ENCLOSURE 2

APP-GW-GLE-002 NS

Revision 1

"Impacts to the AP1000 DCD to Address Generic Safety Issue (GSI)-191"

(Public Version)

AP1000 DOCUMENT COVER SHEET

TDC: _____ Permanent File: _____

AP1000 DOCUMENT NO.	REVISION	PAGE	ASSIGNED TO	OPEN ITEMS (Y/N)
APP-GW-GLE-002 NS	1	1 of 40	W-Asztalos	N

ALTERNATE DOCUMENT NUMBER: N/A WORK BREAKDOWN #:

ORIGINATING ORGANIZATION: Westinghouse Electric Company

TITLE: **Impacts to the AP1000 DCD to Address Generic Safety Issue (GSI)-191**

ATTACHMENTS:	DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION:
N/A	APP-GW-GEE-397 Rev.1
CALCULATION/ANALYSIS REFERENCE: N/A	

ELECTRONIC FILENAME	ELECTRONIC FILE FORMAT	ELECTRONIC FILE DESCRIPTION
APP-GW-GLE-002	Microsoft Word	Entire Document

LEGAL REVIEW J.C. Spadaccene	SIGNATURE / DATE	6-26-08
PATENT REVIEW M.M. CORLETTI	SIGNATURE / DATE	6-26-08

ORIGINATOR(S) P.L. Greco	SIGNATURE / DATE	6/26/2008
REVIEWER(S)	SIGNATURE / DATE	
	SIGNATURE / DATE	
	SIGNATURE / DATE	
VERIFIER(S) S.M. Boyle	SIGNATURE / DATE 6/26/2008	Verification Method: Independent Review

**Plant Applicability: ☒ All AP1000 plants except: No Exceptions
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APPLICABILITY REVIEWER** J.A. Speer	SIGNATURE / DATE	6/26/08
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AP1000 DCD Impact Document

Impacts to the AP1000 DCD to Address Generic Safety Issue (GSI)-191

Revision 1

Public (redacted) Version with sensitive unclassified non-safeguards information relative to the physical protection of an AP1000 nuclear plant withheld under 10 CFR 2.390(d).

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TABLE OF CONTENTS

Document Number: APP-GW-GLE-002 NS **Revision Number:** 1

Title: Impacts to the AP1000 DCD to Address Generic Safety Issue (GSI)-191

Brief Description of the Impact (what is being changed and why):

The AP1000's Containment Recirculation screens and IRWST screens are being refined to address NRC Generic Letter 2004-02 "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED-WATER REACTORS" (Reference 2).

SRP Section Impacted:
The change affects SRP Section 6.3 "Emergency Core Cooling System". DCD Tier 1 Sections 2.2 and 3.3 are impacted by this document, as well as DCD Tier 2 Sections 1.2, 6.3, 9A, and 12.3.

This evaluation is prepared to document the Design Control Document (DCD) change described above. The DCD change is a departure from Tier 1 and Tier 2 information of the AP1000 DCD Revision 16. The changes identified in this document are intended to be included in a revision to the DCD and in the review of the Design Certification amendment or included as generic information in plant specific FSARs. Changes to Tier 1 information require review and approval by the NRC.

I. TECHNICAL DESCRIPTION

The changes described in this report relate to the AP1000 Containment Recirculation and IRWST screens. In response to NRC Generic Letter 2004-02 (Reference 2), the AP1000 design required some modifications so that the long term core cooling provided by the AP1000's Passive Core Cooling System (PXS) would not become degraded due to debris generation and subsequent blockage. The changes made to the screen included refining the design of the Containment Recirculation and IRWST screens so that the PXS is better able to accomplish its long term core cooling mission. The design of the Containment Recirculation screens and IRWST screens conform to Regulatory Guide 1.82 Revision 3 (Reference 1), where this guide is applicable to the AP1000 design.

The actual design changes that create the Design Control Document (DCD) Revision 16 markups in this document are included in two Technical Reports created by Westinghouse for NRC review. Technical Report 147 (Reference 3) included detailed design features of the AP1000's Containment Recirculation and IRWST screens. The refinement of the Containment Recirculation and IRWST screen design resulted in certain DCD changes. Technical Report 26 (Reference 4) describes and gives results of different analyses that were performed in support of the GSI-191 resolution. The changes have been attached in this document under Section V, DCD Markups.

Revision 1 of this document is created to address two items. The first item is the addition of flanges to the lines L113B and L131B as shown on page 25 of this document. Second is a change to the material that encloses the excore detectors. Due to design evolution, the materials the excore detector enclosures can be made of now include stainless steel and titanium.

II. CHANGE JUSTIFICATION

The change is made to address the industry issue of sump screen blockage and emergency core cooling performance. Westinghouse and the NRC have previously communicated and agreed to the approach Westinghouse is taking for closure of Generic Safety Issue-191 with the guidance of the NRC. This report represents one piece of the entire plan to confirm AP1000's compliance with GL-2004-02 (Reference 2).

III. REGULATORY IMPACT

A. EVALUATION OF DEPARTURE FROM TIER 2 INFORMATION (Check correct response and provide justification for that determination under each response)

10 CFR Part 52, Appendix D, Section VIII. B.5.a. provides that an applicant for a combined licensee who references the AP1000 design certification may depart from Tier 2 information, without prior NRC approval, if it does not require a license amendment under paragraph B.5.b. These questions are addressed here to provide an evaluation of the regulatory impact. Regardless of the answers to these questions these changes are being provided to the NRC for review and approval as part of the design certification amendment. Also changes to Tier 1 require NRC review and approval. The questions below address the criteria of B.5.b.

1. Does the proposed departure result in more than a minimal increase in the frequency of occurrence of an accident previously evaluated in the plant-specific DCD? ☐ YES ☒ NO

2. Does the proposed departure result in more than a minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety and previously evaluated in the plant-specific DCD? ☐ YES ☒ NO

3. Does the proposed departure Result in more than a minimal increase in the consequences of an accident previously evaluated in the plant-specific DCD? ☐ YES ☒ NO

4. Does the proposed departure result in more than a minimal increase in the consequences of a malfunction of an SSC important to safety previously evaluated in the plant-specific DCD? ☐ YES ☒ NO

5. Does the proposed departure create a possibility for an accident of a different type from any evaluated previously in the plant-specific DCD? ☐ YES ☒ NO

6. Does the proposed departure create a possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously in the plant-specific DCD? ☐ YES ☒ NO

7. Does the proposed departure result in a design basis limit for a fission product barrier as described in the plant-specific DCD being exceeded or altered? ☐ YES ☒ NO

8. Does the proposed departure result in a departure from a method of evaluation described in the plant-specific DCD for establishing the design bases or safety analyses? ☐ YES ☒ NO

B. IMPACT ON RESOLUTION OF A SEVERE ACCIDENT ISSUE

10 CFR Part 52, Appendix D, Section VIII. B.5.a. provides that an applicant for a combined licensee who references the AP1000 design certification may depart from Tier 2 information, without prior NRC approval, if it does not require a license amendment under paragraph B.5.c. The questions below address the criteria of B.5.c.

1. Does the proposed activity result in an impact to features that mitigate severe accidents? If the answer is Yes, answer Questions 2 and 3 below. ☐ YES ☒ NO

2. Is there is a substantial increase in the probability of a severe accident such that a particular severe accident previously reviewed and determined to be not credible could become credible? ☐ YES ☐ NO ☐ N/A

3. Is there is a substantial increase in the consequences to the public of a particular severe accident previously reviewed? ☐ YES ☐ NO ☐ N/A

C. SECURITY ASSESSMENT

1. Does the proposed change have an adverse impact on the security assessment of the AP1000? ☐ YES ☒ NO

D. OTHER REGULATORY CRITERIA

Further guidance for this change is found in Regulatory Guide 1.82, Revision 3, "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident" (Reference 1).

IV. REFERENCES

1. "Water Sources for Long-Term Recirculation Cooling Following a Loss-of-Coolant Accident", Regulatory Guide 1.82, Revision 3, ML033140347, United States Nuclear Regulatory Commission.
2. "POTENTIAL IMPACT OF DEBRIS BLOCKAGE ON EMERGENCY RECIRCULATION DURING DESIGN BASIS ACCIDENTS AT PRESSURIZED-WATER REACTORS", Generic Letter 2004-02 September 2004, ML042360586, United States Nuclear Regulatory Commission.
3. "AP1000 Containment Recirculation and IRWST Screen Design", TR-147, APP-GW-GLN-147, Westinghouse Electric Company LLC.
4. "AP1000 Verification of Water Sources for Long-Term Recirculation Cooling Following a LOCA", TR-026, APP-GW-GLR-079, Westinghouse Electric Company LLC.

V. DCD MARK-UP

Tier 1

1. *Table 2.2.3-4*
2. *Figure 2.2.3-1 (Sheet 2 of 2)*
3. *Figure 3.3-5*

Tier 2

1. *Figure 1.2-6*
2. *Section 6.3.2.2.7.1*
3. *Section 6.3.2.2.7.2*
4. *Section 6.3.2.2.7.3*
5. *Section 6.3.9*
6. *Table 6.3-2*
7. *Figure 6.3-2 (Sheet 2of 2)*
8. *Figure 6.3-6*
9. *Figure 6.3-8*
10. *Figure 6.3-9*
11. *Figure 9A-1 (Sheet 4 of 16)*
12. *Figure 12.3-1 (Sheet 5 of 16)*
13. *Figure 12.3-2 (Sheet 5 of 16)*
14. *Figure 12.3-3 (Sheet 5 of 16)*

AP1000 Design Control Document Revision 16 Tier 1 Changes

Justification for changes to Table 2.2.3-4 Item 8c) i): The connection from the PXS B recirculation subsystem was revised as discussed in Reference 3 page 8. The resistance listed in the ITAAC was impacted as shown below.

8.c) The PXS provides RCS makeup, boration, and safety injection during design basis events.	i) A low-pressure injection test and analysis for each CMT, each accumulator, each IRWST injection line, and each containment recirculation line will be conducted. Each test is initiated by opening isolation valve(s) in the line being tested. Test fixtures may be used to simulate squib valves.	i) The injection line flow resistance from each source is as follows:
	CMTs: Each CMT will be initially filled with water. All valves in these lines will be open during the test.	CMTs: The calculated flow resistance between each CMT and the reactor vessel is $\geq 1.81 \times 10^{-5}$ ft/gpm^2 and $\leq 2.25 \times 10^{-5}$ ft/gpm^2.
	Accumulators: Each accumulator will be partially filled with water and pressurized with nitrogen. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves.	Accumulators: The calculated flow resistance between each accumulator and the reactor vessel is $\geq 1.47 \times 10^{-5}$ ft/gpm^2 and $\leq 1.83 \times 10^{-5}$ ft/gpm^2.
	IRWST Injection: The IRWST will be partially filled with water. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves.	IRWST Injection: The calculated flow resistance for each IRWST injection line between the IRWST and the reactor vessel is: Line A: $\geq 5.53 \times 10^{-6}$ ft/gpm^2 and $\leq 9.20 \times 10^{-6}$ ft/gpm^2 and Line B: $\geq 6.21 \times 10^{-6}$ ft/gpm^2 and $\leq 1.03 \times 10^{-5}$ ft/gpm^2.
	Containment Recirculation: A temporary water supply will be connected to the recirculation lines. All valves in these lines will be open during the test. Sufficient flow will be provided to fully open the check valves.	Containment Recirculation: The calculated flow resistance for each containment recirculation line between the containment and the reactor vessel is: Line A: $\leq 1.11 \times 10^{-5}$ ft/gpm^2 and Line B: $\leq 1.04 \times 10^{-5}$ ~~1.03×10^{-5}~~ ft/gpm^2.

Justification for changes to Table 2.2.3-4 Item 8c) viii): The existing ITAAC addresses total screen surface areas. This change adds detail to this ITAAC to address screen geometry by including individual pocket frontal face area and screen surface area. Total screen frontal area has also been added. These changes are consistent with the screens discussed in Reference 3.

