U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-317/84-04
50-318/84-04

Docket No. 50-317
50-318

License No. DPR-53
DPR-69 Priority -- Category C

Licensee: Baltimore Gas and Electric Company
P. O. Box 1475
Baltimore, Maryland 21203

Facility Name: Calvert Cliffs Nuclear Power Plant, Units 1 and 2

Inspection At: Lusby, Maryland

Inspection Conducted: February 7-8 and March 26-30, 1984

Inspectors: D. L. Gregg for 4-26-84
S. Pullani, Fire Protection Engineer date

Also participating and contributing to the report were:

R. Eberly, Chemical Engineering Branch, NRR

N. Fioravante, Auxiliary Systems Branch, NRR

E. MacDougall, Electrical System Specialist, BNL

A. Singh, Auxiliary Systems Branch, NRR

H. Thomas, Mechanical System Specialist, BNL

Approved by: Clifford J. Anderson 4/30/84
C. Anderson, Chief, Plant System Section date

Inspection Summary: Inspection on February 7-8 and March 26-30, 1984 (Combined Report No. 50-317/84-04 and 50-318/84-04)

Areas Inspected: Special, announced inspection of the licensee's efforts to comply with the requirements of 10 CFR 50, Appendix R, Section III.G., concerning fire protection features to ensure the ability to achieve and maintain safe shutdown in the event of a fire. The inspection involved 280 inspector hours onsite and 70 inspector hours in-office.

Results: No violations, deviations, or other unacceptable conditions were identified.

DETAILS

1. Persons Contacted

1.1 Baltimore Gas and Electric Company (BG&E)

+*D. Buffington, Fire Protection Specialist
*P. Callanan, Auditor - Internal Audit/Programs
+*R. Denton, General Supervisor - Technical Services
P. Hebrank, Senior Electrical Engineer
+ R. Hunt, Senior Engineer
+*P. Katz, Principal Project Engineer
*R. Kent, Manager - Project Management Department
+ J. Lagiewski, Quality Assurance Specialist
+ D. Latham, Principal Engineer - Operational Licensing and Safety
+*D. Martini, Associate Engineer
*L. Mauk, Construction Administrator - Project Management
+*J. McVicker, Engineer
+*B. Montgomery, Licensing Engineer
+ P. Pieringer, Operations Engineer
+ G. Powell, Fire Protection Engineer
+ B. Proctor, Engineer - Technical Support
*L. Russel, Plant Superintendant
+*L. Salyards, Senior Engineer - Licensing
+*K. Sebra, Principal Engineer
R. Stark, Electrical Design Engineer
+ A. Thornton, Principal Engineer - Nuclear Plant Engineering
G. Wolf, Senior Engineer - Technical Support
C. Yoder, Instrumenation and Controls Design Engineer

1.2 Nuclear Regulatory Commission (NRC)

+*C. Anderson, Chief, Plant Systems Section
+*R. Architzel, Senior Resident Inspector
*R. Froelich, Human Factors Engineer
+*D. Jaffe, Project Manager, Operating Reactor Branch - 3
*A. Krasopoulos, Reactor Engineer
+*L. Whitney, Reactor Operations Engineer

+ Denotes those present at the management meeting on February 8, 1984 (see section 4 of this report)
* Denotes those present at the exit meeting on March 30, 1984

2. Purpose

This inspection was to ascertain that the licensee is in conformance with 10 CFR 50, Appendix R, Section III.G, including exemptions approved by the Office of Nuclear Reactor Regulation (NRR).

