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Your ref: Docket No. 52-006
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July 26, 2010

Subject: AP1000 Response to Request for Additional Information (SRP 3)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 3. This RAI response is submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in this response is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

Enclosure 1 provides the response for the following RAI(s):

RAI-SRP3.8.4-SEB1-03 R2

Questions or requests for additional information related to the content and preparation of this response should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Very truly yours,

Robert Sisk, Manager
Licensing and Customer Interface
Regulatory Affairs and Strategy

/Enclosure

1. Response to Request for Additional Information on SRP Section 3

DO63
NRO

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ENCLOSURE 1

Response to Request for Additional Information on SRP Section 3

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP3.8.4-SEB1-03
Revision: 2

Question:

DCD Rev. 16, Section 3.8.4.4.1 describes the design and analysis procedures of seismic category I structures outside of containment. Several revisions were made in this section some of which are Tier 2* changes. Westinghouse is requested to explain why these revisions in DCD Section 3.8.4.4.1 have been made and to explain or demonstrate the design adequacy of these changes.

DCD Section 3.8.4.4.1 describes the model of the shield building roof and passive containment cooling water storage tank. This DCD section indicates that the model is shown in Figure 3.8.4-3; however, the DCD revision for this figure states that "Figure 3.8.4-3 not used." The staff notes that a cross sectional view showing structural details of the shield building roof and passive containment cooling water storage tank is shown in Figure 3.8.4-2.

Westinghouse is requested to explain why the comparable figure showing the finite element model of this structure was removed.

Appendix 3H, which describes the auxiliary and shield building critical sections, has removed in numerous locations the results of the structural analyses (e.g., DCD Table 3.H.5-2 which previously provided the governing load combinations and required reinforcement) and removed several figures (e.g., Figure 3H.5-11 showing design details of the shield building roof). Westinghouse is requested to explain why these results and figures were removed while the results and figures for other seismic Category I structures remain in the DCD. Much of this information was identified as Tier 2* in the prior revision of the DCD.

Please provide the date at which the following Westinghouse reports will be revised to include the resolution of related RAIs: APP-GW-GLR-027 (Technical Report TR45), APP-GW-GLR-045 (Technical Report TR57), APP-GW-GLN-105 (Technical Report TR105) and APP-GW-GLN-112 (Technical Report TR112). If no revision is planned, so state.

Additional Question: (Revision 1)

Revisions made in DCD Section 3.8.4.4.1: why made and demonstrate adequacy; results of structural analyses removed from DCD (e.g., member forces) which were previously Tier 2*. Based on W/NRC/BNL conference call on 5/12/09, it was indicated that "Westinghouse will provide a revised RAI response to address this item."

DCD Rev. 16, App. 3H has removed, in numerous locations, the results of the structural analyses. For example, Table 3.H.5-2 previously provided the forces for the governing load

combinations and Table 3.H.5-5 provided required reinforcement. These tables were removed from the DCD in DCD Rev. 16. Overall, DCD App. 3H should provide, as it did in the prior certified design, the design summary of the Auxiliary and Shield Bldg critical sections. That is why the staff identified the entire App. 3H as Tier 2* in the previous certified design. Therefore, the staff requests that the same or comparable information should be provided for the updated DCD for all applicable critical sections.

We note that in the 5/4/09 letter response to this RAI, WEC referred to their TR-57, Rev. 1, for the analysis and design of the critical sections for the enhanced shield building. This TR-57 is being reviewed separately by NRC staff and is still unresolved/open at this time. Also, from the title of TR-57, it should also cover the auxiliary bldg. in addition to the shield bldg. So this RAI will remain unresolved until TR-57 review is complete and the appropriate analysis and design information from TR-57 for both the shield bldg. and the auxiliary bldg. are included in the DCD, in a manner comparable to what was done in the previous certified DCD.

Additional Question (Revision 2):

1. In RAI-SRP3.8.4-SEB1-03 Rev. 1 (the response), the governing member forces that were removed from the DCD, Rev. 16 and Rev. 17, are taken from Technical Report APP-GW-GLR-045 (TR-57), Rev. 2 and will be placed in DCD Rev. 18. However, as indicated in the response, the required reinforcement is also part of the results of the structural analyses, and therefore should be provided in the updated DCD for all applicable critical sections as provided in DCD Rev. 15. Provide the required reinforcement in the applicable tables which include Tables 3H.5-3, 3H.5-5 and 3H.5-7.

2. Explain or resolve the following items:
a) DCD Section 3H.5 should discuss and refer to all of the tables that were added to the DCD;
b) in Table 3H.5-8, include the same number and similar locations of critical sections that were provided in DCD Rev. 15;
c) explain why the load combinations in Table 3H.5-2 for walls from elevation 82'-6" to 66'-6" do not include either live load (L) or earth pressure (H);
d) explain why the load combinations in Table 3H.5-6 do not include Ra which was included in the same table in DCD Rev. 15;
e) correct the numerous typos in Table 3H.5-5 (table number and incorrect title);
f) explain why the allowable stresses for bending moments are different in Tables 3H.5-10 and 3H.5-11, while the allowable stresses for shear forces in the two tables are the same; and
g) explain why footnote (1), containing acceptance criteria limits for member forces, was added to Table 3H.5-1 which only tabulates design temperatures for the NI.

3. The RAI response indicates that "Table 3H.5-9, Shield Building Roof Reinforcement Summary, will be updated based on the shield building design modifications reported to the

NRC." Therefore, the resolution of this RAI cannot be determined until Table 3H.5-9 is submitted and the issues associated with the shield building have been resolved.

4. The proposed markups to DCD Section 3H.1 introduced new criteria regarding Tier 2* information. The criteria identify the conditions when changes in the design loads do not require NRC staff approval prior to implementing a change in the information. The criteria are not clear and it is judged to be difficult to interpret, thereby leading to possible misapplication of the criteria in the future. Therefore, revise the criteria to make them very clear in order to ensure their proper implementation. This request also applies to the similar new criteria introduced in the markups to DCD subsections 3.8.3.5.8 and 3.8.5.4.4 in the responses to RAIs SRP3.8.3-SEB1-05 R1 and SRP3.8.3-SEB1-07 R1, respectively.

Westinghouse Response:

The changes were made to Section 3.8.4.4.1 to address the enhanced shield building design features. The enhanced shield building design does not use the T-headed anchors at the end of the shear stirrups which was shown in DCD Revision 15. Therefore, the text in the first bullet of DCD Section 3.8.4.4.1 was updated. The description in the fifth bullet was also updated based on the design of the new air inlets.

The changes to Section 3.8.4.4.1 to address the 'enhanced shield building design' features were communicated to the NRC in Technical Report APP-GW-GLR-045, Revision 1.

- The purpose of APP-GW-GLR-045, Revision 1 (submitted to the NRC with DCP/NRC2047 dated November 21, 2007) was to update critical sections design and analysis to conform to the revised seismic analysis report, APP-GW-S2R-0 10 (TR03), Revision 1, "Extension of Nuclear Island Seismic Analysis to Soil Sites" dated September 2007.

- The APP-GW-GLR-045, Revision 1 contained both the changes that were included in Revision 16 of the DCD and the proposed changes to Revision 16 of the DCD. (Note: The proposed changes to Revision 16 were later incorporated in a DCD Revision 17.

- The critical sections associated with the shield building roof that were included Revision 0 of APP-GW-GLR-045 were not included in Revision 1 of APP-GW-GLR-045. These sections required additional analysis and design details relevant to the design changes that were required in support of the Shield Building Design Enhancement, and were not completed when Revision 1 was published. Revision 2 of APP-GW-GLR-045 included design details relevant to the design changes that were required in support of the Shield Building Design Enhancement. (Note: APP GW GLR 045 was updated to Revision 2; and transmitted with letter DCP/NRC2188, dated July 1, 2008).

