UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30303

Report Nos.: 50-369/85-09 and 50-370/85-10

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: March 4-8, 1985

Inspector: C. F. Smith 4-9-85
C. F. Smith Date Signed

Accompanying Personnel: R. M. Latta, Region II

Approved by: C M Upright 4/9/85
C. M. Upright, Section Chief Date Signed
Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection entailed 70 inspector-hours on site and at Duke Corporate offices in the areas of design control, tests and experiments, and licensee action on previously identified inspection findings.

Results: One violation was identified - Failure to Specify Post Modification Testing Requirements and Acceptance Criteria.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. Barber, Quality Assurance Manager, Operations, Quality Assurance
*A. Batts, Quality Assurance Engineer, Quality Assurance
*E. Brafford, Project Engineer, Design Engineering
*G. Cage, Superintendent Operations, Nuclear Production Department
*E. Estep, Project Services Engineer, Nuclear Production Department
*C. Fish, Contract Coordinator, Nuclear Production Department
D. Franks, Quality Assurance Surveillance Supervisor, Quality Assurance
*G. Grier, Corporate Quality Assurance Manager, Quality Assurance
*P. Herran, Supervising Design Engineer, Design Engineering, Mechanical/Nuclear
W. Houston, Senior Engineer, Project Management Division, Design Engineering
J. Keirnan, Project Engineer, Design Engineering/Electrical Project Management Division
T. Ledford, Supervising Design Engineer, Design Engineering/Electrical
D. Marquis, Performance Engineer, Nuclear Production Department
*T. McConnell, Station Manager, Nuclear Production Department
*N. McGraw, Compliance Engineer, Nuclear Production Department
S. McInnis, Associate Engineer, Compliance Group, Nuclear Production Department
*R. Medlin, Quality Assurance
*D. Mendezoff, Engineering Specialist, Compliance Group, Nuclear Production Department
D. Murdock, Principal Engineer, Design Engineering/Electrical
*P. Nardoci, Licensing Engineer, Nuclear Production Department
B. Peele, Design Engineer, Design Engineering, Mechanical/Nuclear
*D. Rains, Superintendent of Maintenance, Nuclear Production Department
R. Revels, Design Engineer II, Design Engineering Mechanical/Nuclear
*T. Roberts, Quality Assurance
R. Ruth, Site Quality Assurance Supervisor
*B. Travis, Superintendent Integrated Scheduling
M. Tully, Design Engineer II, Research and Projects
D. Vass, Design Engineer II, Design Engineering/Electrical
*R. Weber, Director of Nuclear Projects

NRC Resident Inspectors

*W. Orders, Senior Resident Inspector
*P. Skinner, Visiting Senior Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on March 7, 1985, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings listed below. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

Violation, Failure to Specify Post Modification Testing Requirements and Acceptance Criteria, Paragraph 4.a.

Dissenting comments were received from licensee management concerning this violation. Licensee management stated that this responsibility has been assigned to the Nuclear Production Department by Duke Power Company.

Violation, Failure to Establish Measures for Reporting to the NRC pursuant to 10 CFR 50.59

Subsequent review by Regional Management verified that guidance for reporting design changes to the NRC in accordance with 10 CFR 50.59 is delineated in the regulations. This violation was withdrawn and licensee management was informed of this action in a telephone conversation on March 14, 1985.

Inspector Followup Item, Revision to Exempt Change Program, paragraph 4.b.

Inspector Followup Item, Revision to Nuclear Safety Evaluation Checklist, paragraph 4.c.

Inspector Followup Item, Preparation of Working Level Procedures for Technical Services Staff, Paragraph 4.d.

Inspector Followup Item, Revision to Design Engineering Department Procedure PR-160, paragraph 4.e.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Design Program (37702)

References: (a) 10 CFR 50, Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants, Criterion III

(b) Regulatory Guide 1.64, Quality Assurance Requirements for the Design of Nuclear Power Plants, Revision 2

(c) ANSI N45.2.11-1974, Quality Assurance Requirements for the Design of Nuclear Power Plants

(d) Regulatory Guide 1.33, Quality Assurance Requirements (Operations) November 1972

(e) ANSI N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

(f) 10 CFR Part 50.59, Changes, Tests and Experiments

(g) Technical Specifications Section 6.5, Review and Audit

The inspector reviewed the licensee design change program required by references (a) through (g) to verify that these activities were conducted in accordance with regulatory requirements, industry guides and standards, and Technical Specifications. The following criteria were used during the review to assess the overall acceptability of the established program:

- Procedures have been established to control design changes which include assurance that a proposed change does not involve an unreviewed safety question or a change in technical specifications as required by 10 CFR 50.59.

