9, 1988.

The licensee flushed each heat exchanger by increasing system flow to approximately 8000 gpm, normal flow is 3,000 gpm, to remove loose silt and ran performance tests to measure the actual d/p's. Following the flush, the d/p's were acceptable by both the test instrumentation and the on line monitoring system. The heat exchangers were not declared inoperable since the on line monitoring system was not calibrated, existing normal system flow rates are much less than accident and test flow rates, and experience indicated that an 8,000 gpm flush (accident flow is approximately 10,000 gpm) would clear enough silt to lower the d/p to an acceptable value.

From September 12, 1988, to the end of the inspection period the heat exchangers had to be flushed at least daily and as frequently as every four hours. The on line monitoring system was subsequently calibrated and used to determine operability. The d/p's were also monitored much more frequently. Normal flow through the heat exchangers was increased to approximately 5,000 gpm in an attempt to continually flush silt particles away. Each successive flush at 8,000 gpm was not as successful as the previous and the post flush d/p's increased such that the KC HX's would have to be isolated, drained, and cleaned using brushes. This situation resulted in the licensee entering T.S. 3.0.3. on two occasions during this report period when both KC HX's on a unit were declared inoperable. In both cases a KC HX was returned to service within one hour.

The licensee has also performed a "Failed Surveillance Analysis" to determine what additional actions are needed and to determine whether similar fouling is occurring on other components cooled by RN. Selected heat exchangers were tested and others evaluated to prevent operability problems. The "Failed Surveillance Analysis" process was also initiated as corrective action to the NRC violation in report 87-46.

The licensee believes that this situation has occurred in the past at this time of the year due to changes in Lake Norman and expects the problem to continue into November. Previous inspection reports document nuclear service water (RN) system fouling. The situation was not fully detected in the past since testing was performed monthly or quarterly and the on line monitoring system was not installed. The inspectors consider the online monitoring system to be a significant benefit in maintaining the component cooling system at the required level of performance. The inspectors will continue to monitor actions in this area.

No violations or deviations were identified.

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.

(Closed) Licensee Event Report 369/88-09, Inadvertent Unit 1 Engineered Safety Features Actuation Due to Personnel Error. This item was the subject of a violation in Inspection Report 369,370/88-12. Corrective actions will be tracked in followup to the violation (VIO 369/88-12-03).

(Closed) Licensee Event Report 369/88-14, ESF Actuation and Blackout Occurred as a Result of Personnel Error and Diesel Failure. This event was described in Inspection Report 369,370/88-20 and a violation was issued. Corrective actions will be tracked in the response to violation 88-20-01.

(Closed) Licensee Event Report 370/88-04, Two Inadvertent ESF Actuations Due to Personnel Error. Portions of this event were identified as a violation in Inspection Report 369,370/88-12.

(Closed) Licensee Event Report 370/87-17, Unit Entered TS 3.0.3. to Perform SSPS Testing While RN was Inoperable. The licensee voluntarily entered TS 3.0.3. to perform testing to allow unit startup. The licensee currently limits voluntary entry to TS 3.0.3. by requiring supervisory approval as a minimum prior to voluntarily entering TS 3.0.3. This issue was previously discussed with the licensee. The licensee was informed that it is the NRCs' position that voluntary entry into TS 3.0.3. for convenience violates the intent of TS 3.0.3. The TS basis states that TS 3.0.3. "is not intended to be used as an operational convenience which permits (routine) voluntary removal of redundant systems or components from service in lieu of other alternatives that would not result in redundant systems or components being inoperable."

The following LERs are considered closed:

LER 369/87-05	LER 369/87-26	
LER 369/87-07	LER 369/87-28	LER 369/88-11
LER 369/87-11	LER 369/87-31	LER 369/88-13
LER 369/87-12	LER 369/87-32	LER 369/88-15
LER 369/87-13	LER 369/88-01	
LER 369/87-15	LER 369/88-02	
LER 369/87-18	LER 369/88-07	
LER 369/87-23	LER 369/88-08	
LER 369/87-24	LER 369/88-10	
LER 369/87-25		
LER 370/86-16	LER 370/87-13	
LER 370/86-18	LER 370/87-14	
LER 370/86-20	LER 370/87-16	
LER 370/87-01	LER 370/87-17	

LER 370/87-02 LER 370/86-10
 LER 370/87-04
 LER 370/87-06
 LER 370/87-07
 LER 370/87-10

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) Licensee Identified Violation 369, 370/87-12-02, Halon System Inoperability. This violation was caused by a failure to properly restore the system following MP/O/A/7400/49. The procedure was changed to ensure proper connection of the actuation tubing.

(Closed) Inspector Followup Item 369, 370/87-41-05, Hydrogen Skimmer System Flow Balance. This issue was the subject of Inspection Report 369, 370/88-24 and corrective actions will be tracked by response to 88-24.

(Closed) Violation 369/87-43-02, Failure to Follow Procedures. Corrective actions have been taken to prevent the specific events associated with this event from recurring.

