



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
101 MARIETTA ST., N.W., SUITE 3100  
ATLANTA, GEORGIA 30303

Report No. 50-369/82-17 and 50-370/82-12

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

Facility Name: McGuire Units 1 and 2

Docket Nos. 50-369 and 50-370

License Nos. NPF-9 and CPPR-84

Inspection at the McGuire site near Charlotte, North Carolina

Inspectors: *A. J. [Signature]* for 6/11/82  
P. R. Berris Date Signed

*A. J. [Signature]* for 6/11/82  
P. Hopkins Date Signed

*A. J. [Signature]* for 6/11/82  
T. Heatherly Date Signed

Approved by: *J. C. Bryant* 6/11/82  
J. C. Bryant, Section Chief, Division of Date Signed  
Project and Resident Programs

SUMMARY

Inspection on April 17 - May 15, 1982

Areas Inspected

This routine announced inspection involved 230 resident inspector-hours on site in the areas of operation safety verification, maintenance, surveillance, significant event followup, plant trips, TMI followup items, and training.

Results

Of the seven areas inspected, no items of noncompliance or deviations were identified in six areas; one item of noncompliance was found in one area (violation - failure to comply with housekeeping and cleanliness requirements - paragraph 7a).

## DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*M. McIntosh, Station Manager
- \*W. Sample, Projects and Licensing Engineer
- \*M. Pacetti, Chairman SSRG
- \*D. Lampke, Licensing Engineer

Other licensee employees contacted included superintendents, operating engineers, shift supervisors, reactor operators, unit coordinators, station group supervisors, planners, technicians, mechanics, specialists, security, office personnel, corporate design engineers, training and QA personnel.

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on May 24, 1982, with those persons indicated in paragraph 1 above. The station manager acknowledged the results.

### 3. Licensee Action on Previous Inspection Findings

Not inspected.

### 4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether they are acceptable or may involve noncompliance or deviations. A new unresolved item identified during this inspection is discussed in paragraph 7c.

### 5. Operating History

At the beginning of the inspection period the unit was operating at approximately 50% power due to a power level limitation related to Model D steam generators (SG) imposed by the NRC on April 1, 1982. On April 29, 1982, the inspector attended a meeting between Duke Power personnel and Westinghouse personnel in which a revised operating program was submitted to the NRC. This submittal included results of the last eddy current testing (ECT) performed at McGuire Unit 1, the results of the data obtained from the internal instrumentation installed in two tubes of steam generator (S/G) "A", the latest test results of nondomestic nuclear power plants with similar S/G's, and followup information requested by the NRC in the April 1, 1982 letter. The NRC staff looked favorably on the submittal and assured Duke Power of a response before the end of the 1500 hour run time, after a close review by the NRC staff and consultants.

During the entire inspection period, the unit operated at approximately 50% power except for two transients which are explained in detail in paragraph 9. Also, during the inspection period the emergency plan was implemented when an unusual event was declared due to the loss of both ESF trains. This event is also explained in detail in paragraph 9.

#### 6. Operational Safety Verification

Throughout the inspection interval the inspectors observed operational activities in the plant and the control room. The following activities were reviewed and/or observed as possible on a daily basis: shift turnover; control room and shift manning; control and other vital area access; control room and plant operators adherence to approved procedures for ongoing activities; instrumentation and recorder traces important to safety for anomalies; operator understanding of alarmed control room annunciators including initiation of corrective action in a timely manner; operator response to computer alarms; valve and electrical alignment for emergency safeguards features (ESF), and reactor protection system (RPS) inputs in the control room in compliance with technical specification (TS) requirements; shift supervisor, control operator, tag out, and operator's work request logs; access and egress from the protected area in compliance with requirements of the security procedures; and egress from controlled areas in compliance with the health physics plan.

