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NUCLEAR POWER

SYSTEMS DIVISION

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MFN 059-83
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March 18, 1983

U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, DC 20555

Attention: Mr. D.G. Eisenhut
Division of Licensing

Gentlemen:

SUBJECT: IN THE MATTER OF 238 NUCLEAR ISLAND
GENERAL ELECTRIC STANDARD SAFETY ANALYSIS REPORT (GESSAR II)
DOCKET NO. STN 50-447

REVISED DRAFT RESPONSES, RESPONSES TO DISCUSSION ITEMS AND TEXT CLARIFICATIONS

Attached please find revised final draft responses to selected questions of the Commission's August 25, 1982 and October 5, 1982 information requests. Only modifications (new or revised) to the responses of the referenced letters are provided. Also attached are proposed resolution discussion items. The following are provided:

Attachment Number	
1	Proposed Resolution of Chemical Engineering Branch Discussion Items on Fire Protection and Appendix 9A Text Clarifications
2	Proposed Resolution of Containment Systems Branch Discussion Items
3	Draft Responses to Instrumentation and Control Systems Questions
4	Draft Responses to Structural and Geotechnical Engineering Branch Questions

Sincerely,

E003

R. Artigas for
Glenn G. Sherwood, Manager
Nuclear Safety & Licensing Operation

cc: F.J. Miraglia (w/o attachments)
D.C. Scaletti
C.O. Thomas (w/o attachments)
L.S. Gifford (w/o attachments)

ATTACHMENT NO. 1

PROPOSED RESOLUTION OF
CHEMICAL ENGINEERING BRANCH
DISCUSSION ITEMS ON FIRE PROTECTION
AND APPENDIX 9A TEXT CLARIFICATIONS

The purpose of this attachment is to resolve the GE/NRC discussion items listed below pertaining to fire protection:

1. Qualifications of fire rated barriers
2. Qualifications of fire rated penetration seals
3. Qualifications of fire rated doors
4. Lack of 3-hour fire rated dampers
5. Safe Shutdown Capability
6. Alternate Shutdown Capability
7. Ventilation Systems
8. Separation of the Control Room
9. Lack of smoke detectors in the control room outside air intakes
10. Separation of the cable rooms
11. Separation of the remote shutdown panel

If the resolution to these items described herein are accepted by the NRC, the detailed changes to the GESSAR II design will be provided to the NRC prior to the first Applicant referencing GESSAR II. Any GESSAR II/Applicant interface requirements pertaining to the resolution of these items will be included in Section 1.9, Interface requirements in the next amendment.

Also included in this attachment are Appendix 9A text clarifications requested by the NRC during the fire protection review.

PROPOSED RESOLUTION OF DISCUSSION ITEMS

Discussion Items 1,5,8,10 and 11

For the type 1,2 and 3 wall assemblies, the GESSAR II design will provide completely equivalent construction to tested wall assemblies or testing will be required. All three assemblies will be required to have a 3 hour rating. In addition, a wall and fire door rated 3 hours will be added in the corridor at the (-) 16'10" elevation of the auxiliary building. The combination of these two actions should resolve discussion items 1,3,8,10 and 11.

Discussion Item 2

GESSAR II will require qualification of all penetrations by test if possible or by analysis if testing is impractical or impossible. The penetrations are already required to have a fire rating equivalent to the barrier which they penetrate.

Discussion Item 3

GESSAR II will require that, with the exception of the fuel building railroad door, all door assemblies be tested to prove their ability to provide the required fire rating. The exterior railroad door for the fuel building is too large to be tested in a furnace. Also, for the GESSAR II design, a 3 hour fire rating for the railroad door is not required to meet the requirements of BTP ASB 9.5-1. The plant design objective was to provide a 3 hour fire rating for external walls. The construction of this door is equivalent or better than that which would be required to provide a 3 hour fire rating. On this basis, the requirements to resolve discussion item 3 should be met.

Discussion Item 9

Smoke detectors will be added to the air intakes for the control building. This will resolve discussion item 9.

Discussion Item 6

Discussion item 6 is an NRC staff action item concerning the shutdown capability. Since the GESSAR II design will have redundant remote shutdown capability which meets the requirements for fire separation, no future concerns are expected.

Discussion Items 4 and 7

These two items concern fire dampers in ventilation ducts used for smoke venting. Some of these ventilation ducts are shared systems in that they also provide normal ventilation. Other ducts are for smoke venting only. Based on the discussion below the present GESSAR II design should be adequate and should be acceptable to the NRC, so that items 4 and 7 should be resolved.

The auxiliary building smoke removal system is shown on Figure 9.4-4 and described in Section 9.4.3.2.1.11. Each set of duct work serves and traverses only fire areas of one safety division. There is a smoke vent intake in each fire area with a remote manually operated fire damper which is normally closed. There is a fusible link from the air operator to the vanes so that the damper will close on high temperature. The fire rating of the dampers is 1½ hours. The duct is heavy gage, welded construction which exceeds the requirements for 3 hour fire rated construction. Hence, the design is considered completely adequate for the service.

One of the design objectives of GESSAR II is to avoid fire dampers in smoke vents, as their automatic closure would render the smoke vent inoperative at the very time it was needed. With two exceptions, smoke vents pass through safety areas only of the same division as the vented area. The two exceptions are the Division 2 cable tunnel vent and the primary containment vent.

The Division 2 cable tunnel located in the corridor of (-)6'-3" elevation of the auxiliary building has a dedicated smoke removal system. Which passes through the division 1 area. The inlet to the duct is fitted with a standard sprinkler head. Any heat or smoke that exceeds 165^{o} F will fuse the link allowing fire water to flow through the head. The duct opening is 2.5 sq ft. This deluge spray will be sufficient to cool inlet gases from either direction below a temperature that could cause duct failure which could allow migration of heat to other fire resistence areas. This is consistent with NFPA 13 using sprinklers to protect openings in fire resistence walls where dampers cannot be fitted for other overriding criteria. The calculated flow rate from the cable tunnel during smoke venting is 3000 cfm, a relatively low flow rate. The sprinkler is designed to flow .15 gpm per 100 square foot of floor area or a minimum of 15 gpm, therefore, 3000 cfm will be cooled by a minimum of 15 gpm water. This is sufficient flow to cool gases or smoke below the temperature that would weaken or collapse even a duct of standard gage construction. The duct has a thick wall and is all welded construction, which adds a redundant degree of protection.

The other exception is the vent for primary containment. It has two inboard (1 manual) isolation valves and one outboard isolation valve. If a fire occurs, either the inboard valves or the outboard valve would be located out of the fire area and could be closed. The valve within the fuel building is located in a room with 2 hour rated walls. The room is directly accessible from the fuel building or the stair tower between the fuel and auxiliary building. All return registers except for the pool sweep are located high in the containment so that bulk mixing, aided by the dome mixing system, would occur before any combustion gases enter the ventilation duct. The containment is more sensitive to bulk air temperature than the ventilation duct. If a fire raised the bulk temperature excessively, containment spray would be initiated to protect the containment at a temperature well below the threshold of damage to the ventilation duct. For these reasons, the current GESSAR II design for the containment ventilation is considered proper and adequate.

The remaining smoke vents which do not have fire dampers are the two in the control building. Each one of these smoke vents serves and traverses one division. Since it is impossible for these smoke vents to allow the fire in the area of one division to spread to another division, the current GESSAR II design is considered to be adequate and proper.

TEXT CLARIFICATIONS

9A.5.6 Carbon Dioxide Storage (Continued)

After initial discharge, a second discharge for the largest single hazard area must be maintained in the storage tank. Therefore, the Applicant must maintain a minimum of 11,200 lb of CO_2 for Diesel-Generator Building fire protection.

In the event of malfunction of the automatic sequencing for CO_2 discharge to a hazard area, manual activation of the discharge sequence is provided in the control room.

9A.5.7 HVAC Systems

The majority of the HVAC systems are provided with fire dampers where the duct penetrates a fire-resistive wall; however, there are some exceptions. There are some cases where divisional control valves are in the same fire area. These cases are presented, and the justification and/or effect on the plant operation relative to reactor safe shutdown is presented.

9A.5.7.1 Control Building

The smoke removal systems for the cable rooms and control room are a function of damper arrangement, utilizing the existing air conditioning system. The cable room tunnel exhaust ducts are not provided with fire dampers. (1) The cable rooms are provided with automatic wet pipe sprinklers and POC detectors. The cable trays are solid bottom, covered metal trays. A postulated electrically initiated XLPE-FR cable insulation fire in a closed tray or PGCC would evolve little smoke or heat. The anticipated transitory combustible load, a function of the Applicant's fire safety program, is expected to be negligible. Inlet ducts are equipped with fire dampers to prevent hot smoke or gases from entering the areas from fire sources exterior to the areas.

(1) Since separate smoke removal systems are provided for division 1 and division 2 areas, a fire in either cable room would not preclude safe shutdown utilizing the other division. For a fire in the control room the remote shutdown panel is available.

9A.5.7.2 Division 2 Cable Tunnel - Auxiliary Building

The Division 2 cable tunnel is provided with a dedicated smoke removal system. This system is not fitted with a fire damper. The duct inlet is fitted with a ~~possible leak~~ fusible link spray nozzle fed from the cable tunnel automatic wet pipe sprinkler system. ② POC detection is provided. The cable trays are solid bottom, covered metal trays. A postulated electrically initiated XLPE-FR cable insulation fire in a closed tray would involve little smoke or heat. The anticipated transitory combustible load, a function of the Applicant's fire safety program, is expected to be negligible. Inlet and exhaust ducts from the normal ventilation system are fitted with fire dampers to prevent hot smoke or gases from entering the tunnel via fire sources exterior to the tunnel.

② The spray nozzle will cool any hot gases suficiently to provide protection to the duct.

9A.5.7.3 SGTS Exhaust Stack - Fuel Building

The SGTS exhaust stack begins at the (-)5 ft 3 in. level of the Fuel Building and extends through the roof of the building. There are no fire dampers in this stack; however, fire stops are provided where the stack penetrates a fire-resistive floor. The stack is fabricated of 3/8-in. steel plate and is 18 in. in diameter. Since the exhaust gases that enter the stack pass through a charcoal filter bed equipped with water sprays that preclude a high temperature condition, and the stack must function to maintain safe plant conditions, fire dampers are not necessary or desirable. The functionality of the SGTS exhaust stack has no effect on the ability to accomplish safe shutdown. The exhaust stack does not penetrate any floors which provide fire separation required to insure safe shutdown capability.

9A.5.7.4 Reactor Building HVAC Penetrations

There are two Reactor Building HVAC penetrations. These ducts are 42 in. diameter and are manufactured from 3/8-in. seamless SA106 grade B pipe with the divisional isolation valves welded to the pipe. Transition to ductwork is provided downstream of each valve. The valves are positioned on either side of the Reactor Building wall. Fire dampers are not provided for these penetrations. The consequences of venting hot gases through these valves, should they fail to close during a fire in containment, cannot prevent safe shutdown

9A.5.7.5 Reactor Building

HVAC divisional isolation valves within the Reactor Building are located in opposite quadrants of the building. Since the Reactor Building has no fire separations and is considered one fire area, fire dampers are not provided. There is no HVAC penetration between the Reactor Building and the drywell portion of the Reactor Building. The state of these valves, open or closed, cannot prevent safe shutdown of the reactor.

9A.5.7.6 Auxiliary Building: (-) 32 ft 0 in., Zone 1, Col. E-11

There are two air-operated divisional valves located 3 ft 6 in. apart. Failure of these valves as a result of an area fire would result in a loss of corridor ventilation at this level of the building. Rooms containing ECCS equipment would not be affected, since they are separately exhausted from this system. The dedicated smoke removal system would provide ventilation from this area; safe reactor shutdown would not be prevented. The area is provided with POC detection.

