



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

Report Nos.: 50-369/89-03 and 50-370/89-03

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 6-10, 1989

Inspectors: D.R. Wiseman 3/29/89
 for D. C. Ward Date Signed

J.R. Wiseman 3/29/89
 for J. R. Harris Date Signed

Approved by: J.E. Conlon 3/30/89
 J. E. Conlon, Chief Date Signed
 Plant Systems Section
 Engineering Branch
 Division of Reactor Safety

SUMMARY

Scope: This was an announced Triennial Postfire Safe Shutdown Capability Reverification and Assessment (Module 64150). The team assessed whether the licensee has a functioning configuration management program as it relates to fire protection and postfire safe shutdown capability. The inspection verified that the licensee has a program to maintain the postfire safe shutdown capability achieved during the initial validation inspection previously conducted at McGuire September 24-28, 1984.

Results: During this inspection, the NRC inspectors discussed the plant Appendix R configuration management program history with the licensee's plant and corporate staff. The licensee's responses to these discussions and the results of this assessment indicate that Duke Power has developed and implemented a design change program which considers the potential affects of plant modifications on Appendix R compliance and the postfire safe shutdown capability at McGuire.

8904200088 890406
 PDR ADOCK 05000369
 Q PNU

In general, the licensee's configuration management program as it relates to maintaining Appendix R compliance and postfire safe shutdown capability was found to be adequate. Management appears to be taking the appropriate actions to maintain Appendix R fire protection long-term compliance. Therefore, based upon the satisfactory results of this inspection, a detailed 10 CFR 50 Appendix R compliance reverification inspection for McGuire is not warranted at this time.

Strengths and weaknesses are summarized below:

Strengths:

- The licensee's procedure DC 1.04, Fire Protection Criteria for Applicability of 10 CFR 50 Appendix R Application to Oconee, McGuire and Catawba, was found to be a very comprehensive procedure and a strength in the configuration management program related to postfire safe shutdown. In addition this procedure is very "user friendly". This indicates the licensee has a clear understanding of the Appendix R concerns as they relate to controlling plant design changes.
- The licensee's approach to addressing the concerns outlined in NRC Information Notice 88-04, Inadequate Qualification and Documentation of Fire Barrier Penetration Seals, indicates a clear understanding of these fire protection issues and a commitment by the licensee's management to be responsive to NRC initiatives.

No significant weaknesses were identified in this inspection. However, the two unresolved items identified in this report may result in significant weaknesses being identified at a later date.

No violations or deviations were identified during this inspection. The following unresolved items were identified.

- Emergency Lights for Prudent and Alternate Manual Operator Actions, Paragraph 2.b.(2).
- Incorrect Fuse Installation In Class IE Circuits, Paragraph 2.d.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *G. Addis, Station Services Superintendent
- *D. Brandes, Design Engineering Fire protection
- *W. Byers, Nuclear Production/Regulatory Compliance
- *A. Daughtridge, Design Engineering Mechanical
- *J. Day, Nuclear Compliance
- *W. Matthews, Design Engineering Electrical
- *T. McConnel, Plant Manager
- *R. McIntyre, Industrial Safety Hygiene and Fire Protection
- *D. Mobley, Industrial Safety, Hygiene and Fire Protection
- *D. Murdock, Design Engineering Support
- *J. Oldham, Design Engineering Fire Protection
- *W. Reeside, Nuclear Production/Operations
- *M. Robinson, Design Engineering Mechanical
- *R. Sharpe, Nuclear Compliance
- *M. Weiner, Nuclear Production/Operations

Other licensee employees contacted during this inspection included craftsmen, engineers, operators, mechanics, security force members, technicians, and administrative personnel.

NRC Resident Inspector

*K. VanDoorn

*Attended exit interview

2. Assessment of the Configuration Management Program (64150)

Section 50.48 of 10 CFR 50 requires McGuire to comply with Sections III.G, III.J, and III.O of Appendix R, Fire Protection Program for Nuclear Facilities Operating Prior to January 1, 1979. McGuire compliance with 10 CFR 50, Appendix R, was initially verified by the NRC during an inspection conducted September 24-28, 1984.

