

AP1000 DOCUMENT COVER SHEET

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AP1000 DOCUMENT NO. APP-GW-GLN-003	REVISION NO. 0	Page of	ASSIGNED TO W-A. Sterdis
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ALTERNATE DOCUMENT NUMBER: _____ WORK BREAKDOWN #: _____
 ORIGINATING ORGANIZATION: Westinghouse Electric Company
 TITLE: Hydrogen Igniter Locations

ATTACHMENTS:	DCP #/REV. INCORPORATED IN THIS DOCUMENT REVISION:
CALCULATION/ANALYSIS REFERENCE:	

ELECTRONIC FILENAME	ELECTRONIC FILE FORMAT	ELECTRONIC FILE DESCRIPTION
GLN003	Microsoft Word	

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* Approval of the responsible manager signifies that document is complete, all required reviews are complete, electronic file is attached and document is released for use.

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

The purpose of this AP1000 Standard Combined License Application Technical Report is to correct or modify the elevations or locations of certain hydrogen igniters within the AP1000 hydrogen control system. Igniter locations are being adjusted consistent with the physical plant layout. Their number and electrical power grouping are not changed.

I. APPLICABILITY DETERMINATION

This evaluation is prepared to document that the change described above is a departure from Tier 2 information of the AP1000 Design Control Document (DCD) that may be included in plant specific FSARs without prior NRC approval.

A.	Does the proposed change include a change to:		
	1. Tier 1 of the AP1000 Design Control Document APP-GW-GL-700	<input checked="" type="checkbox"/> NO <input type="checkbox"/> YES	(If YES prepare a report for NRC review of the changes)
	2. Tier 2* of the AP1000 Design Control Document, APP-GW-GL-700	<input checked="" type="checkbox"/> NO <input type="checkbox"/> YES	(If YES prepare a report for NRC review of the changes)
	3. Technical Specification in Chapter 16 of the AP1000 Design Control Document, APP-GW-GL-700	<input checked="" type="checkbox"/> NO <input type="checkbox"/> YES	(If YES prepare a report for NRC review of the changes)
B.	Does the proposed change involve:		
	1. Closure of a Combined License Information Item identified in the AP1000 Design Control Document, APP-GW-GL-700	<input checked="" type="checkbox"/> NO <input type="checkbox"/> YES	(If YES prepare a COL item closure report for NRC review.)
	2. Completion of an ITAAC item identified in Tier 1 of the AP1000 Design Control Document, APP-GW-GL-700	<input checked="" type="checkbox"/> NO <input type="checkbox"/> YES	(If YES prepare an ITAAC completion report for NRC review.)

The questions above are answered no, therefore the departure from the DCD does not require prior NRC review unless review is required by the criteria of 10 CFR Part 52 Appendix D Section VIII B.5.b. or B.5c

II. TECHNICAL DESCRIPTION AND JUSTIFICATION

The elevations and locations of certain hydrogen igniters must be changed either because (1) the polar crane elevation has changed, or (2) to place the igniters in locations where they are more easily accessible or to avoid trip hazard. The compartment areas serviced by the relocated igniters and the assigned power grouping have not been revised.

Changing the elevation or location of the specific hydrogen igniters (identified below) does not alter their design function. These changes have no effect on analysis or analysis method. There is no change to the compartment areas serviced by the relocated igniters or the assigned power grouping of the igniters. There is no change to Tier 1 information.

The changes to the DCD relocating certain igniter presented in this report do not represent an adverse change to the igniter design function or to how hydrogen control functions are performed or controlled. The changes to the DCD do not involve revising or replacing a DCD-described evaluation methodology nor involve a test or experiment not described in the DCD. The DCD change does not require a license amendment per the criteria of VIII. B. 5.b. of Appendix D to 10 CFR Part 52.

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The DCD change does not affect resolution of a severe accident issue and does not require a license amendment based on the criteria of VIII. B. 5.c of Appendix D to 10 CFR Part 52.

III. DCD MARK-UP

Table 6.2.4-6 Revise the third item in Table 6.2.4-6 (Sheet 2 of 3) as follows:

Table 6.2.4-6 (Sheet 2 of 3)
IGNITER LOCATION

- **Pressurizer Compartment** – Hydrogen releases within the pressurizer compartment would flow up through the compartment toward the dome region. Igniter coverage is provided within the compartment consists of a total of four igniters at two different elevations covering the perimeter of the compartment with two igniters powered by one power group and two by the second power group. Additional coverage is provided above the pressurizer compartment at elevation 162' to 164' with two igniters above powered by different power groups.

