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March 26, 1984

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Q-3-P43

Director of Nuclear Reactor Regulation
Attention: Mr. G. W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford SES Unit 3
Docket No. 50-382
Request for Relief from Certain Technical Requirements of
Appendix R to 10CFR50

- ENCLOSURES:
1. Exceptions from the Technical Requirements of 10CFR50, Appendix R for the Reactor Auxiliary Building
 2. Demonstration of Equivalency of Reactor Containment Building to Technical Requirements of Sections III.G.2, III.L, and III.O of Appendix R to 10CFR50
 3. Fire Damper Installation Exceptions
 4. Previously Requested Exceptions to Appendix R and Miscellaneous Items Associated with Fire Protection
 5. Fire Door Installation Exceptions

Dear Sir:

At the suggestion of the Waterford 3 SES fire protection reviewer, Mr. Kubicki (NRC), LP&L initiated a study to identify and document any outstanding exceptions to the technical requirements of Appendix R. Generic Letter 83-33 and other interpretive documents were used to reevaluate our compliance with the technical requirements associated with the rule. The above listed enclosures document the results of our study in the form of relief requests from a portion of the technical requirements of Appendix R associated with selected areas of the plant.

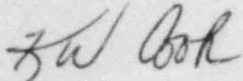
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Previous supplements to the "Safety Evaluation Report Related to the Operation of Waterford SES Unit No. 3" (SER) have found our plant to be in compliance with Appendix R to 10CFR50 and Appendix A to Branch Technical Position 9.5.1. However, as constructively pointed out by Mr. Kubicki, the lack of specificity in the SER supplements requires that previously negotiated positions with his predecessor be revisited as regards exceptions to the fire protection requirements. Therefore, your review of the enclosures is considered necessary to document the more detailed level of review not covered in the broader scope of your previous safety evaluations in order to avoid problems similar to those encountered in recent NRC inspections of nuclear power facilities (i.e. IE Information Notice 84-09).

In view of the nearness of our fuel load date, your expeditious review of the enclosures is respectfully requested. Please direct any questions you may have on the content of this information to our fire protection licensing engineer, Kevin Curley at (504) 363-8950.

Yours very truly,



K. W. Cook
Nuclear Support and Licensing Manager

KWC/KNC/pjl

Enclosures

cc: E. L. Blake, W. M. Stevenson, D. M. Crutchfield, J. Wilson,
D. J. Kubicki, J. Weirmiel, G. L. Constable, J. Collins

NS30301SEG

ENCLOSURE 1
EXCEPTIONS FROM THE
TECHNICAL REQUIREMENTS OF 10CFR50, APPENDIX R
FOR THE REACTOR AUXILIARY BUILDING

NS40202SEG

RAB 1* - CONTROL ROOM ENVELOPE

A. EXCEPTION:

1. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.3 is requested in this fire area, specifically:
 - a. The need to install smoke detection and an automatic fixed fire suppression system in the area under consideration for alternative shutdown capability.
2. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The enclosure of redundant cable tray and/or conduit in the same 1-hour rated fire wrap.

B. FIRE HAZARD ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 1A, 1B 1C and 1D; and Figure X-6.
2. Combustible Material Loading

a. Fire Zone 1A

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	1
Other Solids	<u>7</u>
Total	8

b. Fire Zone 1B

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	16
Other Solids	<u>13</u>
Total	29

c. Fire Zone 1C

	<u>Fire Severity (Minutes)</u>
Cable Insulation	5
Other Solids	<u>5</u>
Total	10

*RAB area designations cited in this enclosure may be found in the Waterford 3 FSAR Section 9.5.1

d. Fire Zone 1D

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	14
Other Solids	10
Total	24

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 1A, 1B, 1C and 1D; and Figure 9.5A-26

D. BASIS FOR EXCEPTIONS

1. Exception from the requirement to install a fixed suppression system in the Control Room Proper (RAB 1A):
 - a. Low combustible loading consisting of cable insulation within control cabinets and conduit and Class A combustibles in steel filing cabinets and fully enclosed bookshelves.
 - b. Continuous manning makes introduction of unnoticed large amount of transient combustibles into the Control Room unlikely and provides for rapid response and suppression of transient exposure fires.
 - c. Ionization detectors reduce possibility of smoldering type fires going unchecked.
 - d. Remote Shutdown Panel (LCP-43) provides alternate shutdown capability which is electrically independent of the Control Room.
2. Absence of an automatic fixed suppression system and complete area wide smoke detection for the Control Room Emergency Living Quarters (RAB 1C):
 - a. No safe shutdown equipment in this zone.
 - b. Detection in adjacent living quarters would detect a postulated fire in the corridor space (where detection is absent) and assure appropriate response by nearby plant personnel in a timely manner.
 - c. Low combustible loading.

3. Absence of complete fixed suppression coverage for the Computer Room (RAB 1D):
 - a. Plant computer not required for safe shutdown.
 - b. Low combustibile loading.
 - c. Halon 1301 fixed suppression is provided for the entire under floor area in the Computer Room which is used for cable runs.
4. Enclosure of essential redundant conduit in the same 1-hour wrap for Battery Room (A, A/B & B) Ventilation Exhaust Systems in the Control RM H&V Room (RAB 1B):
 - a. Reg. Guide 1.75 separation criteria prevents an internal tray or conduit fire from propagating to redundant tray conduit.
 - (1) This separation between one cable tray and a redundant cable tray or conduit within the same fire wrap is accomplished by providing the subject cable tray with either a metal tray cover or a $\frac{1}{2}$ inch B&B blanket cover (i.e. 30 minute fire rating). Where access and spatial separation between cable trays allows, a $1\frac{1}{2}$ inch B&B blanket tray cover (i.e. 1-hour fire rating) is preferred over a $\frac{1}{2}$ inch blanket.
 - b. 1-hour wrap provides sufficient protection to redundant cabling until actuation of automatic suppression system or arrival of fire brigade.
 - c. Ventilation supply to the battery rooms is not affected by loss of battery room exhaust systems. Ventilation exhaust can be effected by opening doors to battery rooms or use of portable equipment if necessary.
 - d. Automatic fixed suppression and smoke detection are provided throughout the Control RM H&V fire zone.
5. Additional considerations applicable to the above deviations:
 - a. The subject fire zones are separated from each other by 2-hour rated fire walls and class B fire doors with the exception of safety related duct penetrations and the corridor access in the north wall of the Control Room proper.
 - b. Presence of portable fire extinguishers and nearby standpipe hose stations ensure the ability to extinguish any conceivable fire in this area.

- c. Ventilation exhaust system has sufficient capacity to further limit damage and assure habitability by removal of heat, smoke, and products of combustion.
 - d. Administrative controls restrict introduction of significant amount of combustibles into the area.
6. The above mitigating features show protection which is at least equivalent to the rule ensuring that at least one train of safe shutdown equipment remains free of fire damage and therefore the above stated exceptions from the technical requirements of Appendix R should be granted.

RAB 2 - H&V MECHANICAL ROOM

A. EXCEPTIONS:

1. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for total area wide coverage of smoke detection and automatic fixed suppression systems.
 - b. The need for a complete 1-hour barrier between redundant safe shutdown equipment.
 - c. The existence of 1½ hour fire dampers in the fire area boundaries.
 - d. The enclosure of redundant cable tray and conduit in the same 1-hour rated fire wrap.
 - e. Protection of a steel maintenance hatch to a fire resistance equivalent to the floor boundary it forms a part of.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 2 and Figures X-6, X-7, X-9, X-10 and X-15.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	5
Control	5
Charcoal (Enclosed within HVAC Units)	<u>44</u>
Total	54

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 2 and Figures 9.5A-24 and 9.5A-37.

D. BASIS FOR EXCEPTIONS

1. Absence of detection and automatic fixed suppression for:
 - a. H&V (for H.M. Shop) Room - EL. +46.00 ft, between column lines L, N, 1A and 2A
 - 1) No safe shutdown equipment.
 - 2) Smoke detection provided.

- 3) Low combustible loading.
 - 4) Separated from remainder of fire area by a 12-inch reinforced concrete wall with unrated penetrations. Smoke detection and automatic fixed suppression in adjacent zone will check propagation of hot gases through these penetrations until arrival of the fire brigade.
- b. Plant Stack & Rad Monitor Equipment Room - EL. +46.0 ft, between column lines L, M, 5A and 9A:
- 1) No safe shutdown equipment.
 - 2) Low combustible loading.
 - 3) Separated from remainder of fire area by a 36-inch reinforced concrete wall with unrated penetrations. Smoke detection and automatic fixed suppression in adjacent zone will check propagation of hot gases through these penetrations until arrival of the fire brigade.
- c. SBVS Filter Laydown Area - EL. +46.0 ft, between column lines J, H, 3A & 5A:
- 1) No safe shutdown equipment.
 - 2) Little or no combustible loading.
 - 3) Smoke detection and automatic fixed suppression coverage in the corridor immediately adjacent to this open space ensures that a postulated fire would be detected in a timely manner and its propagation checked until arrival of the fire brigade.
- d. Roof Exhaust Penthouses - EL. +69.0 ft, between column lines 3A, 2A, J & K and 5A, 6A, J & K:
- 1) No safe shutdown equipment.
 - 2) Separated from remainder of fire area by a 27-inch reinforced concrete floor with unrated exhaust duct penetrations. Smoke detection and automatic fixed suppression in adjacent zone will check propagation of hot gases through these penetrations until arrival of the fire brigade.

- 3) No combustible loading.
 - 4) A transient exposure fire is not credible since access can only be gained through a roof entrance.
- e. EL +91.0 ft:
- 1) Damage by fire to Component Cooling Surge Tank and HVAC Expansion Tank is not credible.
 - 2) Little or no combustible loading.
 - 3) A transient exposure fire is not credible since access can only be gained from a roof entrance after climbing a ladder.
2. Part height 1-hour walls constructed between redundant water chillers, chilled water pumps, and air handlers (AH-13 SA & SB):
- a. Detection and automatic suppression protection provided for all redundant equipment.
 - b. Complete 1-hour barrier isolation is not practical and would severely limit access for damage control purposes.
 - c. One train of redundant cabling and conduit enclosed in a 1-hour rated wrap.
 - d. The 4-feet height 1-hour barrier extends approximately 1-foot above redundant chilled water pumps and provides adequate protection from the radiative effects of a fire postulated on either side. Adequate interference from chilled water heat exchangers exist to preclude negative impact from a fire at either end of the wall. Chilled water heat exchangers extend 1-foot above part height barrier and are less than 20 feet apart, however damage to these water filled components by fire is not deemed credible.
 - e. Redundant chilled water instrumentation cabinets extend approximately 1 foot above part-height barrier. However, a 24 foot separation exists between the furthest distanced cabinets. This plus existing smoke detection and automatic suppression ensure that at least one of the three chilled water systems will remain free of fire damage.
 - f. A 1-hour barrier is provided along the base of AH-13 (SB) which is mounted approximately 8 feet above the EL. +46.0 floor. A 1-hour protective coating on the west side of AH-13 (SB) extending back to a reinforced concrete wall (south end) separates AH-13 (SB) from its redundant air handler, AH-13 (SA). A postulated fire at the north end of

this barrier could expose both units to radiative effects of a single fire. However, interference of piping, conduit and chilled water equipment make the accumulation of a significant amount of combustibles in this location unlikely. In addition, the sound proof casing and exhaust air flow provide more than adequate protection from the radiative or convective effects of a fire until actuation of the automatic fixed suppression system or arrival of the fire brigade.

3. Existence of a 1½ hour fire damper in the following fire area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire Severity (Minutes App)</u>
Floor	42D	Yes	6	47
Floor	18D	Yes (FD-49)	8B	20
East Wall	6D	Yes (FD-50)	6	47

- a. Detection and suppression exist on both sides of each damper.
- b. Fire severity of areas adjacent to each damper are less than fire rating of the subject damper.

4. Enclosure of essential redundant cable tray and conduit in the same 1-hour wrap for the following system:

- Chilled Water System

- a. Reg. Guide 1.75 criteria prevent an internal tray fire from propagating to redundant tray or conduit.
 - 1) This separation between one cable tray and a redundant cable tray or conduit within the same fire wrap is accomplished by providing the subject cable tray with either a metal tray cover or a ½ inch B&B blanket cover (i.e. 30 minute fire rating). Where access and spatial separation between cable trays allows, a 1½ inch B&B blanket tray cover (i.e. 1-hour fire rating) is preferred over a ½ inch blanket.
- b. 1-hour wrap provides sufficient protection to redundant cabling until actuation of automatic suppression system or arrival of fire brigade.

5. Lack of equivalent fire resistance on floor boundary side of steel equipment hatch between fire areas RAB 2 and RAB 23 located along column line J between column lines 4A and 5A:
 - a. A 3-hour fire protective coating will be applied to the RAB 23 (ceiling) side of the equipment hatch.
 - b. Probability of a flammable liquid spill in vicinity of hatch is lessened due to administrative controls and low traffic levels through this area.
 - c. There are no credible sources of ignition in this hatch space.
 - d. The design of the hatch is such that only minor seepage of a liquid past the hatch to floor fitting can occur and thus act as a flame arrestor.
 - e. Smoke detection and automatic fixed suppression coverage below the hatch provide adequate compensation for any fire hazard associated with seepage by the hatch fitting.
6. Additional considerations applicable to the above deviations:
 - a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish an exposure fire in this area in a timely manner.
 - b. Detection and automatic fixed suppression provide coverage over all redundant safe shutdown equipment in the area.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
7. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 3 - HVAC EQUIPMENT ROOM

A. EXCEPTIONS

1. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for a complete 1-hour barrier between redundant safe shutdown equipment.
 - b. The need for total area wide coverage of smoke detection automatic fixed suppression systems.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 3, and Figures X-6 and X-21
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation Low-Level	2

C. SAFE SHUTDOWN ANALYSIS (SSA)

- i. See FSAR Section 9.5.1, Table 9.5A-4, RAB 3 and Figures 9.5A-23 and 9.5A-26.

D. BASIS FOR EXCEPTIONS

1. Part height 1-hour wall constructed between redundant air handlers AH-25 (SA & SB).
 - a. Wall extends the entire width of fire area and constitutes a complete 1-hour separation (including doors and penetrations) up to the height of the wall.
 - b. Since part height wall adjoins 3-hour boundary walls on both sides of the fire area, a postulated fire at either end of the wall which could radiate both air handlers is not possible. This precludes damage to at least one fan unit from the radiative effects of a fire in this area where redundant conduit/cable trays are routed in the overhead on the same side of the part height wall; at least one train is provided with a 1-hour wrap to prevent damage to both essential trains from the build up of convective hot gases which may occur before actuation of sprinkler heads or arrival of the fire brigade.

The air handler casings extend approximately 3 feet above the height of the top of the 8 foot high wall. The fan units inside these casings are below the wall height and are approximately 15 ft. from the part height wall on each side (i.e. total of 30 feet of separation). These fan units and their associated control & power cabling are the only parts of the air handlers considered susceptible to damage by fire.

- c. In the unforeseen event that both AH-25 air handlers are damaged for some reason other than a fire, ventilation to the Cable Vault Relay rooms and Electrical Penetration areas would be lost. Upon loss of ventilation, temperatures in these rooms would take at least 8 hours before reaching 140°F. Cable in this room is qualified for in-containment design environmental conditions.
2. Absence of smoke detection and automatic fixed suppression at the +35.00 EL. H&V duct space located between column lines G & K along column line 12A:
 - a. The following Safe Shutdown Cable Trays and conduits are located within this chase:

Trays: L205-NB
L201D - SA
C2052 - NA

Conduits: (31079A-SB-1½)
(31075A-SA-1½)
 - b. Exposed cable (i.e. Cable Tray L205-NB) are protected by 1-hour wrap. The above noted conduits are separated by approximately 32'-0" with negligible and discontinuous intervening combustibles (i.e. cable trays noted above).
 - c. Negligible Fire Load.
 - d. Normally Inaccessible.
 - e. Smoke detection and suppression of adjoining spaces will ensure that any postulated fire in this area will be detected in a timely manner and that its propagation will be checked until arrival of the fire brigade.
 3. Additional considerations applicable to the above deviations:
 - a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish an exposure fire in this area in a timely manner.

- b. Detection and automatic fixed suppression is provided throughout this area except as noted above.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
4. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 3A - H&V, ELEVATOR MACHINE ROOM
AND ELEVATOR SHAFT

A. EXCEPTIONS

1. Relief from the technical requirements of 10CFR50 Appendix R Section II.G.2 is requested in this area, specifically:
 - a. The need for a complete 1-hour barrier or 20 feet free of intervening combustibles between redundant safe shutdown equipment.
 - b. The need for total area wide coverage of smoke detection and automatic fixed suppression systems.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 3A and Figures X-4, X-5, X-6, X-10 and X-21.
2. Combustible Material Loading - Negligible.

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 3A and Figures 9.5A-18, 9.5A-20, 9.5A-23 and 9.5A-25.

D. BASIS FOR EXCEPTIONS

1. Lack of separation between redundant exhaust fans E-29 (A&B), E-30 (A&B) and E-31 (A&B) by either a 1-hour barrier or 20 feet free of intervening combustibles.
 - a. These fans provide exhaust for the battery rooms. Ventilation of the battery rooms is not adversely affected by loss of these exhaust fans. Procedures exist to effect ventilation of these rooms by opening doors to the battery rooms with continued operation of the unaffected supply fans. Portable equipment to augment exhaust through access doors is available if needed.
2. Absence of smoke detection and automatic fixed suppression coverage for the HVAC duct space and elevator shaft forming part of RAB 3A:
 - a. The spaces open into the floor of RAB 3A at EL. +69.0 ft. They contain no safe shutdown equipment except HVAC ducting whose penetrations into the shaft are sealed and provided with fire dampers equivalent to the barrier rating.

- b. The shafts are separated from each other (except at the top) and from the adjoining stairwell and vestibule by a 2-hour rated fire boundary. Where they adjoin other fire areas a 3-hour rated fire boundary exists.
 - c. The accumulation of transient combustibles in these shafts is not credible.
 - d. If a fire should occur smoke detection in the HVAC room at the top of the open shafts would provide prompt detection and allow timely response and suppression from fire brigade members before damage to safe shutdown equipment could be caused.
3. Additional considerations applicable to the above deviations:
- a. Presence of portable fire extinguishers and nearby standpipe hose station ensure the ability to extinguish exposure fire in this area in a timely manner.
 - b. Detection and automatic fixed suppression coverage overall redundant safe shutdown equipment in area.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Low combustible loading in the fire area.
4. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 6 - ELECTRICAL PENETRATION AREA "A"

A. EXCEPTION

1. Relief from the technical requirements of 10CFR50 Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The existence of 1½ hour fire dampers in 3 hour rated fire boundaries.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 6 and Figure X-21.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	11
Control	23
Low-Level	15
Total	49

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 6 and Figure 9.5A-23.

D. BASIS FOR EXCEPTION

1. The existence of the below listed 1½ hour round fire dampers in fire area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire Severity(Minutes)</u>
West Wall	6 D	Yes(FD-47)	Pipe chase	Negligible
Floor	14 D	Yes(FD-46)	RAB 25	2
East Wall	6 D	Yes(FD-50)	RAB 2	54
Ceiling	42 D	Yes	RAB 2	54
Floor	42 D	Yes	RAB 2	54
South Wall	12 D	Yes(FD-48)	Pipe chase	Negligible

- a. Smoke Detection exists on both sides of each damper except where pipe chases are involved.
- b. Fire severity of adjacent areas is less than the fire rating of each damper.

2. Additional considerations applicable to the above deviation:
 - a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish exposure fire in this area in a timely manner.
 - b. Detection and automatic fixed suppression is provided throughout this area including dedicated automatic fixed suppression for each cable tray.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
3. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 7 - RELAY ROOM

A. EXCEPTIONS

1. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for a complete 1-hour barrier between redundant safe shutdown equipment.
 - b. The enclosure of redundant cable tray and conduit in the same 1-hour rated fire wrap.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 7, and Figure X-21.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Control	19
Low-Level	<u>7</u>
Total	26

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 7 and Figure 9.5A-23.

D. BASIS FOR EXCEPTIONS

1. Part height 1-hour rated walls with class B fire doors constructed to isolate:
 - Auxiliary Panel 3 (A/B) from Auxiliary Panel 2(SB)
 - Auxiliary Panel 3 (A/B) from Auxiliary Panel 1(SA)
 - Auxiliary Panel 4 (A/B) from Isolation Panel and Auxiliary Panel 3 (A/B)
 - SA portion of the Isolation Panel from the SB portion of the Isolation Panel
- a. Walls constitute a complete 1-hour barrier separation (including doors and seals) up to the height of the wall which extends well above the height of the safe shutdown equipment.

- b. Detection and automatic suppression protection provided throughout the area for all redundant equipment. An ionization detection system is provided for each cubicle of the Isolation Panel with individual indication shown at the Master Remote Console Panel.
 - c. Overhead interference makes construction of complete 1-hour wall not feasible.
 - d. Since part height walls adjoin 3-hour boundary walls on both sides of the fire area, there is no postulated fire capable of radiating two redundant auxiliary relay panels simultaneously with the exception of the cabinet tops which protrude approximately 1 foot above the top of the walls. The relays of concern are inside these cabinets and are therefore not exposed to the direct radiative affects of a fire. Due to restricted access in this area it is not postulated that a significant accumulation of combustibles would occur to support a fire of sufficient magnitude to necessitate further protection of such a small exposure surface (i.e. cabinet tops). At least one safe shutdown cable/conduit train is provided with a 1-hour wrap where essential redundant trains occur in each sub zone of RAB 7. This is to prevent damage to both essential safe shutdown trains from the build up of convective hot gases before actuation of the automatic detection and suppression system or arrival of fire brigade.
 - e. The essential redundant train A and train B portions of the Isolation Panel are separated by 1-hour part height walls on the outside of the singular cabinet housing and by a sheet metal wall sandwiched by 1/16 in. thick inorganic fiber insulation boards on the cabinet's inside. A single postulated fire will be limited to damage in only one sub zone by the 1-hour part height wall cubicles outside the Isolation Panel's cabinet and by IEEE-383-74 and Reg. Guide 1.75 separation criteria inside the cabinet. Thus at least one train of safe shutdown components of the Isolation Panel will remain free of fire damage.
2. Enclosure of essential redundant cable tray and conduit in the same 1-hour wrap for the following systems controlled from the Remote Shutdown Panel (LCP-43):
- Shutdown Cooling System
 - Chemical and Volume Control System
- a. Reg. Guide 1.75 criteria prevent internal tray and conduit fire from propagating to redundant tray or conduit.

- 1) This separation between one cable tray and a redundant cable tray or conduit within the same fire wrap is accomplished by providing the subject cable tray with either a metal tray cover or a $\frac{1}{2}$ inch B&B blanket cover (i.e. 30 minute fire rating). Where access and spatial separation between cable trays allows, a $1\frac{1}{2}$ inch B&B blanket tray cover (i.e. 1-hour fire rating is preferred over a $\frac{1}{2}$ inch blanket.
- b. 1-hour wrap provides sufficient protection to redundant cabling until actuation of automatic suppression system or arrival of fire brigade.
3. Additional considerations applicable to the above deviations:
 - a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish an exposure fire in this area in a timely manner.
 - b. Detection and automatic fixed suppression are provided throughout the entire area, including the internal compartments of the isolation panel.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
4. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions to the technical requirements of Appendix R should be granted.

RAB 8 - SWITCHGEAR, COMPUTER BATTERY AND
CEA M/G SET ROOMS

A. EXCEPTIONS

1. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for total area wide coverage of automatic fixed suppression systems.
 - b. The need for a complete 1-hour barrier between redundant safe shutdown equipment.
 - c. The existence of 1½ hour fire dampers and in two cases, the lack thereof in the fire area boundaries.
 - d. The enclosure of redundant cable tray and conduit in the same 1-hour rated fire wrap.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 8, RAB 8A, RAB 8B, RAB 8C, RAB 8D, RAB 8E, RAB 8F and Figures X-5 and X-14.
2. Combustible Material Loadings:

a. Fire Zone 8A

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	7
Control	12
Low-Level	<u>2</u>
Total	21

b. Fire Zone 8B

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	7
Control	12
Low-Level	<u>2</u>
Total	21

c. Fire Zone 8C

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	10
Control	14
Low-Level	<u>3</u>
Total	27

d. Fire Zones 8D, 8E & 8F:

Combustible Material Loading - Negligible.

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 8, RAB 8A, RAB 8B, RAB 8C, RAB 8D, RAB 8E and RAB 8F and Figures 9.5A-20, 9.5A-22 and 9.5A-33.

D. BASIS FOR EXCEPTIONS

1. Absence of automatic fixed suppression for Fire Zones 8D, 8E and 8F:
 - a. No safe shutdown equipment.
 - b. Separated from remainder of fire area by 3-hour rated wall with unrated penetrations and absence of dampers in duct penetrations. Smoke detection and automatic fixed suppression in adjoining fire zones will check propagation of hot gases through these penetrations until arrival of the fire brigade.
 - c. Negligible combustible loading.
 - d. Smoke detection provided in these zones will insure prompt discovery of any fire and its early suppression by fire brigade members before flames can spread to zones containing safe shutdown equipment.
2. Part height 1-hour walls constructed between redundant switchgear rooms RAB 8A, 8B and 8C; and within 8C at the pressurizer heater switchgear:
 - a. Detection and automatic suppression protection provided for all redundant equipment.

- b. Overhead interference makes construction of complete 1-hour wall not feasible.
 - c. Complete 1-hour wall would severely limit access for damage control purposes.
 - d. One train of redundant cable trays and conduit has been provided with a 1-hour rated fire wrap.
 - e. Part height walls extend approximately 1 foot above the height of safe shutdown switchgear and adjoin 3-hour boundary walls on both sides of the fire area. This prevents a single postulated fire from radiating two trains of redundant switchgear simultaneously. To provide protection from convective effects of a fire, at least one train of cable/conduit is provided with a 1-hour wrap throughout each zone where two redundant safe shutdown trains occur. This will insure that at least one train of safe shutdown equipment will remain free of fire damage until actuation of automatic smoke detection and suppression or arrival of the fire brigade.
3. Existence of 1½ fire dampers located in the following area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire Severity(Minutes)</u>
Floor (8A)	16 D	Yes(FD-25)	RAB 27B	17
Floor (8A)	16 D	Yes(FD-26)	RAB 27B	17
Floor (8A)	16 D	Yes(FD-27)	RAB 27B	17
Floor (8A)	16 D	Yes(FD-28)	RAB 27B	17
Ceiling (8A)	16 D	Yes(FD-29)	RAB 27B	17
Floor (8B)	18 D	Yes(FD-31)	RAB 27B	17
Ceiling (8B)	18 D	Yes(FD-49)	RAB 32	5
West Wall (8B)	8 D	Yes	RAB 25	2

- a. Detection and suppression exist on both sides of damper.
 - b. Fire severity of areas adjacent to each damper are less than the fire rating of subject damper.
4. The non-existence of fire dampers for the following duct penetrations in 3-hour rated fire boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Area</u>	<u>Adjacent Area Fire Severity (Min. Approx.)</u>
East Wall (8B)	24 X 16	No	Corridor	Negligible
North Wall(8C)	24 X 16	No	Corridor	Negligible

- a. There is negligible fire loading in the adjacent corridor.
 - b. Detection and suppression systems exist on both sides of duct penetrations.
 - c. Fire severity of areas adjacent to each damper are less than the fire rating of subject damper.
5. Enclosure of essential redundant cable tray/conduit in the same 1-hour wrap for the following systems:
- Standby Emergency Diesel Generator System
 - Component Cooling Water System
 - Component Cooling Water Makeup System
 - Emergency Feedwater System
- a. Reg. Guide 1.75 criteria prevents an internal tray fire from propagating to a redundant tray or conduit.
 - 1) This separation between one cable tray and a redundant cable tray or conduit within the same fire wrap is accomplished by providing the subject cable tray with either a metal tray cover or a $\frac{1}{2}$ inch B&B blanket cover (i.e. 30 minute fire rating). Where access and spatial separation between cable trays allows, a $1\frac{1}{2}$ inch B&B blanket tray cover (i.e. 1-hour fire rating) is preferred over a $\frac{1}{2}$ inch blanket.
 - b. 1-hour wrap provides sufficient protection to redundant cabling until actuation of automatic suppression system or arrival of fire brigade.
6. Additional considerations applicable to the above deviations:
- a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish exposure fire in this area in a timely manner.
 - b. Detection and automatic fixed suppression extend at least 20 feet beyond all redundant safe shutdown equipment in the area.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.

7. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions to the technical requirements of Appendix R should be granted.

RAB 23 - CORRIDOR AREA AND COMMON PASSAGEWAYS

A. EXCEPTIONS

1. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for total area wide coverage of smoke detection and automatic fixed suppression systems.
 - b. Separation of individual fire areas by complete 3-hour rated boundaries.
 - c. The existence of a 1½-hour fire damper in the fire area boundary.
 - d. The enclosure of redundant cable tray and conduit in the same 1-hour rated fire wrap.
 - e. Protection of a steel maintenance hatch to a fire resistance equivalent to the fire rating of the floor boundary it forms a part of.
 - f. Separation of redundant diesel fuel oil piping by less than 20 feet free of intervening combustibles.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 23 and Figures X-3 through X-6.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	7
Control	7
Low-Level	<u>4</u>
Total	18

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 23 and Figures 9.5A-13, 9.5A-16, 9.5A-17, 9.5A-19, 9.5A-20 and 9.5A-21.

D. BASIS FOR EXCEPTIONS

1. Absence of smoke detection and automatic fixed suppression for Boric Acid/Waste Concentrator rooms, Hold Up Tank rooms, Waste Condensate Storage Tank rooms and connecting corridor:

- a. No safe shutdown equipment.
 - b. No combustible loading.
 - c. Rooms are separated from each other and the remainder of the fire area by discontinuous reinforced concrete walls with unrated penetrations.
 - d. Smoke detection and suppression of adjoining spaces will ensure that any postulated fire in these rooms will be detected in a timely manner and that propagation of hot gases through unrated penetrations will be checked until arrival of the fire brigade.
2. Absence of automatic fixed suppression system for pipe chase adjoining north wall of RAB 23:
- a. Safe shutdown equipment consists of redundant diesel fuel oil piping separated by 23 feet.
 - b. Smoke detection provided will ensure early notification and rapid suppression of any fire by fire brigade members.
 - c. Remote location precludes possibility of transient combustible accumulation.
 - d. No source of ignition and negligible fire loading.
 - e. Access will be provided to enhance manual fire suppression activities.
3. Separation between Fire Area RAB 23 and Fire Area RAB 15 by a removable section in the south wall of the Diesel Generator 3BS Room (RAB 15) of a rating less than 3 hours as described in letter W3P83-3180 to Director of NRR, dated October 3, 1983:
- a. The removable section consists of two 4-inch thick acoustic panels (with a 4-inch air gap in between) rated by Underwriters Laboratory Inc., at 45 minutes for each panel from the RAB-23 side and 90 minutes for each panel from the 3BS Diesel Generator side.
 - b. Smoke detection and automatic suppression coverage are provided on both sides of the removable section.
 - c. Fire rating on one removable panel is greater than the area fire severity on either side of the removable section.
 - d. The removable section is required for infrequent removal of the 3BS diesel generator components.

4. Existence of 1½ hour damper in the following area boundary:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire Severity (Minutes)</u>
Floor	18D	Yes (FD-15)	RAB 31	22

- a. Detection and suppression exist on both sides of damper.
 - b. Less than 30 minute fire severity exists in fire areas on both sides of damper.
5. Enclosure of essential redundant cable tray and/or conduit in the same 1-hour wrap for the following system:
- Standby Emergency Diesel Generator System
- a. Reg. Guide 1.75 criteria prevents internal tray fire from propagating to redundant tray or conduit.
 - 1) This separation between one cable tray and a redundant cable tray or conduit within the same fire wrap is accomplished by providing the subject cable tray with either a metal tray cover or a ½ inch B&B blanket cover (i.e. 30 minute fire rating). Where access and spatial separation between cable trays allows, a 1½ inch B&B blanket tray cover (i.e. 1-hour fire rating) is preferred over a ½ inch blanket.
 - b. 1-hour wrap provides sufficient protection to redundant cabling until actuation of automatic suppression system or arrival of fire brigade.
6. Lack of equivalent fire resistance on floor boundary side of steel equipment hatch between fire areas RAB 23 and RAB 31 located along column line J between column lines 4A and 5A.
- a. A 3 hour fire protective coating will be applied to the RAB 31 (ceiling) side of the equipment hatch.
 - b. Protection of floor side (RAB 23) of hatch is accomplished by area wide smoke detection and automatic fixed suppression; additional modifications would be physically cumbersome to traffic flow during maintenance outages.
 - c. Low probability of a flammable liquid spill in vicinity of hatch due to strict administrative controls.

- d. There are no credible sources of ignition in the hatch vicinity.
 - e. The design of the hatch is such that only limited seepage of a liquid past the hatch-to-floor fitting can occur, thus acting as a flame arrester.
 - f. Smoke detection and automatic fixed suppression coverage below the hatch provide adequate compensation for any fire hazard associated with seepage past the hatch fitting.
5. Enclosure of essential redundant cable tray and/or conduit in the same 1-hour wrap for the following system:
- Standby Emergency Diesel Generator System
- a. Reg. Guide 1.75 criteria prevents internal tray fire from propagating to redundant tray or conduit.
 - 1) This separation between one cable tray and a redundant cable tray or conduit within the same fire wrap is accomplished by providing the subject cable tray with either a metal tray cover or a $\frac{1}{2}$ inch B&B blanket cover (i.e. 30 minute fire rating). Where access and spatial separation between cable trays allows, a $1\frac{1}{2}$ inch B&B blanket tray cover (i.e. 1-hour fire rating) is preferred over $\frac{1}{2}$ inch blanket.
 - b. 1-hour wrap provides sufficient protection to redundant cabling until actuation of automatic suppression system or arrival of fire brigade.
6. Lack of equivalent fire resistance on floor boundary side of steel equipment hatch between fire areas RAB 23 and RAB 31 located along column line J between column lines 4A and 5A.
- a. A 3-hour fire protective coating will be applied to the RAB 31 (ceiling side of the equipment hatch).
 - b. Protection of floor side (RAB 23) of hatch is accomplished by area wide smoke detection and automatic fixed suppression; additional modifications would be physically cumbersome to traffic flow during maintenance outages.