The purpose of this inspection was to determine whether the licensee had developed and implemented a configuration management program which ensures that Appendix R compliance and the postfire safe shutdown capability is maintained over the life of the plant. If this inspection had determined that such a program did not exist or was not functioning a detailed inspection to reverify the licensee's continued compliance with the requirements of 10 CFR 50 Appendix R would have been recommended.

a. Configuration Management Program

In order to verify that the configuration management program related to Appendix R compliance and postfire safe shutdown capability was adequate, the inspectors conducted a detailed review of plant and corporate procedures governing the preparation and review of design change documents to determine:

- That these procedures include provisions that ensure all design change documents are reviewed for Appendix R compliance and postfire safe shutdown concerns,
- that these procedures provide adequate guidance for the reviewer to determine if there is impact on Appendix R compliance and the postfire safe shutdown capability, and
- that these procedures include provisions to ensure that all design change documents which do impact Appendix R compliance and postfire safe shutdown capability are incorporated into the analyses, procedures, and programs which support and implement this capability.

In addition, to verify the implementation of these procedures the inspectors selectively reviewed design change documents for modifications to those plant systems required for postfire safe shutdown.

(1) Configuration Control Procedures

Initially in their review of the design change program at McGuire, the inspectors established the methods by which a change to the plant can be made. Through discussions with plant personnel, two types of design change documents were identified.

Nuclear Station Modification (NSM)
Temporary Modification (TM)

The preparation of NSMs and TMs are administered through the Nuclear Station Modification Manual (NSMM). However, within the procedure hierarchy at McGuire there are a number of work place procedures at departmental levels which implement the NSMM requirements. The inspectors reviewed the following procedures and Duke Power Quality Assurance Manual sections (QAM) governing the preparation, review and implementation of NSMs and TMs:

<u>Procedure No (Revision)</u>	<u>Title</u>
NSSM (922/88)	Nuclear Station Modification Manual
SD 4.4.1(12)	Processing of Modifications

<u>Procedure No (Revision)</u> (cont'd)	<u>Title</u>
SD 4.4.2(9)	Control of Temporary Modifications
MPR-101(0)	Mechanical and Nuclear Division, Documentation of Design Inputs and Design Verification
PR-101(31)	Engineering Calculations/Analyses
PR-160(19)	Nuclear Station Modifications
PR-201(28)	Variation Notices
405(2/1/89)	Design Engineering Project Manual
DC-1.04(0)	Electrical Design Manual Fire Protection Criteria for Applicability of 10 CFR 50 Appendix R Application to Oconee, McGuire, and Catawba

The process of developing NSMs under these procedures can be briefly described as follows. The design process can be initiated by any plant personnel initiating a Station Problem Report (SPR) which describes the need for a plant modification identified by the individual and approved by their supervisor. SPRs are processed through the Project Services organization and are dispositioned by an accountable engineer by:

- Initiating an NSM request
- Processing an exempt change
- Sending an editorial SPR to Design Engineering for an update of design documents
- Requesting a design study be performed
- Returning the SPR to the initiator with an explanation of how it can be resolved with a work request
- Returning the SPR to the initiator with an explanation of why the problem does not warrant corrective action.

Of these SPR dispositions, only the preparation of a NSM request or design study appeared to the inspectors to have the potential of having impact on the postfire safe shutdown capability. Design studies are a formal study to investigate possible resolutions to station problems which is then implemented through a NSM.

After the NSM request is approved, the NSM is processed through the Project Services Organization where an accountable engineer is assigned and the decision is made if the design should be completed by site engineering, Station Designed Modification (SDM) or Design Engineering (DE), Design Engineering Designed Modification (DDM).

The responsibility for evaluating NSMs for Appendix R concerns and impact on the postfire safe shutdown capability is divided among the three engineering disciplines, Civil, Mechanical and Electrical, within DE. Within the DE organization all work is completed in accordance with the Design Engineering Department Quality Assurance Manual. In addition, each discipline has working level procedures to assist in their evaluations.

