UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

FIRE PROTECTION

SAFETY EVALUATION REPORT

BY THE

OFFICE OF NUCLEAR REACTOR REGULATION

IN THE MATTER OF

TOLEDO EDISON COMPANY

AND

THE CLEVELAND ELECTRIC ILLUMINATING COMPANY

DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1

DOCKET NO. 50-346

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1.0 INTRODUCTION

We have reviewed the Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse 1) hazards analysis submitted by the Toledo Edison Company (licensee). The submittal, including Revisions 1, 2, 3 and 4, was in response to our request to evaluate their fire protection program against the guidelines of Appendix A to Branch Technical Position (BTP) APCSB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants." As part of the review, we visited the plant site to examine the relationship of safety related components, systems, and structures in specific plant areas to both combustible materials and to associated fire detection and suppression systems. The overall objective of our review of the Davis-Besse 1 fire protection program was to ensure that in the event of a fire at the facility, operators would maintain the ability to safely shut down the unit and keep it in a safe shutdown condition while minimizing the release of radioactivity to the environment.

Our review included an evaluation of the automatic and manually operated water fire suppression systems, the fire detection systems, fire barriers, fire doors and dampers, fire protection administrative controls and fire brigade training, and plant fire protection technical specifications (TS).

Our conclusion given in Section 6.0 is that the fire protection program at Davis-Besse 1 is adequate at the present time, and meets General Design Criterion 3. However, to further ensure the ability of the plant to withstand the damaging effects of fires that could occur, we are requiring the licensee to provide additional fire protection system improvements. In accordance with an existing license condition (Condition 2.C.(3)h), the licensee is scheduling completion of these improvements by April 22, 1980. The schedule for specific fire protection system improvements is presented in Table 1 of this report.

Until the committed fire protection system improvements are operational, we consider that the existing fire detection and suppression systems, the existing barriers between fire areas, improved administrative procedures for control of combustibles and ignition sources, the trained onsite fire brigade, the capability to extinguish fires manually, and the fire protection TS provide adequate protection against a fire that would threaten a safe shutdown.

This report summarizes the results of our evaluation of the fire protection program at Davis-Besse 1.

2.0 FIRE PROTECTION SYSTEMS DESCRIPTION

2.1 Water Suppression Systems

The water fire protection system consists of one full capacity 2500 gpm motor driven fire pump, one full capacity 2500 gpm diesel engine driven fire pump, a separate pressure maintenance (jockey) pump, two separate water sources, and a yard loop with sectionalizing post-indicator isolation valves.

The fire pump connections to the yard main are spatially separated by 60 feet. The motor driven fire pump is located in the water treatment building and takes suction from the 250,000 gallon fire water storage tank. This pump is automatically started when the system pressure drops to 120 psig. The 12 gpm jockey pump, running continuously, maintains a pressure of 135 psig in the fire protection system.

The diesel driven fire pump is located in the seismic Category 1 intake structure and separated by a three-hour fire rated barrier from other pumps in that structure. This pump takes suction from Lake Erie and will automatically start when the system pressure drops to 100 psig. The pump will also start automatically on low level in the fire water storage tank before the motor driven pump shuts off at a lower tank level. Separate alarms monitoring pump running, prime mover availability, or failure to start are provided for the pumps in the plant control room. The fire pumps are installed according to the applicable sections of National Fire Protection Association (NFPA) Standard No. 20.

The automatic sprinkler system and manual hose station hose standpipe system are fed by a main yard loop with multiple connections to interior fire protection system headers, e.g., the auxiliary building, turbine building, service building and reactor building. Each sprinkler system and manual hose station has an independent connection to the fire protection feeder; therefore, a single failure cannot impair both the primary and backup fire protection system.

Post indicator valves are provided to isolate sections of the fire loop for maintenance or repair. Valves in the fire protection system which are not electrically supervised, with indication in the control room, will be locked or sealed in their normal operating position and checked periodically.

The automatic sprinkler systems, i.e., wet sprinkler system, pre-action sprinkler sytems, deluge and water spray systems, are designed to the requirements of NFPA Standard No. 13, "Standard for Installation of Sprinkler Systems," and NFPA Standard No. 15, "Standard for Water Spray Fixed System."

Manual hose stations are located throughout the plant to ensure that an effective hose stream can be directed to any safety related area in the plant. These systems are consistent with the requirements of NFPA Standard No. 14, "Standpipe and Hose System for Sizing, Spacing, and Pipe Support Requirements."