During the inspection period the inspectors also observed, reviewed and/or verified the following: status of instrument calibration, equipment tags and radiation work permits; results of selected liquid and gaseous samples; and gas and liquid waste discharges and logs. The inspectors toured the accessible areas of the plant to make an assessment of the following: plant and equipment conditions; areas which could be fire hazards; interior of selected electrical and control panels; proper personnel monitoring practices, housekeeping and cleanliness practices; and radiation protection controls. The inspectors performed a complete walkdown of the diesel generator starting air system and cooling water system.

Based on this review and observation two inspector followup items were identified.

##### a. Automatic Actuation Signal for Containment Spray System

During the inspection of the control board lineup for the containment spray (NS) system the inspector noticed on the print for NS system that the actuation of NS pumps requires both an "S" signal which is generated by the safety injection logic and a "p" signal which is generated by Hi-Hi containment pressure. The inspector feels the requirement for both signals to be present can generate a safety concern for the following reason: Should a small loss of coolant accident (LOCA) take place inside containment a safety injection (SI) initiation could take place due to either pressurizer pressure or HI containment pressure, depending on the size and location of the break. Operations personnel will reset the SI signal at a minimum of one minute (due to a timer) up to approximately ten minutes so they can

take manual control of the SI equipment. Should the break continue to propagate after the SI signal is reset to the point the Hi-Hi containment pressure setpoint is reached the NS pumps will not receive an automatic start signal because the "S" signal is no longer present. The plant is built according to Westinghouse design for start signals to the NS pumps, but until this logic can be reviewed by NRC technical personnel it will remain an Inspector Followup Item (369/82-17-01; 370/82-12-01).

b. Automatic Actuation of Containment Spray Suction Valves.

During the control board walkdown of the NS system it was found that the valves which allow the NS pumps to take suction from the refueling water storage tank (FWST) do not receive an automatic open signal. These valves are in parallel to meet single failure criteria and during plant operation these valves are required to be open, but most equipment required to be started, opened, or closed receives a "check" signal to insure the emergency safeguards features (ESF) equipment is in the correct position. This item addresses the NS suction valves, but two valves in the ECCS also do not receive a check signal for correct position.

Until this item can be reviewed by NRC technical personnel it will remain an Inspector Followup Item (369/82-17-02; 370/82-12-02).

7. Maintenance

Maintenance activities were observed in progress throughout the inspection period. The inspector verified that the following activities were accomplished by qualified personnel using approved procedures: Radiation controls, fire prevention and safety measures, and QA/QC hold points were observed as appropriate; test equipment used was verified to be calibrated, and data recorded was compared to that observed; required administrative approvals and tagouts were obtained prior to initiating work; limiting conditions for operation (LCO) were met while maintenance was being performed; replacement parts and materials used were properly certified; testing and calibration as necessary were completed prior to returning equipment to service; and housekeeping requirements were met.

The inspector reviewed portions of outstanding work orders for safety-related systems to insure the licensee is performing maintenance in a timely manner and that an excessive backlog is not developing. The inspector examined the used procedures for technical adequacy and the completion of work orders. The following maintenance activities were observed and reviewed in depth:

MP/0/A/7600/36      Dresser Relief Valve Bonnet Screwed To Body-Corrective Maintenance

IP/0/B/3150/02      Peak Shock Recorder and Annunciator Calibration

Based on this review and observation one violation, one unresolved item, and one inspector followup item were identified and are discussed in paragraphs 7a-c.

a. Lower Annulus Housekeeping and Posting Requirements.

The inspector entered the lower annulus with licensee personnel on May 14, 1982 to observe the calibration and maintenance of seismic instrumentation, in particular peak shock recorders.

- (1) Upon entry to the lower annulus the inspector noticed that there was no sign posted providing the housekeeping level requirements.
- (2) Inside the annulus the inspector found numerous cigarette butts and balled up cigarette packs.

Station Directive 3.11.0 Revision 7, "Housekeeping and Cleanliness," which implements 10 CFR 50 Appendix B criterion V and the accepted QA program section 17.2.5 requires that Level IV housekeeping areas be marked by prominently displayed signs and prohibits use of tobacco products.

Failure to meet Station Directive requirements described above constitutes a violation (369/82-17-03).

b. Communication between Inside and Outside the Annulus.