Design work for SDMs is completed within the site organizations such as the Nuclear Production Department (NPD) without DE assistance. However, plant procedures require the site engineer to contact the DE cognizant engineer for verbal approval for designs to be prepared as a SDM. In addition, procedures require information copies of the SDM to be provided to each DE discipline. The procedural requirements for the preparation of SDM, NSMs appeared adequate to ensure that if these types of designs had impact on Appendix R compliance and the post fire safe shutdown capability they would be readily identified.

DDMs are processed through the Project Management Division (PMD) of DE. PMD assigns a lead discipline to prepare the NSM. Within the lead discipline, a lead engineer is assigned who will have primary responsibility for preparing the NSM. In the initial phases of the design, the lead engineer establishes the important design interfaces. All NSMs prepared by DE are required to have at least one calculation prepared in accordance with procedure PR-101 for each NSM. This calculation provides the documentation of work performed. The mechanical and civil division of DE are required by MPR-101 to perform a design verification of all engineering calculations in order to ensure design work meets the intent of ANSI N45.2.11. Item 24 of the verification checklist requires the modification to be evaluated for Appendix R compliance.

The electrical division of DE has procedures DC-1.04 and EDP-9.02 which govern the review of NSMs for Appendix R and postfire safe shutdown concerns. Procedure EDP-9.02 requires that each NSM have an Appendix R review which is documented on a Fire Protection (10 CFR 50 Appendix R/SER) Review form. The criteria for completing this review is in procedure DC-1.04. The inspectors found that procedure DC-1.04 contained adequate information for the reviewer to conduct the required review. In addition, the inspectors found this procedure to be very "user

friendly" and a strength in the configuration management program.

After a NSM design work is approved, changes to the NSM are completed under the Variation Notice process. Variation Notices are required by plant procedures to be processed through the same review cycle as the original NSM.

The inspectors also reviewed the procedure for processing TMs. Although DE is not formally required to review these changes by procedure, the TM Work Request Addendum has sign offs in the Technical Evaluation section for considering fire protection and Appendix R requirements. Given the limited scope of TMs, the required sign off by the TM Qualified Designer and Qualified Design Verifier on the TM appears adequate to ensure Appendix R and postfire safe shutdown is considered for these types of changes.

Based on the review of the above procedures, it appears the licensee has adequately addressed Appendix R and postfire safe shutdown considerations in the plant design changes process.

(2) Implementation of Configuration Control Procedures

The inspectors selected a sample of plant NSMs and TMs for review to ensure the reviews required by plant procedures to determine if Appendix R compliance of the postfire safe shutdown capability were impacted and had been completed. The following plant changes were reviewed:

Change Number

NSM-00286
NSM-00751
NSM-01346
NSM-11590
NSM-11627
NSM-11790
NSM-20068
NSM-20126
NSM-20468
NSM-20478
NSM-20645
TM-5907

The inspectors found that many of these NSMs had been reviewed prior to the implementation of the now required Appendix R reviews. However, for those issued after the procedural requirements were put in effect, the required reviews were performed and documented for each NSM and the subsequent

variation notices. The inspectors found that Appendix R and postfire safe shutdown had been adequately addressed in each change package reviewed.

b. Appendix R Features

(1) Safe Shutdown Cable Separation

10 CFR 50, Appendix R, Section III.G outlines the acceptable methods for providing separation of equipment and cables necessary to facilitate plant shutdown following a fire. These methods include separation of equipment and cables by fire barriers, radiant energy shields and/or special separation and, where necessary, providing automatic suppression and detection.

