



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

Report Nos.: 50-369/88-01 and 50-370/88-01

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: January 4-8, 1988

Inspector: *for Robert H. Girard*  
E. H. Girard

*26 JAN '88*  
Date Signed

Approved by: *J. B. Blake*  
J. B. Blake, Chief  
Materials and Processes Section  
Division of Reactor Safety

*Jan 26, 1988*  
Date Signed

SUMMARY

Scope: This routine, unannounced inspection was in the areas of previous enforcement matters, inservice testing of pumps and valves, and inspector followup items.

Results: No violations or deviations were identified.

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## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*N. Atherton, Production Specialist III
- \*T. McConnel, Station Manager
- \*E. McCraw, Compliance Engineer
- \*M. Sample, Superintendent of Integrated Scheduling
- \*D. Smith, Test Engineer
- \*J. Snyder, Performance Engineer

#### NRC Resident Inspectors

- \*W. Orders, Senior Resident Inspector
- \*D. Nelson, Resident Inspector

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on January 8, 1988, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings listed below. The inspector informed the licensee that they did not appear to have adequately addressed concerns expressed in unresolved item\* 369, 370/86-28-08 and that the matter appeared to represent a violation or deviation.

The Station Manager requested his Performance Test personnel to make procedural changes within two months which may resolve the inspector's concern. The inspector discussed the matter further with the cognizant Performance Engineer on January 14, 1988 and, based on this discussion, the inspector stated the matter would remain unresolved pending NRC review of the planned procedural changes and related data. Details of this matter are described in paragraph 3.a of this inspection report.

The inspector expressed concern to the licensee that Performance Test personnel had not been responsive in providing previously promised historical data in support of their position with regard to unresolved item 370/87-37-01, as described in paragraph 3.c. below. The Station Manager directed performance personnel present to obtain and review the historical data and determine if any corrective action was needed.

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\*An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

<u>Item Number</u>	<u>Status</u>	<u>Title/Reference Paragraph</u>
369, 270/86-26-08	Open	Unresolved Item - Written criteria for evaluation of erratic valve action (paragraph 3.a.)
369, 370/87-16-01	Open	Unresolved Item - IST program requirements for PORVs and block valves (paragraph 3.b.)
370/87-37-01	Open	Unresolved Item - Valve failed to operate (paragraph 3.c.)
369, 370/86-26-06	Closed	Inspector Followup Item - Valve position indication verification at auxiliary locations (paragraph 5)

### 3. Licensee Action on Previous Enforcement Matters (92702)

#### a. (Open) Unresolved Item (369, 370/86-26-08): Written Criteria for Evaluation of Erratic Valve Action

This item identified the inspector's concern that the licensee has no written criteria covering their evaluation of valve test information for identification of erratic or abnormal valve action. The licensee has a compilation of valve stroke time data accessible through computer which they state is used to aid in identifying erratic or abnormal valve operation from stroke time testing. The identification and reporting of erratic or abnormal valve operation is required by the code applicable to the licensee's valve testing, ASME Section XI (80W80).

The licensee's Performance Test Engineer had previously informed the NRC inspector that written criteria covering the use of the computer valve data base was in preparation and would be completed by the end of 1987.

During the current inspection, the inspector asked to see the licensee's written criteria for use of the data and anticipated receiving a procedure. Instead, he found that the licensee had incorporated the criteria into a training list. The criteria were not referenced or required to be utilized by requirements in any plant procedures. The inspector expressed his concern that this did not represent adequate implementation and that it represented a potential violation or deviation. The matter was discussed further

at the NRC exit meeting, during which the Station Manager directed Performance Test personnel to incorporate criteria into plant procedures within two months.

The NRC inspector discussed the matter further with the licensee's Performance Engineer and Test Engineer during a telephone call on January 14, 1988. In that conversation, the inspector stated that the matter would remain unresolved (not a violation or deviation) pending NRC review of the procedural changes directed by the Station Manager. In addition, the inspector stated the following apparent examples of inadequacies in their implementation of criteria for identifying, reporting, and evaluating valve abnormalities and erratic action that occur during stroke time testing:

- (1) There are no written procedural controls on the valve data base to ensure that:
  - The data it contains is complete and accurate
  - New data is added promptly
  - Access for making changes to the program or data base is controlled to maintain its accuracy.
- (2) There are no written procedural requirements for implementation of use of the valve data base which describe:
  - Who is responsible for identifying (and reporting) valve stroking abnormalities or erratic action
  - Who evaluates the abnormalities or erratic action and determines whether corrective action is necessary
  - Where the evaluation is documented.
- (3) Numerical criteria that have been developed by the licensee which address changes in measured stroke time are not adequately based. The criteria, which keyed to changes in stroke time of more than 25%, would fail to identify abnormalities that would be readily detected through widely accepted statistical methods.

NOTE: The inspector stated that statistically based criteria would have identified the abnormal differences that sometimes occur between computer and stopwatch timing of valves, as addressed in unresolved item 370/87-37-01 (paragraph 3.c.).

- (4) The criteria did not appear to have received expert engineering review.