When individuals enter the annulus the only communication they have with the outside is with a phone which is strung from the outside. This creates a concern in that the annulus door must be closed after entrance into the annulus and, according to licensee personnel, the line has been cut in the past leaving individuals inside without outside contact.

Nuclear Station Modification (NSM) MG-656 was submitted to add a phone in the annulus and Work Request 91779 NMS has been written to perform the work. Work is expected to be performed during the next outage. Until the phone has been installed this will be an Inspector Followup Item (369/82-17-04; 370/82-12-02).

c. Problem with exiting the Lower Annulus.

The lower annulus area is posted as a high radiation area. Upon leaving the area, the inspector found it impossible to open the door without outside assistance. Operations stated that at the time this problem occurred they were running the annulus ventilation system to perform DOP and freon testing of the filters. Startup and operation of this system created a high differential pressure which make it extremely hard (if not impossible) to open the annulus door. The occurrence of this type of situation would appear to be contrary to the requirement that individual shall not be prevented from leaving a high

radiation area. Until this item can be discussed with NRC Health physics personnel it shall remain an Unresolved Item (369/82-17-05).

#### 8. Surveillance

Surveillance activities were observed throughout the inspection interval. The inspector reviewed and/or verified that procedures used conform to the technical specification (TS) requirements and had received proper licensee review and approval; that test instrumentation was properly calibrated; that the systems were removed from service and restored to service per procedure; test prerequisites and acceptance criteria were met; test data was accurate and complete; completed tests were properly reviewed and discrepancies were rectified; and tests were performed by qualified individuals. The following surveillance activities were observed in greater depth.

PT/1/A/4208/01B	Containment Spray Pump B Performance Test
PT/1/A/4208/02	NS Valve Stroke Timing (quarterly)
Work Order 108007	Retest Valve Stroke after Repair of Leak
PT/1/A/4700/10	Shift Turnover Verification
PT/1/A/4600/03A	Semi-Daily Surveillance Test
PT/1/A/4600/03B	Daily Surveillance
PT/0/A/4400/01D	Fire Pump Operability Test
PT/1/A/4204/01A	Residual Heat Removal Pump 1A Performance Test
PT/1/A/4204/01B	Residual Heat Removal Pump 1B Performance Test
PT/1/A/4209/01A	Centrifugal Charging Pump 1A Performance Test
PT/1/A/4150/08	Target Flux Difference Calculation
IP/0/B/3150/03A	Strong Motion Accelerograph Seismic Trigger Calibration
IP/0/B/3150/02	Peak Shock Recorder and Annunciator Calibration
IP/0/B/3150/04	Calibration Procedure for SMA-3 Strong Motion Acceleration System
PT/0/A/4450/08B	Control Room Area Outside Air Pressure Train B Test
PT/0/A/4450/12	V. E. Test (Nuclear Air cleaning)

Based on the above review and observation, one inspector followup item was identified.

The inspector witnessed PT/1/A/4401/01A, "Component Cooling Train A Performance Test", and reviewed PT/1/A/4204/01A, "Residual Heat Removal Pump 1A performance Test". During these tests, parts of the system were placed in an abnormal configuration. The control room operators were relied upon to take corrective actions to prevent component or system damage based upon their system knowledge and with the aid of control room indications and alarms, but without specified definitive guidance for safe equipment operation. Until the licensee reviews these procedures to insure that definitive guidance is transcribed from applicable reference documents, to prevent equipment damage and/or personnel hazard, this item will be an Inspector Followup Item (369/82-17-06).

#### 9. Significant Event Followup

On April 23, 1982, at approximately 7:50 p.m. the licensee implemented the emergency plan by declaring an unusual event due to both ESF trains being inoperable and began a unit shutdown. At 10:38 p.m. the plant was manually tripped due to a feedwater problem, which is discussed in paragraph 10a. At 2:35 a.m. on April 24, 1982 one ESF train was restored to service and the licensee secured from the unusual event. Conditions that led to the unusual event are described below.