7. Exception from 20' separation for redundant diesel fuel oil storage and day tank piping:
 - a. Subject piping is located in corridor south of diesel generator rooms (RAB 15 & 16) with a minimum separation of approximately 7 feet.
 - b. Negligible combustible loading in corridor.
 - c. Smoke detection and automatic fixed suppression in this corridor.
 - d. Piping meets Siesmic Category 1 and Safety Class 3 design and construction criteria.
 - e. Construction criteria and heat dissipating capability of Schedule 80 pipe filled with liquid provide adequate protection from radiative and convective effects of a postulated fire until actuation of smoke detection and automatic fixed suppression or arrival of the fire brigade.
8. Additional considerations applicable to the above deviations:
 - a. Presence of pcrtable fire extinguishers and standpipe hose stations ensure the ability to extinguish exposure fire in this area in a timely manner.
 - b. Detection and automatic fixed suppression extend at least 20 feet beyond all redundant safe shutdown equipment in the area.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
9. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 25 - EQUIPMENT ACCESS AREA

A. EXCEPTIONS

1. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area specifically:
 - a. The existence of 1½-hour fire dampers in fire area boundaries.
 - b. Protection of a steel maintenance hatch to a fire resistance equivalent to the floor boundary it forms a part of.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 25 and Figure X-14.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	2

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 25 and Figure 9.5A-32.

D. BASIS FOR EXCEPTIONS

1. Existence of 1½ hour fire dampers in fire boundaries as listed in the below table:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire Severity(Minutes)</u>
Ceiling	42 D	Yes	RAB 32	5
Floor	14 D	Yes(FD-30)	RAB 32	5
Ceiling	14 D	Yes(FD-46)	RAB 6	47
Wall	8 D	Yes	RAB 8B	21

- a. Ionization detection coverage is provided on both sides of the damper.
 - b. Fire severity in areas on both sides of each damper is less than the fire rating of the damper.
2. Lack of equivalent fire resistance on floor boundary side of steel equipment hatch between fire areas RAB 25 and RAB 32 located along column line 3A between column lines N and Q:
 - a. A 3 hour fire protective coating will be applied to the RAB 32 (ceiling) side of the equipment hatch.

- b. Protection of floor side of hatch would be physically cumbersome to traffic flow during maintenance outages.
 - c. Low probability of a flammable liquid spill in vicinity of hatch due to strict administrative controls.
 - d. There are no credible sources of ignition in the hatch vicinity.
 - e. The design of the hatch is such that only limited seepage of a liquid past the hatch-to-floor fitting can occur, thus acting as a flame arrester.
 - f. Smoke detection coverage above and below the hatch provides adequate compensation for any fire hazard associated with seepage past the hatch fitting. In event a fire does occur prompt detection and suppression by the fire brigade is expected before any damage is caused to safety shutdown equipment (located away from the immediate hatch vicinity).
3. Additional considerations related to the above deviations:
- a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish an exposure fire in this area in a timely manner.
 - b. Administrative controls and low traffic volume limit the introduction of significant amount of combustible materials.
 - c. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - d. Low combustible loading in the fire area.
4. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 27 - HVAC, HEALTH PHYSICS, I&C
AND COMMUNICATIONS EQUIPMENT ROOMS

A. EXCEPTIONS

1. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for total area wide coverage of automatic fixed suppression systems.
 - b. The existence of a 1½-hour fire damper in the fire area boundaries.
 - c. The enclosure of redundant cable tray and conduit in the same 1-hour rated fire wrap.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 27, RAB 27A, RAB 27B, RAB 27C and RAB 27D and Figure X-10.
2. Combustible Material Loading:

- a. Fire Zone RAB 27A

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	4
Control	14
Low-Level	<u>8</u>
Total	26

- b. Fire Zone RAB 27B

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	2
Control	7
Low-Level	<u>8</u>
Total	17

c. Fire Zone RAB 27C

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Control	19
Low-Level	7
Other Solids	<u>2</u>
Total	28

d. Fire Zone RAB 27D

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	9

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 27, RAB 27A, RAB 27B, RAB 27C and RAB 27D and Figure 9.5A-18.

D. BASIS FOR EXCEPTIONS

1. Absence of automatic fixed suppression for Fire Zone 27D:
 - a. No safe shutdown equipment.
 - b. Separated from remainder of fire area by 3-hour rated wall with unrated penetrations and undampered duct penetrations. Smoke detection and automatic fixed suppression in adjoining fire zones will check propagation of hot gases through these penetrations until arrival of the fire brigade.
 - c. Negligible combustible loading.
 - d. Smoke detection provided in these zones will insure prompt discovery of any postulated fire and its extinguishment by fire brigade members before flames can spread to zones containing safe shutdown equipment.

2. Existence of 1½ hour fire dampers located in the following area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire (Severity(Minutes))</u>
Ceiling	16 D	Yes(FD-29)	RAB 8A	20
Ceiling	16 D	Yes(FD-25)	RAB 8A	20
Ceiling	16 D	Yes(FD-26)	RAB 8A	20
Ceiling	16 D	Yes(FD-27)	RAB 8A	20
Ceiling	16 D	Yes(FD-28)	RAB 8A	20
Ceiling	18 D	Yes(FD-31)	RAB 8A	20

- a. Detection and Suppression exist on both sides of damper.
- b. Fire severity in adjacent areas less than the fire rating of the damper.
3. Enclosure of essential redundant cable tray and/or conduit in the same 1-hour wrap for the following systems:

- Standby Emergency Diesel Generator System
- Chemical and Volume Control System
- Switchgear Area and Cable Vault Ventilation System
- Pressurizer Heater Bank

- a. Reg. Guide 1.75 criteria prevents internal tray fire from propagating to redundant tray or conduit.

- 1) This separation between one cable tray and a redundant cable tray or conduit within the same fire wrap is accomplished by providing the subject cable tray with either a metal tray cover or a ½ inch B&B blanket cover (i.e. 30 minute fire rating). Where access and spatial separation between cable trays allows, a 1½ inch B&B blanket tray cover (i.e. 1-hour fire rating) is preferred over a ½ inch blanket.

- b. 1-hour wrap provides sufficient protection to redundant cabling until actuation of automatic suppression system or arrival of fire brigade.

4. Additional considerations applicable to the above deviations:

- a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish exposure fire in this area in a timely manner.
- b. Detection and automatic fixed suppression coverage over all redundant safe shutdown equipment in the area.

- c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
5. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the requirements of Appendix R should be granted.

RAB 31 - CORRIDOR & PASSAGEWAYS AT EL. -4.00 FT.

A. EXCEPTIONS

1. Relief from the requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for total area wide coverage of smoke detection and automatic fixed suppression systems.
 - b. The existence of 1½-hour fire dampers in 3 hour rated fire boundaries.
 - c. Protection of steel maintenance hatch to a fire resistance equivalent to the floor boundary it forms a part of.
 - d. 20 feet separation free of intervening combustibles

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 31 and Figure X-4.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	7
Control	10
Low-Level	6
Lubricating Oil	<u>1</u>
Total	24

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 31 and Figures 9.5A-14 through 9.5A-17.

D. BASIS FOR EXCEPTIONS

1. Absence of smoke detection and automatic fixed suppression for pipe chase, CVCS rooms and Blowdown HX rooms to the west of column line 6A and between column lines K & L:
 - a. Rooms are separated from remainder of fire area by discontinuous reinforced concrete walls with wire mesh doors.
 - b. No safe shutdown equipment.
 - c. Low combustible loading.

- d. Presence of smoke detection and automatic fixed suppression in spaces adjacent to these rooms ensures that any postulated fire will be detected in a timely manner and that propagation of hot gases through the wire mesh doors will be checked until arrival of the fire brigade.

- 2. The existence of the below listed 1½ hour round fire dampers in fire area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire (Severity(Minutes))</u>
Floor	18 D	Yes(FD-12)	RAB 39	13
Ceiling	18 D	Yes(FD-15)	RAB 23	17
North Wall	30 D	Yes	Pipe Chase	Negligible

- a. Detection and suppression exist on both sides of each damper.
- b. Fire severity of adjacent areas is less than the fire rating of each damper.

- 3. Lack of equivalent fire resistance on floor boundary side of steel equipment hatch between fire areas RAB 31 and RAB 39 located along column line J between column lines 4A and 5A:

- a. A 3 hour fire protective coating will be applied to the RAB 39 (ceiling) side of the equipment hatch.
- b. Protection of floor side (RAB 31) of hatch would be physically cumbersome to traffic flow during maintenance outages.
- c. Low probability of a flammable liquid spill in vicinity of hatch due to strict administrative controls.
- d. There are no credible sources of ignition in the hatch vicinity.
- e. The design of the hatch is such that only limited seepage of a liquid past the hatch-to-floor fitting can occur, thus acting as a flame arrester.
- f. Smoke detection coverage above and below the hatch provides adequate compensation for any fire hazard associated with seepage past the hatch fitting.

4. Lack of 20 feet separation free of intervening combustibles between Boric Acid Heat Tracing Panels:
 - a. Smoke detection and automatic fixed suppression coverage are provided.
 - b. Panels are separated by approximately 40 feet and from a direct line-of-sight configuration by the 3-hour boundary of RAB 39's Boric Acid Make Up Tank room. Consequently, the direct radiative effects of a transient combustible fire involving the intervening combustibles are considered negligible.
 - c. Intervening combustibles consist of a single bank of cable trays running directly overhead the panels, five trays of which provide a complete continuous cable tray run between panels. The existing separation of redundant panels provide a low probability for flame propagation along the flame retardant (IEEE-383) cable runs involving both panels.
 - d. The 7 foot vertical separation of the cable trays above the panels minimize the convective effects of a fire involving the intervening combustibles such that at least one train of safe shutdown equipment will remain free of fire damage until actuation of the smoke detection and automatic fixed suppression system or arrival of the fire brigade.
5. Additional considerations applicable to the above deviations:
 - a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish exposure fire in this area in a timely manner.
 - b. Detection and automatic fixed suppression coverage overall redundant safe shutdown equipment in the area.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
6. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 32 - PIPE PENETRATIONS: AUXILIARY COMPONENT
COOLING WATER PUMPS PUMPS EL. -35.00 and -4.00 FT.

A. EXCEPTIONS

1. Relief from the requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for total area wide coverage of automatic fixed suppression systems.
 - b. The existence of 1½ hour fire dampers in the fire area boundaries.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 32 and Figure X-13.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	1
Control	3
Low-Level	1
Lubricating Oil	1
	<hr/>
Total	6

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 32 and Figures 9.5A-27 through 9.5A-30.

9. BASIS FOR EXCEPTIONS

1. Absence of automatic fixed suppression other than area bounded by column lines L, M, 2AZ and 11AZ at EL. -35.0 ft:
 - a. Redundant Auxiliary CCW Pumps (hot shutdown) are separated by 172 feet (horizontally) and the southern portion of the containment wall.
 - b. Redundant Instrument Cabinets C-11A and C-11B are separated by 192 feet (horizontally) and the southern portion of the containment wall.
 - c. Redundant train 'A' conduit for the Diesel Oil Transfer Pump 'A' is provided with a 1-hour wrap.

- d. Redundant Safety Injection System valves located within this area are required for cold shutdown only and are provided with manual override capabilities should fire impact the valve operator or assigned cable. These valves and corresponding separation are provided below:

	<u>Valve No.</u>	<u>Separations (Feet)</u>
SIS Recirc Valves	2SI-V809A 2SI-V801B	45
SIS Recirc Valves	2SI-V810A 2SI-V802B	45
LPSI Valves	2SI-V1549A1 2SI-V1539B1	60
LPSI Valves	2SI-V1541A2 2SI-V1543B2	69
SDCS Isol Valves	2SI-V327A 2SI-V326B	130
SDCS Warmup Valves	2SI-V393 2SI-V346	190

2. The existence of the below listed 1½ hour round fire dampers in fire area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Area</u>	<u>Adjacent Area Fire Severity (Min.)</u>
South Wall	30 D	Yes	Pipe Chase	Negligible
Ceiling	18 D	Yes (FD-31)	RAB 8B	20
Ceiling	14 D	Yes (FD-30)	RAB 25	2
South Wall	30 D	Yes (FD-6)	RAB 39	13
South Wall	16 D	Yes (FD-7)	RAB 35	15
South Wall	16 D	Yes (FD-8)	RAB 35	15
South Wall	12 D	Yes (FD-9)	RAB 34	Negligible
South Wall	16 D	Yes (FD-10)	RAB 33	7

- a. Detection exists on both sides of each damper.
- b. Fire severity in adjacent areas less than the fire rating of the damper.

3. Additional considerations applicable to the above deviations:
 - a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish exposure fire in this area in a timely manner.
 - b. Detection is provided throughout this area.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
4. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 33 - SHUTDOWN COOLING HEAT EXCHANGER ROOM

A. EXCEPTIONS

1. Relief from the technical requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for a complete 1-hour barrier between redundant safe shutdown equipment.
 - b. The existence of 1½-hour fire dampers in the fire area boundaries.
 - c. The need for total area wide coverage of automatic fixed suppression systems.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 33 and Figure X-3.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	1
Control	5
Low-Level	2
Total	8

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 33 and Figure 9.5A-11.

D. BASIS FOR EXEMPTION

1. Part-height wall separating the following safe shutdown equipment:
 - Shutdown Cooling Heat Exchangers A & B
 - Air Handling Units AH-3(3A-SA) & AH-3(3B-SB)
 - Instrumentation Cabinets C-27A & C-27B
 - Temperature Elements TE-303X & TE-303Y
- a. Wall extends the entire width of fire area and constitutes a complete 1-hour separation (including doors and penetrations) up to the height of the wall (approximately 10 feet above floor elevation). The top of the wall is approximately 2 feet above the top of the SDCS heat exchangers and associated temperature elements. Redundant instrument cabinets are separated by full height walls and

are enclosed in separate concrete block cubicles within each heat exchanger room. With the exception of air handlers AH-3 (SA & SB) which are mounted above the top of the part height wall, at least one train of redundant safe shutdown equipment is protected by the described barriers from the direct radiative effects of a fire in this area. Redundant air handlers are approximately 17 feet apart and procedures exist to provide alternate ventilation for this area in the unlikely event both units are damaged by fire. The large room volume is expected to dissipate any convective effects from a postulated fire until actuation of the smoke detection and automatic fixed suppression system or arrival of the fire brigade.

- b. The following redundant train 'A' cable or conduit which extends beyond the height of the wall which separates A&B equipment spaces will be provided with a 1-hour wrap:
 - 1) 30589B-SA - 3/4
 - 2) 30589A-SA - 1½
 - 3) 30589T-SA - 1½
 - 4) BOX-B30024SA
- c. In-situ intervening combustibles in this area consist of one cable tray located 10 feet horizontally and 15 feet vertically from the nearest heat exchanger. This negligible amount of combustibles is expected to have little or no impact on a postulated fire in this area.
- d. Presence of 1-hour wrap and smoke detection will provide sufficient protection to at least one redundant safe shutdown train until arrival of the fire brigade or actuation of the automatic fixed suppression system.

- 2. The existence of the below listed 1½ hour round fire dampers in fire area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire Severity(Minutes)</u>
North Wall	16 D	Yes(FD-10)	RAB 32	5
South Wall	16 D	Yes(FD-5)	RAB 39	13

- a. Detection and Suppression exists on both sides of each damper.
 - b. Adjacent area fire severity is less than the fire rating of each damper.
3. The need for automatic fixed suppression coverage for the enclosed cubicles within RAB-33 housing redundant Instrumentation Cabinets C-27A & C-27B:
 - a. Cubicles are completely enclosed and are divided by full height reinforced concrete wall and Class A fire doors.
 - b. Smoke detection provided ensures prompt notification of a postulated fire starting in one of these cubicles and its early suppression by fire brigade members before damage can occur to other safe shutdown equipment in this area (outside the cubicles).
 - c. 1-hour wrap, smoke detection and automatic fixed suppression coverage outside of these entry way cubicles provide sufficient protection to safe shutdown equipment from hot gases escaping these cubicles until arrival of the fire brigade.
4. Additional considerations applicable to the above deviations:
 - a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish an exposure fire in this area in a timely manner.
 - b. Detection and automatic fixed suppression is provided throughout this area with exception of the entry cubicles.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
5. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 34 - VALVE GALLERIES

A. EXCEPTIONS

1. Relief from the requirements of 10 CFR 50, Appendix R, Section III.G.2 is requested for this fire area, specifically:
 - a. The need for an automatic fixed suppression system.
 - b. The existence of 1½-hour fire dampers in the fire area boundaries.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 34 and Figure X-3.
2. Combustible Material Loading is negligible.

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 34 and Figure 9.5A-11.

D. BASIS FOR EXCEPTIONS

1. Absence of an automatic fixed suppression system:
 - a. The following train B cable/conduit will be provided with a 1-hour wrap:
 - (1) 30535A-SB-4
 - (2) 30548M-SB-3/4
 - b. Presence of 1-hour wrap and detection will provide sufficient protection to at least one redundant safe shutdown train until arrival of the fire brigade.
 - c. Cable/conduit assigned to Shutdown Cooling System (SDCS) valving (cold shutdown only) can be lost without adverse impact on the capability to safely shutdown. The SDCS valves are located outside RAB 34 (i.e. RAB 35 & 36) while their handwheels are located inside RAB 34 should manual operation become necessary.
2. The existence of the below listed 1½ hour round fire dampers in fire area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire Severity(Minutes)</u>
South Wall	12 D	Yes(FD-9)	RAB 32	5
Ceiling	12 D	Yes(FD-4)	RAB 39	13

- a. Detection exists on both sides of each damper.
 - b. Fire severity of adjacent areas is less than the fire rating of each damper.
3. Additional considerations applicable to the above deviations:
- a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish exposure fire in this area in a timely manner.
 - b. Smoke detection is provided throughout this area.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
4. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 35 - SAFETY INJECTION PUMP ROOM 'B'

A. EXCEPTION

1. Relief from the requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The existence of 1½-hour fire dampers in the fire area boundaries.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 35 and Figure X-3.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	7
Control	5
Lubricating Oil	6
	<hr/>
Total	18

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 35 and Figure 9.5A-11.

D. BASIS FOR EXCEPTION

1. Existence of 1½ hour fire dampers in the following fire area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Area</u>	<u>Adjacent Area Fire Severity(min.)</u>
North Wall	16 D	Yes(FD-7)	RAB 32	5
North Wall	16 D	Yes(FD-8)	RAB 32	5
West Wall	16 D	Yes(FD-1)	RAB 39	13

- a. Ionization detection coverage is provided on both sides of the damper.
- b. Fire severity in adjacent areas is less than the fire rating of each damper.
- c. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish exposure fire in this area in a timely manner.

- d. Administrative controls and low traffic volume limit the introduction of significant amount of combustible materials.
 - e. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - f. Low combustible loading in the fire area.
2. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exception from the technical requirements of Appendix R should be granted.

RAB 36 - SAFETY INJECTION PUMP ROOM "A"

A. EXCEPTIONS

1. Relief from the technical requirements of 10CFR50 Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need to provide an automatic fixed suppression system.
 - b. The existence of a 1½ hour fire dampers in 3 hour rated fire boundaries.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 36 and Figure X-3.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	7
Control	6
Lubricating Oil	<u>1</u>
Total	14

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 36 and Figure 9.5A-11.

D. BASIS FOR EXCEPTIONS

1. Absence of an automatic fixed suppression for this fire area:
 - a. The following train B safety shutdown cable tray and conduit will be provided with a 1-hour wrap throughout the fire area:
 - 1) 31008C-SB-1
 - 2) 31008A-SB-1½
 - b. Presence of 1-hour wrap and detection will provide sufficient protection to at least one redundant safe shutdown train until arrival of the fire brigade.
2. The existence of the below listed 1½ hour round fire dampers in the following fire area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Area</u>	<u>Adjacent Area Fire Severity(min.)</u>
South Wall	16 D	Yes(FD-3)	RAB 39	13
South Wall	12 D	Yes(FD-4)	RAB 39	13

- a. Smoke detection exists on both sides of each damper.
 - b. Fire severity of adjacent areas is less than the fire rating of each damper.
3. Additional considerations applicable to the above deviations:
- a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish exposure fire in this area in a timely manner.
 - b. Smoke detection is provided throughout this area.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
4. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

RAB 39 - GENERAL AREA

A. EXCEPTIONS

1. Relief from the requirements of 10CFR50, Appendix R, Section III.G.2 is requested in this area, specifically:
 - a. The need for total area wide coverage of smoke detection and automatic fixed suppression systems.
 - b. The need for a complete 1-hour barrier between redundant safe shutdown equipment.
 - c. The existence of a 1½-hour fire damper in the fire area boundaries.
 - d. The enclosure of redundant cable tray and conduit in the same 1-hour rated fire wrap.

B. FIRE HAZARDS ANALYSIS (FHA)

1. See FSAR Section 9.5.1, Table VIII-2, RAB 39 and Figures X-3 and X-4.
2. Combustible Material Loading:

<u>Material</u>	<u>Fire Severity (Minutes)</u>
Cable Insulation	
Power	2
Control	7
Low-Level	4
Lubricating Oil	1
	<hr/>
Total	15

C. SAFE SHUTDOWN ANALYSIS (SSA)

1. See FSAR Section 9.5.1, Table 9.5A-4, RAB 39 and Figures 9.5A-10, 9.5A-12, 9.5A-13 and 9.5A-16.

D. BASIS FOR EXCEPTIONS

1. Absence of smoke detection and automatic fixed suppression for:
 - a. Waste gas processing rooms, boric acid condensate room, spent resin tank room, laundry room and waste management system rooms:
 - 1) No safe shutdown equipment.
 - 2) Separated from remainder of fire area by discontinuous reinforced concrete fire walls with wire mesh doors and unrated penetrations.

- 3) Negligible combustible loading.
 - 4) Presence of detection and automatic fixed suppression in spaces adjacent to these rooms ensures that any postulated fire will be detected in a timely manner and propagation of hot gases through unrated penetrations will be checked until arrival of the fire brigade.
- b. Boric acid makeup tank rooms:
- 1) Damage to safe shutdown equipment (i.e. makeup tanks) by fire not deemed credible.
 - 2) Separated from remainder of fire area by discontinuous reinforced concrete fire walls with wire mesh doors and unrated penetrations. Presence of detection and automatic fixed suppression in spaces adjacent to these rooms ensures that any postulated fire will be detected in a timely manner and propagation of hot gases through the unrated penetrations will be checked until arrival of the fire brigade.
 - 3) Negligible combustible loading.
 - 4) Smoke detection provided ensures prompt notification of any postulated fire starting in this room and its early suppression by fire brigade members before damage to safe shutdown equipment can occur.
2. Part-height 1-hour walls constructed around charging pump "A":
- a. Detection and automatic suppression protection provided for all redundant equipment.
 - b. Overhead interference makes construction of complete 1-hour wall cost prohibitive.
 - c. Charging pump "A" cable trays and conduit have been provided with a 1-hour fire wrap.

3. Existence of 1½-hour fire dampers located in the following area boundaries:

<u>Duct Penetration Location</u>	<u>Duct Size (Inches)</u>	<u>Fire Damper</u>	<u>Adjacent Fire Area</u>	<u>Adjacent Fire Severity(Minutes)</u>
North Wall	16 D	Yes(FD-3)	RAB 36	13
North Wall	12 D	Yes(FD-4)	RAB 34	Negligible
North Wall	16 D	Yes(FD-5)	RAB 33	7
Ceiling	18 D	Yes(FD-12)	RAB 31	22
East Wall	16 D	Yes(FD-1)	RAB 35	15
North Wall	30 D	Yes(FD-6)	RAB 32	5

- a. Smoke Detection exists on both sides of damper.
- b. Fire severity of adjacent areas is less than fire rating of each damper.

4. Enclosure of essential redundant cable tray conduit in the same 1-hour wrap for the following system:

- Shutdown Cooling

- a. Reg. Guide 1.75 criteria prevents internal tray fire from propagating to redundant tray or conduit.
 - 1) This separation between one cable tray and a redundant cable tray or conduit within the same fire wrap is accomplished by providing the subject cable tray with either a metal tray cover or a ½ inch B&B blanket cover (i.e. 30 minute fire rating). Where access and spatial separation between cable trays allows, a 1½ inch B&B blanket tray cover (i.e. 1-hour fire rating) is preferred over a ½ inch blanket.
- b. 1-hour wrap provides sufficient protection to redundant cabling until actuation of automatic suppression system or arrival of fire brigade.

5. Additional considerations applicable to the above deviations:

- a. Presence of portable fire extinguishers and standpipe hose stations ensure the ability to extinguish an exposure fire in this area in a timely manner.

- b. Detection and automatic fixed suppression extend at least 20 feet beyond all redundant safe shutdown equipment in the area.
 - c. Administrative controls and low traffic volume limit the introduction of significant amounts of combustible materials.
 - d. Ventilation exhaust system has sufficient capacity to allow adequate accessibility for damage control.
 - e. Low combustible loading in the fire area.
 - f. One train of redundant safe shutdown cable trays and/or conduit have been provided with a 1-hour fire wrap.
6. The above mitigating features ensure that at least one train of safe shutdown equipment will remain free of fire damage and therefore the previously stated exceptions from the technical requirements of Appendix R should be granted.

Enclosure 2

WATERFORD SES UNIT NO. 3

Demonstration of Equivalency of Reactor

Containment Building to Technical

Requirements of Sections III.G.2, III.L

and III.0 of Appendix R to 10CFR50.

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I. Introduction

This document demonstrates that Waterford-3 either meets or provides equivalent levels of protection as that required by Sections III.G.2, III.L, and III.O for the Reactor Containment Building.

Those components and process monitoring variables inside containment which have been determined by the Waterford-3 Safe Shutdown Analysis to be required for safe shutdown are listed in Table 1. It is the purpose of this enclosure to demonstrate that the plant can be brought from normal power operating conditions to cold shutdown, and be maintained in that state, with or without the availability of offsite power and a fire inside containment.

This is accomplished in two steps. First, for the components listed in Table 2, it is shown in Part II of this submittal that the performance goals for shutdown function delineated in Section III.L.2 of Appendix R to 10CFR50 can be met assuming their loss to fire or any other cause. Second, for the components listed in Table 3, it is shown in Part III that, although the criteria for fire protection of safe shutdown equipment of Section III.G.2 of Appendix R is not met, appropriate mitigating features exist or will be provided to insure that one train of safe shutdown equipment or conduit remains free of fire damage.

Part IV contains a request for exception to the technical requirements of Section III.O (Reactor Coolant Pump Oil Collection System).

II. Demonstration of Compliance to Appendix R, Section III.L.2

A. Charging Line Isolation and Auxiliary Spray Valves

1. Introduction

The charging line isolation valve to loop 1A (1CH-E2503A), the charging line isolation valve to loop 2A (1CH-E2504B), and the two redundant auxiliary spray valves (1CH-E2505A and 1CH-E2505B) are used to maintain the reactor coolant system inventory and shutdown margin and provide pressure control and reduction while bringing the plant from hot standby to cold shutdown. They are, therefore, designated in FSAR Table 9.5A-1B as safe shutdown components.

These four valves are located in the Containment Building in the Regenerative Heat Exchanger (RHX) cubicle (see FSAR Figures 1.2-18 and 9.5A-30). Since they are located within the same area, they are evaluated together to determine alternate safe shutdown capabilities.

The charging line isolation valves are normally open, fail closed, solenoid operated globe valves; the auxiliary spray valves are normally closed, fail closed, solenoid operated globe valves. (See Flow Diagram, FSAR Figure 9.3-6).

2. Physical Configuration

The charging line isolation valves and auxiliary spray valves are all located in the Regenerative Heat Exchanger (RHX) cubicle in the southeast quadrant of the containment on elevation +21.0. Therefore, a fire in this cubicle will have the most significant effect on the valves' ability to provide their safe shutdown functions. In addition, the fail closed, solenoid actuated, pneumatic letdown valves 1CH-F1516A/B and 1CH-F2501A/B) are also located in this cubicle.

The RHX cubicle is enclosed on all sides by concrete walls. There is an entryway on its east face, a blowout area on its south face (approximately twenty feet above the floor elevation), and an equipment hatch above the RHX at elevation +46.0 (see FSAR Figures 1.2-18, 1.2-21, 9.5A-30 and 9.5A-33). There are no cable trays in the cubicle. All the components are located near the floor and their cables are routed in conduits inside the cubicle. Outside the cubicle, the conduits empty into either the A or B cable trays traversing the southern perimeter of the containment and are then routed to either the A or B electrical penetration areas.

There are therefore negligible combustible materials inside the cubicle and minimal chance of an exposure fire due to its limited accessibility.

3. Alternate Shutdown Evaluation

A fire in the RHX cubicle that envelops the cables to these valves would most probably cause their deenergization and closure. Although the letdown isolation valves are not designated safe shutdown, their position will influence the shutdown method and, therefore, their closure due to a fire and deenergization is considered.

Assuming closure and loss of function of the charging line isolation, auxiliary spray and letdown isolation valves, the shutdown functions of Section III.L.2 of Appendix R can be achieved as follows:

- a) Safe shutdown is initially performed manually by rod insertion from the control room, or automatically on loss of power.
- b) Reactor coolant inventory and the reactor shutdown margin are maintained by one of three positive displacement charging pumps by either of two alternate routes:

- i) via the normal charging line RCS nozzle by injecting and borating through a spring loaded check valve (1CF-V2506) in series with a locked open manual bypass valve (1CH-V2507) around the charging line isolation valve to loop 1A. These valves are located in the RHX cubicle in a space below the floor grating at elevation +21.0 or,
 - ii) by injecting and borating via the HPSI header. This is accomplished outside containment by locally opening two locked closed manual valves (2CH-V1501-5 and 2SI-V1600) (see FSAR Figures 9.3-6 and 6.3-1), and closing the normal charging line containment isolation valve (2CH-F1529AB), located outside containment. The latter action can be done remotely from the control room.
- c) Decay heat removal and cooldown to shutdown cooling entry conditions can be accomplished by releasing steam from the steam generators via the atmospheric dump valves and the safety relief valves. Makeup to the steam generators can be provided by the Emergency Feedwater (EFW) Pumps (2 motor driven, 1 steam driven). These pumps take suction from the condensate storage pool (170,000 gallons minimum) or, if necessary, can be aligned to the Wet Cooling Tower basins (360,000 gallons).
- d) Primary system pressure can be reduced by removing heat through natural circulation cooldown with steam generators to shutdown cooling entry conditions. The pressurizer can be cooled gradually by refilling with condensate inventory by way of charging pumps. Primary pressure can be controlled by use of the pressurizer heaters, which are unaffected by a fire in this area (RHX cubicle), and use of the charging pumps as described above. This method of cooldown, assuming the unavailability of the letdown lines and auxiliary spray lines will be covered under the Waterford-3 Functional Recovery Emergency Operating Procedure. Under these conditions, cold shutdown can be achieved within 72 hours. Subcooling margin and the presence of voids in the reactor vessel upper head region would be monitored by the Qualified Safety Parameter Display System (QSPDS) installed as a result of NUREG-0737, Item II.F.2 (see FSAR Appendix 1.9A). There is a potential for void formation in the upper head region under this scenario. It will not, however, inhibit natural circulation cooldown (see CEN-199/Effects of Vessel Head Uncovering Transients and Accidents in CE NSSS).

4. Spurious Operation

Failure of the charging line isolation, auxiliary spray or letdown valves in other than the fail closed position is considered spurious. It has been assumed to occur, in this

case, as a result of fire induced hot shorts. Spurious operation of any combination of these valves will have no affect on the ability to achieve cold shutdown as described in Section 3 above for the following reasons:

- a) The valves may be deenergized by opening breakers in their respective Power Distribution Panels (PDP's) located outside containment. Safe shutdown may then proceed as described in Section 3.
- b) In the highly unlikely event of a hot short which precludes deenergization, the charging and auxiliary spray lines which branch off the common charging header inside containment may be isolated from outside containment and charging provided via the cross-connect to the HPSI header described in Section 3.b)ii) above. The letdown line may also be isolated or controlled from the control room by operation of the letdown containment isolation valve located outside containment. Shutdown may then proceed as described in Section 3 above or by feed and bleed of the primary loop using charging and letdown lines if we assume the letdown isolation valves in the RHX cubicle fail open.

B. Safety Injection Tank Isolation Valves

1. Introduction

The SITIV's are motor operated valves located at the discharge of the four SIT's (See FSAR Figure 6.3-1). They are opened above approximately 500 psig RCS pressure. After opening, they are locked open in the control room, and the motor circuit breaker is padlocked in the open position. During cooldown, the SIT pressure is lowered to 377 psig at an RCS pressure of 650 psig by venting to prevent inadvertent pressurization of the shutdown cooling system. The SITIV's are then closed by the operator when RCS pressure drops to about 400 psig.

2. Physical Configuration

The four SIT's and their respective isolation valves are each located in a quadrant of the containment. The power cables for the SIT's are routed in conduits, most of which are embedded in concrete. There are areas where these conduits come within twenty feet of each other.

3. Alternate Shutdown Evaluation

In the highly unlikely event that a containment fire precludes closing one or more of these valves, they may be closed manually by handwheel operators. These handwheels are in easily accessible locations in shutdown radiation zone III-IV (see FSAR Section 12.3) areas outside the primary shield wall.