Table 2.2.3-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

	viii) Inspections of the IRWST and containment recirculation screens will be conducted. The inspections will include measurements of the pockets and the number of pockets used in each screen. The pocket frontal face area is based on a width times a height. The width is the distance between pocket centerlines for pockets located beside each other. The height is the distance between pocket centerlines for pockets located above each other. The pocket screen area is the total area of perforated plate inside each pocket; this area will be determined by inspection of the screen manufacturing drawings.	viii) The screens utilize pockets with a frontal face area of $\geq$ 6.2 in^2 and a screen surface area $\geq$ 140 in^2 per pocket. Each IRWST screen has a sufficient number of pockets to provide a frontal face area $\geq$ 20 ft^2 and a ~~The~~ screen surface area ~~of each IRWST screen is~~ $\geq$ 500 ft^2. Each containment recirculation screen has a sufficient number of pockets to provide a frontal face area $\geq$ 105 ft^2 and a ~~The~~ screen surface area ~~of each containment recirculation screen is~~ $\geq$ 2500 ft^2. A debris curb exists in front of the containment recirculation screens which is $\geq$ 2 ft above the loop compartment floor. The bottom of the IRWST screens are located $\geq$ 6 in above the bottom of the IRWST. ~~The bottom of the containment recirculation screens is $\geq$ 2 ft above the loop compartment floor.~~

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Justification for changes to Table 2.2.3-4 Item 8c) xiii) and xiv): Item xiii) was changed slightly to better define the reference for the plate size requirements. Item xiv) was added to address the major input to the potential formation of chemical precipitants as well as plate out of chemicals on the fuel following a LOCA. The major input is from aluminum surfaces that are flooded during a LOCA. The excore detectors contain the vast majority of such aluminum. In the AP1000 design these detectors are enclosed in stainless steel. These changes are consistent with the evaluations performed in Reference 4.

Table 2.2.3-4 (cont.)
Inspections, Tests, Analyses, and Acceptance Criteria

	xiii) Inspections will be conducted of the surfaces in the vicinity of the containment recirculation screens. The surfaces in the vicinity of the containment recirculation screens are the surfaces located above the bottom of the recirculation screens up to and including the bottom surface of the plate discussed in Table 2.2.3-4, item 8.c.vii, out at least 10 feet perpendicular to and at least 7 feet perpendicular to the side of the ~~trash rack portion of the~~ screen face.	xiii) These surfaces are stainless steel.
	xiv) Inspections will be conducted of the exposed surfaces of the source range, intermediate range, and power range detectors.	xiv) These surfaces are made of stainless steel or titanium.

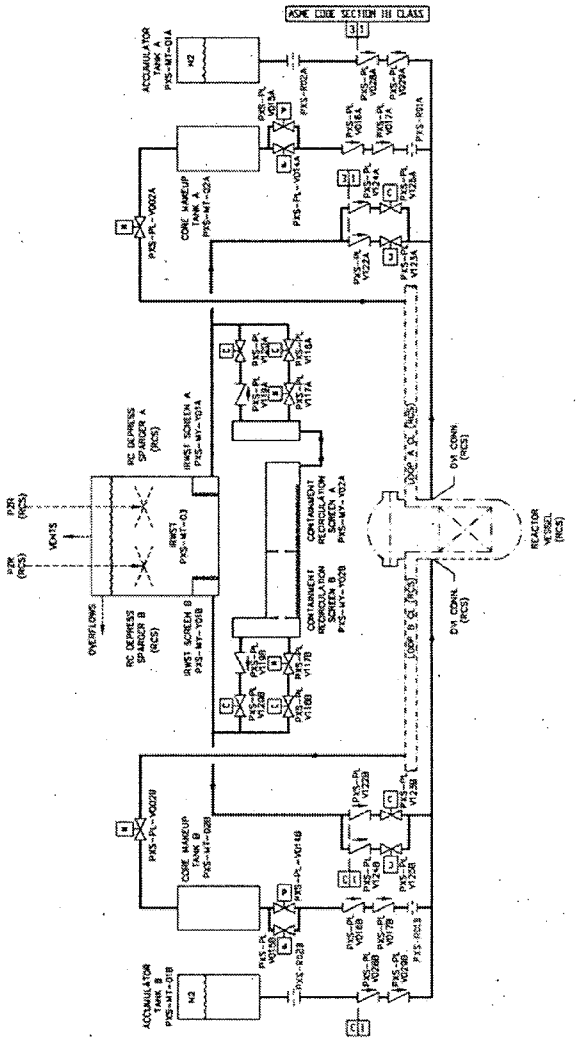

Figure 2.2.3-1 (Sheet 2 of 2)
Passive Core Cooling System

ORIGINAL Revision 16 Figure

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Justification for changes to Figure 2.2.3-1 (Sheet 2 of 2): The screens are now separated by a flow channel and on inspection it was noticed that the A and B components were flipped on this figure. Previously, when the system was symmetric, this was not an issue; however, with the addition of the flow channel, the A and B components were flipped to match Figure 6.3-2 (Sheet 2 of 2) to avoid a Human Factors Error.

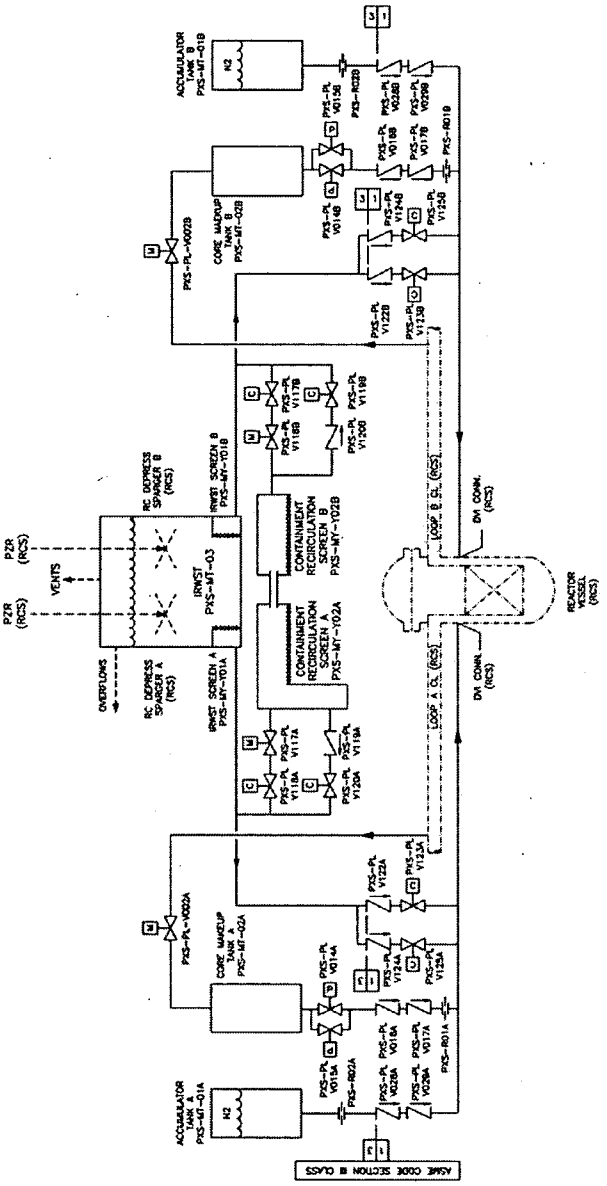
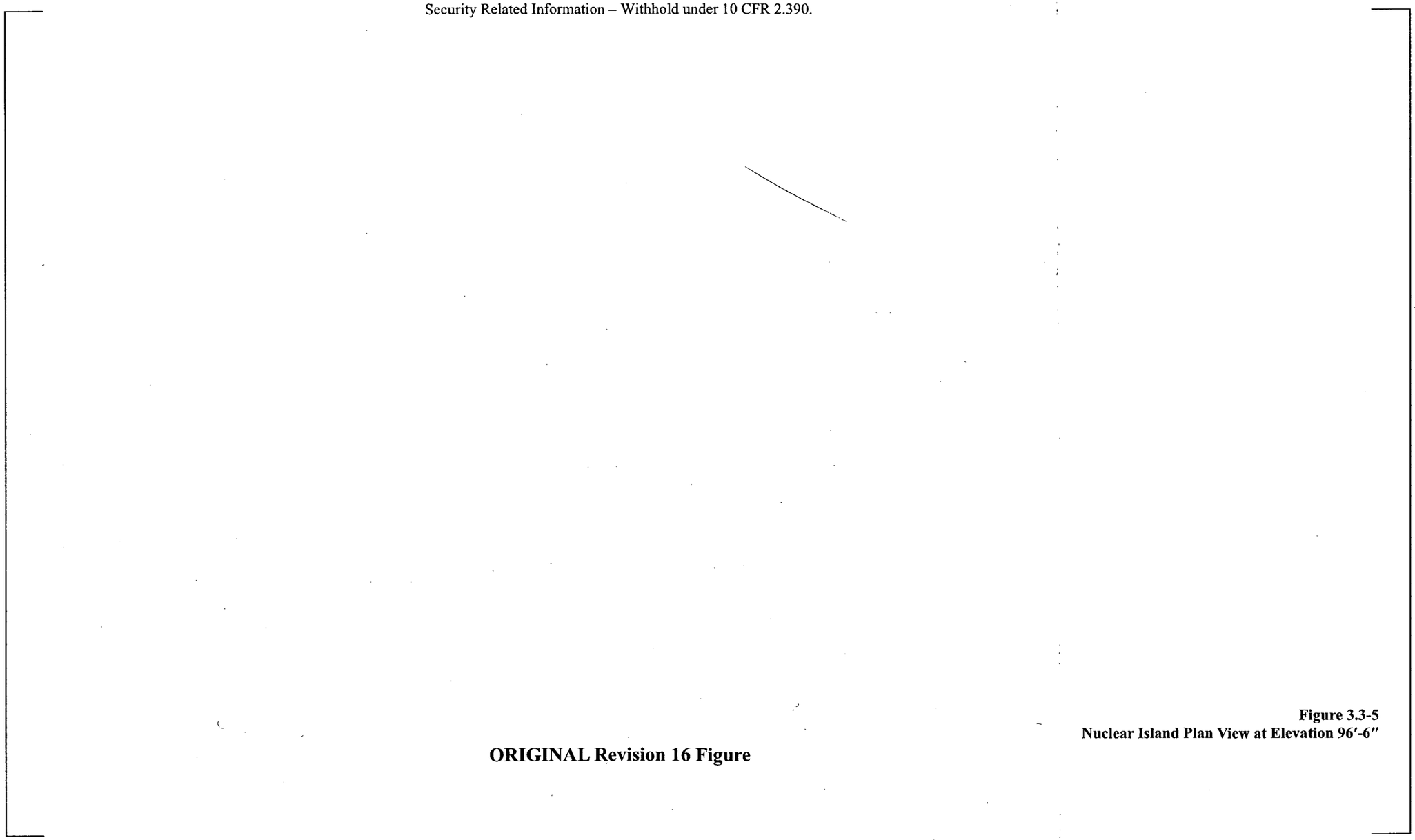


Figure 2.2.3-1 (Sheet 2 of 2)
Passive Core Cooling System

REVISED Revision 16 Figure

Security Related Information – Withhold under 10 CFR 2.390.