In DCD Revision 15, Figure 3.8.4-3 showed the finite element model of the details of the Tension Ring, the Air Inlet and the air inlet columns. Due to design changes associated the enhanced shield building design, the details shown in DCD Revision 15, Figure 3.8.4-3 are no longer correct. Figure 3.8.4-3 is no longer referenced in DCD Section 3.8.4.4.1, Revision 17. Design information for the enhanced shield building design is included in DCD Revision 17 section 3H.5.6, in Table 3H.5-9, and in Figures 3H.5-11.

The detailed finite element analysis model for the shield building roof and passive containment cooling water storage tank is contained in a Westinghouse calculation and has a level of detail not appropriate for inclusion in the DCD. This information is available for NRC review and audit. It was presented to the NRC review staff during an October 2008 meeting.

The changes in DCD Appendix 3H to remove results of the structural analyses (the calculated results for load combinations and required reinforcement) were communicated to the NRC in Technical Report APP-GW-GLR-045 (TR57) Revision 1, Chapter 5.0 "DCD Mark Up" (November 2007). APP-GW-GLR-045, Revision 1 also identified the removal of the design load summary tables of member forces and moments in Appendix 3H.

The information removed from tables in the DCD represents the results of detailed calculations and analyses. These results change slightly during the design finalization due to changes related to constructability and construction sequence. Finalization of the design spectra can also result in minor changes in the as-designed results. The DCD changes between Revision 15 and Revision 16 also supported the change of the design spectra from a hard rock only case to design spectra acceptable for multiple rock and soil cases. Small changes in modeling and updates to software may also have a minor effect on the results. For these reasons it is not practical to lock in the design and analysis results in the DCD.

DCD Subsections 3.8.3, 3.8.4, and Appendix 3H provide information on the criteria, design configuration, and concrete reinforcement. Information on design of the critical sections of the shield building is included in DCD Revision 17. These requirements and criteria lock-in the design for NRC review and demonstrate to the NRC that the requirements and criteria for the design conforms with review guidance or otherwise uses appropriate design and analysis methods. The level of detail represented by the design summary tables of forces and moments does not appear to be consistent with the guidance of Regulatory Guide 1.70 and Standard Review Plan Section 3.8.4. SRP Section 3.8.3 and 3.8.4 do not suggest that this detailed information should be included in the DCD. Attempting to lock in the design loads results overspecifies the design. The design loads and related information removed in DCD Revision 16 included the amount of reinforcement provided and identified the fraction of the limit calculated. This overly restricts the changes to the design during design finalization.

Detailed results of the analyses of the critical structures and other structures are available for NRC audit and have been reviewed by NRC review staff. One of the reasons that the specific results for the critical structures were included in the DCD through Revision 15 was because of

the relatively limited amount of design information available for the NRC review staff to look at to make a judgment about the implementation of the design methods, requirements, and criteria in the structural design. The information now available for the shield building for NRC review is much more complete and comprehensive.

Technical reports APP-GW-GLR-027, APP-GW-GLR-045, APP-GW-GLN-105, and APP-GW-GLN-112 were prepared to support the preapplication review of completion of COL information items and changes to the certified design. The Design Certification amendment application was submitted in May 2007 and changes have been incorporated into DCD Revisions 16 and 17. Also, RAI responses are included in the Design Certification amendment docket. So, there is little utility in revising technical reports to incorporate RAIs responses. Westinghouse does not plan to make additional revision to these technical reports. Please note that APP-GW-GLR-045 was updated to Revision 2 and transmitted with letter DCP/NRC2188, dated July 1, 2008

Westinghouse Additional Response: (Revision 1)

This response addresses the tables that are contained in the DCD Appendix 3H.

Tables that were removed in DCD Revision 16 are replaced in DCD Revision 18. Technical Report APP-GW-GLR-045 (TR-57), Revision 2, was submitted to the NRC July 1, 2008 via letter DCP/NRC2188. The forces and moments in critical locations that are being restored in the DCD are taken from this report.

Table 3H.5-9, "Shield Building Roof Reinforcement Summary," will be updated based on the shield building design modifications reported to the NRC.

Westinghouse Additional Response: (Revision 2)

1. Please see the revised tables 3H.5-3, 3H.5-5, and 3H.5-7 which include required and provided reinforcement.

2a. References for Tables 3H.5-2, 3H.5-4, and 3H.5-6 will be added to the DCD (please see text below). The other tables are already referenced in DCD Section 3H.5.
2b. The same number of critical sections are provided in DCD Rev 18 as are provided in DCD Rev. 15. Each critical section has its own table. In DCD Revision 15 Table 3H.5-8 included information on five elements. The previous response provided informatin on three elements. Four additional sheets of Table 3H.5-8 will be added to the DCD for a total of seven elements to provide a design summary of spent fuel pool wall design loads, load combinations and comparisons to acceptance criteria for other elements such as element no. 21402. A revised Figure 3H.5-10 is also provided showing the location of the elements.

2c. The load combination does not include live load (L) or earth pressure (H) because it was not a governing load case.
2d. Thermal reaction force (Ra) was not included because the MSIV compartment is a break exclusion area and the main steam line was qualified for leak before break. Westinghouse agreed previously to do an analysis just for the jet load and pressure load (see also DCD Section 3.6.1.2.2).
2e. The incorrect title and table number listed in this RAI for Table 3H.5-5 has been corrected.
2f. The difference in values is due to differences in Stress Limit Coefficients. For Table 3H.5-10, the beam is simply supported and the acting stress is in tension; a Stress Limit Coefficient of 1.6 is applied (per load combination #3) to get the allowable stress 38.0 ksi. However, in Table 3H.5-11, the beam ends are fixed and the acting stress is in compression; a Stress Limit Coefficient of 1.4 is applied (per load combination #3) to calculate an allowable stress of 33.26 ksi. In both tables, the same Stress Limit Coefficient of 1.4 is used for shear allowable stress to give a value of 20.1 ksi.
2g. Footnote 1 of Table 3H.5-1 is part of a certified design table.

3. Table 3H.5-9, Shield Building Roof Reinforcement Summary, will be updated based on the shield building design modifications. This update will be included in the DCD mark-ups for the Shield Building report.

4. The criteria added for reporting of Tier 2* information was developed to focus reporting requirements on significant design changes and not require reporting of minor changes in calculation results. The criteria has been reformatted and simplified to clarify the criteria.

Design Control Document (DCD) Revision: (below)

PRA Revision: None

Technical Report (TR) Revision: None

Design Control Document (DCD) Revision: ~~None~~See Below

Modify Section 3H.1, "Introduction," as follows:

3H.1 Introduction

[*This appendix summarizes the structural design and analysis of structures identified as "Critical Sections" in the auxiliary and shield buildings. The design summaries include the following information:*

- *Description of buildings*
- *Governing codes and regulations*
- *Structural loads and load combinations*
- *Global analyses*
- *Structural design of critical structural elements*

Subsections 3H.2 through 3H.4 include a general description of the auxiliary building, a summary of the design criteria and the global analyses. Examples of the structural design are shown for twelve critical sections which are identified in subsection 3H.5 and shown in Figures 3H.5-1 (3 sheets). Representative design details are provided for these structures in subsection 3H.5.]*

[Changes in the values in the critical section tables that are designated as Tier 2 must be reported to the NRC if*

- *A change to design parameters is required. These design parameters include reinforcement provided, concrete strength, and steel section size. Both design parameter increases and decreases must be reported.*
- *Changes in the values of loads, moments, and forces in the critical section tables that are designated as Tier 2* must be reported to the NRC if the change results in a required reinforcement (or plate thickness for CA modules) increase greater than 10% of the provided reinforcement (or plate thickness for CA modules).]** For example the change must be reported if a change in moments or forces in Table 3H.5-2 results in a calculated required reinforcements value in Table 3H-3 more than 10% of the corresponding provided reinforcement value.

