POWER AUTHORITY OF THE STATE OF NEW YORK

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November 22, 1982
JPN-82-87

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation

Subject: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Reassessment of Fire Protection
Features for Comformance to Appendix R to 10 CFR 50

Reference: PASNY letter, J.P. Bayne to H.R. Denton
dated July 13, 1982 (JPN-82-61)

Dear Sir:

The Power Authority transmitted the reassessment of the FitzPatrick plant, for conformance to Appendix R, to the NRC via the referenced letter. During subsequent discussions with the NRC staff, they requested clarification of information contained in that evaluation. The clarification requested which was not provided during the discussions is provided in the attachments to this letter.

Attachment 1 contains responses to the NRC staff's specific questions. Revised pages for insertion into the reassessment are contained in attachment 2. These revised pages incorporate the requested clarifications. Changes to the pages are indicated by vertical bars in the margin. Attachment 3 provides revised pages which incorporate clarifications not requested by the NRC staff, but which the Authority feels would assist them in their review. To show the proper location of revised pages which are unnumbered, the revised pages were reproduced on colored paper and inserted into a copy reassessment report. This revised copy is included in Attachment 4.

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The Authority's staff is available to discuss the enclosed information if any questions arise. If the NRC staff determines that additional information is needed to assist their review, the Authority will provide such information as quickly as is reasonably possible. If you have any further questions, please contact Mr. J.A. Gray, Jr. of my staff.

Very truly yours,

Robert A Burns for

J.P. Bayne
Executive Vice President
Nuclear Generation

cc: Mr.Ron Barton
United Engineers & Constructors, Inc.
30 S. 17th Street
Philadelphia, PA 19101

Mr. J. Linville
Resident Inspector
U.S. Nuclear Regulatory Commission
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POWER AUTHORITY OF THE STATE OF NEW YORK
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

Request for Clarification of the Reassessment of Fire Protection Features for Conformance to 10 CFR 50 APPENDIX R

Attachment 1 to
JPN-82-85
November 22, 1982

1. Demonstrate that use of the alternate shutdown capability will not result in core uncovery.

The alternate shutdown capability is provided to insure safe shutdown in the highly unlikely event of a fire in the Control Room (CR-1), Cable Spreading Room (CS-1) or the Relay Room (RR-1). The alternate shutdown capability, and the postulated scenario for its use, is described in Section 5.4 of the reassessment report (pages 5-6 through 5-18).

An initial assumption was made that a fire occurs, in one of these three areas, which theatens to cause loss of system control or the Control Room to become uninhabitable. The reactor operator then: manually scrams the reactor; trips the main turbine; verifies that all control rods are fully inserted; closes the Main Steam Isolation Valves (MSIVs); and leaves the Control Room. Once these actions are completed (which in a real emergency would take only a matter of seconds), the reactor vessel is fully isolated. The only coolant inventory loss is through the safety/relief valves, which actuate intermitently to relieve pressure and provide core cooling.

After leaving the Control Room, the operators proceed to their assigned stations and initiate the alternate shutdown capability. This consists of the Automatic Depressurization System (ADS) and the Low Pressure Coolant Injection (LPCI) mode of the Residual Heat Removal (RHR) System. The final steps in the initation of the alternate shutdown capability are the manual actuation of the ADS valves and the opening of the RHR injection valve.

The SAFE computer code has been used to predict the reactor vessel water level from reactor scram and isolation, until RHR injection results in an increasing water level. The purpose of this analysis was to clearly establish the time available between scram and isolation, and actuation of the ADS valves, such that use of the alternate shutdown capability will not result in core uncovery. For the purposes of this analysis only, it has been extremely conservatively assumed that the fire disables <u>all</u> high pressure makeup to the vessel <u>coincident</u> with the manual scram. Therefore, no inventory makeup is provided during this interim period. (In actuality, this scenario is not considered credible.)

The results of this analysis are as follows:

a. Case 1: ADS actuation occurs 10 minutes after reactor scram and isolation.

In this case, the water level is several feet above the top of active fuel (TAF) at the time of ADS actuation. During depressurization and injection the level drops to, but not below, the TAF. The level decrease, which occurs in all cases, is due to inventory loss during depressurization and cold water injection. Cold water injection causes void collapse, coolant volume shrinkage and a corresponding level decrease. The water level remains at the TAF for approximately 50 seconds and then increases continuously. The level is not below the TAF at anytime.

b. Case 2: ADS actuation occurs 11 minutes after reactor scram and isolation.

During depressurization and injection the water level falls from above the TAF to approximately 4 inches below the TAF. The level remains 4 inches below the TAF for approximately 60 seconds. After 60 seconds the level rises above the TAF and increases continuously.

c. Case 3: ADS actuation occurs 12 minutes after reactor scram and isolation.

At the time of ADS actuation, the water level is above the TAF. During depressurization and injection the level falls to approximately 10 to 11 inches below the TAF for a period of 60 to 80 seconds. Then the water level rises above the TAF and continues to increase.

d. Case 4: ADS actuation occurs 12 to 20 minutes after reactor scram and isolation.

As the time between ADS actuation and reactor scram and isolation increases, the water level drops further below the TAF and remains below TAF for longer periods of time.

e. Case 5: ADS actuation occurs 20 minutes after reactor scram and isolation.

In this case, the water level falls to approximately 36 inches below the TAF during depressurization and injection. The level remains below the TAF for approximately 120 seconds and then rises above the TAF and continues to increase.

This extremely conservative analysis shows that, even assuming loss of all high pressure makeup coincident with reactor scram and isolation (which is not considered credible), core uncovery will not occur if ADS is actuated within 10 minutes of the scram. In fact, the Authority considers the time available to be more than 10

minutes. Further, the Authority considers that there is sufficient time for the operator to initiate the alternate shutdown capability (ADS and LPCI) such that its use will not result in core uncovery. A examination of the conservatisms used in this analysis will demonstrate this.

A fire in the Control Room, Relay Room or Cable Spreading Room will be detected almost immediately (and most probably extinguished). Once the fire is detected, the fire brigade will respond to fight the fire. In addition, the three operators in the plant will immediately begin to prepare for use of the alternate shutdown capability. Many, if not most, of the operator actions outlined in pages 5-14 through 5-18 will be complete prior to reactor scram and isolation. It is very likely that the alternate shutdown capability could be initiated immediately after the reactor is scrammed and isolated.

Even if the operator in the Control Room was unable to delay reactor scram, it is not considered credible that all high pressure injection systems will be disabled coincident with the scram. In actuality one or more of these systems is likely to survive and provide makeup to the reactor vessel, for at least a short period of time.

The SAFE code which was used for this analysis has some inherent conservatism. Preliminary rough estimates (which have not been confirmed by calculation) indicate that with the conservatism removed from the code, an elapsed time of 12 minutes would not result in core uncovery.

It should also be noted that loss of normal AC power, coincident with loss of all high pressure makeup, results in a scenario more severe than those evaluated here. In this case, reactor vessel water level would slowly decrease while the operators attempt to establish high pressure makeup. Assuming the operators were unable to do this, ADS would automatically actuate on low water level. Although a detailed analysis of this scenario was not performed, the Authority believes that this case would result in water levels significantly below the TAF and significantly lower than those which would be experienced during use of the alternate shutdown capability.