Areas that have been equipped or will be equipped with automatic water suppression systems are:

(a) Cable spreading room*

(b) Auxiliary Building Passage and hatch area 310 and 313*

(c) Auxiliary Building Corridor 209 and corridor 304*

(d) Auxiliary Building Passage 227

(e) Service water pump rooms*

(f) Component cooling water pump room*

(g) Mechanical Penetration Room No. 4*

(h) Clean Waste Receiver Tank Room*

(i) North and east walls of Boric Acid Evaporator Room 235

(j) Diesel Generator Rooms

(k) Diesel Generator Day Tank Rooms

(l) Radwaste exhaust equipment and main station exhaust fan Room*

(m) Wall between Room 314 and the heater bay area of the turbine building.*

*Sprinkler system to be installed by April 1980.

The protection to be provided for the pipe rupture blowout panels located in the auxiliary building between Rooms 235 and 124 will be an automatic water curtain actuated by thermal actuation devices.

We have reviewed the design criteria and bases for the water suppression systems and conclude that these systems, with the additional sprinkler systems to be installed, meet the guidelines of Appendix A of BTP ASB 9.5-1. In addition, the systems are in accord with the applicable portions of the NFPA Codes and are therefore acceptable.

2.2 Gas Suppression Systems

Davis-Besse 1 has no fixed gas suppression systems installed in the plant.

2.3 Fire Detection Systems

The fire detection system consists of the detectors, associated electrical circuitry, electrical power supplies, and the fire annunciation panel. The types of detectors used at the Davis-Besse 1 are ionization (products of combustion) and thermal (heat sensors). The system is continuously supervised with a NFPA Standard No. 72D Class B supervised system.

Fire detection systems will give audible and visual annunciation in the control room. Local audible and/or visual alarms are also provided.

At our request, the licensee has agreed to install additional smoke detectors in the electrical and mechanical penetration rooms on elevations 565', 585' and 603'.

Additional smoke detectors will also be installed in corridor 209, fuel handling area room 300, and the ECCS pump rooms.

We have reviewed the fire detection systems to ensure that fire detectors are located to provide detection and alarm of fires that could occur. We have also reviewed the fire detection systems' design criteria and bases to ensure that they conform to the applicable sections of NFPA 72D. We conclude that the design and the installation of the fire detection systems, with the additional detectors to be installed, meet the guidelines of Appendix A of BTP ASB 9.5-1 and the applicable portions of NFPA 72D, and are therefore acceptable.

3.0 OTHER ITEMS RELATING TO THE STATION FIRE PROTECTION PROGRAM

3.1 Fire Barriers

All floors, walls, and ceilings enclosing separate fire areas are rated at a minimum of 3-hour fire rating. The main control room area contains peripheral rooms which are located within the main control room 3-hour fire barrier. These peripheral rooms are provided with detectors and alarms and one-hour fire rated ceilings and fire doors.

The licensee has provided acceptable documentation to substantiate the fire rating of the 3-hour barriers.

3.2 Fire Doors, Dampers, and Fire Barrier Penetrations

We have also reviewed the placement of the fire doors to ensure that proper fire ratings have been provided.

All doors which separate safety related redundant divisions, including doors separating the turbine building from any safety related equipment room will be locked mechanically. Strict administrative procedures will be used to assure that the doors are not left open or propped open during maintenance or plant operation. The licensee will add or replace fire doors in the Component Cooling Water (CCW) pump room, Emergency Core Cooling System (ECCS) pump room and the Control Room complex with UL listed fire rated door assemblies.

Penetrations through rated barriers, including electrical penetration seals, are sealed to provide fire resistance equivalent to the barrier itself. Ventilation penetrations through barriers are protected by standard fire door dampers. The licensee will add UL listed fire rated door type dampers in the Electrical Penetration Room. The licensee has provided the necessary information to demonstrate that the seals used in the penetrations for cable trays, conduits, and piping, as well as fire dampers and their method of installation, can provide a fire rating equivalent to the fire barrier. The fire dampers are installed in accordance with NFPA Standard No. 90A.

We conclude that the fire barriers, barrier penetrations, fire doors, and dampers, with the additional doors and dampers to be installed or replaced, meet the guidelines of Appendix A of BTP ASB 9.5-1, and are therefore acceptable.