9A.5.7.7 Auxiliary Building: (-) 32 ft 0 in., Zone 1, Col. D-11

The normal ventilation system for the ECCS areas is supplied by divisional valves located 4 ft 0 in. apart in this area. Loss of both of these valves as a result of an area fire would result in loss of ECCS room pressure control. ⑦ The SGTS can provide pressure control for these areas if normal exhaust is lost as a result of fire or other system failures. The area is provided with POC detection.

⑦ Since room cooling is provided by internal fan coil units the room pressure control system has no effect on the operation of the ESF systems within a room. Therefore, the ability to safely shutdown the plant is unaffected by the room pressure

9A.5.7.8 Auxiliary Building: (-) 6 ft 10 in.

Two divisional SGTS valves are on 5-ft centers in this area. Failure of both of these valves as a result of fire or other

9A.5.7.8 Auxiliary Building: (-) 6 ft 10 in. (Continued)

occurrence would result in failure of the SGTS to exhaust the ECCS areas. Since these valves and the area are protected with wet pipe sprinklers and POC detection, it is unlikely that the valves would be affected by fire. The normal valve mode is fail closed upon loss of the air-operated motor. Loss of either or both valves would not prevent safe reactor shutdown.

9A.5.7.9 Auxiliary Building: (-) 6 ft 10 in.

Two divisional valves that provide ventilation to the RWCU area are located on 3-ft centers in the corridor. Loss of these air motor-operated valves, as a result of fire or other causes, would result in loss of ventilation to the RWCU area. These valves provide ventilation only if the area is entered for surveillance or maintenance activities. The valves are protected by automatic wet pipe sprinklers and POC detection. The RWCU is not required for safe shutdown.

9A.5.7.10 Auxiliary Building: 28 ft 6 in. HVAC Equipment Room, Zone 1

The pressurizing air supply to the Reactor Building has two divisional valves located in this room. These valves are separated by 12 ft. The loss of both valves as a result of fire or other causes would result in loss of pressurizing air to containment. (9) Leakage of air from the reactor to the annulus, as a result of this loss, would be handled by the annular ventilating system and would be routed to either the plant exhaust or SGT System if high radiation occurs. The HVAC room is provided with POC detection systems. (9) The operability of this system does not effect safe shutdown.

9A.5.7.11 Fuel Building: (-) 17 ft 0 in.

There are two divisional valves located on 8-ft centers in this area that control room ventilation to the divisional SGT system.

9A.5.7.11 Fuel Building: (-) 17 ft 0 in. (Continued)

Loss of these air motor-operated valves, from fire or other accidental causes, will result in the loss of comfort ventilation in the SGTS rooms. The SGTS is separately cooled; therefore, there would be no loss of SGTS availability nor would safe shutdown be prevented. The area is provided with POC detection.

9A.5.7.12 Fuel Building: (-) 17 ft 0 in.

There are two divisional valves located on 8-ft centers, separated from the valves discussed in Subsection 9A.5.7.11 by about 20 ft. These air-operated valves are part of the outside air system that supplies cooling air to the SGTS charcoal filter beds. One valve is normally closed except when needed for system operation. The loss of these valves, from fire or other accidental causes, will result in lack of ability to provide air cooling to the SGTS. The SGTS is provided with water sprays in the charcoal filters that can be initiated manually upon high temperature alarm should the outside air system be inoperative. POC detection is provided. SGTS(A) is located in a separate fire rated compartment from SGTS(B), so that a single failure would not fail the entire system. The SGTS is not required for safe shutdown under fire conditions

9A.5.7.13 Fuel Building: (-) 5 ft 3 in.

There are two divisional valves located on 8-ft centers, that are part of the fuel pool air sweep system. This system is used only when low level radioactivity is present in the fuel pool. Loss of the system would result in loss of sweep air. High radiation level in the Fuel Building exhaust is monitored and, if detected, the air is sent to the SGTS. The valves are protected by an automatic wet pipe sprinkler system and POC detection is provided. The pool sweep system is not required for safe shutdown.

9A.5.7.14 Fuel Building: (-) 5 ft 3 in.

There are two divisional valves, located in an identical configuration as described in Subsection 9A.5.7.12, and which perform the same function. This building level has wet pipe sprinkler provided as well as POC detection. The analysis and justification is the same. The fire dampers in the common duct, which feeds both divisions of SGTS, could close as a result of fire in an area which feeds SGTS. However, since fire and LOCA are not required to be considered concurrently, the SGTS is not required for safe shutdown under fire conditions.

9A.5.7.15 Fuel Building: El 28 ft 6 in.

There are several sets of divisional valves, located on this mezzanine floor level, associated with the fuel and reactor building ventilation system. These valves are located in pairs, about 4 to 12 ft on centers, and there are three pairs spatially separated from each other around the building walls. The loss of any pair of valves, from any cause, would result in using the SGTS at a reduced flow rate to pick up the affected system. The area has POC detection. No plant operations are performed on this level and the possibility of fire is remote. The operational conditions of these systems cannot prevent safe shutdown under fire conditions.

9A.5.7.16 Control Building: El 28 ft 6 in.

The HVAC equipment systems for the Control Building are housed in two 3-hr fire-resistive rooms. The systems are divisional and 100% redundant. There are two valves of the opposite division in each area. The loss of either division, for any cause, will result in transferring the HVAC load to the standby division. Both divisional areas have POC detection systems.

The operational state of a valve in a single fire area can only affect the operation of the HVAC train in that area. For a fire in an area the redundant train in the other area will be available so that safe shutdown may be accomplished.

Table 9A.5-2

NONFIRE RATED DOORS

Door No.	Building and Elevation	Location - Function	Design Criteria
~~R-8-1~~	~~Reactor (-) 31 ft 7 in.~~	~~Exterior Wall - Annulus~~	~~Pressure - Seismic~~
~~R-8-6~~	~~Reactor (-) 5 ft 3 in.~~	~~Exterior Wall - Annulus~~	~~Pressure - Seismic~~
~~R-11-7~~	~~Reactor 11 ft 0 in.~~	~~Exterior Wall - Personnel~~	~~Bulkhead Doors in~~ Pressure Vessel
~~F-84-8~~	~~Reactor 84 ft 7 in.~~	~~Exterior Wall - Personnel~~	~~Bulkhead Doors in Pressure Vessel~~
F-7-4	Fuel (-) 32 ft 0 in. ~~84 ft 7 in.~~	Secondary Containment ~~Exterior Wall - Personnel~~	Seismic, Pr ~~Bulkhead Doors in Pressure Vessel~~
F-27-12	Fuel (-) 32 ft 0 in.	Secondary Containment	Seismic, Pressure, Watertight
F-7-25	Fuel (-) 5 ft 3 in.	Secondary Containment	Seismic, Pressure
F-27-31	Fuel (-) 5 ft 3 in.	Secondary Containment	Seismic, Pressure
F-29-32[2]	Fuel (-) 5 ft 3 in.	Exterior Wall - Exit	Tornado Pressure, Seismic
F-25-33[1]	Fuel (-) 9 ft 0 in.	Exterior Wall - Cask Car	Tornado Pressure, Missile, Seismic
F-7-43	Fuel 11 ft 0 in.	Secondary Containment	Seismic, Pressure
~~F-8-44~~	~~Fuel 11 ft 0 in.~~	~~Fuel Transfer Room Shield Plug~~	~~Shielding, Seismic, Pressure~~
F-27-45	Fuel 11 ft 0 in.	Secondary Containment	Seismic, Pressure
F-7-53	Fuel 28 ft 6 in.	Secondary Containment	Seismic, Pressure
F-27-57	Fuel 28 ft 6 in.	Secondary Containment	Seismic, Pressure
F-4-62[2]	Fuel 51 ft 7 1/2 in.	Exterior Wall, Exit	Tornado Pressure, Seismic

1. Large exterior shielding door which is not required to have a 3 hour rating to meet CMEB 9.5-1

2. Exterior door, not required to be fire rated to meet CMEB 9.5-1

Table 9A.5-2

NONFIRE RATED DOORS (Continued)

Door No.	Building and Elevation		Location - Function	Design Criteria
F-5-68	Fuel	84 ft 7 in.	Secondary Containment	Seismic, Pressure
F-4-72[2]	Fuel	101 ft 5 1/2 in.	Exterior Wall, Exit	Tornado Pressure, Seismic
A-12-49	Auxiliary (-) 32 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-10-3	Auxiliary (-) 12 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-11-4	Auxiliary (-) 32 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-14-6	Auxiliary (-) 32 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-13-5	Auxiliary (-) 32 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-15-7	Auxiliary (-) 32 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-17-9	Auxiliary (-) 32 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-19-10	Auxiliary (-) 32 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-20-11	Auxiliary (-) 32 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-22-12	Auxiliary (-) 32 ft 0 in.		Secondary Containment	Watertight, Pressure, Seismic
A-16-25[2]	Auxiliary (-) 6 ft 10 in.		Exterior Wall - Exit	Tornado Pressure, Watertight, Seismic

Table 9A.5-2

NONFIRE RATED DOORS (Continued)

Door No.	Building and Elevation	Location - Function	Design Criteria
A-10-27	Auxiliary (-) 6 ft 10 in.	Secondary Containment	Pressure, Seismic
A-19-28	Auxiliary (-) 6 ft 10 in.	Secondary Containment	Pressure, Seismic
A-14-29	Auxiliary (-) 6 ft 10 in.	Secondary Containment	Pressure, Seismic
A-19-37	Auxiliary (-) 0 ft 10 in.	RHR Blowout Panel	Pressure, Seismic
A-9-42	Auxiliary 11 ft 0 in.	Vestibule - Exit	Tornado Pressure, Seismic
A-9-52	Auxiliary 28 ft 6 in.	Exterior Wall - Exit	Tornado Pressure, Seismic
A-10-55 through A-10-62	Auxiliary 29 ft 10 1/2 in.	Steam Tunnel, Eight Blowout Panels	Pressure, Seismic, Light Weight Panels for Pressure Relief to Steam Tunnel
C-19-14	Control (-) 6 ft 10 in.	Exterior Wall, Equipment Doors	Tornado Pressure, Missile, Seismic
C-19-13	Control (-) 6 ft 10 in.	Vestibule, Exit	Tornado Pressure, Seismic
C-19-5	Control (-) 6 ft 10 in.	Exterior Wall, Exit	Tornado Pressure, Seismic
C-19-17	Control (-) 6 ft 10 in.	Corridor, Equipment Doors	Oversize Doors for Equipment Removal
C-15-18	Control (-) 6 ft 10 in.	Cable Tunnel	Bullet Resistive, Seismic
C-15-20	Control (-) 6 ft 10 in.	Control Room	Bullet Resistive, Seismic
C-22-21	Control (-) 6 ft 10 in.	Computer Room	Bullet Resistive, Seismic

Table 9A.5-2

NONFIRE RATED DOORS (Continued)

Door No.	Building and Elevation	Location - Function	Design Criteria
C-15-22	Control (-) 6 ft 10 in.	Cable Tunnel	Bullet Resistive, Seismic
C-25-44 2	Control 11 ft 0 in.	Exterior Wall, Exit	Tornado Pressure, Seismic
RW 43-46 2	Radwaste (-) 6 ft 10 in.	Exterior Wall, Truck Dock	Shielding, Seismic
~~DG-1~~	~~Diesel Generator (-) 6 ft 10 in Division 1~~	~~Exterior Wall, Equipment Removal, Exit~~	~~Tornado Pressure, Seismic~~
DG-1-6	Diesel Generator (-) 28 ft 6 in. Division 1	Vestibule, Exit	Tornado Pressure, Seismic
~~DG-5-1~~	~~Diesel Generator (-) 6 ft 10 in., Division 2~~	~~Exterior Wall, Equipment Removal, Exit~~	~~Tornado Pressure, Seismic~~
DG-5-3 2	Diesel Generator (-) 6 ft 10 in. Division 2	Exterior Wall, Exit	Tornado Pressure, Seismic
DG-5-7	Diesel Generator (-) 6 ft 10 in.	Vestibule, Exit	Tornado Pressure, Seismic
~~DG-9-1~~	~~Diesel Generator (-) 6 ft 10 in. Division 3~~	~~Exterior Wall, Equipment Removal, Exit~~	~~Tornado Pressure, Seismic~~
DG-10-9	Diesel Generator 28 ft 6 in. Division 3	Vestibule, Exit	Tornado Pressure, Seismic

ATTACHMENT NO. 2

PROPOSED RESOLUTION OF
CONTAINMENT SYSTEMS BRANCH
DISCUSSION ITEMS

Item 3a

The following change will be made in GESSAR Section 6.2.1.6.1.4, Page 6.2-70. The first ~~line~~ sentence of that section will read: "The drywell is to be subjected to ~~a~~ preoperational and periodic low pressure integrated leak rate tests to confirm continuing adequate leak-tightness."