- b. (Open) Unresolved Item (369, 370/87-16-01): IST Program Requirements for PORVs and Block Valves

This item expresses concern that the licensee does not provide for complete ASME Section XI testing of both their power operated relief

valves and their block valves in their inservice testing (IST) program.

In the current inspection, the inspector was informed that the valves are being tested in accordance with Section XI requirements and that a program revision would be sent to the NRC shortly to reflect this testing. The inspector verified the licensee's procedural requirements for stroke timing the block valves and stated that the item would remain open pending further review of the PORV testing and their IST program revision submittal.

c. (Open) Unresolved Item (370/87-37-01): Valve Failed to Operate.

This item identified concerns with regard to the valve stroke timing. As of the last inspection of this item in NRC Inspection 369, 370/87-40, the concerns requiring resolution were as follows:

- (1) Although valve 2RN-231 failed to indicate the correct movement to open in its first actuation during testing, the licensee considered that the valve performed acceptably. The Performance Test Engineer stated that this type of valve had a history of not tripping the second limit switch. A work request (WR) was issued to check the valve within two weeks. The NRC inspector questioned whether that long a delay in verifying correct valve operation was acceptable. The Unit was operating in Mode 1 at the time of the test and the valve in question was the decay heat removal pump 2B cooler isolation valve.
- (2) Valve stroke time tests performed with the licensee's Operator Aid Computer (OAC) yield stroke time values which, for some valves, may differ significantly (up to 10%) from stroke times obtained using stopwatches. This is because the timing for the two methods is done using indications from different limit switches. ASME Section XI (the Code applicable to this testing) requires an increased frequency of testing or corrective action when stroke time increases of as small as 25% are observed. The licensee's procedures permit stopwatch timing when the OAC is not available but they do not provide for changes in determination of stroke time increases when the different methods are used. This is an apparent procedural deficiency as it could result in the Code requirements (for increased test frequency or corrective action) not being met.
- (3) The licensee does not calibrate or otherwise provide for assurance that the accuracy of the stopwatches used for stroke timing is maintained.

With regard to (1) above, at the end of NRC Inspection 369, 370/87-37, the licensee had previously agreed to provide the NRC inspector with data supporting their contention that valves like 2RN-231 had a history of not tripping the second limit switch. The

inspector requested the data at the beginning of Inspection 369, 370/87-40 but it was never provided. The NRC inspector again asked for the data during the current inspection. The data was not provided and the inspector commented adversely on the licensee's responsiveness during the exit meeting.

The matter described in (2) above was not specifically addressed during the current inspection. However, as noted in 3.a. above, significant stroke time differences from the two timing methods would be identified as abnormalities if proper evaluation criteria were implemented.

With regard to (3) above, the inspector requested manufacturer's information describing the stopwatches used for stroke timing and asked if they were subject to any periodic maintenance checks. The inspector was informed that there was no periodic maintenance on the stopwatches. No other information was provided.

#### 4. Inservice Testing of Pumps and Valves (73756) Units 1 and 2

The NRC inspector examined the licensee's inservice testing (IST) of pumps and valves to determine whether regulatory requirements and licensee commitments were being met. The code requirements applicable to the licensee's IST are those of ASME Section XI (80W80).

The inspector's examination of IST was as follows:

##### a. Responsibilities

The inspector reviewed licensee instructions and procedures and interviewed cognizant licensee personnel to determine that the licensee had assigned responsibilities to persons and organizations for:

- (1) preparation, review, and approval of inservice testing (IST) procedures
- (2) scheduling of IST for normal and increased frequency testing
- (3) performance of testing per approved procedures
- (4) performance of post-maintenance and post-modification IST
- (5) proper certification and calibration of IST instruments

Instructions and procedures reviewed by the inspectors relative to the above were as follows:

<u>Document No.</u>	<u>Revision</u>	<u>Title</u>
SD 4.2.1	26	Handling of Station Procedures
SD 3.2.1	18	Identifying and Scheduling Plant Surveillance Testing
SD 3.2.2	0	Identifying and Performing Plant Retesting
SD 2.3.0	12	Control of Measuring and Test Equipment
SD 2.3.1	1	Performance Measuring and Test Equipment - Control and Storage

b. Procedure Control

The inspector examined the licensee's procedure controls, as described in SD 2.1.1 R28, to verify that the licensee has requirements to assure the use of the latest procedures. In addition, the inspector verified that the licensee utilized the correct revision of the test procedure in testing performed on Unit 1 Component Cooling Water pumps 1B1 and 1B2 during the NRC inspection.

c. Scheduling

The inspector reviewed the licensee's scheduling methods with the Superintendent of Integrated Scheduling to verify that the licensee's normal frequency scheduling of IST would be in conformance with the code requirements described in the licensee's IST program (Note: The NRC has not completed its evaluation and approval of the licensee's program).

d. IST Procedure Content

The inspector reviewed two of the licensee's IST procedures to verify that the procedures specify (except for items addressed by relief request or already identified as NRC items):