3. Background

10 CFR 50.48 and 10 CFR 50, Appendix R became effective on February 17, 1981. Section III.G of Appendix R requires that fire protection be provided to ensure that one train of equipment necessary to achieve and maintain safe shutdown remains available in the event of a fire at any location within a licensed operating facility. For hot shutdown conditions, one train of the systems necessary must be free of fire damage (III.G.1.a). For cold shutdown conditions, repair is allowed using in place procedures and materials available onsite with the provision that cold shutdown be achievable within 72 hours of the initiating event (III.G.1.b). Section III.G.2 lists specific options as follows to provide adequate protection for redundant trains of equipment located outside of the primary containment:

- Separation by a fire barrier having a three hour rating (III.G.2.a).
- Separation by a horizontal distance of at least 20 feet with no intervening combustibles and with fire detection and automatic fire suppression installed in the fire area (III.G.2.b).
- Enclosure of one train in a fire barrier having a one hour rating in addition to having fire detection and automatic suppression installed in the fire area (III.G.2.c).

For non-inerted primary containment, Section III.G.2 specifies one of the above three protection options, or any of the following:

- Separation by a horizontal distance of at least 20 feet with no intervening combustibles or fire hazards (III.G.2.d).
- Fire detection and automatic fire suppression installed in the fire area (III.G.2.e).
- Separation of redundant trains by a non-combustible radiant energy shield (III.G.2.f).

If the protection required by Section III.G.2 is not provided or the systems of concern are subject to damage from fire suppression activities, Section III.G.3 of the rule requires that an alternate or dedicated shutdown capability be provided which is independent of the area of concern. Any alternate or dedicated system requires NRC review and approval prior to implementation.

For situations in which fire protection does not meet the requirements of Section III.G, however, such protection is deemed to be adequate by the licensee for the specific situation, the rule allows the licensee to request an exemption on a case-by-case basis. Such exemption requests are submitted to the NRC for review and approval and must be justified by the licensee on a technical basis.

4. Correspondence

All correspondence between the licensee and the NRC concerning compliance with Section III.G was reviewed by the inspection team in preparation for the site visit. Several items of correspondence were of particular importance with respect to their impact on the inspection.

The NRC, in its pre-Appendix R fire protection Safety Evaluation Report (SER) dated September 14, 1979, requested that the licensee install alternate shutdown capability independent of the cabling and equipment in 9 specific plant areas (control room, 2 cable spreading rooms with their adjoining cable chases, and 6 cable chases) and other plant areas where "redundant cabling/equipment required for safe shutdown cannot be separated by fire barriers of appropriate ratings." The licensee by letter dated May 14, 1982, committed to provide the required alternate shutdown system. The letter also indicated that the necessary procedures will be in place and the manpower requirements will be met by the implementation date for the alternate shutdown system. The letter also stated that other areas of the plant not required to have an alternate shutdown system would comply with the requirements of Section III.G.2 of Appendix R unless an exemption request has been approved by the NRC.

By submittals dated March 19, 1981; May 18, 1981; September 30, 1981; January 29, 1982; May 14, 1982; and September 7, 1982; the licensee described proposed modificatons to the Calvert Cliffs plant, Units 1 and 2, to meet the requirements of 10 CFR Part 50, Appendix R, Items III.G.3 and III.L. The licensee also responded to staff requests for additional information transmitted to the licensee by letters dated February 20, 1981, and August 6, 1982. Additional information and clarification was obtained through telephone conferences of December 14, 1981 and December 24, 1981, and through a meeting held on June 18, 1982.

By letter dated September 30, 1981, the licensee submitted their fire hazard analysis, entitled "Interactive Cable Analysis for Calvert Cliffs Nuclear Power Plant - Unit No. 1". In this letter, the licensee stated that a room by room study of the post-fire safe shutdown capability had been made and concluded that the changes proposed for the post-fire requirements should be combined with the post-TMI requirements because equipment such as new electric auxiliary feedwater (AFW) pumps would be used to meet Residual Heat Removal (RHR) requirements and post fire shutdown capability requirements. This entailed the removal of the existing auxiliary shutdown panel (ASP) from room 603 and the installation of a new ASP in room 430 (See Section 7.2.1 for additional details).

By letter dated August 6, 1982, the NRC provided their position regarding the need for installation of additional, electrically independent, source range flux monitoring instrumentation. The licensee responded by letter dated September 7, 1982, and provided a commitment to install one channel of source range flux monitoring instrumentation, per reactor, to be located on the Alternate Shutdown Panel.