- Procedures and responsibilities for design control have been established including responsibilities and methods for conducting safety evaluations.

- Administrative controls for design document control have been established for the following:

  - Controlling changes to approved design change documents

  - Controlling or recalling obsolete design change documents such as revised drawings and modification procedures

  - Release distribution of approved design change documents

- Administrative controls and responsibilities have been established commensurate with the time frame for implementation to assure that design changes will be incorporated into:

  - Plant procedures

  - Operator training programs

  - Plant drawings to reflect implemented design changes and modifications

- Design controls require that implementation will be in accordance with approved procedures.

- Design controls require assigning responsibility for identifying post-modification testing requirements and acceptance criteria in approved test procedures and for evaluation of test results.

- Procedures assign responsibility and delineate the method for reporting design changes to the NRC in accordance with 10 CFR 50.59.

- Controls require review and approval of temporary modifications in accordance with Section 6 of the Technical Specifications and 10 CFR 50.59.

The documents listed below were reviewed to verify that these criteria had been incorporated into the licensee design program:

Duke Power Company Topical Report, Quality Assurance Program, Duke-1 Section 17.2.3, Revision 8

Duke Power Company, Quality Assurance Manual, Design Engineering Department

Section DEQAP, Department Quality Assurance Plan, Revision 15

Section PR-160, Nuclear Station Modification, Revision 6

Section PR-170, Design Specifications, Revision 4

Section PR-201, Variation Notice, Revision 22

Section PR-202, Design Nonconformance, Revision 7

Section PR-220, Nonconforming Item Report, Revision 15

Section PR-260, Nuclear Station Problem Report, Revision 6

Section PR-290, Nuclear Regulatory Commission Reporting Requirements, Revision 11

Section PR-400, Quality Assurance Program for Client Projects, Revision 1

Section PR-931, Design Quality Assurance Records Review, Approval and Storage, Revision 8

Design Engineering Department Manual

Section II.4.2, Station Modifications, Revised 10-01-84

Section II.4.3, Station Modification Interim Procedure for McGuire 1, Revised 10-01-84

. Section II.5.1, Design Criteria Documentation, Revised 10-01-84

Electrical Division Procedure 9.0.1, Design Process Summary, Revision 0

Electrical Design Manual, Revision 17

Nuclear Station Modification Manual

Section 4.2, Design Engineering Designed Modifications, Revision 0

Section 4.3, Station Designed Modifications, Revision 0

Section 4.4, Exempt Changes, Revision 0

Section 7.0, Administration of Nuclear Station Modifications, Revision 0

Section 7.6, Design, Revision 0

Section 7.7, Drawing Control, Revision 0

Section 8.0, Administration of Major Construction Projects, Revision 0

Section 9.0, Administration of Exempt and Temporary Changes, Revision 0

Station Directives Manual, Revised 02-20-85

Section 4.4, Modification

The inspector interviewed licensee onsite QA staff to determine the degree of involvement of QA staff members in the performance of surveillance in the functional area of plant modifications. The following surveillance reports were reviewed by the inspector:

Surveillance Report MC-84-71, Nuclear Station Modifications dated January 10, 1985. No deficiencies were identified by this surveillance. The surveillance summary states that in October 1984 the nuclear station modification program was changed to improve the modification program system. A Nuclear Station Modification Manual which clearly delegates responsibilities and introduces new forms into the program had also been prepared. Because of the "newness" of this program change, this surveillance was performed on nuclear station modifications performed prior to October 1984.

Surveillance Report MC-84-39, Station Modifications, dated September 14, 1984. This surveillance identified two deficiencies in connection with procedural non-compliance. The deficiencies were noted as having been corrected.

Surveillance Report MC-84-62, Station Modifications, Temporary Modifications and Lead Shielding, dated March 27, 1984. No deficiencies or nonconforming items were identified by this surveillance.