During this inspection, the separation provided for redundant equipment and cables necessary for postfire safe shutdown were reviewed on a sample basis. At the McGuire plant, the licensee has provided a dedicated shutdown system to ensure the ability to shutdown following a fire. This system, the Standby Shutdown System (SSS), is for the most part independent of the normal plant systems. The exception is the use of the Turbine Driven Auxiliary Feedwater (TDAFW) pump for the purpose of removing reactor heat. To facilitate the separation of the SSS from normal plant (A and B Train) components, the licensee has divided the plant into a number of fire areas which are designated as SSS or normal shutdown (Train A or B). Table 7.2.1 of procedure DC 1.04 provides a list of fire areas and the assured method of safe shutdown. Using this table the inspectors selected a number of components necessary for postfire shutdown using normal plant system or the SSS and verified adequate separation is provided. The results of this review are summarized below.

- Component Cooling Water (CCW) Pump 1B2 (Train B) is necessary for shutdown using Train B. The inspectors reviewed the routing of power cable 1*KC624 in the following fire areas:

<u>Fire Area</u>	<u>Assured Plant Shutdown</u>
11	A
13	A

This cable is only routed through Train A shutdown fire areas. Therefore, adequate separation is provided.

- CCW Pump 1A2 (Train A) is necessary for shutdown using Train A. The inspectors reviewed the routing of power cable 1*KC622 in the following fire areas:

<u>Fire Area</u>	<u>Assured Plant Shutdown</u>
17	B
19	SSS
21	SSS

This cable is only routed through Train B and SSS shutdown fire areas. Therefore adequate separation is provided.

- Auxiliary Feedwater (AFW) suction from Nuclear Service Water header 1A valve 1CA15A (Train A) is necessary for shutdown using Train A. The inspector reviewed the routing of power cable 1*CA562 within the following fire areas:

<u>Fire Area</u>	<u>Assured Safe Shutdown</u>
21	SSS

Since SSS is the assured shutdown system for Fire Area 21, adequate separation is provided.

- CCW pump suction valve 1KC3A (Train A) is necessary for shutdown using Train A. The inspectors reviewed the routing of power cable 1*KC527 in the following fire area:

<u>Fire Area</u>	<u>Assured Safe Shutdown</u>
21	SSS

Since SSS is the assured shutdown system for Fire Area 21, adequate separation is provided.

- AFW suction from Nuclear Service Water header 1B valve CA18B (Train B) is necessary for shutdown using Train B. The inspectors reviewed the routing of power cable 1*CA545 and control cable 1*CA686 in the following fire areas:

Power Cable

<u>Fire Area</u>	<u>Assured Safe Shutdown</u>
9	A
11	A
13	SSS

Control Cable

<u>Fire Area</u>	<u>Assured Safe Shutdown</u>
9	A

These cables are routed through Train A and SSS shutdown fire areas. Therefore, adequate separation is provided.

- AFW suction from Nuclear Service Water header 1A valve 1CA161C (SSS) is necessary for shutdown using SSS. The inspectors reviewed the routing of power cable 1*CA754 and control cable 1*CA658 in the following fire areas:

Power and Control Cables

<u>Fire Area</u>	<u>Assured Safe Shutdown</u>
2	SSS
9	A
11	A

Within Fire Area 2 the raceways containing these power and control cables and the 1CA161C valve itself are protected by a one hour fire barrier and automatic suppression and detection is provided. In the other fire areas, Train A shutdown is utilized. Therefore, adequate separation is provided.

- Unit 1 and Unit 2

T COLD instrumentation for the SSS is necessary for shutdown using SSS. The inspectors reviewed the routing of Unit 1 cables 1*NC1078, 1*NC1081 and 1*NC1082 and Unit 2 cables 2*NC953, 2*NC954 and 2*NC950 in the following fire areas:

Unit 1 Cables

<u>Fire Area</u>	<u>Assured Safe Shutdown</u>
6	A
9	A
11	A

Unit 2 Cables

<u>Fire Area</u>	<u>Assured Safe Shutdown</u>
10	A
12	A
Unit 2 Turbine Bldg.	A or B
Service Bldg.	A or B

These cables are routed through Train A and Train B shutdown fire areas. Therefore, adequate separation is provided.