SRI



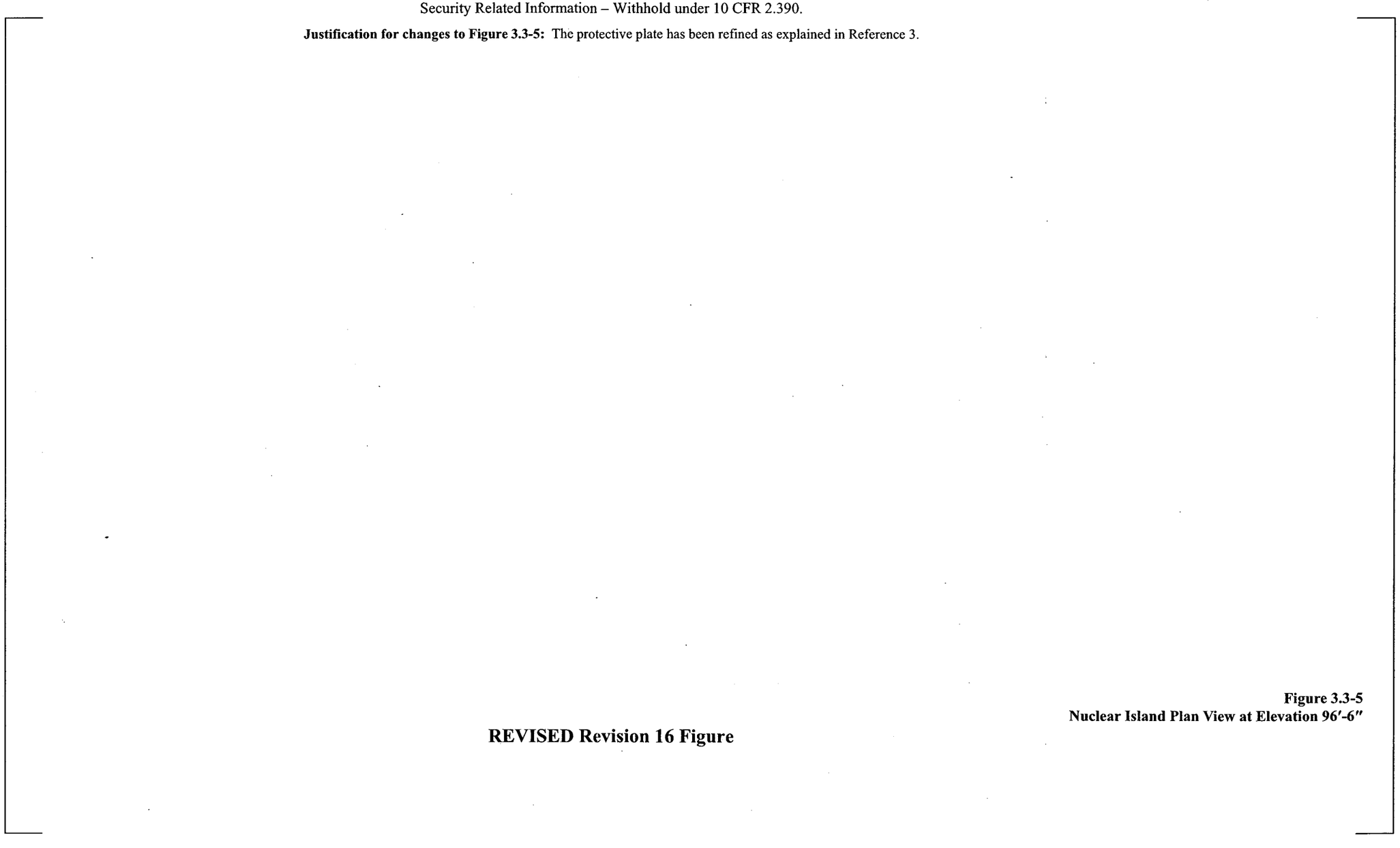
ORIGINAL Revision 16 Figure

Figure 3.3-5
Nuclear Island Plan View at Elevation 96′-6″

Security Related Information – Withhold under 10 CFR 2.390.

SRI

Justification for changes to Figure 3.3-5: The protective plate has been refined as explained in Reference 3.



REVISED Revision 16 Figure

Figure 3.3-5
Nuclear Island Plan View at Elevation 96′-6″

AP1000 Design Control Document Revision 16 Tier 2 Changes

Security Related Information – Withhold under 10 CFR 2.390.

SRI

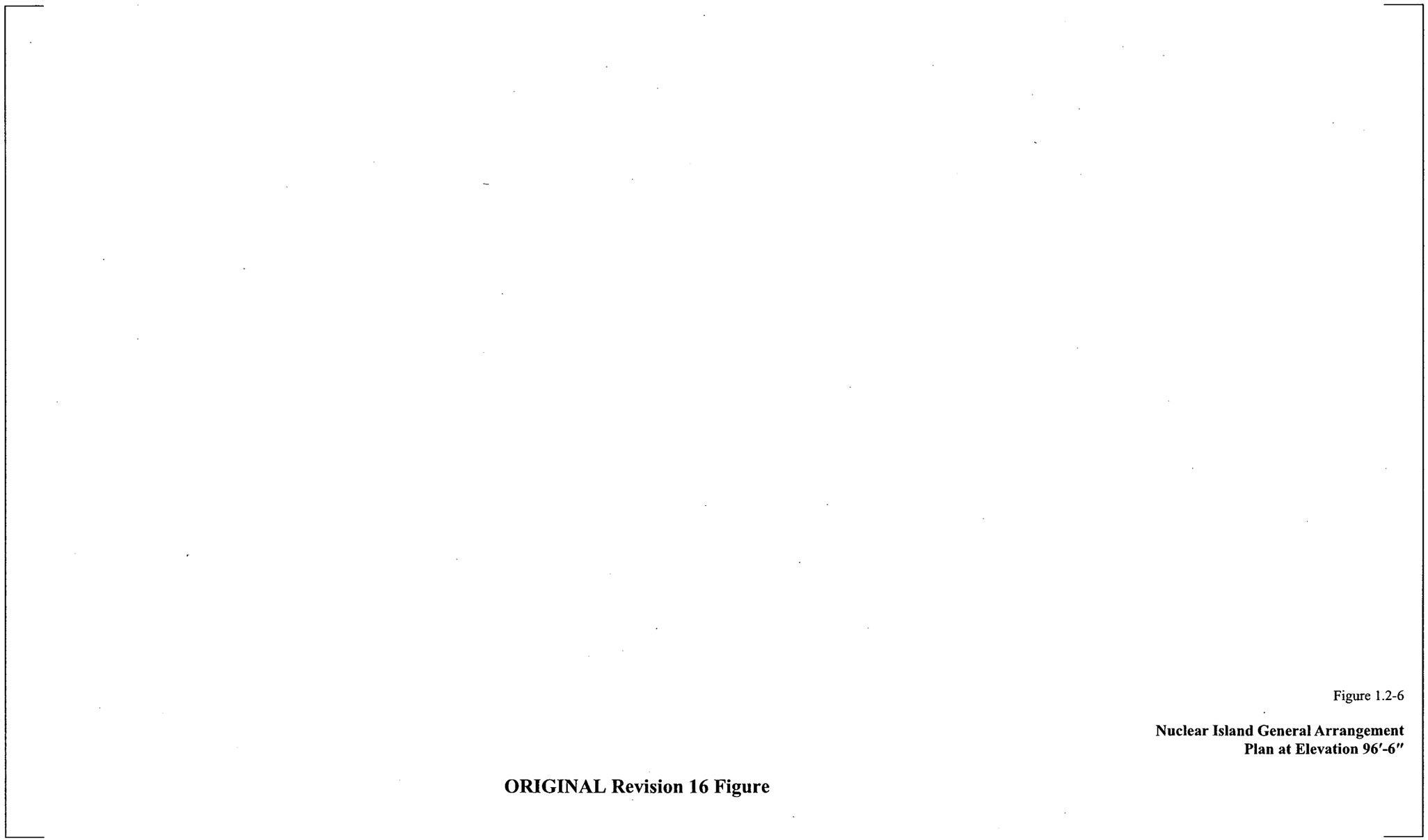


Figure 1.2-6

Nuclear Island General Arrangement Plan at Elevation 96′-6″

ORIGINAL Revision 16 Figure

Security Related Information – Withhold under 10 CFR 2.390.

SRI

Justification for changes to Figure 1.2-6: The protective plate has been refined as explained in Reference 3.

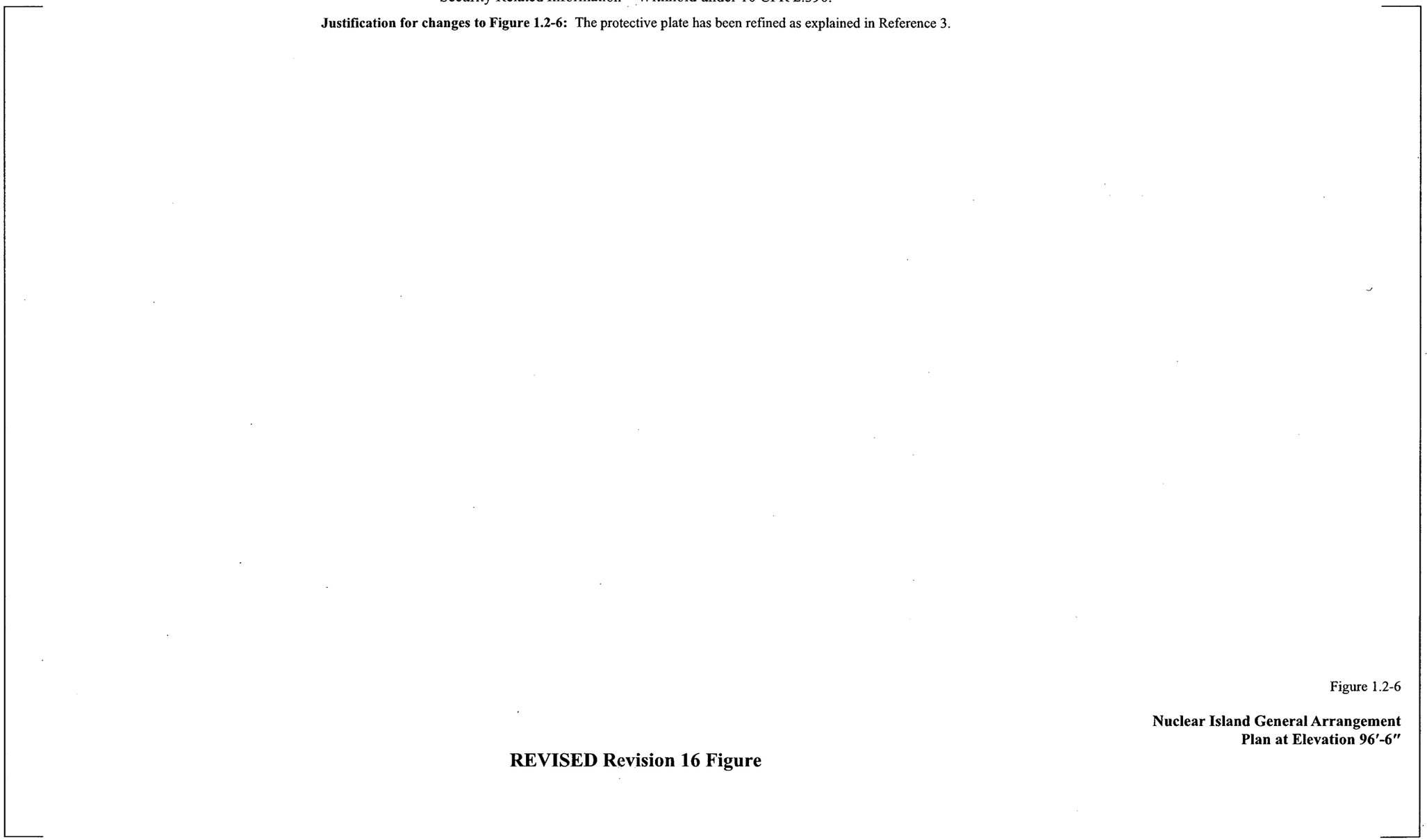


Figure 1.2-6

Nuclear Island General Arrangement Plan at Elevation 96′-6″

REVISED Revision 16 Figure

Justification for changes to Section 6.1.1.4, Paragraph 4: This paragraph has been changed to reflect the analysis performed in Reference 4.

6.1.1.4 Material Compatibility with Reactor Coolant System Coolant and Engineered Safety Features Fluids

In the post-accident environment, both aluminum and zinc surfaces in the containment are subject to chemical attack resulting in the production of hydrogen and/or chemical precipitants that can affect long term core cooling. Primary sources of aluminum in the AP1000 containment are the excore detectors described in Section 7.1.2.7.2. To avoid sump water contact with the excore detectors, they are enclosed in housings. The non-flooded surfaces would be wetted by condensing steam but they would not be subjected to the boric acid or trisodium phosphate solutions since there is no containment spray. Nonsafety-related passive autocatalytic recombiners are provided to limit hydrogen buildup inside containment.

Justification for changes to Section 6.3.2.2.7.1, Item 1, Bullets 2 and 6: These items have been changed to reflect the screen design defined in Reference 3.

6.3.2.2.7.1 General Screen Design Criteria

1. Screens are designed to Regulatory Guide 1.82, including:

   - Screens are located well below containment floodup level. Each screen provides the function of a trash rack~~,~~ and a fine screen.~~, and a~~ A debris curb is provided to prevent high density debris from being swept along the floor to the screen face.

   - Screens have solid top cover. Containment recirculation screens have protective plates that are located no more than 1 foot above the top of the screens and extend at least 10 feet in front and 7 feet to the side of the screens. The plate dimensions are relative to the portion of the screens where water flows enters the screen openings.~~through the trash rack.~~

Justification for changes to Section 6.3.2.2.7.2, Paragraph 4: These items have been changed to reflect the screen design defined in Reference 3.