Modify Section 3H.5.1.1 per Response (Revision 2a) item 2a.

3H.5.1.1 Exterior Wall at Column Line 1

[*The wall at column line 1 is the exterior wall at the south end of the nuclear island. The reinforced concrete wall extends from the top of the basemat at elevation 66'-6" to the roof at elevation 180'-0". It is 3'-0" thick below the grade and 2'-3" thick above the grade.*

*The wall is designed for the applicable loads including dead load, live load, hydrostatic load, static and dynamic lateral soil pressure loads, seismic loads, and thermal loads. For various segments of this wall, Table 3H.5-2 provides the listing and magnitude of the various design loads and Table 3H.5-3 presents the details of the wall reinforcement. The sections where the required reinforcement is calculated are shown in Figure 3H.5-2 (Sheet 1). Typical wall reinforcement is shown on Figure 3H.5-3.]**

Modify Section 3H.5.1.2 per Response (Revision 2a) item 2a.

3H.5.1.2 Wall at Column Line 7.3

[The wall at column line 7.3 is a shear wall that connects the shield building and the nuclear island exterior wall at column line I. It extends from the top of the basemat at elevation 66'-6" to the top of the roof. The wall is 3 feet thick below the grade at elevation 100'-0" and 2 feet thick above the grade. Out-of-plane lateral support is provided to the wall by the floor slabs on either side of it and the roof at the top.

*For various segments of this wall, the corresponding governing load combination and associated design loads are shown in Table 3H.5-4. Table 3H.5-5 presents the details of the wall reinforcement. The sections where the required reinforcement is calculated are shown in Figure 3H.5-2 (Sheet 2). Typical wall reinforcement is shown on Figure 3H.5-4]**

Modify Section 3H.5.1.3 per Response (Revision 2a) item 2a.

3H.5.1.3 Wall at Column Line L

[The wall at column line L is a shear wall on the west side of the Main Control Room. It extends from the top of the basemat at elevation 66'-6" to the top of the roof. The wall is 2 feet thick. Out-of-plane lateral support is provided to the wall by the floor slabs on either side of it and the roof at the top. The segment of the wall that is a part of the main control room boundary is from elevation 117'-6" to elevation 135'-3".

The auxiliary building design loads are described in subsection 3H.3.3, and the wall is designed for the applicable loads. In addition to the dead, live and seismic loads, the wall is designed to withstand a 6 pounds per square inch pressure load due to a pipe break in the MSIV room even though it is a break exclusion area. This wall segment is also designed to withstand a jet load due to the pipe break.

*The governing load combination and associated design loads are those due to the postulated pipe rupture and are shown in Table 3H.5-6. Table 3H.5-7 and Figure 3H.5-12 present the details of the wall reinforcement. The sections where the required reinforcement is calculated are shown in Figure 3H.5-2 (Sheet 3).]**

Update Table 3H.5-1, "Nuclear Island: Design Temperatures For Thermal Gradient," as follows:

Table 3H.5-1

[NUCLEAR ISLAND: DESIGN TEMPERATURES FOR THERMAL GRADIENT]*(1)

(Table information unchanged)

Notes:

1. *N/R means loads due to a thermal gradient are not required to be considered.*
2. *Based on ACI 349-01 (Appendix A), the base temperature for the construction is assumed to be 70°F.*

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Update Table 3H.5-2, "Exterior Wall On Column Line 1: Forces And Moments In Critical Locations," as follows:

~~Table 3H.5-2 not used.~~

Table 3H.5-2

[EXTERIOR WALL AT COLUMN LINE 1
FORCES AND MOMENTS IN CRITICAL LOCATIONS](1)*

(Units: kips, ft)

Load Combination	M_X	M_Y	M_{XY}	T_X	T_Y	T_{XY}
Elevation 180'-0" to 135'-3"						
D + L + H + Ta		*177.8*	*3.1*		*115.5*	*8.8*
1.05 D + 1.3 L + 1.3 H + 1.2 To	*106.4*		*5.6*	*117.0*		*23.9*
Elevation 135'-3" to 100'-0"						
D + L + H + Ta		*50.8*	*0.3*		*89.8*	*104.8*
D + L + H + Ta	*82.9*		*7.6*	*172.9*		*24.8*
D + L + H + Ta	*60.0*		*3.6*	*165.7*		*106.0*
Elevation 100'-0" to 82'-6"						
1.05 D + 1.3 L + 1.3 H + 1.2 To		*48.1*	*8.4*		*106.1*	*17.3*
D + L+ Es	*1.8*		*5.4*	*15.6*		*58.6*
Elevation 82'-6" to 66'-6"						
D + L – Es		*93.8*	*26.5*		*170.7*	*31.5*
0.9 D + Es		*32.7*	*27.2*		*182.1*	*42.4*
0.9 D + Es	*15.5*		*27.2*	*18.6*		*42.4*

Note:
X is along the horizontal direction, and Y is in the vertical direction.

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Update Table 3H.5-3, "Exterior Wall On Column Line 1: Details Of Wall Reinforcement," as follows:

~~Table 3H.5-3~~

~~[EXTERIOR WALL ON COLUMN LINE 1~~
~~DETAILS OF WALL REINFORCEMENT (in^2/ft)]*(1)~~

~~(See Figure 3H.5-2 for Locations of Wall Sections.)~~

~~(Table information unchanged)~~

Table 3H.5-3

[EXTERIOR WALL ON COLUMN LINE 1
DETAILS OF WALL REINFORCEMENT (in^2/ft)]*(1)

(See Figure 3H.5-2 for Locations of Wall Sections.)

Wall Segment	Location	Required			Provided		
		Vertical	Horizontal	Shear	Vertical	Horizontal	Shear
WALL SECTION 1, 6							
Elevation 180′-0″ to 135′-3″				NR			None
	Outside Face	3.48	2.65		3.91	3.12	
	Inside Face	1.94	1.52		3.12	3.12	
WALL SECTION 2,3,7							
Elevation 135′-3″ to 100′-0″				NR			None
	Outside Face	1.88	3.04		3.12	3.12	
	Inside Face	1.77	2.23		3.12	3.12	
WALL SECTION 4,8							
Elevation 100′-0″ to 82′-6″				0.003			0.44

	Outside Face	1.42	0.70		3.12	1.56	
	Inside Face	1.01	0.70		3.12	1.27	
WALL SECTION 5,9							
Elevation 82′-6″ to 66′-6″				0.27			1.00
	Outside Face	2.29	0.87		4.39	1.27	
	Inside Face	1.87	0.87		3.12	1.27	
Note: NR – Not Required							

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Update Table 3H.5-4, "Interior Wall At Column Line 7.3: Forces And Moments In Critical Locations," as follows:

~~Table 3H.5-4 not used.~~

Table 3H.5-4

[INTERIOR WALL AT COLUMN LINE 7.3 FORCES AND MOMENTS IN CRITICAL LOCATIONS](1)*

(Units: kips, ft)

Load Combination	M_X	M_Y	M_{XY}	T_X	T_Y	T_{XY}
From Roof to Elevation 155'-6"						
1.05 D + 1.3 L + 1.2 To		*135.3*	*10.9*		*117.3*	*210.2*
1.05 D + 1.3 L + 1.2 To	*75.5*		*4.1*	*229.8*		*94.3*
Elevation 155'-6" to 135'-3"						
0.9 D – Es		*14.1*	*1.3*		*160.8*	*228.7*
D + L – Es	*28.0*		*1.0*	*29.8*		*231.7*
Elevation 135'-3" to 117'-6"						
0.9 D – Es		*3.3*	*1.3*		*142.2*	*140.9*
D + L – Es	*10.0*		*1.0*	*41.7*		*175.0*
Elevation 117'-6" to 100'-0"						
0.9 D – Es		*4.7*	*2.8*		*143.9*	*184.9*
D + L + Es	*6.4*		*1.5*	*172.8*		*107.9*
Elevation 100'-0" to 82'-6"						
0.9 D – Es		*15.4*	*2.6*		*90.4*	*169.8*
D + L – Es	*8.7*		*2.6*	*46.6*		*175.6*
Elevation 82'-6" to 66'-6"						
0.9 D – Es		*23.5*	*1.3*		*80.9*	*49.3*
D + L – Es	*0.8*		*1.3*	*1.7*		*74.1*

Note:
X is along the horizontal direction, and Y is in the vertical direction.