6.2.1.6.1.3.2 High-Pressure Leak-Rate Test

Immediately following the high-pressure structural proof test, the drywell pressurization source is shut off and the change in drywell pressure and temperature is monitored for the next 30 minutes.

The drywell pressure and temperature decay information is used to establish that the drywell leak rate is less than the allowable value. The drywell air-flow rate from the 1-hr structural test holding period is used as a gross check on the drywell leak rate. Figure 6.2-37 shows the expected pressure decay rate for the drywell from the 30-psig starting point, the possible effect of temperature, and the calculated allowable and technical specification limits. The figure demonstrates that adequate accuracy in the drywell leak rate can be obtained by a 30-min test.

The acceptance criterion for the high-pressure leak-rate test is demonstration that the drywell has a bypass $A/\sqrt{K}$ of less than 10% of the $A/\sqrt{K}$ value for bypass capability under DBA conditions (i.e., less than 10% of 4.3 ft^2 or 0.43 ft^2).

6.2.1.6.1.4 Post-Construction Drywell Test

The drywell is [to be] subjected to [preoperational and] periodic low pressure integrated leak rate tests to confirm continuing adequate leak-tightness. The frequency of these tests will be identified in the technical specifications. The differential pressure selected for the periodic tests is sufficient to simulate controlling SBE conditions, but slightly less than the differential pressure required to clear the top row of horizontal vents. That is, the head of suppression pool water above the top row of horizontal vents, under test conditions, is sufficient to seal the vents without having to install temporary closures.

Item 3a

Item 3b

GESSAR Sections 6.2.1.6.2, Page 6.2-72 and 6.2.1.7, Page 6.2-74 will be changed to include the requirements for visual inspection of vacuum breakers, etc. The changes are as follows:

ITEM 36 See also next page

The acceptance criteria for the bypass $A/\sqrt{K}$ for the drywell at 3 psig is less than 10% of the $A/\sqrt{K}$ value of 1.45 ft^2, as calculated in Subsection 6.2.1.1.5.5. Figure 6.2-39 shows the expected pressure decay for the drywell, assuming several leak rates and rates-of-temperature changes. The figure demonstrates that the low pressure leak rate test can be completed within the 30-min period and the gross effects of temperature change can be accounted for.

6.2.1.6.2 Post-Operational Leakage Rate Tests

The containment vacuum relief valves will be tested once a year. The leaktightness of the valves will not be tested separately but will be tested along with the entire containment, during the containment leak rate tests. Operability of the vacuum relief valves will be verified by position-limit switches on the valves, after the valve has been activated locally or remotely. ¶ Accessible portions of the drywell vacuum relief system, hydrogen mixing system, drywell purge system and drywell bleed system will be visually inspected to determine that they are free of foreign debris at each refuelling outage. For descriptions of the containment integrated leak rate test (ILRT) and other post-operational leakage rate tests (10CFR50 Appendix J tests Type A and B) see Subsection 6.2.6.

6.2.1.6.3 Design Provisions for Periodic Pressurization

In order to assure the capability of the containment to withstand the application of peak accident pressure at any time during plant life, for the purpose of performing integrated leakage rate tests, close attention has been given to certain design and maintenance provisions. Specifically, the effects of corrosion on the structural integrity of the containment have been minimized by the use of stainless steel cladding in the suppression pool area. Other design features which have the potential to deteriorate with age, such as flexible seals, will be carefully inspected and tested as outlined above. In this manner, the structural and leak integrity of the containment will remain essentially the same as originally accepted.

ITEM 36

The acceptance criteria for the bypass $A/\sqrt{K}$ for the drywell at 3 psig is less than 10% of the $A/\sqrt{K}$ value of 1.45 ft^2, as calculated in Subsection 6.2.1.1.5.5. Figure 6.2-39 shows the expected pressure decay for the drywell, assuming several leak rates and rates-of-temperature changes. The figure demonstrates that the low pressure leak rate test can be completed within the 30-min period and the gross effects of temperature change can be accounted for. VISUALLY INSPECT HYDROGEN MIXING, DRYWELL PURGE & DRYWELL VACUUM BREAKERS & DRYWELL [illegible] SYSTEMS FOR LEAKAGE ([illegible] SEE FIG 9.4-8).

6.2.1.6.2 Post-Operational Leakage Rate Tests INSPECT [illegible] DRYWELL VACUUM BREAKER AIR OPENINGS FOR CLEARANCE FROM FOREIGN MATERIAL.

The containment vacuum relief valves will be tested once a year. The leaktightness of the valves will not be tested separately but will be tested along with the entire containment, during the containment leak rate tests. Operability of the vacuum relief valves will be verified by position-limit switches on the valves, after the valve has been activated locally or remotely.

For descriptions of the containment integrated leak rate test (ILRT) and other post-operational leakage rate tests (10CFR50 Appendix J tests Type A and B) see Subsection 6.2.6.

6.2.1.6.3 Design Provisions for Periodic Pressurization

In order to assure the capability of the containment to withstand the application of peak accident pressure at any time during plant life, for the purpose of performing integrated leakage rate tests, close attention has been given to certain design and maintenance provisions. Specifically, the effects of corrosion on the structural integrity of the containment have been minimized by the use of stainless steel cladding in the suppression pool area. Other design features which have the potential to deteriorate with age, such as flexible seals, will be carefully inspected and tested as outlined above. In this manner, the structural and leak integrity of the containment will remain essentially the same as originally accepted.

ITEM 3b

containment. Similar transmitters, which sense containment-to-shield-annulus differential pressure, are initiating inputs to the Containment Vacuum Relief System. VACUUM RELIEF VALVES ARE CHECKED FOR OPERABILITY AT LEAST ONCE A MONTH. ACCESSIBLE PORTIONS OF THE VACUUM RELIEF VALVE SYSTEMS SHALL BE VISUALLY INSPECTED TO DETERMINE THAT THEY ARE CLEAR OF FOREIGN DEBRIS, AT EACH REFUELING OUTAGE. 10.084 Item 3b

[illegible] space and containment RWCU room temperatures are inputs to the Leak Detection System. Four thermocouples are mounted at appropriate elevations of the drywell space, and 12 thermocouples monitor drywell HVAC differential temperatures. Sixteen thermocouples are mounted in the containment RWCU rooms.

Four suppression pool-level sensors are immersed in the suppression pool water, and the assocaited level transducers are mounted above the water level. The level signals are transmitted to SPMU System logic in the control room. Eighteen thermocouples are immersed in the suppression pool water. Suppression pool temperature readouts and alarms are located in the control room.

Two hydrogen analyzers are mounted in the drywell, and two are mounted in the containment. Each analyzer draws a sample from an appropriate area of the drywell or containment.

Hydrogen concentration alarms and recorders are located in the control room.

Radiation detectors are mounted in the containment ventilation exhaust ducts. Radiation monitors and containment isolation trip circuitry is located in the control room.

Refer to Section 7.2 for a description of drywell pressure as an input to the Reactor Protection System, and Section 7.3 for a description of containment and drywell pressure, containment-to-

Item 4

GESSAR Section 6.2.3.3.1.3, Page 6.2-93 will be changed to include blowout panel tests, as follows:

6.2.3.3.1.2.5 Residual Heat Removal (RHR-C) Compartment (Continued)

There are no high energy lines in the RHR-C compartment; therefore, the DBA for this compartment is the moderate energy line crack of the steam condensing line in the RHR-B compartment.

6.2.3.3.1.2.6 Main Steam Tunnel

The Auxiliary Building main steam tunnel is located in between the 48-in. concrete walls separating it from the RHR-A and B compartments. The steam tunnel houses the high energy and highly radioactive main steam and feedwater lines along with some portions of the high energy RCIC steam bypass lines, RHR steam condensing lines, and RWCU piping.

The DBA for the Auxiliary Building steam tunnel is the double-ended break of one of the 26-in. main steamlines which route from the vessel, into the tunnel and through, into the Turbine Building. There is 658 ft^2 of open vent space into the Turbine Building in the event of the postulated DBA or any other high energy line break occurring in the Auxiliary Building compartments.

6.2.3.3.1.3 Design Evaluation

Blowout panels are used in place of open vent pathways when the environmental conditions of one compartment must be isolated from the environment in another compartment, for the benefit of personnel during maintenance periods. The RWCU pump and valve room, and the RHR-A and B compartments utilize one-way blowout panels for this purpose. The panels are designed to open upon a differential pressure of 0.25 psid. The panels are assumed to be fully opened after 0.1 sec following their release. Performance tests shall be performed to verify that the panels will open at specified pressure and opening time and produce no damaging missiles.

The RELAP4 computer program was used to calculate the mass and energy release rates and the resultant compartment pressures and

Item 5a

The following note is to be added to Table 6.2-21 on Page 6.2-185 of GESSAR. This note is to be attached to the last column of the table ~~on that page~~ which indicates the status of opening and if they are displayed in the control room. The note is to read as follows: "The applicant will provide that openings not indicated as having status lights must be under administrative control with alarm indications in the control room."

