



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

Report Nos. 50-369/92-01 and 50-370/92-01

Licensee: Duke Power Company  
12700 Hagers Ferry Road  
Huntersville, NC 28078-8985

Facility Name: McGuire Nuclear Station, Units 1 and 2

Docket Nos.: 50-369 and 50-370

License Nos.: NPF-9 and NPF-17

Inspection Conducted: January 27 - 31, 1992

Inspector: W. H. Miller, Jr.  
W. H. Miller, Jr., Project Engineer

2-13-92  
Date Signed

Approved by: G. A. Belisle  
G. A. Belisle, Section Chief  
Division of Reactor Projects

2/10/92  
Date Signed

SUMMARY

Scope: This routine inspection was conducted to evaluate the plant's fire protection/prevention implementation program.

Results: Within the area examined no violations or deviations were identified.

The following strengths and weaknesses were identified:

Strengths:

- Strong fire protection engineering technical expertise is available from site Design Engineering Group and is frequently utilized (Paragraph 2.a).
- Secondary fire brigade organization (Paragraph 2.e(1)).
- Restoration of fire protection impairments is generally performed in a timely manner (Paragraphs 2.b).

Weaknesses:

- Quality Assurance audits of the fire protection program at McGuire are comprehensive and detailed. However, corrective action is not consistently implemented to correct potential problems identified by the audits (Paragraph 2.f).

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*K. Bostian, Fire Protection Specialist
- \*F. Fowler, Health and Human Resources Manager
- \*G. Gilbert, Safety Assurance Manager
- B. Hamilton, Superintendent of Operations
- \*T. McConnell, Station Manager
- T. McMeekin, Vice President, McGuire Site
- \*D. Mobley, Safety and Health Services Manager
- \*K. Mullen, Compliance Engineer
- \*J. Oldham, Fire Protection Engineer, Design Engineering
- \*N. Pope, Superintendent of Maintenance
- \*R. Sharpe, Compliance Manager

Other licensee employees contacted included craftsmen, technicians, operators, mechanics, security force members, and office personnel.

#### NRC Resident Inspectors:

- \*K. VanDoorn
- \*T. Cooper

\*Attended exit interview

### 2. Fire Protection/Prevention Program (64704)

The inspector evaluated the overall adequacy and implementation of the licensee's Fire Protection Program. The fire protection program is described in the licensee's Final Safety Analysis Report and in the document entitled, "McGuire Nuclear Station Fire Protection Review".

#### a. Fire Protection Organization

The Health and Human Resources Manager, who reports to the Site Vice President, has the overall responsibility for the McGuire fire protection program. This responsibility has been assigned to the Safety and Health Services Manager who is under the supervision of the Health and Human Resources Manager. A Fire Protection Specialist and two Safety Specialist assigned to the Safety and Health Services group, with assistance from the site Design Engineering group, develop and maintain the station's Fire Protection Program procedures and policies. Actual implementation of the program is accomplished by various plant groups such as maintenance, operations and the Construction and Modification Division (CMD). These groups

have received special training in this program. The site safety staff, with strong support from the Design Engineering group, is conscientious and in general appears to be effectively coordinating the implementation of the fire protection program. A new program oversight committee, called the Fire Protection Working Group, has recently been formed to review and coordinate the implementation of the program. This group is composed of representatives from operations, maintenance, quality assurance, CMD, safety and Design Engineering. The group plans to meet quarterly. It met once in 1991 and is scheduled to meet again in February 1992. The group is not yet fully functional, but has the potential to be a program strength. Presently, the strong fire protection technical support available and frequently provided by the Design Engineering group is considered a program strength.