The input parameters and computer analyses have been initially verifed. Final validation and verification of the results reported in cases 1 through 5 above are in progress. The computer generated transient curves are being developed and will be completed in the immediate future. If additional detailed information is required, it will be provided promptly on request.

POWER AUTHORITY OF THE STATE OF NEW YORK
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

Request for Clarification of the Reassessment of Fire Protection Features for Conformance to 10 CFR 50 APPENDIX R

Attachment 1 to
JPN-82-85
November 22, 1982

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An initial assumption was made that a fire occurs, in one of these three areas, which theatens to cause loss of system control or the Control Room to become uninhabitable. The reactor operator then: manually scrams the reactor; trips the main turbine; verifies that all control rods are fully inserted; closes the Main Steam Isolation Valves (MSIVs); and leaves the Control Room. Once these actions are completed (which in a real emergency would take only a matter of seconds), the reactor vessel is fully isolated. The only coolant inventory loss is through the safety/relief valves, which actuate intermitently to relieve pressure and provide core cooling.

After leaving the Control Room, the operators proceed to their assigned stations and initiate the alternate shutdown capability. This consists of the Automatic Depressurization System (ADS) and the Low Pressure Coolant Injection (LPCI) mode of the Residual Heat Removal (RHR) System. The final steps in the initation of the alternate shutdown capability are the manual actuation of the ADS valves and the opening of the RHR injection valve.

The SAFE computer code has been used to predict the reactor vessel water level from reactor scram and isolation, until RHR injection results in an increasing water level. The purpose of this analysis was to clearly establish the time available between scram and isolation, and actuation of the ADS valves, such that use of the alternate shutdown capability will not result in core uncovery. For the purposes of this analysis only, it has been extremely conservatively assumed that the fire disables <u>all</u> high pressure makeup to the vessel <u>coincident</u> with the manual scram. Therefore, no inventory makeup is provided during this interim period. (In actuality, this scenario is not considered credible.)

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c. Case 3: ADS actuation occurs 12 minutes after reactor scram and isolation.

At the time of ADS actuation the water level is above the TAF. During depressurization and injection the level falls to approximately 10 to 11 inches below the TAF for a period of 60 to 80 seconds. Then the water level rises above the TAF and continues to increase.

d. Case 4: ADS actuation occurs 12 to 20 minutes after reactor scram and isolation.

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A fire in the Control Room, Relay Room or Cable Spreading Room will be detected almost immediately (and most probably extinguished). Once the fire is detected, the fire brigade will respond to fight the fire. In addition, the three operators in the plant will immediately begin to prepare for use of the alternate shutdown capability. Many, if not most, of the operator actions outlined in pages 5-14 through 5-18 will be complete prior to reactor scram and isolation. It is very likely that the alternate shutdown capability could be initiated immediately after the reactor is scrammed and isolated.

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The SAFE code which was used for this analysis has some inherent conservatism. Preliminary rough estimates (which have not been confirmed by calculation) indicate that with the conservatism removed from the code, an elapsed time of 12 minutes would not result in core uncovery.

It should also be noted that loss of normal AC power, coincident with loss of all high pressure makeup, results in a scenario more severe than those evaluated here. In this case, reactor vessel water level would slowly decrease while the operators attempt to establish high pressure makeup. Assuming the operators were unable to do this, ADS would automatically actuate on low water level. Although a detailed analysis of this scenario was not performed, the Authority believes that this case would result in water levels significantly below the TAF and significantly lower than those which would be experienced during use of the alternate shutdown capability.

The input parameters and computer analyses have been initially verifed. Final validation and verification of the results reported in cases 1 through 5 above are in progress. The computer generated transient curves are being developed and will be completed in the immediate future. If additional detailed information is required, it will be provided promptly on request.

2. Describe how reactor vessel water level indication is available at the alternate shutdown panels.

Reactor vessel water level instrumentation is located in racks adjacent to the control panels for the alternate shutdown capability. The following drawings have been provided:

11825-FM - 1D - 9: Machine Locations, Reactor Building Plan. EL. 300'-0".

11825-7.70 - 179B: Instrument Rack - Reactor Protection and NSSS System.

11825-7.70 - 157B: Reactor Protection Rack 15-6-001.

These drawings show the location of the instrument racks and the water level instruments themselves. Although the alternate shutdown panels are not shown they are located adjacent to the instrument racks. The instrumentation racks are visible from the shutdown panels.

3. Revise pages 5-25 through 5-27 to describe how each high pressure/low pressure interface will be handled to prevent an unrecoverable situation from developing.

The pages have been revised as requested and a new page 5-28 added. These pages detail how each high pressure/low pressure interface is handled.

4. Review the submittal and identify (if necessary) any additional fuses which have to be pulled as a result of the fire.

No fuses, in addition to those previously identified, will need to be pulled.

POWER AUTHORITY OF THE STATE OF NEW YORK
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

Request for Clarification of the Reassessment of Fire Protection Features for Conformance to 10 CFR 50 APPENDIX R

Attachment 2 to
JPN-82-85
November 22, 1982

Question: 1.0 (Cont)

The following is a synopsis of the actions to be taken by Operations personnel in order to effect plant shutdown and cooldown using the alternative shutdown capability. The same procedure is used for fires in any of three areas (CR-1, RR-1, and CS-1).

The initial assumption is that a fire occurs in one of the three areas and that the fire causes system control to be lost or the Control Room to become uninhabitable. The alternative shutdown capability is also valid for any situation which develops which threatens the life and function of the Nuclear Control Operator (NCO) in the Control Room.

1) Initial Operator Actions - When the NCO realizes that the Control Room must be evacuated or has determined that a serious fire is underway in the Control Room, Relay Room, or Cable Spreading Room and that damage to normal reactor shutdown equipment is taking place, the NCO performs the following actions before evacuating:

a. Initiates manual reactor scram.

b. Trips the main turbine.

c. Verfies all control rods are fully inserted.

d. Closes the Main Steam Isolation Valve.

If the NCO is unable to manually scram the reactor for some reason, a

Question: 2.0 (cont)

2) 12-MOV 15, 18 & 80

3) 23-MOV 15, 16 & 60

4) 02-AOV 17 & 18

5) 29-MOV 74 & 77

6) 03-AOV 32 A/B

7) 03-AOV 33

8) MSIVs

Question: 2.0 (cont)

b. For each set of redundant valves identified in a., verify the redundant cabling (power and control) have adequate physical separation as required by Section III.G.2 of Appendix R.

RESPONSE:

i) For each set of redundant valves identified in a., the following set of redundant valves have met the physical separation requirements of Appendix R, Section III,G.2, except for the Control Room, relay Room and Cable Spreading Room.