4. Spurious Operation

Since the electrical cables servicing these valves are run in conduit and are deenergized, and the valves have handwheels as described above, a spurious operation evaluation is not applicable.

C. Steam Generator Pressure Indication

1. Introduction

This is a process monitoring variable which is required as cooldown is conducted via blowdown of the steam generators through the atmospheric dump and safety relief valves under the scenario of a shutdown with the loss of offsite power.

2. Physical Configuration

The pressure transmitters listed in the Safe Shutdown Analysis are the two redundant control channels on each steam generator (see Table 2). The cables are routed from each steam generator in exposed and embedded conduit to their respective containment penetrations. There are locations at each electrical penetration area where three of four conduits carrying redundant steam generator pressure indication cables are separated by less than twenty feet.

3. Alternate Shutdown Evaluation

Alternate steam generator pressure indication is provided completely outside containment via pressure transmitters PT-0301AS and PT-0303AS (Steam Generator 1) and PT-0301BS and PT-0303BS (Steam Generator 2). These pressure transmitters are located outside containment on the main steam lines between the penetrations and the main steam isolation valves. PT-0301 provides 0-1300 psig indication on a chart recorder and on a CRT in the control room. PT-0303 provides 0-1200 psig indication on a CRT in the control room. Both the Plant Computer and CRTs are powered by a static uninterruptable power supply (SUPS).

In addition, there are four Plant Protection System channels with pressure transmitters located inside containment which provide similar pressure indication in the control room. They are as follows:

SG 1

PT-MS-1013A, B, C, D

SG 2

PT-MS-1023A, B, C, D

There is therefore no fire which can cause total loss of pressure indication to either steam generator.

D. Manual/Automatic Service Pressurizer Controls

1. Introduction

These controls were listed in the Safe Shutdown Analysis (FSAR Table 9.5A-1B), since, if offsite power is available, and the plant is being maintained at hot standby, they may be utilized to automatically maintain the pressurizer pressure and level program.

2. Alternate Shutdown Evaluation

Pressurizer pressure and level may be maintained and controlled manually. These controls and associated cable are therefore not required for either hot standby or cold shutdown.

III. Request for Exceptions to the Technical Requirements of Appendix R to 10CFR50, Section III.3.2 in the Reactor Containment Building

There are certain fire protection features that are generic to the following specific requests. They are described in more detail in the Fire Hazards Analysis for the Reactor Containment Building (FSAR Section 9.5.1, Volume 1, Section VIII, p VIII-218) but are summarized below:

- ° Ionization type detectors in areas of high relative fire loadings (See Figures X-13, 14 and 15).
- ° Continuous line thermistor type detectors over the Reactor Coolant Pump areas.
- ° Multicycle automatic sprinkler systems in the Reactor Coolant Pump areas.
- ° Reactor Coolant Pump Lube Oil Collection System
- ° Strategically located hose stations such that all areas are within 75 feet of a hose nozzle (See Figures X-13, 14 and 15).
- ° Portable Fire Extinguishers (See Figures X-13, 14 and 15).
- ° Fire breaks at approximately 15 foot intervals in vertical cable trays.
- ° Low combustible loading.
- ° IEEE-383 qualified cables.
- ° Administrative procedures to limit quantities of transient combustibles.
- ° A well trained Fire Brigade and a well thought out Fire Protection Program.

Since, exception to the requirement that there be no intervening combustibles between redundant divisions of safe shutdown equipment located in the same fire area (i.e., RCB) is the primary focus of this part, a generic description of combustibles in containment is in order. Combustible materials inside containment consist of cable insulation, lubricating oil and charcoal in the Airborne Radioactivity Removal System (ARRS).

Cable is run either in conduit or trays. The cable trays in containment are particularly lightly loaded. Currently there is a maximum of 35 percent fill in power cable trays, 65 percent in control cable trays and 60 percent in low level cable trays. As indicated above, the cables themselves are all qualified to IEEE-383. Tray and conduit separation in accordance with Regulatory Guide 1.75 is provided either by meeting the minimum separation distances of the guide (three feet vertical, five feet horizontal) or by totally enclosing the redundant raceways.

Lubricating oil inside containment is discussed in Section IV of this enclosure.

The two charcoal filter systems are located in wholly contained tight HVAC cabinets. Under normal conditions, the captured radioactive particles are insufficient to cause self-ignition. In the unlikely event of temperature increases, forced air maintains the system below self-ignition temperatures. By first refueling, a manual deluge system will also be provided for each filter bank.

In summary, since the containment is a single fire area, the justifications for exceptions to the technical requirements of III.G.2 that follow are based on demonstrating that by a combination of physical distance, inherent barriers such as shield walls and low levels of intervening combustibles, at least one channel or division of safe shutdown equipment will be available after fire. In addition, in Sections C, D, E, F and G, it is also shown that there is additional instrumentation, aside from that designated in the Safe Shutdown Analysis, that will provide the control room operator with the required information.

A. Pressurizer Heaters

1. Introduction

Two banks of proportional heaters (150 Kw each) from redundant electrical buses are capable of being manually loaded onto their respective diesel generators. Pressurizer heaters are used to maintain adequate subcooled margin during a shutdown. Emergency operating procedures based on the NRC approved guidelines of CEN-152 exist which provide for shutdown without the pressurizer heaters. It has been decided, however, to justify exception to the technical requirements of Section III.G.2 rather than base compliance on III.L. (Alternate Shutdown).

2. Basis for Exception

Exception to the technical requirements of Section III.G.2.d that cables and equipment and associated non-safety circuits of redundant trains be separated by a horizontal distance of more than twenty feet with no intervening combustibles or fire hazards is based on the following.

As shown in Figures III.A-1, 2 and 3, the cables from the banks of proportional heaters leave the bottom of the pressurizer inside the skirt area, and enter conduits separated by about seven feet. There are about two feet of exposed cable before they enter the conduits. The conduits then descend six feet into the slab beneath and are embedded. The conduit for each redundant bank next comes out of concrete at boxes on opposite sides of the pressurizer cubicle.

It is not credible that a fire in the pressurizer cubicle could disable both banks of proportional heaters. The exposed cable beneath the pressurizer, connecting to the heater elements, consists of short lengths of Rockbestos Rockhide cables (Firewall SR Class 1E electric cables, each wrapped with 45 mils of asbestos glass braid) capable of performing at temperatures up to 200°C.

The entire pressurizer cubicle is extremely restrictive both from a temperature and radiological point of view. The skirt area itself is also physically restrictive. It is accessible via only one small manway. Thus, there is little chance that transient combustibles would be brought into the space. The only actual combustibles permanently in the cubicle are the small amounts of Rockbestos cable lengths from the heater elements to the conduit.

Thus, at the location where redundant pressurizer heater cables would be most vulnerable to a fire, the cable itself effectively acts as a radiant energy shield, and the low combustible loading and restrictive access precludes self-ignited or transient combustible generated fires.

The A train conduit exits the pressurizer cubicle on its west face above Elevation -4.0; the B train conduit exits on the east face. At this point, the cubicle itself acts as full height barrier. The A train conduit then empties into the A cable tray at EL. 30'-9". This tray is one of a bank of five located about 15 feet above the Elevation +21.0 grating. The B conduit empties into the B tray located beneath the Elevation -4.0 grating. Thus, the closest point of approach of the redundant conduits outside the cubicle is in the area outside the Southeast corner. At this point, the A cables are in a tray about 15 feet above the Elevation -4.0 grating and the B cables are in a tray just below the grating with about five feet horizontal separation between them. The only intervening combustibles are two lightly loaded trays of control and low level cables. An exposure fire that could consume both trays is considered highly unlikely. The nearest operating platform below both trays is at Elevation -4.0 which is twenty-five feet below that A tray and about forty feet below the B tray. The area is also covered by ionization detectors that alarm in the control room.

From this area, the cables diverge as they travel to their respective electrical penetrations. At the penetrations, there is about 60 feet horizontal separation. Again, the only intervening combustibles are the banks of trays shown.

B. Shutdown Cooling System Isolation Valves

1. Introduction

On each shutdown cooling train, there are two isolation valves inside containment. These valves form the boundary between the Class 1 RCS and the Class 2 SDCS. Each train has two gate valves which are locked closed during normal operation. Both valves in each train are on the same electrical channel, i.e. there is an "A-A" train redundant to a "B-B" train. The two valves within each train are located side by side on elevation +21.0'. The A division valves are at approximately 116° in the southeast quadrant and the B division valves are at approximately 255° in the southwest quadrant.

These valves are normally remote manually opened from the control room when aligning the shutdown cooling heat exchangers, prior to proceeding to cold shutdown.

2. Basis for Exception

Exception to the technical requirements of Section III.G.2.d that cables and equipment and associated cables of non-safety circuits of redundant trains be separated by a horizontal distance of more than twenty feet with no intervening combustibles or fire hazards is based on the following:

Please refer to Figures III.B-1, 2 and 3.

The electrical cables servicing these valves are routed inside containment entirely in exposed and embedded conduit from the area of the valves themselves to their respective penetration areas. The A division valves are located within approximately 18 feet horizontally of the B division electrical penetrations and the B division valves are located within approximately 18 feet horizontally of the A division electrical penetrations. These are the only areas where redundant divisions are vulnerable to a fire. From the valves, the conduits travel north around the primary shield wall; the A division cables then travel southwest in embedded conduit to their penetration area in the southwest quadrant; the B division cables then travel southeast in embedded conduit to their penetration area in the southeast quadrant. Thus, except on the platform on Elevation +21.0, adjacent to the valves, the exposed conduits from the redundant trains are shielded from each other by the two outer secondary shield walls and inner primary shield walls which all extend forty feet above Elevation +21.0.

In order to provide at least twenty feet of separation between redundant divisions at these points, the conduits for one set of valves (i.e., A train or B train) shall be protected by a radiant energy shield to a point where there is at least twenty feet of separation between the redundant divisions. This will ensure that the cables, actuators and penetrations of at least one SDCS train will be undamaged after a fire.

C. Pressurizer Pressure/Pressurizer Level Indication

1. Introduction

Pressurizer pressure and pressurizer level are important process variables for monitoring adequate subcooling margin and RCS inventory.

Although cabinets C-1A and C-1B house the pressure and level transmitters listed in the Waterford 3 Safe Shutdown Analysis as being those which are required for safe shutdown, redundant instruments are available in cabinet C-1D which can be used in lieu of those in cabinet C-1B. The following exception request is based on this redundant availability.

2. Basis for Exception

Exception to the technical requirements of Section III.G.2.d that cables and equipment and associated non-safety circuits of redundant trains be separated by a horizontal distance of more than twenty feet with no intervening combustibles or fire hazards is based on the following:

Please refer to Figures III.C-1, 2 and 3.

The Waterford 3 Safe Shutdown Analysis (FS-2 Table 9.5A-1B) indicates that the following pressure and level indication is required for safe shutdown:

Pressure:

<u>Transmitter</u>	<u>Cabinet</u>	<u>Cabinet Location</u>	<u>Electrical Division</u>
PT-102A	C-1A	RCB E1 +21.0	SA
PT-102B	C-1B	RCB E1 +21.0	SB

Level:

<u>Transmitter</u>	<u>Cabinet</u>	<u>Cabinet Location</u>	<u>Electrical Division</u>
LT-110X	C-1A	RCB E1 +21.0	SA
LT-110Y	C-1B	RCB E1 +21.0	SB

However, in addition to the above, there are redundant instruments as follows:

Level:

<u>Transmitter</u>	<u>Cabinet</u>	<u>Cabinet Location</u>	<u>Electrical Division</u>
LT-0103	C-1D	RCB E1 +21.0	NS (Vital)

Pressure:

<u>Transmitter</u>	<u>Cabinet</u>	<u>Cabinet Location</u>	<u>Electrical Division</u>
PT-102D	C-1D	RCB E1 +21.0	SB

LT-0103 has full span level indication with readout in the control room. PT-102D has similar range and indication as PT-102A and PT-102B. All of these instruments are powered by vital AC supplies and therefore will be available upon loss of offsite power.

Cabinets C-1A and C-1D are located outside the secondary shield wall at about 200° and 230°, respectively, in the southwest quadrant. C-1A is located approximately 7 feet below two banks of lightly loaded overhead cable trays and is serviced by cables which are run in exposed conduit which travels from the cabinet southward under the grating at EL. +21.0 to the containment wall where it rises up to Penetration 121 at EL. +40.5 and passes out of containment. Cabinet C-1D is located approximately 50 feet from cabinet C-1A and approximately 7 feet below and 5 feet horizontally from a bank of lightly loaded overhead cable trays. The cable servicing PT-102D and cabinet C-1D is run in embedded conduit below the cabinet to its penetration area where the conduit becomes exposed and travels upwards from EL. +21.0 to Penetration 123, EL. +40.5, and below and approximately 5 feet horizontally from a bank of lightly loaded overhead cable trays. The cable servicing LT-0103 in cabinet C-1D is run in exposed conduit below and in a northeast direction from the cabinet to its "B" train low level cable tray which is a covered and solid bottom type cable tray. This low level cable travels along in a bank of three lightly loaded cable trays at approximately EL +11'-0", below the pressurizer cubicle and around the southern perimeter of the RCB where it leaves the tray and enters exposed conduit that runs southeast to the containment wall and ascends to Penetration 140, EL +37.5 and passes out of containment. At one location, the covered low level "B" train cable tray passes approximately 10 feet below cabinet C-1A. A fire on the grating at EL. +21.0 in the vicinity of C-1A will not damage the train "B" cable since it is in a completely enclosed cable tray which is 10 feet below. A fire at EL -4.0, below the covered cable tray and cabinet C-1A, will not damage either the train "B" cable in the tray or the redundant train "A" instrument in C-1A or its cable, due to heat dissipation and the fact that both the cable

tray and C-1A have solid metal bottoms. The penetration location for the C-1A cables is widely separated by approximately 58 feet from the penetration location for the C-1D cables. Therefore, at least one train of redundant instruments are assured of being available after a fire.

D. Steam Generator Level Indication

1. Introduction

Steam Generator Level is a process variable needed for monitoring the performance of the emergency feedwater system during reactor coolant system decay heat removal and cooldown via the Steam Generators. The Safe Shutdown Analysis takes credit for the two redundant channels of Wide Range Level indication on each steam generator.

2. Basis for Exception

Exception to the technical requirements of III.G.2.d that cables and equipment and associated non-safety circuits of redundant trains be separated by a horizontal distance of more than twenty feet with no intervening combustibles or fire hazards is based on following:

The level indication assumed in the safe shutdown analysis is as follows:

<u>Transmitter</u>	<u>Cabinet</u>	<u>Cabinet Location</u>	<u>Electrical Division</u>
<u>SG1</u>			
LT-FW 1115AS	Local Rack	RCB E1 -4.0 (SW quad)	SA
LT-FW 1115BS	Local Rack	RCB E1 -4.0 (NW quad)	SB
<u>SG2</u>			
LT-FW 1125AS	Local Rack	RCB E1 -4.0 (SE quad)	SA
LT-FW 1125BS	Local Rack	RCB E1 -4.0 (NE quad)	SB

Please refer to Figures III.D-1, 2 and 3

As indicated above, the local instrument racks from which the cables for these instruments originate are widely separated via their location in the four separate quadrants of containment outside the secondary shield wall. The local cabinets for the redundant transmitters for each individual steam generator are themselves separated by about 25 feet horizontally in areas with low levels of intervening combustibles. The cables for these instruments are routed via exposed conduit from four separate instrument racks to their electrical penetrations.

The conduit for the B instrument for SG1 runs from the instrument rack along the periphery of the Shield Building at about Elevation -9.0. Near column 18, the conduit for the B instrument runs adjacent to the conduit for the A instrument for SG1. They run together to Column 15.

The area, so far described, i.e. at about Elevation -9.0, under the grating at Elevation -4.0 is one with a minimal combustible load. There are neither exposed cable trays nor oil or flammable liquids in this area. From Column 15, the A and B conduits for the SG1 ascend together to Elevation +21.0. They then run together above the grating at Elevation +21.0, against the Shield Building to Column 15. At this point, the A conduit ascends along Column 15 to Elevation +35.0 and then to adjacent Penetration 148; the B conduit, however continues traveling along the Shield Building Wall at Elevation +21.0 to Penetration 119 near Column 8 at Elevation +28.0.

The conduits for instruments A and B for SG2 run in a near mirror-image like manner as those for SG1, from the instrument racks to penetrations 148 and 119, respectively.

An inspection of Figures III.D-1 thru 3 reveals that the only areas where 3 of the 4 conduits are within twenty feet horizontally are at the electrical penetrations. A fire would have to occur at these areas to damage three of four conduits. A fire at either area would be approximately 90° away from the fourth conduit. As can be seen, the entire interposing area is one of very low combustible load with a small number of lightly loaded cable trays and no flammable liquids. This combined with the tremendous distance between the area of 3-conduit vulnerability and the fourth conduit, guarantees that at least one steam generator would continue to have wide range level indication. As analyzed in the FSAR, the plant can be shutdown via a single steam generator.

Another mitigating factor is that, in addition to the above discussed Wide Range Level indication, there are the following four channels of narrow range level indication available on each steam generator:

<u>Transmitter</u>	<u>Cabinet</u>	<u>Cabinet Location</u>	<u>Electrical Division</u>
<u>SG1</u>			
LT-1113A	C-1A	RCB E1 +21.0	SA (SMA)
LT-1113B	C-1B	RCB E1 +21.0	SB (SMB)
LT-1113C	C-1C	RCB E1 +21.0	SA (SMC)
LT-1113D	C-1D	RCB E1 +21.0	SB (SMD)
<u>SG2</u>			
LT-1123A	C-1A	RCB E1 +21.0	SA (SMA)
LT-1123B	C-1B	RCB E1 +21.0	SB (SMB)
LT-1123C	C-1C	RCB E1 +21.0	SA (SMC)
LT-1123D	C-1D	RCB EL +21.0	SB (SMD)

First it is assumed that a fire takes place in the vicinity of Penetration 148 and disables both Wide Range Level Indication channels from SG1 and one of two channels from SG2. SG2, therefore, is left with one channel of Wide Range Level Indication, SG1 with none. However, the SMD narrow range level instrument (LT1113D) is located in Instrument Cabinet C1D. This cabinet is located approximately 60 feet from the

vertical plane at Penetration 148. The intervening area has a minimal combustible load consisting of two banks of lightly loaded overhead cable trays. The conduit from C1D leaves the cabinet, descends to below Elevation -4.0, is then embedded, and runs as embedded conduit across the containment to the B electrical penetration area. Similarly, if a fire were to occur in the vicinity of Penetration 119, both Wide Range Level Indicators from SG2 should be disabled, and one channel from SG1. In this case, the SMA and SMC channels on SG2 (IT-1123A and LT-1123C) would still be available. These instruments are located in cabinets C-1A and C-1C on Elevation +21.0, respectively. As can be seen, these cabinets are located approximately 90° from the vertical plane near Penetration 119. The intervening area again consists of minimal combustibles with two banks of lightly loaded overhead cable trays and no permanent flammable liquids.

The narrow range indication has the same upper limit but a higher lower limit than the wide range coinciding with the normal operating levels of the steam generator. Although wide range is preferred to verify performance of the Emergency Feedwater System, the narrow range is a viable alternative. During the cooldown, level is maintained with the narrow range limits. If it dropped below its range, the EFW pumps and control valves (outside containment) would be automatically or manually ramped to bring ring level within indicated range. There is, therefore, no credible fire which could affect both the narrow and wide range level indication for either steam generator.

E. RCS Hot Leg Temperature Indication

1. Introduction

RCS Hot Leg temperature indication is an important process monitoring variable used to monitor subcooling margin and decay heat removal while shutting down.

The hot leg instrumentation listed in the Safe Shutdown Analysis is as follows:

<u>Temperature Element</u>	<u>RCS Loop</u>	<u>Range</u>
TE-RC0112HA	1	525 - 675°F
TE-RC0112HB	1	525 - 675°F
TE-RC0122HA	2	525 - 675°F
TE-RC0122HB	2	525 - 675°F

2. Basis for Exception

Exception to the technical requirements of III.G.2.d that cables and equipment and associated non-safety circuits of redundant trains be separated by a horizontal distance of more than twenty feet with no intervening combustibles or fire hazards is based on the following:

Please refer to Figures III.E-1,2 and 3.

The cables are routed in exposed conduit from their respective instrument boxes, located on the hot legs at about Elevation +16.0, to the point where they are embedded in the secondary shield wall. From Figure III.E-1, it is obvious that the conduits for each loop's instruments are separated by two sides of the primary shield walls and a minimum horizontal distance of about 35 feet. The only intervening combustibles are cables and cable trays above the reactor vessel (See Figure III.E-3). The hot gases and products of combustion from a fire affecting one loop's instruments would be dissipated into the large overhead RCB volume and would not affect the other loop's instruments.

Once the conduits leave the secondary shield wall embedments they travel directly to the containment wall, ascend to Elevation +35.0 and travel to their electrical penetrations.

As can be seen from Figure III.E-2, there are two locations where three of the four conduits are vulnerable to the same fire, i.e. in the vicinity of the electrical penetrations. If, therefore, it is assumed that a fire occurs adjacent to Penetration 134, then RCS Loop 1 would lose both instruments, RCS Loop 2 would lose its train B instrument (TE-RCO122HB). The fourth conduit would, however, be 55 feet horizontally away from the area of fire. The intervening combustibles between the three cables assumed destroyed and the fourth would be low, consisting of two stacks of lightly loaded cable trays as indicated.

A fire at Penetration 135 would have similar effects. Thus, there is no fire in containment that could disable more than 3 of 4 instruments. One channel of hot leg indication is sufficient for safe shutdown. There is therefore, no fire which could cause the loss of this process monitoring variable. Another mitigating feature is the fact that there are additional hot leg temperature elements, namely TE-111X and TE-121X. These are powered from vital AC and are therefore available with loss of offsite power, and have suitable control room indication. The conduits from these instruments are routed on opposite sides of the containment. In fact, their closest point of approach is at their electrical penetrations which are separated by about 50 feet.

F. RCS Cold Leg Temperature Indication

1. Introduction

RCS Cold Leg temperature indication is an important process monitoring variable used to monitor subcooling margin and decay heat removal while shutting down.

The cold leg instrumentation listed in the Safe Shutdown Analysis is as follows:

<u>Temperature Element</u>	<u>RCS Loop</u>	<u>Range</u>
TE-111Y	1A	500-650°F
TE-0112CB	1B	50-750°F
TE-121Y	2B	500-650°F
TE-0122CA	2A	50-750°F

2. Basis for Exception

Exception to the technical requirements of Section III.G.2.d that cables and equipment and associated cables of non-safety circuits of redundant trains be separated by a horizontal distance of more than twenty feet with no intervening combustibles or fire hazards is based on the following:

Please refer to Figures III.F-1, 2 and 3.

The cables from these elements are routed in a similar fashion as for the hot legs and are routed to adjacent electrical penetrations. The same reasoning and justification therefore applies. There are also additional temperature elements on loops 1A and 2B, TE-RC0112CA and TE-RC0122CB respectively, which are routed in exposed and embedded conduit located on opposite sides of the primary shield wall, to their respective electrical penetration and maintaining greater than twenty feet of separation at all times. Their closest point of approach is at the widely separated electrical penetration areas.

G. Neutron Flux Monitors

1. Introduction

Two redundant startup neutron flux channels are process monitoring variables used to verify reactor trip and monitor reactor power levels during shutdown. The two excore flux channels are powered from vital AC supplies and have indications in the control room with a range of $1-10^5$ CPS on a log scale.

2. Basis for Exception

Exception to the technical requirements of Section III.G.2.d that cables and equipment and associated cables of non-safety circuits of redundant trains be separated by a horizontal distance of more than twenty feet with no intervening combustibles or fire hazards is based on the following:

Please refer to Figures III.G-1, 2 and 3.

These two redundant channels for excore neutron flux indication travel through the containment in embedded and exposed conduit. Channel 1 indication is routed in exposed conduit down along the south side of the reactor vessel until it reaches EL. -4.0' where the conduit becomes embedded as it travels southeast to a coil box and pre-amplification box located approximately 28 feet below a bank of lightly loaded overhead cable trays and approximately 15 feet horizontally from a bank of lightly loaded overhead cable trays. The channel continues embedded from the adjacent boxes, southwest to the containment wall where it runs in exposed conduit approximately 10 feet horizontally and below a bank of lightly loaded cable trays, up to Penetration 126 at EL +40.5' and out the containment. Channel 2 is routed similarly from the north side of the reactor vessel but proceeds embedded into the northeast quadrant where its adjacent boxes are approximately 20

feet horizontally from the "B" train charcoal filter unit. The channel then continues embedded from the boxes, southeast to the containment wall where it runs in exposed conduit approximately 3 feet horizontally and below a bank of lightly loaded cable trays, up to Penetration 125 at EL. +37.5' and out the containment. The exposed redundant boxes are located on opposite sides of the refueling pool in the northeast and southeast quadrants and the redundant penetration areas are widely separated by approximately 120 feet. Therefore, at least one startup channel of excore neutron flux indication is assured of availability after a fire.

H. Containment Fan Coolers

1. Introduction

There are four CFCs. Two are powered from the A electrical division and two from the B. The cooling units are located on two levels in the containment outside the secondary shield wall. The A fan coolers are at elevation +21.0' and the B fan coolers are at elevation -4.0'. The fan coolers are located in the northeast and northwest quadrants of the containment. Each A division CFC is located approximately 8 feet above a B division CFC and separated by a steel grating.

The CFCs are designed to operate during normal and accident conditions to remove heat from the containment atmosphere, thus maintaining containment pressure and temperature at acceptably low levels. During normal operation, three of four fan coolers are usually operating at high speed.

2. Basis for Exception

Exception to the technical requirements of Section III.G.2.d that cables and equipment and associated non safety circuits of redundant trains be separated by a horizontal distance of more than twenty feet with no intervening combustibles is based on the following:

As can be seen on Figure III.H-2, the power cables from redundant divisions come no closer than at their electrical penetration area above the platform at Elevation +35.0. At this point, cables from units 3A-SA and 3B-SB are about 40 feet apart. The only intervening combustibles are the inboard banks of lightly loaded cable trays. As is apparent from Figure III.H-2, all four penetrations for the power cables are widely spaced.

As shown in Figure III.H-1 and 2, the control cables from the two opposite sets of fan coolers run in conduit and tray outside the secondary shield wall to their respective penetrations. Control cables from units 3B-SB and 3D-SB terminate inside containment at Penetration 142; cables from units 3A-SA and 3C-SA terminate at Penetration 141. At each electrical penetration area, the control cables from 3 of 4 fan coolers could conceivably be damaged by fire.

If a fire is assumed at Penetration 141, then control cables from units 3A-SA and 3B-SA which terminate there could be damaged, as well as the control cable from unit 3D-SB which traverses in a tray below the Elevation +21.0 grating. Note there is approximately 16 feet vertical separation. In this case, however, the control conduit from the remaining fan cooler, 3C-SA, is approximately 90° and 100 feet away. The space intervening between the three conduits assumed damaged and the fourth, contains low levels of intervening combustibles. These consist of the two banks of lightly loaded cable trays, the majority of which are filled with low energy level and control cables.

Thus, at least one fan cooler will be operable for any fire in the containment. Safe shutdown can be achieved with one fan cooler.

All class 1E equipment inside containment is qualified in accordance with NUREG-0588 for 40 years of life at maximum normal ambient conditions plus one year post LOCA (with the exception of certain components for which justification for interim operation is submitted under the environmental qualification program).

Once offsite power is restored, Containment Purge could be aligned to make the containment more habitable for fire fighters. With offsite power available, there would be some additional heat input from the Reactor Coolant Pumps but this would be compensated for by the fact that the S-3 and E-23 supply and exhaust fans would be lined up for purge. Equipment survivability without fans is not a concern as indicated above. In any case, due to the low combustible load in the RCB, lack of continuity of combustibles, administrative controls to preclude introduction of large quantities of combustibles, and heat dissipation into the large RCB volume, a fire in the RCB would have little effect on overall RCB ambient temperature.

IV. Request for Exception from the Requirements of Appendix R to 10CFR50, Section III.0

1. Basis for Exception

Exception from the technical requirement of Section III.0 of Appendix R to 10CFR50 to provide an oil collection system capable of holding the entire lube oil system inventory from all Reactor Coolant Pumps is based on the following:

- a. The four Reactor Coolant Pumps have a gravity drain piping system in conjunction with their oil pan/enclosures, installed to transport leaking lube oil from all potential pressurized and unpressurized leakage sites in their lube oil systems, via two separate collection headers. One header serves RCP 1A and 1B and the other serves RCP 2A and 2B. Each header feeds into an individual 200 gallon oil collection tank which is installed outside the steam generator shield walls. These tanks each have the capacity to hold the entire inventory of lube oil from one RCP.

- b. The Oil Collection System and the Reactor Coolant Pumps' lube oil systems are seismically designed such that there is reasonable assurance that the system will withstand the SSE. This is consistent with NRC memo; R. H. Vollmer to D. G. Eisenhut, dated April 1, 1983, Position 3.
- c. There is automatic suppression and thermistor wire detectors over each RCP.

TABLE 1
SAFE SHUTDOWN COMPONENTS AND PROCESS MONITORING
VARIABLES INSIDE CONTAINMENT

(Reference: FSAR Tables 9.5A-1B and 9.5A-2B)

<u>Components</u>	<u>Tag No.</u>
1. Charging Line Isolation Valves	1CH-E2503A (SA) 1CH-E2504B (SB) *1CH-V2507 *2CH-V1501-5+ *2SI-V1600+
2. Auxiliary Spray Valves	1CH-E2505A (SA) 1CH-E2505B (SB)
3. Safety Injection Tank Isolation Valves	1SI-V1505 (SA) (TK1A) 1SI-V1506 (SB) (TK1B) 1SI-V1507 (SA) (TK2A) 1SI-V1508 (SB) (TK2B)
4. Pressurizer Proportional Heaters	Two Redundant Strings; 150 Kw each.
5. Shutdown Cooling System Isolation Valves	1SI-V1504A (SA) TRAIN A (MOV) 1SI-V1503A (SA) TRAIN A (ELECTRO-HYDRAULIC) 1SI-V1502B (SB) TRAIN B (MOV) 1SI-V1501B (SB) TRAIN B (ELECTRO-HYDRAULIC)
6. Containment Fan Coolers	AH-1 (3A-SA) AH-1 (3B-SB) AH-1 (3C-SA) AH-1 (3D-SB)

*To be added to the FSAR Tables as primary or additional equipment to achieve the described function inside Containment only.

+Located outside the Reactor Containment Building.

TABLE 1 (Cont'd)

Process Monitoring Variables

1. Neutron Flux Startup Channels 1 & 2	JI-RC0005-1 JI-RC0006-2
2. RCS Cold Leg Temperature	TE-111Y TE-121Y TE-RC0122CA TE-RC0113CB
3. RCS Hot Leg Temperature	TE-RC0112HA TE-RC0112HB TE-RC0122HA TE-RC0122HB
4. Steam Generator Level (Wide Range)	LT-FW1115AS (SG1) LT-FW1115BS (SG1) LT-FW1125AS (SG2) LT-FW1125BS (SG2)
5. Steam Generator Pressure	PT-1013B (SG1) PT-1013D (SG1) PT-1023B (SG2) PT-1023D (SG2) *PT-0301AS (SG1)+ *PT-0303AS (SG1)+ *PT-0301BS (SG2)+ *PT-0303BS (SG2)+
6. Pressurizer Pressure	PT-102A PT-102B *PT-102D

TABLE 1 (Cont'd)

7. Pressurizer Level

LT-110X (SA)

LT-110Y (SB)

*LT-0103

- * To be added to the FSAR Tables as primary or additional indication for the described process monitoring variable for inside Containment only.
- + Located outside the Reactor Containment Building.