In addition to reviewing the above cable separation, the inspectors reviewed the routings of the control cables for Volume Control Tank (VCT) outlet valves. The inspectors evaluated if the spurious closure of these valves would have negative impact on the ability to reach safe shutdown in fire areas where Train A or Train B was being used to shutdown. However, the inspectors found that the control cables for these valves were only routed in fire areas where the SSS is the assured safe shutdown method.

All the cables examined by the inspectors were found to meet the separation requirements of 10 CFR 50 Appendix R.

(2) Emergency Lighting and Communications

The inspectors reviewed the adequacy of emergency lighting provided to meet the requirements of Appendix R, Section III.J. A walkdown with plant operators was made of the plant locations where the operator actions described in procedure OP/O/A/6100/17, Operation of the Standby Shutdown Facility, must be accomplished.

The inspectors noted that emergency lights were not provided in many locations where manual actions are required by procedure. Through discussions with DE and operations personnel the inspectors found that the licensee had only provided emergency lighting at the locations where the Safe Shutdown Analysis had determined a manual action was required. The remaining actions, not provided with lighting, were added to the operations procedure as prudent steps to prevent equipment damage or as alternative methods of operation. An example is step 2.7.3 of the procedure. In this step an operator is dispatched to the Interior and Exterior Dog Houses to throttle AFW flow from the TDAFW Pump to the four (4) steam generators. Adequate lighting is only provided for one valve 1CA-SOB, in the opinion of the inspectors. The licensee's representatives stated the remaining valves were not provided with lights since this is only an

alternative method to throttling AFW flow to the steam generators. Step 2.7.5 instructs the operator to throttle the steam supply to the TDAFW pump to control AFW flow to the steam generators. These valves are provided with adequate lighting.

The inspectors expressed concern that lights were not provided since the procedure does not identify these steps as optional. Therefore, it would appear emergency lights are required under Appendix R, Section III.J for these steps. The inspectors identified this as Unresolved Item 369,370/89-03-01, Emergency Lights for Prudent and Alternate Manual Operator Actions, and are requesting an interpretation from NRR whether emergency lighting is required for these locations.

In addition, during the walkdown of procedure OP/O/A6100/17 the inspectors verified communications between the plant locations and the SSF using portable radio's. Portable radios are identified as the primary method of communication in the procedure. Communications was tested using both the channel which is supported by the inplant radic repeater system and the channel without the repeater since the licensee had not analyzed the effects of having portions of the repeater system damaged by a fire. Communications between all locations and the SSF using the repeater system were found acceptable. However, communication between the Unit 2 TDAW pump room and the SSF could not be accomplished without the repeater. The remaining areas had acceptable communication without the repeater system.

As a followup to this finding the inspectors reviewed the repeater system design. This system is composed of a battery backed repeater with ten (10) antennas located throughout the plant. Since this system is the primary method of communication when the SSF is put into service the inspectors reviewed the cable routings between the repeater and each antenna to determine the affects of a fire on the repeater system.

The inspectors found that the cables for three antennas, SA-3, SA-5 and SA-6, passed through the Unit 1 Cable Room and the cables for two antennas, SA-3 and SA-5, passed through the Unit 2 Cable Room. For a fire in these areas the SSS is the assured safe shutdown method and the repeater system would be the primary means of communication with the SSF. The licensee had not evaluated the affects of a loss of these antennas on the communication system and agreed to test the system to evaluate this finding. Therefore this is identified as as Inspector Followup Item 369, 370/89-03-02, Review Radio Repeater System Testing.

c. Postfire Safe Shutdown Procedures

(1) Operator Training

The inspectors reviewed the training program provided on procedure OP/O/A/6100/17. This training consists of an initial classroom session conducted by the plant training department under lesson plan OP-MC-CP-AP. This training is provided as part of the License Preparation Reactor Operator (LPRO) and License Preparation Senior Reactor Operator (LPSO) programs. The training provides the operators with familiarization of the operation of the SSF. This training is part of the required training before being assigned as an RO or SRO. The classroom training supports the licensee's Test and Qualification (T&Q) program which provides the operator with on the job training on plant equipment prior to being assigned to a job. T&Q Task Numbers MO-8006 and MO-5307 provide this training on procedure OP/O/A/6100/17. This training is required to be completed by all plant operators. In addition, the plant training department had developed a classroom retraining module under lesson plan OP-MC-CP-SS which is covered every two years. This training appears adequate to ensure operators are properly qualified on postfire safe shutdown procedures.