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Update Table 3H.5-5, "~~Exterior Wall On Column Line 1: Details Of Wall Reinforcement~~Interior Wall on Column Line 7.3: Details of Wall Reinforcement," as follows:

Table 3H.5-5

[INTERIOR WALL ON COLUMN LINE 7.3 DETAILS OF WALL REINFORCEMENT)]*(1)

(SEE FIGURE 3H.5-2 FOR LOCATIONS OF WALL SECTIONS.)

Wall Segment	Location	Wall Section	Reinforcement on Each Face (in^2/ft)	
			Required	Provided
From Roof to Elevation 155′-6″	Horizontal	1	3.96	4.12
	Vertical	7	3.60	3.72
Elevation 155′-6″ to 135′-3″	Horizontal	2	2.80	3.12
	Vertical	8	3.59	3.72
Elevation 135′-3″ to 117′-6″	Horizontal	3	2.03	2.54
	Vertical	9	2.63	3.12
Elevation 117′-6″ to 100′-0″	Horizontal	4	2.29	2.54
	Vertical	10	2.98	3.12
Elevation 100′-0″ to 82′-6″	Horizontal	5	1.69	2.54
	Vertical	11	2.08	3.12
Elevation 82′-6″ to 66′-6″	Horizontal	6	0.85	1.27
	Vertical	12	0.98	1.56
Shear Reinforcement (in^2/ft^2)				
From Roof to Elevation 155′-6″	Standard hook or T headed bar	7	0.38	0.44

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Insert Table 3H.5-6, "Interior Wall At Column Line L: Forces And Moments In Critical Locations," as follows

~~Table 3H.5-6 not used.~~

Table 3H.5-6

[INTERIOR WALL AT COLUMN LINE L
FORCES AND MOMENTS IN CRITICAL LOCATIONS](1)*

(Units: kips, ft)

Load Combination	M_X	M_Y	M_{XY}	T_X	T_Y	T_{XY}
Elevation 154'-2" to 135'-3"						
0.9 D + Es+ Pa + Yj		*6.0*	*3.5*		*115.4*	*170.2*
0.9 D + Es+ Pa + Yj	*14.3*		*3.5*	*46.0*		*170.2*
Elevation 135'-3" to 117'-6"						
0.9 D + Es+ Pa + Yj		*145.3*	*12.2*		*26.0*	*38.2*
0.9 D + Es+ Pa + Yj	*24.5*		*7.1*	*15.5*		*114.9*

Note:
X is along the horizontal direction, and Y is in the vertical direction.

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Update Table 3H.5-7, "Interior Wall At Column Line L: Forces Details Of Wall Reinforcement," as follows

~~Table 3H.5-7~~

~~[INTERIOR WALL ON COLUMN LINE L DETAILS OF WALL REINFORCEMENT]*(1)~~

~~(SEE FIGURE 3H.5-2, SHEET 3, FOR LOCATIONS OF WALL SECTIONS.)~~

~~Wall Segment~~	~~Location~~	~~Wall Section~~	~~Reinforcement (in^2/ft^2)~~
			~~Provided~~
~~Elevation 154' 2" to 135' 3"~~	~~Horizontal~~	~~1~~	~~2.27~~
	~~Vertical~~	~~3~~	~~3.12~~
~~Elevation 135' 3" to 117' 6"~~	~~Horizontal~~	~~2~~	~~4.39~~
	~~Vertical~~	~~4~~	~~5.66~~
~~Shear Reinforcement:~~			
~~Elevation 154' 2" to 135' 3"~~	~~Standard hook or T headed bar~~	~~5~~	~~0.11~~
~~Elevation 135' 3" to 117' 6"~~	~~Standard hook or T headed bar~~	~~5 6~~	~~2.00~~

Table 3H.5-7

[INTERIOR WALL ON COLUMN LINE L DETAILS OF WALL REINFORCEMENT]*(1)

(SEE FIGURE 3H.5-2, SHEET 3, FOR LOCATIONS OF WALL SECTIONS.)

Wall Segment	Location	Wall Section	Reinforcement on Each Face (in^2/ft)	
			Required	Provided
Elevation 154′-2″ to 135′-3″	Horizontal	1	2.08	2.27
	Vertical	3	2.59	3.12
Elevation 135′-3″ to 117′-6″	Horizontal	2	1.36	4.39
	Vertical	4	2.02	5.66

Shear Reinforcement (in^2/ft^2)				
Elevation 154′-2″ to 135′-3″	Standard hook or T headed bar	5	0.01	0.11
Elevation 135′-3″ to 117′-6″	Standard hook or T headed bar	6	0.33	2.00

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Revise Table 3H.5-8, "Design Summary Of Spent Fuel Pool Wall: Design Loads, Load Combinations, And Comparisons To Acceptance Criteria," as follows:

~~Table 3H.5-8 (Sheet 1 of 3)~~

~~[DESIGN SUMMARY OF SPENT FUEL POOL WALL: ELEMENT NO. 20477]*~~

~~Notes:~~

~~See Figure 3H.5-10 for element location.~~

~~Plate thickness provided is 0.50 inches, which is much greater than the plate thickness required.~~

Table 3H.5-8 (Sheet 1 of ~~37~~)

[DESIGN SUMMARY OF SPENT FUEL POOL WALL DESIGN LOADS, LOAD COMBINATIONS, AND COMPARISONS TO ACCEPTANCE CRITERIA - ELEMENT NO. 20477](1)*

Load/Comb.	S_{xx} kip/ft	S_{yy} kip/ft	S_{xy} kip/ft	M_{xx} k-ft/ft	M_{yy} k-ft/ft	N_x kip/ft	N_y kip/ft	Comments
Dead (D)	-16.15	-22.92	-28.34	-1.34	-1.06	-0.32	-0.32	
Live (L)	1.46	0.32	-1.57	-0.06	-0.21	0.04	0.03	
Hydro (F)	37.52	12.36	-4.32	-100.50	-14.49	62.14	-9.95	
Seismic (Es)	46.21	56.51	183.20	81.72	28.70	103.00	14.79	
Thermal (To)	-561.80	-267.70	-51.15	-426.90	-145.50	90.32	-23.66	
Thermal (Ta)	-955.80	-444.60	-139.70	-1401.0	-450.00	227.50	-83.16	
LC(1a)	32.40	-14.25	-48.39	-142.68	-22.12	86.61	-14.33	1. 4D+1. 7L+1. 4F
LC(3a)	84.05	51.21	147.24	-60.38	7.15	189.71	0.56	D+L+F+Es
LC(3b)	84.05	51.21	-219.16	-223.82	-50.25	-16.29	-29.02	D+L+F+=E' s
LC(3e)	-267.08	-116.11	115.28	-327.19	-83.79	246.16	-14.22	D+L+F+Es+To
LC(3f)	-267.08	-116.11	-251.12	-490.63	-141.19	40.16	-43.80	D+L+F+=E' s+To
LC(3m)	84.20	53.18	151.64	-60.18	7.46	189.71	0.57	0. 9D+F+Es
LC(3n)	84.20	53.18	-214.76	-223.62	-49.94	-16.29	-29.01	0. 9D+F+=E' s