Operability of the fire protection and detection systems is controlled by operations and verified through surveillance tests and inspections performed by the maintenance, performance, safety and operations groups. The issuance of "Hot Work" permits is by the maintenance and CMD groups who have been trained to perform this function. However, personnel who initiate the "Hot Work" permits do not receive any formal specialized training for this function or in the fire hazards associated with welding, cutting and grinding. Duke's Nuclear Production Fire Protection Training and Qualification manual indicates this training subject should be considered at each of the Duke nuclear sites. A commitment was apparently not made to the NRC to provide this training. The licensee is presently reevaluating this policy.

b. Administrative Procedures

The following procedures describe and implement portions of the plant's Fire Protection Program:

<u>Procedure</u>	<u>Title</u>
Station Directive 2.11.1	Fire Brigade Organization and Training (Rev. 20)
Station Directive 2.11.2	Fire Protection and Surveillance (Rev. 11)
Station Directive 2.11.3	Control of Combustible Materials (Rev. 13)
Station Directive 2.11.4	Fire Protection Equipment Impairment Reporting and Action (Rev. 5)

Station Directive 2.11.5	Tech Spec Fire Barriers (Rev. 5)
Station Directive 2.11.6	Station Requirements for Temporary Structures (Rev. 4)
MP/O/B/7650/09	Ignition Sources (Cutting, Welding, Grinding, Bolt Heating and Open Flame Safety) (Rev. 10)

These procedures were reviewed and found to conform to the NRC guidelines or commitments made to the NRC, except for the specified frequency for fire drills. Station Directive 2.11.1 was recently revised to require shift fire brigade drills to be performed every 90 days with a plus or minus 21 days grace period for each shift. The commitment made to the NRC was for fire brigade drills to be performed each quarter. The NRC guidelines require quarterly fire drills, but also state that the time between the drills for each shift brigade should not exceed three months. The licensee agreed to revise this procedure to conform to the NRC guidelines. These revisions are scheduled to be completed by February 29, 1992 and will resolve the inspector's concerns in this area.

The Fire Protection Equipment Impairment Log entries for 1991 were reviewed. A total of 38 impairments, were recorded for 1991. Most of these impairments, with the exception of non-essential equipment/systems such as the fire protection system jockey pump, were restored to service within one day following impairment identification. Based on this review, it appears that when fire protection equipment/systems are found degraded or inoperable, a high priority is assigned to promptly return these systems to service.

#### c. Surveillance of Fire Protection Features

The following surveillance test procedures were reviewed to verify compliance to the fire protection operability requirements of the fire protection systems formerly included in the Technical Specifications (TS) but now included in the McGuire Selected Licensee Commitments Manual which is Chapter 16 of the FSAR.

<u>Procedure</u>	<u>Title</u>
PT/O/A/4400/10	Main Fire Pump Test (Rev. 8)
PT/O/A/4600/16A	Fire Detection System Operability Test (Rev. 2)
PT/1/A/4400/01N	Halon 1301 System Periodic Test (Rev. 16)
PT/1/A/4700/42	SLC Fire Hose Station Valve Operability Test (Rev. 1)

PT/2/A/4700/43 SLC Fire Hose Station Valve Operability Test  
(Rev. 1)

No discrepancies were identified.

d. Fire Protection Surveillance Testing

The following completed test procedures were reviewed to verify that the tests were performed in accordance with the test procedures and within the required frequency:

<u>Procedure No.</u>	<u>Title</u>	<u>Dates Performed</u>
PT/0/A/4400/10	Main Fire Pump Test	9-13-90 and 9-11&17-91
PT/0/A/4400/17	Fire Pumps A and B Operability Test	7-11-91, 8-13-91, 9-13-91, 10-11-91, 11-12-91, 12-11-91 and 1-16-92*
PT/0/A/4400/18	Fire Pump C Operability Test	7-25-91, 8-26-91, 9-27-91, 10-25-91, 11-26-91 and 12-26-91
PT/0/B/4600/15	Fire Detection Monthly Test	7-30-91, 8-29-91, 9-25-91, 10-21-91, 11-18-91 and 12-17-91
PT/1/A/4400/01L	Unit 1 Fire Protection Containment Header Test	11-21 & 22-88, 5-12-90 and 11-27 & 12-3-91
PT/0/A/4400/01C	Fire Protection System Monthly Test	8-1 to 7-91, 9-2 to 5-91, 10-1 to 7-91, 11-1 to 6-91, 12-2 to 6-91 and 1-2 to 7-92
MP/0/A/7200/13	Auxiliary Feedwater Pump Halon System Weight Check	5-24-91 and 11-26 to 28-91
MP/0/A/7200/49	Diesel Generator Halon System Weigh Check	11-21&22-90, 5-22-91 and 11-20-91