Surveillance Report MC-84-12, Station Modifications, Temporary Modifications. This surveillance identified one deficiency in connection with the independent verification for restoration of temporary modification. This deficiency is listed as having been corrected. One deficiency was identified and noted as not having been corrected. This concerned the determination of seismic classifications of system piping by a qualified reviewer, who is required to be a Safety Review Committee (SRC) member. Station Directive 2.10.12 was subsequently revised to delegate responsibility for determination of seismic requirements to non-SRC reviewers.

The inspector interviewed licensee management in the Engineering Design Department to verify that a quality assurance program for design had been established and documented to comply with the requirements of ANSI N45.2.11-1974.

In October 1984 the nuclear station modification program was revised. This resulted in the preparation of a Nuclear Station Modification Manual which specifies the appropriate requirements which shall be met to implement a modification at an operational nuclear station.

Additionally, the Design Engineering Department Manual was reformatted, revised, divided into two volumes, and reissued to allow a better understanding and handling of the Department Manual procedures. The licensee has established a Design Engineering Department Manual Review Committee consisting of representatives from each Division. This committee meets monthly for reviewing any proposed changes to the Department Manual for merit and for assuring appropriate interdepartmental review. Procedures have been established to assure that design activities performed by Design Engineering are carried out in a planned, controlled, orderly, and correct manner.

Specific types of modifications can be designed by the Nuclear Production Department following concurrence from Design Engineering. Nuclear Station Modification Manual Section 7.6, Design, delineates the administrative controls applicable to both Design Engineering Designed Modifications (DDMs) and Station Designed Modifications (SDMs). Additional requirements for the processing of Nuclear Station Modifications are delineated in Station Directive Section 4.4.

Nuclear Safety Evaluations are performed for DDMs and SDMs to assure that a proposed change does not involve an unreviewed safety question or a change in the Technical Specifications (TS) as required by 10 CFR 50.59. Additionally, measures have been established to control temporary modifications including the performance of a Nuclear Safety Evaluation for determination of an unreviewed safety question in accordance with 10 CFR 50.59. Station Directive (SD) 4.4.2 Revision 5 delineates the administrative controls applicable to the control of temporary modifications. The inspector reviewed a draft copy (revision 6) of SD 4.4.2 which is being revised to include a Temporary Modification Evaluation Checklist in addition to providing more prescriptive guidance for the controls of temporary modifications.

Within this area, one violation and four inspector followup items were identified and they are discussed in the following paragraphs.

a. Failure to Specify Post Modification Test Requirements and Acceptance Criteria

The Nuclear Station Modification Manual Section 7.6 states that the design of modifications is normally the responsibility of the Design Engineering Department. Section 7.6.1, Design Engineering Designed Modification (DDMs), further states that modifications designed by Design Engineering should be processed in accordance with Design Engineering Department Quality Assurance Manual Procedure PR-160 and Design Engineering Department Manual Procedure VI.E.2.

Licensee accepted QA program endorses Regulatory Guide 1.64 Revision 2 and ANSI N45.2.11-1974. Regulatory guide 1.64 paragraph C, Regulatory position and ANSI N45.2.11 Section 3.2.20 requires that test requirements including in-plant test and the conditions under which they will be performed be specified as design inputs.

The administrative controls delineated in procedure PR-160 do not address the requirements of ANSI N45.2.11-1974 Section 3.2.20 in that test requirements including in-plant tests and the conditions under which they will be performed are not provided as design inputs for station modifications designed by Design Engineering.

Additionally, licensee lower tier document Design Engineering Department Manual Section II.4.2, Station Modifications, revised October 1, 1984, does not address requirements for post modification tests and post modification test acceptance criteria.

This failure to establish measures required by the accepted QA program section 17.2.3 is identified as violation 369/85-09-01 and 370/85-10-01.

b. Revision to Exempt Change Program

Exempt changes are defined as a change to a structure, system, or component that is exempt from the requirements of Section 7.0 of the Nuclear Station Modification Manual. Exempt changes are intended to be changes to structures, systems, or components that do not require the same level of approvals, reviews, and documentation as a station designed modification (SDM) or a Design Engineering designed modification (DDM).

Nuclear Station Modification Manual Section 9.0, Administration of Exempt and Temporary Changes, delineates the requirements for changes conducted under the Exempt Change Program and provides typical examples of changes that may be performed in paragraph 9.2.1. The inspector expressed a concern at the lack of specificity contained in the program for activities that may be performed as exempt changes. Additionally, the inspector stated in a telephone conversation to licensee management on March 13, 1985, that all changes to QA Condition 1 Systems (Nuclear Safety Related) must be conducted within the controls of the nuclear station modification program as required by licensee commitments delineated in the accepted QA Program.