LC(3o)	*-266.92*	*-114.13*	*119.68*	*-326.99*	*-83.47*	*246.16*	*-14.22*	*0. 9D+F+Es+To*
LC(3p)	*-266.92*	*-114.13*	*-246.72*	*-490.43*	*-140.87*	*40.16*	*-43.80*	*0. 9D+F=+E' s+To*
LC(5a)	*-574.55*	*-288.12*	*-121.54*	*-977.52*	*-297.00*	*204.04*	*-62.22*	*D+L+F+Ta*
LC(5b)	*-825.30*	*-421.18*	*-153.29*	*-53.19*	*-5.28*	*63.89*	*-15.73*	*D+L+F+Ta*
LC(7a)	*-397.01*	*-211.45*	*-74.69*	*-427.19*	*-125.72*	*132.70*	*-28.49*	*1.05D+1.3L+1.05F+1.2To*

Notes:

x- direction is horizontal; y- direction is vertical.

See Figure 3H.5-10 for element location.

Plate thickness required for load combinations excluding thermal:	0.429 inches
Plate thickness provided:	0.50 inches
Maximum principal stress for load combination 5a including thermal:	46.33 ksi
Yield stress:	65.0 ksi
Maximum stress intensity range for load combination 5a including thermal:	46.3 ksiN/A
Allowable stress intensity :	130.0 ksi

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.

~~Table 3H.5-8 (Sheet 2 of 3)~~

~~[DESIGN SUMMARY OF SPENT FUEL POOL WALL: ELEMENT NO. 10529]*~~

~~Notes:~~

~~See Figure 3H.5-10 for element location.~~

~~Plate thickness provided is 0.50 inches, which is much greater than the plate thickness required.~~

Table 3H.5-8 (Sheet 2 of ~~37~~)

[DESIGN SUMMARY OF SPENT FUEL POOL WALL DESIGN LOADS, LOAD COMBINATIONS, AND COMPARISONS TO ACCEPTANCE CRITERIA - ELEMENT NO. 10529](1)*

Load/Comb.	S_{xx} kip/ft	S_{yy} kip/ft	S_{xy} kip/ft	M_{xx} k-ft/ft	M_{yy} k-ft/ft	N_x kip/ft	N_y kip/ft	Comments
Dead (D)	-24.40	-96.30	-20.71	-1.16	-2.27	-0.28	-0.34	
Live (L)	-0.44	-2.48	-0.55	-0.01	-0.24	0.01	0.08	
Hydro (F)	9.86	-5.49	6.22	8.37	-73.49	16.94	16.02	
Seismic (Es)	110.80	335.20	95.73	19.03	93.81	22.15	29.34	
Thermal (To)	-215.70	-479.30	-150.10	-99.69	-357.90	16.39	19.34	
Thermal (Ta)	-389.40	-883.60	-273.20	-364.10	-982.20	40.42	17.26	
LC(1a)	-21.10	-146.72	-21.23	10.09	-106.48	23.34	22.09	1.4D+1.7L+1.4F
LC(3a)	99.77	228.74	83.17	29.58	-11.59	45.60	51.51	D+L+F+Es
LC(3b)	99.77	228.74	-108.29	-8.48	-199.21	1.30	-7.17	D+L+F+~~=~~E's
LC(3e)	-35.05	-70.83	-10.64	-32.72	-235.28	55.84	63.60	D+L+F+Es+To
LC(3f)	-35.05	-70.83	-202.10	-70.78	-422.90	11.54	4.92	D+L+F+~~=~~E's+To
LC(3m)	102.64	240.85	85.80	29.71	-11.12	45.61	51.47	0.9D+F+Es
LC(3n)	102.64	240.85	-105.66	-8.35	-198.74	1.31	-7.21	0.9D+F+~~=~~E's
LC(3o)	-32.17	-58.72	-8.02	-32.60	-234.81	55.86	63.55	0.9D+F+Es+To

LC(3p)	*-32.17*	*-58.72*	*-199.48*	*-70.66*	*-422.43*	*11.56*	*4.87*	*0. 9D+F+=E' s+To*
LC(5a)	*-258.35*	*-656.52*	*-185.79*	*-220.36*	*-689.88*	*41.93*	*26.55*	*D+L+F+Ta*
LC(5b)	*-362.67*	*-963.64*	*-260.17*	*7.94*	*-144.07*	*12.21*	*12.80*	*D+L+F+Ta*
LC(7a)	*-177.61*	*-469.58*	*-128.51*	*-67.20*	*-348.29*	*29.80*	*31.07*	*1.05D+1.3L+1.05F+1.2To*

Notes:

x- direction is horizontal; y- direction is vertical.

See Figure 3H.5-10 for element location.

Plate thickness required for load combinations excluding thermal:	0.47 inches
Plate thickness provided:	0.50 inches
Maximum principal stress for load combination 5~~a~~ including thermal:	~~33.52~~40.3 ksi
Yield stress:	65.0 ksi
Maximum stress intensity range for load combination 5~~a~~ including thermal:	~~N/A~~50.8 ksi
Allowable stress intensity :	130.0 ksi

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

~~Table 3H.5-8 (Sheet 3 of 3)~~

~~[DESIGN SUMMARY OF SPENT FUEL POOL WALL: ELEMENT NO. 10544]*~~

~~Notes:~~

~~See Figure 3H.5-10 for element location.~~

~~Plate thickness provided is 0.50 inches, which is much greater than the plate thickness required.~~

Table 3H.5-8 (Sheet 3 of ~~37~~)

[DESIGN SUMMARY OF SPENT FUEL POOL WALL DESIGN LOADS, LOAD COMBINATIONS, AND COMPARISONS TO ACCEPTANCE CRITERIA - ELEMENT NO. 10544](1)*

Load/Comb.	S_{xx} kip/ft	S_{yy} kip/ft	S_{xy} kip/ft	M_{xx} k-ft/ft	M_{yy} k-ft/ft	N_x kip/ft	N_y kip/ft	Comments
Dead (D)	-20.03	-75.69	-42.72	3.53	-2.18	-0.01	-1.93	
Live (L)	-0.64	-1.98	-1.22	0.36	-0.06	0.02	-0.07	
Hydro (F)	-4.13	-2.97	-4.10	39.78	3.54	0.99	-4.80	
Seismic (Es)	67.42	185.70	113.20	48.28	7.62	5.78	5.32	
Thermal (To)	-121.60	-387.30	-239.80	75.83	-107.40	39.64	49.91	
Thermal (Ta)	-215.20	-670.10	-416.60	184.20	-269.30	115.50	136.20	
LC(1a)	-34.91	-113.49	-67.62	61.25	1.81	1.40	-9.54	1.4D+1.7L+1.4F
LC(3a)	40.97	103.87	63.52	107.86	10.34	7.18	-3.41	D+L+F+Es
LC(3b)	40.97	103.87	-162.88	11.30	-4.90	-4.39	-14.04	D+L+F+=E's
LC(3e)	-35.03	-138.19	-86.36	155.26	-56.79	31.95	27.79	D+L+F+Es+To
LC(3f)	-35.03	-138.19	-312.76	58.70	-72.02	20.39	17.15	D+L+F+=E's+To
LC(3m)	43.61	113.42	69.01	107.15	10.61	7.16	-3.14	0.9D+F+Es
LC(3n)	43.61	113.42	-157.39	10.59	-4.62	-4.41	-13.78	0.9D+F+=E's
LC(3o)	-32.39	-128.64	-80.87	154.54	-56.51	31.93	28.05	0.9D+F+Es+To

LC(3p)	*-32.39*	*-128.64*	*-307.27*	*57.98*	*-71.75*	*20.37*	*17.41*	*0. 9D+F+=E' s+To*
LC(5a)	*-159.30*	*-499.45*	*-308.41*	*158.79*	*-167.01*	*73.19*	*78.32*	*D+L+F+Ta*
LC(5b)	*-267.05*	*-805.64*	*-503.54*	*51.38*	*-38.58*	*1.37*	*-9.65*	*D+L+F+Ta*
LC(7a)	*-117.40*	*-375.64*	*-230.60*	*102.82*	*-79.20*	*30.78*	*30.27*	*1.05D+1.3L+1.05F+1.2To*

Notes:

x- direction is horizontal; y- direction is vertical.