1. 12-MOV 15, & 12-MOV 18 & 80
2. 23-MOV 15, 16 & 60
3. 02-AOV 17 & 18
4. 29-MOV 74 & 77
5. MSIVs

For a fire in the Control Room, Relay Room or Cable Spreading Area isolation and control switches will be installed outside the control room to prevent fire induced spurious actuations. The valves for which isolation & control switches will be provided are listed in page 5 - 9 thru 5 - 11.

ii) For each set of redundant valves identified in a., the following set of redundant valves have not met the physical separation requirements of Appendix R, Section III.G.2:

1. 10-MOV 17 & 18
2. 03-AOV 32A/B
3. 03-AOV 33

Question: 2.0 (cont)

c. For each case where adequate separation is not provided, show that fire induced failures (hot short, open circuits or short to ground) of the cables will not cause maloperation and result in a LOCA.

RESPONSE:

i) 10-MOV 17 & 18

10-MOV 17 & 18 isolate reactor coolant loop from RHR pump suction. These valves are normally closed. The circuit breaker for 10-MOV 18 will be left open to preclude the possibility of opening the valve due to a fire. In addition, the control and power cables for 10-MOV 18 will be re-routed.

ii) 03-AOV 32A/B and 03-AOV33

03-AOV 32A and B are the Scram Discharge volume vent valves and 03-AOV-33 is the drain valve. This system is currently being redesigned to meet the NRC Long Term CRD requirements. For this new design, the control circuit for these valves will be located in the Control Room. Thus, a fire outside the Control Room will either short or open the 125V DC supply wires to the valve. This type of damage will not cause the valve to open after closed or will cause the valve to close (safe position) if open. For a fire in the Contol Room, Relay Room and Cable Spreading Room, the operator by procedure is instructed to isolate the control rod air header air supply to the Scram Valves to preclude fire induced

Question 2.0 (cont)

spurious control rod actuations (refer to page 5-16). This operator action also isolates the air supply to the above mentioned valves. Thus Control Room, Relay Room and Cable Spreading Room fire induced spurious actuations will not cause these valves to open.

POWER AUTHORITY OF THE STATE OF NEW YORK
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

Request for Clarification of the Reassessment of Fire Protection Features for Conformance to 10 CFR 50 APPENDIX R

Attachment 3 to
JPN-82-85
November 22, 1982

2. Planned Additional Fire Protection

a. To provide protection considered adequate for this zone the fire protection features described below are proposed and an exemption is requested from the requirements of section III.G.2 of Appendix R for the interface between this zone (RB-1E) and RB-1W to the west. The only intervening combustible is flame retardant cabling in trays which pass from RB-1E to RB-1W. This cabling has been assumed lost for the proposed shutdown path for this fire zone except for 5 cables for which an exemption is requested. Therefore the fire protection concern is only the presence of the intervening combustible.

To mitigate this concern, the intervening cable trays which are located at, or within 20 foot seperation of redundant/diverse circuits or equipment, will be equipped with a water spray system to further mitigate postulated cable combustion. The density and distribution of the spray will be commensurate with the fire loading resulting from the intervening cabling. The spray system will be a pre-action system equipped with fusable link spray heads. The pre-action valve will be automatically opened by heat detectors near the cable trays and the boundary of the zone. R

b. A fire barrier will be provided in the stairway area to mitigate the propagation of fire from zone RB-1E (El. 227) to zone RB-1A, (El. 272) above the stairway. The fire rating of this barrier

TABLE 2.7.2.3-1 FIRE ZONES: RB-1 EAST AND RB-1 WEST
REACTOR BUILDING ELEV. 227'-6" HPCI AREA
EVALUATION PARAMETERS SUMMARY TABLE - (Cont)

4. Radiant Heat Shields

   a. The HPCI steam supply piping is lagged, thus minimizing the potential that sprayed lube oil could be raised to its flash point and become a source of combustible material.

   b. The cable trays in the area which are routed along the south wall are above large insulated pipes (approx 36 in. in diameter), steel plates and/or the steel casing of unit cooler UC-22K, all of which will act as flame impingement baffles and minimize the potential for any piloted ignition of these cables.

5. Sprays with fusible heads will be provided for cable trays which are located at, or within 20 foot seperation of redundant/diverse circuits or equipment. R

pressure Reactor coolant makeup and Level Control will be provided by RHR (Division A) LPCI Mode after injection valves have been powered from MCC153. Extended cooling can be provided by LPCI Heat Exchanger, Long term cooling can also be provided later by manual line-up of the RHR Shutdown Cooling mode after manual opening of 10-MOV-18.

III. Identify and Justify Any Required Manual Action

1. No manual operations are initially required in order to achieve the hot shutdown condition if ADS Division A and RCIC Division A are used.

2. If the assumed loss of inverter 3A actually occurs LPCI operation can be restored by manually closing breaker 0G2 in MCC163.

3. Long term cooling in addition to LPCI Heat Exchanger may be provided by manually opening 10-MOV-18 if its control cables are actually affected. This will make RHR Shutdown Cooling available.

IV. Necessary Instrumentation Available in Control Room

1. Reactor Pressure
2. Reactor Water Level
3. Suppression Pool Temperature
4. Suppression Pool Level
5. Core Spray System
   a) Injection flow
   b) Pump discharge pressure
6. RHR System
   a) Pump discharge pressure
   b) Injection flow

2. Planned Additional Fire Protection

a. The major combustibles in this fire zone are the flame retardant cables located in the cable tray system which is located throughout the fire zone. In providing the safe shutdown capability for this zone, it is conservatively assumed that all cable and equipment in this zone becomes disabled. The bases for protection is to contain the fire in this zone and not allow its propogation to other fire zones identified in Section V above.

To provide protection considered adequate for this zone the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1A. This request is the same as requested for RB-1A. A three hour fire rated wall does not exist at this zone boundary. The only combustibles located in the vicinity of the fire zone boundary are flame retardant electrical cabling. These cables are not directly intervening because there is an open 6' horizontal air-gap between cabling in the two zones. There are no cables on either side of the zone boundary for 20 feet required for the proposed shutdown path for a fire in this zone. In addition, the fire loading resulting from cabling located at twenty feet to either side of the zone boundary is low (less than 25 cables total). Therefore, no additional modifications are considered necessary in this zone for this concern. R

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R

b. To provide protection considered adequate for this zone, the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1A in the area of the connecting stairway between elevations 300' and 326' (northeast corner). This is the same request as for Zone RB-1A. A three hour fire rated enclosure does not presently isolate this stairway. The only combustibles located in the vicinity of the stairway is flame retardant cabling which pass through sleeves at the 326' elevation floor boundary which are adjacent to the stairway. These cables are all Division B cables which are <u>not</u> required for the safe shutdown capability required for a fire in zone RB-1C.