During the surveillance test of diesel generator (D/G) 1A on April 23, 1982 the breaker would not close to allow the diesel to tie into its associated bus and at 6:15 p.m. of the same date D/G 1A was declared inoperable. At the time this occurred, centrifugal charging pump 1B was inoperable due to preventive maintenance being performed. An unusual event was declared because neither ESF train met the operability requirements. Technical Specifications (T/S) allow one hour to fix the problem or begin a unit shutdown. At 7:50 p.m. unit shutdown was commenced. D/G 1A was returned to operability at 2:35 a.m. on April 24, 1982 which allowed the licensee to secure from the unusual event.

Even though T/S required the unit shutdown, all the equipment in ESF train A, except for the D/G, could operate and be powered by normal power sources - the only piece of equipment that could not operate was the emergency power source. Cause of the failure of the breaker to close was due to wire terminations made in the local panel when they should not have been made. This caused a signal to the protective relay that the diesel was tripped on overcurrent. Improper the terminations were due to an IEA technician error. This occurrence is discussed in detail in licensee event report 82-30.

#### 10. Plant Transients, Trips and Safety System Challenges

During the inspection period, the unit experienced two transients, a reactor trip and a 45% load reduction in 21 seconds, as well as three minor transients due to digital electrohydraulic control (DEH) problems. These transients are discussed in more detail in the following paragraphs.

a. Reactor trip

On April 23, 1982 at 7:50 p.m. the licensee began a unit shutdown as required by T/S. The reason for this shutdown is discussed in paragraph 9. At 10:38 p.m. the reactor was manually tripped from a power level of approximately 25% due to loss of feedwater which caused a turbine trip. Main feedwater pump 1A tripped due to a discharge pressure setpoint being set too low. The unit was maintained at no-load temperature and pressure while IEA attempted to repair D/G 1A and centrifugal charging pump 1B. The licensee attempted to tie the unit back into the grid at 4:46 p.m. on April 24, 1982, but it immediately tripped off line. A faulty relay in the generator field relay system was found. It was repaired and the unit was tied back into the grid at 10:03 p.m. on April 24, 1982.

b. Turbine runback

On May 12, 1982 at approximately 8:39 p.m. the unit experienced a turbine runback from 50% reactor power to approximately 7%. The runback was caused by a stator water cooling problem on the main electrical generator. All systems functioned as required and neither the reactor nor the turbine tripped off line. The unit returned to 50% power by 2:00 a.m. on May 13, 1982.

c. DEH problems

The licensee is continuing to have minor problems with the turbine control system which cause load swings, but the operators and the plant react as expected to make the transients insignificant. The licensee is presently working to correct the DEH.

11. Independent Inspection

During the inspection period the inspector attended and reviewed various portions of the licensee's requalification and Senior Reactor Operator (SRO) upgrade program. The licensee is making a concerted effort to provide individuals with both an NRC license and actual plant operations experience to act in a supervisory and teaching role in their operator training program to ensure the most accurate information possible is being taught. The inspectors also attended timed tests that were being run at the McGuire simulator. These tests utilized licensed plant operators to test different formats for the emergency procedure upgrade.

Also during the inspection period the inspector reviewed the licensee's procedure for cold hydro of the Unit 2 reactor coolant system.

Based on the above review and observation no violations or deviations were identified.

## 12. Followup on TMI Items

(Closed) TMI item, 80-RD-32, NUREG 0737 item III.D.1.1, Primary Coolant Radiation Sources Outside Containment. The inspector reviewed the licensee's commitment for identifying and reducing leakage from piping systems outside containment containing radioactive fluids and gases. Procedures have been written and tests conducted on these systems. The procedures specified appropriate corrective actions. Weekly surveillance of systems will be conducted to reduce leakage to as-low-as-practical levels. Implementation, procedural adequacy and documentation to verify corrective action were not reviewed, but will be completed in a followup inspection. Based upon the review of the licensee's commitment and establishment of test and surveillance procedures, this item is closed.