By letters listed below, the licensee requested several exemptions from the requirements of 10 CFR 50, Appendix R. The disposition of these exemptions requested are also indicated below.

March 19, 1981	Section III.E - Hydrostatic Hose Test; Section III.O - RCP Lube Oil Collection; and Section III.G - Use of Water Curtains (Granted via NRC letters dated June 30, 1981 and August 16, 1982)
May 18, 1981	10 CFR 50.48(c)(5) - Schedular Relief for Section III.G.3 (Granted via NRC letter dated June 30, 1981)
February 23, 1983	10CFR50.48(c) - Schedular Relief for Emergency Lighting (Granted via NRC letter dated March 15, 1983)
March 4, 1983	10 CFR 50.48(c) - Automatic Fire Suppression for Control Room and Intake Structure. Schedular Relief for Outage Related Modifications - Licensee letter dated March 17, 1983 provided additional information (Granted via NRC letter dated April 21, 1983)
November 21, 1983	Section III.G.2 - Fire Door Assemblies; Section III.O - RCP Lube Oil Collection; Section III.G.2 - Partial Sprinkler Coverage (Granted via NRC Leter March 15, 1984)
March 14, 1984	Section III.G.2 - Partial Sprinkler Coverage (Under review by NRR)

The NRC forwarded Generic Letter 81-12, dated February 20, 1981, to all licensees required to comply with Appendix R requirements. The purpose of the letter was to clarify to the licensees the rule requirements and to provide NRC staff positions concerning fire protection. The importance of Generic Letter 81-12 for the team inspection was that it specifically stated that licensees were required under the rule to reassess their facilities to determine whether the protection required by Section III.G.2 was satisfied.

By another Generic Letter 83-33, dated October 19, 1983, NRC forwarded to all licensees NRC positions on certain requirements of Appendix R which were differently interpreted by some licensees. The letter stated that the NRC Inspection team would be using these positions as their criteria for conformance for these requirements. Later, on February 8, 1984, a meeting was held between NRC staff and the licensee to discuss the lessons learned from previous Safe Shutdown inspections. The topics discussed included some of the NRC positions in Generic Letter 83-33. Subsequently, by letter dated March 14, 1984, the licensee requested an exemption from 10 CFR 50, Appendix R, Section III.G. This exemption request is currently under review by NRR, as noted earlier.

By letter dated February 13, 1984, NRC forwarded to all licensees, IE Information Notice 84-09, Lessons Learned from NRC Inspections of Fire Protection Safe Shutdown Systems (10 CFR 50, Appendix R). The notice provided additional guidance on the requirements. The notice was partly revised by Revision 1 dated March 7, 1984.

5. Post-Fire Safe Shutdown Capability

5.1 Systems Required for Safe Shutdown

The licensee has designated a common set of systems, irrespective of different fire areas, for the purpose of achieving and maintaining safe shutdown. This set of systems is also applicable to those fire areas where alternate shutdown is provided as discussed in Section 5.2 below.

Safe shutdown of the reactor is initially performed by rod insertion from the control room; it can also be accomplished by removing the 240 volt AC supply at the panels in the cable spreading room and by removing the 480 volt AC supply to the motor generator sets in the switchgear room.

Reactor coolant inventory and the reactor shutdown are maintained by one of three charging pumps taking suction from the concentrated boric acid tanks or the refueling water storatge tank (RWST).

Decay heat removal is accomplished by the auxiliary feedwater (AFW) pumps supplying water to the steam generators from the condensate storage water tank 12. The atmospheric dump system (ADS) or the steam generator safety valves will be used to remove heat from the steam generators.

Primary system pressure is maintained by the pressurizer heaters and spray or the charging pumps taking suction from the boric acid tanks combined with letdown.

For cold shutdown, shutdown is maintained by increasing primary coolant boration using one of three charging pumps taking suction from the boric acid tanks or the RWST.

Primary system water cooling is done by the use of a Low Pressure Safety Injection (LPSI) pump to circulate this water through the shutdown cooling heat exchanger where component cooling water is used as the heat sink. The component cooling water in turn is cooled by salt water in the component cooling water heat exchanger.