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Table 6.2-21

SECONDARY CONTAINMENT PENETRATIONS - ARCHITECTURAL

AUXILIARY BUILDING

Opening Type	Leakage (cfm)	Elevation	Room/Area	Opening Number	Status Lights[1]
Doors	0	(-)32 ft 0 in.	LPCS	A-22-12	No
			RCIC	A-20-11	No
			RHR "C"	A-19-10	No
			HPCS	A-17-9	No
	0	(-)6 ft 10 in.	RHR "A"	A-14-29	Yes
			RWCU	A-19-28	Yes
			RHR "B"	A-10-27	Yes
Equipment Hatches	0	(-)32 ft 0 in.	LPCS	A-15-7	No
			RHR "A"	A-14-6	No
			RCIC	A-13-5	No
			RHR "C"	A-11-4	No
			RHR "B"	A-10-3	No
			HPCS	A-9-2	No
	0	(+)51 ft 11 in. (Roof)	RHR "A"	A-50-E	No
				A-50-F	No
			RHR "B"	A-50-B	No
				A-50-C	No
Blowout Panels	0	(+)28 ft 6 in.	RHR "A"	A-14-59	No
				A-14-60	No
				A-14-61	No
				A-14-62	No
			RHR "B"	A-10-55	No
				A-10-56	No
				A-10-57	No
				A-10-58	No

FUEL BUILDING

Opening Type	Leakage (cfm)	Elevation	Room/Area	Opening Number	Status Lights
Doors	30	(-)32 ft 0 in.	Access From Elevator Tower	F-7-4	Yes
Door	50	(-)32 ft 0 in.	Access From Stair Tower	F-27-12	Yes
Door	30	(-)5 ft 3 in.	Access From Elevator Tower	F-7-25	Yes
Door	40	(-)5 ft 3 in.	Access From Stair Tower	F-27-31	Yes
Door	30	(+)11 ft 0 in.	Access From Elevator Tower	F-7-43	Yes

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Table 6.2-21

SECONDARY CONTAINMENT PENETRATIONS - ARCHITECTURAL (Continued)

FUEL BUILDING (Continued)

Opening Type	Leakage (cfm)	Elevation	Room/Area	Opening Number	Status Lights[1]
Door	30	(+)11 ft 0 in.	Access From Stair Tower	F-27-45	Yes
Door	30	(+)28 ft 6 in.	Access From Elevator Tower	F-7-53	Yes
Door	30	(+)28 ft 6 in.	Access From Stair Tower	F-27-57	Yes
Door	50	(+)84 ft 7 in.	Access to Personnel Air-	F-5-68	No
Railroad	50	(-)5 ft 3 in.	lock Cask Car Space	F-25-33	No
Equipment Hatch	0	(+)51 ft 11 in.	Roof	F-51-E	No
Equipment Hatch	0	(+)51 ft 11 in.	Roof	F-51-F	No
REACTOR BUILDING					
Door	50	(-)32 ft 0 in.	FB to Annulus	R-8-1 & F-8-1	No
Manhole	50	(+)35 ft 3 in.	Steam Tunnel (AB) to Annulus	85	No

Notes

(1) The applicant will provide that openings not indicated as having status lights must be under administrative control with alarm indications in the control room.

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As a result of the review of potential sources of bypass leakage, changes will be made to GESSAR Tables 6.2-20 and 6.2-24, and Figure 6.2-48 to address the following subjects:

1) The 4" SPCU from demineralizer line will be added to secondary containment Table 6.2-20.

2) HPCS and ~~Eight inch~~ RCIC from condensate storage system line will be added to Table 6.2-24 as a footnote. ~~This footnote will be attached to penetration No. 16C and 17C.~~

3) A note will be added to Figure 6.2-48 on GESSAR Page 6.2-279 indicating that the Type 4 penetration has a sealing system on the inner set of valves.

The specific GESSAR changes are as follows:

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Table 6.2-20

SECONDARY CONTAINMENT PENETRATIONS
AUXILIARY BUILDING PIPING

Line Number	Isolation Scheme (1)	Penetration	Sleeve Type (2)	Seal Type (2)
8-in. COND4-AAB	Type 4 (3)	107 AP	2	F
6-in. MS206-AEC	Type 3	118 AP	7	F
1-in. IA7-ADC	Type 2	108 AP	1 or 2	F
1-in. SA109-ADC	Type 3	109 AP	1 or 2	F
1-in. COND84-AAC	Type 3	260 AP	1 or 2	F
1-in. SA114-AAC	Type 3	288 AP	1 or 2	F
3-in. CRW11-AEC	Types 5 & 7	457 AP	1	F
6-in. DRW20-AEC	Types 5 & 7	456 AP	1	F
1-in. RCIC27-AHC	Type 4 (4)	120 AP	7	S
6-in. RCIC7-EAB	Type 4 (4)	119 AP	1 or 2	F
4-in. COND21-AAC	Type 6	117 AP	1 or 2	F
16-in. ESW28-ADC	Type 8	106 AP	1	F
3-in. DMW21-ABC	Type 1	113 AP	1 or 2	F
16-in. ESW26-ADC	Type 8	105 AP	1	F
1-1/2-in. ESW34-ATC	Type 8	111 AP	1 or 2	S
4-in. ESW30-ADC	Type 8	114 AP	1 or 2	F
1-1/2-in. ESW35-ADC	Type 8	112 AP	1 or 2	S
4-in. ESW29-ADC	Type 8	115 AP	1 or 2	F
4-in. ESW21-ADC	Type 8	253 AP	1 or 2	F
4-in. ESW22-ADC	Type 8	252 AP	1 or 2	F
3/4-in. ADS24-ADC	Type 8	300 AP	1 or 2	F
3-in. COND22-ADC	Type 3	22 AP	1 or 2	F
6-in. ESW352-ADC	Type 8	62 AP	1 or 2	F
6-in. ESW17-ADC	Type 8	61 AP	1 or 2	F
3-in. IA6-ADC	Type 2	60 AP	1 or 2	F
4-in. SA62-ADC	Type 1	59 AP	1 or 2	F
10-in. RHR51-BAC	Type 8	58 AP	1 or 2	F
12-in. FPCC94-AAC	Type 8	57 AP	1	F
3-in. COND153-AAC	Type 1	302 AP	1	F
1-1/2-in. SA150-ADC	Type 1	301 AP	1	F
6-in. RHR63-AEC	Type 4	Embedded	-	-
8-in. SPCU7-ABC	Type 1	788 AP	1	F
2-in. WPS14-ABB	Type 4	795 AP	1	F
3-in. DRW5-AEC	Type 1	960 AP	1	F
1-1/2-in. ESW-ATC	Type 8	783 AP	1	F
1-1/2-in. ESW196-ATC	Type 8	782 AP	1	F
2-in. DMW18-ABC	Type 1	749 AP	1	F
2-in. RWCU262-AGC	Type 3	Embedded	-	-
2-in. RWCU277-AGC	Type 3	Embedded	-	-
3-in. DRW47-AEC	Type 3	Embedded	-	-
3-in. CRW1-AEC	Type 3	Embedded	-	-
3/4-in. APS20-ADB	Type 8	800 AP	1	F
3/4-in. WPS26-ABB	Type 8	799 AP	1	F

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Table 6.2-20

SECONDARY CONTAINMENT PENETRATIONS
AUXILIARY BUILDING PIPING (Continued)

Line Number	Isolation Scheme (1)	Penetration	Sleeve Type (2)	Seal Type (2)
4-in. SA62-ADC	Type 1	752 AP	1	F
3-in. IA6-ADC	Type 1	753 AP	1	F
3-in. CW306-ADC	Type 8	750 AP	1	F
3-in. CW304-ADC	Type 8	751 AP	1	F
6-in. ESW17-ADC	Type 8	754 AP	1	F
6-in. ESW352-ADC	Type 8	755 AP	1	F
2-in. WPS14-ABB	Type 8	950 AP	1	S
3/4-in. APS7-ADB	Type 8	951 AP	1	S
1-1/2" CW205-ADC	Type 5	744 AP	1	S
1-1/2-in. CW204-ADC	Type 5	745 AP	1	S
2-in. PLCS8-ECB	Type 8	952 AP	1	S
1-in. PLCS9-ECB	Type 3	955 AP	1	S
4-in. FPW52-ADC	Type 1	793 AP	1	S
4-in. FPW52-ADC	Type 1	791 AP	1	S
3-in. DRW20-AED	Types 5 & 7	190 AP	1	S
4-in. RWCU96-AEC	Type 4 (4)	305 AP	1	S
3-in. DRW5-AEC	Type 3	960 AP	1	S
2-in. COND160-AAC	Type 3	315 AP	1	F
18-in. COND3-AAB	Type 3	98 AP	1	F
4-in. ESW63-ADC	Type 8	130 AP	1	S
4-in. ESW64-ADC	Type 8	129 AP	1	S
16-in. ESW60-ADC	Type 8	127 AP	1	F
3-in. ESW70-ADC	Type 8	126 AP	1	F
3-in. ESW69-ADC	Type 8	125 AP	1	F
3-in. ESW69-ADC	Type 8	125 AP	1	F
1-in. SA98-ADC	Type 1	774 AP	1	S
3/4-in. APS7-ADB	Type 8	961 AP	1	S
3/4-in. APS7-ADB	Type 8	966 AP	1	F
4-in. FPW2-ADC	Type 1	792 AP	1	S
4-in. FPW2-ADC	Type 1	786 AP	1	S
3/4-in. WPS23-ABB	Type 8	962 AP	1	S
3/4" WPS23-ABB	Type 8	965 AP	1	F
3-in. ESW54-ATC	Type 1	725 AP	1	S
3-in. ESW53-ATC	Type 1	724 AP	1	S
1-in. SA98-ADC	Type 1	963 AP	1	F
3/4-in. ADS37-ADB	Type 8	963 AP	Later	F
3/4-in. CRW72-ECB	Type 3	535 FAP	3 or 4	Later
3/4-in. CRW73-ECB	Type 3	535 FAP	3 or 4	Later
3/4-in. CRW74-ECB	Type 3	535 FAP	3 or 4	Later
3/4-in. CRW75-ECB	Type 3	535 FAP	3 or 4	Later
6-in. RWCU135-EAC	Type 1	105 FAP	3 or 4	Later
6-in. RWCU285-EAC	Type 1	171 FAB	3 or 4	Later
6-in. RHR26-BAB	Type 8	522 FAP	3 or 4	Later
2-in. PLCS2-ECB	Type 8	954 AP	1	S

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Table 6.2-20

SECONDARY CONTAINMENT PENETRATIONS
AUXILIARY BUILDING PIPING (Continued)

Line Number	Isolation Scheme(1)	Penetration	Sleeve Type(2)	Seal Type(2)
2-in. PLCS12-ECB	Type 8	972 AP	1	S
3-in. ESW170-ADC	Type 8	447 AP	1	F
3-in. ESW169-ADC	Type 8	446 AP	1	F
1-1/2-in. SA153-ADC	Type 1	357 AP	1 or 2	S
3-in. CW304-ADC	Type 9	356 AP	1 or 2	S
3-in. CW306-ADC	Type 9	355 AP	1 or 2	S
14-in. RHR32-BAB	Type 8	309 AP	7	F
10-in. MS201-ECB	Type 8	310 AP	7	F
1-in. RHR136-AAB	Type 8	524 FAP	3 or 4	Later
6-in. MS202-ECB	Type 8	104 FAP	3 or 4	Later
4-in. COND21-AAC	Type 6	103 FAP	3 or 4	Later
1-in. IA7-ADC	Type 2	536 FAP	3 or 4	Later
10-in. MS204-ACB	Type 8	102 FAP	3 or 4	Later
4-in. RWCU96-AEC	Type 3	106 FAP	3 or 4	Later
6-in. RCIC2-EAB	Type 8	523 FAP	3 or 4	Later
3/4-in. CRW46-EAC	Type 3	534 FAP	3 or 4	Later
3/4-in. CRW47-EAC	Type 3	534 FAP	3 or 4	Later
3/4-in. CRW48-EAC	Type 3	534 FAP	3 or 4	Later
3/4-in. CRW49-EAC	Type 3	534 FAP	3 or 4	Later
20-in. RHR20-BAB	Type 8	170 FAP	3 or 4	Later
6-in. RWCU4-EAC	Type 1	297 AP	1	S
6-in. RWCU5-EAC	Type 1	295 AP	1	S
3-in. ESW39-ATC	Type 1	746 AP	1	S
3-in. ESW11-ATC	Type 1	747 AP	1	S
3-in. ESW53-ATC	Type 1	772 AP	1	S
3-in. ESW54-ADD	Type 1	773 AP	1	S
12-in. FPCC95-AAC	Type 8	6 AP	1	F
10-in. RHR52-BAC	Type 8	7 AP	1 or 2	F
3/4-in. ADS54-ADC	Type 3	312 AP	1 or 2	F
4-in. CSSW4-ADC	Type 8	8 AP	1 or 2	F
4-in. CSSW3-ADC	Type 8	9 AP	1 or 2	F
1-in. COND76-AA	Type 3	255 AP	1 or 2	F
10-in. HPCS7-EAB	Type 4 (3)	99 AP	1	F
1-in. COND79-AAC	Type 3	132 AP	1 or 2	F
1-in. SA111-ADC	Type 3	131 AP	1 or 2	F
1-in. COND80-AAC	Type 3	257 AP	1 or 2	F
1-in. SA69-ADC	Type 1	121 AP	1 or 2	F
3-in. COND27-AAC	Type 3	316 AP	1 or 2	S
10-in. MS201-ECB	Type 8	442 AP	1	S
14-in. RHR33-BAB	Type 8	441 AP	1	S
3-in. DMW22-ABC	Type 3	128 AP	1	F
3-in. COND31-AAC	Type 3	124 AP	1	F
2-in. CCW21-ADC	Type 5	123 AP	1	F
2-in. CCW22-ADC	Type 5	122 AP	1	F
1-in. SA112-ADC	Type 3	10 AP	1	S