The only requirement for fire protection is to prevent the propagation of flame from Elevation 300' to Elevation 326' via the stairway. To resolve this concern, a fire barrier with fire-rated doors and dampers (if required), will be constructed around the stairway to mitigate the propagation of fire from zone RB-1C to RB-1A at this location. The fire rating of this barrier will be commensurate with the fire loading in the entire zones and the immediate area, and the distance of combustibles from the zone boundary to be isolated.

c. To provide protection considered adequate for this zone the fire protection features described below are proposed and, an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1B on the 300' elevation . A three hour fire-rated wall does not exist at this zone boundary. The only combustible located in the vicinity of the fire zone boundary is flame retardant electrical cabling. There are no cables on either side of the zone boundary for 20 feet which are required for the proposed shutdown path for a fire in this zone. In addition, the fire loading resulting from cabling located within twenty feet of the zone boundary is relatively low. To resolve this concern, the intervening cable trays, which are located at or within twenty feet separation of redundant/diverse circuit or equipment will be equipped with a water spray system to mitigate postulated cable combustion. The density and distribution of the spray will be commensurate with the fire loading resulting from the

R

automatically opened by heat detectors near the cable trays and the boundary of the zone.

c. To provide protection considered adequate for this zone the fire protection features described below are proposed, and an exemption is requested from Section III.G.2 of Appendix R for the interface between this zone (RB-1A) EL 300' and zone RB-1B on the 300' elevation. A three hour fire rated barrier does not exist on this zone boundary. The only combustibles located in the vicinity of the fire zone boundary is flame retardant electrical cabling. These cables are not directly intervening because there is an open 4' horizontal air-gap between cabling in the two zones. There are no cables on either side of the zone boundary for 20 feet which are required for the proposed shutdown path for a fire in this zone. In addition, the fire loading resulting from cabling located twenty feet to either side of the zone boundary is very low (about 6 cables). Therefore, the fire retardant cables are of very low density to cause the propagation of fire from one zone to the other. No modifications are considered necessary in this zone for this concern.

d. To provide protection considered adequate for this zone the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1A) and zone RB-1C in the area of the connecting stairway between Elevations 300' and 326' (northeast corner). This is the same request for zone RB-1C. A three hour fire rated enclosure does not presently isolate the stairway. The

2. Planned Additional Fire Protection

a. The major combustibles in this fire zone are the flame retardant cables located in the cable tray system which is located throughout the fire zone. In providing the safe shutdown capability for this zone, it is conservatively assumed that all cable and equipment in this zone becomes disabled. The bases for protection is to contain the fire in this zone and not allow its propogation to other fire zones identified in Section V above.

To provide protection considered adequate for this zone the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1A. This request is the same as requested for RB-1A. A three hour fire rated wall does not exist at this zone boundary. The only combustibles located in the vicinity of the fire zone boundary are flame retardant electrical cabling. These cables are not directly intervening because there is an open 6' horizontal air-gap between cabling in the two zones. There are no cables on either side of the zone boundary for 20 feet required for the proposed shutdown path for a fire in this zone. In addition, the fire loading resulting from cabling located at twenty feet to either side of the zone boundary is low (less than 25 cables total). Therefore, no additional modifications are considered necessary in this zone for this concern. | R

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R

b. To provide protection considered adequate for this zone, the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1A in the area of the connecting stairway between elevations 300' and 326' (northeast corner). This is the same request as for Zone RB-1A. A three hour fire rated enclosure does not presently isolate this stairway. The only combustibles located in the vicinity of the stairway is flame retardant cabling which pass through sleeves at the 326' elevation floor boundary which are adjacent to the stairway. These cables are all Division B cables which are <u>not</u> required for the safe shutdown capability required for a fire in zone RB-1C.

2. Planned Additional Fire Protection

a. The major combustibles in this fire zone are the flame retardant cables located in the cable tray system which is located throughout the fire zone. In providing the safe shutdown capability for this zone, it is conservatively assumed that all cable and equipment in this zone becomes disabled. The bases for protection is to contain the fire in this zone and not allow its propogation to other fire zones identified in Section V above.

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b. To provide protection considered adequate for this zone, the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1A in the area of the connecting stairway between elevations 300' and 326' (northeast corner). This is the same request as for Zone RB-1A. A three hour fire rated enclosure does not presently isolate this stairway. The only combustibles located in the vicinity of the stairway is flame retardant cabling which pass through sleeves at the 326' elevation floor boundary which are adjacent to the stairway. These cables are all Division B cables which are <u>not</u> required for the safe shutdown capability required for a fire in zone RB-1C.

2. Planned Additional Fire Protection

a. The major combustibles in this fire zone are the flame retardant cables located in the cable tray system which is located throughout the fire zone. In providing the safe shutdown capability for this zone, it is conservatively assumed that all cable and equipment in this zone becomes disabled. The bases for protection is to contain the fire in this zone and not allow its propogation to other fire zones identified in Section V above.

To provide protection considered adequate for this zone the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1A. This request is the same as requested for RB-1A. A three hour fire rated wall does not exist at this zone boundary. The only combustibles located in the vicinity of the fire zone boundary are flame retardant electrical cabling. These cables are not directly intervening because there is an open 6' horizontal air-gap between cabling in the two zones. There are no cables on either side of the zone boundary for 20 feet required for the proposed shutdown path for a fire in this zone. In addition, the fire loading resulting from cabling located at twenty feet to either side of the zone boundary is low (less than 25 cables total). Therefore, no additional modifications are considered necessary in this zone for this concern. R

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b. To provide protection considered adequate for this zone, the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1A in the area of the connecting stairway between elevations 300' and 326' (northeast corner). This is the same request as for Zone RB-1A. A three hour fire rated enclosure does not presently isolate this stairway. The only combustibles located in the vicinity of the stairway is flame retardant cabling which pass through sleeves at the 326' elevation floor boundary which are adjacent to the stairway. These cables are all Division B cables which are <u>not</u> required for the safe shutdown capability required for a fire in zone RB-1C.

FIRE AREA/ZONE SUMMARY SHEET

FIRE AREA SU-1

Torus Room

I. Safe Shutdown Systems Disabled

No safe shutdown systems are assumed disabled.

II. Shutdown Capability

Hot and subsequent cold shutdown can be accomplished using Division A systems operated from the Control Room. Shutdown can also be accomplished using Division B systems operated from the Control Room with local operation of ADS from local control panel 02ADS-071.

III. Identify and Justify Any Required Manual Action

ADS Division B Valves can be operated from Panel 02 ADS-071. Note, however, that ADS Division A is available and can be operated from the Control Room. R

IV. Necessary Instrumentation Available in Control Room

1. Reactor Pressure
2. Reactor Water Level
3. Suppression Pool Temperature
4. Suppression Pool Level
5. Core Spray System
   a) Pump discharge pressure
   b) Injection flow
6. RHR System
   a) Pump discharge pressure

2.7.2.11 Exemption request for the Interface Between Fire Zones RB-1B and RB-1A through Stairway R

The Power Authority requests an exemption from the requirements of Section III.G.2, III.G.3 and III.L of Appendix R to 10 CFR 50, to the extent that the separation criteria of III.G.2 or the alternative shutdown capability criteria of III.G.3 and III.L would have to be met for Fire Zones RB-1B and RB-1A on Elevations 300'-0" and 326'-0" respectively in the Reactor Building through stairway. The Authority specifically requests exemption from the requirement that the zones be separated by enclosing the stairway between them with a 3 hour barrier.