A fire in a component cooling room of one unit could disable all of the component cooling pumps in that room. If this happened, component cooling water from the unaffected unit could be supplied by manually operating valves in an existing cross-connection between the two units.

The support systems for the post-fire safe shutdown are redundant trains of 4KV unit buses, 480 volt unit buses, 480 volt motor control centers, 120 volt AC instrument buses, 120 volt AC inverter buses and 125 volt DC battery buses. Other support systems that have been satisfactorily addressed are switchgear air conditioning, plant communications, and the onsite emergency diesel generators.

The process monitoring instruments to be used for a post fire shutdown includes reactor hot and cold leg temperatures, pressurizer pressure and level, steam generator pressure and level, and auxiliary feedwater pump discharge pressure and condensate, boric acid, and refueling water storage tank levels. The licensee, in accordance with the commitment in their letter dated September 7, 1982, installed one additional channel of source range flux monitoring instrumentation, per reactor, on the Alternate Shutdown Panel.

5.2 Areas Where Alternate Shutdown is Provided

The licensee, in accordance with the commitment in their letter dated May 14, 1982, has provided alternate shutdown capability independent of the cabling and equipment in the control room, 2 cable spreading rooms (with their adjoining cable chases), 6 cable chases, and other plant areas where "redundant cabling/equipment required for safe shutdown cannot be separated by fire barriers of appropriate ratings".

The alternate shutdown capability is further discussed in Section 7.2.

5.3 Remaining Plant Areas

All other areas of the plant, not provided with an alternate safe shutdown capability, are required to comply with Sections III.G.1 and 2 of Appendix R, unless an exemption request has been approved by NRR.

6. Inspection Methodology

The inspection team examined the licensee's capabilities for separating and protecting equipment, cabling and associated circuits necessary to achieve and maintain hot and cold shutdown conditions. This inspection sampled selected fire areas which the licensee had identified as being in compliance with Section III.G.

The following functional requirements were reviewed for achieving and maintaining hot and cold shutdown:

- Reactivity control
- Pressure Control
- Reactor coolant makeup
- Decay heat removal
- Support systems

- Process monitoring

The inspection team also examined the licensee's capability to achieve and maintain hot shutdown and the capability to bring the plant to cold shutdown conditions in the event of a fire in areas where alternate shutdown capability is provided. The examination included a review of the drawings for the alternate shutdown capability and review of the procedures for achieving the alternate shutdown. Drawings were reviewed to verify electrical independence from the areas of concern. Procedures were reviewed for general content and feasibility.

Also inspected were fire detection and suppression systems and the degree of physical separation between redundant trains of Safe Shutdown Systems (SSSs). The team review included an evaluation of the susceptability of the SSSs for damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems.

The inspection team examined the licensee's fire protection features provided to maintain one train of equipment needed for safe shutdown free of fire damage. Included in the scope of this effort were fire area boundaries, including walls, floors and ceilings, and fire protection of openings such as fire doors, fire dampers, and penetration seals.

7. Inspection of Protection Provided to Safe Shutdown Systems

The team reviewed the protection provided to SSSs in selected fire areas for compliance with Appendix R, Sections III.G.1, 2, and 3. The team did not identify any violation, deviations, or other unacceptable conditions. This conclusion is based on the following:

7.1 Protection in Various Fire Areas

7.1.1 Turbine Buildings, El. 12', Auxiliary Feed Pump Rooms

The auxiliary feed pump rooms contain the steam turbine driven auxiliary feed pumps, piping and manual valves associated with main steam system and auxiliary feedwater system. The auxiliary feed pump rooms are enclosed concrete structures with floor, walls, and ceiling having a minimum 3 hour fire rating. The rooms have two watertight steel doors. One of the watertight door assemblies consists of a double leaf configuration. This is not an approved fire door and is the subject of an exemption request submitted by the licensee's letter of March 14, 1984. The team examined the area to assess the acceptability of this exemption request.

