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

Report Nos.: 50-369/84-38 and 50-370/84-36

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: November 20 - December 20, 1984

Inspectors: C. W. Burger for W. Orders — Date Signed 2/1/85

C. W. Burger for P. Pierson — Date Signed 2/1/85

Approved by: H C Dance — Date Signed 2/1/85
H. Dance, Section Chief
Division of Reactor Projects

SUMMARY

Scope: This routine, unannounced inspection involved 160 resident inspector-hours on site in the areas of operations, safety verification, surveillance testing and maintenance activities.

Results: Of the four areas inspected, no violations or deviations were identified.

DETAILS

1. Licensee Employees Contacted

*M. McIntosh, Station Manager
*G. Cage, Superintendent of Operations
D. Mendezoff, Licensing Engineer
*D. Rains, Superintendent Maintenance
*L. Weaver, Superintendent Administration
*T. McConnell, Superintendent Technical Services

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on January 2, 1984, with those persons indicated in paragraph 1 above. The licensee acknowledged understanding of the issues discussed and offered no substantive related discussion.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Plant Operations

The inspection staff reviewed plant operations during the report period, November 20 - December 20, 1984 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 rooms were monitored during shifts and at shift changes. Actions and/or activities observed were conducted as prescribed in applicable station administrative directions. The complement of licensed personnel on each shift met or exceeded the minimum required by technical specifications.

Plant tours were taken during the reporting period on a systematic basis. The areas toured include but are not limited to the following: Turbine Buildings, Auxiliary Buildings, Units 1 and 2, Electrical Equipment Rooms, Units 1 and 2, Cable Spreading Rooms, Station Yard Zone within the protected area, and Unit 1 Reactor Building.

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. The unit was maintained at or about full power until November 23, 1984, when unit shutdown began for a planned maintenance outage. The unit entered Mode 4 on Saturday, November 24, 1984, Mode 5 on November 25, 1984 and cooldown was commenced at 10:19 p.m. on November 26, 1984. Following cooldown the unit was maintained in Mode 5 at a pressure of 75-90 psig and a temperature of 135-150°F through December 16, 1984, when the pressure was increased to 300 psig.

The unit entered Mode 4 at 2:12 a.m., and Mode 3 at 11:38 p.m., on December 19. The unit completed the reporting period in Mode 3 preparing for Unit startup following the planned maintenance outage.

During the planned maintenance outage the steam generator platforms were modified to mount manway tensioners. Maintenance performed included valve maintenance on several systems including the Upper Head Injection vent and drain valves. Several components were inspected including the "C" main coolant pump motor, the "B" main feedwater pump turbine and the main generator.

McGuire Unit 2 began the reporting period operating at 100% power. The unit was maintained at or about full power until November 21, 1984, when a reactor trip was received at 3:55 p.m. on overtemperature WT. At the time of the trip loop A overtemperature WT was in the trip condition due to spurious noise on Nuclear Instrument System Channel 41 which provides an input to loop A overtemperature WT. This reactor trip and subsequent problems detected in the overpower WT reactor trip system instrumentation have been discussed in a special report (Report Numbers 369/84-40 for Unit 1 and 370/84-35 for Unit 2 dated November 27, 1984 through December 11, 1984).

Following recovery from the reactor trip the unit regained criticality at 7:25 a.m., on November 25, 1984 and subsequently reached 100% power at 7:20 p.m., that evening. The unit was then maintained at or about 100% power until December 5, 1984, when power was reduced to 50% because of problems associated with Unit 2 "A" main feed pump. Power was maintained at or about 50% until Wednesday, December 12, 1984, when the 2 "A" main feed pump was placed in service and the unit's power was subsequently increased to 100%. At 8:00 p.m., that evening load reduction was commenced because additional problems with the 2 "A" main feed pump was encountered. Power was reduced to 77% and maintained at 77% through 11:45 p.m., on December 13, 1984, when power was again increased to 100% following repairs to the 2 "A" main feed pump.

Power was maintained at or about 100% until Friday December 14, 1984, when power was reduced in preparation to perform maintenance on the inboard main feed check valves which were leaking excessively. Power was reduced to 10-8 amps in the intermediate range and was maintained at that level through 3:42 a.m., on December 16, 1984, when power escalation, following the maintenance, occurred. The unit entered Mode 1 at 7:50 a.m., and the generator

was placed on line at 8:11 a.m. Power reached 100% at 9:08 a.m., and was maintained at 100% until 5:20 a.m., the following morning when a reactor trip from low-low steam generator C occurred. The trip was induced by a loss of the "A" main feed pump which occurred due to a loss of circulation water to the feed pump's condenser. All systems responded normally. Unit recovery was initiated and the unit reached criticality that evening and entered Mode 1 at 8:06 p.m. The generator was paralleled to the grid at 10:31 p.m., that night. Power was subsequently increased and the unit completed the reporting period operating at 100% reactor power.

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.

PT/1/A/4208/01A	NS Pump 1A Performance Test
PT/1/A/4208/01B	NS Pump 1B Performance Test
PT/2/A/4252/01A	Motor Driven Auxiliary Feed Pump 2A Performance Test
PT/2/A/4252/01B	Motor Driven Auxiliary Feed Pump 2B Performance Test
PT/2/A/4403/01B	Service Water Train 2B Performance Test
PT/1/A/4401/01A	Component Cooling Train 1A Performance Test
PT/2/A/4252/01	Auxiliary Feedwater Pump 2 Performance Test
PT/2/A/4401/01B	Component Cooling Train 2B Performance Test
PT/1/A/4450/03C	Annulus Ventilation System Performance Test
PT/0/A/4150/17A	Pressurizer Heater Capacity Test
PT/1/A/4255/03	SM Valve Stroke Timing Shutdown
PT/0/A/4600/05/A	Radiation Monitor System Operational Tests

7. Maintenance Observations

The maintenance activities categorized below were analyzed and/or witnessed by the resident inspection staff to ascertain procedural and performance adequacy.