6.3.2.2.7.2 IRWST Screens

The design of the IRWST screens reduces the chance of debris reaching the screens. The screens are oriented vertically such that debris that settles out of the water does not fall on the screens. A debris curb is provided to near the base~~The screen design provides a debris curb function at the base~~ of the IRWST screens to prevent high density debris from being swept along the floor by water flow to the IRWST screens. The screen design provides the trash rack function. This is accomplished by the screens having a large surface area to prevent a single object from blocking a large portion of the screen and by the screens having a robust design to preclude an object from damaging the screen and causing by-pass. The screen prevents debris larger than 0.125" from being injected into the reactor coolant system and blocking fuel cooling passages. The screen is a type ~~(folded, pockets, etc.)~~ that has sufficient surface area to accommodate debris that could be trapped on the screen. The design of the IRWST screens is described further in APP-GW-GLN-147 (Reference 4).

Justification for changes to Section 6.3.2.2.7.3, Paragraphs 1, 2, and 6: These items have been changed to reflect the screen design defined in Reference 3.

6.3.2.2.7.3 Containment Recirculation Screens

The containment recirculation screens are oriented vertically along walls above the loop compartment floor (elevation 83 feet). Figure 6.3-8 shows a plan view and Figure 6.3-9 shows a section view of these screens. Two separate screens are provided as shown in Figure 6.3-3. The loop compartment floor elevation is significantly above (11.5 feet) the lowest level in the containment, the reactor vessel cavity. A two-foot-high debris curb is provided in front of the screens.~~The bottom of the recirculation screen is two feet above the floor, providing a curb function.~~

During a LOCA, the reactor coolant system blowdown will tend to carry debris created by the accident (pipe whip/jets) into the cavity under the reactor vessel which is located away from and below the containment

recirculation screens. As the accumulators, core makeup tanks and IRWST inject, the containment water level will slowly rise above the 108 foot elevation. The containment recirculation line opens when the water level in the IRWST drops to a low level setpoint a few feet above the final containment floodup level. When the recirculation lines initially open, the water level in the IRWST is higher than the containment water level and water flows from the IRWST backwards through the containment recirculation screen. This back flow tends to flush debris located close to the recirculation screens away from the screens. A flow connection between screen A and screen B is provided ~~cross connect pipe line interconnects the two PXS subsystems~~ so that both recirculation screens will operate, even in the case of a LOCA of a DVI line in a PXS valve room. Such a LOCA can flood the recirculation valves located in one of the PXS rooms before they are actuated, and the failure of these valves is assumed since they are not qualified to operate in such conditions. The recirculation valves in the other PXS valve room are unaffected.

The design of the containment recirculation screens reduces the chance of debris reaching the screens. The screens are orientated vertically such that debris settling out of the water will not fall on the screens. The protective plates described above provide additional protection to the screens from debris. ~~The bottom of the screens are located 2 feet above the floor, instead of using a debris curb,~~ A two-foot-high debris curb is provided to prevent high density debris from being swept along the floor by water flow to the containment recirculation screens. The screen design provides the trash rack function. This is accomplished by the screens having a large surface area to prevent a single object from blocking a large portion of the screen and by the screens having a robust design to preclude an object from damaging the screen and causing by-pass. The screen prevents debris larger than 0.125" from being injected into the reactor coolant system and blocking fuel cooling passages. The screen is a type ~~(folded, pocket, etc.)~~ that has more surface area to accommodate debris that could be trapped on the ~~fine~~ screen. The design of the containment recirculation screens is described further in APP-GW-GLN-147 (Reference 4).

Justification for changes to Section 6.3.9: This section is changed to include the reference to APP-GW-GLN-147 in the DCD.

6.3.9 References

1. WCAP-8966, "Evaluation of Mispositioned ECCS Valves," September 1977.

2. WCAP-13594 (P), WCAP-13662 (NP), "FMEA of Advanced Passive Plant Protection System," Revision 1, June 1998.

3. APP-GW-GLR-079, "AP1000 Verification of Water Sources for Long-Term Recirculation Cooling Following a LOCA," Westinghouse Electric Company LLC.

4. APP-GW-GLN-147, "AP1000 Containment Recirculation and IRWST Screen Design," Westinghouse Electric Company LLC.

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Justification for changes to Table 6.3-2: These items have been changed to reflect the screen design defined in Reference 3.

Table 6.3-2 (Sheet 2 of 2)

COMPONENT DATA - PASSIVE CORE COOLING SYSTEM

Screens	IRWST	Containment Recirculation
Number	2	2 ~~(Connected)~~
Surface area, screen (square feet)	≥500 per screen	≥2,500 per screen
Material	Stainless steel	Stainless steel
AP1000 equipment class	C	C

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SEE FOLLOWING PAGE FOR MARKUPS OF CIRCLED AREAS

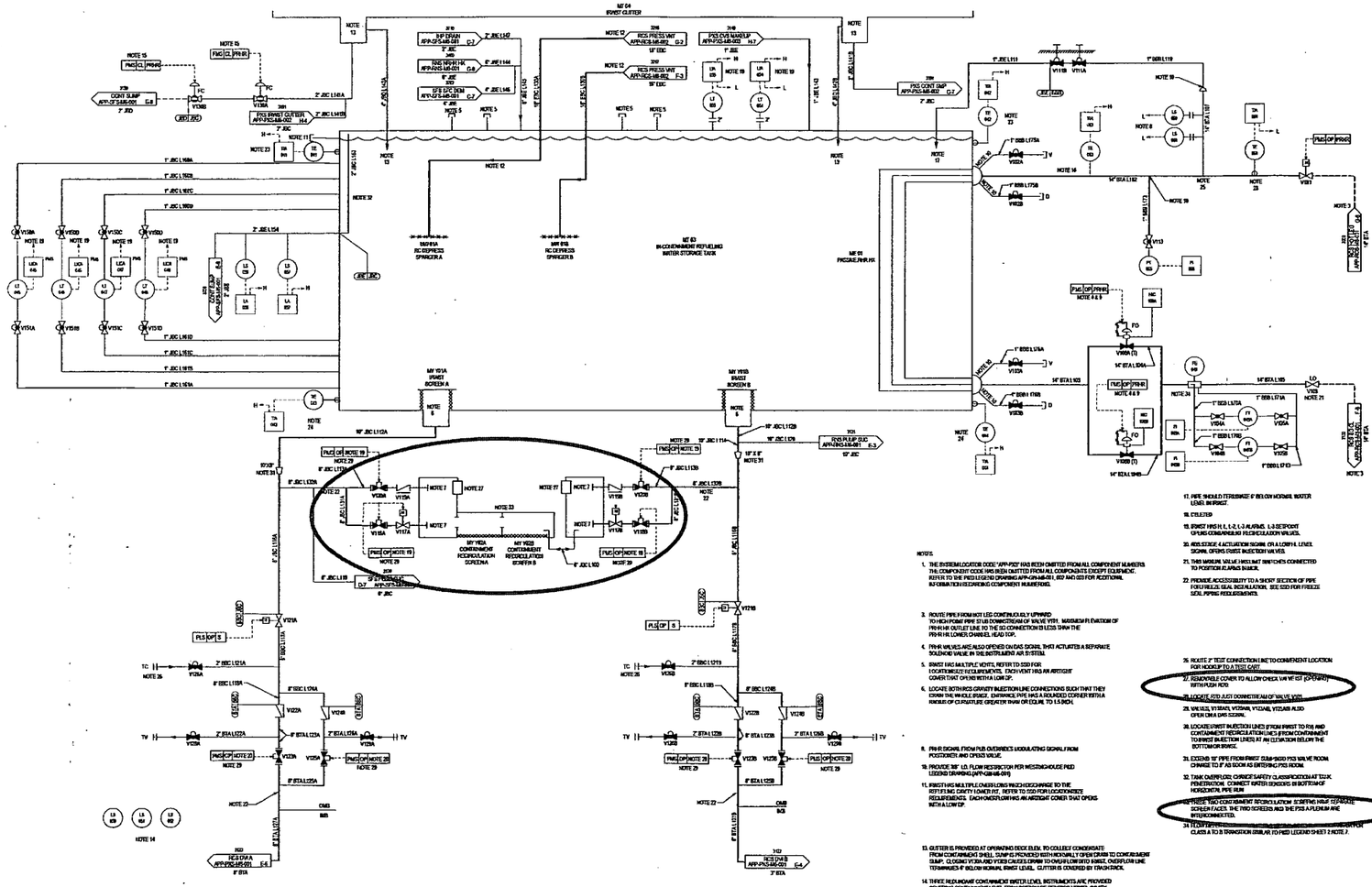

Figure 6.3-2
Passive Core Cooling System
Piping and Instrumentation Diagram (Sheet 2)

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Justification for changes to Figure 6.3-2 Sheet 2: These items have been changed to reflect the screen design defined in Reference 3 including the new 10 inch connection pipe between the north end of screen B and the Line B piping system.

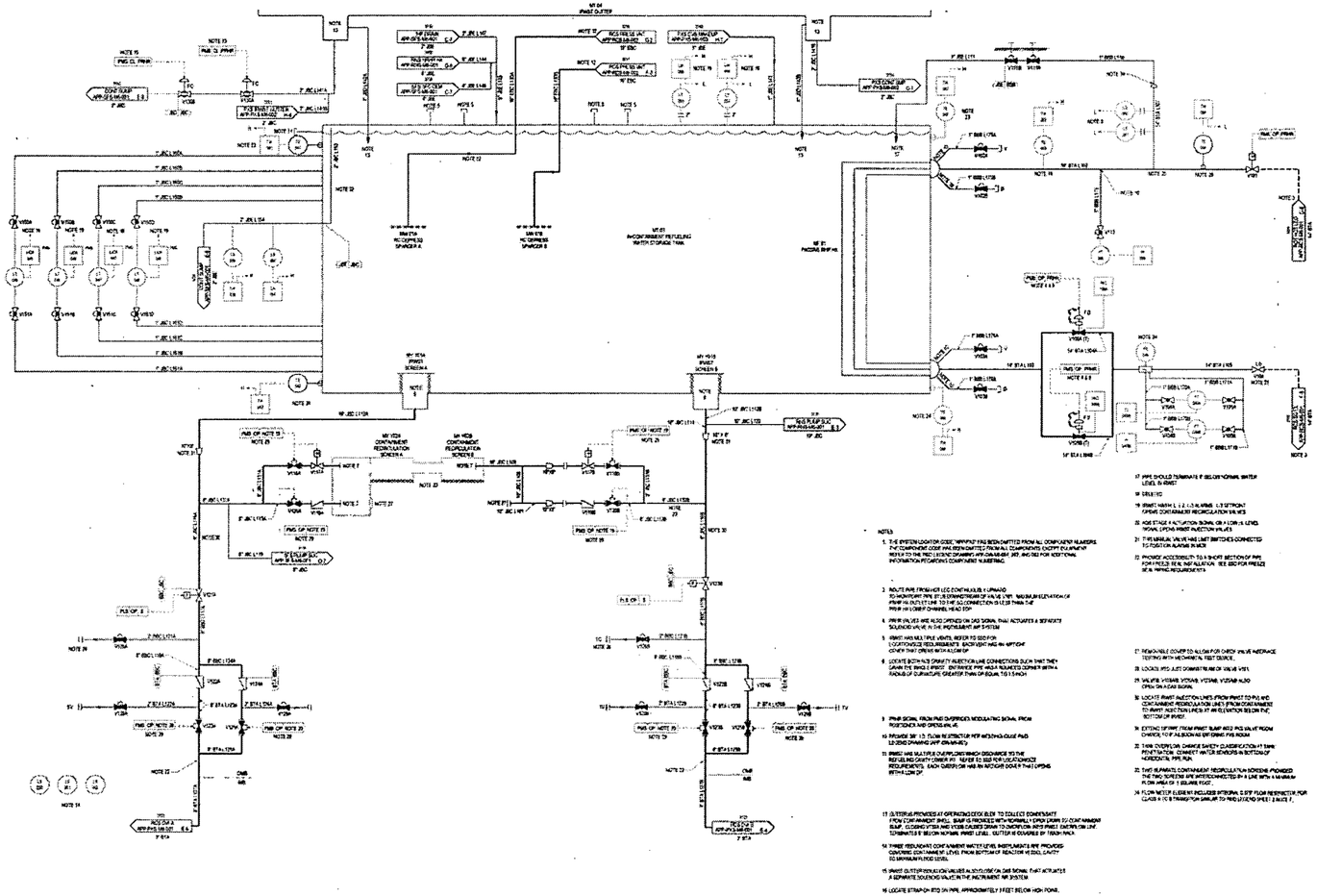

Figure 6.3-2
Passive Core Cooling System
Piping and Instrumentation Diagram (Sheet 2)