In addition, the inspectors verified that a sample of the operators on the "A" shift had completed their T&Q training. Plant records indicated that all these operators had received the required training.

(2) Damage Control Procedures

Appendix R Section III.L.5 requires fire protection features to be provided for structures, systems and components important to safe shutdown and to be capable of limiting fire damage so that systems necessary to achieve and maintain cold shutdown are free of fire damage or can be repaired such that the equipment can be made operable and cold shutdown achieved within 72 hours. Materials for such repairs are required to be readily available on site and procedures are to be in effect to implement such repairs.

The inspectors verified that the materials outlined in plant procedure IP/O/A/3090/23, Enclosure 11.83, Fire Damage Control Equipment List, was available on site. The equipment was found stored in the site warehouse and was properly identified as fire damage control equipment.

d. Associated Circuits Review

The inspectors selected a number of fuses installed in electrical circuits and verified that the proper fuse type and rating was

installed by a walkdown. The purpose of this inspection was to ensure that the fuses analyzed in the licensee's Associated Circuits/Breaker-Fuse Coordination study were as installed in the plant. At each of the following cabinets, the fuses installed were compared to plant design specifications.

<u>Panel</u>	<u>Fuse Location</u>	<u>Design Fuse</u>	<u>Installed Fuse</u>
2ATC-264	BB1(FU)	FNQ 10AMP	FNQ 10AMP
1SMTC1-1	BCFU10	FNA 3AMP	FNA 3AMP
1STMC1-1	BCFU14	FNA 3AMP	FNA 3AMP
2ATC-2A	GA 1,2	FNA 2AMP	FNA 2AMP
2ATC-2A	GA 3,4	FNA 2AMP	FNA 2AMP
*2SMTC1	BB 5,6	FNA 3AMP	KTK 10AMP
*2SMTC1	BB 13,14	FNA 3AMP	KTK 10AMP
1ATC11	DJ 1,2	FNQ 5AMP	FNQ 5AMP
1ATC11	DJ 3,4	FNQ 5AMP	FNQ 5AMP
TB260	FU10	FNQ 2AMP	FNQ 2AMP
TB260	FU14	FNQ 2AMP	FNQ 2AMP
1ATC10	BB 1,2	FNA 5AMP	FNA 5AMP
1ATC10	BB 3,4	FNA 5AMP	FNA 5AMP

*Indicates wrong type/rating fuse installed.

The inspectors found that in panel 2SMTC1 the wrong type/rating of fuse had been installed. The Bill of Material MCBM-2792-01.01 states the fuses on the BB fuse block are all required to be FNA 3 AMP fuses. However, the inspectors found that the fuses on the BB fuse block at the following location were not correct:

<u>Fuse Location</u>	<u>Fuse Installed</u>
BB 3,4	KTK 10AMP
BB 5,6	KTK 10AMP
BB 11,12	KTK 10AMP
BB 13,14	KTK 10AMP
BB 15,16	KTK 10AMP

In addition, the inspectors checked the fuses installed on the BA fuse block in panel 2SMTC1. These fuses are required to be FNQ 10 AMP per the Bill of Materials MCB,-2792-01.01. However, the fuse installed at BA 15, 16 was found to be a KTK 10 AMP.