TABLE 2

SAFE SHUTDOWN COMPONENTS AND PROCESS MONITORING VARIABLES
INSIDE CONTAINMENT FOR WHICH COMPLIANCE WITH
SECTION III.L.2 OF APPENDIX R TO 10CFR50 IS
DEMONSTRATED FOR A FIRE INSIDE CONTAINMENT

<u>Component/PMV</u>	<u>Tag No.</u>
1. Charging Line Isolation Valves	1CH-E2503A (SA) 1CH-E2504A (SB)
2. Auxiliary Spray Valves	1CH-E2505A (SA) 1CH-E2505B (SB)
3. Safety Injection Tank Isolation Valves	1SI-V1505 (SA) (TK1A) 1SI-V1506 (SB) (TK1B) 1SI-V1507 (SA) (TK2A) 1SI-V1508 (SB) (TK2B)
4. Steam Generator Pressure	PT-1013B (SG1) PT-1013D (SG1) PT-1023B (SG2) PT-1023D (SG2)

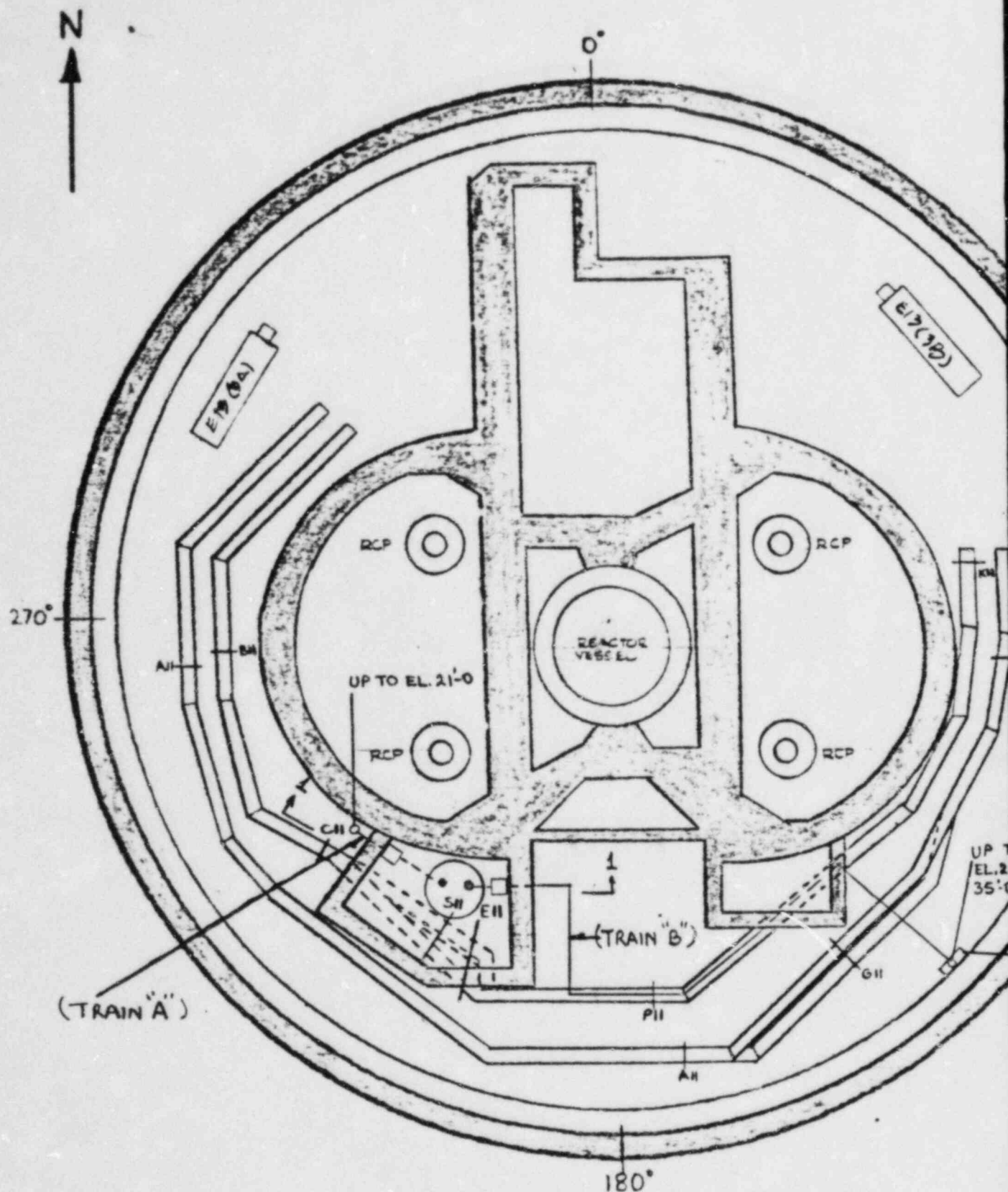
TABLE 3

SAFE SHUTDOWN COMPONENTS AND PROCESS MONITORING VARIABLES
INSIDE CONTAINMENT FOR WHICH EXCEPTIONS FROM SECTION
III.G.2 OF APPENDIX R TO 10CFR50 ARE REQUESTED.

<u>Component/PMV</u>	<u>Tag No.</u>
1. Pressurizer Proportional Heaters	Two Redundant Strings; 150Kw each
2. Shutdown Cooling System Isolation Valves	1SI-V1504A (SA) TRAIN A (MOV) 1SI-V1503A (SA) TRAIN A (ELECTRO-HYDRAULIC)
3. Containment Fan Coolers	AH-1 (3A-SA) AH-1 (3A-SB) AH-1 (3C-SA) AH-1 (3D-SB)
4. Pressurizer Level/Pressure	LT-110X (SA) LT-110Y (SB) PT-102A PT-102B
5. Steam Generator Level (Wide Range)	LT-FW-1115AS (SG-1) LT-FW-1115BS (SG-1) LT-FW-1125AS (SG-2) LT-FW-1125BS (SG-2)

TABLE 3 (Cont'd)

<u>Component/PMV</u>	<u>Tag No.</u>
6. RCS Hot Leg Temperature	TE-RC0112HA TE-RC0112HB TE-RC0122HA TE-RC0122HB
7. RCS Cold Leg Temperature	TE-111Y TE-121Y TE-RC0122CA TE-RC0112CB
8. Neutron Flux Startup Channels 1 & 2	JI-RC0005-1 JI-RC0006-2



PLAN ELEVATION -4.00 AND ABOVE

[P08-SB] EL 18-8

[C05-SB] EL 17-7

AII

[P08-SB] EL 18-5

[C19-SB] EL 17-4

[L10-SB] EL 16-3

BII

[P08-SB] EL 11-0

[C19-SB] EL 9-11

[L10-SB] EL 8-10

CII

[P08-SB] [C19-SB] [L10-SB] EL 11-0

EII

[P08-SB] EL 18-8

[C05-SB] EL 17-7

GII

[P08-SB] EL 18-5

[C19-SB] EL 17-4

[L10-SB] EL 16-3

KII

[P08-SB] EL 18-8

[C19-SB] EL 17-7

[L10-SB] EL 16-6

PII

[P08-SB] EL 11-0

[C19-SB] EL 9-11

[L10-SB] EL 8-10

SII

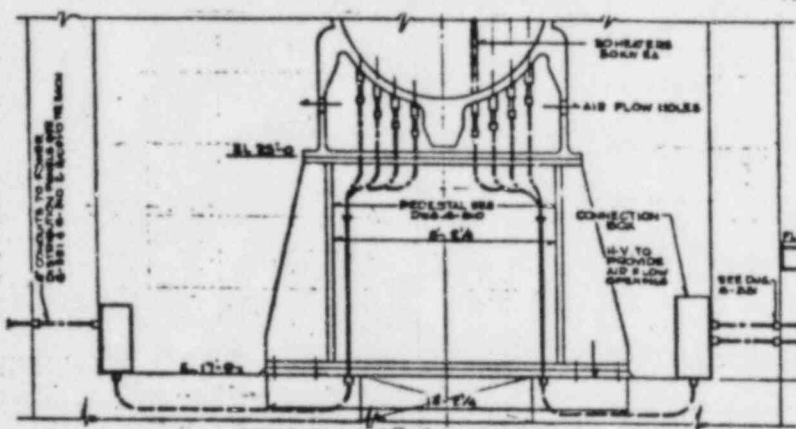
[P08-SB] EL 18-1

[C05-SB] EL 17-0

UII

TRAIN B

TI
APERTURE
CARD



SECTION 1-1
SECTION THRU PRESSURIZER SKIRT

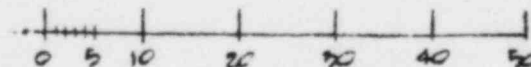
EMBEDDED CONDUIT

EXPOSED CONDUIT

(EXCEPT IN CABLE TRAYS)

Also Available On
Aperture Card

SCALE (FT)



PROPORTIONAL PRESSURIZER
HEATERS - TRAIN A & TRAIN B

LOUISIANA POWER & LIGHT CO.

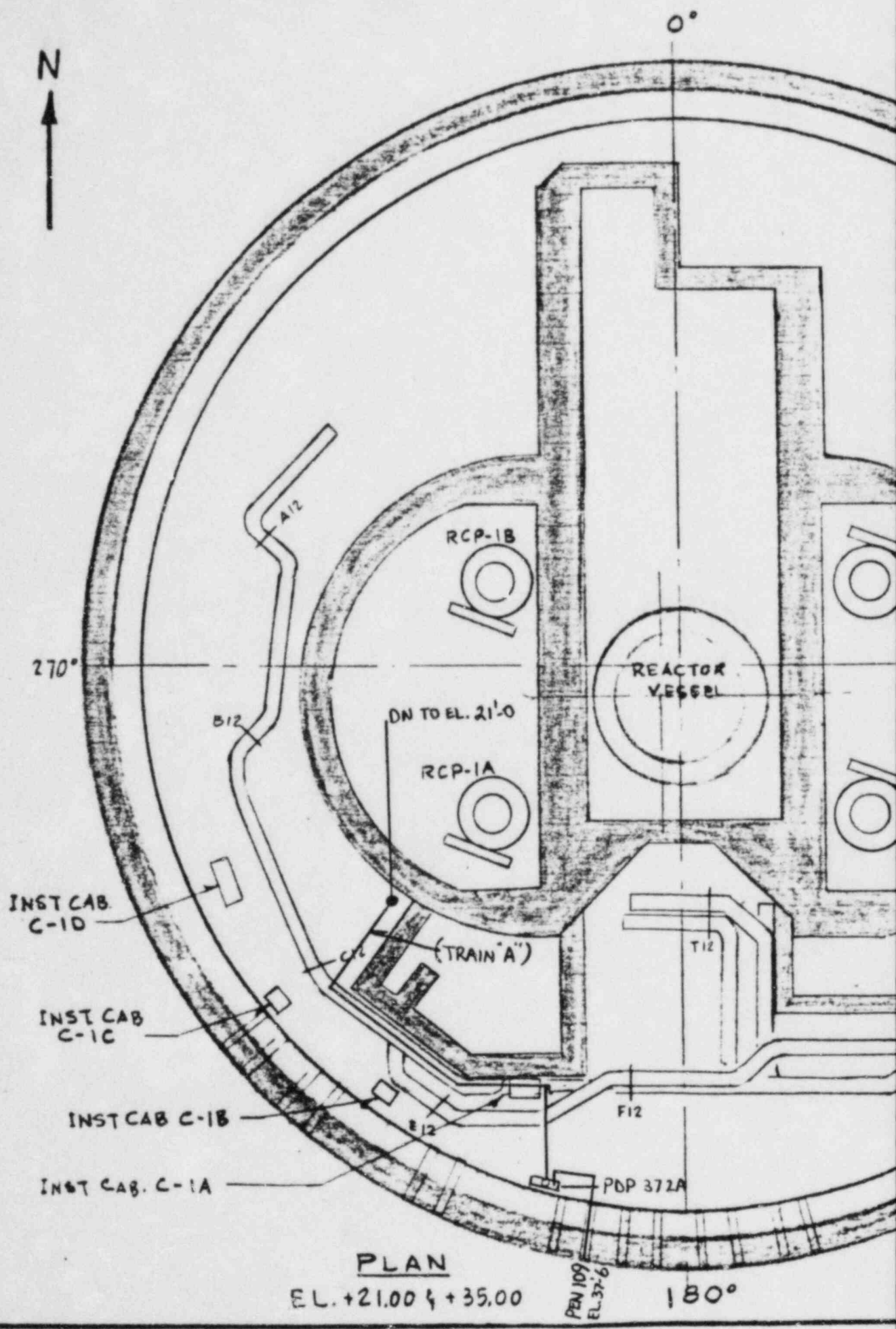
Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING

PLAN EL -4.00'

FIGURE III.A-1

8404020067-01



L102-SHA, C106-NB, EL 37'-6
 L103-SHA, C117-NB, EL 36'-6
 C118-NB, EL 35'-6
 L108-NB, EL 32'-6

T12

P102-SA, EL 35'-0
 C106-SA, EL 36'-11
 L108-NB, EL 35'-10
 A12

P102-SA, EL 37'-0
 C106-SA, EL 36'-11
 L108-NB, EL 36'-10
 S12

P102-SA, EL 40'-6
 C106-SA, EL 39'-5
 P102-NB, EL 38'-0
 C106-NB, EL 30'-11
 L108-NB, EL 29'-10
 B12

TRAIN A

C118-NB, EL 38'-4
 C118-SA, EL 37'-6
 C116-NB, EL 31'-0
 C117-NB, EL 30'-10
 C118-NB, EL 30'-0
 L102-SHA, EL 28'-2
 L102-SHA, EL 28'-4
 P12

P102-SA, EL 42'-4
 C106-SA, EL 41'-6
 P102-NB, EL 30'-0
 C106-NB, EL 28'-2
 L108-NB, EL 28'-4
 C12

P102-SA, EL 42'-4
 C106-SA, EL 41'-6
 E12

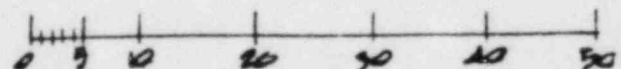
P102-SA, EL 41'-6
 C106-SA, EL 40'-6
 L102-SHA, EL 35'-3
 L102-SHA, EL 34'-2
 P102-NB, EL 32'-0
 C106-NB, EL 30'-11
 L108-NB, EL 28'-10
 F12

P102-SA, EL 40'-9
 P102-SA, EL 39'-7
 P102-NB, EL 37'-3
 C106-NB, EL 36'-9
 L102-NB, EL 35'-9
 L12

Also Available On Aperture Card

P102-SA, EL 40'-6
 C106-SA, EL 39'-7
 P102-NB, EL 37'-4
 C106-NB, EL 36'-3
 L102-NB, EL 35'-2
 N12

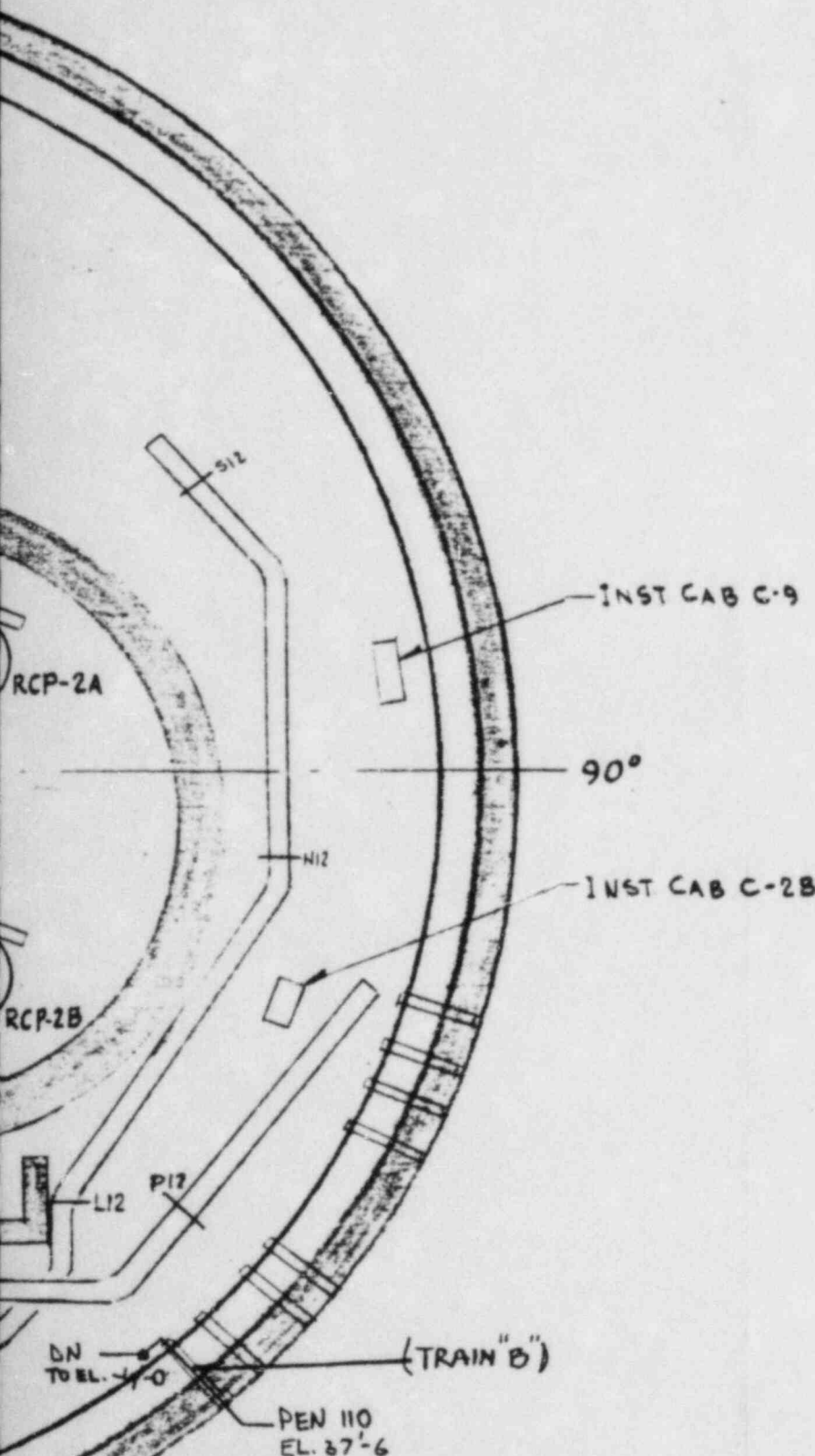
SCALE (FT)



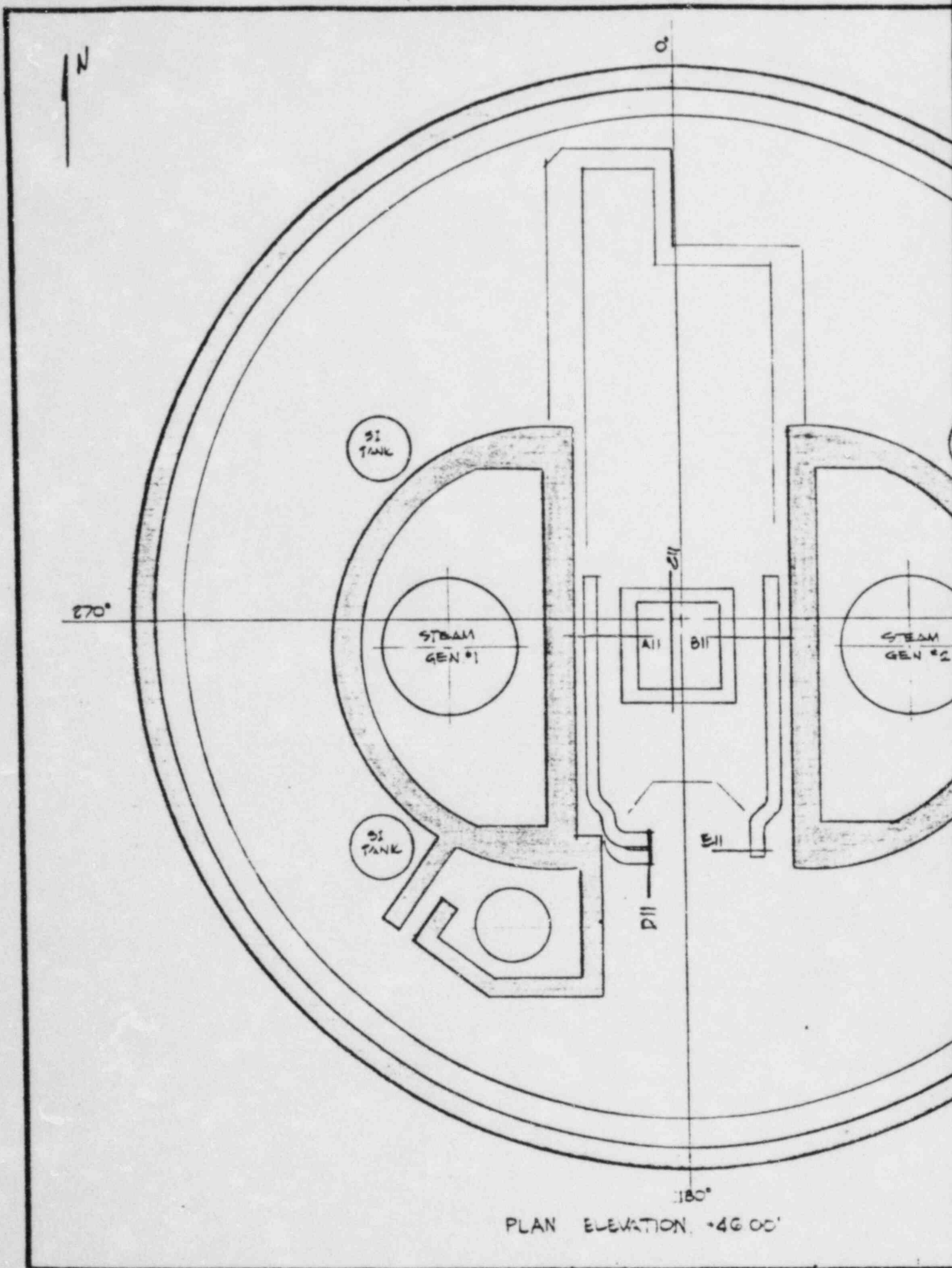
LOUISIANA POWER & LIGHT CO.
 Waterford Steam Electric Station

FIRE PROTECTION
 REACTOR BUILDING
 PLAN EL +21.00' AND +35.00'
 FIGURE III, A-2

PROPORTIONAL PRESSURIZER
 HEATERS - TRAIN A & TRAIN B



8404020062-02



TI APERTURE CARD

EL 60.0 [C116-NB]

EL 59.0 [C117-NB]

EL 58.0 [L103-SMA]

EL 57.0 [L103-SMA]

EL 56.0 [L103-SMA]

[L103-SMA] EL 57.0

[L103-SMA] EL 59.0

A11

[C116-NB] EL 60.0

[C117-NB] EL 59.0

[L103-SMA] EL 58.0

EL 57.0 [L103-SMA]

[L103-SMA] EL 57.0

EL 56.0 [L103-SMA]

[L103-SMA] EL 56.0

B11

EL 57.0 [L103-SMA]

[L103-SMA] EL 57.0

EL 56.0 [L103-SMA]

[L103-SMA] EL 56.0

C11

[L103-SMA] [C116-NB] EL 57.0

[L103-SMA] [C117-NB] EL 58.0

EL 59.0 [L103-SMA] [C118-NB] EL 59.0

[C118-NB] EL 59.0

[C119-NB]

[L103-SMA]

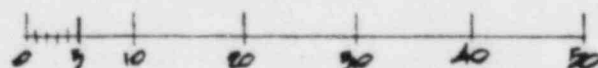
[L103-SMA]

[L103-SMA] EL 59.0

E11

Also Available On
Aperture Card

SCALE (FT)



LOUISIANA POWER & LIGHT CO.

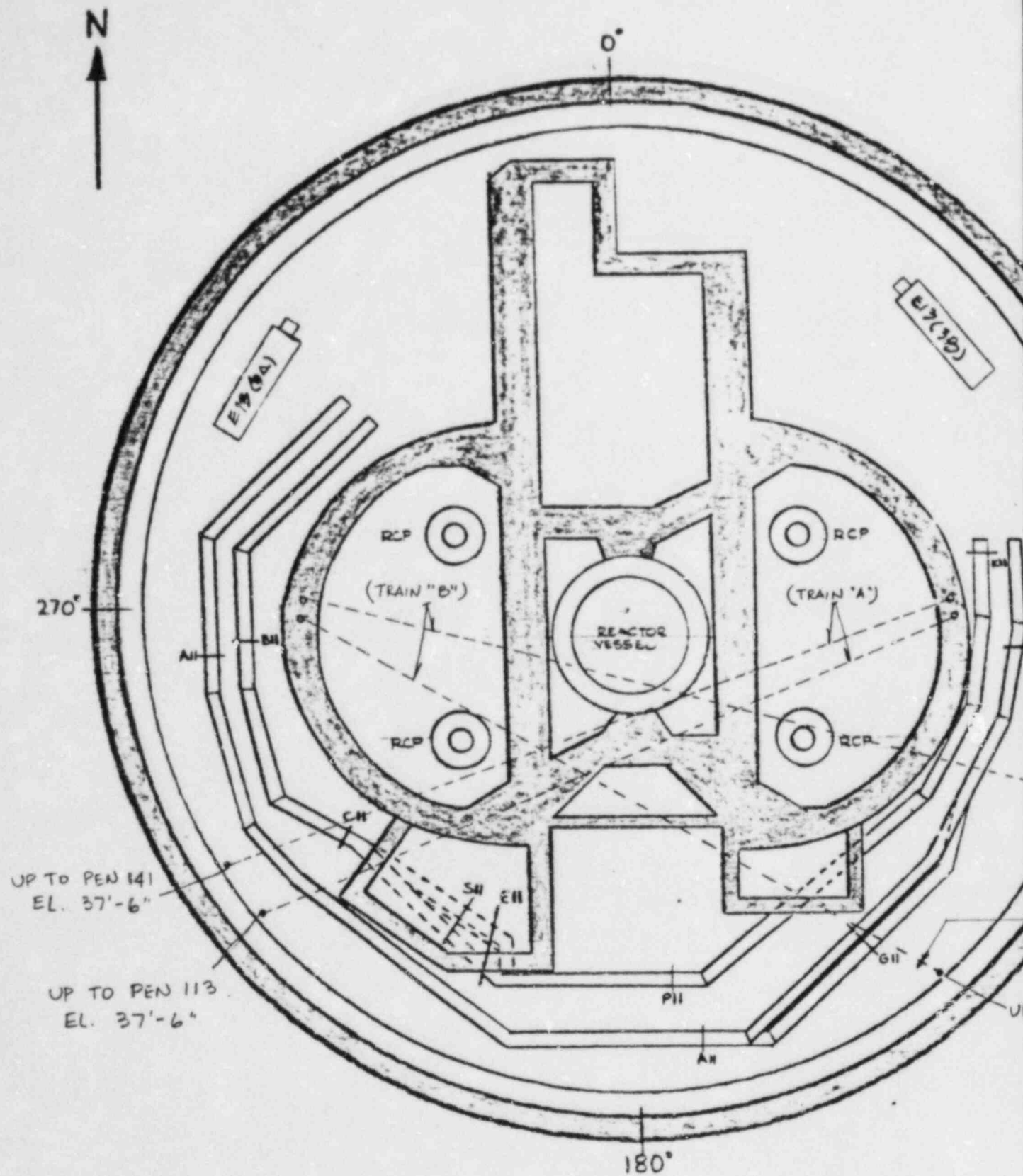
Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL +46.00'

FIGURE III, A-3

PROPORTIONAL PRESSURIZER
HEATERS- TRAIN A & TRAIN B

8404020067-03



PLAN ELEVATION -4.00 AND ABOVE

[D08-NB] EL 18-8

[C05-NB] EL 17-7

AII

[P08-NB] EL 18-8

[C119-NB] EL 17-6

[L110-NB] EL 16-3

BII

[P108-NB] EL 11-0

[C119-NB] EL 9-11

[L110-NB] EL 8-10

CII

[P108-NB] [C119-NB] [L110-NB] EL 11-0

EII

[D08-NB] EL 18-8

[C105-NB] EL 17-7

GII

[P108-NB] EL 18-8

[C119-NB] EL 17-6

[L110-NB] EL 16-3

KII

[D08-NB] EL 18-8

[C119-NB] EL 17-7

[L110-NB] EL 16-6

PII

[P108-NB] EL 11-0

[C119-NB] EL 9-11

[L110-NB] EL 8-10

SII

[P104-NB] EL 18-1

[C05-NB] EL 17-0

UII

TI
APERTURE
CARD

90°

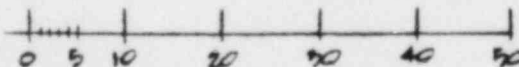
UP TO PEN 142
EL. 37'-6"

EMBEDDED
CONDUIT

TO PEN 117
EL. 37'-6"

Also Available On
Aperture Card

SCALE (FT)

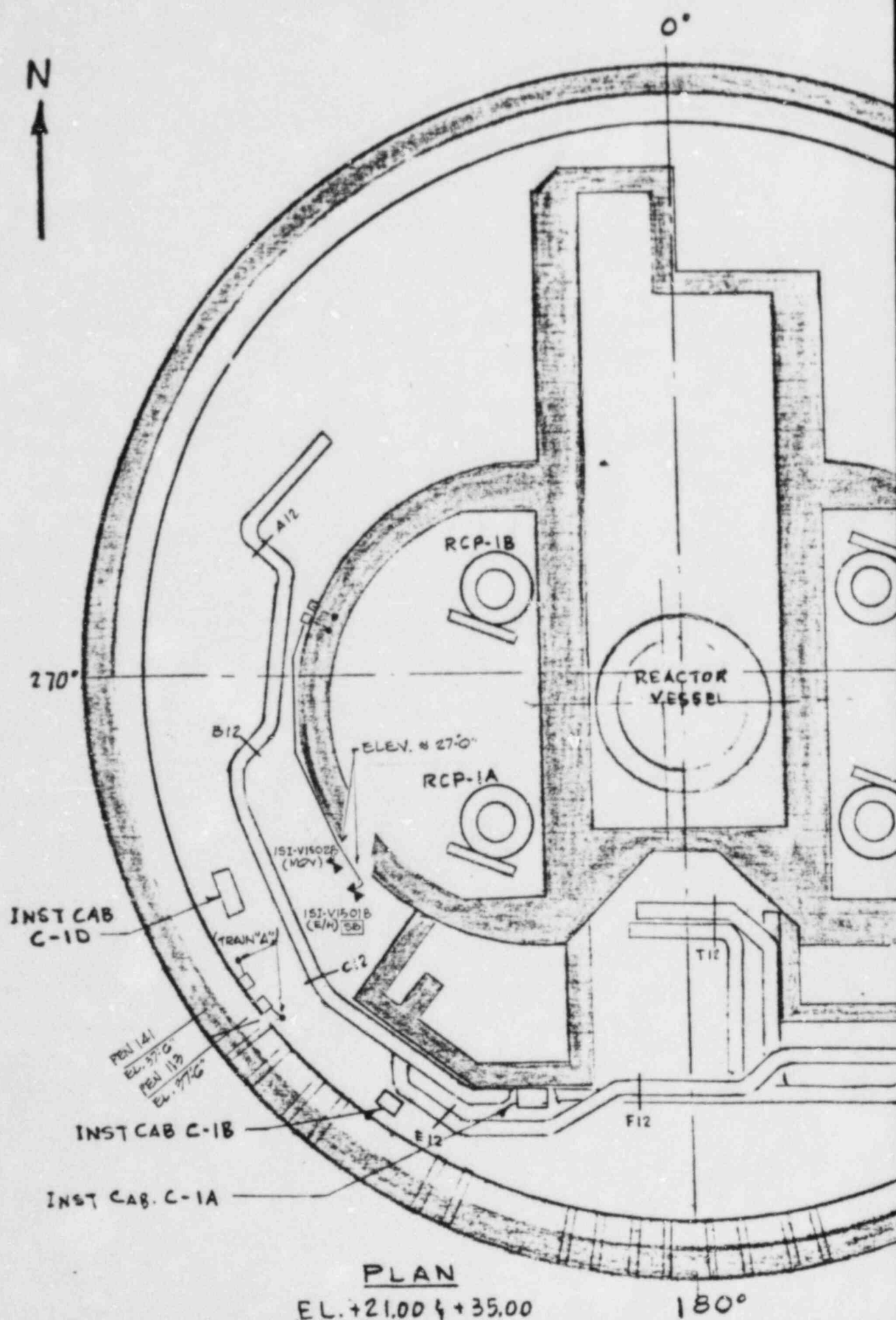


SHUTDOWN COOLING
ISOLATION VALVES
TRAIN "A" & TRAIN "B"

LOUISIANA POWER & LIGHT CO.
Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL -4.00'
FIGURE III. B-1

8404020067-04



PLAN
EL. +21.00 & +35.00

180°

L102-SHA EL 37.0
 L102-SHA EL 36.6
 L102-NB EL 35.6
 L102-NB EL 32.6

T12

P102-NB EL 37.0
 P102-NB EL 36.11
 P102-NB EL 34.10
 S12

P102-NB EL 35.0
 P102-NB EL 36.11
 P102-NB EL 35.0
 A12

P102-SA EL 40.6
 P102-SA EL 39.6
 P102-NB EL 36.0
 P102-NB EL 30.11
 P102-NB EL 28.10
 B12

C112-NB EL 33.4
 C112-NB EL 32.6
 C112-NB EL 31.0
 C112-NB EL 30.0
 C112-NB EL 28.0
 C112-NB EL 27.2
 C112-NB EL 26.6
 P12

P102-SA EL 42.4
 P102-SA EL 41.6
 P102-NB EL 30.0
 P102-NB EL 28.2
 P102-NB EL 26.6
 C12

P102-SA EL 42.4
 P102-SA EL 41.6
 E12

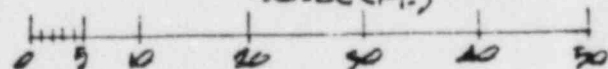
P102-SA EL 41.6
 P102-SA EL 40.6
 L102-SHA EL 35.8
 L102-SHA EL 34.2
 P102-NB EL 32.0
 P102-NB EL 30.11
 P102-NB EL 28.10
 F12

P102-SA EL 40.6
 P102-SA EL 39.7
 P102-NB EL 37.8
 P102-NB EL 36.9
 P102-NB EL 35.0
 L12

NOTES:

- CONDUIT ROUTING FOR ELEC - HYDR. VALVES ISI-1501B & ISI-1502A SHOWN ONLY.
- CONDUIT/BOXES/PENETRATIONS PERTAINING TO VALVES ISI-1501B & ISI-1502A TO BE PROTECTED WITH 1/2 HE 250. ENERGY SHIPS.
- MOV'S ISI-1502B & ISI-1504A ARE PROVIDED WITH HAND WHEELS FOR MANUAL OPERATION (REQ FOR COLD SHUTDOWN ONLY)

SCALE (FT.)