Table 6.2.4-6 Revise the third and fifth item in Table 6.2.4-6 (Sheet 3 of 3) as follows:

Table 6.2.4-6 (Sheet 3 of 3)
IGNITER LOCATION

- **IRWST** – Hydrogen releases into the IRWST are controlled by the distribution of igniters internal to the IRWST and within the vents from and into the IRWST. Two igniters on different power groups are located within the IRWST just below the tank roof of the IRWST and near above the spargers. In the event of hydrogen releases via the spargers, the igniters near directly above the release points will provide the most immediate point of recombination. Should the environment within the IRWST be inerted or otherwise not be ignited by the assemblies above the spargers, the hydrogen will be ignited as it exhausts from the IRWST at any of four of the vents fitted with igniter assemblies. Two of the four igniters are powered by one power group and two by the second power group. Finally, in the event that the IRWST is hydrogen rich and air is drawn into the IRWST the mixture will become flammable. In order to provide this recombination, the two inlet vents on the other side of the IRWST from the sparger and primary exhaust vents are fitted an igniter each.
- **Upper Compartment** – Hydrogen control is provided at three separate levels within the upper compartment. At the 162-176 foot elevations, 10 igniters are distributed over the area primarily above the major release flow paths including the loop compartments, refueling cavity, pressurizer compartment and above the stairwell from the lower compartment area. The igniters are split between the two power groups. At 23328 foot elevation, an igniter is provided in each quadrant at the mid region of the upper compartment with two igniters on each of the two power groups. At the upper region elevation 2587 four additional igniters are located to initiate recombination of hydrogen not ignited at either the source or along its flow path. The four igniters are split between the two power groups.

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Table 6.2.4-7 Revise the 13th, 17th 18th, and 19th rows in Table 6.2.4-7 as follows:

Table 6.2.4-7		
SUBCOMPARTMENT/AREA IGNITER COVERAGE		
Subcompartment	Igniter Coverage (Elevation) ¹	
	Power Group 1	Power Group 2
IRWST Compartment Outlets	35, 37 (El 1357')	36, 38 (El 1357')
Upper Compartment		
Lower Region	39, 42, 44, 43, 47 (El 162'164'-176167')	40, 41, 45, 46, 48 (El 162'-176177')
Mid Region	51, 54 (El 23328')	52, 53 (El 23328')
Upper Region	61, 63 (El 2587')	62, 64 (El 2587')

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Revise Figure 6.2.4-5 as follows:

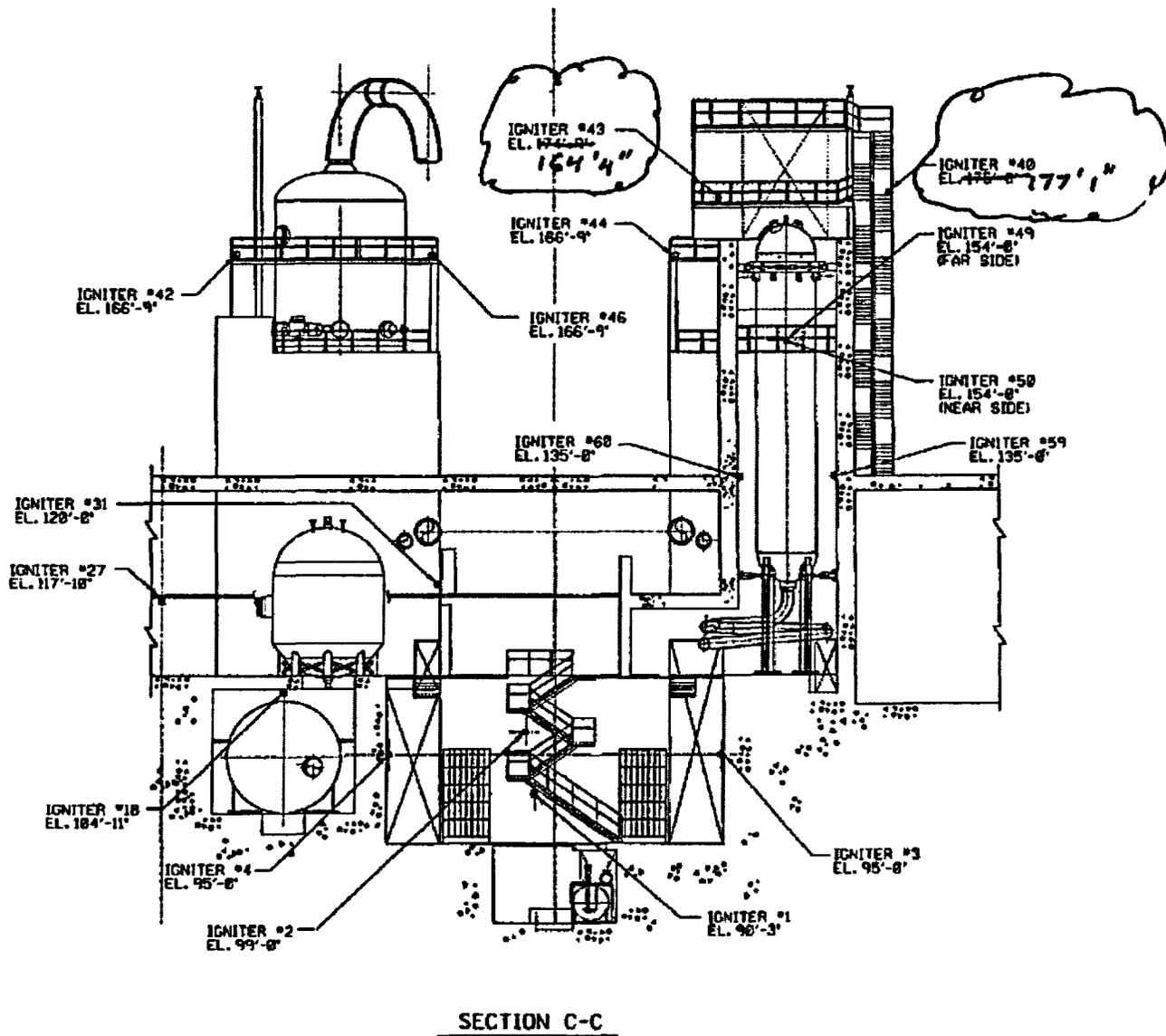


Figure 6.2.4-5

Hydrogen Igniter Locations – Section View

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Figure 6.2.4-9 Revise Figure 6.2.4-9 as shown on the next page.