Full automatic suppression and detection are provided in the pump rooms. The combustible loading in the pump rooms and adjacent areas of the turbine building is low. Due to the configuration of the doors and additional fire protec-

tion, there is reasonable assurance that a fire of sufficient magnitude to breach the doors is unlikely. Furthermore, the electric motor driven auxiliary feed pump remotely located (approximately 50 feet away) in the service water pump room (see Section 7.1.2) provide redundancy to the steam driven auxiliary feed pumps. Through a cross-connection between Units 1 and 2, the alternate unit's electric motor driven auxiliary feed pump provides additional redundancy.

Based on the above considerations, the team concluded that the protection provided to the safe shutdown equipment in the auxiliary feed pump rooms is an acceptable alternate to the Section III.G.2 requirements.

7.1.2 Auxiliary Building, El. 12', Service Water Pump Rooms

The service water pump rooms contain the electric motor driven auxiliary feed pumps and piping associated with auxiliary feedwater systems for Units 1 and 2. The service water pump rooms are enclosed structures with floor, walls and ceiling having a 3 hour minimum fire rating. The rooms have non-fire rated double leaf door assemblies identical to those of the auxiliary feed pump rooms discussed in Section 7.1.1. These doors are also the subject of the exemption request discussed in Section 7.1.1.

The protection in the service water pump rooms is identical to that of the auxiliary feed pump rooms. Full automatic suppression and detection is provided. Redundant service water pumps are available from opposite unit.

Based on these considerations, the team concluded that the protection provided to the safe shutdown equipment in the rooms is an acceptable alternate to the Section III.G.2 requirements.

7.1.3 Auxiliary Building, El. 45', Emergency Diesel Generator (EDG) Rooms

The three EDG rooms are located at the west end of the auxiliary building at the station grade level. The team examined the protection provided to the safe shutdown equipment in the rooms. Each EDG and its auxiliaries are located in a separate 3-hour rated enclosure. All access doors and penetration seals were found to be properly rated and in good condition. Each room is provided with a smoke detection system and an automatic pre-action water sprinkler system.

Each EDG has an associated fuel oil day tank and outdoor fuel oil storage tank. The fuel systems are separate and independent. No deficiencies were identified in the EDG rooms.

7.1.4 Auxiliary Building, El.-10', Charging Pump Rooms

The charging pump rooms contain all three charging pumps and motors, the associated suction and discharge piping and valves, and the boric acid gravity feed line with heat tracing.

At least one of the three pumps and associated motor, cabling, piping and valves is required to maintain reactor coolant system pressure and pressurizer level and to subsequently borate the reactor coolant system to a cold shutdown boron concentration.

The charging pumps are separated from each other by 1-hour rated barriers and are provided with automatic suppression and detection. No deficiencies were identified in the charging pump areas.

7.1.5 Auxiliary Building, El. 27', Battery Rooms

The redundant battery rooms are enclosed by 3 hour rated concrete barriers with approved fire door assemblies. In addition, detection is provided. No deficiencies were identified in the battery room area.

7.1.6 Auxiliary Building, Fire Area 11

Fire Area 11 is a large area on the west side of the auxiliary building, consisting of approximately 94 rooms at elevations - 10', 5', 27', 45' and 69' of Units 1 and 2. The area contains several items of safe shutdown equipment as listed in the licensee's fire hazard analysis (FHA) made available to the team. However, redundant equipment outside of this fire area is provided.

Fire areas 10, 16A, 17A, 24, 30, and 41 also contain multiple rooms, but relatively very much fewer rooms than in Fire Area 11. The licensee stated that their FHA based on the "fire area concept" has not identified any unacceptable conditions beyond those identified by their FHA based on the "fire zone concept", i.e., room by room analysis. The team reviewed both FHAs and associated modifications on a random sampling basis and did not identify any unacceptable conditions.