The existing and proposed alternate protection, technical basis and justification for this exemption request are contained in the attached Fire Area/Zone Summary Sheets for RB-1B and RB-1A. R

SEE APERTURE CARDS

APERTURE CARD NO# _____

AVAILIBILITY _____ PDR _____ CF _____ HOLD _____

NUMBERS OF PAGES. 3

result of a fire within the area. This review also considered associated cables. However, since each of these areas is enclosed by a 3 hour rated fire barrier which meets the requirement of Appendix R, and all the equipment within the area is assumed lost, separation with the redundant system shown to be available for a shutdown path, was not reviewed further. See Figures 4-1 thru 4-5.

The Reactor Building was divided into 5 zones depending on the systems and components required for safe shutdown located within the zones. Since each zone contained equipment associated with a shutdown path, separation analysis considered the effects of a fire extending 20 ft at either side of the boundary. This additional area considers the separation of 20 feet between cables, equipment and associated non-safety circuits of redundant trains and/or diverse counterparts.

The Reactor Building zones were redefined from those previously described in the Safe Shutdown Analysis dated October 1980. The Crescent Area was divided into east and west zones, and the remainder of the Reactor Building was divided into three zones. This division is justified by the defense in depth features utilized for fire protection. These new Fire Zones are shown on Figures 4-6 thru 4-11.

The control room, relay room and cable spreading room were reviewed relative to Section III.G.3 and III. L and the analysis is addressed in section 5.0 of this report.

provided the valve is accessible and can be locally operated within the time required. The analysis thus identified the safe shutdown function available in the event of a fire.

Spurious valve actuation, credible shorts and simultaneous failure of loads were also considered. The detailed description and procedure used for each was identical to that found in the original Safe Shutdown Analysis Report dated October, 1980.

4.2.3 Task Three

Task Three addressed the event of a total loss of function resulting from the fire. This situation occurs if both sets of redundant trains or diverse counterparts of equipment are located within the 20-foot expanded fire zone or if the equipment malfunctions and results in an unrecoverable condition. In this case, the physical location of the safety cables routed through the additional 20-foot zone and the physical location of its redundant train or diverse counterparts in the original fire zone was examined and plotted. If the separation between the trains or counterparts was determined to be at least 20 feet with no intervening combustibles, then it was concluded that the separation criteria between redundant trains or diverse counterparts was satisfied and the redundant train or diverse counterparts in the additional 20-foot zone was assumed to be available.

If the seperation between the redundant trains or diverse counterparts was determined to be less than 20 feet, then it was concluded that both counterparts were lost due to the fire and appropriate fix was recommended to ensure that at least one safety related train or diverse counterpart required for safe shutdown is available.

4.4 Fire Area/Zone Summary Sheets

A summary sheet for each of the Fire Areas and Zones listed below is included in this Section.

FIRE AREAS/ZONES

Number	Name	Location
1	RB-1E	Crescent Area East Elev. 227'-6"
2	RB-1W	Crescent Area West Elev. 227'-6"
3	RB-1A	Reactor Building Elev. 272'-0" East, Elev. 300'-0"(SE), Entire Elev. 326'-0", thru Elev. 369'-0"
4	RB-1B	Reactor Building Elev. 272'-0" West, Elev. 300'-0" (SW)
5	RB-1C	Reactor Building Elev. 300'-0", (NE & NW)
6	CR-1	Main Control Room
7	RR-1	Relay Room
8	CS-1	Cable Spreading Room
9	MG-1	Motor Generator Room Elev. 300'-0"
10	AD-1	Administration Bldg. Elev. 272'-0"
11	AD-2	Administration Bldg. Elev. 272'-0"
12	AD-3	Administration Bldg. Elev. 272'-0"
13	AD-4	Administration Bldg. Elev. 286"-0"
14	AD-5	Administration Bldg. Elev. 286"-0"
15	AD-6	Administration Bldg. Elev. 300"-0"
16	CR-2	Radwaste Control Room, Elev. 284'-0" R
17	CT-1	Cable Tunnel West-Elev. 260'0"
18	CT-2	Cable Tunnel East-Elev. 260'0"

FIRE AREAS/ZONES (Cont'd)

Number	Name	Location	
19	CT-3	Cable Tunnel 3 Elev. 286'-0"	
20	CT-4	Cable Tunnel 4 Elev. 286'-0"	
21	TB-1	Turbine Bldg. (Basement) Elev. 252'-0", (Mezzanine) Elev. 272'-0" and (Operating Floor) Elev. 300'-0"	
22	RW-1	Radwaste Bldg. and Pipe Tunnel	
23	SH-13	Screen Well House Elev. 272'-0"	
24	SW-1	Turbine Bldg. Switchgear Room Elev. 272'-0"	R
25	SW-2	Turbine Bldg. Switchgear Room Elev. 272'-0"	R
26	FP-1	Diesel Fire Pump Room	
27	FP-2	Foam Room Turbine Bldg. Elev. 272' 0"	
28	SG-1	Standby Gas Filter Room	
29	AS-1	Auxiliary Boiler Room	
30	BR-1	Battery Room No. 1	
31	BR-2	Battery Room No. 2	
32	BR-3	Battery Room No. 3	
33	BR-4	Battery Room No. 4	
34	BR-5	Battery Room Corridor	
35	EG-1	Emergency Diesel Generator Room	
36	EG-2	Emergency Diesel Generator Room	
37	EG-3	Emergency Diesel Generator Room	
38	EG-4	Emergency Diesel Generator Room	
39	EG-5	Emergency Diesel Generator Switchgear	R
40	EG-6	Emergency Diesel Generator Switchgear	R
41	SP-1	Service Water Pump Room (Train B)	

Spray System (Division A) is used for reactor coolant makeup and level control, RHR System (Division A) may be lined up on the suppression pool cooling mode. If RHR System (Division A) is used for injection and level control with vessel discharge occurring through the open safety relief valve lines, suppression pool cooling will also be provided.

Long term cooling can later be provided by manual line-up of the normal shutdown cooling mode of the RHR System (Division A).

III. Identify and Justify any Required Manual Actions | R

1. Local manual operation of the following RHR System (Division A) valves may be required: 10MOV-25A, 10MOV-27A, 10MOV-39A, and 10MOV-38A.

2. Local manual operation of RHR valves required for the normal shutdown cooling mode of RHR for long term cooling may be required. Manual operation of the ADS (Division A) System and Core Spray will be used initially for achieving hot shutdown. This will provide sufficient time for the operators to manually operate the RHR valves mentioned above. The number of valves above are few and repositioning of the valve if necessary, manually, can be accomplished relatively easy.

2. Planned Additional Fire Protection

a. To provide protection considered adequate for this zone the fire protection features described below are proposed and an exemption is requested from the requirements of section III.G.2 of Appendix R for the interface between this zone (RB-1E) and RB-1W to the west. The only intervening combustible is flame retardant cabling in trays which pass from RB-1E to RB-1W. This cabling has been assumed lost for the proposed shutdown path for this fire zone except for 5 cables for which an exemption is requested. Therefore the fire protection concern is only the presence of the intervening combustible.