Licensee management stated in the telephone conversation that not all controls of the nuclear station modification program would be applicable to some activities performed on QA Condition 1 system as exempt changes. Licensee management expressed concern regarding the use of resources and the documentation requirement for changes of this type.

The licensee has previously identified the need to revise the requirements of the Exempt Change program to provide prescriptive guidance for activities to be conducted under this program. Until the program description has been delineated in appropriate documents, this is identified as Inspector Followup Item 369/85-09-02 and 370/85-10-02.

c. Revision to Nuclear Safety Evaluation Checklist

Station Designed Modifications (SDMs) are performed by qualified designers and checked by qualified design verifiers in the Nuclear Production Department. A safety evaluation is required to be performed for determination of an unreviewed safety question in accordance with 10 CFR 50.59. A qualified designer in the Nuclear Production Department originates a Nuclear Safety Evaluation Checklist form for each SDM. The checklist documents the safety evaluation for the modification including the reviews of the FSAR, Technical Specifications (TS), all appendices to the TS, and potential unreviewed safety questions. The checklist is independently reviewed by a qualified design reviewer.

The inspector expressed concern that the Nuclear Safety Evaluation Checklist does not provide a basis for the decisions reached. The checklist documents the decision that an unreviewed safety question

does not exist without documenting the specific reviews and actions taken to arrive at this conclusion.

The licensee concurred with the inspector's observations and stated that the Nuclear Safety Evaluation Checklist will be revised to provide substantiating information for the decision documented. The final form for this checklist has not been completed. The inspector understands that a narrative description of the justification for responses to questions delineated in Parts A, B, and C of the Nuclear Safety Evaluation Checklist Form will be provided.

Until the licensee has revised the Nuclear Safety Evaluation Checklist to incorporate justification for the decisions documented, this is identified as Inspector Followup Item 369/85-09-03 and 370/85-10-03.

d. Preparation of Working Level Procedures for Technical Services Department Staff

The inspector determined that the licensee has identified a need for working level instructions for staff members within the Technical Services Department. The inspector reviewed a draft copy of a table of contents of a proposed manual which addresses appropriate activities performed by this group.

Until the licensee has developed working level instructions for the Technical Services Department, this is identified as Inspector Followup Item 369/85-09-04, 370/85-10-04.

e. Revision to Design Engineering Department Procedure PR-160.

The inspector determined that the licensee has identified a need to revise engineering department procedure PR-160. This is the controlling QA procedure for Nuclear Station Modifications performed by Design Engineering and delineates requirements for processing, controlling, approving, and clearing nuclear station modifications within Design Engineering.

The changes to PR-160 is intended to address the reorganization of the Safety Review and Licensing (SRAL) group which is assigned responsibility for performing the Nuclear Safety Evaluations for DDMs. Additionally, other changes brought about by the reformatting and reorganization of the nuclear station modification program will be incorporated into the procedure.

Until the Licensee completes the revision to Design Engineering Department procedure PR-160, this is identified as Inspector Followup Item 369/85-09-05, 370/85-10-05.

5. Tests and Experiments (37703)

References:
(a) Appendix B to 10 CFR 50 - Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants

(b) 10 CFR 50.59 - Changes, Tests and Experiments

(c) Duke Power Company Topical Report, Quality Assurance Program, Duke-1-A, Section 17.2.11, Revision 7

(d) Technical Specification, Section 6.5, Review and Audit

(e) Regulatory Guide 1.33, Quality Assurance Requirements (Operations) November 1972

(f) ANSI N18.7-1976, Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants

The inspector reviewed the licensee's test and experiment program required by references (a) through (f) to verify that the program was in conformance with regulatory requirements, commitments in the application, and industry guides and standards. The following criteria were used during this review to assess the overall acceptability of the established program:

- A formal method has been established to handle all requests or proposals for conducting plant tests involving safety related components.

- Provisions have been made to assure that all tests will be performed in accordance with approved written procedures.

- Responsibilities have been assigned for reviewing and approving test procedures.

- A formal system, including assignment of responsibility, has been established to assure that all proposed tests will be reviewed to determine whether they are as described in the FSAR.