The licensee's staff was able to demonstrate that the incorrect fuse installation at each location did not have any affect on the Breaker/Fuse Coordination. However, the inspector expressed concern since these circuits support Class 1E equipment. Main Steam Bypass valves 2SM10 and 2SM11 on the BB fuse block and Main Steam Isolation Valve 2SM7 on the BA fuse block. Therefore, this is identified as

Unresolved Item 50-369, 370/89-03-03, Incorrect Fuse Installation in Class 1E Circuits. This item will be followed up by the resident inspector.

f. Standby Shutdown System Surveillance

The SSS is made up of equipment which is independent of normal plant systems with the exception of the TDAFW pump and associated valves. Therefore the licensee has developed a surveillance program for the SSS components which were not covered by the normal plant system surveillance program.

The inspectors reviewed the following surveillance procedures and results for the SSS:

<u>Procedure Number</u>	<u>Procedure Title/ Resulted Reviewed</u>
IP/O/B/3252/01	Steam generator level calibration performed quarterly. Reviewed tests performed July 9, 1988; November 29, 1988 and December 1, 1988.
IP/O/B/3061/20	SSF diesel generator battery recharge and equalize procedure performed quarterly. Reviewed tests performed June 25, 1988, July 7, 1988, August 5, 1988, September 2, 1988, October 4, 1988, November 4, 1988, December 2, 1988, January 6, 1989, February 3, 1989, and March 3, 1989.
PT/OB/435/35A	Weekly inspection, station auxiliary safe shutdown and power batteries. Reviewed tests performed August 6, 13, 20, 27; September 3, 10, 17, 24; October 1, 8, 15, 22, 29; November 5, 12, 19, 26; December 3, 10, 17, 24, 31, 1988; January 7, 14, 21, 28; February 4, 11, 18, 25 and March 4, 1989.
PT/2A/4209/01C	Standby makeup pump flow periodic test. Reviewed tests performed February 27, 1987; June 26, 1987; August 31, 1987; November 25,

1987; February 24, 1988; May 31, 1988; July 19, 1988; and January 6, 1989.

PT/1/A/4209/09

Standby makeup pump valve test performed when unit status is in modes 3, 4, 5 or 6. Reviewed tests performed June 13, 1984, April 24, 1985, August 22, 1986, November 20, 1987; and December 7, 1988.

The inspectors found the required surveillance were completed within the required intervals and the results were satisfactory.

3. NRC Information Notices (92703)

- a. Information Notice No. 88-04, Inadequate Qualification and Documentation of Fire Barrier Penetration Seals, February 5, 1988.

During this inspection, the inspectors asked the licensee how they had responded to Information Notice 88-04. The licensee indicated that plant configurations are controlled by mechanical maintenance procedure which is based on Design Engineering Specifications MCS-1390.01-00-0056 (Electrical) and MCS-1206.03-0001 (Mechanical). Penetration seals arrangements allowed by these specifications are based on fire test results conducted by Southwest Research Institute and Chemtrol Corporation. Design Engineering reviewed the test results and found the specifications were based on the valid test results. One variance was identified and modified to meet tested or analyzed arrangements.

Testing of the electrical penetrations consisted of a nine foot by six foot opening in a concrete slab containing eleven cable tray assemblies installed by Southwest Research Institute and a silicone penetration seal installed by Duke Power Company and Chemtrol Corporation, was exposed to the Standard ASTM E-119-76 Time/Temperature curve for three hours as specified by Duke Power Company. The test furnace was modified so that an enclosure could be installed over the unexposed side to allow for a continuous negative pressure of one inch of water. This imposed a more severe exposure factor on the penetration slab. Upon completion of the three hour exposure period, the test slab was lifted, remaining horizontal, and subjected to the Nuclear Mutual Limited (NML) hose stream test.

Testing of the mechanical penetrations consisted of a series of eight penetration opening cast into the test slab. Six penetrations consisted of conduit pipe openings and two consisted of large cable tray openings. The conduit openings were both 12 inch and four inch in diameter. All penetrations were cast into an 8 foot x 10 foot x 12

inch thick concrete slab. Penetration construction consisted of ten inches of silicone foam material with one inch of fiber damming a large opening (42 x 80 inches) and in some pipe sleeves. The purpose of the test was to obtain a three-hour fire rating for referenced seal design in accordance with ASTM E119-76 time/temperature requirements and a negative pressure of one inch of water on the exposed side. The test slab was placed on a horizontal furnace and exposed to the Standard ASTM E119/Temperature curve. After three hours the test slab was lifted in a horizontal position for the hose stream test and then moved to an area adjacent to the furnace, where it was put on blocks to cool and view.