See Figure 3H.5-10 for element location.

Plate thickness required for load combinations excluding thermal:	0.31 inches
Plate thickness provided:	0.50 inches
Maximum principal stress for load combination 5a including thermal:	46.95 ksi
Yield stress:	65.0 ksi
Maximum stress intensity range for load combination 5a including thermal:	~~N/A~~84.9 ksi
Allowable stress intensity :	130.0 ksi

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Table 3H.5-8 (Sheet 4 of 7)

[DESIGN SUMMARY OF SPENT FUEL POOL WALL DESIGN LOADS, LOAD COMBINATIONS, AND COMPARISONS TO ACCEPTANCE CRITERIA - ELEMENT NO. 10524]*(1)

Load/Comb.	S_{xx} *kip/ft*	S_{yy} *kip/ft*	S_{xy} *kip/ft*	M_{xx} *k-ft/ft*	M_{yy} *k-ft/ft*	N_x *kip/ft*	N_y *kip/ft*	*Comments*
Dead (D)	*-35.61*	*-104.80*	*0.68*	*-4.70*	*7.72*	*-0.55*	*-2.22*	
Live (L)	*-0.45*	*-2.21*	*-0.72*	*-0.25*	*-0.49*	*0.00*	*0.10*	
Hydro (F)	*11.85*	*-1.35*	*4.92*	*28.52*	*16.50*	*3.71*	*3.79*	
Seismic (Es)	*76.80*	*225.60*	*79.29*	*53.31*	*177.00*	*6.83*	*55.70*	
Thermal (To)	*-369.10*	*-433.40*	*179.90*	*-215.40*	*-109.40*	*-7.32*	*-59.63*	
Thermal (Ta)	*-696.60*	*-730.00*	*329.40*	*-555.10*	*-487.60*	*-13.58*	*-95.78*	
LC(1a)	*-34.04*	*-152.37*	*6.62*	*32.92*	*33.09*	*4.43*	*2.37*	*1.4D+1.7L+1.4F*

LC(3a)	57.33	116.69	86.14	88.29	207.34	11.48	58.89	D+L+F+Es
LC(3b)	57.33	116.69	-72.44	-18.33	-146.66	-2.18	-52.51	D+L+F+E's
LC(3e)	-173.36	-154.18	198.57	-46.34	138.96	6.90	21.62	D+L+F+Es+To
LC(3f)	-173.36	-154.18	39.99	-152.96	-215.04	-6.76	-89.78	D+L+F+E's+To
LC(3m)	61.34	129.38	86.78	89.00	207.05	11.53	59.02	0.9D+F+Es
LC(3n)	61.34	129.38	-71.80	-17.62	-146.95	-2.13	-52.38	0.9D+F+E's
LC(3o)	-169.35	-141.49	199.22	-45.62	138.68	6.96	21.75	0.9D+F+Es+To
LC(3p)	-169.35	-141.49	40.64	-152.24	-215.32	-6.71	-89.65	0.9D+F+E's+To
LC(5a)	-459.59	-564.62	210.75	-323.37	-281.01	-5.32	-58.19	D+L+F+Ta
LC(5b)	-741.71	-755.24	398.88	19.86	124.99	-105.77	-114.64	D+L+F+Ta
LC(7a)	~~302.367~~ ~~41.71~~	~~755.244~~ 39.4	~~398.881~~ 39.9	~~19.86~~ 136.9	~~124.99~~ 57.2	~~105.77~~ 2.2	~~114.64~~ 42.9	1.05D+1.3L+1.05F+1.2To ~~D+L+F+Ta~~

Notes:

x- direction is horizontal; y- direction is vertical.

See Figure 3H.5-10 for element location.

Plate thickness required for load combinations excluding thermal:	0.32 inches
Plate thickness provided:	0.50 inches
Maximum principal stress for load combination 5 including thermal:	42.1 ksi
Yield stress:	65.0 ksi
Maximum stress intensity range for load combination 5 including thermal:	72.5 ksi
Allowable stress intensity :	130.0 ksi

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.

Table 3H.5-8 (Sheet 5 of 7)

[DESIGN SUMMARY OF SPENT FUEL POOL WALL DESIGN LOADS, LOAD COMBINATIONS, AND COMPARISONS TO ACCEPTANCE CRITERIA - ELEMENT NO. 20462]*(1)

Load/Comb.	S_{xx} *kip/ft*	S_{yy} *kip/ft*	S_{xy} *kip/ft*	M_{xx} *k-ft/ft*	M_{yy} *k-ft/ft*	N_x *kip/ft*	N_y *kip/ft*	*Comments*

Dead (D)	*-7.31*	*-29.13*	*-1.51*	*-1.45*	*-3.75*	*-0.06*	*0.35*	
Live (L)	*-0.11*	*-0.55*	*0.21*	*-0.14*	*-0.60*	*0.00*	*0.05*	
Hydro (F)	*5.04*	*-0.04*	*-1.61*	*-16.58*	*64.59*	*-1.48*	*-20.87*	
Seismic (Es)	*25.64*	*33.82*	*32.90*	*10.45*	*114.90*	*2.48*	*12.55*	
Thermal (To)	*-286.10*	*-78.70*	*66.37*	*-208.70*	*-130.00*	*0.86*	*-1.51*	
Thermal (Ta)	*-616.80*	*-121.80*	*116.60*	*-650.20*	*-502.40*	*6.16*	*3.93*	
LC(1a)	*-3.36*	*-41.77*	*-4.01*	*-25.47*	*84.16*	*-2.15*	*-28.64*	*1.4D+1.7L+1.4F*
LC(3a)	*25.28*	*4.09*	*29.35*	*-14.35*	*200.98*	*0.35*	*-16.27*	*D+L+F+Es*
LC(3b)	*25.28*	*4.09*	*-36.45*	*-35.25*	*-28.82*	*-4.61*	*-41.37*	*D+L+F+E's*
LC(3e)	*-153.54*	*-45.10*	*70.83*	*-144.78*	*119.73*	*0.89*	*-17.21*	*D+L+F+Es+To*
LC(3f)	*-153.54*	*-45.10*	*5.03*	*-165.68*	*-110.07*	*-4.07*	*-42.31*	*D+L+F+E's+To*
LC(3m)	*26.11*	*7.55*	*29.29*	*-14.06*	*201.95*	*0.35*	*-16.35*	*0.9D+F+Es*
LC(3n)	*26.11*	*7.55*	*-36.51*	*-34.96*	*-27.85*	*-4.61*	*-41.45*	*0.9D+F+E's*
LC(3o)	*-152.70*	*-41.63*	*70.77*	*-144.50*	*120.70*	*0.89*	*-17.29*	*0.9D+F+Es+To*
LC(3p)	*-152.70*	*-41.63*	*4.97*	*-165.40*	*-109.10*	*-4.07*	*-42.39*	*0.9D+F+E's+To*
LC(5a)	*-387.88*	*-105.84*	*69.97*	*-424.54*	*-253.76*	*2.31*	*-18.01*	*D+L+F+Ta*
LC(5b)	*-646.13*	*-113.41*	*80.41*	*35.38*	*175.18*	*-4.36*	*-31.38*	*D+L+F+Ta*
LC(7a)	*-217.10*	*-90.37*	*46.78*	*-175.63*	*-34.40*	*-0.96*	*-22.61*	*1.05D+1.3L+1.05F+1.2To*

Notes:

x- direction is horizontal; y- direction is vertical.