**IGNITER S #9 AND #10 ARE BEING MOVED
CLOSER TO VENTS ALONG THE SG 01 WALL.**

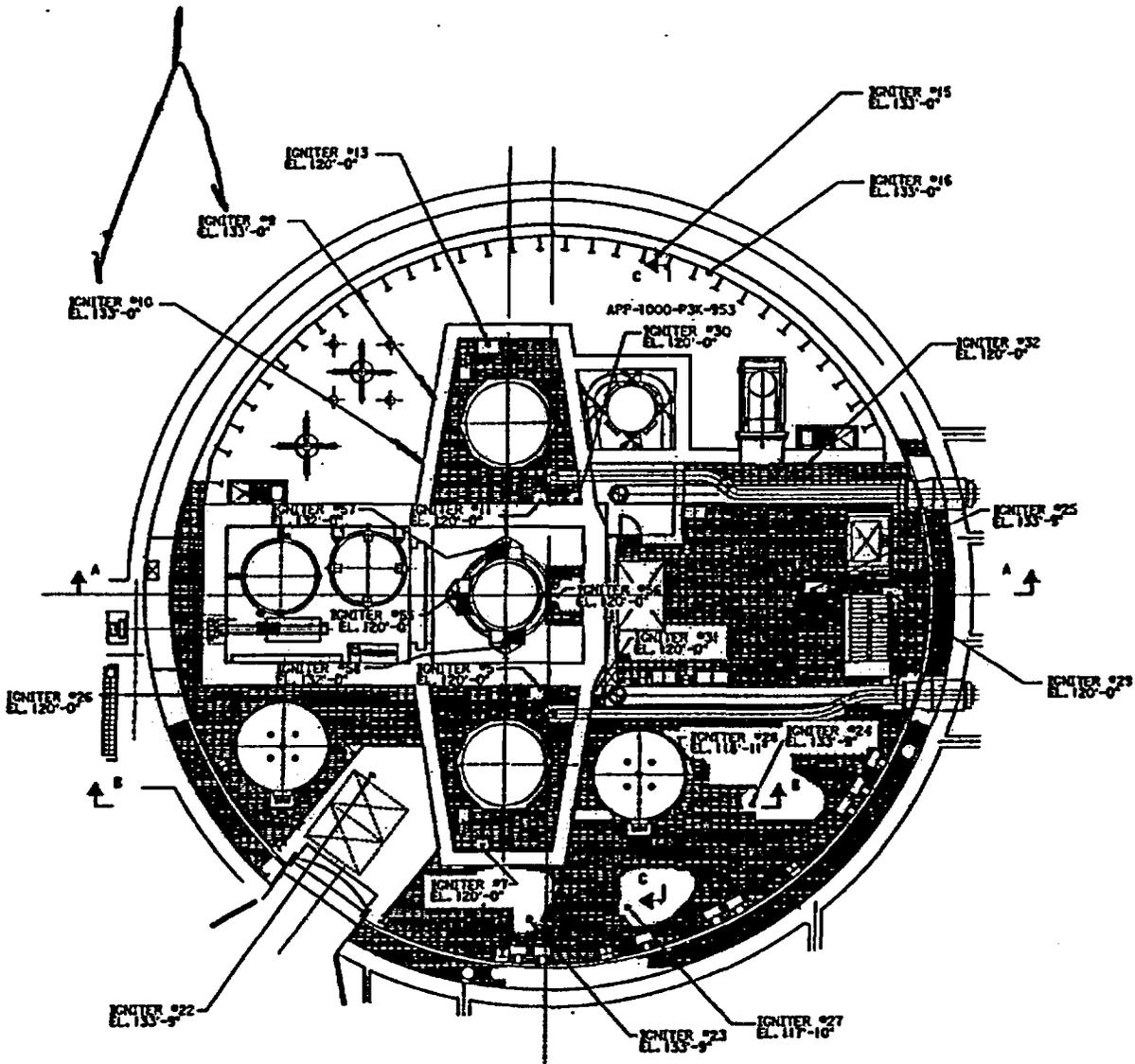


Figure 6.2.4-9

Hydrogen Igniter Locations
Plan View Elevation 118'-6"

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Figure 6.2.4-10 Revise Figure 6.2.4-10 as follows:

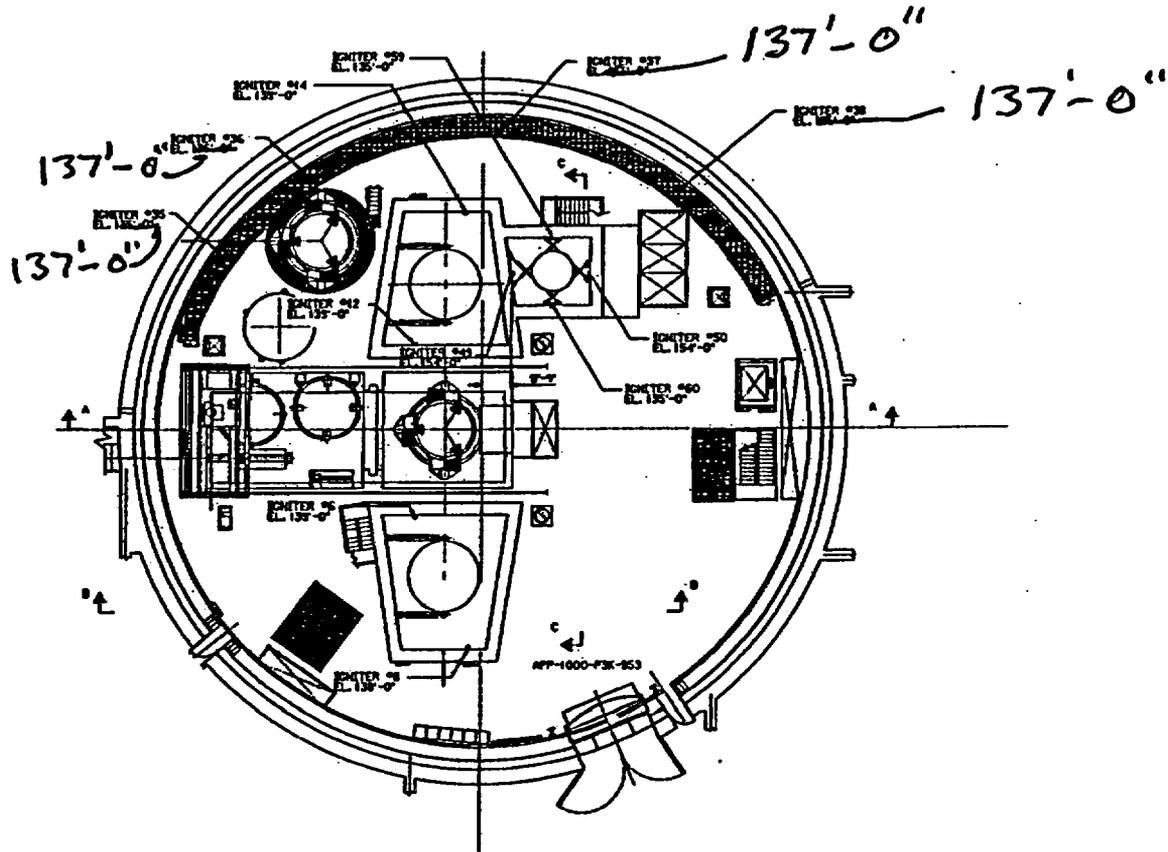


Figure 6.2.4-10

Hydrogen Igniter Locations
Plan View Elevation 135'-3"

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Revise Figure 6.2.4-11 as follows:

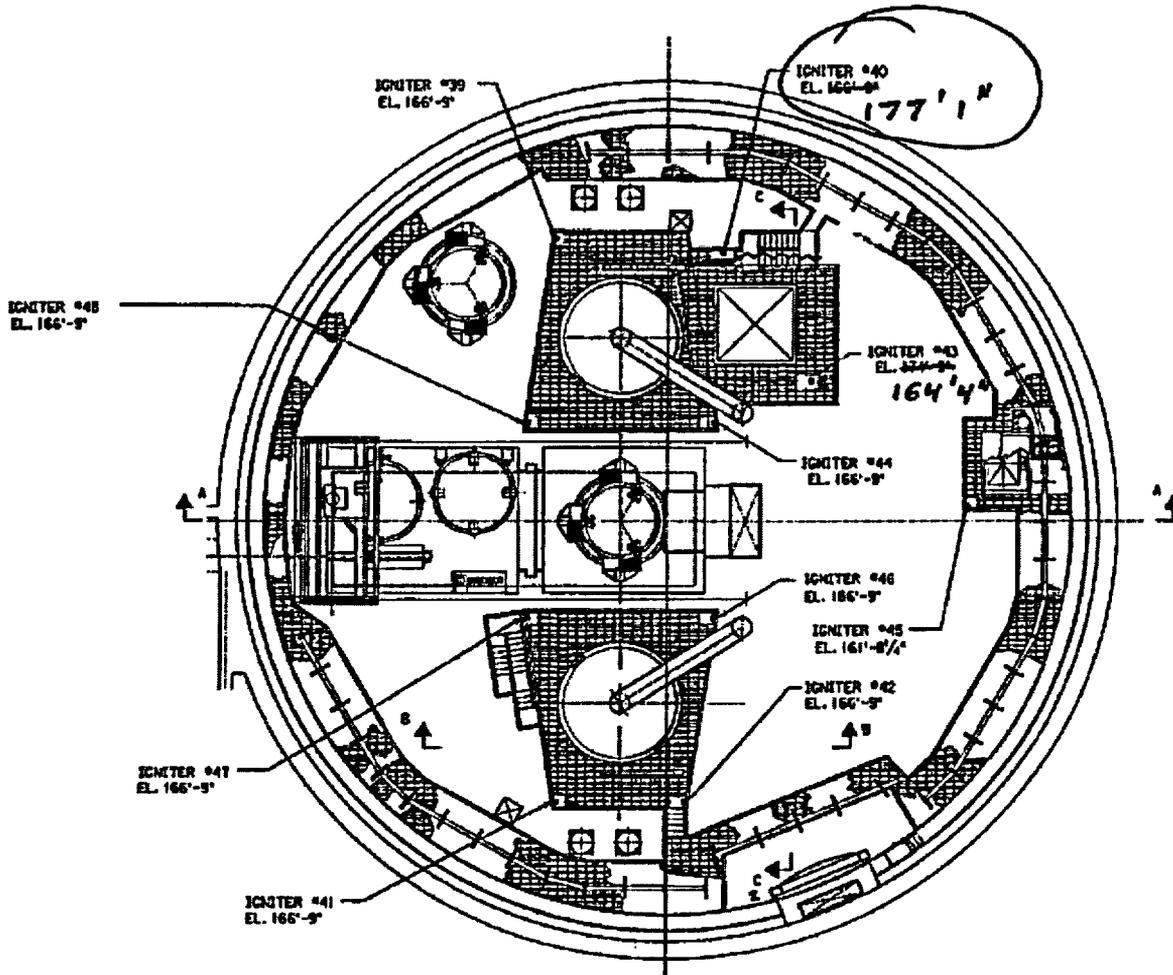


Figure 6.2.4-11

Hydrogen Igniter Locations
Plan View Elevation 162'-0"

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Figure 6.2.4-12 Revise Figure 6.2.4-12 as follows:

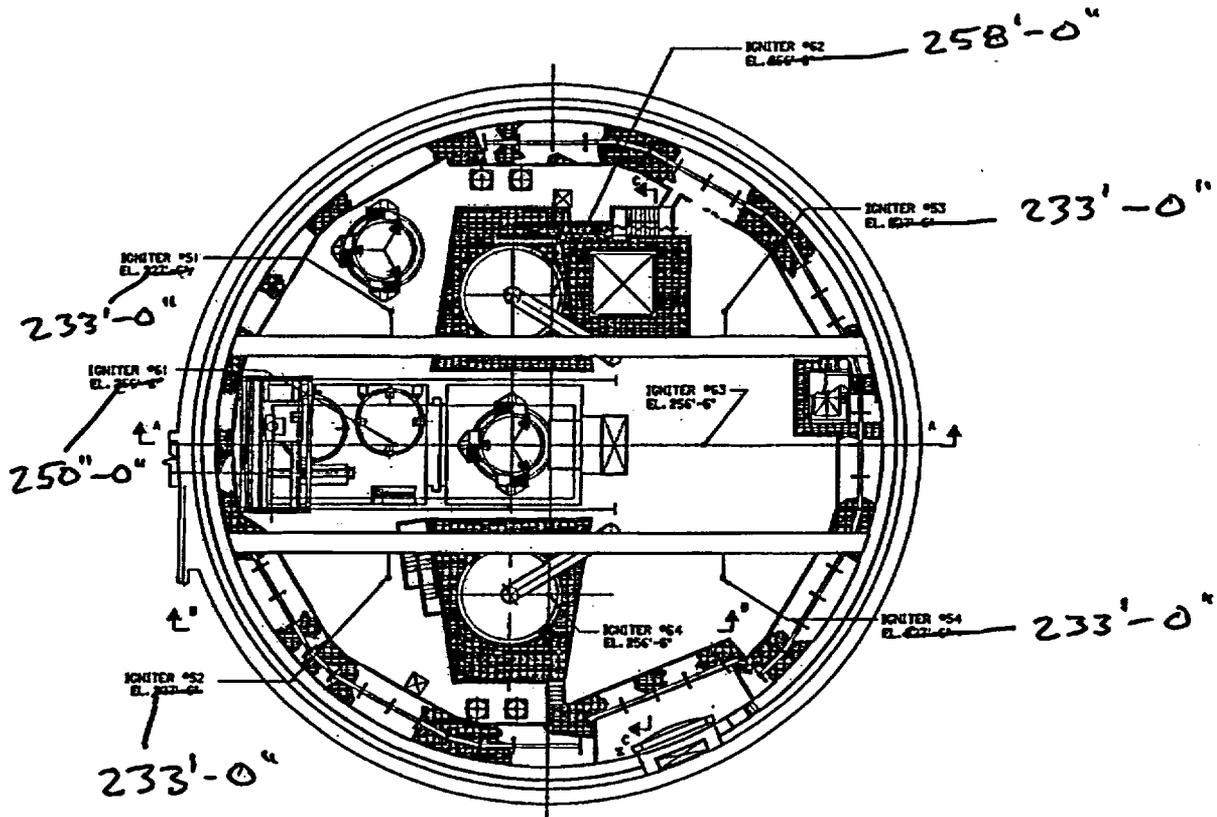


Figure 6.2.4-12

Hydrogen Igniter Locations
Plan View Elevation 210'-0"