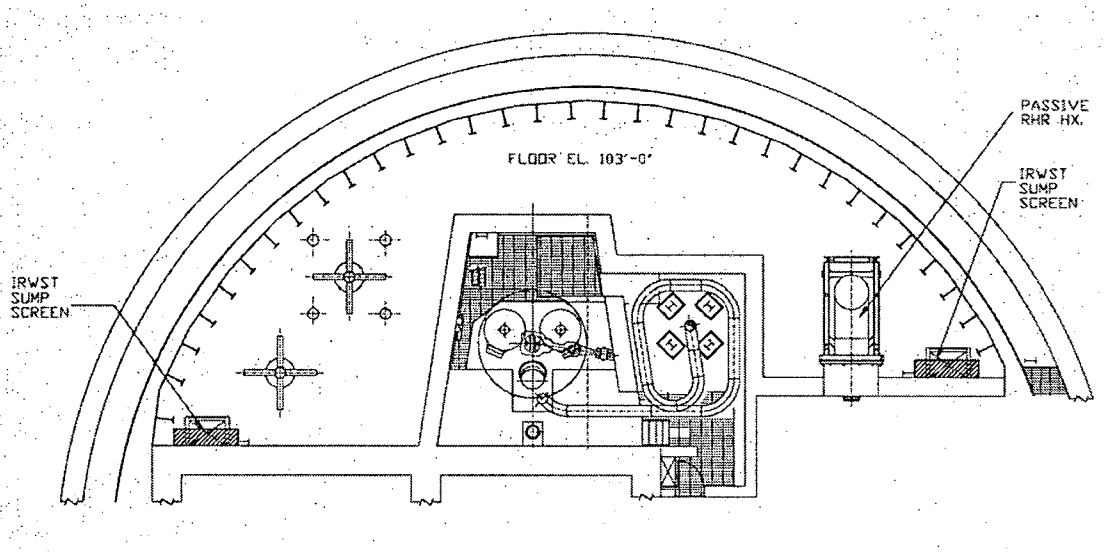

Figure 6.3-6

IRWST Screen Plan Location

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Justification for changes to Figure 6.3-6: The figure is changed to show the revised location of the IRWST screens.

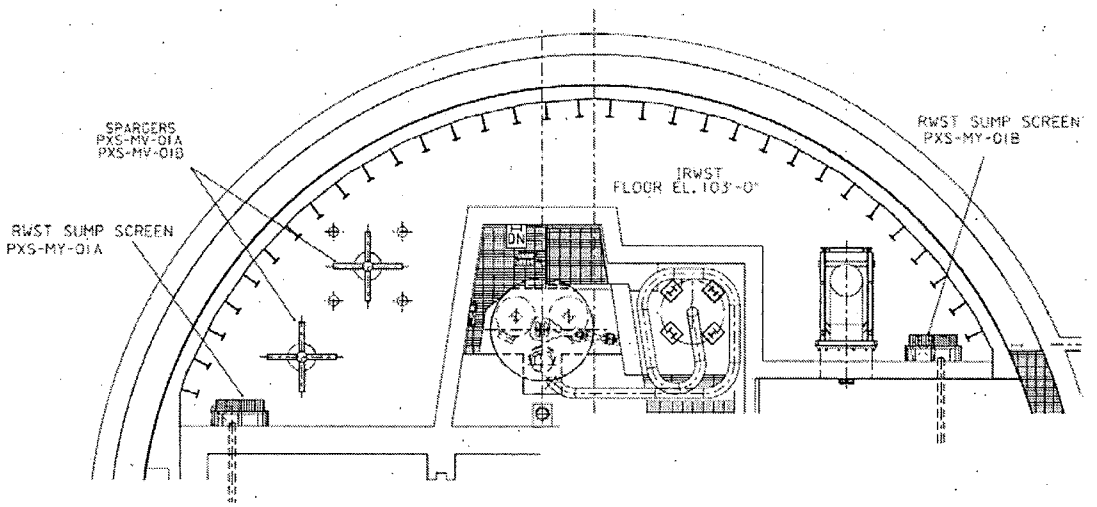


Figure 6.3-6

IRWST Screen Plan Location

REVISED Revision 16 Figure

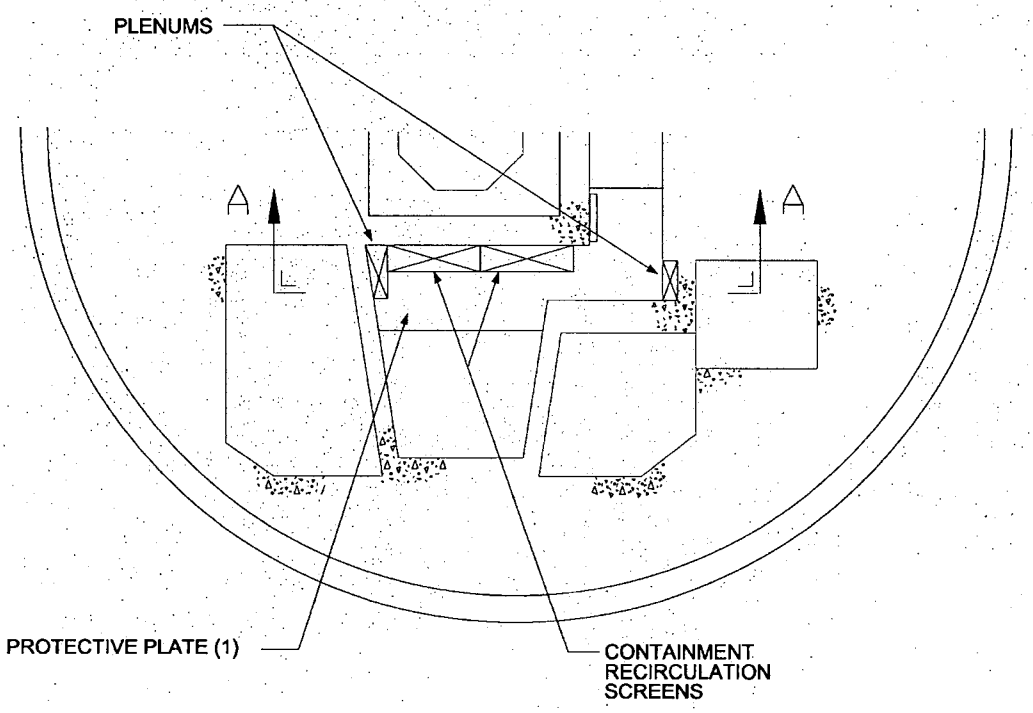
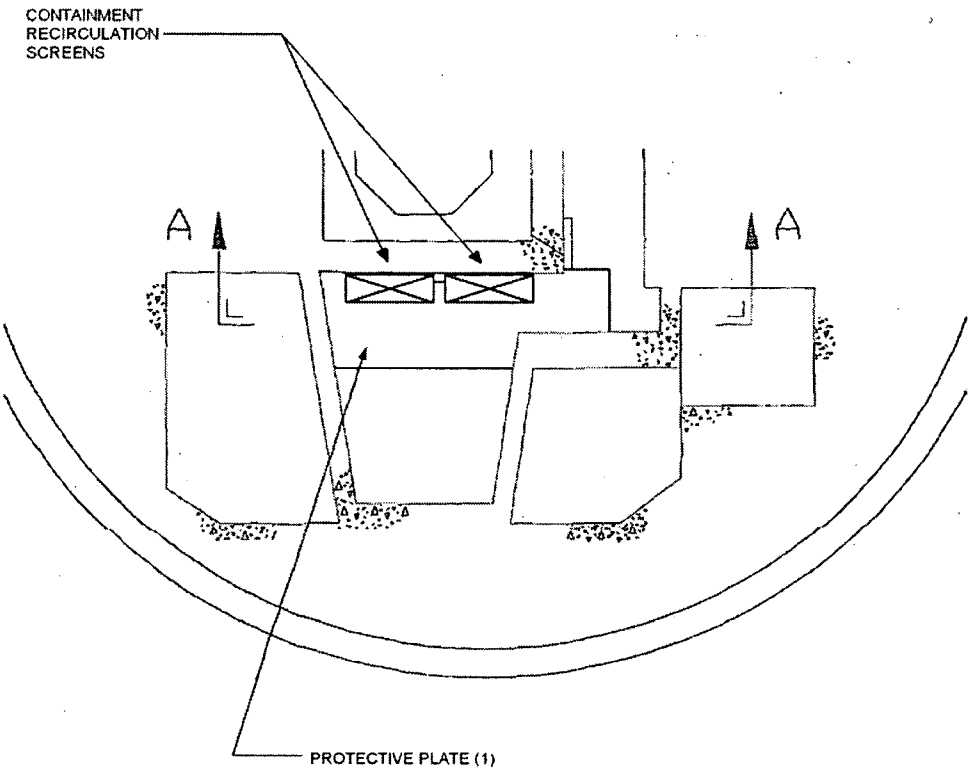


Figure 6.3-8

Containment Recirculation Screen Location Plan

ORIGINAL Revision 16 Figure

Justification for changes to Figure 6.3-8: The figure is changed to show the revised screen design defined in Reference 3.

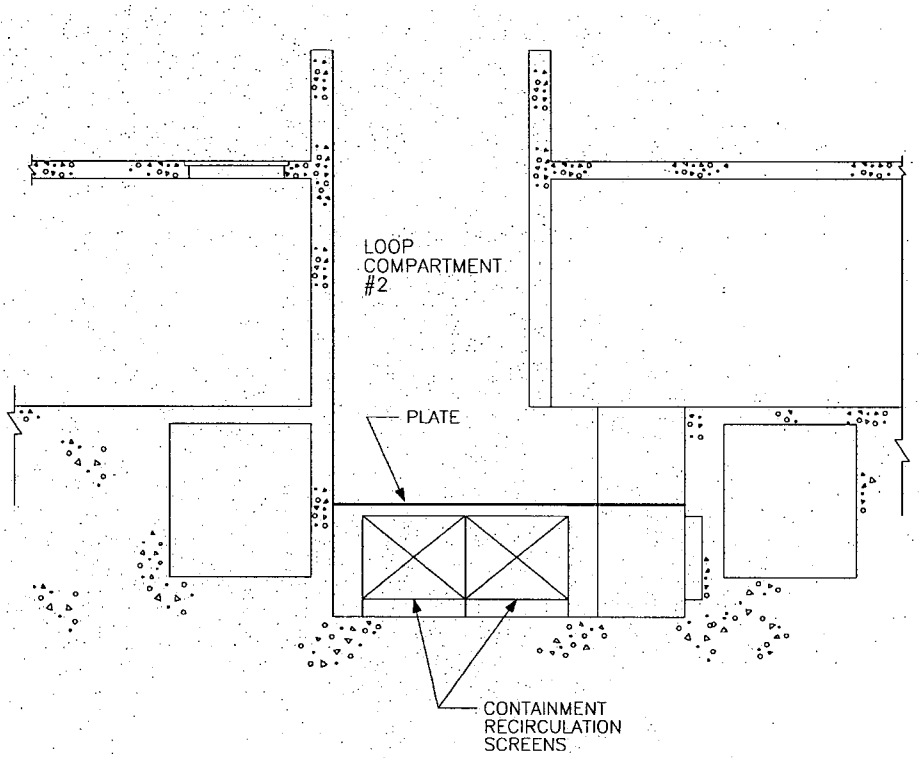


(1) MINIMUM PLATE SIZE AND ELEVATION LIMITS ARE DEFINED IN SUBSECTION 6.3.2.2.7.1

Figure 6.3-8

Containment Recirculation Screen Location Plan

REVISED Revision 16 Figure



SECTION A–A

NOTE 1 – MINIMUM PLATE SIZE AND ELEVATION LIMITS ARE DEFINED IN SUBSECTION 6.3.2.2.7.1.

Figure 6.3-9

Containment Recirculation Screen Location Elevation

ORIGINAL Revision 16 Figure

Justification for changes to Figure 6.3-9: The figure is changed to show the revised screen design defined in Reference 3.