\*Pump A only. Pump B was out of service for maintenance.

All inspections and tests were completed within the time specified by the Selected Licensee Commitments Manual or within the permitted grace period.

e. Fire Brigade

(1) Organization

Two fire brigades, composed of operations, maintenance, health physics and other shift personnel, are provided. The brigade required by the Technical Specifications which is the primary brigade is composed of at least five operations personnel on each shift. A total of 169 people are on the fire brigade of which 116 are from operations. The remaining personnel are from other shift work groups such as maintenance, chemistry, etc. The average number of fire brigade members assigned to each shift is 21 people from operations for the primary brigade and 9 from other work groups who are assigned to the secondary brigade.

The fire brigade Captain is normally one of the unit supervisors or one of the assistant shift supervisors. The remaining primary fire brigade members are non-licensed operators. One security officer and other plant staff personnel, such as maintenance and health physics personnel, normally respond if required.

The secondary or backup fire brigade is composed of plant staff personnel from work groups other than operations. This brigade receives the same training as the primary brigade and responds to fires and alarms as conditions warrant. This brigade is not an NRC commitment but offers additional defense in depth and is considered a program strength.

The primary fire brigade assignments for the following shifts and dates were reviewed to verify that qualified personnel were assigned:

<u>Shift A</u>	<u>Shift B</u>	<u>Shift C</u>	<u>Shift D</u>	<u>Shift E</u>
12/26-29/91	12/12-15/91	1/2-3/92	12/16-19/91	12/12-15/91
1/13-16/92	12/30-1/1/92	1/13-16/92	1/9-12/92	1/16-19/92
1/24-26/92	1/23-26/92	1/20-23/92	1/27-28/92	1/26-29/92

No discrepancies were noted.

## (2) Training and Drills

A review of the training records for the fire brigade members indicated that the training, drill, respiratory and physical examination requirements for each member met the established site training requirements.

The inspector reviewed the shift drills for 1991 and verified that at least one fire drill had been conducted for each shift per quarter. It was noted that the time between several drills exceeded the 3 month interval of the NRC guidelines. The licensee is taking appropriate action to resolve this problem. Refer to paragraph 2.b for details.

## (3) Fire Brigade Equipment

The fire brigade turnout gear and equipment are stored in fire brigade equipment cabinets in three locations. The following list contains the location and principle equipment provided:

<u>Equipment</u>	<u>Unit 1 Turbine Building-760'</u>	<u>Unit 2 Turbine Building-760'</u>	<u>Control Building</u>
Turnout Gear(1)	10	10	30
SCBA(2)	9	6	10
SCBA Tanks	30	15	
Smoke Ejector	3	3	
Foam Equipment	1(3)	1(4)	
2 1/2" Hose	200'	200'	
1 1/2" Hose	1000'	2000'	
Deluge Set(5)	1	1	
Radios	1	1	1
Other(6)	yes(7)	yes	

- NOTES:
- (1) Turnout gear includes complete sets of coats, pants, helmets and gloves.
  - (2) Self contained breathing apparatus (SCBA).
  - (3) Foam cart with 32 gallons of foam and discharge nozzle.
  - (4) High expansion foam equipment with 30 gallons of foam.
  - (5) Master stream nozzle assembly.
  - (6) Other equipment includes miscellaneous nozzles, rope, axes, forcible entry tools, etc.



(7) Location of air compressor to refill the SCBAs.