To mitigate this concern, the intervening cable trays which are located at, or within 20 foot seperation of redundant/diverse circuits or equipment, will be equipped with a water spray system to further mitigate postulated cable combustion. The density and distribution of the spray will be commensurate with the fire loading resulting from the intervening cabling. The spray system will be a pre-action system equipped with fusable link spray heads. The pre-action valve will be automatically opened by heat detectors near the cable trays and the boundary of the zone. IR

b. A fire barrier will be provided in the stairway area to mitigate the propagation of fire from zone RB-1E (El. 227) to zone RB-1A, (El. 272) above the stairway. The fire rating of this barrier

level control with vessel discharge occurring through the open safety relief valve lines, suppression pool cooling will also be provided.

Long term cooling can later be provided by manual line-up of the normal cooling mode of the RHR System (Division B)

III. Identify And Justify Any Required Manual Actions

Local manual operation of the following RHR System (Division A) valves may be required: 10MOV-25B, 10MOV-27B, and 10MOV-17.

Local manual operation of RHR valves required for the normal shutdown cooling mode of RHR for long term cooling may be required.

Using ADS and core spray for initial shutdown cooling will provide sufficient time to manually operate the above valves.

IV. Necessary Instrumentation Available in Control Room

1. Reactor Pressure
2. Reactor Water Level
3. Suppression Pool Temperature
4. Suppression Pool Level
5. Core Spray System
   a) Pump discharge pressure
   b) Injection flow
6. RHR System
   a) Pump discharge pressure
   b) Injection flow (Cable of this instrumentation will be rerouted from the fire zone to ensure its availability). R

only combustibles located in the vicinity of the stairway are flame retardant cabling which pass through sleeves at the 326' Elevation floor boundary which is adjacent to the stairway. These cables are all Division B cables which are not required for the safe shutdown capability required for a fire in zone RB-1A.

The only requirement for fire protection is to prevent the propagation of flame from Elevation 300' to Elevation 326 via the stairway. To resolve this concern, a fire barrier with fire-rated doors and dampers (if required), will be constructed around the stairway to mitigate the propagation of fire from zone RB-1A to RB-1C at this location. The fire rating of this barrier will be commensurate with the fire loading in the entire zones and the immediate area and the distance of combustibles from the zone boundary to be isolated.

e. See also fire zone RB-1E exemption request for stairwell barrier between this zone and RB-1E.

f. The major combustibles in this fire zone are the flame retardant cables located in the cable tray system which is located throughout the fire zone. In providing the safe shutdown capability for this zone, it it conservatively assumed that all cable and equipment in this zone becomes disabled. The bases for protection is to contain the fire in this zone and not allow its propogation to other fire zones identified in Section V. above. R

To provide protection considered adequate for this zone the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2

of Appendix R for the interface between this zone RB-1A and zone RB-1C on Elev. 300'. A three hour fire rated wall does not exist at this zone boundary. The only combustibles located in the vicinity of the fire zone boundary are flame retardant electrical cabling. These cables are not directly intervening because there is an open 6' horizontal air-gap between cabling in the two zones. There are no cables on either side of the zone boundary for 20 feet required for the proposed shutdown path for a fire in this zone. In addition, the fire loading resulting from cabling located at twenty feet to either side of the zone boundary is low (less than 25 cables total). Therefore, no additional modifications are considered necessary for this concern.

g. To provide protection considered adequate for this zone, the fire protection features described below are proposed, and an exemption is requested from the requirement of Section III.G.2 of Appendix R for the interface between this zone (RB-1A) and zone RB-1C in the area of the connecting stairway between elevations 300'-0" and 326'-0" and elevations 300'-0" and 272'-0" (northeast corner). A three hour fire rated enclosure does not presently isolate this stairway. The only combustibles located in the vicinity of the stairway is flame retardant cabling which pass through sleeves at the 326' elevation floor boundary which are adjacent to the stairway. These cables are all Division B cables which are not required for the safe shutdown capability required for a fire in zone RB-1C.

The only requirement for fire protection is to prevent the propagation of flame from elevation 300' to elevation 326' via the stairway. To resolve this concern, a fire barrier with fire-rated doors with dampers (if required) will be constructed around the stairway to mitigate the propagation of fire from zone RB-1C to RB-1A at this location. The fire rating of this barrier will be commensurate with the fire loading in the entire zones and the immediate area, and the distance of combustibles from the zone boundary to be isolated.

h. In order to prevent a fire in zone RB-1A elevation 326'-0" from propagating to zone RB-1C elevation 300' through the open hatch located in the northeast corner, a plug with a 3 hour rating will be provided. This ensures compliance with 10CFR50, Appendix R, Section III.G.2.

The only requirement for fire protection at this zone boundary is to prevent the propagation of flame from Elevation 300' to Elevation 326 via the stairway. Flame retardant cable is the nearest combustible to this stairway (approximately 30 feet away on Elevation 326 and approximately 40 feet away on Elevation 300). Therefore, additional protection is not considered necessary. Approval of this exemption is requested without additional modifications.

d. In order to prevent a fire in Zone RB-1B (elev. 272') from propagating to Zone RB-1C (Elev. 300') through the open hatch located in the northwest corner, a 3 hour rated concrete plug was provided previously. This ensures compliance with 10CFR50 Appendix R, Section III.G.2 since a fire barrier with a 3 hour rating is provided.

e. To provide protection considered adequate for this zone the fire protection features described below are proposed, and an exemption is requested from Section III.G.2 of Appendix R for the interface between this zone RB-1B elevation 300' and zone RB-1A on the 300' elevation. A three hour fire rated barrier does not exist on this zone boundary. The only combustibles located in the vicinity of the fire zone boundary is flame retardant electrical cabling. These cables are not directly intervening because there is an open 4' horizontal air-gap between cabling in the two zones. There are no cables on either side of the zone boundary for 20 feet which are required for the proposed shutdown path

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for a fire in this zone. In addition, the fire loading resulting from cabling located twenty feet to either side of the zone boundary is very low (about 6 cables). Therefore, the fire retardant cables are of very low density to cause the propagation of fire from one zone to the other. No modifications are considered necessary in this zone for this concern.

pressure Reactor coolant makeup and level control will be provided by RHR (Division A) LPCI Mode after injection valves have been powered from MCC153. Extended cooling can be provided by LPCI Heat Exchanger, long term cooling can also be provided later by manual line-up of the RHR Shutdown Cooling mode after manual opening of 10-MOV-18.

III. Identify and Justify Any Required Manual Action

1. No manual operations are initially required in order to achieve the hot shutdown condition if ADS Division A and RCIC Division A are used. R

2. If the assumed loss of inverter 3A actually occurs LPCI operation can be restored by manually closing breaker 0G2 in MCC163. R

3. Long term cooling in addition to LPCI Heat Exchanger may be provided by manually opening 10-MOV-18 if its control cables are actually affected. This will make RHR Shutdown Cooling available.