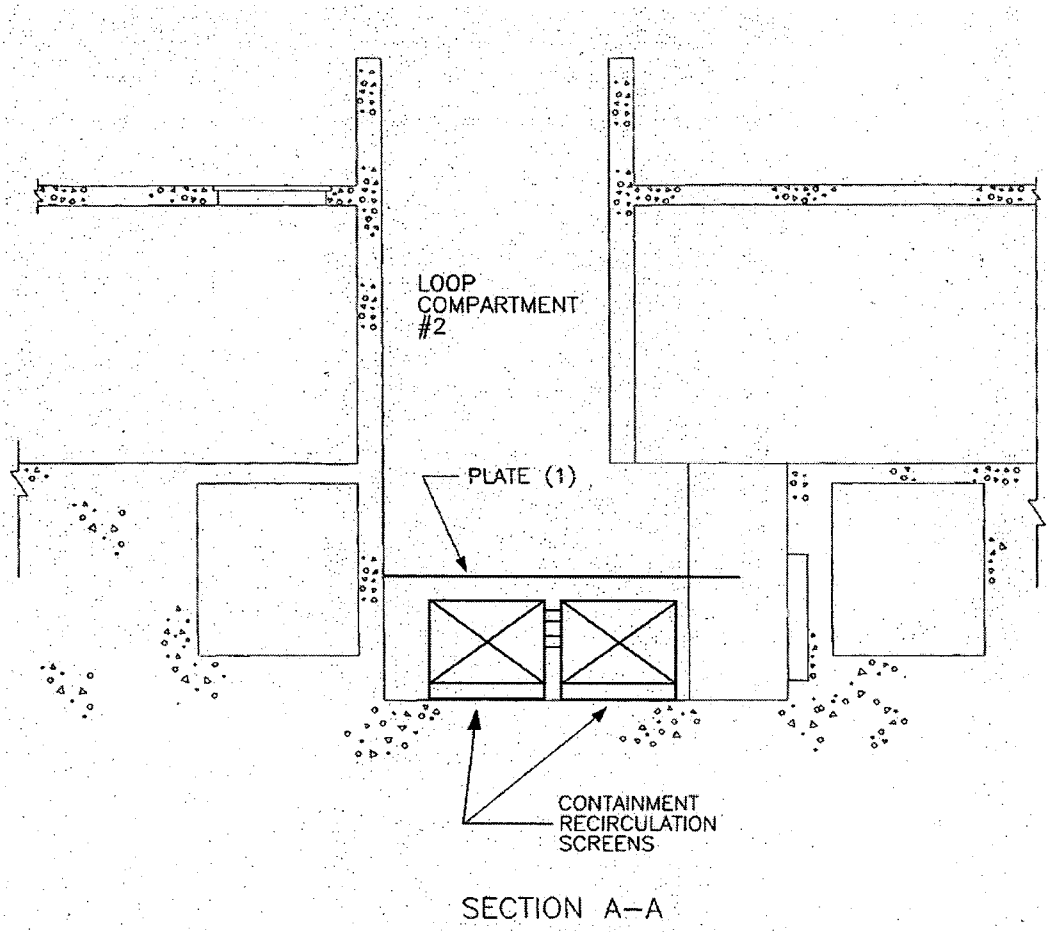


Figure 6.3-9

Containment Recirculation Screen Location Elevation

REVISED Revision 16 Figure

Security Related Information – Withhold under 10 CFR 2.390.

SRI

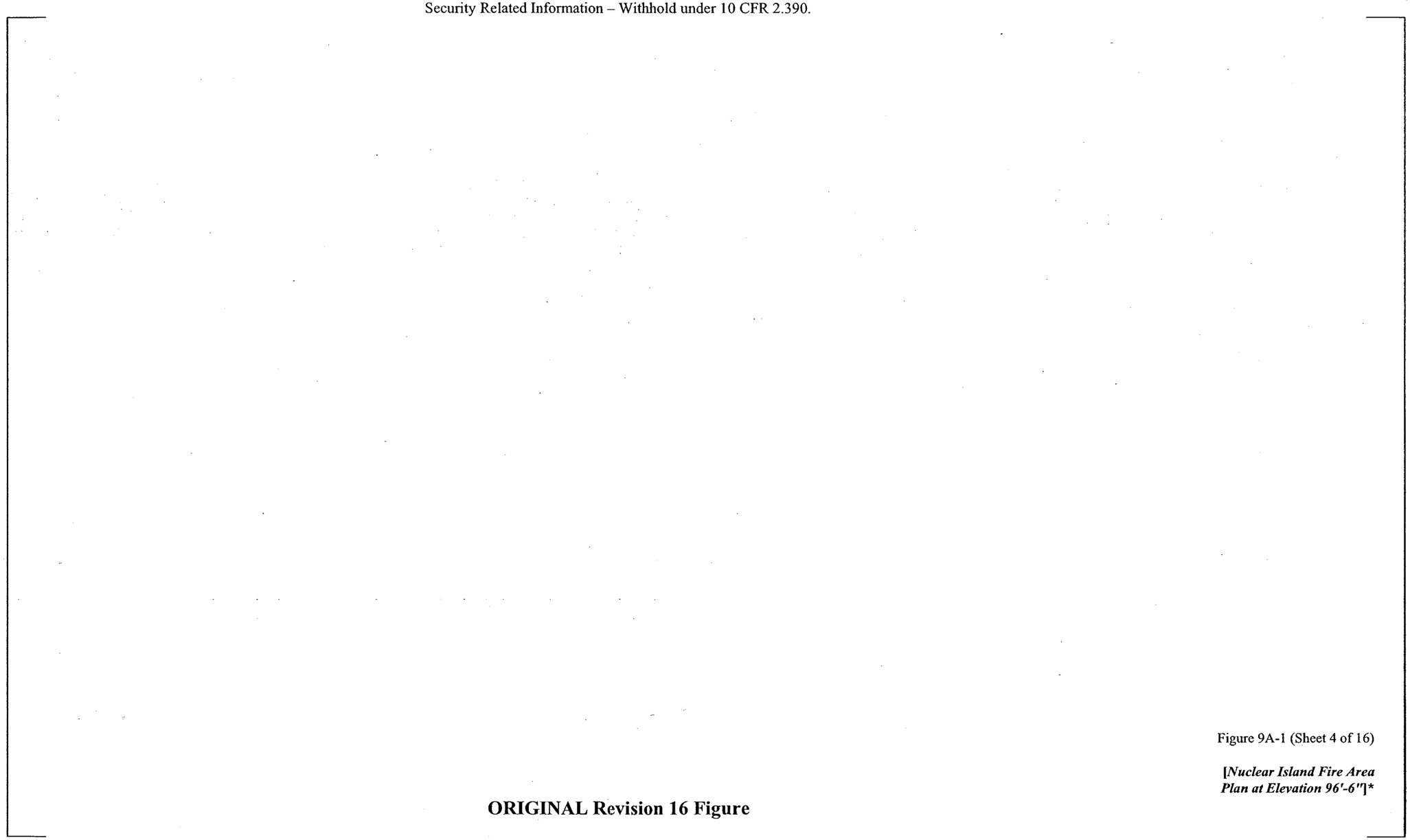


Figure 9A-1 (Sheet 4 of 16)

[Nuclear Island Fire Area Plan at Elevation 96'-6"]*

ORIGINAL Revision 16 Figure

Security Related Information – Withhold under 10 CFR 2.390.

Justification for changes to Figure 9A-1: The protective plate has been refined as explained in Reference 3.

SRI

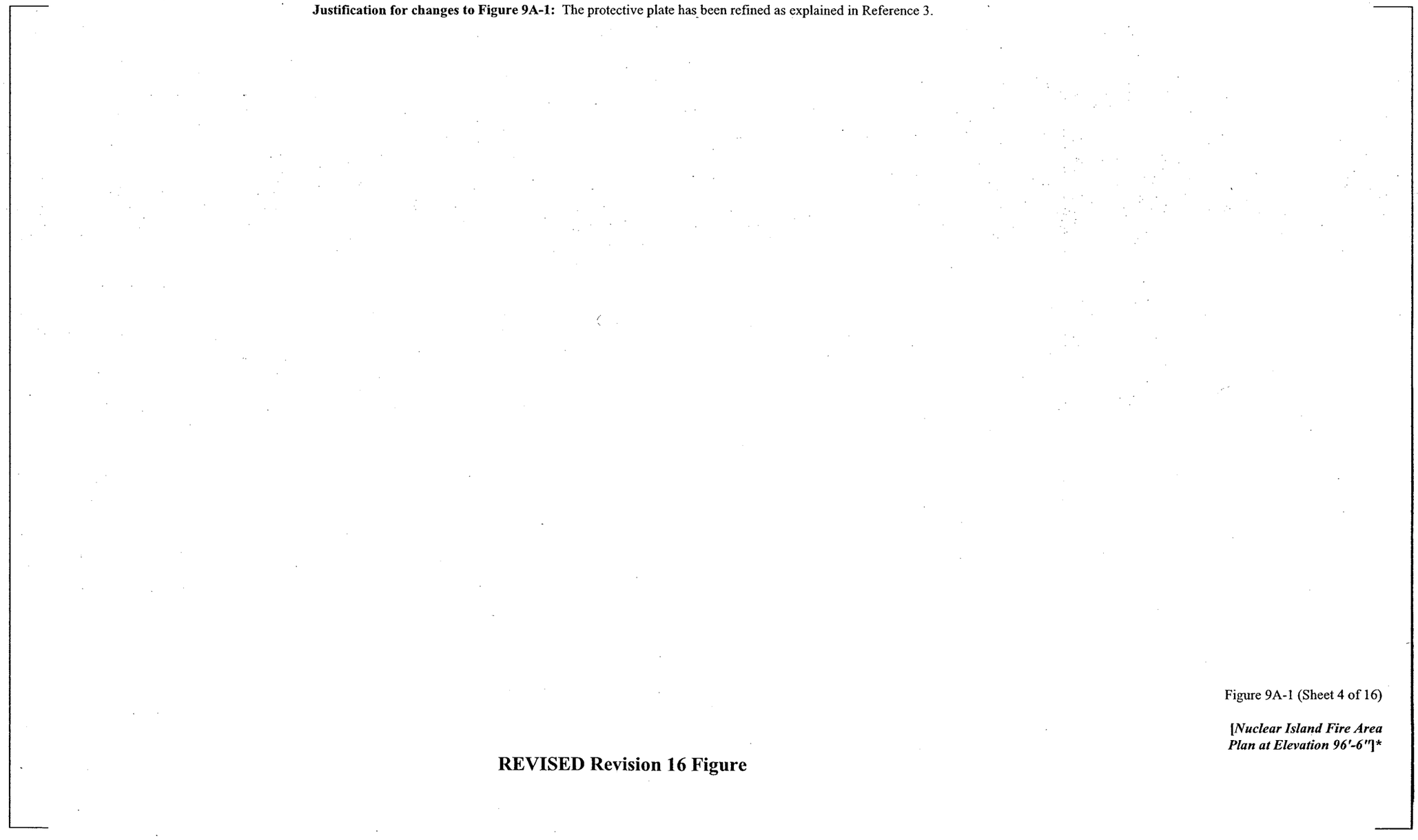


Figure 9A-1 (Sheet 4 of 16)

[Nuclear Island Fire Area Plan at Elevation 96'-6"]*

REVISED Revision 16 Figure

Security Related Information – Withhold under 10 CFR 2.390.