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Table 6.2-20

SECONDARY CONTAINMENT PENETRATIONS
AUXILIARY BUILDING PIPING (Continued)

Line Number	Isolation Scheme[1]	Penetration	Sleeve Type[2]	Seal Type[2]
.2-in. ESW48-ADC	Type 5	597 FP	7	F
.2-in. ESW47-ADC	Type 5	598 FP	8	F
:-in. CW3-ADC	Type 5	544 FP	8	F
:-in. CW8-ADC	Type 5	545 FP	8	F
:-in. HWD17-AAC	Type 5	546 FP	8	F
:-in. HWD1-AAC	Type 5	547 FP	8	F
-in. SDW215-AEC	Type 5	Roof Drain	-	-
-in. SDW214-AEC	Type 5	Roof Drain	-	-
:-in. SPCU7-AAC	Type 5	578 FP	1 or 2	F
:/4-in. APS19-ADB	Type 8	504 FP	1 or 2	F
:/4-in. APS19-ADB	Type 8	560 FP	1 or 2	F
:-in. ESW187-ADC	Type 8	614 FP	1 or 2	F
:-in. ESW192-ADC	Type 8	615 FP	1 or 2	F
:-in. CCW1-ABC	Analyzed for leakage	585 FP	1 or 2	F
:-in. DRW56-AEC	Type 3	Embedded	-	-
:-in. FPW11-ADC	Type 5	Embedded	-	-
:/4-in. APS4-ADB	Type 8	621 FP	1 or 2	F
4-in. SPCU12-AAC	Type 3(5)	Embedded	—	—
4-in. SPCU35-AAC	Type 3(6)	Embedded	—	—

NOTES:

(1) See Figure 6.2-~~52~~48
(2) See Figure 6.2-~~47~~.52

(3) Line always water filled - water leakage bypasses secondary containment - leakage included in Table 6.5-5; dose effect is negligible.

(4) Containment isolation valves provided with positive leakage control.

(5) Normally deactivated valve.

(6) Capped spare line.

Table 6.2-24

EVALUATION OF POTENTIAL CONTAINMENT BYPASS LEAKAGE PATHS

Primary Containment Penetration		Line Size Penetrating Containment	Termination Region (1)	Bypass Leakage Barrier (2)	Potential Bypass Path
2C.	Equipment Hatch	NA	S	NA	No
3C.	Personnel Lock	NA	S	NA	No
4C	Personnel Lock	NA	S	NA	No
8C.	Fuel Transfer Tube	NA	S	NA	No
9C-12C.	Main Steamlines	26-in.	E	C, (3), (4)	No
13C.	Steam Isolation Valve Drain	3-in.	E	C, A, (3)	No
16C, 17C.	Feedwater Lines	20-in.	E	C, (3), (4)	No
25C	CRD Pump Discharge	2-in.	E (6)	C, (3), (6)	No
27C.	RHR System (LPCI Mode) A - Div 1	14-in.	S (5), (6)	C (5), (6)	No
28C.	RHR System (LPCI Mode) B - Div 2	14-in.	S (5), (6)	C, (5), (6)	No
29C.	RHR System (LPCI Mode) C - Div 2	14-in.	S (5), (6)	C, (5), (6)	No
30C.	RHR "A" Pump Suction - Div 1	24-in.	S (5), (6)	(5), (6)	No
31C.	RHR "B" Pump Suction - Div 2	24-in.	S (5), (6)	(5), (6)	No
32C.	RHR "C" Pump Suction - Div 2	24-in.	S (5), (6)	(5), (6)	No
33C.	RHR Pump "A" Disch to Suppression Pool	14-in.	S (5) (6)	(5), (6)	No
34C.	RHR Pump "B" Disch to Suppression Pool	14-in.	S (5) (6)	(5), (6)	No
35C.	RHR Pump "C" Disch to Suppression Pool	14-in.	S (5), (6)	(5), (6)	No
36C.	Demineralizer Water to G33-2020	2-in.	E	C, (3)	No
37C.	RHR SRV to Suppression Pool	12-in.	S	NA	No
39C.	RHR SRV to Suppression Pool	12-in.	S	NA	No
40C.	RHR SRV to Suppression Pool	6-in.	S	NA	No
41C.	RHR SRV to Suppression Pool	4-in.	S	NA	No
42C.	RHR SRV to Suppression Pool	3-in.	S	NA	No
43C.	RHR SRV to Suppression Pool	3-in.	S	NA	No
44C.	RHR Suction FM Recirc	20-in.	S	C	No
47C.	Steam to RCIC Turbine	10-in.	S	C, (3)	No
48C.	RCIC pump Discharge Head Spray	6-in.	S (5)	C, A, (5), (4)	No (7)
49C.	RCIC Pump Suction from Suppression Pool	8-in.	S (5)	(5)	No
50C.	RCIC Turbine Discharge to Suppression Pool	16-in.	S	V	No
52C.	RCIC Pump Minimum Flow Bypass	3-in.	S (5)	(5)	No
53C.	LPCS Pump Discharge	12-in.	S	C	No

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Table 6.2-24

EVALUATION OF POTENTIAL CONTAINMENT BYPASS LEAKAGE PATHS (Continued)

Primary Containment Penetration		Line Size Penetrating Containment	Termination Region (1)	Bypass Leakage Barrier (2)	Potential Bypass Path
54C.	LPCS Pump Discharge	12-in.	S	NA	No
55C.	LPCS Pump Test Line	12-in.	S	NA	No
56C.	LPCS SRV Discharge to Suppression Pool	2-in.	S	NA	No
57C.	Air Positive Seal to Air System	3/4-in.	S	NA	No
58C.	HPCS Pump Discharge	12-in.	S (5), (6)	C (5)	No (7)
59C.	HPCS Pump Suction	24-in.	S (5), (6)	(5), (6)	No
60C.	HPCS SRV Discharge	12-in.	S (5), (6)	(5), (6)	No
63C.	RWCU Pump Suction From Recirc Pump	6-in.	S	C	No
64C.	RWCU Return to Feedwater Line	6-in.	S	C	No
65C.	RWCU Discharge to Main Condenser	4-in.	E	C, (6), (3)	No
68C.	Containment Supply Purge (HVAC)	42-in.	E	C, (3)	No
69C.	Containment Exhaust (HVAC)	42-in.	E	C, (3)	No
70C.	Containment Vacuum Relief Outlet	24-in.	S	C	No
72C.	Containment Vacuum Relief Outlet	24-in.	S	C	No
78C.	Skimmer Drain to FPCC	10-in.	E	C, (3)	No
79C.	Demineralizer to FPCC Pool	10-in.	S	L	No
83C.	24-in. Pipe Spare	24-in.	S	NA	No
$84C_1$	Instrument Line	3/4-in.	S	NA	No
$84C_2$-$84C_4$	Spares	-	S	NA	No
114C.	Drywell CRW Sump to CRW	3-in.	E	C, (3)	No
115C.	Drywell DRW Sump to DRW	3-in.	E	C, (3)	No
116C, 117C.	12-in. Pipe Spares	12-in.	S	NA	No
118C.	24-in. Pipe Spare	24-in.	S	NA	No
119C.	RWCU Backwash Drain	2-in.	E	C, (3), (4)	No
120C.	CCW To Containment	10-in.	E	C, (3)	No
121C.	CCW Return from Containment	10-in.	E	C, (3)	No
124C.	12-in. Pipe Spare	12-in.	S	NA	No
125C.	NI Chilled Water to Containment	6-in.	E	C, L	No
126C.	NI Chilled Water from Containment	6-in.	E	C, (3)	No
127C.	Condensate Dist to Containment	6-in.	E	C, L	No
$128C_1$	3/4-in. Pressure Sensing Line for ILRT	3/4-in.	S	NA	No
$128C_2$	Spare	-	S	NA	No

Item 5c(i)

Item 5c(i)

Table 6.2-24

EVALUATION OF POTENTIAL CONTAINMENT BYPASS
LEAKAGE PATHS (Continued)

NOTES:

(1) Termination Region

S = Secondary containment (ECCS Rooms or Fuel Building). Lines terminating within the secondary containment are not potential throughline leakage path.

E = Environmental, beyond secondary containment. Such lines either pass directly through the secondary containment to the environment, or are connected to branch lines which pass through the secondary containment to the environment. For either case, potential throughline leakage is precluded by a combination of leakage barrier.

(2) Bypass Leakage Barriers

C = Redundant Primary Containment Isolation Valves

A = Redundant Secondary Containment Isolation Valves

L = Water Leg Seal

V = Vented to Secondary Containment with CLOC (Closed Loop Outside Containment, see Subsection 6.5.3.2.1)

(3) Containment Seal Leakage Control System Provided.

(4) Third Isolation Valve (Remote Manual) Provided.

(5) The system generally operates in a closed-loop mode, within the secondary containment. However, there are several lines such as flushing water, etc, which penetrate the secondary containment and offer a potential leakage path from the primary containment to environment. For such case, however, throughline leakage and bypass of the secondary containment is precluded by the following:

a. If the line provides a source of makeup water to the RPV, no isolation is necessary.

b. If the line does not provide makeup to the RPV, isolation is provided by redundant valves at the secondary containment or a single valve with redundant solenoids.

(6) Secondary containment leakage control is provided. Type of protection is shown in Figure 6.2-52 for each individual case.

(7) HPCS & RCIC test return lines to condensate are potential suppression pool bypass paths to environs. Lines have redundant safety-grade valves and are below suppression pool level. Bypass water leakage is included in Table 6.5-5.