IV. Necessary Instrumentation Available in Control Room

1. Reactor Pressure
2. Reactor Water Level
3. Suppression Pool Temperature
4. Suppression Pool Level
5. Core Spray System
   a) Injection flow
   b) Pump discharge pressure
6. RHR System
   a) Pump discharge pressure
   b) Injection flow

2. Planned Additional Fire Protection

a. The major combustibles in this fire zone are the flame retardant cables located in the cable tray system which is located throughout the fire zone. In providing the safe shutdown capability for this zone, it is conservatively assumed that all cable and equipment in this zone becomes disabled. The bases for protection is to contain the fire in this zone and not allow its propogation to other fire zones identified in Section V above.

To provide protection considered adequate for this zone the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1A on elevation 300'-0". A three hour fire rated wall does not exist at this zone boundary. The only combustibles located in the vicinity of the fire zone boundary are flame retardant electrical cabling. These cables are not directly intervening because there is an open 6' horizontal air-gap between cabling in the two zones. There are no cables on either side of the zone boundary for 20 feet required for the proposed shutdown path for a fire in this zone. In addition, the fire loading resulting from cabling located at twenty feet to either side of the zone boundary is low (less than 25 cables total). Therefore, no additional modifications are considered necessary for this concern. R

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b. To provide protection considered adequate for this zone, the fire protection features described below are proposed, and an exemption is requested from the requirements of Section III.G.2 of Appendix R for the interface between this zone (RB-1C) and zone RB-1A in the area of the connecting stairway between elevations 300' and 326' (northeast corner). This is the same request as for Zone RB-1A. A three hour fire rated enclosure does not presently isolate this stairway. The only combustibles located in the vicinity of the stairway is flame retardant cabling which pass through sleeves at the 326' elevation floor boundary which are adjacent to the stairway. These cables are all Division B cables which are <u>not</u> required for the safe shutdown capability required for a fire in zone RB-1C.

intervening flame retardant cabling. The spray system will be a pre-action system equipped with fusible link spray heads. The pre-action valve will be automatically opened by heat detectors near the cable trays and the boundary of the zone.

d. In order to prevent a fire in zone RB-1C Elev -300' from propagating to zone RB-1A Elev 326' through the open hatch located in the northwest corner, a new concrete plug with a 3 hour rating will be provided. This ensures compliance with 10CFR50 Appendix R. Section III.G.2. R

FIRE AREA/ZONE SUMMARY SHEET

FIRE AREA BR-2

Battery Room

I. Safe Shutdown Systems Disabled

All Division A systems are assumed to be disabled.

II. Shutdown Capability

Hot and subsequent cold shutdown can be accomplished using Division B systems, operated from the Control Room with local operation of ADS from local control panel 02ADS-071.

III. Identify and Justify Any Required Manual Action

ADS Division B valves can be operated from Panel 02 ADS-071, Since ADS Division A is not available. R

IV. Necessary Instrumentation Available in Control Room

1. Reactor Pressure
2. Reactor Water Level
3. Suppression Pool Temperature
4. Suppression Pool Level
5. Core Spray System
   a) Pump discharge pressure
   b) Injection flow
6. RHR System
   a) Pump discharge pressure
   b) Injection flow

FIRE AREA/ZONE SUMMARY SHEET

FIRE AREA BR-4

Battery Room

I. Safe Shutdown Systems Disabled

All Division B systems are assumed to be disabled.

II. Shutdown Capability

Hot and subsequent cold shutdown can be accomplished using Division A systems operated from the Control Room.

III. Identify and Justify Any Required Manual Action. R

No Manual action required.

IV. Necessary Instrumentation Available in Control Room

1. Reactor Pressure
2. Reactor Water Level
3. Suppression Pool Temperature
4. Suppression Pool Level
5. Core Spray System
   a) Pump discharge pressure
   b) Injection flow
6. RHR System
   a) Pump discharge pressure
   b) Injection flow
7. HPCI System

FIRE AREA/ZONE SUMMARY SHEET

FIRE AREA BR-5

Battery Room - Corridor Reactor Building-El. 272'0"

I. Safe Shutdown Systems Disabled

All Division B systems are assumed to be disabled.

II. Shutdown Capability

Hot shutdown can be accomplished using ADS (Division A) to depressurize with Core Spray (Division A) or LPCI for cooling. Cold shutdown can be accomplished using RHR Shutdown Cooling or Suppression Pool Cooling.

III. Identify and Justify any Manual Action. R

No manual action required.

IV. Necessary Instrumentation Available in Control Room

1. Reactor Pressure
2. Reactor Water Level
3. Suppression Pool Temperature
4. Suppression Pool Level
5. Core Spray System
   a) Pump discharge pressure
   b) Injection flow
6. RHR System
   a) Pump discharge pressure
   b) Injection flow

FIRE AREA/ZONE SUMMARY SHEET

FIRE AREA SU-1

Torus Room

I. Safe Shutdown Systems Disabled

No safe shutdown systems are assumed disabled.

II. Shutdown Capability

Hot and subsequent cold shutdown can be accomplished using Division A systems operated from the Control Room. Shutdown can also be accomplished using Division B systems operated from the Control Room with local operation of ADS from local control panel 02ADS-071.

III. Identify and Justify Any Required Manual Action

ADS Division B Valves can be operated from Panel 02A DS-071. Note, however, that ADS Division A is available and and can be operated from the control room R

IV. Necessary Instrumentation Available in Control Room

1. Reactor Pressure
2. Reactor Water Level
3. Suppression Pool Temperature
4. Suppression Pool Level
5. Core Spray System
   a) Pump discharge pressure
   b) Injection flow
6. RHR System
   a) Pump discharge pressure

Fire Area	Area Location(cont'd)
AD-4, -5,	Administratation Building, elev. 286'-0" | R
CR-2	Radwaste Control Room
CT-1	Cable Tunnel West, elev. 260'
CT-2	Cable Tunnel East, elev. 260'
CT-3	Cable Room North, elev. 286'
CT-4	Cable Room South, elev. 286'
TB-11	Turbine Bldg. Basement, elev. 252'
TB-12	Turbine Bldg. Mezzanine, elev. 272'
TB-13	Turbine Bldg. Operating Floor, elev. 300'
RW-1	Radwaste Bldg. and Pipe Tunnel
SH-1	Screenhouse Area, elev. 272'
SW-1	Switchgear Room West, elev. 272'
SW-2	Switchgear Room East, elev. 272'
FP-1	Diesel Fire Pump Room, elev. 260'
FP-2	Turbine Bldg. Foam Room, elev. 272'
SG-1	Standby Gas Filter Room, elev. 272'
AS-1	Auxiliary Boiler Room, elev. 272'
BR-1	Battery Room No. 1, elev. 272'
BR-2	Battery Room No. 2, elev. 272'
BR-3	Battery Room No. 3, elev. 272'
BR-4	Battery Room No. 4, elev. 272'
BR-5	Battery Room Corridor, elev. 272'
EG-1, -2, -3, -4	Emergency Diesel Generator Rooms, elev. 272'

Fire Area	Area Location(cont'd)
EG-5, -6	Emergency Diesel Generator Switchgear Rooms, elev. 272'
SP-1, -2	Service Water Pump Rooms, elev. 260'
OR-1, -2	Turbine Oil Storage Rooms
OR-3	Miscellaneous Oil Storage Room, elev. 272'
PC-1	Primary Containment Area.