4.0 FIRE PROTECTION FOR SPECIFIC AREAS

4.1 Cable Spreading Room

The walls, floors and ceiling in the cable spreading room are designed to have a fire rating of three hours. Primary fire protection will be provided by an automatic sprinkler (fog nozzle) system. The backup fire suppression system is the hose station located immediately outside the cable spreading room. Smoke detectors are provided that will initiate a local alarm and audible and visual alarms in the control room.

All power, control or instrumentation cable pass the flame test equivalent to the current IEEE No. 383 Flame Test. All cable trays within the cable spreading room have solid metal bottoms with an air gap between the tray bottom and the cable and ceramic fiber blanket barrier tray cover. All power cables in this room are enclosed in conduits to minimize the possibility of a cable spreading room fire due to power cable overload. The licensee will install in-tray, linear-type, thermal sensing fire detectors inside all cable trays within the cable spreading room in addition to the ceiling-mounted, area-type smoke detectors.

The licensee is also committed to establish emergency shutdown procedures that provide capability to achieve safe shutdown in the event of a cable spreading room exposure fire or a control room cabinet fire which might disable redundant cable divisions of systems necessary for safe shutdown. The licensee committed to implement procedures and modifications for hot and cold shutdown by February 1979 and October 1979 respectively.

Pending satisfactory findings by a Regional Office of Inspection and Enforcement of the new implemented procedures, we consider that appropriate fire protection has been provided. After the modifications and procedures are implemented, the fire protection will conform to the provisions of Appendix A of BTP ASB 9.5-1, and are therefore acceptable.

4.2 Component Cooling Water Pump Room

All three Component Cooling Water (CCW) pumps for the plant are located at one end of this room. The heat exchangers for the CCW systems occupy the middle of the room. There are two CCW valves above a mezzanine grating at the opposite end of the room from the pumps. We were concerned that an exposure fire could damage more than one CCW pump or valve train. At our request, the licensee agreed to provide an automatic sprinkler system in the CCW pump room and under the mezzanine floor grating below the CCW valves to protect them from a possible exposure fire. In addition a one-half hour rated fire barrier will be provided for the under side of the valve motors and for the conduit associated with each CCW pump and CCW valve.

We have reviewed the licensee's Fire Hazards Analysis for this area and conclude that appropriate fire protection has been provided. After the modifications are implemented, the fire protection will meet the guidelines of Appendix A of BTP ASB 9.5-1, and is therefore acceptable.

4.3 Service Water System Pump Intake Structure

The intake structure contains the three safety related plant service water pumps, two non-safety related cooling water makeup pumps, and the diesel driven fire pump. The plant service water pumps and the makeup pumps are in a compartment separated by three-hour fire-rated barrier from the fire pump. The service water pumps and makeup pumps are in a single row about five to seven feet from each other with each service water pump separated from the other by a makeup pump. The piping and conduit for each pump is routed away from each pump about five to eight feet above the floor, and exists through the wall away from the row of pumps. During our site visit we noted that there was a high lateral air flow velocity caused by the room ventilation system. We stated our concern to the licensee about an exposure fire on the floor from which the heat could convect laterally due to the air flow and damage the electrical conduits and the Service Water System (SWS) pumps before the sprinklers could be activated. At our request the licensee agreed to provide by July 1979, a sprinkler system with fast acting sprinkler heads at the same elevation as the service water pump motors. The sprinkler system header supply valves will be electrically supervised, or padlocked open and periodically checked. Fire barriers of at least one-half hour rating will also be provided to protect the electric conduits and the service water valves inside the room. The SWS is presently cross-connected to the condenser circulating water system with normally closed isolation valves. The licensee is committed to provide an emergency operating procedure which will permit the condenser circulating water system to be used as backup to the SWS to achieve safe shutdown using offsite power. This procedure was t be established by February 1979. The licensee further committed to provide a cross-connection from the Davis-Besse Unit 2 or 3 SWS into the Unit 1 SWS by mid-1984 as a long term back-up to the Unit 1 SWS pumps to achieve safe shutdown without offsite power. Subsequent to this commitment, the Davis-Besse 2 and 3 schedule was significantly delayed. The licensee has therefore committed to provide by mid-1984 a backup to the Unit 1 SWS that will not require offsite power.

Pending satisfactory findings by a Regional Office of Inspection and Enforcement review of the newly implemented procedure, we conclude that the fire protection to be provided for the service water pump intake structure is consistent with the positions of Appendix A of BTP ASB 9.5-1, and is therefore acceptable.