SHUTDOWN COOLING
 ISOLATION VALVES
 TRAIN "A" & TRAIN "B"

LOUISIANA POWER & LIGHT CO.
 Waterford Steam Electric Station

FIRE PROTECTION
 REACTOR BUILDING
 PLAN EL +21.00' AND +35.00'
 FIGURE III. B-2

8404020067-05

N

270°

0°

SI
TANK

STEAM
GEN #1

SI
TANK

A11 B11

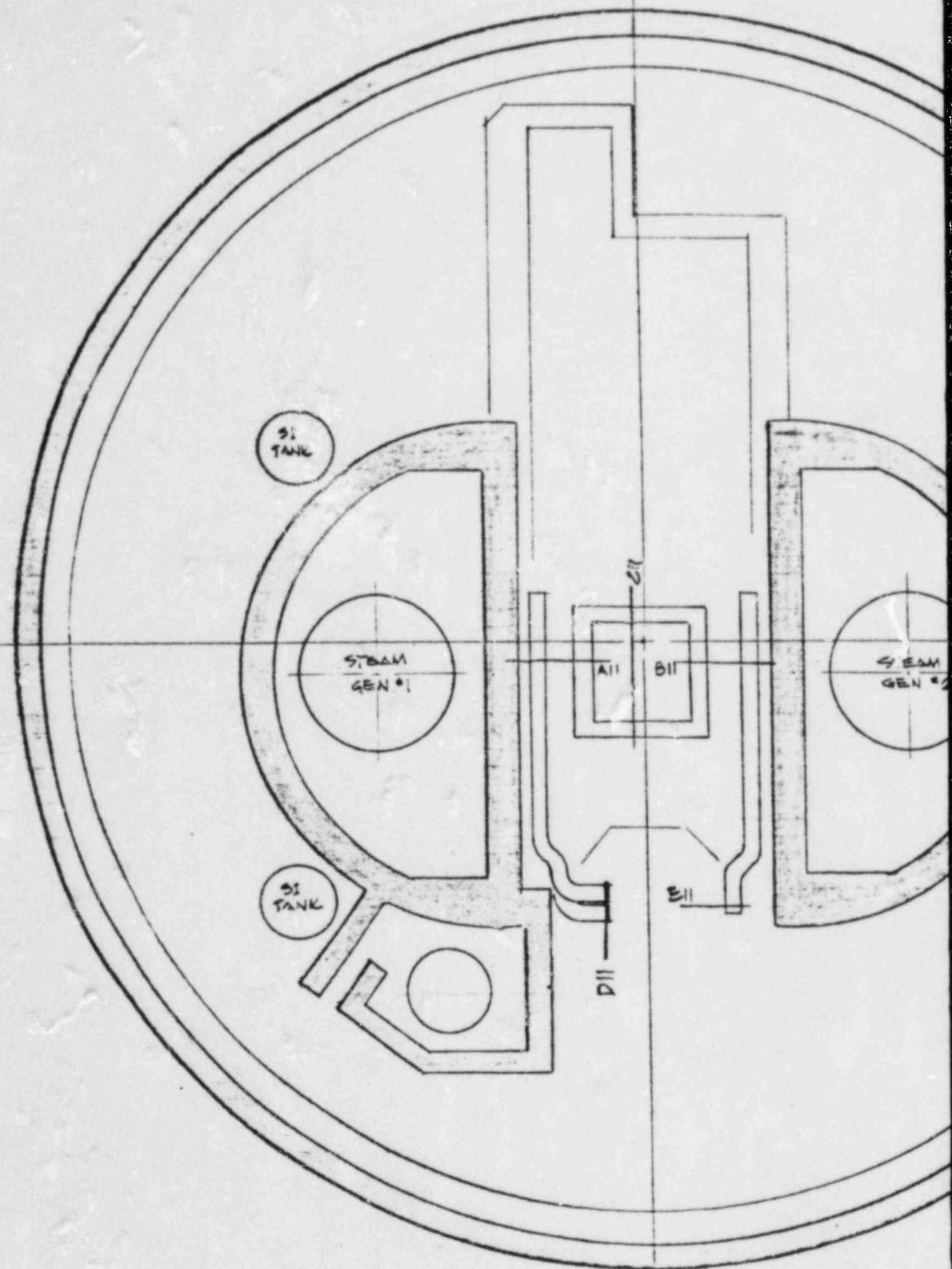
STEAM
GEN #2

D11

E11

180°

PLAN ELEVATION +46.00'



TI APERTURE CARD

EL 60.0 [C116-NB]
 EL 59.0 [C117-NB]
 EL 58.0 [L103-SMA]
 EL 57.0 [L103-SMA] EL 57.0
 EL 56.0 [L103-SMA] EL 56.0

A11

[C116-NB] EL 60.0
 [C117-NB] EL 59.0
 [L102-SMA] EL 58.0
 EL 57.0 [L103-SMA] [L102-SMA] EL 57.0
 EL 56.0 [L103-SMA] [L102-SMA] EL 56.0

B11

EL 57.0 [L102-SMA] [L102-SMA] EL 57.0
 EL 56.0 [L102-SMA] [L102-SMA] EL 56.0

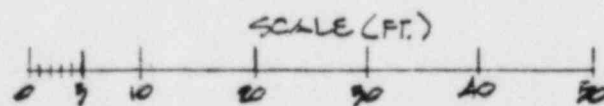
C11

[L103-SMA] [C116-NB] EL 57.0 [C116-NB] EL 57.0
 [L103-SMA] [C117-NB] EL 56.0 [C117-NB] EL 56.0
 EL 55.0 [L103-SMA] [C116-NB] EL 55.0 [C116-NB] EL 55.0
 [L103-SMA] [C117-NB] EL 54.0 [C117-NB] EL 54.0

D11

E11

Also Available On
Aperture Card

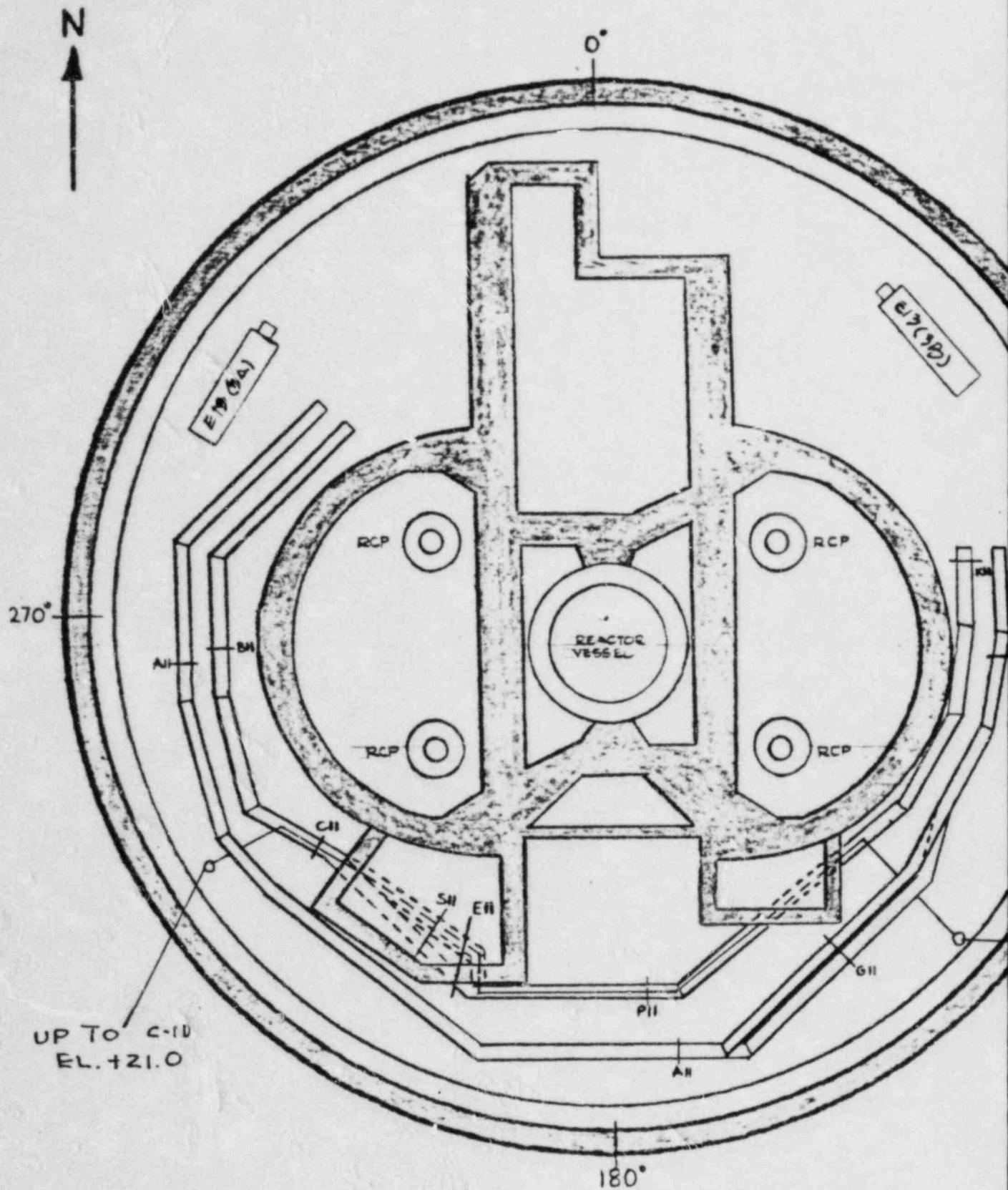


SHUTDOWN COOLING
ISOLATION VALVES
TRAIN "A" & TRAIN "B"

LOUISIANA POWER & LIGHT CO.
Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL +46.00'
FIGURE III.B-3

8404020067-06



PLAN ELEVATION -4.00 AND ABOVE

[POB-NB] EL 18'-8"
 [COS-SB] EL 17'-7"
AII
 [POB-NB] EL 18'-8"
 [CIS-NB] EL 17'-4"
 [L10-NB] EL 16'-3"
BII
 [POB-NB] EL 11'-0"
 [CIS-NB] EL 9'-11"
 [L10-NB] EL 8'-10"
CII

[POB-NB] [CIS-NB] [L10-NB] EL 11'-0"
EII
 [POB-NB] EL 18'-8"
 [CIS-NB] EL 17'-7"
GII
 [POB-NB] EL 18'-5"
 [CIS-NB] EL 17'-4"
 [L10-NB] EL 16'-3"
KII

[POB-NB] EL 18'-8"
 [CIS-NB] EL 17'-7"
 [L10-NB] EL 16'-6"
PII
 [POB-NB] EL 11'-0"
 [CIS-NB] EL 9'-11"
 [L10-NB] EL 8'-10"
SII
 [POB-NB] EL 18'-1"
 [COS-SB] EL 17'-0"
UII

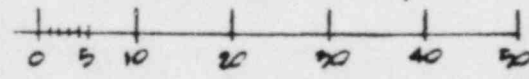
(TRAIN "B")

TI
APERTURE
CARD

UP TO PEN 140
 EL. 37'-6"

Also Available On
Aperture Card

SCALE (FT)

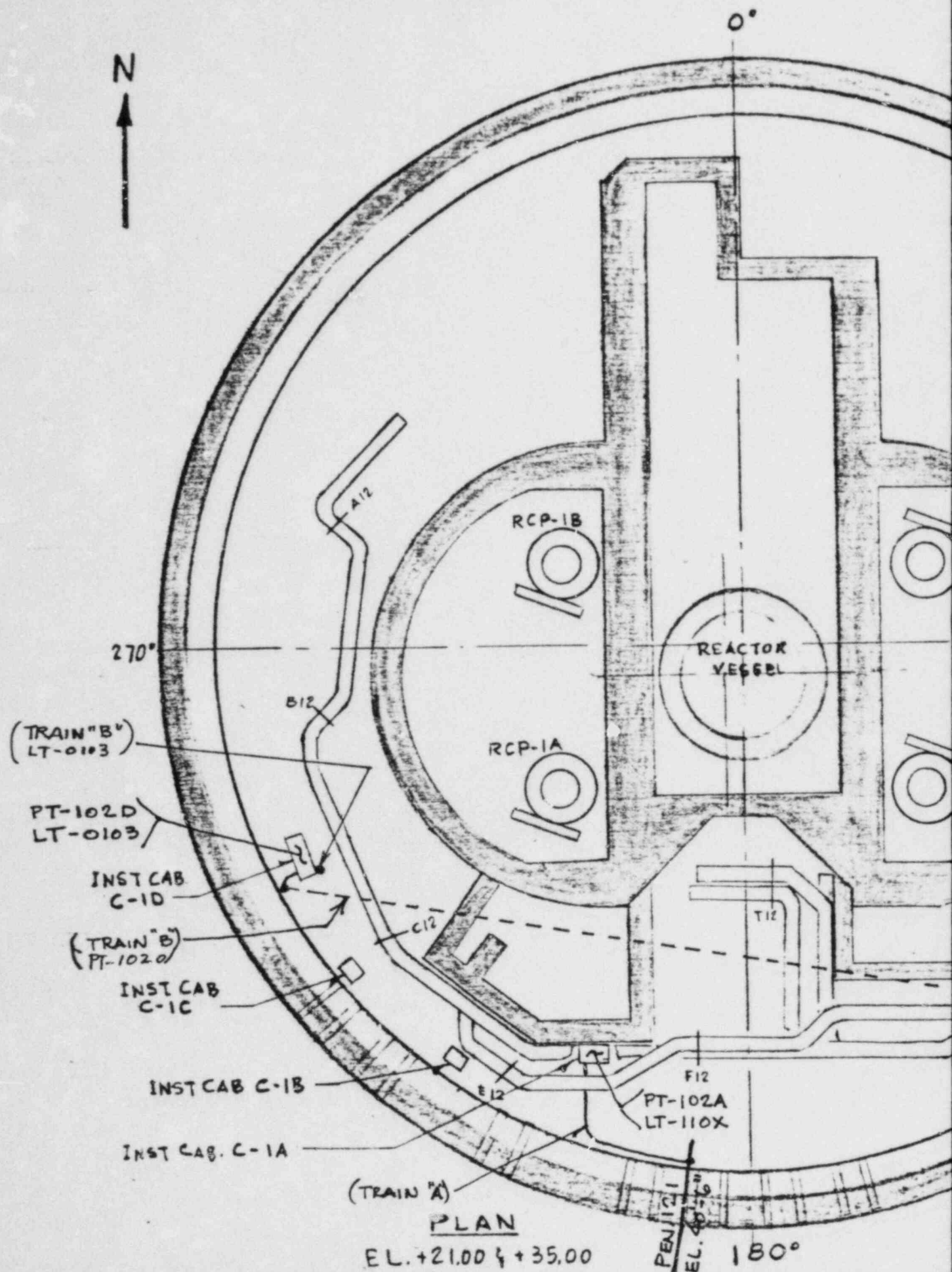


PRESSURIZER PRESSURE/LEVEL
 INDICATION - TRAIN A & TRAIN B

LOUISIANA POWER & LIGHT CO.
 Waterford Steam Electric Station

FIRE PROTECTION
 REACTOR BUILDING
 PLAN EL -4.00'
 FIGURE III.C-1

8404020067-07



N
↑

0°

270°

(TRAIN "B")
LT-0103

PT-102D
LT-0103

INST CAB
C-1D

(TRAIN "B")
PT-1020

INST CAB
C-1C

INST CAB C-1B

INST CAB. C-1A

(TRAIN "A")

PLAN

EL. +21.00 & +35.00

REACTOR
VESSEL

RCP-1B

RCP-1A

T12

F12

PT-102A
LT-110X

PENETRATION
EL. +21.00

180°

LIOR-NA EL 37-6
LIOR-SM EL 35-6
LIOR-NA EL 35-6
LIOR-NA EL 32-6

T12

PIOR-NA EL 35-0
CIOR-NA EL 35-11
LIOR-NA EL 35-10
 A12

PIOR-NA EL 37-0
CIOR-NA EL 35-11
LIOR-NA EL 35-10
 S12

PIOR-SA EL 40-6
CIOR-SA EL 39-5
PIOR-NA EL 38-0
CIOR-NA EL 30-11
LIOR-NA EL 29-10
 B12

CIOR-NA EL 38-4
CIOR-NA EL 32-6
CIOR-NA EL 31-0
CIOR-NA EL 30-10
CIOR-NA EL 30-0
LIOR-SM EL 28-6
LIOR-SM EL 28-6
 P12

PIOR-SA EL 42-4
CIOR-SA EL 41-6
PIOR-NA EL 30-0
CIOR-NA EL 28-2
LIOR-NA EL 28-4
 C12

PIOR-SA EL 42-4
CIOR-SA EL 41-6
 E12

PIOR-SA EL 41-6
CIOR-SA EL 40-6
LIOR-SM EL 35-8
LIOR-SM EL 34-2
PIOR-NA EL 32-0
CIOR-NA EL 30-11
LIOR-NA EL 29-10
 F12

PIOR-SA EL 40-9
CIOR-SA EL 39-7
PIOR-NA EL 37-9
CIOR-NA EL 35-9
LIOR-NA EL 35-0
 L12

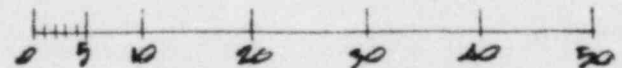
PIOR-SA EL 40-8
CIOR-SA EL 39-7
PIOR-NA EL 38-4
CIOR-NA EL 32-3
LIOR-NA EL 31-2
 N12

TI
 APERTURE
 CARD

Also Available On
Aperture Card

EMBEDDED CONDUIT -----
 EXPOSED CONDUIT _____

SCALE (FT)



LOUISIANA POWER & LIGHT CO.
 Waterford Steam Electric Station

FIRE PROTECTION
 REACTOR BUILDING
 PLAN EL +21.00' AND +35.00'
 FIGURE III.C-2

PRESSURIZER PRESSURE/
 LEVEL INDICATION -
 TRAIN A & TRAIN B

8404020067-08

N

270°

SI
TANK

STEAM
GEN #1

SI
TANK

0

27

D11

E11

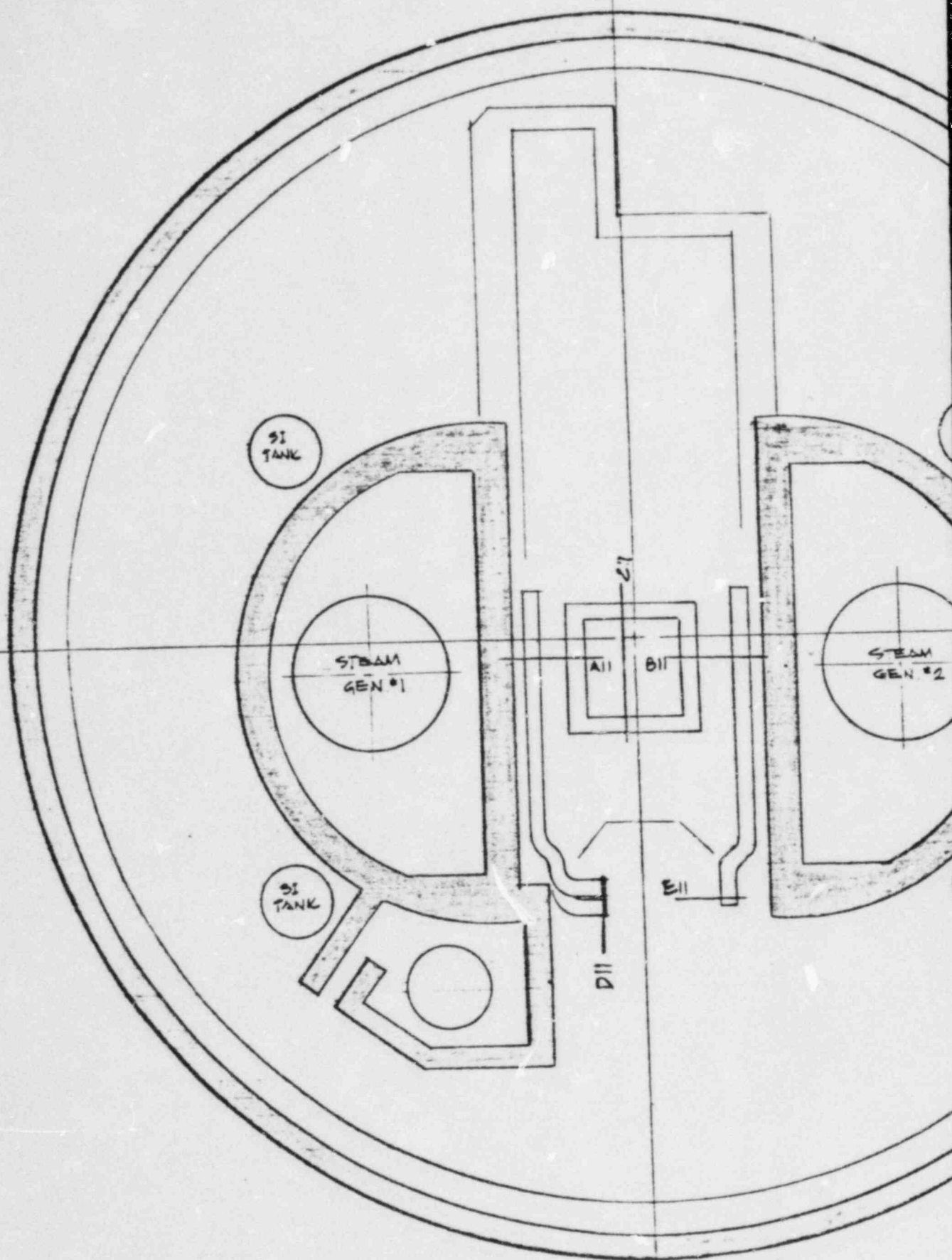
A11

B11

STEAM
GEN #2

180°

PLAN ELEVATION +46 00'



EL 60.0 [C116-NB]

EL 59.0 [C117-NB]

EL 58.0 [L103-SMA]

EL 57.0 [L103-SMC]

EL 56.0 [L103-NB]

[L103-SMA] EL 57.0

[L103-SMA] EL 59.0

A11

TI
APERTURE
CARD

[C116-NB] EL 60.0

[C117-NB] EL 59.0

[L103-SMA] EL 58.0

EL 57.0 [L103-SMA]

[L103-SMA] EL 57.0

EL 56.0 [L103-SMA]

[L103-NB] EL 56.0

B11

EL 57.0 [L104-SMA]

[L104-SMA] EL 57.0

EL 56.0 [L104-SMC]

[L104-SMA] EL 56.0

C11

[L103-SMA] [C116-NB] EL 57.0

[L103-SMC] [C117-NB] EL 56.0

EL 52.0 [L103-NB] [C118-NB] EL 55.0

[C118-NB] EL 50.10

[C119-NB]

[L104-SMA]

[L104-SMA]

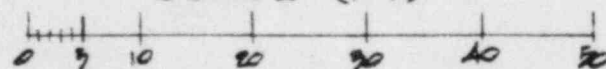
[L104-NB] EL 52.0

E11

D11

Also Available On
Aperture Card

SCALE (FT)



PRESSURIZER PRESSURE/LEVEL
INDICATION - TRAIN A & TRAIN B

LOUISIANA POWER & LIGHT CO.

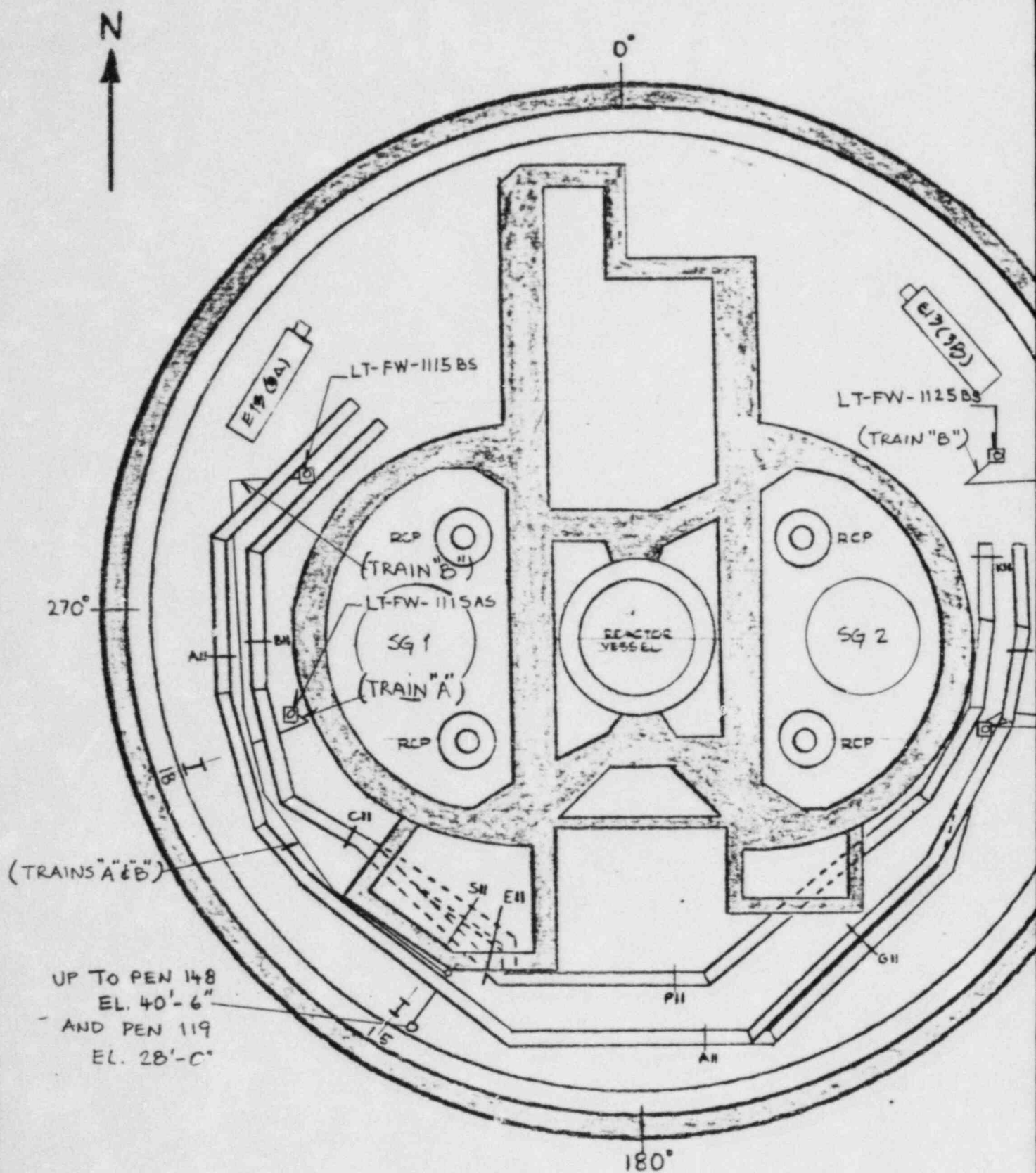
Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING

PLAN EL +46.00'

FIGURE III.C-3

8404020067-09



PLAN ELEVATION -4.00 AND ABOVE

[POB-SB] EL 18'-8"

[COS-SB] EL 17'-7"

AII

[POB-NB] EL 18'-5"

[C119-NB] EL 17'-4"

[L110-NB] EL 16'-3"

BII

[POB-NB] EL 11'-0"

[C119-NB] EL 9'-11"

[L110-NB] EL 8'-10"

CII

[POB-NB] [C119-NB] [L110-NB] EL 11'-0"

EII

[POB-SB] EL 18'-8"

[C105-SB] EL 17'-7"

GII

[POB-NB] EL 18'-5"

[C119-NB] EL 17'-4"

[L110-NB] EL 16'-3"

KII

[POB-NB] EL 18'-8"

[C119-NB] EL 17'-7"

[L110-NB] EL 16'-6"

PII

[POB-NB] EL 11'-0"

[C119-NB] EL 9'-11"

[L110-NB] EL 8'-10"

SII

[POB-SB] EL 18'-1"

[COS-SB] EL 17'-0"

UII

APERTURE
CARD

UP TO PEN 119
EL. 28'-0"

(TRAIN "A")

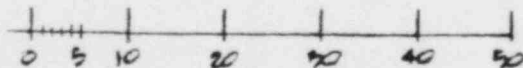
90°

UP TO PEN 148
EL. 40'-6"

LT-FW-1125A5

Also Available On
Aperture Card

SCALE (FT)

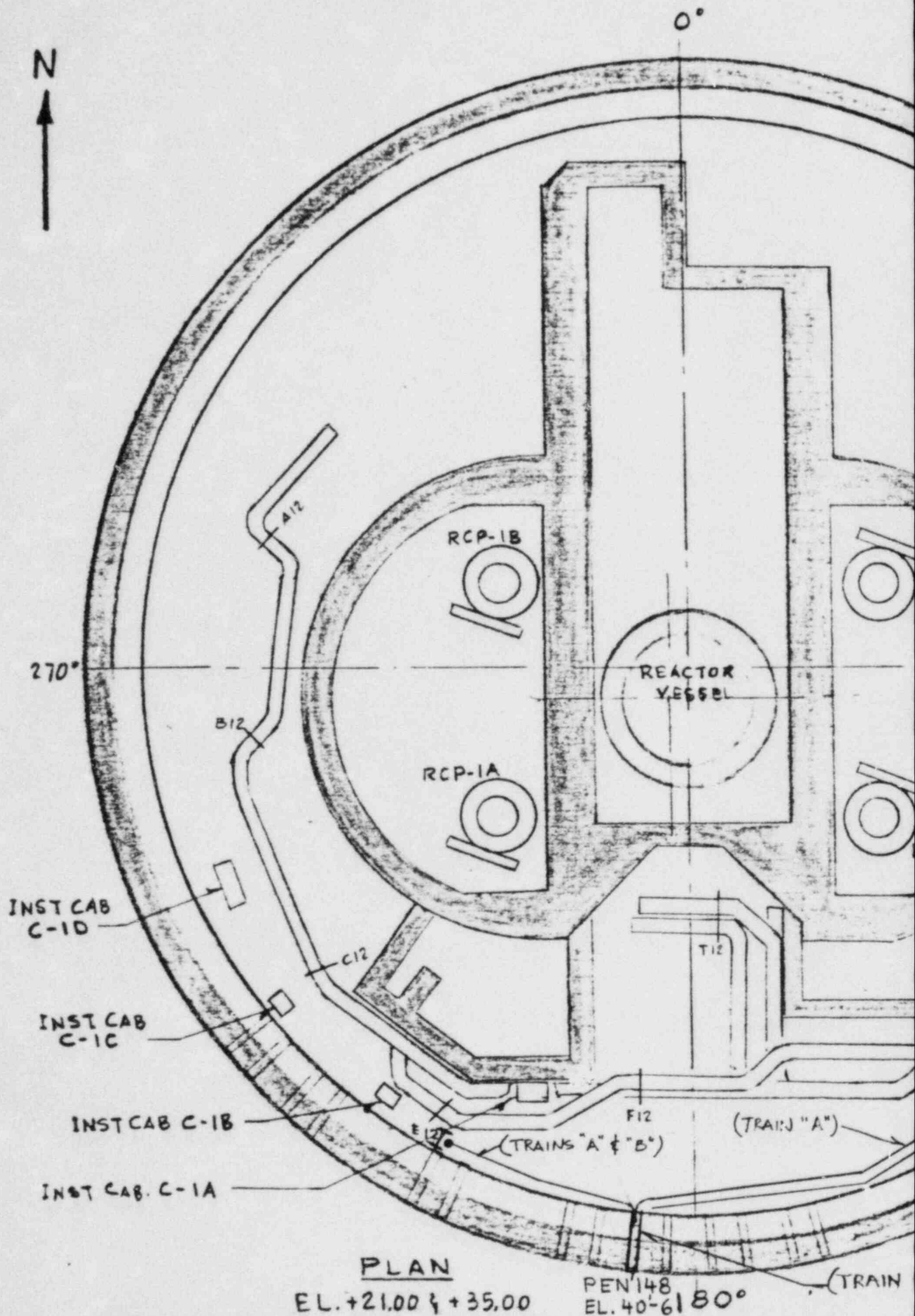


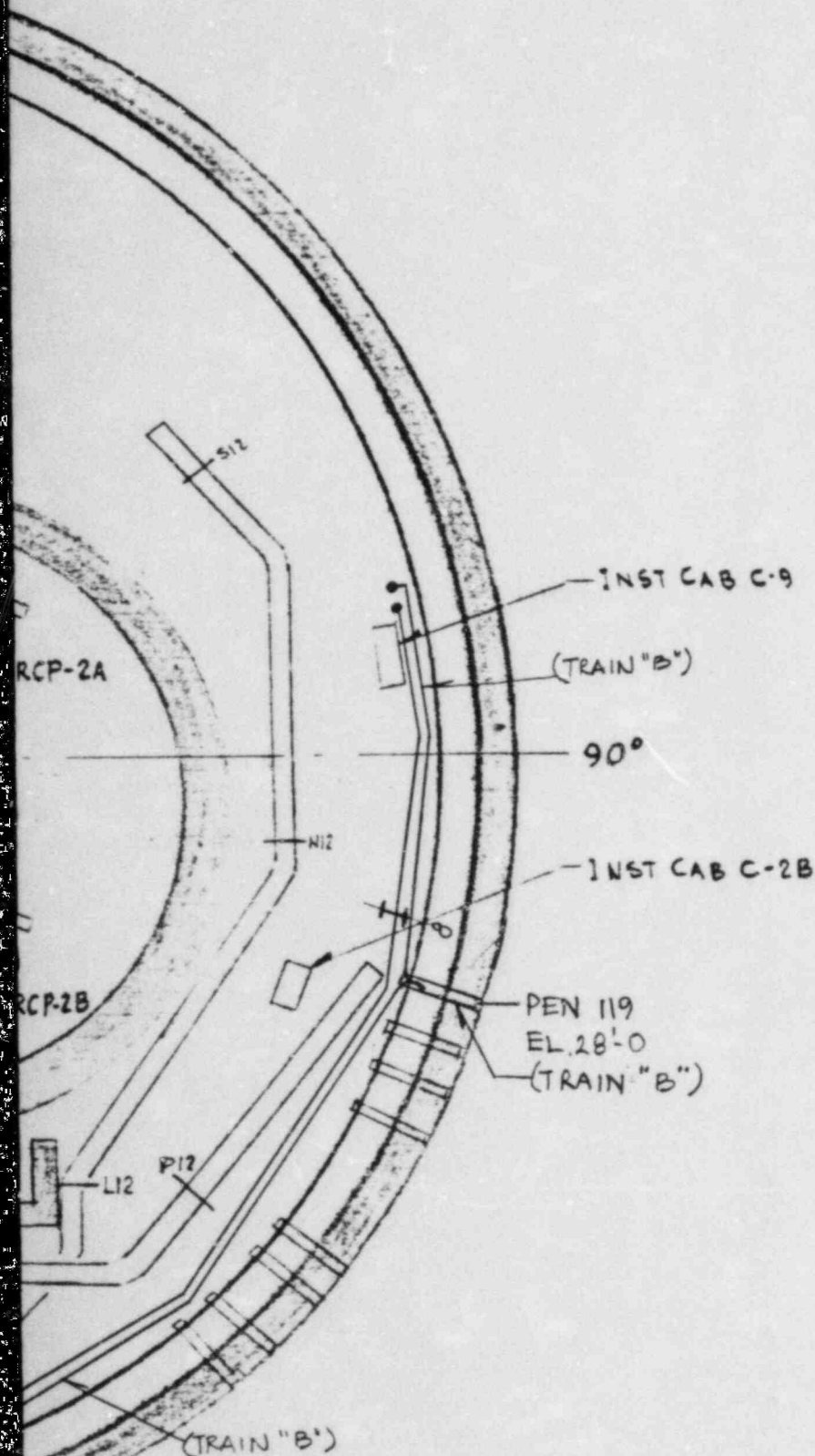
STEAM GEN 1 & 2 LEVEL TRANSMITTERS
TRAIN A & TRAIN B