R

Fire Areas For Which Alternative Shutdown Capability will be Provided

The following fire zones do not meet Appendix R, Section III.G.2 separation requirements and an alternative shutdown capability will be provided (see Response Section 5.0):

Fire Area	Area Location
CR-1	Control Room, elev. 300'
RR-1	Relay Room, elev. 286'
CS-1	Cable Spreading Room, elev. 272'

Fire Areas for Which Appendix R, Section III.G.2 Exemption Requests are Provided

The following fire zones do not fully meet the separation requirements of Appendix R, Section III.G.2 and exemption requests are being provided:

Fire Area	Area Location
RB-1E	Reactor Bldg. East, elev. 227'
RB-1W	Reactor Bldg. West, elev. 227'
RB-1A	Reactor Bldg. elev. 272' (east), 300' (southeast) and elevations 326', 344', and 369'
RB-1B	Reactor Bldg., elev. 272' (west) and 300' (west)
RB-1C	Reactor Bldg., elev. 300' (north)
SU-1	Torous Room

R

Question: 1.0 (Cont)

For each of those fire areas of the plant requiring an alternative shutdown system(s) provide a complete set of responses to the following for each fire area:

a. List the system(s) or portions thereof used to provide the shutdown capability with the loss of offsite power.

Response:

List of Systems and Subsystems Used to Provide Alternative Shutdown Capability

An alternative shutdown capability per Appendix R, Section III.G.3 will be provided for the following fire areas:

1. Control Room (CR-1)

2. Cable Spreading Room (CS-1)

New Circuits

Component	Function	Location	
RHR Pump 10P-3D	Isolate and Control	New Panel in RB-1C	
RHR Service Water Pump 10P-1B	Isolate and Control	New Panel in RB-1C	R
Emergency Service Water Pump 46P-2B	Isolate and Control	600V Swgr L26 in SW-2	
10-MOV66B	Isolate and Control	New Panel In RB-1C	
10-MOV39B	Isolate and Control	MCC 163 in RB-1E	
10-MOV25B	Isolate and Control	New Panel in RB-1C	
10-MOV27B	Isolate and Control	MCC 165 in RB-1E	R
10-MOV13D	Isolate and Control	MCC 163 in RB-1E	R
10-MOV15D	Isolate and Control	MCC 163 in RB-1E	R
10-MOV148B	Isolate and Control	MCC 161 in RB-1A	
10-MOV12B	Isolate and Control	MCC 161 in RB-1A	
10-MOV65B	Isolate and Control	MCC 163 in RB-1E	R
10-MOV18	Isolate and Control	MCC 151 in RB-1B	
10-MOV16B	Isolate and Control	MCC 163 in RB-1E	R
10-MOV70B	Isolate and Control	MCC 161 in RB-1A	
10-MOV166B	Isolate and Control	MCC 161 in RB-1A	
10-MOV21B	Isolate and Control	MCC 163 in RB-1E	R
10-MOV89B	Isolate and Control	New Panel in RB-1C	
10-MOV148A	Isolate and Control	MCC 151 in RB-1B	R
46-MOV102B	Isoalte and Control	MCC 262 in SW-2	

New Circuits (cont'd)

Component	Function	Location
46-MOV101B	Isolate and Control	MCC 262 in SW-2
27-SOV126B	Transfer Switch to Alternate Power Supply	Outside CR1, RR-1, CS-1 Areas
27-SOV129B	Transfer Switch to Alternate Power Supply	Outside CR-1, RR-1, CS-1 Area
29-AOV86A	Fail Safe Valve Position	Near Valve Area
29-AOV86B	Fail Safe Valve Position	Near Valve Area
29-AOV86C	Fail Safe Valve Position	Near Valve Area
29-AOV86D	Fail Safe Valve Position	Near Valve Area
29-MOV77	Isolate and Control	BMCC-2 in RB-1E
02-AOV17	Fail Safe Valve Position	Near Valve Area
23-MOV16	Isolate and Control	BMCC-6 in RB-1A
23-MOV60	Isolate and Control	BMCC-2 in RB-1E
23-MOV25	Isolate and Control	BMCC-4 in RB-1E
12-MOV18 & 80	Isolate and Control	BMCC-4 in RB-1E R
New Instrument	Suppression Pool Temperature	New Panel in RB-1C
New Instrument	Suppression Pool Level	New Panel in RB-1C
New Instrument	RHR "B" Loop Flow From "B" Loop Injection	New Panel in RB-1C
New Instrument	RHR "D" Pump Discharge Pressure	New Panel in RB-1C
New Instrument	RHR "B" Loop Service Water Flow	New Panel in RB-1C

New Circuits (cont'd)

Component	Function	Location
New Instrument	Drywell Temperature	New Panel in RB-1C
4KV Breaker 10604	Isolate and Control	4KV SWGR H06 in EG-6
4KV Breaker 10602	Isolate and Control	4KV SWGR H06 in EG-6
4KV Breaker 10612	Isolate and Control	4KV SWGR H06 in EG-6
4KV Breaker 10614	Isolate and Control	4KV SWGR H06 in EG-6
4KV Breaker 10660	Isolate and Control	4KV SWGR HO6 in EG-6 1R
600V Breaker 12602	Isolate and Control	600V Bus L26 in SW-2
600V Breaker 11602	Isolate and Control	600V Bus L16 in RB-1C

Question 1.0 (Con't) 1R

c. Provide drawings of the alternative shutdown system(s) which highlight any connections to the normal shutdown systems (P&IDs for piping and components, elementary wiring diagrams of electrical cabling). Show the electrical location of all breakers for power cables, and isolation devices for control and instrumentation circuits for the alternative shutdown systems for that fire area.

Response:

The alternate shutdown systems and components will be independent of the CR-1, RR-1 and CS-1 areas and drawings will be provided for all components when design drawings/locations are finalized.

Question: 1.0 (Cont)

d. Verify that changes to safety systems will not degrade safety systems; (e.g., new isolation switches and control switches should meet design criteria and standards in the FSAR for electrical equipment in the system that the switch is to be installed; cabinets that the switches

Question: 1.0 (Cont)

The following is a synopsis of the actions to be taken by Operations personnel in order to effect plant shutdown and cooldown using the alternative shutdown capability. The same procedure is used for fires in any of three areas (CR-1, RR-1, and CS-1).

The initial assumption is that a fire occurs in one of the three areas and that the fire causes system control to be lost or the Control Room to become uninhabitable. The alternative shutdown capability is also valid for any situation which develops which threatens the life and function of the Nuclear Control Operator (NCO) in the Control Room.

1) Initial Operator Actions - When the NCO realizes that the Control Room must be evacuated or has determined that a serious fire is underway in the Control Room, Relay Room, or Cable Spreading Room and that damage to normal reactor shutdown equipment is taking place, the NCO performs the following actions before evacuating:

a. Initiates manual reactor scram.

b. Trips the main turbine.

c. Verfies all control rods are fully inserted.

d. Closes the Main Steam Isolation Valve.

If the NCO is unable to manually scram the reactor for some reason, a