See Figure 3H.5-10 for element location.

Plate thickness required for load combinations excluding thermal:	0.17 inches
Plate thickness provided:	0.50 inches
Maximum principal stress for load combination 5 including thermal:	20.6 ksi
Yield stress:	65.0 ksi
Maximum stress intensity range for load combination 5 including thermal:	20.6 ksi
Allowable stress intensity :	130.0 ksi

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.

Table 3H.5-8 (Sheet 6 of 7)

[DESIGN SUMMARY OF SPENT FUEL POOL WALL DESIGN LOADS, LOAD COMBINATIONS, AND COMPARISONS TO ACCEPTANCE CRITERIA - ELEMENT NO. 21402](1)*

Load/Comb.	S_{xx} kip/ft	S_{yy} kip/ft	S_{xy} kip/ft	M_{xx} k-ft/ft	M_{yy} k-ft/ft	N_x kip/ft	N_y kip/ft	Comments
Dead (D)	-1.82	-17.93	4.00	0.92	0.93	-0.32	0.22	
Live (L)	-0.21	-0.98	0.41	0.19	-0.04	-0.02	-0.03	
Hydro (F)	7.14	0.29	-2.18	104.60	15.51	-16.65	3.08	
Seismic (Es)	36.81	21.41	17.68	139.90	28.75	12.42	12.08	
Thermal (To)	-228.50	-181.90	85.52	-291.30	-212.00	11.34	6.92	
Thermal (Ta)	-379.10	-378.40	159.80	-783.80	-661.10	41.72	28.29	
LC(1a)	7.08	-26.36	3.24	148.06	22.95	-23.80	4.56	1.4D+1.7L+1.4F
LC(3a)	44.77	2.90	19.03	287.45	51.36	-11.24	16.58	D+L+F+Es
LC(3b)	44.77	2.90	-16.33	7.65	-6.14	-36.08	-7.58	D+L+F+E's
LC(3e)	-98.05	-110.78	72.48	105.39	-81.14	-4.15	20.90	D+L+F+Es+To
LC(3f)	-98.05	-110.78	37.12	-174.41	-138.64	-28.99	-3.26	D+L+F+E's+To
LC(3m)	45.16	5.68	18.23	287.17	51.31	-11.18	16.59	0.9D+F+Es
LC(3n)	45.16	5.68	-17.13	7.37	-6.19	-36.02	-7.57	0.9D+F+E's
LC(3o)	-97.65	-108.01	71.68	105.11	-81.19	-4.09	20.91	0.9D+F+Es+To
LC(3p)	-97.65	-108.01	36.32	-174.69	-138.69	-28.93	-3.25	0.9D+F+E's+To
LC(5a)	-231.84	-255.12	102.10	-384.16	-396.79	9.08	20.95	D+L+F+Ta
LC(5b)	-268.90	-468.00	168.35	-17.41	14.23	-18.83	13.88	D+L+F+Ta
LC(7a)	-166.1	-156.2	66.6	-107.4	-141.8	-9.3	8.6	1.05D+1.3L+1.05F+1.2To

Notes:

x- direction is horizontal; y- direction is vertical.

See Figure 3H.5-10 for element location.

Plate thickness required for load combinations excluding thermal:	0.28 inches
Plate thickness provided:	0.50 inches
Maximum principal stress for load combination 5 including thermal:	25.1 ksi
Yield stress:	65.0 ksi
Maximum stress intensity range for load combination 5 including thermal:	31.3 ksi
Allowable stress intensity :	130.0 ksi

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.

Table 3H.5-8 (Sheet 7 of 7)

[DESIGN SUMMARY OF SPENT FUEL POOL WALL DESIGN LOADS, LOAD COMBINATIONS, AND COMPARISONS TO ACCEPTANCE CRITERIA - ELEMENT NO. 21414]*(1)

Load/Comb.	S_{xx} *kip/ft*	S_{yy} *kip/ft*	S_{xy} *kip/ft*	M_{xx} *k-ft/ft*	M_{yy} *k-ft/ft*	N_x *kip/ft*	N_y *kip/ft*	*Comments*
Dead (D)	*0.69*	*-10.62*	*-2.57*	*-0.52*	*-0.22*	*-0.03*	*0.12*	
Live (L)	*0.18*	*0.12*	*-0.45*	*0.00*	*-0.11*	*-0.01*	*0.02*	
Hydro (F)	*4.25*	*0.56*	*-2.73*	*-27.01*	*-31.06*	*-1.46*	*1.82*	
Seismic (Es)	*26.90*	*13.88*	*36.68*	*26.35*	*21.70*	*2.17*	*4.34*	
Thermal (To)	*-79.35*	*-40.69*	*49.04*	*-129.00*	*-119.30*	*10.01*	*6.90*	
Thermal (Ta)	*-129.60*	*-66.37*	*57.50*	*-374.60*	*-374.70*	*26.38*	*24.34*	
LC(1a)	*7.24*	*-13.89*	*-8.19*	*-38.54*	*-43.97*	*-2.09*	*2.75*	*1.4D+1.7L+1.4F*
LC(3a)	*33.73*	*4.16*	*29.84*	*-11.98*	*-22.11*	*0.10*	*7.03*	*D+L+F+Es*
LC(3b)	*33.73*	*4.16*	*-43.52*	*-64.68*	*-65.51*	*-4.24*	*-1.66*	*D+L+F+E's*
LC(3e)	*-15.86*	*-21.27*	*60.49*	*-92.61*	*-96.67*	*6.36*	*11.34*	*D+L+F+Es+To*
LC(3f)	*-15.86*	*-21.27*	*-12.87*	*-145.31*	*-140.07*	*2.01*	*2.66*	*D+L+F+E's+To*
LC(3m)	*33.48*	*5.10*	*30.55*	*-11.93*	*-21.98*	*0.11*	*7.00*	*0.9D+F+Es*

LC(3n)	*33.48*	*5.10*	*-42.81*	*-64.63*	*-65.38*	*-4.23*	*-1.69*	*0.9D+F+E's*
LC(3o)	*-16.12*	*-20.33*	*61.20*	*-92.56*	*-96.54*	*6.37*	*11.31*	*0.9D+F+Es+To*
LC(3p)	*-16.12*	*-20.33*	*-12.16*	*-145.26*	*-139.94*	*2.02*	*2.62*	*0.9D+F+E's+To*
LC(5a)	*-75.87*	*-51.43*	*30.19*	*-261.65*	*-265.57*	*15.00*	*17.17*	*D+L+F+Ta*
LC(5b)	*-114.31*	*-96.07*	*55.47*	*-35.06*	*-36.08*	*2.55*	*-1.61*	*D+L+F+Ta*
LC(7a)	*-54.08*	*-40.93*	*30.63*	*-125.65*	*-122.46*	*5.94*	*7.24*	*1.05D+1.3L+1.05F+1.2To*

Notes:

x- direction is horizontal; y- direction is vertical.

See Figure 3H.5-10 for element location.

Plate thickness required for load combinations excluding thermal:	0.14 inches
Plate thickness provided:	0.50 inches
Maximum principal stress for load combination 5 including thermal:	22.1 ksi
Yield stress:	65.0 ksi
Maximum stress intensity range for load combination 5 including thermal:	22.1 ksi
Allowable stress intensity :	130.0 ksi

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.