Item 5c(i)

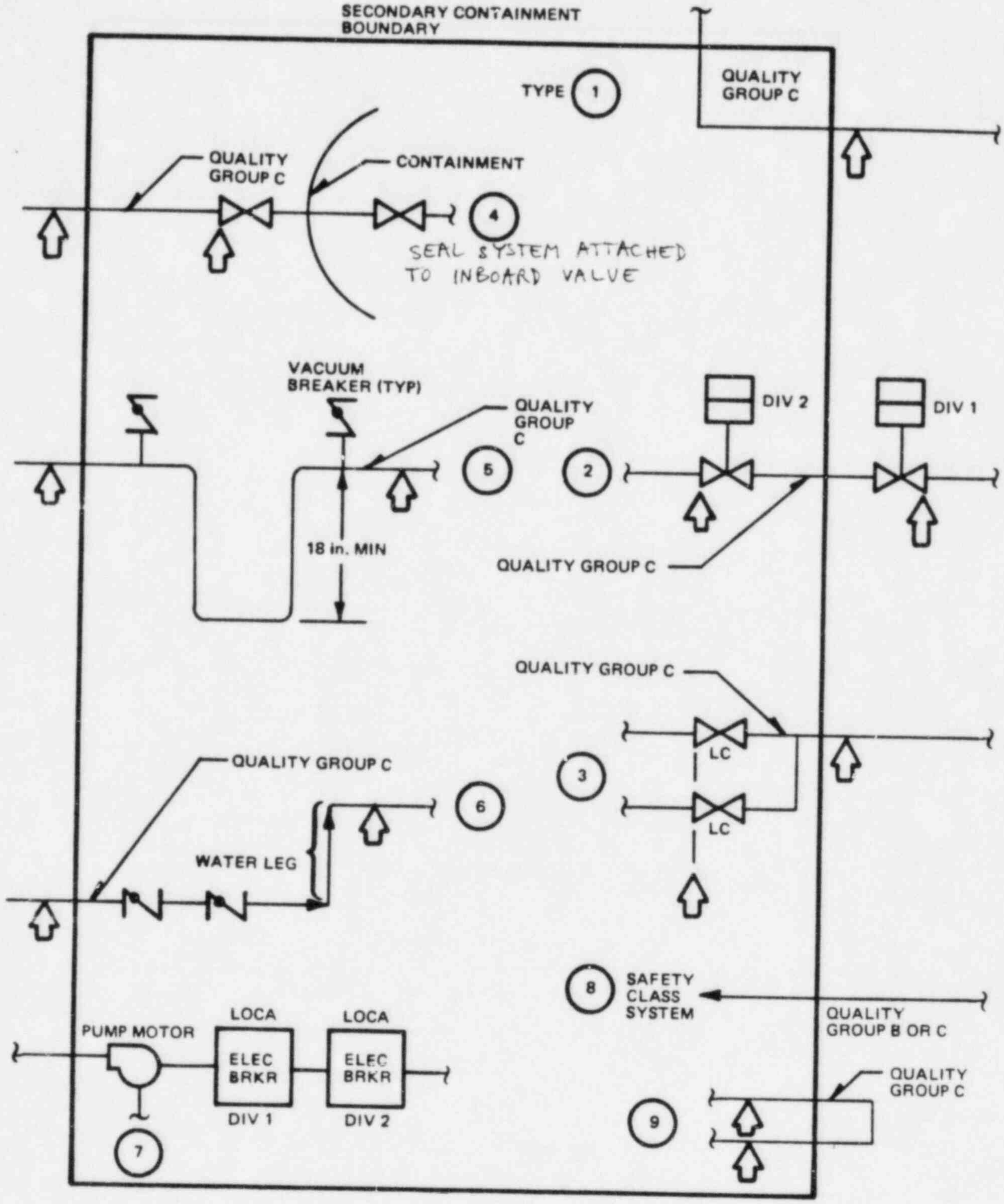

Figure 6.2-48. Secondary Containment Penetration Types for Leakage Control

Item 5d

It was agreed to revise the GESSAR text in Sections 6.5.1.4.1 and 6.5.1.4.2, Inservice Testing, on Page 6.5-15 to read as follows:

Item 5d and 5e(B)

6.5.1.4.1 Preoperational Testing (Continued)

(6) adsorber bed residence time verification test
(7) air-aerosol uniformity test
(8) in-place HEPA test
(9) in-place adsorber test
(10) laboratory test of adsorbent
(11) electric heater test.

After installation of the ESF filter trains, a performance test of system capabilities to meet the specified requirements is conducted. The test is to demonstrate the ability to maintain the prescribed ~~negative~~ pressure and the ability to respond to flow transients, if required. The SGTS test shall demonstrate the capability to provide required exhaust flow for each secondary containment area to maintain negative pressure. Tests shall also be performed to demonstrate that secondary containment inleakage is within acceptable limits. Inleakage tests can be performed by isolation of a secondary containment area and observing the pressure rise.

~~6.5.1.4.2 Inservice Testing~~

~~Inservice testing of the ESF filtration systems is~~ conducted in accordance with the surveillance requirements given in the plant technical specifications, Chapter 16.

6.5.1.5 Instrumentation Requirements

Controls and instrumentation for CBOACS and SGTS charcoal filter trains are discussed in Section 7.3. Each system is designed to function automatically upon receipt of an applicable ESF actuation signal.

Differential pressure indicators are provided to measure the pressure drop across each filter and charcoal bed. Pressure drop across each filter train is measured and an indication of high differential pressure is alarmed in the Control Room.

6.5.1.4.2 Inservice Testing

Inservice testing of ESF filtration systems is to be conducted at each refuelling or at intervals not exceeding 18 months. Specific details of the testing program are given in the Plant Technical Specification, Chapter 16 (to be provided by applicant). Inservice testing of SGTS shall demonstrate capability to provide required exhaust flow for ~~maintain~~ each ~~maintain~~ area of secondary containment to maintain negative pressure. Testing shall also include measurement of secondary containment in leakage.

Item 5e

A) Change Table 6.2-19 to correct post-LOCA conditions.

B) GESSAR changes were included in response to Item 5d, Deleted Fig. 6.5-10.

C) Clarify assumptions and add pressures to the chronological sequence in Section 6.5.1.3.2.2 on pages 6.5-9 and 10.

D) Modify Fig. 6.5-11

Changes are shown on attached sheets.

Table 6.2-19

DESIGN AND PERFORMANCE DATA OF THE SECONDARY CONTAINMENT STRUCTURES

Secondary Containment Design	Shield Annulus	Auxiliary Building	Fuel Building
A. Free Volume (ft^3)	433,000	270,000	400,000 (a)
			309,000 (b)
B. Pressure (inches water)			
1. Normal Operation	(-)5.0	(-)0.625 max	(-) 1.0 max
2. Post-LOCA	(-)0.25 max	(-) 0.500 max (f)	(-) 0.500 max (f)
C. Leak Rate at Post-LOCA Pressure (%/day)	> 100 (e)	>100 (e)	>100 (e)
D. Exhaust Fans (c)			
1. Number	2-100%	2-100%	2-100%
2. Type	Centrifugal	Centrifugal	Centrifugal
E. Filters (in SGTS)*	6 Prefilters 6 HEPA 1 Charcoal 6 HEPA	Same as Shield Annulus	Same as Shield Annulus
Total	19 per system		

*Flow diverted to SGTS on high radiation or LOCA signal.

Notes:

(a) Above operating floor.
(b) Below operating floor.
(c) Not including Standby Gas Treatment System, normal operation.
(d) At (-) 5 in H_2O normal operating pressure.
(e) At (-)0.25 in H_2O Post-LOCA pressure.
(f) 0.25 in H_2O margin for wind effects.

6.5.1.3.2.2 Auxiliary Building ECCS and RWCU Pump Rooms Pressure Response Analysis

The Auxiliary Building pressure control exhaust system fan maintains the ECCS and RWCU pump rooms under a negative pressure differential of 0.625 in WG during normal plant operation by withdrawing the amount of air equal to the in-leakage. Ductwork connection and damper switch control are provided between the ECCS pressure control exhaust system and the SGTS.

In the event of a LOCA coincidental with the loss of normal preferred power ~~AC power~~ (LOPP), the Auxiliary Building pressure control exhaust system fan stops., Inleakage produces a rise in pressure. The SGTS fan operates at its rated flow 27 sec after a LOCA +LOPP, and picks up the exhaust flow required to limit pressure rise and ~~to~~ maintain the ECCS and RWCU Pump Rooms under a negative pressure. The ECCS equipment is also activated to provide rated cooling flow to the core in the RPV at 27 sec. RCIC and RWCU system are not activated.

Activation of the ECCS equipment generates heat to the space and consequently causes both pressure and temperature to rise. An exhaust flow rate of 2980 cfm to the SGTS is required. The ECCS Pump Room coolers are assumed effective when space temperature reaches 122°F. The chronological sequence associated with LOCA signal generation is as follows:

T = 0 sec. All dampers assume their failure mode position and the ECCS pressure control system fans stops.

T = 10 sec. Diesel Generators start and provide emergency power. Refer to Table 8.3-4 for specific equipment starting times. Room heating is considered negligible until rated pump conditions are established.

T = 27 sec. Maximum pressure is ~ (-) 0.500" W.G in RWCU* room due to inleakage between 0 and 27 sec. Calculated inleakage = 45 cfm.

~~T = 27 sec~~. SGTS fans have started and reach their rated capacity, associated dampers are at least three-fourths open allowing the SGTS fan to draw 2980 cfm from the ~~ECCS and RWCU Pump Rooms~~ secondary containment areas to prevent pressure rise from volumetric expansion due to heating and further inleakage.

* Each room looked at individually.

6.5.1.3.2.2 Auxiliary Building ECCS and RWCU Pump Rooms Pressure Response Analysis (Continued)

T = 27 sec to 122 sec. ~~Short-term cooling mode~~ No ECCS room cooling mode, 2980 cfm exhausted to SGTS. Volumetric expansion due to heating and inleakage exhausted. Pressure < (-) 0.500" W.G

T = 122 to ~~164~~ 131 sec. Partial ECCS room Intermediate cooling mode ~~reduced heat generation~~, 2025 cfm SGTS flow. ~~- 1360 cfm exhausted to SGTS.~~ At 122 sec HPCS room reaches 122°F and HPCS room cooler prevents further volumetric expansion due to heating. P < (-) 1.500" W.G

T = ~~164~~ 131 to ~~774~~ 164 sec. ~~Intermediate~~ Partial ECCS room cooling mode ~~with ECCS coolers~~, ~~935~~ 1360 cfm ~~exhausted directly to~~ SGTS flow. At 131 sec LPCS room reaches 122°F LPCS room cooler becomes effective. P < (-) 0.500" W.G.

T = 164 to 774 Partial ECCS Room cooling mode. 935 cfm SGTS flow.
~~T = Beyond 774 sec. Long-term cooling mode, 80 cfm.~~
At 164 sec RHR C room reaches 122 and RHR C room cooler becomes effective. P < (-) 0.500" W.G

~~The temperature response profile for the ECCS and RWCU Pump Rooms~~
~~is shown~~ in Figure 6.5-10.

T ≥ 774 sec Full ECCS room cooling mode, 80 cfm SGTS flow. At 774 sec RHR(A), RHR(B) & RCIC room reach 122°F and their room coolers become effective. P < (-) 0.500" W.G.

6.5.1.3.2.3 Fuel Building Pressure Response Analysis

The Fuel Building pressure control exhaust system fan maintains the Fuel Building under a negative pressure differential of ~~0.625~~ 1.0 in WG during normal plant operation by withdrawing the amount of air equal to the in-leakage. Ductwork connection and damper switching control are provided between the pressure control system and the SGTS. In the event of a LOCA coincidental with the loss of normal AC power, the Fuel Building pressure control system fan stops. The SGTS fan operates at its rated flow 27 sec after a LOCA and exhausts 1645 cfm continuously from the Fuel Building to maintain a subatmospheric condition. The pressure and temperature response profiles for the Fuel Building are shown in Figures 6.5-11 and 6.5-12, respectively.