4.4 Fire Protection Inside Containment

The major fire hazard within the containment is the reactor coolant pump (RCP) lube oil system. To prevent a fire due to oil leakage the licensee has provided an engineered oil containment and collection system for each RCP. The system has been designed to contain the oil from leakage or a pipe failure, and drains to a collection tank which is periodically emptied to assure tank capacity for the oil contained in one motor at all times while the reactor is critical.

The redundant safety related cable divisions enter the containment at penetrations approximately 90° from each other or 120 feet apart resulting in acceptable separation. In addition all safety related cables are installed in rigid steel conduit or covered steel wireway. The fire detection system consists of ionization type detectors installed at various areas within the containment. The fire suppression system inside the containment relies on manual fire fighting operation. Portable fire extinguishers are provided. Hose stations are also provided just outside the containment. We have reviewed the licensee's Fire Hazard Analysis for the areas inside containment and conclude that, with the addition of the RCP oil collection system, appropriate fire protection is provided for this area. The fire protection meets the guidelines of Appendix A of BTP ASB 9.5-1, and is therefore acceptable.

4.5 Other Plant Areas

The licensee's Fire Hazards Analysis addresses other plant areas not specifically discussed in this report. The licensee has committed to install additional detectors, protable extinguishers, hose stations and some additional emergency lighting as identified in the licensee's installation schedule. We find these areas with the commitment made by the licensee to install the additional equipment, to be in accordance with the guidelines of Appendix A of BTP ASB 9.5-1 and the applicable sections of the National Fire Protection Association Code. The fire protection systems for these areas are therefore acceptable.

5.0 ADMINISTRATIVE CONTROLS

The administrative controls for fire protection consists of the fire protection organization, the fire brigade training, the controls over combustibles and ignition sources, the prefire plans and procedures for fighting fires and quality assurance.

In response to Appendix A of BTP ASB 9.5-1, the licensee described those procedures and controls that were in existence at that time.

In a submittal dated November 25, 1978, the licensee agreed to revise their administrative controls and training procedures to follow supplemental staff guidelines contained in "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," dated June 14, 1977. Procedures on (a) Fire Brigade Training, (b) Control of Combustibles and (c) Control of Ignition Sources would be implemented by February 1979. Procedures on Fire Fighting Procedures (Preplans) would be completed by October 1979.

In a submittal dated September 25, 1978, the licensee committed to a plant fire brigade of at least five members to provide immediate response to fires that may occur at the site. The plant fire brigade will also be equipped with pressure demand breathing apparatus, portable communications equipment, portable lanterns and other necessary fire fighting equipment. Spare air cylinders and recharge capability are provided to satisfy the guidelines of Appendix A of BTP ASB 9.5-1.

The fire fighting brigade participates in periodic drills. Liaison between the plant fire brigade and the local fire departments has been established. The local fire departments have been on plant tours and have also been involved in training sessions with the plant fire brigade.

Pending satisfactory findings by a Regional Office of Inspection and Enforcement review of the revised administrative controls and training procedures, we conclude that the fire brigade equipment and training conform to the recommendations of the National Fire Protection Association, Appendix A to BTP ASB 9.5-1, and supplemental staff guidelines. They are therefore acceptable.

6.0 TECHNICAL SPECIFICATIONS

We have reviewed the plant Technical Specifications issued for Davis-Besse 1 and find that they are consistent with our Standard Technical Specifications for fire protection. Following the implementation of the modifications of fire protection systems and administrative controls resulting from this review, the Technical Specifications will be modified accordingly to incorporate the limiting conditions for operation and surveillance requirements to reflect these modifications.

7.0 CONCLUSIONS

The fire protection system for Davis-Besse 1 was evaluated and found to meet General Design Criterion 3, "Fire Protection," at the time the original Safety Evaluation Report was issued in December 1976.

As a result of investigations conducted by the staff on the fire protection systems, fire protection criteria were developed and further requirements were imposed to improve the capability of the fire protection system to prevent unacceptable damage that may result from a fire. At our request, the licensee conducted a reevaluation of their proposed fire protection system for Davis-Besse 1. The licensee submitted a Fire Hazards Analysis in January 1978, and in response to our positions four revisions to the Analysis. He also has compared his system, in detail, with the guidelines of Appendix A to BTP ASB 9.5-1.

Our review has covered the licensee's submittals and their responses to our requests for additional information. In addition, we have made a site visit to evaluate the fire hazards that exist in Davis-Besse 1 and the design features and protection systems provided to minimize these hazards.