SRI

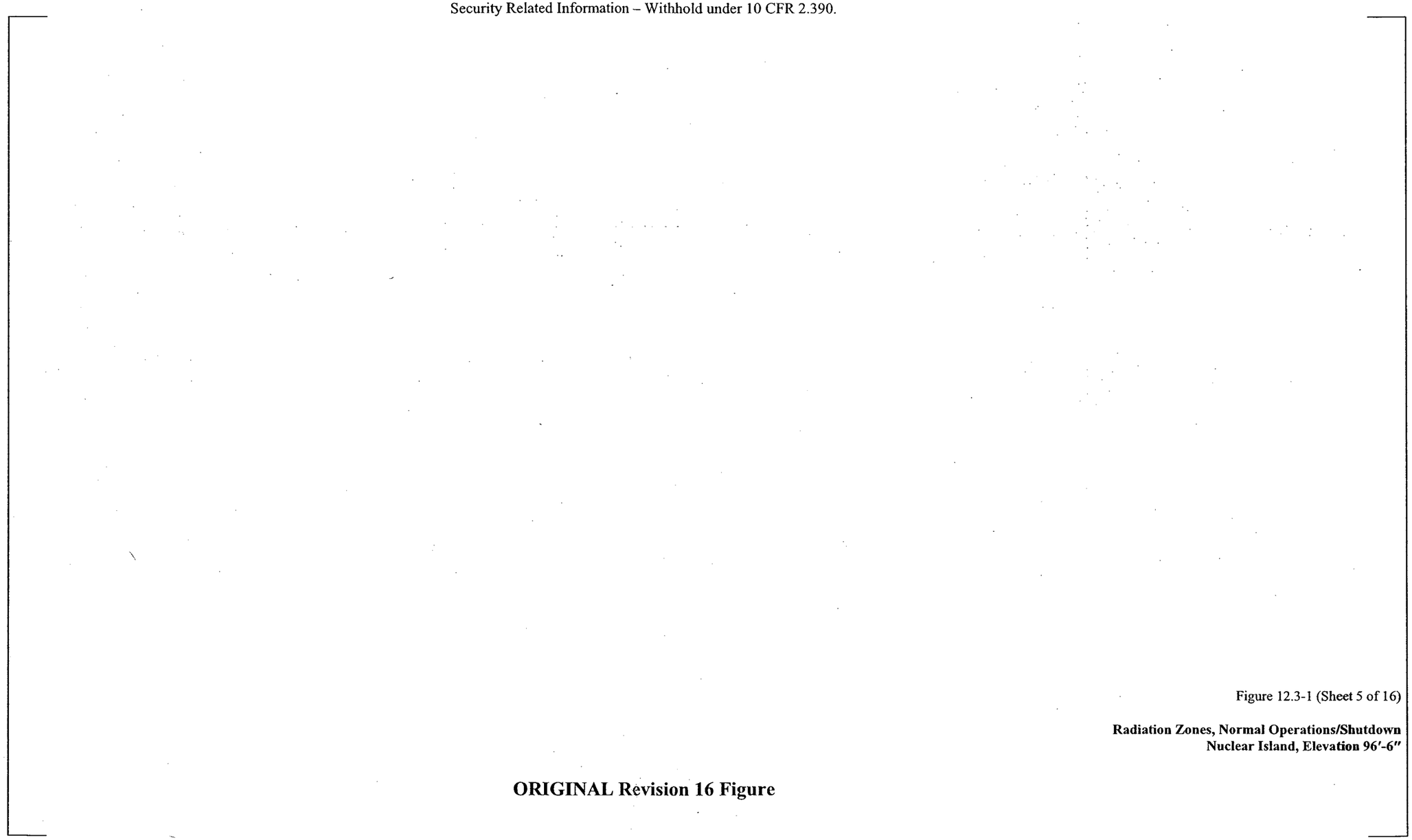


Figure 12.3-1 (Sheet 5 of 16)

Radiation Zones, Normal Operations/Shutdown
Nuclear Island, Elevation 96′-6″

ORIGINAL Revision 16 Figure

Security Related Information – Withhold under 10 CFR 2.390.

SRI

Justification for changes to Figure 12.3-1: The protective plate has been refined as explained in Reference 3.

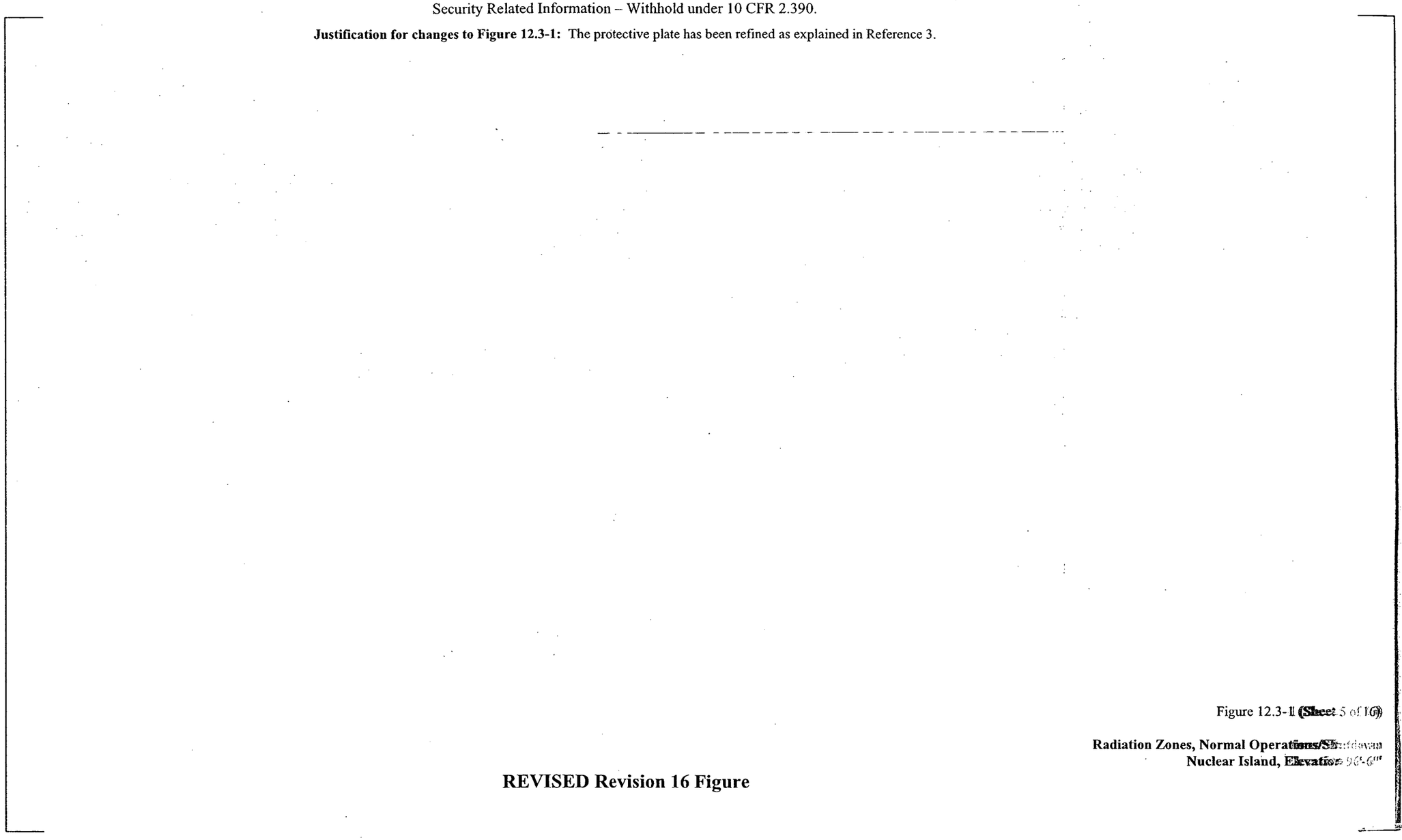


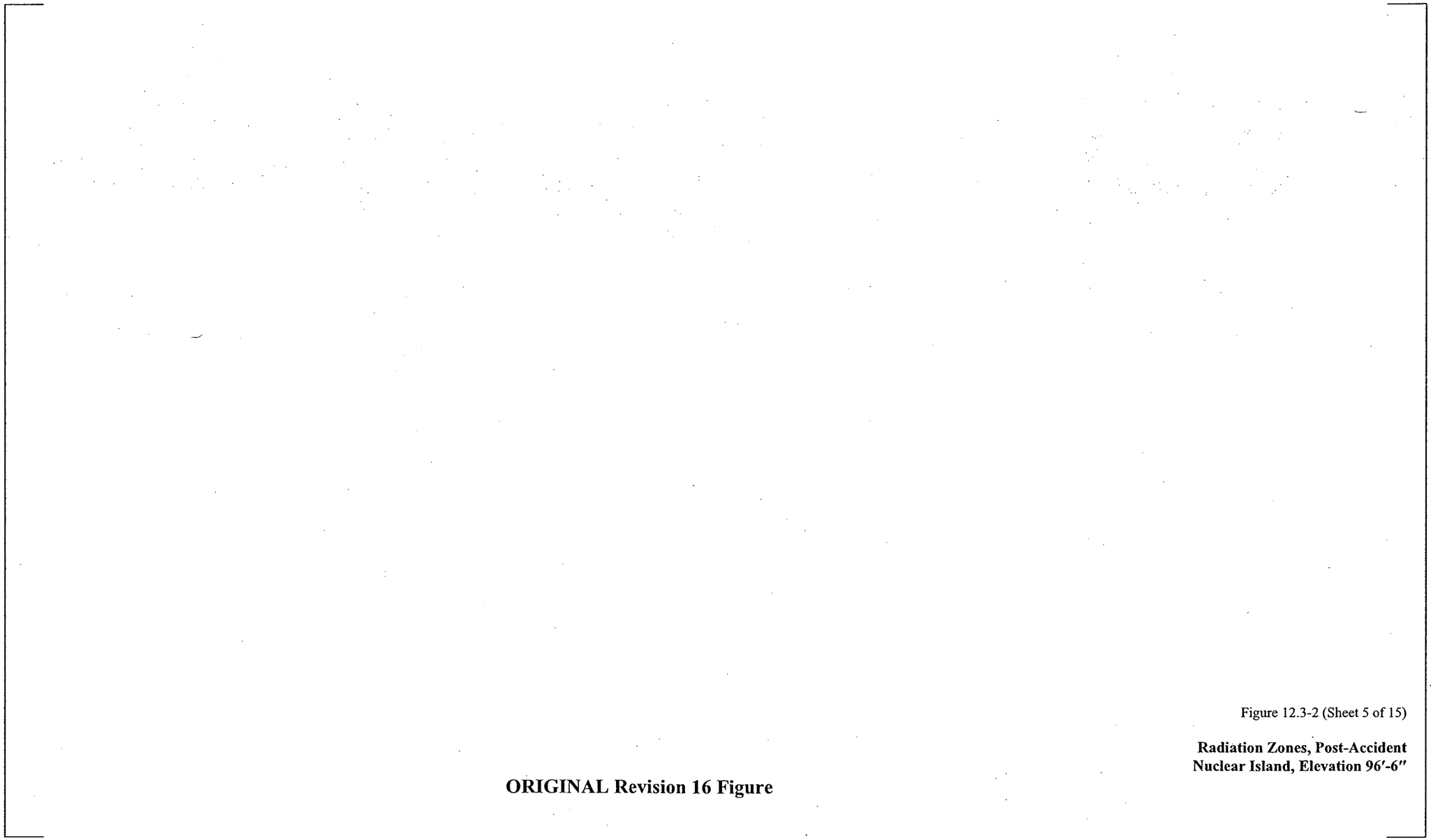
Figure 12.3-1 (Sheet 5 of 16)

Radiation Zones, Normal Operations/Shutdown
Nuclear Island, Elevation 90'-0"

REVISED Revision 16 Figure

Security Related Information – Withhold under 10 CFR 2.390.

SRI



ORIGINAL Revision 16 Figure

Figure 12.3-2 (Sheet 5 of 15)

Radiation Zones, Post-Accident
Nuclear Island, Elevation 96′-6″

Security Related Information – Withhold under 10 CFR 2.390.

SRI

Justification for changes to Figure 12.3-2: The protective plate has been refined as explained in Reference 3.