The brigade equipment was in good condition and appeared to be well maintained.

(4) Fire Fighting Preplans

A total of 36 fire fighting (pre-fire plans) strategies are provided for the safety related plant areas of the plant. Each of these strategies address the fire potential, area location, means of fire brigade approach, fire protection equipment available, fire brigade action, special instructions and hazards to be considered, operational considerations and communications available.

The following strategies were reviewed during this inspection:

- Pre-Fire Plan 1                      ND/NV (RHR and Chemical and  
Volume Control Systems) Pump  
Rooms
- Pre-Fire Plan 6                      DG1B (Unit 1, B Diesel Generator  
Room)
- Pre-Fire Plan 19                      Unit 1 Cable Spreading Room

These plans satisfactory address the areas of concern.

(5) Fire Drill

Due to both units being shutdown and the high priority work in progress, a fire brigade drill was not conducted during this inspection. To evaluate drill performance, the drill critique data for the following three drills was reviewed by the inspector.

- April 11, 1991, at 1:46 a.m., Shift B.  
New Chemistry Laboratory.
- September 7, 1991, at 4:20 p.m., Shift D.  
Operations/Safety and Health Services Facility.
- October 20, 1991, at 10:30 a.m., Shift A.  
Radiation Protection Separator Sorter Trailer.
- November 4, 1991, at 9:30 a.m., Shift A. Turbine  
Building of Unit 2, 739' elevation, Vacuum Repair  
Shop.



Based on this review, the overall response and participation for these drills were satisfactory. Following each drill, an exercise critique was conducted to discuss the drill, participants performance and recommendations for improvements.

f. Fire Protection Quality Assurance Audits

The most recent fire protection quality assurance (QA) annual, triennial and 24 month audits required by TS Section 6.5.2.9 were reviewed by the inspector.

Audit NP-89-23(MC), conducted from August 21 - September 1, 1989, was the most recent three year independent audit of the fire protection program. This audit identified three follow-up items, two observations and two recommendations. The inspector verified that appropriate corrective action had been taken to resolve these items.

Audit NP-91-13(MN)(GO)(WL), conducted July 29 - August 8, 1991, was the most recent combined annual and 24 month audit of the fire protection program. This audit identified one finding and four observations. The observations are items which should be corrected before they become a problem or a finding. A finding is similar to an NRC identified violation. The inspector verified that appropriate corrective action had been taken on the finding; however, for the observation items, corrective action had not been implemented. Furthermore, it appeared that no one had been assigned the responsibility to resolve these concerns. Refer to paragraph 2.g for additional information on this item.

In general, the fire protection QA audits are detailed, comprehensive and have identified good issues and problems that needed resolution. It appears that corrective action is usually promptly implemented on the audit findings. However, it appears that corrective action is not initiated on items which are identified as potential problems such as audit concerns or observations. These items have the potential to lead to program problems. The inability of the licensee to correct these concerns or observations is considered a weakness.

g. Plant Tour

A general plant walkdown inspection was performed by the inspector to verify: acceptable housekeeping; compliance with the plant's fire prevention procedures such as "Hot Work" permits and transient combustibles; operability of the fire detection and suppression systems; and, installation and operability of fire barriers, fire stop and penetration seals (fire doors, dampers, electrical penetration seals, etc.).

Within the areas inspected, the general housekeeping was satisfactory, considering that Unit 2 was in a refueling outage and Unit 1 was in a maintenance outage to repair a leak in a steam generator. The housekeeping for areas containing potential lubrication oil and diesel fuel leaks, such as the diesel generator rooms, appeared to be properly controlled by frequent wiping down of the equipment to remove excessive leakage and the use of oil absorption materials to catch and absorb the oil from the leaks. The oil absorption materials appear to be replaced at frequent intervals. The control of other combustible and hazardous materials and flammable and combustible liquids and gases was also satisfactory.