7.1.7 Intake Structure, El. 3', Units 1 and 2

The intake structure contains the salt water pumps, and associated motors, cabling and piping, for both Units 1 and 2. The intake structure is an enclosed concrete structure having equivalent to a 3-hour fire rating. The structure contains 2 watertight steel doors which provide fire fighter access. Salt water pumps are located in separate concrete lined pits below the floor level of the structure and are spatially separated by approximately 20 feet.

The team examined the protection provided for the intake structure. Spatial separation of pumps, fire detection, and manual fire suppression capability are provided. By letter dated April 21, 1983, this combination of features was accepted by NRR as an exemption to the technical requirements of Section III G.2. The team did not find any unacceptable conditions in the intake structure area.

7.1.8 Containment, Units 1 and 2

The containment and redundant equipment are sub-divided into two distinct halves - the west side and the east side. These areas are separated by distance in addition to many radiation shield walls, missile barriers, and structural walls. The personnel hatch at elevation 69' and the emergency personnel hatch at elevation 45' are available for fire fighter access. Several intervening cable trays pass from the east half of the containment to the west half. To preclude the spread of flames across these cable trays, the licensee has enclosed them in a Marinite barrier for a distance of 25 feet and provided fire stops at each end of the enclosure. The team audited the drawings depicting this configuration and found that the cable tray protection serves to provide 20 feet free of intervening combustibles, as required by Section III.G.2.

7.2 Alternate Shutdown Capability

The licensee elected to provide alternate shutdown capability for the control room, 2 cable spreading room, 6 cable chases, and other plant areas where alternate shutdown is required (see section 5.2). In accordance with the schedular requirements of 10 CFR 50.48(c), the licensee completed all required modifications for Unit 1 during the last refueling outage; and for Unit 2, similar modifications are expected to be completed by the upcoming refueling outage in 1984.

7.2.1 Alternate Shutdown Provisions

The performance goals for post fire safe shutdown will be met using the safe shutdown systems as discussed in Section

5.1. The control of these functions will be accomplished using the new alternate shutdown panel (ASP) or the control room depending on the fire location. The ASP is located in the switchgear room at the 45' elevation of the turbine building. Controls and instrumentation are installed on the ASP. For cold shutdown, in addition to the systems discussed in Section 5.1, reactivity shutdown margin can be provided by boric acid from the concentrated boric acid tanks by one of the two boric acid pumps through a charging line isolation valve or safety injection header valve. These valves can be manually operated.

The auxiliary feedwater pumps and backup pressurizer heaters are controllable from the ASP. Local controls for auxiliary feedwater and service water pumps, and letdown and various other valves are also provided.

The licensee had developed the required procedure for alternate shutdown. The following 2 sections discuss the inspections with respect to the alternate shutdown procedure.

7.2.3 Alternate Shutdown Procedure Review

The team reviewed licensee procedure AOP-17, Alternate Shutdown Procedure, Revision 1.

The scope of review was to ascertain that the alternate shutdown could be attained in a safe and orderly manner, to determine the level of difficulty involved in operating equipment, and to verify that there was no dependence on repairs for achieving hot shutdown. For purpose of the review, a repair would include installing electrical or pneumatic jumpers, wires or fuses to perform an action required for hot shutdown.

As a result of the review, the team had only minor comments which were promptly resolved by the licensee in Revision 2 of the procedure. The team did not identify any unacceptable conditions with the revised procedure.

7.2.4 Alternate Shutdown Procedure Walk-Through

The team walked through selected portions of the procedure to determine that shutdown could be attained in an orderly and timely fashion. The team did not identify any unacceptable conditions.

As a result of the walk-through, the team concluded that the licensee's procedures and equipment would allow the plant to be brought to a safe hot shutdown condition and also reach safe cold shutdown within the required 72 hours.

7.3 Protection for Associated Circuits

Appendix R, Section III.G requires that protection be provided for associated circuits that could prevent operation or cause maloperation of redundant trains of systems necessary for safe shutdown. The circuits of concern are generally associated with safe shutdown circuits in one of three ways:

- Common bus concern
- Spurious signals concern
- Common enclosure concern

The associated circuits were evaluated by the team for common bus, spurious signal, and common enclosure concerns. Power, control, and instrumentation circuits were examined for potential problems. A sampling basis was used in making the examination, since many circuits were involved and a determination of cable routing took considerable time.