LOUISIANA POWER & LIGHT CO.
Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL -4.00'
FIGURE III.D-1

8404020067-10





L108-NA EL 37'-6
L108-SMA EL 35'-6
L108-NA EL 35'-6
L108-NA EL 37'-6

T12

P108-NA EL 37'-0
P108-NA EL 36'-11
P108-NA EL 36'-10

S12

C119-NA EL 38'-4
C119-NA EL 38'-6
C116-NA EL 31'-0
C117-NA EL 30'-0
C118-NA EL 30'-0
L108-SMA EL 28'-6
L108-SMA EL 28'-6

P12

P108-NA EL 35'-0
C108-NA EL 36'-11
L108-NA EL 35'-10
A12

P108-SA EL 40'-6
C108-SA EL 38'-6
P108-NA EL 36'-0
C108-NA EL 30'-11
L108-NA EL 29'-10

B12

P108-SA EL 42'-4
C108-SA EL 41'-6
P108-NA EL 30'-0
C108-NA EL 28'-2
L108-NA EL 28'-4

C12

P108-SA EL 42'-4
C108-SA EL 41'-6
E12

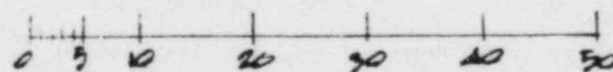
P108-SA EL 41'-6
C108-SA EL 40'-6
L108-SMA EL 35'-3
L108-SMA EL 34'-2
P108-NA EL 32'-0
C108-NA EL 30'-11
L108-NA EL 28'-10
F12

P108-SA EL 40'-9
C108-SA EL 39'-7
P108-NA EL 37'-3
C108-NA EL 36'-9
L108-NA EL 35'-0
L12

Also Available On
Aperture Card

P108-SA EL 40'-8
C108-SA EL 39'-7
P108-NA EL 37'-4
C108-NA EL 37'-3
L108-NA EL 36'-12
N12

SCALE (FT)

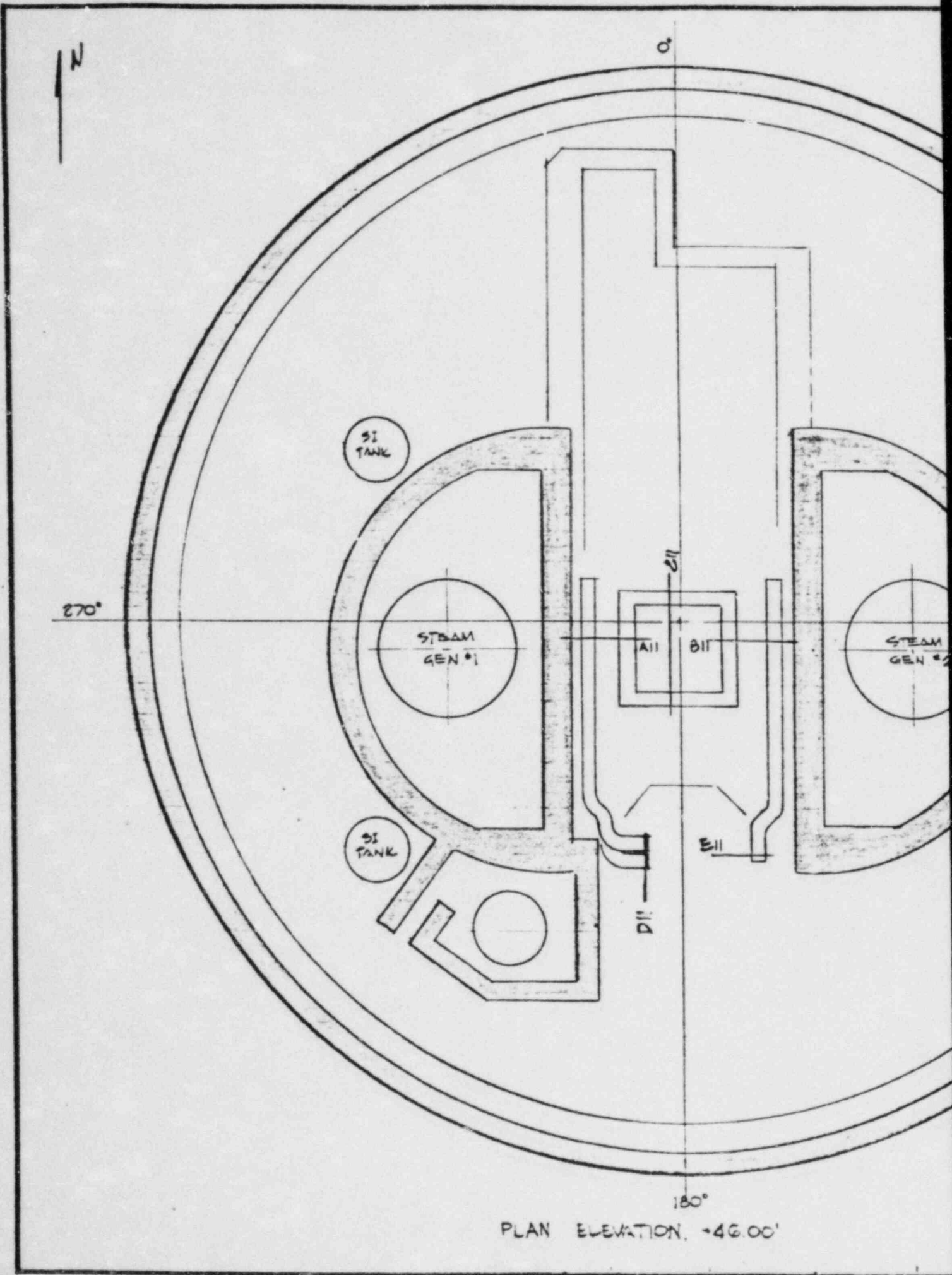


LOUISIANA POWER & LIGHT CO.

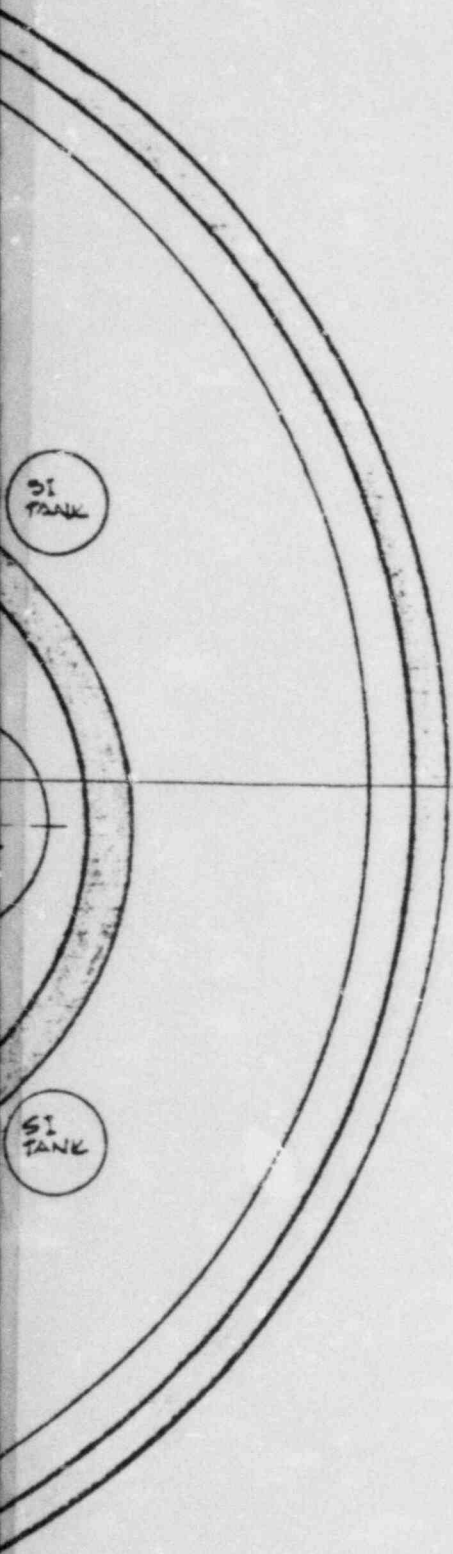
Waterford Steam Electric Station

FIRE PROTECTION
 REACTOR BUILDING
 PLAN EL +21.00' AND +35.00'
 FIGURE III.D-2

8404020067-//



PLAN ELEVATION, +46.00'



EL 60.0 [C116-NB]
EL 59.0 [C117-NB]
EL 58.0 [L103-SMA]
EL 57.0 [L103-SMC] [L103-SMB] EL 57.0
EL 56.0 [L103-NA] [L103-SMA] EL 59.0

A11

11
APERTURE
CARD

[C114-NB] EL 60.0
[C115-NB] EL 59.0
[L102-SMB] EL 58.0
EL 57.0 [L103-SMB] [L103-SMA] EL 57.0
EL 55.0 [L103-SMA] [L103-NA] EL 56.0

B11

EL 57.0 [L103-SMA] [L103-SMB] EL 57.0
EL 55.0 [L103-SMC] [L103-SMA] EL 55.0

C11

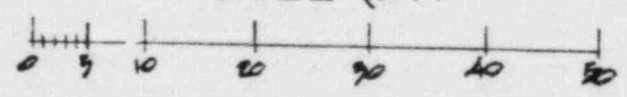
[L103-SMA] [C116-NB] EL 57.0 [C114-NB] EL 58.10
[L103-SMC] [C117-NB] EL 56.0 [C115-NB]
EL 52.0 [L103-NA] [C118-NB] EL 55.0 [L103-SMB]
[L102-SMB]
[L103-NA] EL 52.0

D11

E11

Also Available On
Aperture Card

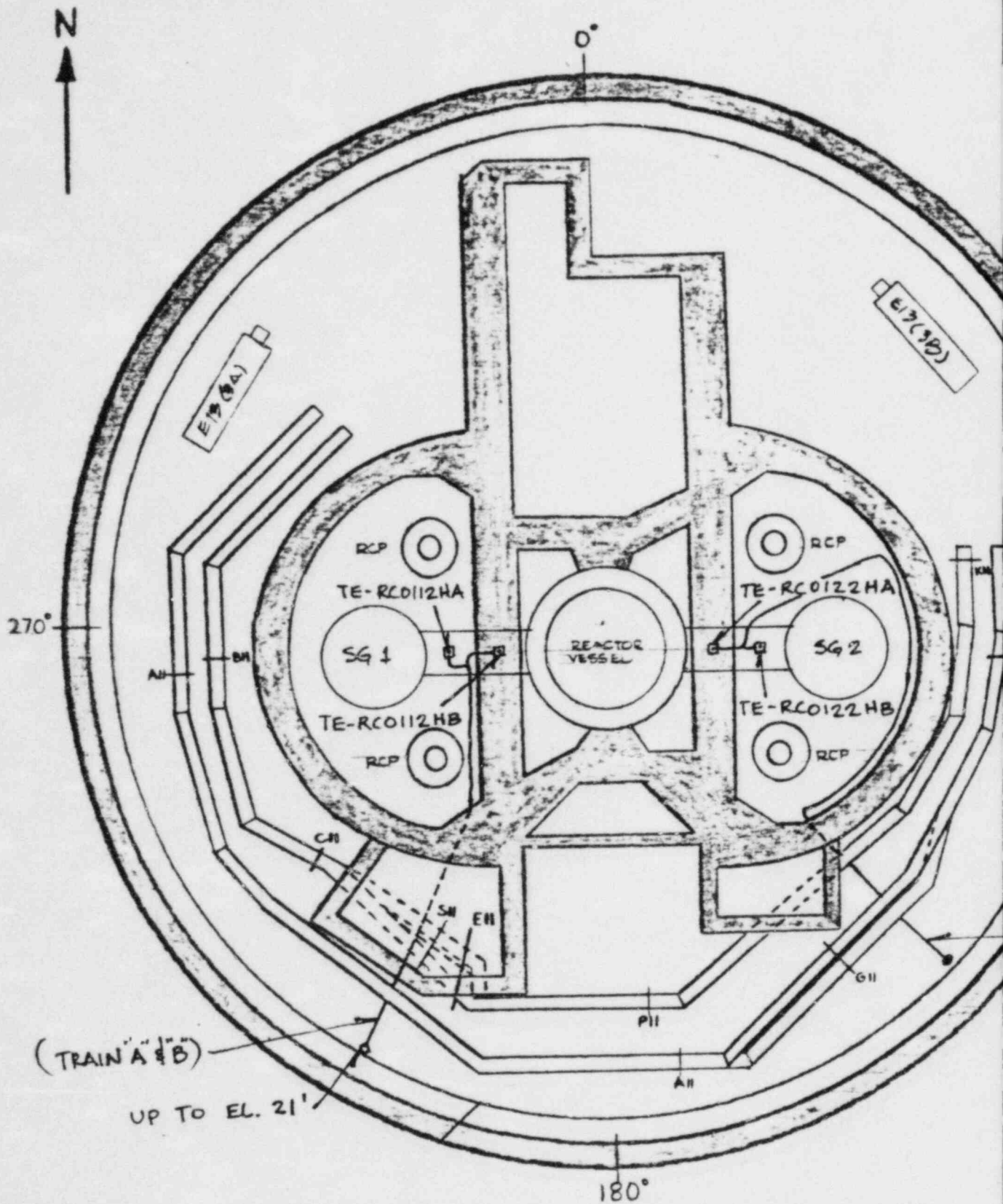
SCALE (FT)



STEAM GEN 1 & 2 LEVEL TRANSMITTERS
TRAIN A & TRAIN B

LOUISIANA POWER & LIGHT CO. Waterford Steam Electric Station
FIRE PROTECTION REACTOR BUILDING PLAN EL +46.00' FIGURE III.D-3

8404020067-12



[POC-SB] EL 18-8

[COS-SB] EL 17-7

AII

[POB-NB] EL 18-5

[C119-NB] EL 17-4

[L110-NB] EL 16-3

BII

[P106-NB] EL 11-0

[C119-NB] EL 9-11

[L110-NB] EL 8-10

CII

[POB-NB] [C119-NB] [L110-NB] EL 11-0

EII

[POC-SB] EL 18-8

[C105-SB] EL 17-7

GII

[P106-NB] EL 18-5

[C119-NB] EL 17-4

[L110-NB] EL 16-3

KII

[POB-NB] EL 18-8

[C119-NB] EL 17-7

[L110-NB] EL 16-6

PII

[P106-NB] EL 11-0

[C119-NB] EL 9-11

[L110-NB] EL 8-10

SII

[P03-SB] EL 18-1

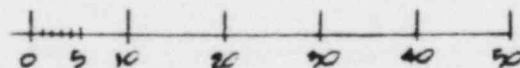
[C05-SB] EL 17-0

UII

TI
APERTURE
CARD

Also Available On
Aperture Card

SCALE (FT)



8404020067-13

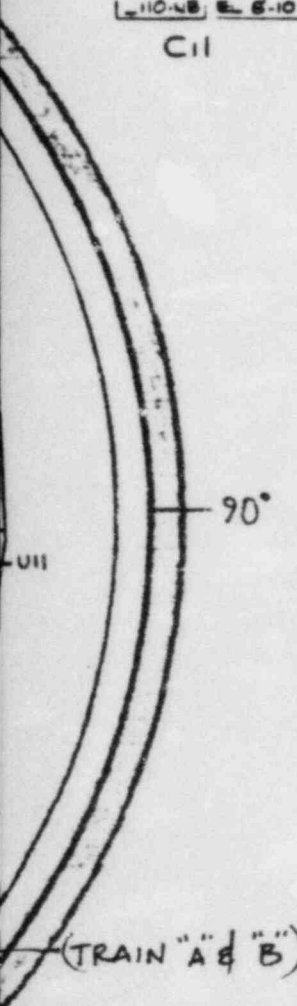
LOUISIANA POWER & LIGHT CO.

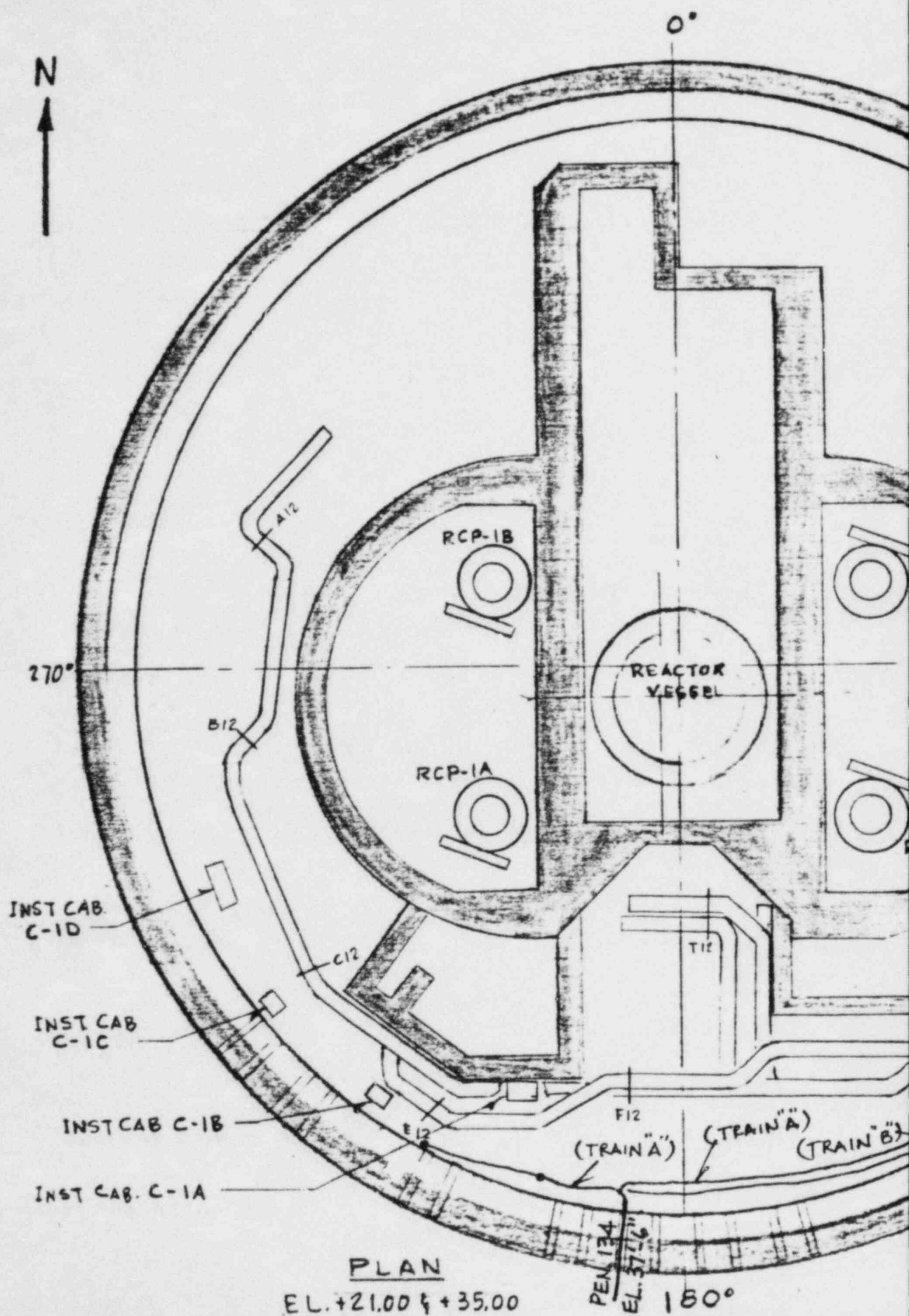
Waterford Steam Electric Station

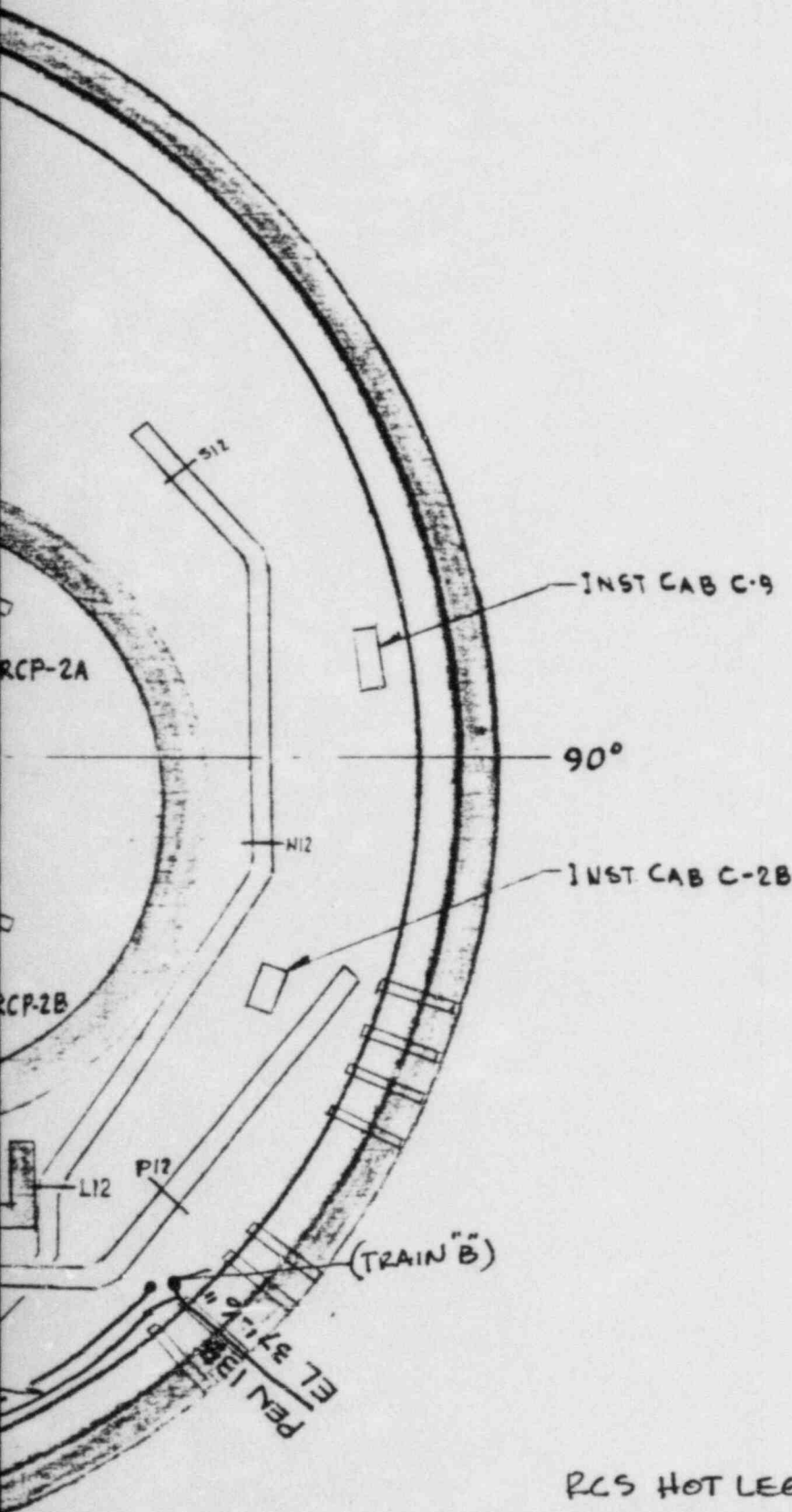
FIRE PROTECTION
REACTOR BUILDING
PLAN EL -4.00'

FIGURE III.E-1

RCS HOT LEG
TEMPERATURE
INDICATION
TRAIN A & TRAIN B







L108-NB, EL 37'-6
L108-SB, EL 35'-6
C118-NB, EL 35'-6
L108-NB, EL 32'-6

T12

P108-NA, EL 37'-0
C108-NA, EL 35'-11
L108-NA, EL 35'-10

S12

C114-NB, EL 33'-4
C115-NB, EL 32'-6
C116-NB, EL 31'-0
C117-NB, EL 30'-10
C118-NB, EL 30'-0
L107-SB, EL 28'-4
L107-SB, EL 28'-4

P12

P108-NA, EL 35'-0
C108-NA, EL 35'-11
L108-NA, EL 35'-10
 A12

P108-SA, EL 40'-6
C108-SA, EL 38'-6
P108-NB, EL 38'-0
C108-NB, EL 30'-11
L108-NB, EL 29'-10
 B12

P108-SA, EL 42'-4
C108-SA, EL 41'-6
P108-NA, EL 30'-0
C108-NA, EL 30'-2
L108-NA, EL 28'-4

C12

P108-SA, EL 42'-4
C108-SA, EL 41'-6
 E12

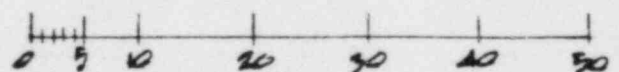
P108-SA, EL 41'-6
C108-SA, EL 40'-6
L108-SB, EL 35'-3
L108-SB, EL 34'-2
P108-NA, EL 32'-0
C108-NA, EL 30'-11
L108-NA, EL 29'-10
 F12

P108-SA, EL 40'-9
C108-SA, EL 39'-7
P108-NA, EL 37'-3
C108-NA, EL 35'-9
L108-NA, EL 35'-0
 L12

P108-SA, EL 40'-0
C108-SA, EL 39'-7
P108-NA, EL 38'-4
C108-NA, EL 37'-3
L108-NA, EL 36'-2
 N12

Also Available On
Aperture Card

SCALE (FT)



RCS HOT LEG
 TEMPERATURE
 INDICATION
 TRAIN A & TRAIN B

LOUISIANA POWER & LIGHT CO.
 Waterford Steam Electric Station

FIRE PROTECTION
 REACTOR BUILDING
 PLAN EL +21.00' AND +35.00'

FIGURE III.E-2

8404020067-17

N

270°

0

SI
TANK

STEAM
GEN #1

SI
TANK

A11 B11

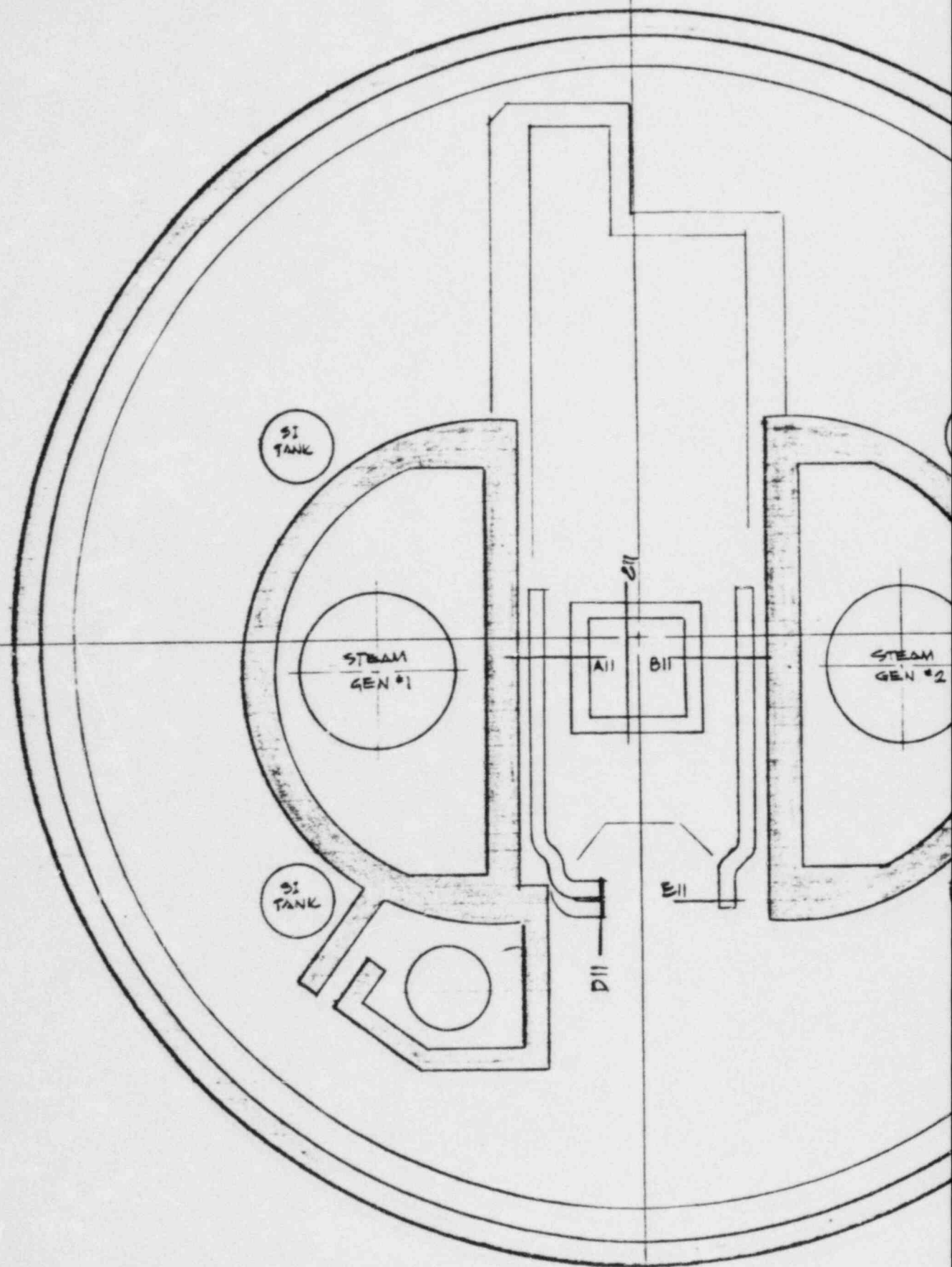
STEAM
GEN #2

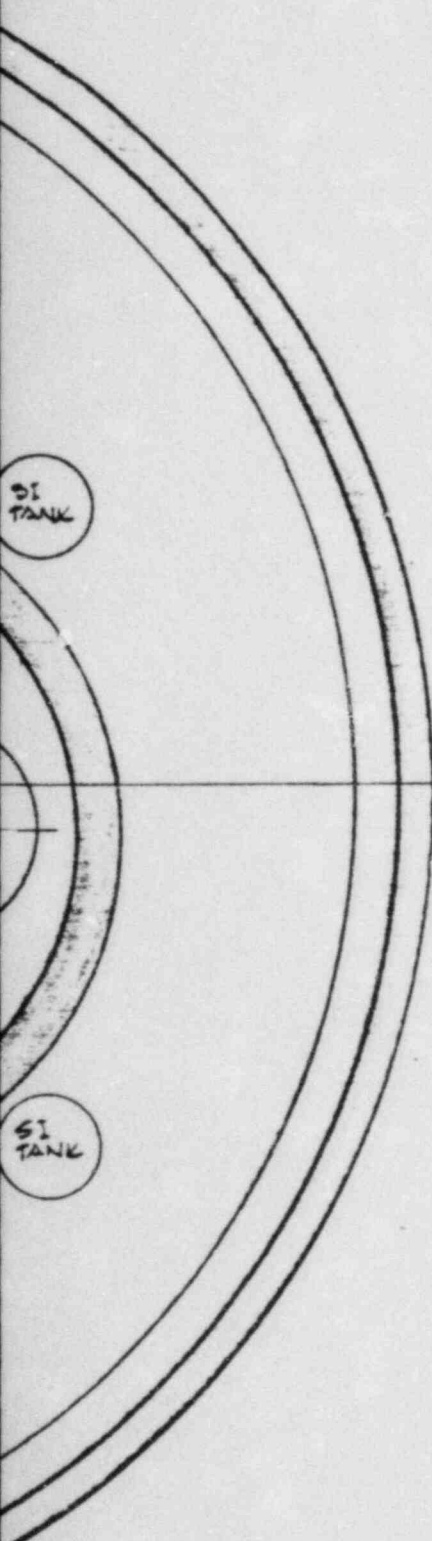
D11

E11

180°

PLAN ELEVATION. +46.00'





EL 60-0 [C116-NB]

EL 59-0 [C117-NB]

EL 58-0 [L103-SMA]

EL 57-0 [L103-SMC]

EL 56-0 [L103-SMA]

[L103-SMB] EL 57-0

[L103-SMA] EL 58-0

A11

[C116-NB] EL 60-0

[C117-NB] EL 59-0

[L102-SMA] EL 58-0

EL 57-0 [L103-SMB]

[L102-SMA] EL 57-0

EL 56-0 [L103-SMA]

[L102-SMA] EL 56-0

B11

EL 57-0 [L104-SMA]

[L104-SMB] EL 57-0

EL 56-0 [L104-SMC]

[L104-SMB] EL 56-0

C11

[L103-SMA] [C116-NB] EL 57-0

[C116-NB] EL 58-10

[L103-SMC] [C117-NB] EL 56-0

[C117-NB]

[C118-NB] EL 55-0

[L102-SMA]

EL 52-0 [L102-SMA]

[L102-SMB]

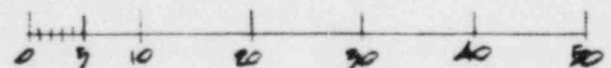
[L102-SMA] EL 52-0

D11

E11

Also Available On
Aperture Card

SCALE (FT)



8404020067-15

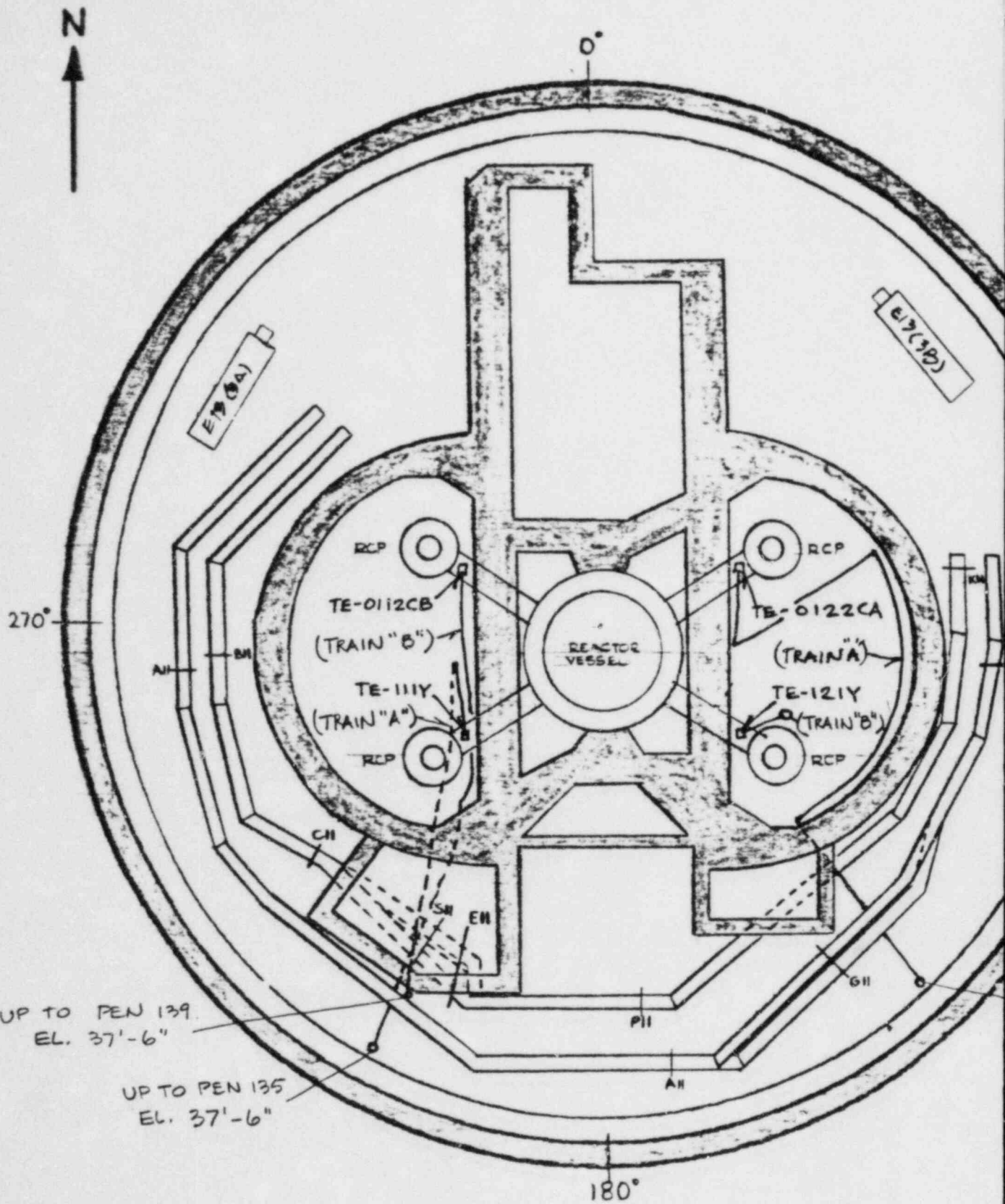
LOUISIANA POWER & LIGHT CO.

Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL +46.00'

FIGURE III.E-3

RCS HOT LEG
TEMPERATURE
INDICATION
TRAIN A & TRAIN B



PLAN ELEVATION -4.00 AND ABOVE

[P04-SB] EL 18-8

[C05-SB] EL 17-7

AII

[P05-NB] EL 18-5

[C119-NB] EL 17-4

[L110-NB] EL 16-3

BII

[P106-NB] EL 11-0

[C119-NB] EL 9-11

[L110-NB] EL 8-10

CII

[P06-NB] [C119-NB] [L110-NB] EL 11-0

EII

[P04-SB] EL 18-8

[C106-SB] EL 17-7

GII

[P106-NB] EL 18-5

[C119-NB] EL 17-4

[L110-NB] EL 16-3

KII

[P06-NB] EL 18-8

[C119-NB] EL 17-7

[L110-NB] EL 16-6

PII

[P106-NB] EL 11-0

[C119-NB] EL 9-11

[L110-NB] EL 8-10

SII

[P04-SB] EL 18-1

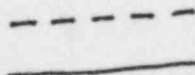
[C05-SB] EL 17-0

UII

TI
APERTURE
CARD

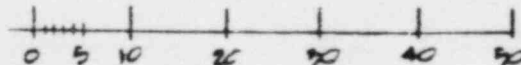
EMBEDDED CONDUIT

EXPOSED CONDUIT



Also Available On
Aperture Card

SCALE (FT)



UP TO PEN 134
EL. 37'-6"

RCS COLD LEG
TEMPERATURE
INDICATION
TRAIN A & TRAIN B

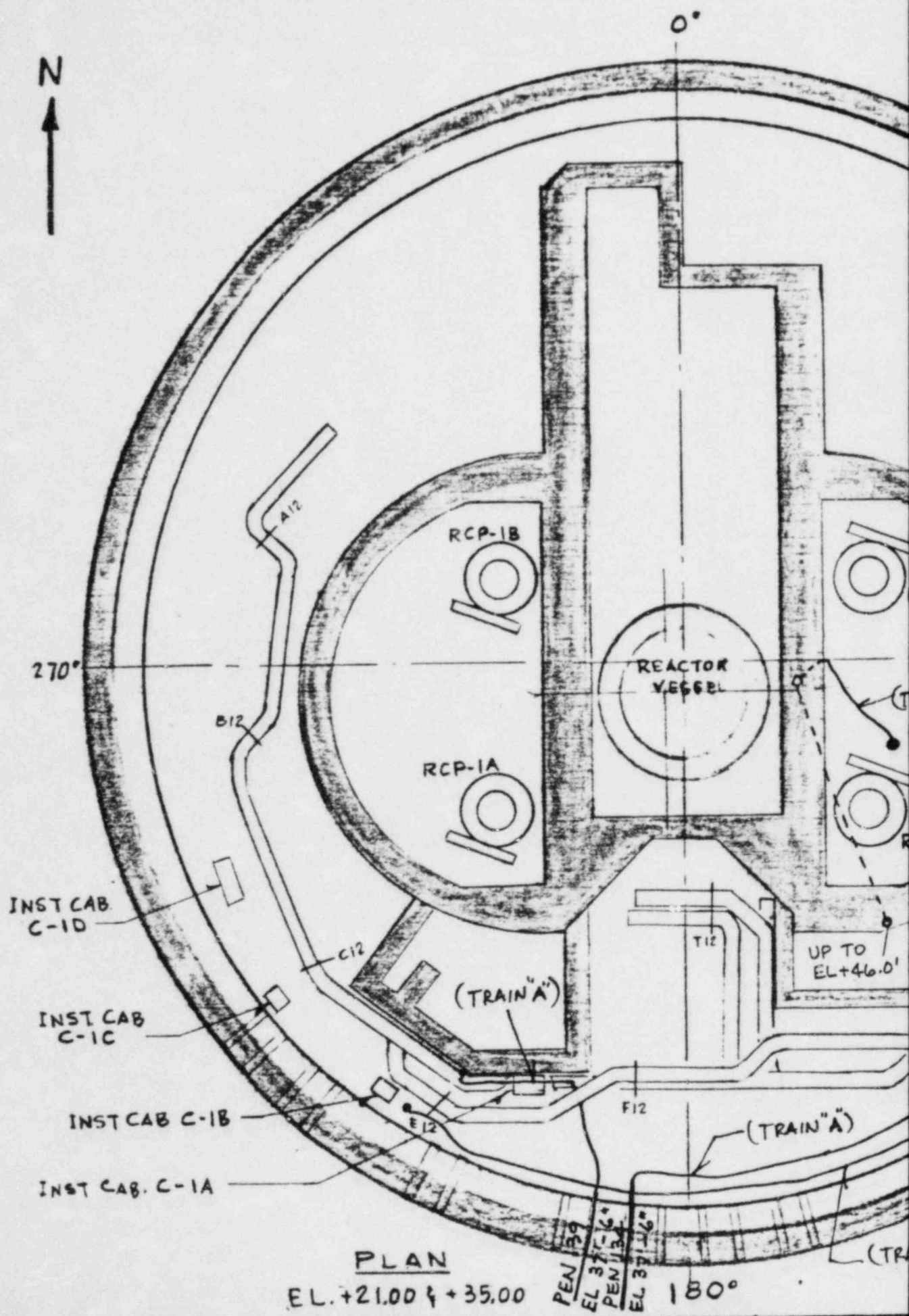
8404020067-16

LOUISIANA POWER & LIGHT CO.

Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL -4.00'

FIGURE III.F-1





270°

SI
TANK

STEAM
GEN #1

SI
TANK

211

A11

B11

STEAM
GEN #2

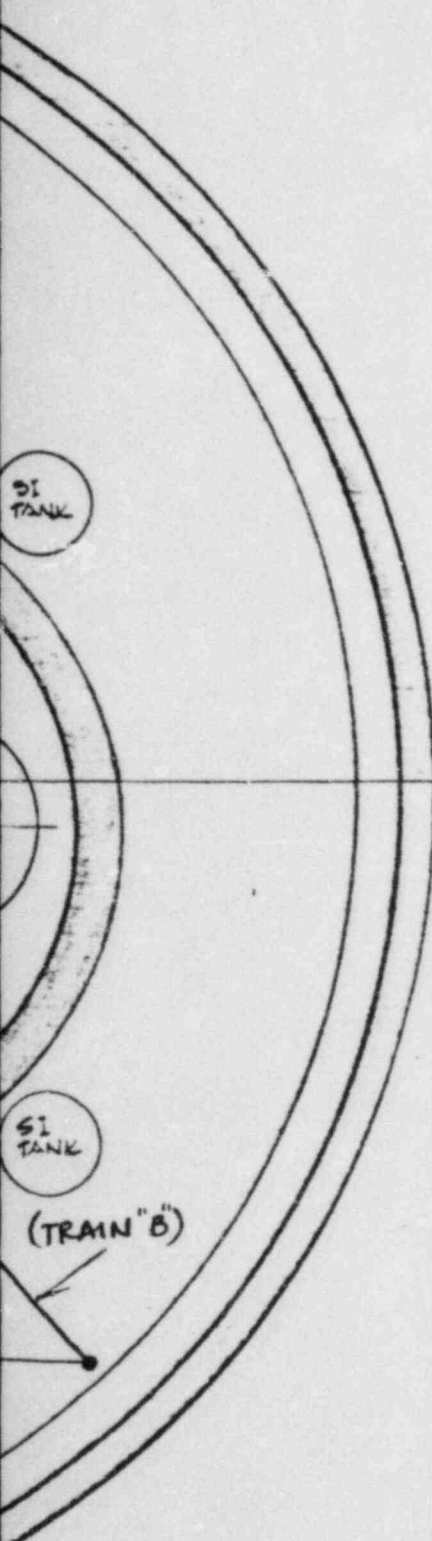
D11

E11

DOWN TO
PEN 140
EL. 37'-6"

180°

PLAN ELEVATION. +46.00'



EL 60.0 [C116-NB]

EL 59.0 [C117-NB]

EL 58.0 [L103-SMA]

EL 57.0 [L103-SMC]

EL 56.0 [L103-SMA]

[L103-SMB] EL 57.0

[L103-SMA] EL 59.0

A11

[C116-NB] EL 60.0

[C117-NB] EL 59.0

[L103-SMA] EL 58.0

EL 57.0 [L103-SMB]

[L103-SMA] EL 57.0

EL 55.0 [L103-SMA]

[L103-NB] EL 56.0

B11

EL 57.0 [L104-SMA]

[L104-SMB] EL 57.0

EL 55.0 [L104-SMC]

[L104-SMB] EL 55.0

C11

[L103-SMA] [C116-NB] EL 57.0

[L103-SMC] [C117-NB] EL 56.0

EL 52.0 [L103-NB] [C118-NB] EL 55.0

[C116-NB] EL 58.10

[C117-NB]

[L103-SMA]

[L103-SMB]

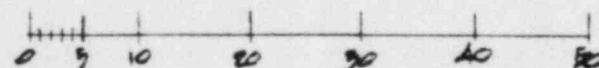
[L103-NB] EL 55.0

E11

D11

Also Available On
Aperture Card

SCALE (FT)

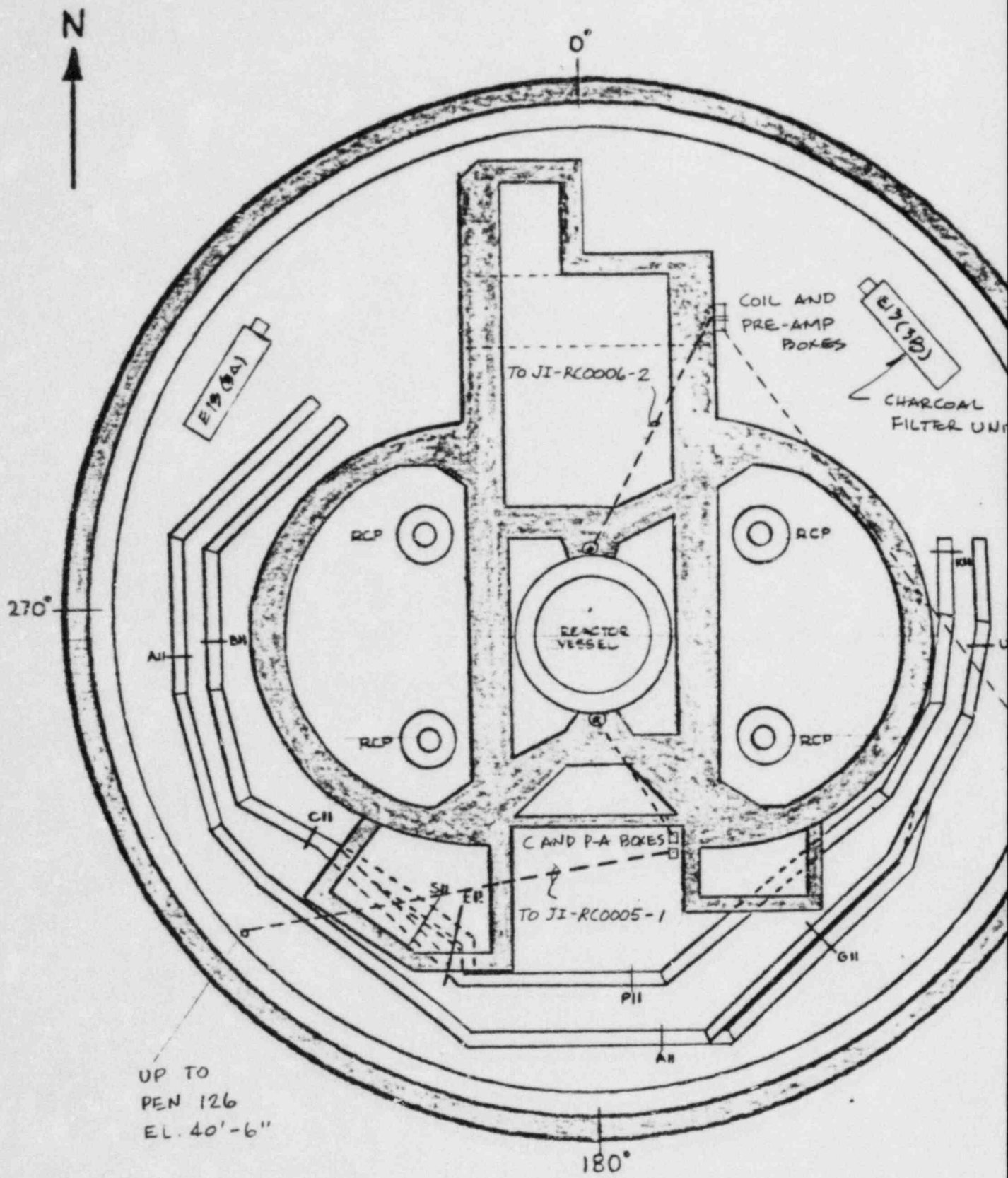


RCS COLD LEG
TEMPERATURE
INDICATION
TRAIN A & TRAIN B

LOUISIANA POWER & LIGHT CO.
Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL +46.00'
FIGURE III.F-3

8404020067-8



UP TO
PEN 126
EL. 40'-6"

PLAN ELEVATION -4.00 AND ABOVE

[P08-NB] EL 18'-8"

[C05-NB] EL 17'-7"

AII

[P08-NB] EL 18'-5"

[C119-NB] EL 17'-4"

[L110-NB] EL 16'-3"

BII

[P108-NB] EL 11'-0"

[C119-NB] EL 9'-11"

[L110-NB] EL 8'-10"

CII

[P108-NB] [C119-NB] [L110-NB] EL 11'-0"

EII

[P04-NB] EL 18'-8"

[C105-NB] EL 17'-7"

GII

[P108-NB] EL 18'-5"

[C119-NB] EL 17'-4"

[L110-NB] EL 16'-3"

KII

[P08-NB] EL 18'-8"

[C119-NB] EL 17'-7"

[L110-NB] EL 16'-6"

PII

[P108-NB] EL 11'-0"

[C119-NB] EL 9'-11"

[L110-NB] EL 8'-10"

SII

[P04-NB] EL 18'-1"

[C05-NB] EL 17'-0"

UII

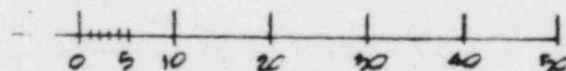
TI
APERTURE
CARD

90°

UP TO PEN 125
EL 37'-6"

Also Available On
Aperture Card

SCALE (FT)

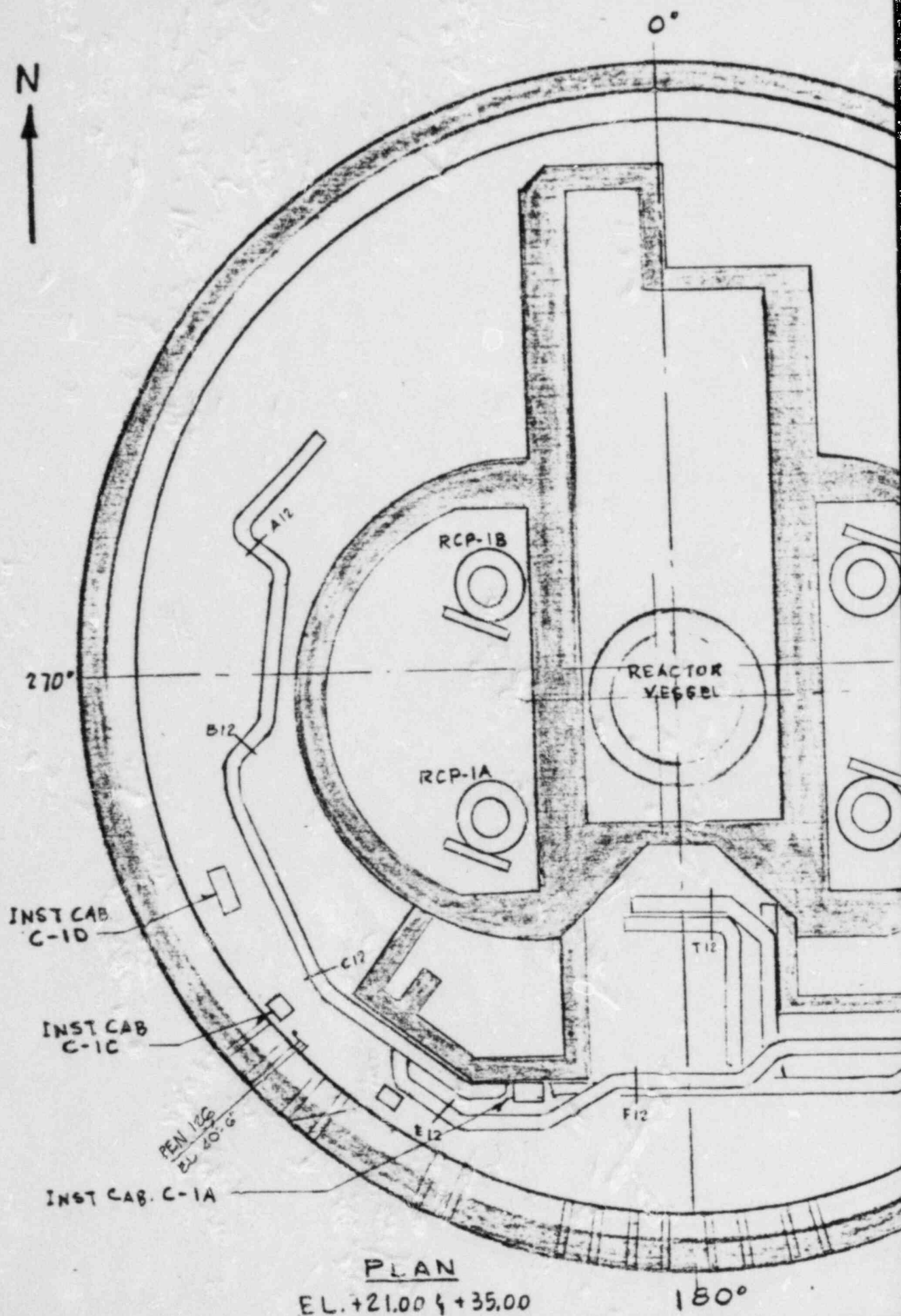


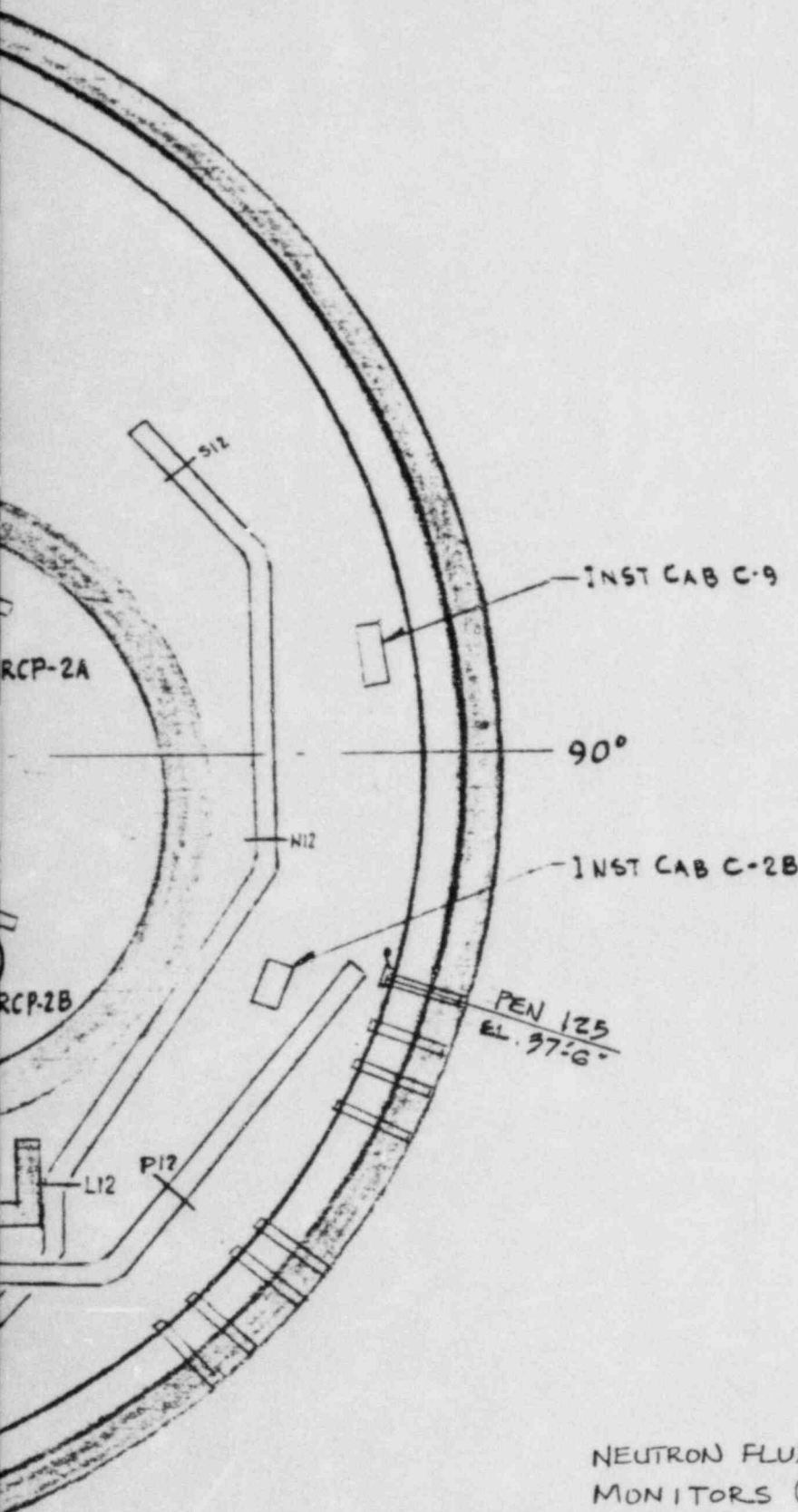
NEUTRON FLUX
MONITORS (EXCORE)
CHANNELS 1 & 2

LOUISIANA POWER & LIGHT CO.
Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL -4.00'
FIGURE III.G-1

8404020067-19





LI08-NA EL 87'-0
LI02-SG EL 86'-6
LI08-NA EL 85'-6
LI08-NA EL 82'-6
 T12

PI08-NA EL 85'-0
CI08-NA EL 86'-11
LI08-NA EL 85'-10
 A12

PI08-NA EL 87'-0
CI08-NA EL 86'-11
LI08-NA EL 84'-10
 S12

PI08-SA EL 40'-6
CI08-SA EL 39'-6
PI08-NA EL 38'-0
CI08-NA EL 30'-11
LI08-NA EL 29'-10
 B12

CI08-NA EL 38'-4
CI08-NA EL 32'-6
CI08-NA EL 31'-0
CI08-NA EL 30'-0
CI08-NA EL 30'-0
CI08-NA EL 28'-6
 P12

PI08-SA EL 42'-4
CI08-SA EL 41'-6
PI08-NA EL 30'-0
CI08-NA EL 28'-2
LI08-NA EL 28'-4
 C12

PI08-SA EL 42'-4
CI08-SA EL 41'-6
 E12

PI08-SA EL 41'-6
CI08-SA EL 40'-6
LI08-SG EL 35'-8
LI08-SG EL 34'-2
PI08-NA EL 32'-0
CI08-NA EL 30'-11
LI08-NA EL 29'-10
 F12

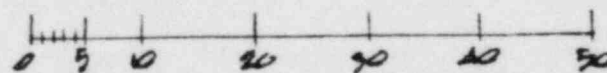
PI08-SA EL 40'-9
CI08-SA EL 39'-7
PI08-NA EL 37'-9
CI08-NA EL 36'-9
LI08-NA EL 35'-0
 L12

PI08-SA EL 40'-0
CI08-SA EL 39'-7
PI08-NA EL 38'-4
CI08-NA EL 37'-2
LI08-NA EL 36'-2
 N12

TI
 APERTURE
 CARD

Also Available On
 Aperture Card

SCALE (FT)



NEUTRON FLUX
 MONITORS (EXCORE)
 CHANNELS 1 & 2

LOUISIANA POWER & LIGHT CO.
 Waterford Steam Electric Station

FIRE PROTECTION
 REACTOR BUILDING
 PLAN EL +21.00' AND +35.00'
 FIGURE III.G-2

8404020067-20

N

270°

0°

SI
TANK

STEAM
GEN #1

SI
TANK

AII

BII

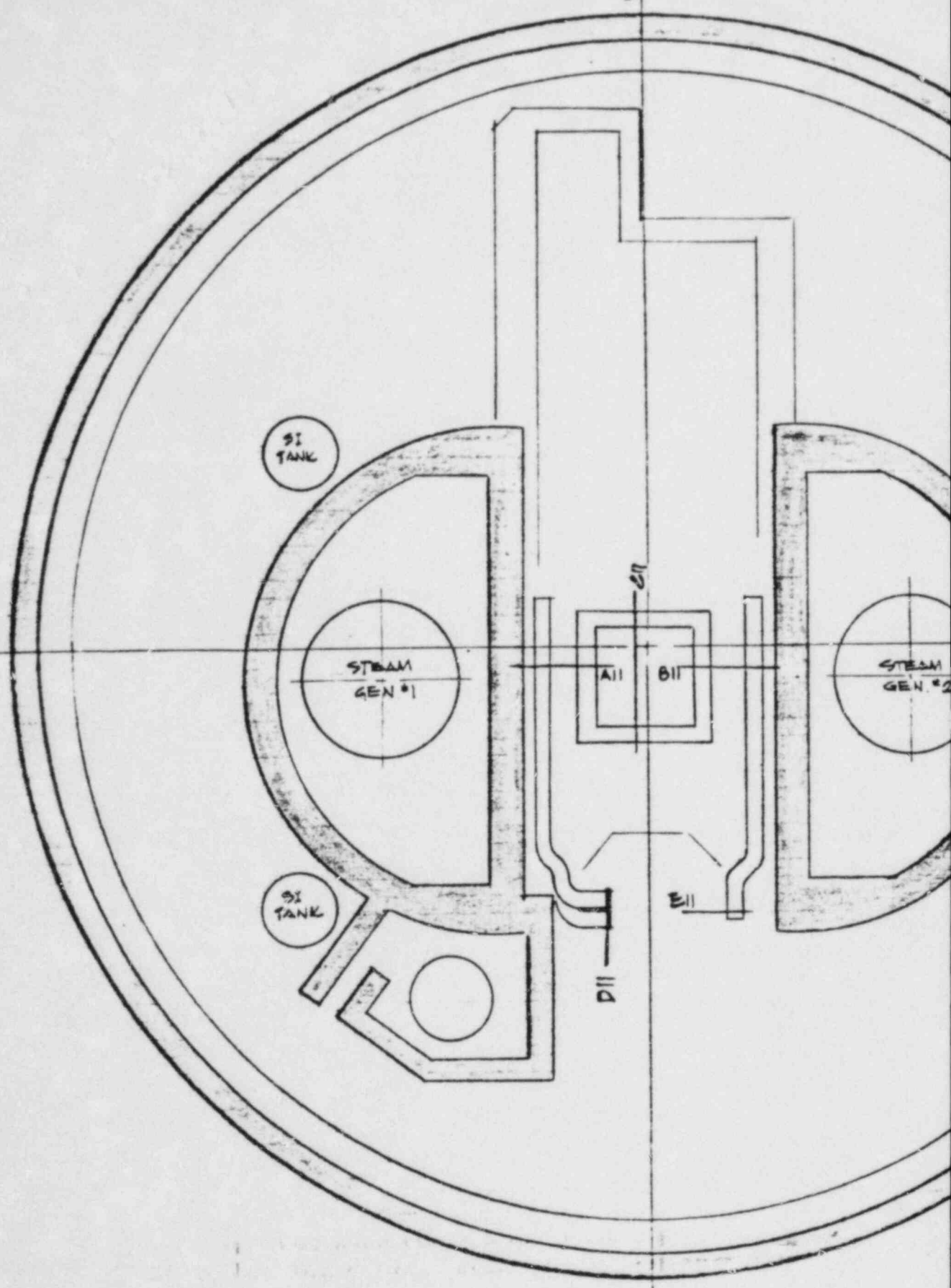
STEAM
GEN #2

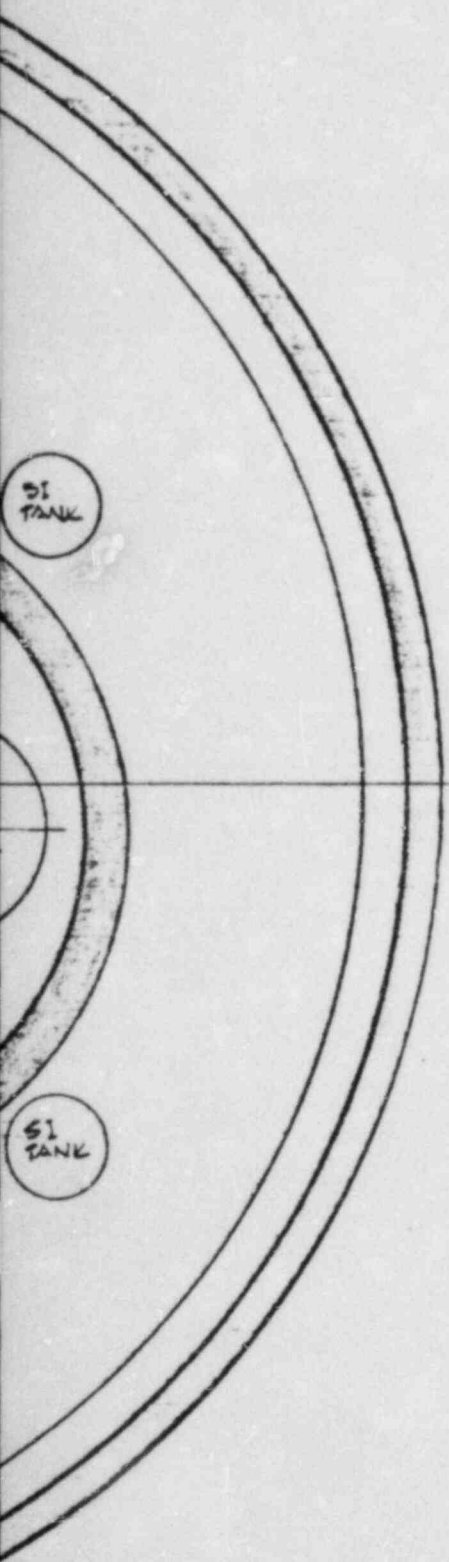
DII

EII

180°

PLAN ELEVATION. +46.00'