Three in-process "Hot Work" operations, involving welding and grinding, were observed. These operations were being performed in the Turbine Building. A "Hot Work" permit had been issued for each operation and the appropriate fire prevention controls were established and implemented.

The station fire pumps were inspected and two of the three pumps were found to be in service. This met the station fire protection operability requirements as outlined in the Selected Licensee Commitment manual. Fire pump B was tagged out of service to repair a recirculation valve on January 13, 1992, and was scheduled to be returned to service by early February. This down time was longer than normally anticipated for important fire protection components and was attributed to unavailable repair parts. Otherwise, the fire pumps appeared to be satisfactorily maintained.

The following fixed fire protection extinguishing systems were inspected to determine if the systems were operable and properly maintained:

- Halon Systems for Units 1 and 2 Diesel Generator Rooms
- Halon System for Unit 1 Turbine Auxiliary Feedwater Pump
- Halon System for Unit 2 Turbine Auxiliary Feedwater Pump
- Sprinklers for RHR Pump Rooms; Valves 1RF-917, RF-915, 1RF-923 and 1RF-921
- Sprinklers for Charging Pump Rooms; Valves 1RF-925, 1RF-927, 1RF-929 and 1RF-931
- Sprinklers for Nuclear Service Water Pumps; Valve 1RF-940
- Sprinklers for Corridor Elevation 695'; Valve 1RF-1127
- Sprinklers for Unit 1 Auxiliary Feedwater Pumps; Valve 1RF-935

- Sprinklers for Unit 2 Auxiliary Feedwater Pumps; Valve 1RF-938
- Sprinklers for Component Cooling Water Pumps; Valve 1RF-948
- 1-Hour Fire Wrap for one cable raceway in Unit 2 Auxiliary Feedwater Pump Room
- 1-Hour Fire Wrap for two cable raceways in Unit 1 Auxiliary Feedwater Pump Room
- 3-Hour Fire Wrap for two cable raceways in ETB Switchgear Room

These systems were all in service and appeared to be well maintained.

The inspector reviewed the Fire Protection System Console which is located in the control room. This console is a computer monitor which provides audible and visual annunciation and identification for all alarms received from the various fire detection and suppression systems and panels located throughout the plant site. This console utilizes computer screen window menus which require the use of a computer "mouse" to locate the location and type of alarm received. This system appeared to be complex and require special training in order for the control room operators to effectively use the system. The annual Fire Protection Audit, Audit NP-91-13(MN), completed August 8, 1991, identified this (Observation NP-91-13(MG)(09)) as an area in need of improvement and suggested that additional training be provided to increase the operator's ability to ascertain and acknowledge alarms in a timely manner. However, as of the date of this inspection no corrective action had been initiated.

The inspector performed an inspection of the electrical equipment required to implement procedure IP/O/A/3090/23, Fire Damage Control Procedure. Most of this equipment is stored in a wooden storage container located in the warehouse inside the protected area. The equipment was labeled and appeared to be properly stored. However, the licensee does not have a procedure to indicate the quantity of equipment or components required to be maintained. The electrical cables required by the procedure are stored on cable reels beneath an open storage shed in a locked fenced storage yard located outside the protected area. Some of these cable reels are constructed of wood and are not fully protected from the weather elements. The reels at one time were provided with identification signs and labels, but these are either no longer in place or have deteriorated from exposure to the weather and are no longer clearly legible. Although these cables have been stored in reserve as part of the Appendix R fire damage control equipment for approximately 6 years, site personnel are available who know the location of and purpose for

the e cables. This concern was identified as Observation Item NP-91-13(MG)(12) during the licensee's annual Fire Protection Audit which was completed on August 8, 1991; however, no action had been taken to correct this potential problem.

The failure to initiate appropriate action to resolve potential problems identified during licensee's Fire Protection Program audits is identified as a program weakness.

Within the areas inspected no violations or deviations were identified.

### 3. Exit Interview

The inspection scope and findings were summarized on January 31, 1992, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection results. 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.