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Figure 6.2.4-13 Revise Figure 6.2.4-13 as follows:

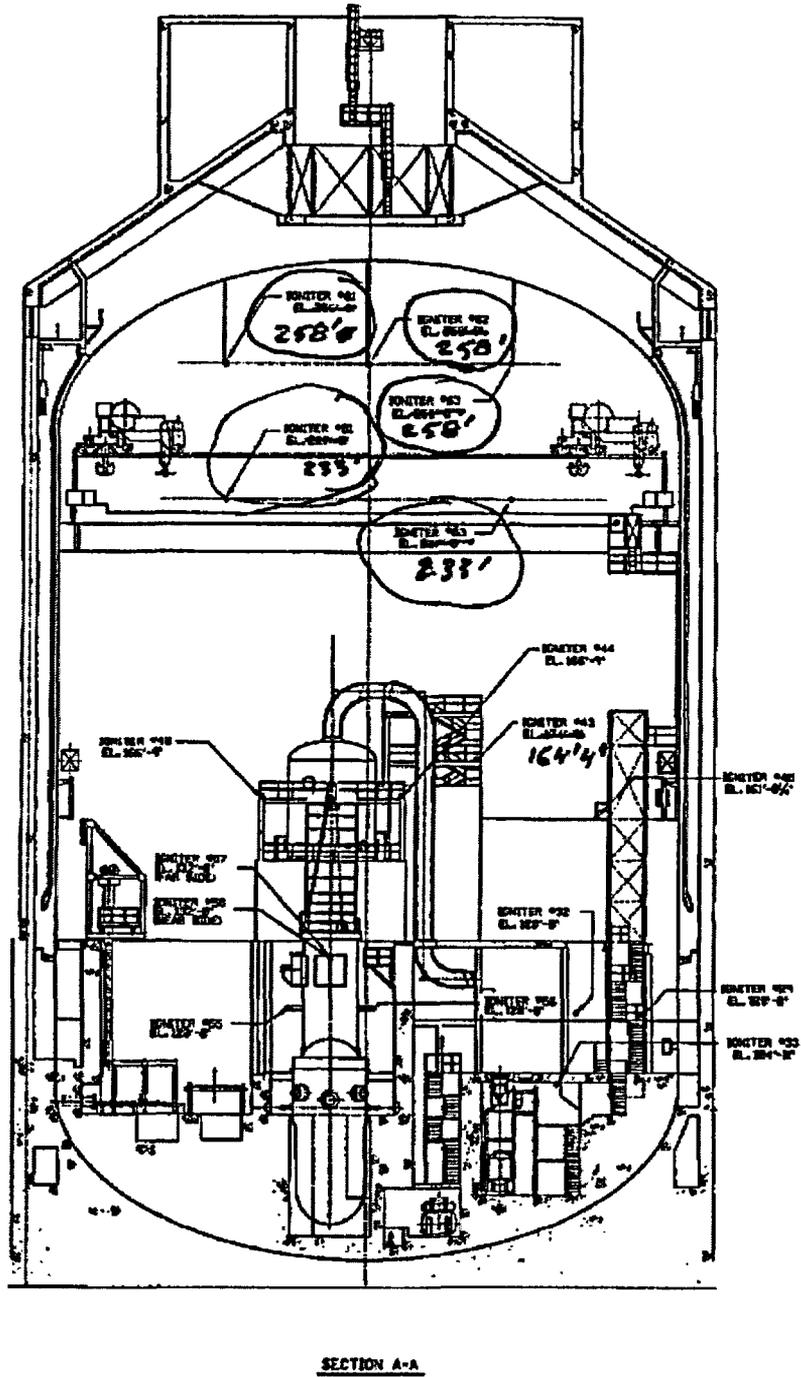


Figure 6.2.4-13

Hydrogen Igniter Locations Section A-A

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IV. REGULATORY IMPACT

A. FSER IMPACT

The FSER discusses containment combustible gas control in Subsection 6.2.5. The changes to the support identified in this change review have no effect on the discussion in the FSER. The changes have no effect on the conclusions in FSER Subsection 6.2.2.5 about the containment hydrogen control system

B. SCREENING QUESTIONS (Check correct response and provide justification for that determination under each response)

1. Does the proposed change involve a change to an SSC that adversely affects a DCD described design function? YES NO

The number and operating characteristics of the igniters are not changed. The volumes covered by the igniters are not changed by the subject changes in the location of the igniters.