EL 60.0 [C116-NB]
 EL 59.0 [C117-NB]
 EL 58.0 [L103-SMA]
 EL 57.0 [L103-SMC] [L103-SMA] EL 57.0
 EL 56.0 [L103-SMA] [L103-SMA] EL 56.0

AII

[C116-NB] EL 60.0
 [C117-NB] EL 59.0
 [L103-SMA] EL 58.0
 EL 57.0 [L103-SMA] [L103-SMA] EL 57.0
 EL 56.0 [L103-SMA] [L103-SMA] EL 56.0

BII

EL 57.0 [L103-SMA] [L103-SMA] EL 57.0
 EL 56.0 [L103-SMA] [L103-SMA] EL 56.0

CII

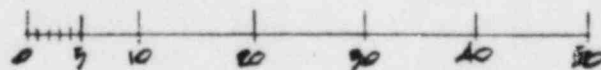
[L103-SMA] [C116-NB] EL 57.0 [K116-NB] EL 57.0
 [L103-SMA] [C117-NB] EL 56.0 [K117-NB] EL 56.0
 EL 55.0 [L103-SMA] [C118-NB] EL 55.0 [K118-NB] EL 55.0

DII

EII

Also Available On
Aperture Card

SCALE (FT)

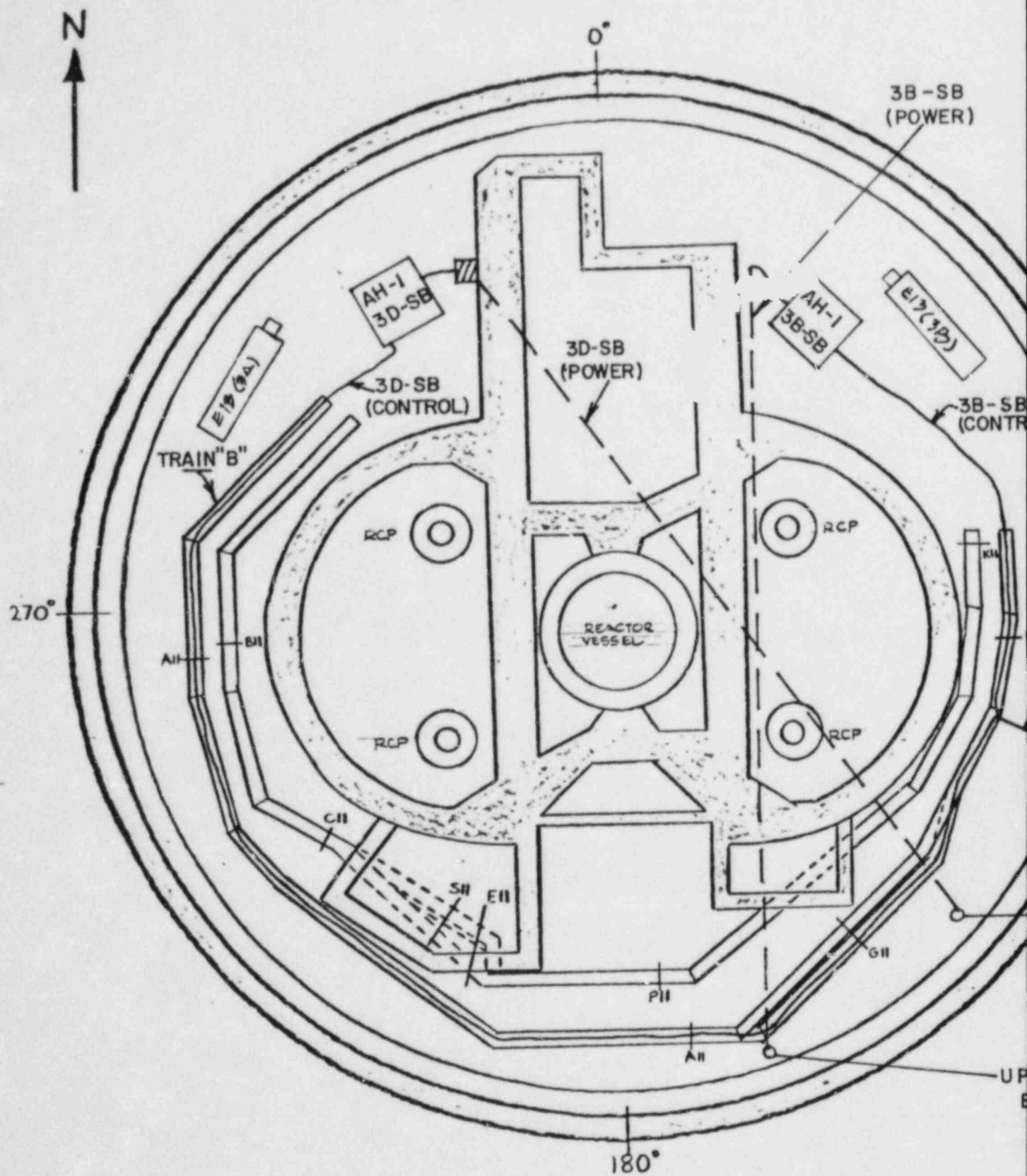


NEUTRON FLUX
 MONITORS (EXCORE)
 CHANNELS 1 & 2

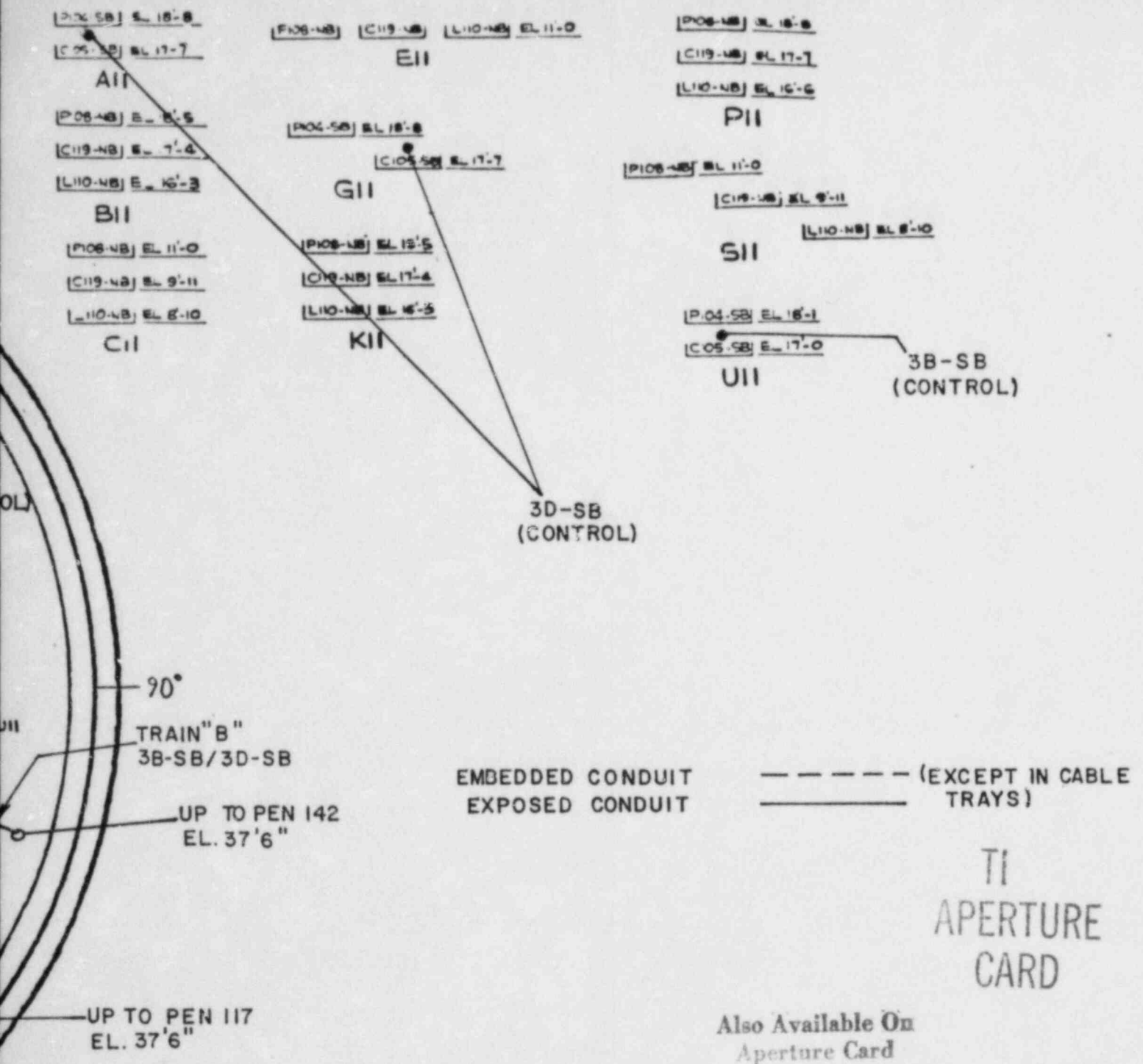
LOUISIANA POWER & LIGHT CO.
 Waterford Steam Electric Station

FIRE PROTECTION
 REACTOR BUILDING
 PLAN EL +46.00'
 FIGURE III.G-3

8404020067-2/



PLAN ELEVATION -4.00 AND ABOVE

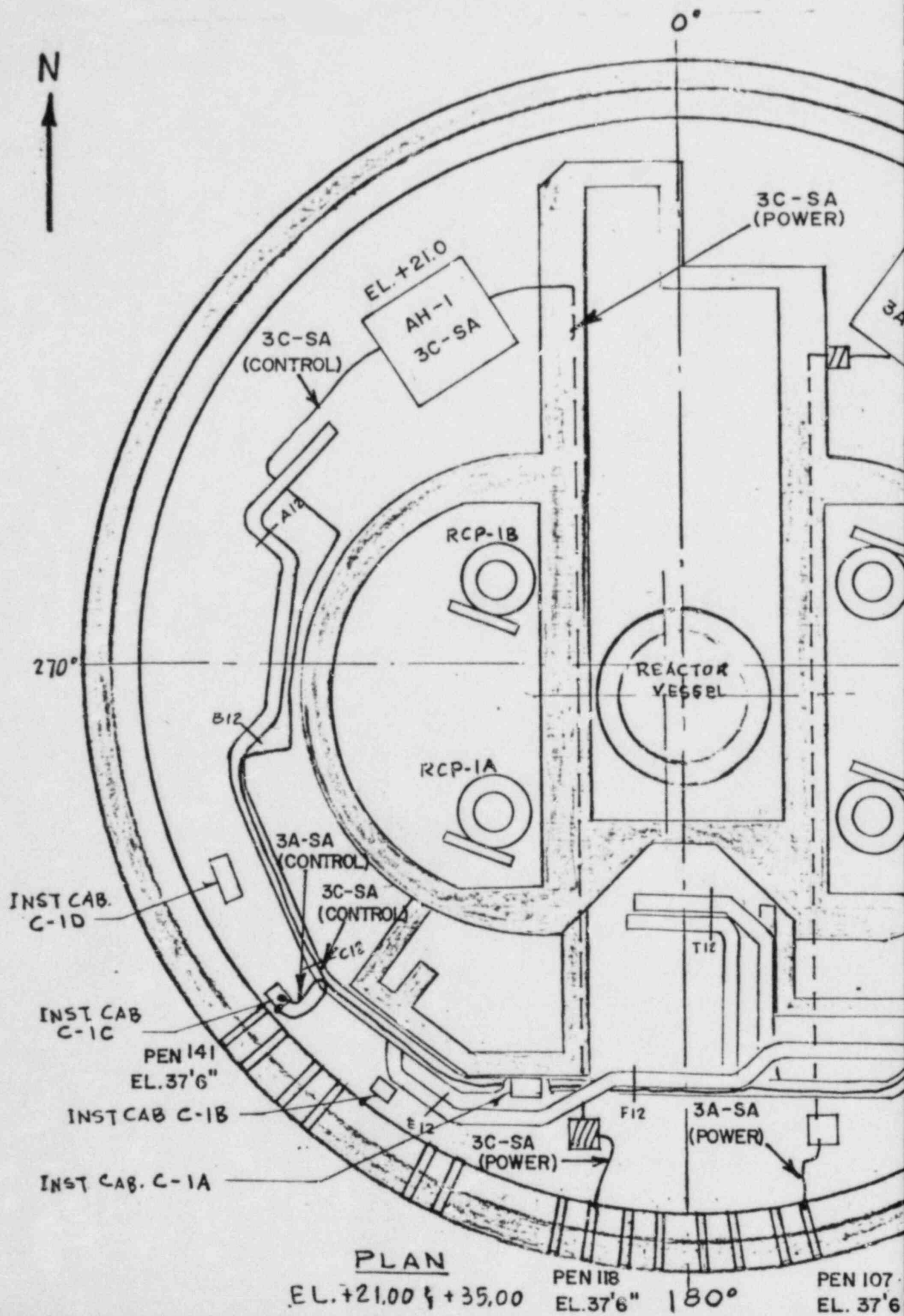


CONTAINMENT
FAN COOLERS
TRAIN A & TRAIN B

LOUISIANA POWER & LIGHT CO.
Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL -4.00'
FIGURE III. H-1

8404020067-22



N

270°

SI
TANK

STEAM
GEN. #1

SI
TANK

A11 B11

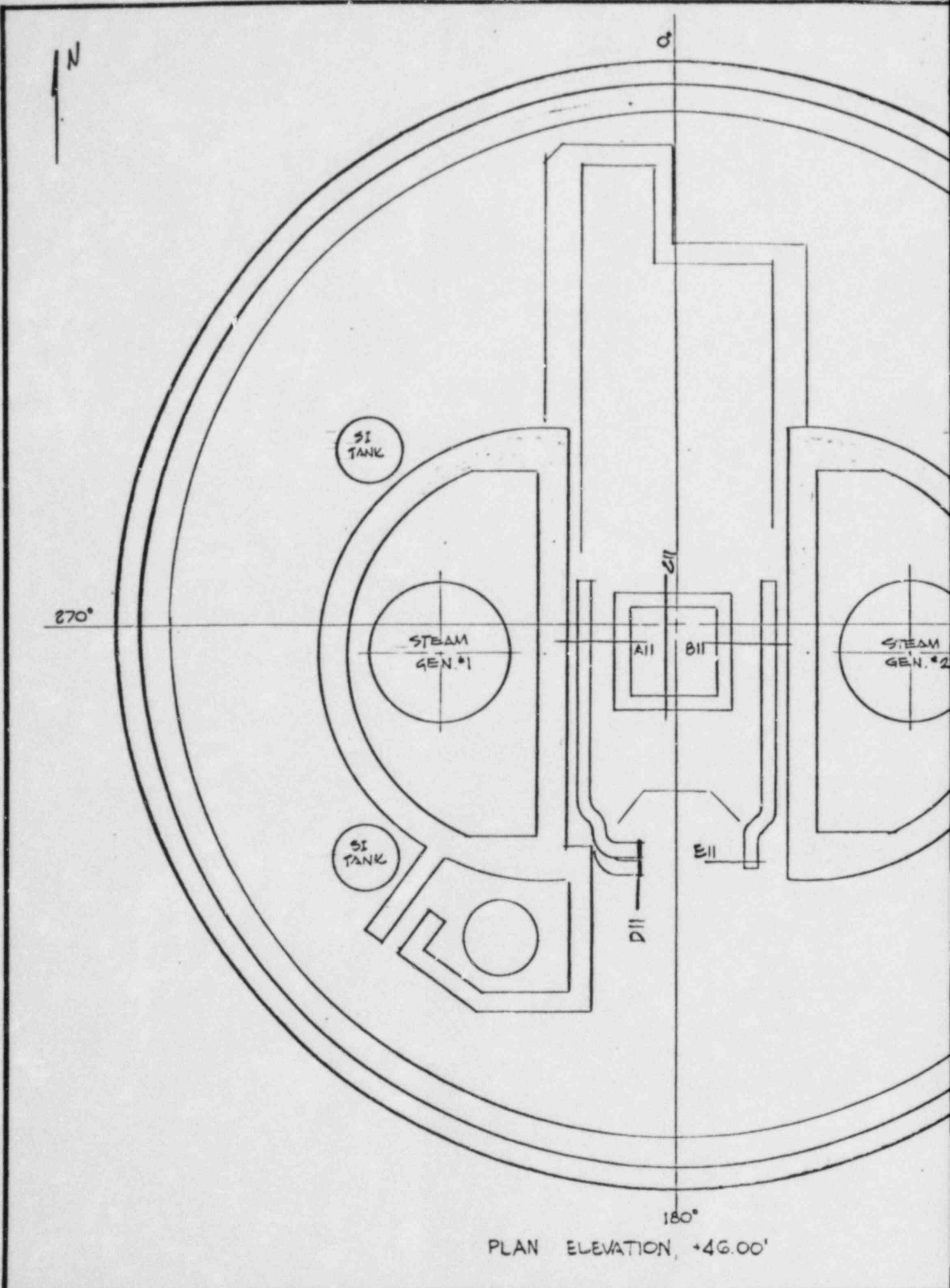
D11

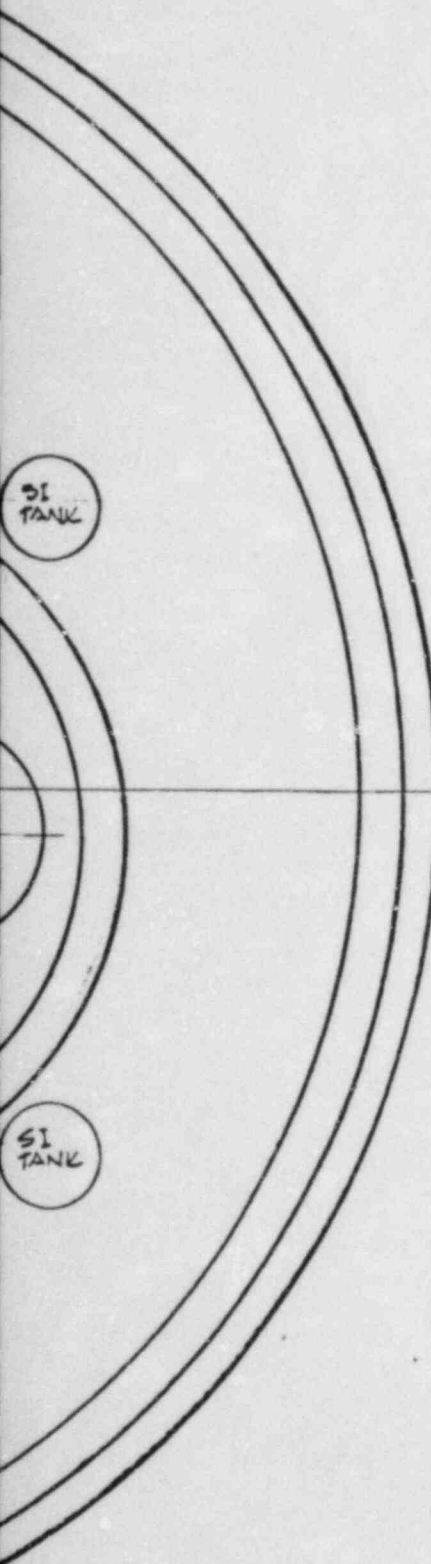
E11

STEAM
GEN. #2

180°

PLAN ELEVATION, +46.00'





EL. 60-0 [C116-NB]

EL. 59-0 [C117-NB]

EL 58-0 [L103-SMA]

EL 57-0 [L103-SMC]

EL 56-0 [L103B-NA]

[L103-SMB] EL 57-0

[L103-SMA] EL 55-0

A11

[C114-NB] EL 60-0

[C115-NB] EL 59-0

[L102-SMB] EL 58-0

[L102-SMA] EL 57-0

[L102A-NA] EL 56-0

EL 57-0 [L103-SMB]

EL 55-0 [L103-SMA]

B11

EL 57-0 [L103-SMA]

[L103-SMB] EL 57-0

EL 55-0 [L103-SMC]

[L103-SMA] EL 55-0

C11

[L103-SMA] [C116-NB] EL 57-0

[L103-SMC] [C117-NB] EL 56-0

[L103B-NA] [C118-NB] EL 55-0

EL 52-0

[L103B-NA]

D11

[C114-NB] EL 60-0

[C115-NB]

[L102-SMB]

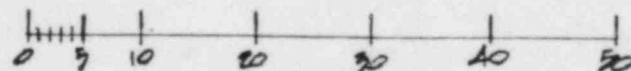
[L102-SMA]

[L102A-NA] EL 56-0

E11

Also Available On
Aperture Card

SCALE (FT)



CONTAINMENT
FAN COOLERS
TRAIN A & TRAIN B

LOUISIANA POWER & LIGHT CO.

Waterford Steam Electric Station

FIRE PROTECTION
REACTOR BUILDING
PLAN EL +46.00'

FIGURE III.H-3

8404020067-24

ENCLOSURE 3

FIRE DAMPER INSTALLATION EXCEPTIONS

NS30302

Relief is requested from the technical requirements of Appendix R section III.G.2 as it relates to separation of fire areas by fully approved 3-hour fire boundaries. Specifically, exceptions in fire damper installation in fire area boundaries as follows:

1. Requirement for U.L. labels on fire dampers installed in non-safety duct systems.
2. Fire dampers installation variances between Waterford 3 installation and tested configuration as outlined in vendor/U.L. installation instructions.

These exceptions are considered minor and do not adversely effect operation or fire resistive ratings of the fire damper assemblies. Specific exceptions are listed and discussed below:

Exception No. 1: Requirement for U.L. labels on fire dampers installed in non-safety duct systems. Fire dampers installed in non-safety duct systems are constructed in accordance with U.L. labeling requirements and meet the requirements of NFPA 80-1974 but do not have U.L. labels attached. Vendors have provided a letter of certification for the above.

Exception No. 2: Fire damper installation variances between Waterford 3 installation and tested configuration as outlined in vendor/installation instructions.

The following is an itemized listing of these installation variances:

1. U.L. and NFPA 90A requires that a sleeve be installed in place of the normal duct where dampers are installed through fire rated walls or floor/ceiling. In lieu of this arrangement, Waterford 3 uses a sleeve which is inserted into the duct which results in a double thickness through the wall or floor/ceiling. The sleeve is welded to the duct in accordance with the minimum spacing requirements of the vendor/U.L. requirements for attaching the damper to the sleeve. The objective (A sleeve that is stronger than the normal duct) is met, if not exceeded, with the Waterford 3 installation.
2. Sleeve welded one side only: Damper sleeves with a perimeter of 108" or less are welded to the duct on one side only. Advanced Air's (a manufacturer of fire dampers similar in construction to those provided at Waterford 3) installation instructions indicate that for dampers with a perimeter of 108" or less, attachment of only one face of the damper to sleeve is sufficient. Since a 16 gage sleeve is installed in a 20 gage or thicker duct, the assembly provides adequate strength without the additional welds between the sleeve and duct. (The damper to sleeve attachment is on both sides.)

3. Damper-to-sleeve welding and damper-to-damper welding (multiple damper assemblies) in non-safety duct systems varies from the manufacturers installation instruction: The installation contractor purchased the damper/sleeve assemblies from the vendor (Ruskin) who used a maximum 12" on center welding requirement for shop assembly. The vendor's shop assembly procedure is considered equivalent to the field installation requirement for 8" on center welding.
4. Sleeve to wall or floor/ceiling arrangement varies from the vendor's installation instructions and NFPA 90A. Since penetrations must meet additional functional requirements (air, radiation, etc.) the opening outside the sleeve/duct is sealed in accordance with tested penetration seal details or filled with grout; therefore, the NFPA 90A and vendors installation instructions requirements for an open air space and retaining angles are replaced with a penetration seal which provides equivalent fire barrier protection while meeting the other functional requirements.
5. Arrangement of duct-to-sleeve varies from NFPA 90A and vendors installation instructions: The joint between the sleeve and duct must be within 6" of the wall or floor/ceiling and the sleeve must be 14 gauge if damper is larger than 36" W or 24"H to meet the NFPA and vendor instructions. Waterford 3 uses a 16 gauge sleeve inside a minimum 20 gauge duct which is equivalent to the 14 gauge requirement. The 6" from wall or floor/ceiling to first connection joint is based on an industrial requirement that assumes gross structural failure, and therefore; a joint that will allow the duct to break away from the damper sleeve. Since Waterford 3 duct systems are seismically supported, this failure is not required.

ENCLOSURE 4

PREVIOUSLY REQUESTED EXCEPTIONS TO

APPENDIX R AND MISCELLANEOUS ITEMS

ASSOCIATED WITH FIRE PROTECTION

NS20099

A number of miscellaneous or generic items requiring further NRR attention are itemized below for the convenience of the reviewer.

1. Previously submitted exception requiring review:
 - a. Letter from F. J. Drummond (LP&L) to Director NRR, "Fire Water System Connection (Tertiary Backup) to Lubrication and Cooling Water for Circulating Water Pumps," dated August 8, 1983.
 - b. Letter from F. J. Drummond (LP&L) to Director NRR, "HVAC Fire Dampers," dated September 9, 1983.
 - c. Letter from F. J. Drummond (LP&L) to Director NRR, "Removable Section in South Wall of Diesel Generator 3BS Room", dated October 3, 1983.
2. Corrections to wording in supplemental safety evaluations (SSER) are requested:
 - a. SSER 3, P. 9-10, Switchgear Room - Described as having total area wide automatic fixed suppression coverage and complete 1-hour barrier separation. This is incorrect and Enclosure 1 requests relief from meeting these requirements in this area (RAB 8).
 - b. SSER 5, Section 9.5.1.6(1), pg. 9-4 - The third paragraph should read:

"The applicant committed by letter dated December 21, 1981 to install a control supplement to ensure complete electrical independence from the control room after activation of the transfer switches. The instrumentation and control circuits to the remote control panel will be modified to ensure that there is sufficient electrical and physical separation such that a fire in either the control room or at the remote control panel will not affect at least one train of the instrumentation and controls determined to be needed for safe shutdown."

3. To satisfy human factors safety concerns, carpet is proposed for the control room. NRR concurrence is requested for this carpet which is NFPA Class A ASTM E-84 Collins and Achman Carpet, type Gramercy Park Style No. 15003 colors Cordova (Code 08900) and Elmwood (Code 08600); and meets the following criteria:
 - a. Flame spread of no more than 25
 - b. Fuel combustion factor of 25 or less
 - c. Smoke density of 50
 - d. Radiant flux greater than .45 Watts/cm²

The carpet's effect on fire loading (BTU per square foot) is negligible. Fuel loading of book binders and administrative materials is included in fire hazard analysis.

ENCLOSURE 5

Fire Door Installation Exceptions

NS40207SEG

Relief is requested from the requirements of Appendix R, Section III.G.2 in that installed fire doors must have a national laboratory fully approved rating equivalent to that of the required barrier it forms a part of. The doors requiring review are listed below by door number and can be located by referring to this number as it appears in the fire area figures of the Fire Hazard Analysis, Section 9.5.1 of the FSAR. In most cases the doors were built to Class A or Class B construction standards but have variances not previously tested in laboratory conditions. These exceptions (due to security, or airtight or other special requirements) are minor in nature and should not detract from the overall capability of these doors to act as effective fire barriers. Outside doors generally were not built to Class A or B construction standards due to tornado or watertight construction requirements. They are only listed for your consideration wherever their location might be deemed necessary for fire mitigation purposes.

Doors with exceptions as documented by vendor and visual inspection:

D7, D9 - Elmwood security double doors:

- (1) Missing U.L. label on frame. Vendor ID tag installed on frame. Letter of certification on file.
- (2) Electric striker of security latch in the inactive door.
- (3) Removable transom modified on site to a solid transom.

D24, D29 - Pioneer security double door:

- (1) U.L. label cannot be applied due to conduit in the inactive door.
- (2) Class "A" construction label on doors and frame. Vendor certification on file.

D35, 36, 37 - R. V. Harty Door:

- (1) Exterior door located in wall between fire area and outside space - its primary function is other than fire resistance (i.e., tornado, flood, leaktight, or radiation shield door). Outdoor exposure fires are not postulated in the plant yard based on lack of combustible storage adjacent to buildings. Where concentrations of combustible material (such as oil in the Turbine Generator Building or transformer area) exist, fire detection and automatic suppression systems are provided and the flow of combustible liquids is confined as outlined in the Fire Hazard Analysis Report.

D 46, 47 - Pioneer airtight double doors - U.L. label missing due to items (1) through (4):

- (1) Stainless steel door.
- (2) Oversized.
- (3) Surface Gasket installed.
- (4) Frame.
- (5) 3-hour "A" construction label on door and frame. Letter of certification on file.

D53A - Elmwood:

- (1) Removable transom modified on site to a solid transom.
- (2) Vendor I.D. tag or frame. Letter of certification on file.

D71, D77, D78, D121, D174, D175, D178, D218, D219, D259, Mosler Doors:

- (1) U.L. labels damaged or lost during construction.
- (2) Vendor label installed on assembly. Letter of certification on file.

D84 - Pioneer security double door:

- (1) Special purpose door missing U.L. label.
- (2) Bullet proof glass windows installed in door.
- (3) Oversized double doors.
- (4) Vendor label installed on assembly with letter of certification on file.

D85 - Pioneer security double door:

- (1) Electric security strike installed in inactive door.
- (2) Door is made with 14 gauge steel. 3-hour "A" construction labels on doors and frame.

D91 - Pioneer airtight door:

- (1) Surface mounted gasket profile not U.L. accepted.
- (2) 1½-hour "B" construction label on doors and frame.

D96, D97 - R. V. Harty:

- (1) Exterior door located in wall between stair tower and roof - its primary function is other than fire resistance (i.e., tornado, missile door). Outdoor exposure fires are not postulated on rooftops based on the lack of combustible storage and heat dissipation from fires in transient combustibles.

D128 - Pioneer airtight door:

- (1) Surface mounted gasket
- (2) Mortised door bottom
- (3) 3-hour "A" construction label on door and frame.

D141 - Pioneer double door:

- (1) Fuseable link door louvers needed for proper ventilation are not U.L. listed.
- (2) 1½-hour "B" construction label on doors. Frame is U.L. labeled.

D161, D167 - Pioneer security door:

- (1) Electrical components in door not U.L. listed.
- (2) 14 gauge steel construction.
- (3) 3-hour "A" construction label on door and frame.

D163, D250 - Pioneer:

- (1) 14 gauge steel construction not U.L. listed.
- (2) Vendor 3-hour "A" construction label on door and frame.

D170 - Pioneer airtight security door:

- (1) Electrical items and security latch in inactive door.
- (2) Surface type gaskets.
- (3) 3-hour "A" construction label on doors and frame.

D179 - Pioneer airtight security door:

- (1) Electrical items in door.
- (2) Surface type gaskets.
- (3) Mortised door bottom.
- (4) 3-hour "A" construction labels on door and frame.

D185 - R. V. Harty:

- (1) Exterior door located in wall between stair tower and roof - its primary function is other than fire resistance (i.e., tornado, missile door). Outdoor exposure fires are not postulated on rooftops based on the lack of combustible storage and heat dissipation from fires in transient combustibles.

D192 - Pioneer airtight security door:

- (1) Electrical items in door.
- (2) Surface type gaskets.
- (3) 3-hour "A" construction label on door and frame.

D208A, D208B, D209A, D209B - Elmwood:

- (1) Head section of frame missing due to installation in part-height wall.
- (2) Vendor I.D. tag installed on frame. Letter of certification on file.

D252 - Elmwood:

- (1) U.L. label damaged or lost during construction
- (2) Vendor ID tag installed on door and frame. Letter of certification on file.

D252A - Elmwood double door:

- (1) Oversized door.
- (2) Head section of frame missing due to part-height wall installation.
- (3) Vendor ID tags install on assembly. Letter of certification on file.

D262 - R. V. Harty:

- (1) Exterior door located in wall leading to outside stair tower - its primary function is other than fire resistance (i.e., tornado, missile door). Outdoor exposure fires are not postulated on rooftops based on the lack of combustible storage and heat dissipation from fires in transient combustibles.

D263, D265, D266, D270 - R. V. Harty:

- (1) Exterior door located in wall between fire area and outside space - its primary function is other than fire resistance (i.e., tornado, missile door). Outdoor exposure fires are not postulated on rooftops based on the lack of combustible storage adjacent to building. Where concentrations of combustible material, such as diesel generator fuel oil storage day tanks, is located adjacent to building, adequate confinement is provided via rated fire barriers; fire doors; retention curbs; and detection and suppression systems.

Containment Personnel Access:

- (1) Two such entries exist for the containment building. They consist of two double gasketed, airtight, solid steel doors placed in series for each entry. Adequate fire protection measures as described in the Fire Hazards Analysis precludes damage to these doors from transient or in-situ combustibles.

RAB ELEVATOR SHAFT DOORS:

- (1) Constructed in accordance with U.L. and vendor requirements for 1½-hour Class "B" fire doors with the exception of a 5" x 8" wire glass window. Letter of certification on file.