The licensee has completed many modifications and proposed to make additional modifications to improve the fire resistance capability for fire doors, dampers, fire barriers and barrier penetration seals.

The licensee has also proposed to install additional sprinkler systems for areas such as the cable spreading room, service water pump intake structure, component cooling water pump room and various other areas. To ensure that fires can be detected rapidly and the plant operators informed promptly, additional detectors will be installed in various areas of the plant.

In addition, the licensee has committed to establish emergency shutdown procedures to bring the plant to safe cold shutdown condition in the event of a damaging fire in the cable spreading room, the main control room or the service water pump room.

The licensee is committed by license condition to make all improvements by May 1980, except that providing a backup to the SWS pumps without requiring offsite power will be implemented by mid-1989. We have reviewed the licensee's schedule and find it acceptable and have included it in Table 1.

We find that the Fire Protection Program for Davis-Besse 1, with the improvements already made by the licensee, is adequate at the present time. With the scheduled modifications, the program will meet the guidelines contained in Appendix A of BTP ASB 9.5-1, meets the General Design Criterion 3, and is therefore acceptable.

Until the committed fire protection system improvements are operational, we consider that the existing fire detection and suppression systems, the existing barriers between fire areas, improved administrative procedures for control of combustibles and ignition sources, the trained onsite fire brigade, the capability to extinguish fires manually and the requirements of the fire protection technical specifications provide adequate protection against a fire that would threaten safe shutdown.

Our overall conclusion is that a fire occurring in any area of the Davis-Besse 1 will not prevent the plant from being brought to a controlled safe cold shutdown, and further, that such a fire would not cause the release of significant amounts of radiation.

We have determined that the amendment does not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendment involves an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR Section 51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of this amendment.

We have concluded, based on the considerations discussed above, that: (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously considered and does not involve a significant decrease in a safety margin, the amendment does not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

8.0 CONSULTANT'S REPORT

Under contract with the Nuclear Regulatory Commission, Gage-Babcock and Associates, Inc. (GBA), has provided the services of a fire protection consultant who participated in the evaluation of the licensee's fire protection program and in the preparation of the Safety Evaluation Report (SER). In a letter to the Commission dated April 4, 1979, Mr. James D. Behn of GBA provided several comments which have been incorporated into the SER. Mr. Behn stated that, with these comments incorporated into the SER, the report adequately reflects GBA's concerns and recommendations. He further stated that GBA concurs in the Commission's findings and the conclusion that upon implementation of the modifications listed in the report, the fire protection program at Davis-Besse 1 will be acceptable.

Dated: July 26, 1979

TABLE 1

Davis-Besse 1 Fire Protection System Modifications

A. 1. Service water pump and valve room fire protection system modifications are scheduled to be complete by July 1, 1979.

2. Procedures for backup to the Service Water system from the Circulating Water system were implemented by February 28, 1979.

3. Procedures on Fire Fighting Procedures (Preplans) will be completed by October 1979.

B. In accord with [illegible] Condition 2.C.(3)h, the licensee is scheduling completion of all of the following modifications by April 22, 1980* except that the licensee will provide a Service Water system backup system which is independent of offsite power by mid-1984.

1. FIRE EXTINGUISHERS

Install additional hand-held portable fire extinguishers in the following rooms:

No. 2 Mechanical Penetration Room (Room 236)

No. 1 Mechanical Penetration Room (Room 208)

No. 3 Mechanical Penetration Room (Room 303)

No. 4 Mechanical Penetration Room (Room 313)

No. 2 Electrical Penetration Room (Room 427)

Passage (Room 241)

Valve Room (Room 212)

Maintenance Room (Room 320)

High Voltage Switchgear Room (Room 323)

Fuel Handling Area (Room 300)

Service Water Pump Room (Intake Structure)

Control Room Complex

Maintenance Work Area (Room 109) - Special Class D Dry Power Type Extinguisher Located Near Lathe.

* Some modifications must be accomplished during first refueling outage which is presently scheduled for mid-March thru mid-May 1980.