The completed procedures examined were analyzed for embodiment of the necessary prerequisites, preparation, instruction, acceptance criteria and sufficiency of technical detail.

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.

The selected work requests/maintenance packages perused attested conformance with applicable Technical Specifications and procedural requirements and appeared to have received the required administrative review.

Work Request	Activity
WR 027953	Perform PM on NIS 41, 42, 43 and 44 calibrate to Best Estimate Thermal Power.
WR 63377	PORV NC-32, NI-431 Oper. Rotate Valve Operator (Limitorque).
WR 038063	PM Channel Function Test on Nuclear Service Water 2B Radiation Monitor.

8. Containment Personnel Air Lock

The resident inspector staff notified the licensee of a potential deficiency associated with W. J. Wooley Company pneumatic supply systems to containment personnel air lock seals, as referenced in a letter with enclosures from Robert C. Baer, Chief, Engineering and Generic Communications Branch, Division of Emergency Preparedness and Engineering Response, Office of Inspection and Enforcement, dated November 28, 1984, to Enerfab of Cincinnati, Ohio. Another licensee had reported a problem with the seismic qualification of the pneumatic supply system. McGuire Units 1 and 2 were potentially affected in that the installed personnel air locks were supplied by the same vendor, W. J. Woolley Company, Oakbrook, Illinois. An investigation by the licensee determined that seismic qualification at McGuire Units 1 and 2 was not a concern in that the licensee had performed their own fabrication and seismic analysis for the containment personnel air lock systems.

9. Control Rod Drive Mechanism Fabrication Error

On December 7, 1984, the licensee was informed by Westinghouse of a potential problem with Control Rod Drive Mechanism (CRDM) heavy drive rod assemblies. Investigation determined that the control rod drive mechanism (CRDM) heavy drive rod assembly guide screw rotated out of position, fell from the drive rod and landed on top of the CRDM latch assembly where it became lodged and prevented driveline motion. The guide screw is normally locked into position by a welded pin that engages the mating threads thus preventing the guide screw from rotating out of position.

The function of the guide screw in the heavy drive rod assembly is to provide alignment and guide the breech components for coupling and uncoupling the drive rod from the rod cluster control assembly during refueling. During normal plant operation, a guide screw that backs out of its thread engagement would be expected to migrate into the annulus between the drive rod assembly and the rod travel housing as a result of control rod stepping. It can then lodge on top of the CRDM latch assembly. This could potentially result in misstepping intermittent sticking of the drive line or a totally stuck driveline.

An evaluation by Westinghouse and DPC, with United States Nuclear Regulatory Commission staff concurrence, concluded that this issue did not constitute an immediate safety concern for McGuire Unit 2 which has this type CDRM. This conclusion was based inpart on the following considerations:

a. Westinghouse inspection results on other units show that most guide screws are properly secured. In addition, these results have shown that at the unit which experienced a failure only one of the four guide screws which failed the reverse torque test backed out of position.

b. Current experience indicates that it is highly unlikely that multiple potentially loose guide screws will become actual loose parts at the same time. Because of the variable resistance of removal of the guide screws during inspections, it is most likely that the times for any potentially loose guide screw to actually back out of position are highly variable.

c. Stepping tests of the kind performed by Technical Specification requirements will identify any control rods affected.

   Further it is extremely unlikely that an accident situation, such as a seismic event, could cause a loose guide pin to move inasmuch as normal rod stepping motions impart loads in the range of 20-30g. Therefore, any loose guide screw migration would most likely be cause by normal rod stepping and any impedance of rod motion would be identified by stepping tests.

d. Current FSAR accident analyses demonstrate safe reactor shutdown with the highest worth control rod stuck in the fully withdrawn position.

e. Machine Unit 2 has completed preoperational testing, startup testing, and more than one year of power operation with no occurrence of rod drive interference from loose guide pins. The unit has approximately 35 EFPD of power operation left before the end of the current cycle. This represents a short and acceptable exposure window with respect to the probability of a multiple stuck rod situation.

In order to further assure that the possibility of this occurrence would not go undetected, the following actions will be taken at McGuire.

a. The frequency of control rod stepping tests will be increased from once every 31 days to once every 7 days.

b. If rod stepping anomalies of a mechanical nature occur during these stepping tests or during any normal rod stepping, the plant will be shutdown and the drive rod assemblies inspected.

c. As part of shift turnover, action 1 and 2 are reviewed and the potential for this event at McGuire is noted.

d. If no rod stepping anomalies of a mechanical nature occur, the drive rod assemblies will be inspected at the next scheduled outage which is scheduled to occur in January 1985.

e. Each operating shift is reviewing a description of the event and is being advised of the potential for a similar occurrence at McGuire Unit 2.

10. IEB 84-02 Failure of General Electric Type HYA Relays

Pursuant to a review performed by Region II Division of Reactor Safety, the results of which were transmitted to Region II Division of Reactor Projects in a memorandum of September 18, 1984, Bulletin 84-02 is closed for both units WTO.

11. 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.

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

Unit 1, Docket 50-369

LER 83-06	LER-83-24
LER 83-09	LER-83-27
LER 83-13	LER-83-32
LER 83-19	LER-83-67
LER 83-20	LER-83-109
LER 83-21	LER-84-03
LER 83-22	IEB-84-02

Unit 2, Docket 50-370

LER 83-02	LER-83-22
LER 83-04	LER-83-35
LER 83-07	LER-83-76
LER 83-09	IEB-84-02