- (1) valid test criteria for the components being tested
- (2) pump vibration test requirements that include vibration measurement locations and data analysis requirements
- (3) requirements that pump tests be conducted at reference conditions

The procedures reviewed by the inspector were:



<u>Procedure No.</u>	<u>Revision</u>	<u>Title</u>
PT/1/A/4401/01B	Changes 0-19	Component Cooling Train 1B Performance Test
PT/1/A/4403/01B	Changes 0-28	Nuclear Service Water Train 1B Performance Test

e. Observation of Pump Test

The inspector observed IST performed on Unit 1 Component Cooling Water pump 1B2 to verify conformance with procedure PT/1/A/4401/1B requirements relative to:

- (1) test gage ranges and calibration
- (2) proper flow
- (3) test duration
- (4) location of vibration measurements
- (5) recording of required data

While observing the pump test, the inspector noted a manual component cooling valve locked in position through a chain attaching the valve handle to a cable tray. The tray did not appear to contain safety-related cables. The inspector informed operations supervision and the chain was promptly removed from the cable tray. The chaining of the cable tray to the valve was of concern because it might have caused stresses not considered in the design (under accident conditions). The inspector subsequently toured the Auxiliary Building and did not observe any additional examples of improperly chained valves. The example previously observed by the inspector was apparently an isolated instance.

f. Records Review

(1) Pumps

The inspector reviewed the licensee's completed procedure record, dated January 6, 1988, of IST performed on Unit 1 pumps 1B1 and 1B2 (per procedure PT/1/A/4401/1B) to verify that the record showed proper entries of data, test performance, calculations and evaluation of data.

(2) Valves

The inspector reviewed the licensee's computer data base to verify that the following power operated valves had been stroke timed at the required test frequencies (quarterly or cold shutdown) during 1985 through 1987:



<u>Valve No.</u>	<u>Category</u>	<u>Test Dates</u>
1KC424b*	A, B	4/22/85, 7/16/86, 11/3/86, 11/18/86, 10/11/87, 10/17/87
2KC424b*	A, B	2/27/85, 4/9/85, 7/15/85, 12/16/85, 4/4/86, 5/2/86, 11/4/86, 5/7/87
1KC425a*	A, B	4/22/85, 7/16/86, 11/3/86, 9/18/87, 10/18/87, 10/19/87
2KC425a*	A, B	2/27/85, 4/9/85, 7/15/85, 12/16/85, 4/4/86, 11/4/86, 5/7/87, 5/29/87
1RN63a*	B	4/22/85, 6/24/86, 11/12/86, 11/24/86, 11/8/87
2RN63a*	B	1/30/85#, 7/15/85#, 12/13/85#, 4/2/86#, 11/10/86#, 5/7/87
1RN64a*	B	4/22/85, 6/24/86, 11/12/86, 11/24/86, 11/8/87
2RN64a*	B	1/30/85#, 7/15/85#, 12/13/85#, 5/7/86#, 11/10/86#, 5/7/87
1RN134a	B	12/19/86, 3/16/87, 6/8/87#, 9/3/87#, 11/6/87#, 11/27/87#, 12/1/87
2RN134a	B	7/23/86, 10/23/86, 1/14/87, 4/7/87, 6/25/87, 7/1/87, 10/1/87, 12/21/87
1RN137a	B	10/14/86, 12/19/86, 3/16/87, 6/11/87#, 9/3/87#, 9/29/87#, 11/6/87#, 11/27/87#
2RN137a	B	7/25/86, 10/23/86, 1/14/87, 4/7/87, 4/28/87, 7/1/87, 10/1/87, 12/21/87

NOTES: 1. An \* beside the valve number identifies a valve required to be tested on a cold shutdown frequency. Otherwise the valves were to be tested quarterly.

2. An # beside a test date indicates the inspector verified accuracy of the test date and stroke time given in the licensee's computer data base by checking the completed procedure record.
3. The first valve number indicates the Unit (1 of 2). The two following letters indicate the system. RN is Nuclear Service Water and KC is Component Cooling.

In reviewing the pump procedures, as described in 4.d above, the inspector noted that the procedures appeared not to require an immediate comparison of pump test data with acceptance criteria. This would permit unsatisfactory pump performance to go unrecognized for several days pending an "analysis" of the data. The Performance Test Engineer assured the NRC inspector that, in practice, the test values were checked immediately after test completion and if the values indicated unacceptable pump performance the pumps were quickly declared inoperable. The inspector accepted this explanation but the matter will be examined further in routine NRC inspection of the licensee's pump testing.

Within the area inspected, no violations or deviations were identified.

5. Inspector Followup Items (92701)

(Closed) Inspector Followup Item (369, 370/86-26-06): Valve Position Indicator Checks at Auxiliary Locations.

This item identified a question as to whether or not the licensee verified proper position indication for valves at auxiliary control locations.

During the current inspection, the NRC inspector discussed the item with the licensee's Performance Test Engineer. The Test Engineer identified procedure changes that had been made to assure that valve position indicators at auxiliary control locations were correctly checked. Based on the information provided, this matter is considered closed.