2. SPRINKLER SYSTEMS

a) Install wet pipe sprinkler systems equipped with quick response type sprinklers in the following rooms:

No. 4 Mechanical Penetration Room (Room 314)

Passage (Room 227)

Corridor (Room 209)

Passage and Hatch Area (Rooms 310 & 313)

Corridor (Room 304)

Radwaste Exhaust Equipment and Main Station Exhaust Fan Room (Room 501)

Component Cooling Water Heat Exchanger and Pump Room (Room 328)

Service Water Pump Room and Valve Room (Intake Structure)

Clean Waste Receiver Tank Room (Room 124)

b) Install a wet pipe sprinkler system equipped with thermal actuated type water spray nozzels in the Cable Spreading Room.

c) Convert the existing manual sprinkler system in Diesel Generator Rooms 318 and 319 to an automatic pre-action type sprinkler system.

d) A moderate energy line crack analysis will be performed on water fire suppression system modifications and the existing auxiliary building water fire suppression system.

3. WATER CURTAINS

Install an automatic water curtain on the following walls designated as fire barriers which are designed to spray water across unprotected feedwater vent openings.

No. 4 Mechanical Penetration Room (Room 314) - Feedwater vent openings located in the east wall of the room.

Boric Acid Evaporator Tank Room (Room 235) East wall - Feedwater vent opening interfacing with clean waste receiver tank room 124.

Boric Acid Evaporator Tank Room (Room 235) - Feedwater vent opening located in the north wall of the room.

NOTE: These wall openings are required to relieve room overpressurization from a steam or feedwater line rupture.

4. CONCRETE CURBING

a) Install concrete floor curbs around the pumps in the following rooms:

Component Cooling Water Heat Exchanger and Pump Room (Room 328)

Service Water Pump Room (Intake Structure)

b) Install a concrete curb under the following doors:

Door 316 located in the north wall of Diesel Generator Room 318.

Door 317 located in the east wall of Diesel Generator Room 318.

Door 218, at the entrance to the service water pump area on the diesel fire pump side.

5. HOSE STATIONS

Install an additional hose station in each of the following areas:

Near Door 322 in the heater bay area on Elevation 585'-0".

Intake Structure

No. 2 Mechanical Penetration Room (Room 236)

No. 1 Mechanical Penetration Room (Room 208)

Diesel Generator Room (Room 319)

Diesel Generator Room (Room 318)

No. 1 Main Steam Line Area (Room 601)

Heater Bay (Room 430) Near Room 427

6. BATTERY ROOM ALARMS

Install loss of air flow indication with annunciation and alarm in the control room for the following rooms:

Battery Room B (Room 428A)

Battery Room A (Room 428B)

7. FIRE RATED DOORS

a) Install 3 hour fire rated door assemblies in the folowing openings:

Tube pull openings in the north wall of Component Cooling Water Heat Exchanger and Pump Room (Room 328).

Door opening southwest corner of ECCS Pump Room (Room 115).

HVAC openings exceeded 48" x 48" in the 3 hour fire barrier separating the turbine area from the Non-Radwaste Supply Air and Exhaust Equipment Room (Room 516).

b) Replace the following door assemblies with UL listed fire rated door assemblies rated for 1 1/2 hours:

Door 502 in the Control Room Complex.

Door 508 in the Control Room Complex.

8. FIRE RATED DAMPERS

Install UL listed 3 hour fire rated door type damper in the following floor slab duct penetrations:

18" x 6" supply and 18" x 6" return duct from Electrical Penetration Room 402 to radwaste fuel handling area air supply equipment area, Room 500 at the 623' elevation floor slab.

18" x 12" supply grill at the 623' elevation floor slab, descending from room 501 down into the No. 2 Electrical Penetration Room (Room 427) on Elevation 603'-0".

9. STRUCTURAL STEEL AND CABLE TRAY FIRE PROTECTION

Apply spray-on type fire proofing to the following structural steel:

Supports for the four horizontal cable trays penetrating the 3 hour fire barrier at column line Q-F on elevation 602'-0".

Supporting structural steel in the mechanical and electrical penetration rooms.

Portions of the structural supporting steel in the turbine building as determined by the turbine building thermal expansion analysis.