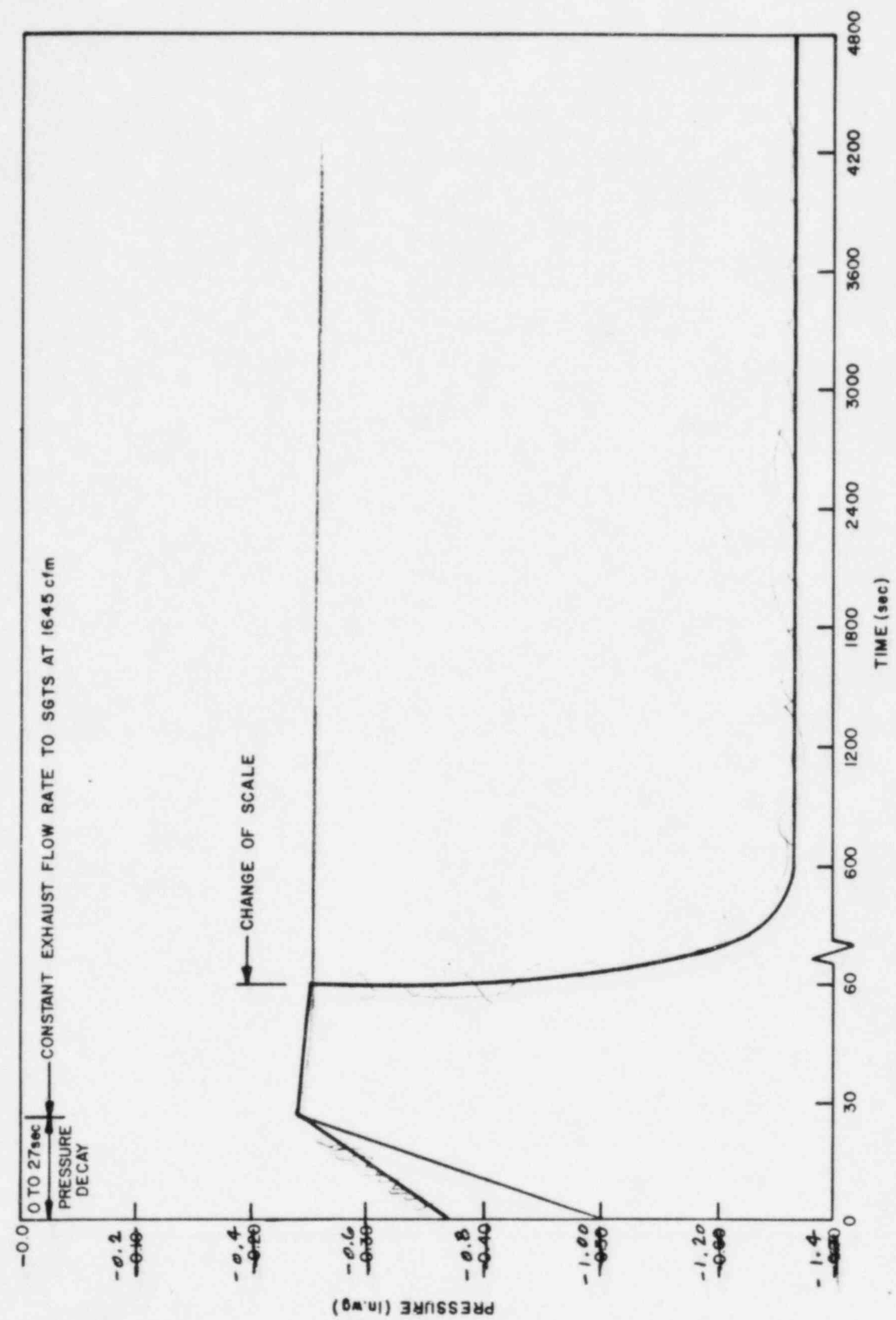

Figure 6.5-11. Post-LOCA Fuel Building Pressure Response

9a) After review of the design, we concluded that we cannot meet single failure of the Division 1 power because we lose both the jockey pump and the main pump. Therefore, we must commit to an air test. We will implement the following on the RCIC, LPCI, AB&C, LPCS and HPCS discharge lines. We will add requirements to drain the discharge piping on these systems and perform Type A tests or Type C air tests and the resulting leakage shall be added to the Type A leakage for acceptance. Table 6.2-29 will be changed as follows:

ITEM 9a

ATTACHMENT 9

Table 6.2-29

CONTAINMENT PENETRATION AND CONTAINMENT ISOLATION VALVE LEAKAGE RATE TEST LIST (Continued)

Penetration Number	Description	Bellows Seal	Test Type*	Inboard Isolation Barrier: Barrier Description/ Valve Number(17)	Notes	Outboard Isolation Barrier: Barrier Description/ Valve Number(17)	Notes
2c	Equipment Hatch	No	B	Double O-Ring	1	-	-
3c	Personnel Lock - Lower						
	Inner Door	No	B	Double Gasket	1	-	-
	Outer Door	No	B	-	-	Double Gasket	1
	Barrel	No	B	Inner Door	2	Outer Door	2
4c	Personnel Lock - Upper						
	Inner Door	No	B	Double Gasket	1	-	-
	Outer Door	No	B	-	-	Double Gasket	1
	Barrel	No	B	Inner Door	2	Outer Door	2
8c	Fuel Transfer Tube	No	B	Double O-Ring	1	-	-
9c	Main Steamline D	Yes	C	B21F022D	3,4	B21F028D	3
		Yes	C			B21F067D	3
		Yes	C			B21F086D	3
10c	Main Steamline B	Yes	C	B21F022B	3,4	B21F028B	3
		Yes	C			B21F067B	3
		Yes	C			B21F086	3
11c	Main Steamline A	Yes	C	B21F022A	3,4	B21F028A	3
			C			B21F067A	3
			C			B21F086	3
12c	Main Steamline C	Yes	C	B21F022C	3,4	B21F028C	3
			C			B21F067C	3
			C			B21F086	3

480.44

* TYPE A TEST ALSO REQUIRED

ITEM 9a changes noted with {cloud}

Table 6.2-29

CONTAINMENT PENETRATION AND CONTAINMENT ISOLATION VALVE LEAKAGE RATE TEST LIST (Continued)

Penetration Number	Description	Bellows Seal	Test Type*	Inboard Isolation Barrier: Barrier Description/ Valve Number	Notes	Outboard Isolation Barrier: Barrier Description/ Valve Number	Notes
13c	Steam Isolation Valve Drain	Yes	C C	B21F016	3	B21F019 B21F085	3 3
16c	Feedwater Line	Yes	C C C	B21F010A	5,16	B21F032A B21F065A B21F102A	5,16 5 5
17c	Feedwater Line	Yes	C C C	B21F010B	5,16	B21F032B B21F065B B21FF102B	5 5 5
25c	CRD Pump Discharge	Yes	C C	C11FF215 C11F122	6 6	C11F083	6
27c	RHR System (LPCI Mode) Line A Division 1	Yes	C**	E12F042A	~~5,8~~ 16	E12F027A	~~5,8~~ 16
28c	RHR System (LPCI Mode) Line B Division 2	Yes	C**	E12F042B	~~5,8~~ 16	E12F027B	~~5,8~~ 16
29c	RHR System (LPCI Mode) Line C Division 2	Yes	C**	E12F041C	~~5,8~~ 16	E12F042C	~~5,8~~ 16
30c	RHR A Pump Suction Division 1	No	C**	Closed System	~~8~~ 16	E12F004A	~~8~~ 16
31c	RHR B Pump Suction Division 2	No	C**	Closed System	~~8~~ 16	E12F004B	~~8~~ 16
32c	RHR C Pump Suction Division 2	No	C**	Closed System	~~8~~ 16	E12F105	~~8~~ 16

* TYPE A TEST ALSO REQUIRED UNLESS NOTED OTHERWISE

** REMAINS WATER FILLED DURING TYPE A TEST

480.43

480.43

Item 9a

Table 6.2-29

CONTAINMENT PENETRATION AND CONTAINMENT ISOLATION VALVE LEAKAGE RATE TEST LIST (Continued)

Penetration Number	Description	Bellows Seal	Test Type*	Inboard Isolation Barrier: Barrier Description/ Valve Number	Notes	Outboard Isolation Barrier: Barrier Description/ Valve Number	Notes
33c	RHR Pump A Discharge to Suppression Pool	No	C**	Closed System	7 16	E12F024A E12F011A E12F064A	9 8 16 8 8
34c	RHR Pump B Discharge to Suppression Pool	No	C**	Closed System	7 16	E12F024B E12F011B E12F064B	8 8 8
35c	RHR Pump C Discharge to Suppression Pool	No	C**	Closed System Closed System	7 16 7 16	E12F021 E12F064C	8 8
36c	Demin Water to G33-2020 RWCU Sample Panel	No	C	P46FF182	6	P46FF055	6
37c	RHR SRV F055A & F055C to Suppression Pool	Yes	C**	Closed System Closed System	7 16 7	E12F055A E12F055C	9 8 16 8
39c	RHR SRV F055B & F055D to Suppression Pool	Yes	C**	Closed System Closed System	7 7	E12F055B E12F055D	8 8
40c	RHR SRV F036 to Suppression Pool	No	C**	Closed System	7	E12F036	8
41c	RHR SRV F005, F017A and FF236 to Suppression Pool	Yes	C**	Closed System	7	E12F005 E12F017A E12F236	8 8 8
42c	RHR SRV F101, F025C to Suppression Pool	Yes	C**	Closed System	7	E12F101 E12F025C	8 8

480.43

480.43

* TYPE A TEST ALSO REQUIRED UNLESS NOTED OTHERWISE

** REMAINS WATER-FILLED DURING TYPE TEST

Table 6.2-29 Item 9a

CONTAINMENT PENETRATION AND CONTAINMENT ISOLATION VALVE LEAKAGE RATE TEST LIST (Continued)

Penetration Number	Description	Bellows Seal	Test Type*	Inboard Isolation Barrier: Barrier Description/Valve Number	Notes	Outboard Isolation Barrier: Barrier Description/Valve Number	Notes
43c	RHR SRV F017B, F030 to Suppression Pool	Yes	C** (C**)	Suppression Pool	8,15 (15)	E12F017B E12F030	8 ,13
44c	RHR Suction from Recirc	Yes	C **	E12F009	16	E12F008	[illegible]
47c	Steam to RCIC Turbine	Yes	C C	E51F063 E51F076	5,4 5,4	E51F064	5
48c	RCIC Pump Discharge Head Spray	Yes	C ** (C 2) C	~~Closed System~~ (E51-F095) ~~Closed System~~	16	E51F065 ~~E51F013~~ (E12-F023)	8,16
49c	RCIC Pump Suction From Suppression Pool	No	C **	Closed System	16	E51F031	8 16
50c	Turbine Discharge to Suppression Pool	Yes	C	Closed System		E51F068	8
52c	RCIC Pump Minimum Flow Bypass	No	C **	Closed System		E51F019	8
53c	LPCS Pump Discharge	Yes	C ** (2)	E12F006	8	E21F005	8
54c	LPCS Pump Suction	No	C **	Closed System	16	E21F001	8 16
55c	LPCS Pump Test	No	C **	Closed System Closed System		E21F012 E21F011	8 8
56c	LPCS SPV Discharge to Suppression Pool	No	C **	Closed System Closed System		E21F008 E21F031	8 8
57c	Air Positive Seal to P51FF010 & P51FF040	No	C	Closed System		P61FF046	8

* TYPE A TEST ALSO REQUIRED UNLESS NOTED OTHERWISE

** REMAINS WATER FILLED DURING TYPE A TESTS

Item 9a

Table 6.2-29

CONTAINMENT PENETRATION AND CONTAINMENT ISOLATION VALVE LEAKAGE RATE TEST LIST (Continued)

Penetration Number	Description	Bellows Seal	Test Type*	Inboard Isolation Barrier: Barrier Description/ Valve Number	Notes	Outboard Isolation Barrier: Barrier Description/ Valve Number	Notes
58c	HPCS Pump Discharge	Yes	C **	E22F005	[illegible]	E22F004	9
59c	HPCS Pump Suction	No	C **	Closed System	16	E22F015	16
60c	HPCS SRV Discharge to Suppression Pool	No	C **	Closed System	7	E22F023, E22F012	8
		No	C **	Closed System	7	E22F014, E22F035	8
63c	RWCU Pump Suction from Recirc	Yes	C	G33F001	[illegible]	G33F004	[illegible]
64c	RWCU Return to Feedwater Line	Yes	C	G33F040	5,10	G33F039	5,10
65c	RWCU Discharge to Main Condenser	Yes	C	G33F028	6	G33F034	6
68c	Containment Supply Purge HVAC	No	C C	T41FF015 T41FF045	5 5	T41FF014 T41FF047	5 5
69c	Containment Exhaust HVAC	No	C C	T41FF005 T41FF044	5 5	T41FF006 T41FF046	5 5
70c	Containment Vacuum Relief Outlet	No	C	T41FF034A	[illegible]	T41FF033A	[illegible]
72c	Containment Vacuum Relief Outlet	No	C	T41FF034B	[illegible]	T41FF033B	[illegible]
78c	Skimmer Drain to FPCC	No	C	G41F044	6	G41F029	6

* TYPE A TEST ALSO REQUIRED UNLESS NOTED OTHERWISE.