In following up on this item the inspectors walked down and looked at cable tray and mechanical penetrations in the Unit 1 cable room, Unit 1 switchgear room, Unit 1B switchgear room, Unit 2B switchgear room, Unit 2 penetration room, Unit 2 cable room, and common areas of the auxiliary building.

Based on this review, it appeared that the licensee had adequately addressed the concerns outlined in IN 88-04.

4. Followup on Previously Identified Items (92700 and 92701)

- a. (Closed) IFI 369, 370/86-24-02, Inadequate Mechanical Protection Provided for Battery Room Sprinkler Systems. Sprinkler protection is provided in the Unit 1 and Unit 2 battery room area (Fire Area 13) over the floor pipe trenches. These sprinkler heads are located approximately five feet off the floor and were therefore subject to mechanical damage.

In response to this finding the licensee provided guard cages over each sprinkler head in this area. This will be adequate to protect the heads from mechanical damage.

- b. (Closed) Licensee Event Report 369/87-22-01, A Fire Barrier Blanket was Breached Without Compensatory Action Due to Personnel Not Recognizing the Blanket as a Fire Barrier.

On September 21, 1987, during an annual fire protection audit, a breached fire blanket was discovered. The fire blanket covered an auxiliary feedwater CA pressure switch. It was determined that the breach occurred on September 12, 1987, when Instrument and Electrical personnel, who were unaware the blanket was a fire barrier, cut the blanket to perform preventative maintenance. The cause of the event was attributed to management deficiency because no training had been given to the technicians to enable them to recognize the covering as a fire barrier. Placards were attached to the fire blankets over the instrumentation in both Units 1 and 2 CA rooms identifying them as fire barriers. Training was modified to emphasize recognizing fire

barriers. Instruments which have fire blanket coverings will be identified on their preventative maintenance/periodic test work requests as such to aid in identifying this type of fire barrier. During this inspection the inspector walked down the Unit 2 and Unit 1 Turbine Driven CA pump room and verified that proper repairs had been made and the identification placards were in place.

- c. (Closed) Licensee Event Report No. 369 88-30-01, Capped Spare Sleeves through Fire Barrier Penetrations were not Qualified as Three Hour Fire Barriers - Design Deficiency. Immediate corrective actions included declaring the 96 spare sleeves inoperable and security personnel established fire watches and CMD personnel posted fire watch tags in the affected areas. Corrective actions included installation of foam or a second pipe cap on the affected fire barrier penetration sleeves. Project personnel initiated McGuire Exempt Variation Notice No. 1453 to revise the Electrical Installation Specification MCS-1390.01-00-0056 to require double ended capping of those empty pipe sleeves when capping is appropriate. All 3/4 O.2. Gedney seals were deleted from stock using requisition 7320 89 0398 and placed in surplus stock. New O.Z Gedney seals were ordered specifying one inch gromets only. Procedure M/P/O/A/7650/64 was revised to require double ended capping of spare circular openings when capping is appropriate. During this inspection the inspectors verified that foam had been installed in the pipe sleeves and that double ended capping of spare pipe sleeves was installed where required.

5. Exit Interview

The inspection scope and results were summarized on March 10, 1989, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results listed above. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

<u>Item Number</u>	<u>Description and Reference</u>
369,370/89-03-01	URI - Emergency Lights for Prudent and Alternate Manual Operator Actions, Paragraph 2.b.(2).
369,370/89-03-02	IFI - Review Radio Repeater System Testing, Paragraph 2.b.(2).
369,370/89-03-03	URI - Incorrect Fuse Installation In Class IE Circuits, Paragraph 2.d.