(Closed) Inspector Followup Item 369, 370/87-12-01, Missed Estimated Critical Rod Position. Procedure OP/O/A/6100/06, Reactivity Balance Calculation, has been changed to limit the time that the ECP is in effect to one hour from the estimated time. Better methods of estimating Xenon worth have also been implemented.

(Closed) Inspector Followup Item 369, 370/87-12-03, Failure of Removal and Restoration Procedures. This item involved the failure to electrically isolate a cable prior to work and was an IKPO finding in 1987. On June 2, 1987, a memorandum was sent to all station personnel from the plant manager emphasizing the requirement to verify proper equipment isolation prior to commencing work.

(Closed) Violation 369/87-12-04, Auxiliary Feedwater Valve Alignment. This event was discussed with each shift and the system operating procedure was changed to allow alternate alignments.

(Closed) Violation 369, 370/87-14-03, Failure to Log Equipment Operability. All licensed personnel reviewed this incident and it was covered in Operator Re-qualification Training to ensure inoperable equipment is properly logged.

(Closed) Violation 369,370/87-14-01, Failure to Identify and Report Transient Cycles. The appropriate reports were subsequently made and training was given on the appropriate station directive. Also, the station operator aid computer program was upgraded to flag all normal pressurizer relief valve operations.

(Closed) Inspector Followup Item 370/86-28-02, Solenoid Failure. The solenoid failed due to the malfunction of the electrical coil. The coil was found to have chlorides introduced during manufacture. The manufacturer and the licensee believe this is an isolated case. Additional details can be found in LER 370/86-17.

(Closed) Violation 369,370/87-46-01, Inadequate Surveillance Test Program Which Led to Inoperable Safety Related Equipment. This violation dealt with the failure of the test program to detect fouling of the Component Cooling Heat Exchangers. An on line monitoring system is installed and being used effectively. Also, a failed surveillance analysis program has been implemented to evaluate the adequacy of the testing frequency and evaluate common mode type problems. See paragraph 4 for additional details.

(Closed) Unresolved Item 369/87-21-03, ESF Actuation During Slave Relay Testing. This event was reported by the licensor in LER 369/87-12 and the individual event had no significant safety implications. The root cause was determined to be procedural inadequacy and corrective actions have been taken. The problem of procedural adequacy has continued to be a problem and is well documented in several violations and events following this occurrence. The inspectors will continue to monitor the licensee performance in this area.

8. Inoperable Fire Barriers

On September 8, 1988, the licensee determined that several spare (empty) sleeves through fire barriers may not be qualified as three hour rated fire barriers since they were capped at only one end. The licensee was in the process of reviewing fire barrier penetrations as followup to NRC Information Notice 88-04, Inadequate Qualification and Documentation of Fire Barrier Penetration Seals. This qualification question was raised based on a scenario where a fire occurs in the room with the open end of the sleeve and temperature on the capped end of the sleeve in the adjacent room exceeds the required limits.

The licensee initiated a Problem Investigation Report (PIR O-M88-0222) to document the potential problem and Design Engineering evaluated the operability of the existing sleeve conditions. On September 15, 1988 Design Engineering determined that the sleeves in question did not meet the three hour fire rating. The penetrations were declared inoperable and a fire watch was established. The areas affected were the electrical penetration and electrical equipment rooms on elevations 733 and 750 and involved approximately 97 penetrations.

The sleeves were upgraded to meet the 3 hour fire rating by installing foam or pipe caps on both ends of the sleeves. The repairs were completed on September 18, 1988. The condition had apparently existed since initial construction.

T.S. 3.7.11 states that all fire barrier penetrations (wall, floor/ceilings, cable tray enclosures and other fire barriers) separating safety-related fire areas or separating portions of redundant systems important to safe shutdown within a fire area and all sealing devices in fire rated assembly penetrations (fire doors, fire windows, fire dampers, cable piping, and ventilation duct penetration seals) shall be OPERABLE. With one or more of the above required fire barrier penetrations and/or sealing devices inoperable, within 1 hour either establish a continuous fire watch on at least one side of the affected assembly, or verify the OPERABILITY of fire detectors on at least one side of the inoperable assembly and establish an hourly fire watch patrol.

Several fire barriers were inoperable since initial construction. This is identified as Licensee Identified Violation (LIV 369,370/88-26-01) since the criteria of 10CFR2 Appendix C is met for classification as an LIV.

9. Annual Emergency Response Exercise

The McGuire Nuclear Station Annual Emergency Preparedness Exercise was conducted on September 14-15, 1988. The resident inspectors participated in the exercise by responding to the control room and technical support center. Details regarding the exercise are contained in Inspection Report 50-369,370/88-27.

10. Exit Interview (30703)

The inspection findings identified below were summarized on September 23, 1988, with those persons indicated in paragraph 1 above. The following items were discussed in detail:

(CLOSED) Licensee Identified Violation 369/370/88-26-01, Inoperable Fire Barriers. (See paragraph 8)

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.