7.3.1 Common Bus Concern

The common bus concern is found in circuits either safety related or non-safety related where there is a common power source with shutdown equipment and the power source is not electrically protected from the circuit of concern.

The team examined, on a sampling basis, the protection for several circuits including coordination of fuses, circuit breakers, and relays. The licensee has been performing relay settings at approximately 1½ year intervals. No unacceptable conditions were identified.

7.3.2 Spurious Signals Concern

The spurious signal concern is made up of 2 items:

- False motor, control, and instrument indications can occur such as those encountered during 1975 Brown's Ferry fire. These could be caused by fire initiated grounds, short or open circuits.

- Spurious operation of safety related or non-safety related components can occur that would adversely affect shutdown capability (e.g., RHR/RCS isolation valves).

No spurious signal concerns were identified after reviewing the following areas:

- Current transformer secondaries
- High low pressure interface
- General fire instigated spurious signals

7.3.3 Common Enclosure Concern

The common enclosure concern is found when redundant circuits are routed together in a raceway or enclosure and they are not electrically protected or when fire can destroy both circuits due to inadequate fire penetrations.

A number of circuits selected for this concern were all found to be electrically protected.

7.4 General Fire Protection Features

The team examined the general fire protection features in the plant provided to maintain one train of safe shutdown equipment free of fire damage. Included in the scope of this effort were fire area boundaries, including walls, floors and ceilings, and fire protection of openings such as fire doors, fire dampers, and penetration seals. No unacceptable conditions were identified.

The team also examined various fire protection systems and procedures in addition to those needed to satisfy the requirements of Section III.G. It was evident that management afforded a great deal of importance to fire protection safety in the plant. A sampling of automatic suppression systems were checked for compliance with the applicable NFPA codes. No apparent deviations were identified. Manual fire suppression equipment was observed to be well maintained and in readily operable condition. All cutting and welding operations observed were attended by a properly equipped and trained fire watch.

The licensee maintains three full time fire protection engineers on-staff. It is the conclusion of the team that the plant fire protection program is being properly implemented and maintained in conjunction with full management support.

7.5 Quality Assurance

During the course of the inspection, the team reviewed several drawings, fire hazard analysis, fire protection modification packages, procedures, and other fire protection documents. The scope of review included verification of their technical adequacy, appropriate reviews, design and procurement controls, and other Quality Assurance

requirements for the licensee's fire protection program. The team did not identify any unacceptable conditions.

During the course of inspection, a licensee represenative stated that the 125 VDC replacement fuses in the safety related circuits are being procured presently using Non-Class IE practices but the practice is being changed to that of Class IE. The NRC Resident Inspector will follow up this matter.

7.6 Fire Brigade Training

Fire Brigade training was reviewed to determine whether protection of safe shutdown equipment was addressed. Fire Brigade knowledge of safe shutdown equipment is of concern due to the potential to inadvertently disable or damage redundant trains of equipment during fire suppression activities. The team noted that the plant fire brigade is equipped with an explicit fire fighting strategies manual. Appendix A to the manual provides a room-by-room listing of safe shutdown cables and equipment. Additionally, the lesson plans for fire brigade training were examined and found to provide general guidance that extinguishment actions must be carefully directed to prevent damage to redundant trains by the misapplication of extinguishing agents.

Based on these considerations, the fire brigade training, in regard to the fire protection of safe shutdown cables and equipment, is considered adequate.

8. Conclusions

The team did not identify any violation, deviation, or other unacceptable condition with respect to 10 CFR 50,Appendix R, Section III.G.

9. Exit Interview

The inspection teams met with the licensee representatives denoted in Paragraph 1 at the conclusion of the inspection on March 30, 1984. The team leader summarized the scope and findings of the inspection at that time.

At no time during this inspection was written material provided to the licensee by the team.