** REMAINS WATER-FILLED DURING TYPE A TEST

480.43

Table 6.2-29

CONTAINMENT PENETRATION AND CONTAINMENT ISOLATION VALVE LEAKAGE RATE TEST LIST (Continued)

Penetration Number	Description	Bellows Seal	Test Type*	Inboard Isolation Barrier: Barrier Description/ Valve Number	Notes	Outboard Isolation Barrier: Barrier Description/ Valve Number	Notes	
143c	Chilled Water from Drywell Coolers	No	C **	P44FF016	-	P44 FF017	6	480.43
144C1	RHR HX DRAIN (RHR A)	No	C**	E12 F073A	16	E12 F074A	16	Δ
145c1	ESW Supply to H_2 Mixing Blower (Div 1)	Yes	C	P41FF169	7	-	-	
145c2	ESW Return from H_2 Mixing Blower (Div 1)	Yes	C	P41FF172	[illegible]	P41FF171	[illegible]	
144C2	RHR HX DRAIN (RHR B)	No	C**	E12 F073B	16	E12 F074B	16	Δ
146c	24-in. Pipe Spare	No		Capped	-		-	
147c	12-in. Pipe Spare	No		Capped	-	-	-	
148c	ADS Pneumatic Supply Division 1	No		P53FF017A	9	P53FF015A	[illegible]	
156c	Spare	No	-	-	-	-	-	
157c	-	-	-	-	-	-	-	
158c	ESW Supply to H_2 Mixing Blower (Div 2)	No	C	P41FF115	[illegible]	P41FF114	[illegible]	
160c	Air to RCIC Turbine Exhaust Line	No		-	5	E51F078, E51F077	5	
164c	RWCU Pump to Filter Demineralizer	Yes	C	G33F053	8	G33F054	8	
165c	ESW Return from Mixing Blower (Div 2)	No	C	P41FF117	[illegible]	P41FF116	[illegible]	

*TYPE A TEST ALSO REQUIRED UNLESS NOTED OTHERWISE

** REMAINS WATER-FILLED DURING TYPE A TEST.

480.43

Item 9a

Table 6.2-29

CONTAINMENT PENETRATION AND CONTAINMENT ISOLATION VALVE LEAKAGE RATE TEST LIST (Continued)

(11) DELETED ~~Butterfly valves are tested in reverse direction.~~ 480.44

(12) ~~This valve is exempt from Type C test due to the provision of water leg seals.~~ WATER LEG SEAL IS PROVIDED. TYPE C TEST SHALL BE PERFORMED WITH WATER AT PRESSURE = 1.10 Pa 480.46 SEE NOTE 3. 480.49

(13) This valve is located on a non-Safety Grade piping system which is not a CLOC.

(14) The primary seal for each of the electrical penetrations consist of two concentric O-rings with a test connection to permit leak testing the space between the O-ring seals. Test volume is pressurized with dry nitrogen.

(15) Influent lines terminating in the suppression pool are discussed in Subsection 6.2.4.3.2.2.1.1.

(16) THESE SYSTEMS penetrate the containment ~~that~~ AND are designed to remain intact following a LOCA. ~~from which containment atmosphere leakage would not occur,~~ THEY are not specifically vented to the containment atmosphere or to the outside atmosphere and may remain water filled during Type A testing. 480.43

(17) Test vent + drain ~~lines~~ connections used to facilitate local and containment integrated leak rate testing shall be under administrative control and subject to periodic surveillance to assure their integrity.

Item 9c) It was agreed that we would add the following words to GESSAR Section 6.2.6.3.2, "Leakage testing of the closed ESF systems outside containment is performed in accordance with Section XI of the ASME B&PV code, but will comply with the testing frequencies and leakage reporting requirements of Appendix J of 10CFR50.

Item 9c

6.2.6.4 Scheduling and Reporting of Periodic Tests (Continued)

results shall be submitted to the NRC in a summary report approximately three months after each test.

6.2.6.5 Special Testing Requirements

The maximum allowable leakage rate into the secondary containment and the means to verify that the inleakage rate has not been exceeded, as well as the bypass leakage rate, are discussed in Subsections 6.2.3 and 6.5.1.3.
Leakage testing of the closed ESF systems outside containment is performed in accordance with Section XI of ASME B&PV code, but will comply with the testing frequencies and reporting requirements of Appendix J of 10CFR50.

6.2.7 Suppression Pool Makeup System

The Suppression Pool Makeup System provides additional water from the upper containment pool to the suppression pool by gravity flow following a LOCA. The quantity of water is sufficient to account for all conceivable post-accident entrapment volumes (i.e., places where water can be stored while maintaining long-term drywell vent water coverage).

6.2.7.1 Design Basis

The following criteria were used in the design of the Suppression Pool Makeup System:

(1) The system is redundant with two 100% capacity lines. The redundant lines are physically separated and electrical controls are separated into two divisions in accordance with IEEE-279.

(2) The system is Safety Class 2, Seismic Category I, and Quality Group B.

(3) Minimum long-term post-accident suppression pool water coverage over the top of the top drywell vent is 2 ft.

ATTACHMENT NO. 3

DRAFT RESPONSES TO
INSTRUMENTATION AND CONTROL SYSTEMS BRANCH
QUESTIONS

Draft Supplement 3-18-83

421.32 QUESTION Based on our review, it appears that the proposed logic for manual initiation for several ESF systems is interlocked with permissive logic from various sensors. In some cases, it appears that the permissive logic is dependent on the same sensors as those used for automatic initiation of the system. Our position on this matter is that the capability to manually initiate each safety system should be independent of the permissive logic, the sensors and the circuitry used for automatic initiation of that system. (Refer to Section 4.17 of IEEE Std. 279). Identify each safety system which is interlocked in a manner similar to that described above. Provide proposed modifications or justification for the present design.

In this regard, manual control of actuated devices at the motor control center (MCC) has been typically provided in previous designs. Our review of drawings I-960 A through M indicates that this feature has not been provided for your proposed design. Provide your rationale for not providing local control at the MCC's.

Response Supplement

The response submitted previously on the docket remains unchanged. However, the following information is provided to supplement the justification supporting the design of the HPCS and the Containment Spray System interlocks.

HPCS

The HPCS injection valve can be closed without restriction using the component level manual switch. However, the same switch (spring return to AUTO from either OPEN or CLOSE) will only open the valve if a two-out-of-two level 8 signal is not present.

This interlock is important in that it prevents inadvertent overfill of the vessel. Such overfill can escalate a relatively minor occurance (loss of feedwater) to a major event (Water in the main steam lines). This could potentially expose the safety relief valves and turbine controlled safety equipment to high pressure water slugs.

In an emergency situation requiring the Standby Liquid Control System, a vessel overfill could also dilute the boron concentration in the vessel.

For these reasons, it is GE's position that the L8 signals should not be bypassed to force manual opening control. It is possible to provide separate hardware for the manual L8 control interlock. However, without a bypass, such redundant hardware could not open the valve anyway, if the automatic interlocks were forcing it closed.

It is recognized that a single failure could cause inadvertent closure of the HPCS injection valve. This loss of HPCS is acceptable from a safety standpoint because of ADS and the low pressure system which maintains water inventory in the vessel. These systems are powered from divisions 1 and 2 as opposed to discussion 3 for HPCS. Thus, their functions and interlocks are totally independent from those of HPCS.

Inadvertant failure of HPCS is a risk most certainly preferable to inadvertant flooding of the main steam lines.

Containment Spray Mode of RHR

As explained above, separate automatic vs. manual interlocks for single valves cannot function independently in both opening and closing modes of the valve. With the manual spring-return-to-"AUTO" switch, an opposing automatic closure signal would immediately reclose the valve as soon as its opening command seal-in relays dropped out. Valve cycling would thus result from opposing signals unless one permanently bypassed the other. Such a bypass would preclude the need for separate interlocks.

A manual bypass for the Containment Spray would increase the risk of inadvertent operation. In the Mark III design, the spray is located over the refueling area. During refueling, the RHR is functioning in another mode to keep the vessel cool. The bypass would pose a safety hazzard to personnel within the containment.

Operator initiated inadvertent containment spray has occured several times in both foreign and domestic plants where containment spray systems are employed. (Note recent occurrence at Oyster Creek: LER-50-219NA.)

The interlock is a deliberate preventive measure for the Mark III. A single failure of the interlock could cause loss of one train of containment spray. However, such a failure is of little consequence because of the redundant train. Thus, the risk of failure of one train is most certainly preferable to inadvertent containment spray.

ATTACHMENT NO. 4

DRAFT RESPONSES TO
STRUCTURAL AND GEOTECHNICAL ENGINEERING BRANCH
QUESTIONS

220.11 (3.7.2) At the time of this review, Appendix 3H which describes the effect of the concrete between the containment and the shield building on the seismic analysis, is not available. Indicate when this appendix will be provided. This information should be made available prior to the forthcoming structural audit in December 1982.

Response

The effects of the concrete between the Containment and the Shield building on the seismic analysis is discussed in Appendix 3H which will be submitted in April 1983.

Shell forces, shell moments and element stresses have been obtained for various structures and for individual soil cases. These results were then enveloped to arrive at a set of final responses. These are included in the appendix and are generally within the envelope used in the design. At a few locations, the unit forces are slightly higher, for instance in the range of 3% of the allowable stress. This is certainly within the structural design margin.

Response spectra for various structures have also been generated for individual soil cases. Envelopes were obtained for them and are included in Appendix 3H as well. The majority of the curves fall within the original envelope and are still used for conservatism. A few curves show some exceedance in accelerations and some frequency shift in the range of 5-10%. However, the increased accelerations are within engineering design margin for equipment and systems.

220.13 (3.7.2) It is not clear in the discussion provided in Sections 3.7.2.3 and 3.7.2.5 of your FSAR how you have accounted for the vertical flexibility of floors in the generation of the vertical response spectra. Accordingly, provide the procedures you have used to account for this phenomenon.

Response

A confirmatory analysis which accounts for the vertical flexibility of floors is in progress and nearly completed and will be submitted in April 1983. A brief description of this analysis follows:

Three typical floor panels were modeled by Spring-Dashpot Oscillators; they were then added to the mass point at the floor of of interest in the mathematical model of the building. A time-history analysis was performed for a soil case expected to provide the maximum response. Vertical Response Spectra for the selected floor panels and the main building mass point were generated and a comparison with the current corresponding response spectrum curves at the selected floor will be made.

By views of previous seismic analysis work the selection of the building and floor in this building will produce the maximum vertical amplification due to floor flexibility was made and resulted in the selection of the floor, at elevation 28'6" in the Auxiliary Building. Preliminary results indicate that the existing vertical response spectrum curve (Fig. 3.10-38) will envelope the response spectra from the confirmatory analysis.