2. Does the proposed change involve a change to a procedure that adversely affects how DCD described SSC design functions are performed or controlled? YES NO

The procedures requiring use of igniters and other procedures related to hydrogen control are not changed by the subject changes in the location of the igniters.

3. Does the proposed activity involve revising or replacing a DCD described evaluation methodology that is used in establishing the design bases or used in the safety analyses? YES NO

The methods used to determine hydrogen generation and evaluate control of hydrogen levels by the igniters are not altered by the subject changes in the location of the igniters.

4. Does the proposed activity involve a test or experiment not described in the DCD, where an SSC is utilized or controlled in a manner that is outside the reference bounds of the design for that SSC or is inconsistent with analyses or descriptions in the DCD? YES NO

There are no changes to testing requirements to support the subject changes in the location of the igniters. There are no changes to how SSCs are utilized or controlled due to the subject changes in the location of the igniters.

C. 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. The questions below address the criteria of B.5.b.

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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

Since there is no change to the design function or operation of the hydrogen igniters there are no new accident initiators and no effect on the frequency of evaluated accidents.
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

Since there is no change to the design function or operation of the hydrogen igniters there is no effect on malfunctions of structures, systems, or components. The operating conditions for the containment are not altered.
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

The changes have no effect on the operation, performance, and pressure boundary integrity of the containment vessel. Therefore, there is no increase in the calculated release of radioactive material during postulated accident conditions.
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

The changes have no effect on the design functions or reliability of the hydrogen igniters or other elements of hydrogen control. Therefore, there is no increase in the calculated release of radioactive material due to a malfunction of an SSC.
5. Does the proposed departure create a possibility for an accident of a different type than any evaluated previously in the plant-specific DCD? YES NO

The changes have no effect on the operation, performance, and pressure boundary integrity of the hydrogen igniters or containment vessel. The response of the containment vessel to postulated accident conditions is not altered by the changes. The changes do not introduce any additional failure modes to the igniters. Therefore, there is no possibility of an accident of a different type than any evaluated previously in the DCD.
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

The changes have no effect on the design functions of the hydrogen igniters or other elements of hydrogen control. Therefore, there are no additional failure modes or the possibility for a malfunction of an SSC important to safety with a different result than any evaluated previously.
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

There is no change to the design function of the hydrogen igniters or other elements of hydrogen control. The criteria to provide hydrogen control are not exceeded or altered.
8. Does the proposed departure result in a departure from a method of evaluation described in the plant-specific DCD used in establishing the design bases or in the safety analyses? YES NO

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The methods used to determine hydrogen generation and evaluate control of hydrogen levels by the igniters are not altered by the subject changes in the location of the igniters.

- The answers to the evaluation questions above are "NO" and the proposed departure from Tier 2 does not require prior NRC review to be included in plant specific FSARs as provided in 10 CFR Part 52, Appendix D, Section VIII. B.5.b
- One or more of the the answers to the evaluation questions above are "YES" and the proposed change requires NRC review.

D. 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. 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

The changes have no effect on the operation, and performance of the hydrogen igniters or other elements of hydrogen control. Therefore, there is no effect on the calculation of the probability of a severe accident.

- 2. Is there is a substantial increase in the consequences to the public of a particular severe accident previously reviewed? YES NO

The changes have no effect on the operation, and performance of the hydrogen igniters or other elements of hydrogen control. Therefore, there is no effect on the calculation of the release of radioactive material during a severe accident.

- The answers to the evaluation questions above are "NO" and the proposed departure from Tier 2 does not require prior NRC review to be included in plant specific FSARs as provided in 10 CFR Part 52, Appendix D, Section VIII. B.5.c
- One or more of the he answers to the evaluation questions above are "YES" and the proposed change requires NRC review.

E. SECURITY ASSESSMENT

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

The change to the locations of the hydrogen igniters will not alter barriers or alarms that control access to protected areas of the plant. The change to the locations of the hydrogen igniters will not alter requirements for security personnel.

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(Print name) (Sign)

Reviewer: D.A. Lindgren *D.A. Lindgren* Date: 4/15/2006
(Print name) (Sign)