10. FIRE DETECTION

a) Install Additional Area Type Fire Detection in the following rooms:

ECCS Pump Room (Room 105)
ECCS Pump Room (Room 115)
Decay Heat Coolers Room (Room 113)
Passage (Room 110)
Clean Waste Receiver Tank Room (Room 124)
Annulus space, in the areas of Electrical Cable Penetrations
Incore Instrumentation Trench Area (Room 220)

Letdown Cooler Area (Room 215)
Flooding Tank Area (Room 214)
Hatch Area (Room 317)
Passage (Room 410)
No. 1 Mechanical Penetration Room (Room 208)
No. 2 Mechanical Penetration Room (Room 236)
No. 3 Mechanical Penetration Room (Room 303)
No. 4 Mechanical Penetration Room (Room 314)
No. 1 Electrical Penetration Room (Room 402)
No. 2 Electrical Penetration Room (Room 427)
Auxiliary Feedwater Pump Room (Room 237)
Boric Acid Addition Tank Room (Room 240)
Waste Gas Compressor Room (Room 244)
Waste Gas Compressor Room (Room 243)
Demineralizer Filter Room (Room 230)
Valve Room (Room 242)
Filter Room (Room 231)
Valve Room (Room 232)
Demineralizer Room (Room 233)
Boric Acid Evaporator Room (Room 234)
Boric Acid Evaporator Room (Room 235)
Passage (Room 227)
Passage (Room 241)
Makeup Pump (Room 225)
Valve Room (Room 212)
Valve Room (Room 211)
Charge Room (Room 321)
Passage (Room 322)
High Voltage Switchgear Room (Room 325)
Component Cooling Water Heat Exchanger & Pump Room (Room 328)
Passage and Hatch Area (Rooms 310 & 313)
Spent Fuel Pool Pump Room (Room 312)
Fuel Handling Area (Room 300)
Corridor (Room 304)
Passage (Room 400)
Corridor (Room 404)
Battery Room B (Room 428A)
Low Voltage Switchgear Room (F-Bus) (Room 428)
Low Voltage Switchgear Room (E-Bus) (Room 429)
Battery Room A (Room 429B)
Corridor (Room 411)
Access Control Area
Purge Exhaust Equipment Room (Room 515)
Radwaste Exhaust Equipment & Main Station Exhaust Fan Room (Room 501)
Air Supply Equipment, Radwaste Fuel Handling Areas (Room 500)
Control Room Toilet (Room 513)
Shift Supervisors Officer (Room 512)
Control Room Toilet (Room 506)
Instrument Calibration Room & Storage (Room 503)
A/C Equipment Room (Room 603)

b) Install Fire Detection in the Auxiliary Shutdown Panel (C-3630).

c) Relocate one of the fire detectors in the High Voltage Switchgear Room 323 to obtain maximum coverage of the room.

d) Install in-tray, linear type, thermal sensing fire detectors inside all cable trays inside the Cable Spreading Room (Room 422A).

e) Modify the fire alarm system to include rezoning, adding detectors, alarming each zone in the control room, adding line supervision to the output circuitry of the fire detection and fire protection panels, adding line supervision to the flow and pressure switches associated with the fire protection system, and incorporating the fire alarm system into the data processing and management section of the plant security.

11. COMMUNICATION

Make portable radio communication equipment available to the fire brigade for emergency fire fighting operations in the following rooms or operations:

ECCS Pump Room (Room 105)
ECCS Pump Room (Room 115)
No. 1 Mechanical Penetration Room (Room 208)
No. 3 Mechanical Penetration Room (Room 203)
No. 4 Mechanical Penetration Room (Room 314)
No. 2 Electrical Penetration Room (Room 427)
No. 1 Electrical Penetration Room (Room 402)
No. 1 Main Steam Line Area (Room 601)
No. 2 Main Steam Line Area (Room 602)
Purge Inlet Equipment Room (Room 600)
Auxiliary Feed Pump Unit Room (Room 237)
Auxiliary Feed Pump Unit Room (Room 238)
Passage (Room 227)
Boric Acid Evaporator Room (Room 234)
Passage (Room 241)
Pump Room (Room 225)
Corridor (Room 209)
Diesel Generator Room (Room 319)
Maintenance Room (Room 320)
Passage (Room 322)
High Voltage Switchgear Room (Room 323)
Auxiliary Shutdown Panel and Transfer Switch Room (Room 324)
High Voltage Switchgear Room (Room 325)
Component Cooling Water Heat Exchanger & Pump Room (Room 328)
Passage & Hatch Area (Rooms 310 & 313)
Fuel Handling Area (Room 300)
Corridor (Room 304)
Corridor (Room 404)
Low Voltage Switchgear Room (Room 429)
Corridor (Room 411)
Non-Radwaste Supply Air & Exhaust Equipment Room (Room 516)
Radwaste Exhaust Equipment & Main Station Exhaust Fan Room (Room 501)
Radwaste Fuel Handling Areas Air Supply Equipment Area (Room 500)

12. EMERGENCY LIGHTING

Install 8-hour emergency battery pack lights in the following rooms:

ECCS Pump Room (Room 105)
ECCS Pump Room (Room 115)
Decay Heat Cooler Room (Room 113)
Passage (Room 110)
Pipe Tunnel (Room 101)
No. 1 Mechanical Penetration Room (Room 208)
No. 2 Mechanical Penetration Room (Room 236)
No. 3 Mechanical Penetration Room (Room 303)
No. 4 Mechanical Penetration Room (Room 314)
No. 2 Electrical Penetration Room (Room 427)
No. 1 Electrical Penetration Room (Room 402)
No. 1 Main Steam Line Area (Room 601)
No. 2 Main Steam Line Area (Room 602)
Purge Inlet Equipment Room (Room 600)
Auxiliary Feed Pump Unit Room (Room 237)
Auxiliary Feed Pump Unit Room (Room 238)
Boric Acid Addition Tank Room (Room 240)
Passage (Room 227)
Boric Acid Evaporator Room (Room 234)
Boric Acid Evaporator Room (Room 235)
Passage (Room 241)
Waste Gas Compressor Room (Room 244)
Waste Gas Compressor Room (Room 243)
Demineralizer Filter Room (Room 230)
Valve Room (Room 242)
Demineralizer Room (Room 223)
Pump Room (Room 225)
Corridor (Room 209)
Monitor Tank Transfer Pump Room (Room 203)
Filter Room (Room 204)
Clean Liquid Waste Monitor Tank Room (Room 201)
Clean Liquid Waste Monitor Tank Room (Room 202)
Valve Room (Room 212)
Valve Room (Room 211)
Maintenance Room (Room 320)
Passage (Room 322)
Component Cooling Water Heat Exchangers & Pump Room (Room 328)
Passage and Hatch Area (Rooms 310 & 313)
Spent Fuel Pool Pump Room (Room 312)
Fuel Handling Exhaust Unit Room (Room 401)
Fuel Handling Area (Room 300)
Corridor (Room 304)
Corridor (Room 404)
Storage (Room 405)
Hot Instrument Shop (Room 406)
Battery Room B (Room 428A)
Low Voltage Switchgear Room (Room 428)
Low Voltage Switchgear Room (Room 429)

Battery Room A (Room 429B)
No. 1 Electrical Isolation Room (Room 428A)
No. 2 Electrical Isolation Room (Room 429A)
Corridor (Room 411)
Purge Exhaust Equipment Room (Room 515)
Radwaste Exhaust Equipment & Main Station Exhaust Fan Room (Room 501)
Air Supply Equipment, Radwaste Fuel Handling Areas (Room 500)
Lube Oil Storage Tank Room (Room 249)
Turbine Lube Oil Tank Room (Room 432)

13. CONDUIT PROTECTION

Install required Kaowool around conduits in the following rooms to protect equipment required for cold shutdown:

Passage 227 (A 1/2 hour fire rated barrier will be provided around the entire length of the conduits associated with the auxiliary feedwater pump suction valve, train No. 1, and the interlock to service water valve 1382.)

Passage 209 (A 1/2 hour fire rated barrier will be provided around the entire length of the conduits associated with the BWST level instrumentation, makeup pump No. 2, and Channel 2 BWST outlet valve.)

Passage and Hatch Area 310 and 313 (A 1/2 hour fire rated barrier will be provided around the entire length of the conduits associated with both trains of CCW valves, the CCW crossover header and CCW return header from containment.)

Service Water Pump Room (A 1/2 hour fire rated barrier will be provided around the conduits associated with power and control for the service water pumps and power and control for the service water valves on the return line to the forebay and the cooling tower makeup. The service water valve motors will also be enclosed with a 1/2 hour fire rated barrier.

Valve Room - Intake Structure - (A 1/2 hour fire rated barrier will be provided around the conduits associated with power and control for the service water valves located in the service water discharge header.)

Component Cooling Water Pump and Heat Exchanger Room (A 1/2 hour fire rated barrier will be provided around the conduits associated with control for the component cooling water pumps and power and control for the CCW crossover valves. The underside of the valve motors will also

14. [illegible]

The administrative controls and training procedures will be revised to follow supplemental staff guidelines contained in "Nuclear Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," dated June 14, 1977, and will be implemented prior to start up following the first refueling outage.

847 153

15. MISCELLANEOUS

The hydrogen line routed through the component cooling water heat exchanger and pump room will be relocated to an area not containing safety related equipment.