- Responsibilities have been assigned to assure that a written safety evaluation required by 10 CFR 50.59 will be developed for each test to assure that it does not involve an unreviewed safety question or a change in Technical Specifications (TS).

The documents listed below were reviewed to verify that the previously listed criteria had been incorporated into the licensee's tests and experiments program.

Administrative Policy Manual for Nuclear Power Station

Section 3.2.3, Special Testing, Revision 21

Section 4.8, Safety Related Analyses, Revision 21

Station Directives Manual, Revised 02-20-85

Section 3.2.1, Identifying, Scheduling, and Performance of Plant Testing, Revision 13 (draft copy)

Section 4.2.1, Handling of Station Procedures

The inspector reviewed licensee test and experiment program documents to determine the program scope and content. The inspector determined that a test program has been established to assure that all testing required to demonstrate satisfactory operation in service of structures, systems, and components has been identified. Additionally, all testing is performed in accordance with approved written procedures.

The inspector verified that written safety evaluations required by 10 CFR 50.59 are developed for special tests to assure that unreviewed safety questions or changes to the TS do not exist. The inspector expressed concern regarding the Nuclear Safety Evaluation Checklist used for documenting nuclear safety evaluations. This concern is addressed in paragraph 4.c where an Inspector Followup Item was identified to monitor licensee corrective action.

The inspector reviewed the following special tests to verify conformance with licensee documented program:

ID No: TT/1/A/9100/73, Procedure Title: Power Operation with Increased Tave, dates performed 11/1/83 thru 11/3/83.

ID No: TT/1/A/9100/82, Procedure Title: Dropped Rod Check, date performed 5/3/84

ID No: TT/1/A/9100/68, Procedure Title: Turbine Governor Valves Wide Open Test, date performed 8/10/83.

The inspector reviewed the nuclear safety evaluation of special test number 9100/73. The inspector determined that the basis for the decision documented in Part C of the Nuclear Safety Evaluation Checklist did not specifically address requirements of TS Section 2.0, Safety Limits and Limiting Safety System Settings. Section 2.1, Safety Limits, specifically delineates the safety limits for the combination of thermal power, pressurizer pressure, and the highest operating loop coolant temperature (Tavg).

The special test involved variation of two of the parameters delineated in TS Section 2.1 which were the highest operating loop coolant temperature Tavg and thermal power. Thermal power was estimated during the test because of inaccuracies in the power range detectors due to increased downcomer temperature. The third parameter, pressurizer pressure, was not documented

as a variable to be monitored during the test performance. Section 8.0 of the special test procedure stated that, as a prerequisite system condition, the pressurizer pressure control is in the auto mode. The inspector was informed that pressurizer pressure during the performance of the special test was as shown in TS Table 3.2-1 (DNB Parameters).

The inspector reviewed the nuclear safety evaluation for special test number 9100/82. The inspector could not determine the basis for the decision documented in Part C of the Nuclear Safety Evaluation Checklist in that references were not provided in the writeup. This example along with the one that preceds it is indicative of the inspector's concern regarding the adequacy of the Nuclear Safety Evaluation as documented on the Nuclear Safety Evaluation Checklist.

The inspector interviewed licensee management concerning actions taken upon determination that an unreviewed safety question exists. The inspector determined that once station testing personnel decide that an unreviewed safety question exists, the special test requirements are forwarded for review to Nuclear Production Department, Nuclear Safety Analysis Group. Special tests are not conducted until the unreviewed safety question determination has been resolved.

Within this area, no violations or deviations were identified.

6. Licensee Action on Previously Identified Inspection Findings (92701)

(Closed) Inspector Followup Item 369/82-34-01 and 370/82-29-01, Audited Organization Not Responding to Audit Finding in the Required Time Interval

The inspector reviewed biannual report-periodic assessment of QA Audit results, dated 10-15-84. Examination of the objective evidence contained in this document indicates that the licensee is providing responses to audit findings within the prescribed time frame.

(Closed) Inspector Followup Item 369/84-33-02 and 370/84-30-02, Two year Periodic Review of I&E Periodic Test Procedures.

The inspector reviewed McGuire action item completion documentation - sequence No. 2401-030BC, dated 2-1-85, and verified that corrective actions for completion of the two year review of I&E periodic test procedures were completed on 1-7-85 using PT/0/B/4700/04A.