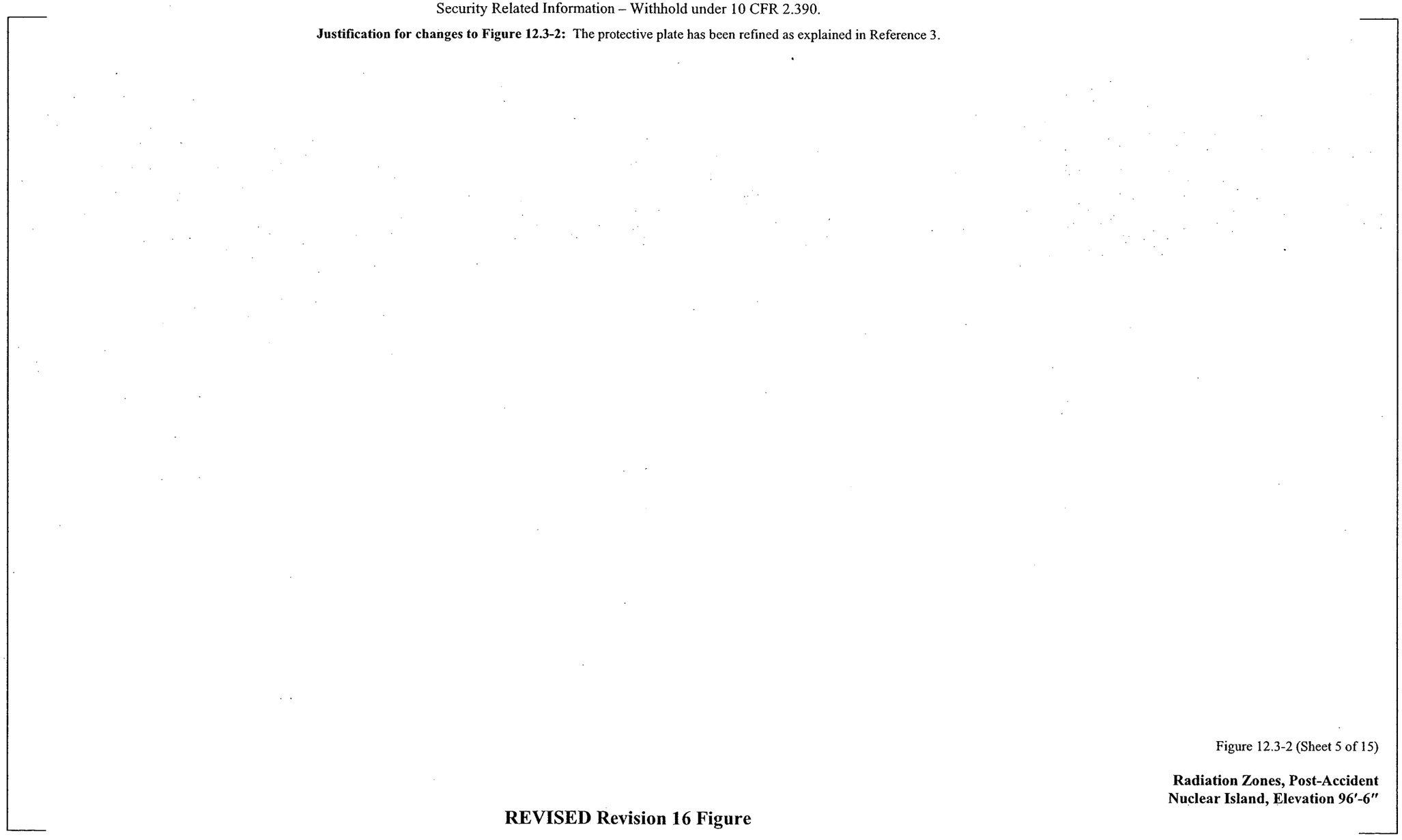


Figure 12.3-2 (Sheet 5 of 15)

Radiation Zones, Post-Accident
Nuclear Island, Elevation 96′-6″

REVISED Revision 16 Figure

SRI

Security Related Information – Withhold under 10 CFR 2.390.

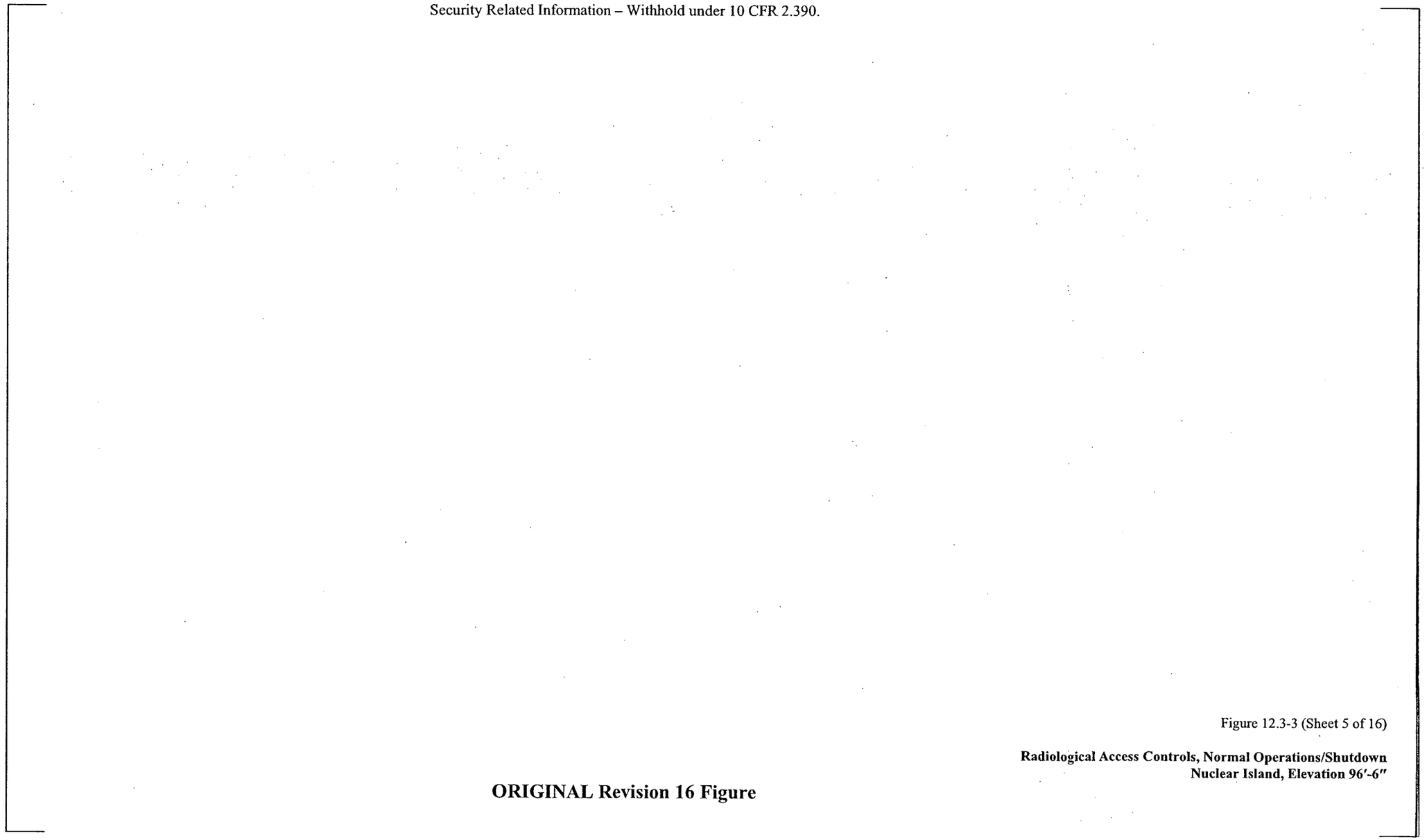


Figure 12.3-3 (Sheet 5 of 16)

**Radiological Access Controls, Normal Operations/Shutdown
Nuclear Island, Elevation 96′-6″**

ORIGINAL Revision 16 Figure

Security Related Information – Withhold under 10 CFR 2.390.

Justification for changes to Figure 12.3-3: The protective plate has been refined as explained in Reference 3.

SRI

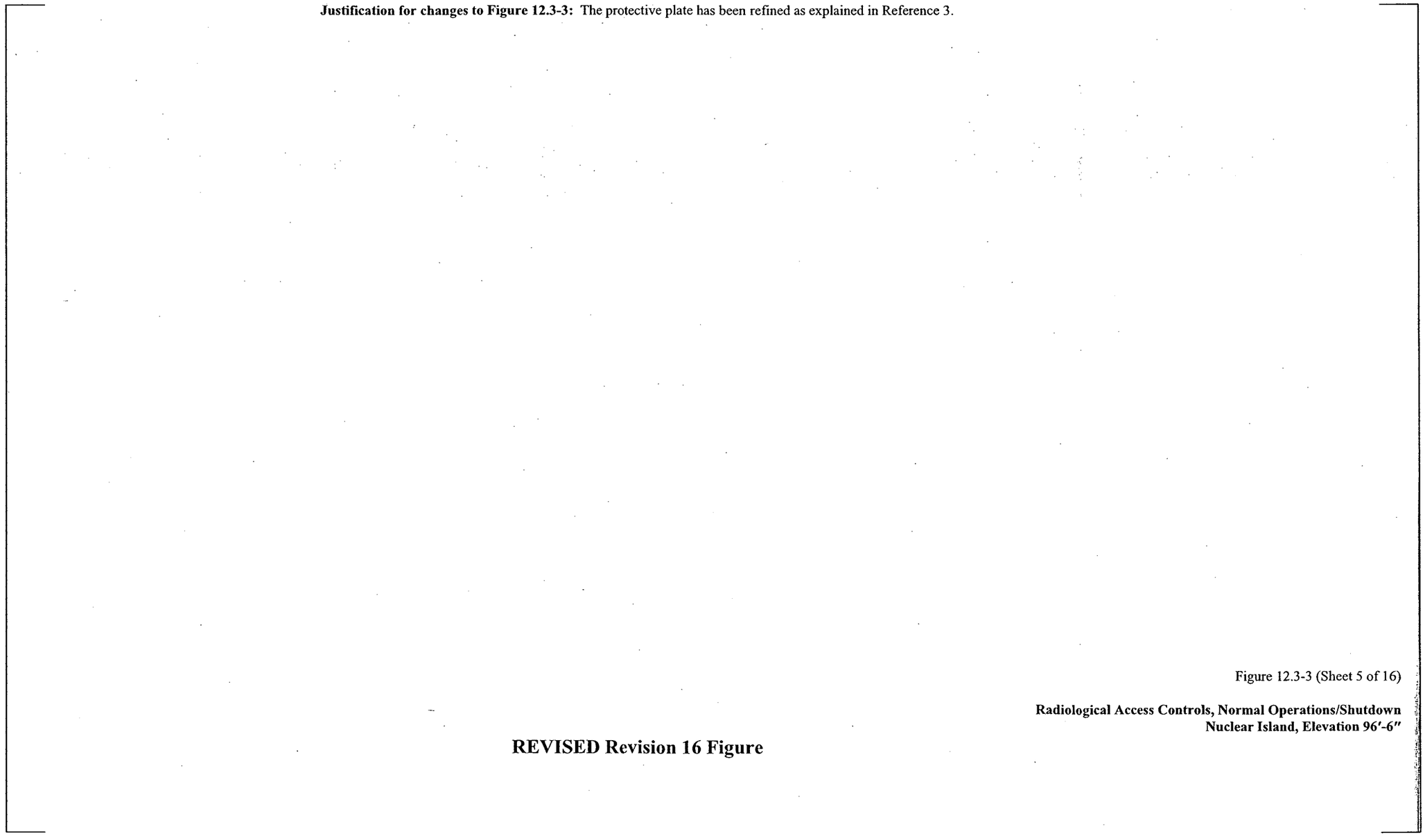


Figure 12.3-3 (Sheet 5 of 16)

Radiological Access Controls, Normal Operations/Shutdown
Nuclear Island, Elevation 96′-6″

REVISED Revision 16 Figure

Document Number: APP-GW-GLE-002 NS **Revision Number:** 1

Title: Impacts to the AP1000 DCD to Address Generic Safety Issue (GSI)-191

Justification for changes to Table 14.3-2 (Sheet 3 of 17): To be consistent with the analysis performed in Reference 4.

Table 14.3-2 (Sheet 3 of 17)

DESIGN BASIS ACCIDENT ANALYSIS

Reference	Design Feature	Value
Table 5.4-17	Pressurizer Safety Valves - Design Parameters: - Number - Minimum required relieving capacity per valve (lbm/hr) - Set pressure (psig)	 2 ≥ 750,000 2485 ± 25
Table 6.1-2	The exterior of the containment vessel (above plant elevation 135′ 3″) and the interior of the containment vessel (above 7′ above the operating deck) is coated with an inorganic zinc coating.	
Section 6.1.1.4	The exposed surfaces of the excore detectors are made of stainless steel or titanium.	
Section 6.1.2.1.5	The nonsafety-related coatings used inside containment on walls, floors, ceilings, structural steel which is part of the building structure, and on the polar crane have a minimum dry film density (lb/ft^3).	≥ 100
Section 6.2.1.1.3	Internal containment structures, both metallic and concrete, act as passive internal heat sinks during a LOCA or a MSLB.	
Figure 6.2.2-1	The passive containment cooling system consists of a water storage tank, cooling water flow discharge path to the containment shell, a water distribution system for the containment shell, and a cooling air flow path.	
Figure 6.2.2-1	The minimum duration the PCS cooling water flow is provided from the PCCWST (hours).	≥ 72
Table 6.2.2-1	The water coverage of the containment shell exceeds the amount used in the safety analysis.	
Table 6.2.2-1	The minimum drain flow rate capacity of the upper annulus drain (gpm).	≥ 525
Table 6.2.2-1	The minimum makeup flow rate capability from an external source to the PCS water storage tank (gpm).	≥ 100
Table 6.2.2-1	The minimum makeup flow rate capability from the PCS water storage tank to the spent fuel pit (gpm).	≥ 118