Replace Table 3H.5-10, "Design Summary Of Roof At Elevation 180'-0", Area 6 (Near Shield Building Interface)," as follows:

Table 3H.5-10 [DESIGN SUMMARY OF ROOF AT ELEVATION 180'-0", AREA 6]* (Near Shield Building Interface)	
Governing Load Combination (Roof Girder)	
Combination Number	3 – Extreme Environmental Condition Downward Seismic Acceleration
Bending Moment:	
Allowable Stress	= 33.3 ksi > Actual Stress
Shear Force:	
Allowable Stress	= 20.1 ksi > Actual Stress
Governing Load Combination (Concrete Slab)	
Parallel to the Girders	
Combination Numbers	3 – Extreme Environmental Condition
Reinforcement (Each Face)	
Provided	= 2.54 in^2/ft > Required
Perpendicular to the Girders	
Combination Numbers	3 – Extreme Environmental Condition
Reinforcement (Each Face)	
Provided	= 3.12 in^2/ft > Required

Table 3H.5-10

[DESIGN SUMMARY OF ROOF AT ELEVATION 180'-0", AREA 6 (NEAR SHIELD BUILDING INTERFACE)](1)*

Governing Load Combination (Roof Girder)	
Combination Number	*3 – Extreme Environmental Condition Downward Seismic Acceleration*
Bending Moment	*= 7125 kips-ft*
Corresponding Stress	*= 24.1 ksi*
Allowable Stress	*= 38.0 ksi*
Shear Force	*= 447 kips*
Corresponding Stress	*= 17.0 ksi*
Allowable Stress	*= 20.1 ksi*
Governing Load Combination (Concrete Slab)	
Parallel to the Girders	
Combination Numbers	*3 – Extreme Environmental Condition*
Reinforcement (Each Face)	
Required	*= 1.74 in^2/ft*
Provided	*= 2.54 in^2/ft*
Perpendicular to the Girders	
Combination Numbers	*3 – Extreme Environmental Condition*
Reinforcement (Each Face)	
Required	*= 1.68 in^2/ft*
Provided	*= 3.12 in^2/ft*

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Replace Table 3H.5-11, "Design Summary Of Floor At Elevation 135′-3″: Area 1 (Between Column Lines M And P)," as follows:

Table 3H.5-11 [DESIGN SUMMARY OF FLOOR AT ELEVATION 135′-3″ AREA 1 (BETWEEN COLUMN LINES M AND P)]*	
Governing Load Combination (Steel Beam)	
Load Combination *Bending Moment* *Allowable Stress*	*3 – Extreme Environmental Condition Downward Seismic* *= 33.26 ksi > Actual stress*
Shear Force *Allowable Stress*	*= 20.1 ksi > Actual stress*
Governing Load Combination (Concrete Slab)	
Parallel to the Beams *Load Combination* *Reinforcement (Each Face)* *Provided*	*3 – Extreme Environmental Condition Downward Seismic* *= 0.44 in^2/ft > Required*
Perpendicular to the Beams *Load Combination* *Reinforcement (Each Face)* *Provided*	*Normal Condition* *= 0.60 in^2/ft > Required*

Table 3H.5-11

[DESIGN SUMMARY OF FLOOR AT ELEVATION 135'-3" AREA 1 (BETWEEN COLUMN LINES M AND P)](1)*

Governing Load Combination (Steel Beam)	
Load Combination	*3 – Extreme Environmental Condition Downward Seismic*
Bending Moment	*= (-) 63.9 kips-ft*
Corresponding Stress	*= 17.0 ksi*
Allowable Stress	*= 33.26 ksi*
Shear Force	*= 30.7 kips*
Corresponding Stress	*= 8.7 ksi*
Allowable Stress	*= 20.1 ksi*
Governing Load Combination (Concrete Slab)	
Parallel to the Beams	
Load Combination	*3 – Extreme Environmental Condition Downward Seismic*
Bending Moment	*= (-) 16.0 kips-ft/ft*
In-plane Shear	*= 20.0 kips (per foot width of the slab)*
Reinforcement (Each Face)	
Required	*= 0.41 in^2/ft*
Provided	*= 0.44 in^2/ft*
Perpendicular to the Beams	
Combination Number	*Normal Condition*
Bending Moment	*= (+) 6.66 kips-ft (per foot width of the slab)*
Reinforcement (Each Face)	
Required	*= 0.28 in^2/ft*
Provided	*= 0.60 in^2/ft*

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Replace Table 3H.5-12, "Design Summary Of Floor At Elevation 135'-3" (Operator Work Area (previously known as 'Tagging Room') Ceiling," as follows:

Table 3H.5-12 [DESIGN SUMMARY OF FLOOR AT ELEVATION 135'-3" (OPERATIONS WORK AREA (TAGGING ROOM) CEILING)]*	
Design of Precast Concrete Panels	
Governing Load Combination	Construction
Bottom Reinforcement (E/W Direction)	
Provided	= 0.79 in^2/ft
Top Reinforcement (E/W Direction)	
Required	= (Minimum required by Code)
Provided	= 0.20 in^2/ft
Top and Bottom Reinforcement (N/S Direction)	
Required	= (Minimum required by Code)
Provided	= 0.20 in^2/ft
Design of 24-inch-Thick Slab	
Governing Load Combination	Extreme Environmental Condition (SSE)
Bottom Reinforcement (E/W Direction)	
Provided	= 1.00 in^2/ft > Required
Top Reinforcement (E/W Direction)	
Provided	= 1.00 in^2/ft > Required
Top and Bottom Reinforcement (N/S Direction)	
Provided	= 0.79 in^2/ft > Required

Table 3H.5-12

[DESIGN SUMMARY OF FLOOR AT ELEVATION 135'-3" (OPERATOR WORK AREA (PREVIOUSLY KNOWN AS 'TAGGING ROOM') CEILING)](1)*

Design of Precast Concrete Panels	
Governing Load Combination	*Construction*
Design Bending Moment (Midspan)	*= 14.53 kip-ft/ft*
Bottom Reinforcement (E/W Direction)	
Required	*= 0.58 in^2/ft*
Provided	*= 0.79 in^2/ft*
Top Reinforcement (E/W Direction)	
Required	*= (Minimum required by Code)*
Provided	*= 0.20 in^2/ft*
Top and Bottom Reinforcement (N/S Direction)	
Required	*= (Minimum required by Code)*
Provided	*= 0.20 in^2/ft*
Design of 24-inch-Thick Slab	
Governing Load Combination	*Extreme Environmental Condition (SSE)*
Design Bending Moment (E/W Direction) Midspan	*= 14.40 kips ft/ft*
Design In-plane Shear	*= 31.9 kips/ft*
Design In-plane Tension	*= 21.9 kips/ft*
Bottom Reinforcement (E/W Direction)	
Required	*= 0.53 in^2/ft*
Provided	*= 0.79 in^2/ft*
Design Bending Moment (E/W Direction) at Support	*= 28.81 kips-ft/ft*
Design In-plane Shear	*= 31.9 kips/ft*
Design In-plane Tension	*= 21.9 kips/ft*
Top Reinforcement (E/W Direction)	
Required	*= 0.93 in^2/ft*
Provided	*= 1.00 in^2/ft*
Design Bending Moment (N/S Direction)	*= 8.47 kips ft/ft*
Design In-plane Shear	*= 31.9 kips/ft*
Design In-plane Tension	*= 27.2 kips/ft*
Top and Bottom Reinforcement (N/S Direction)	

Required	*= 0.59 in^2/ft*
Provided	*= 0.79 in^2/ft*

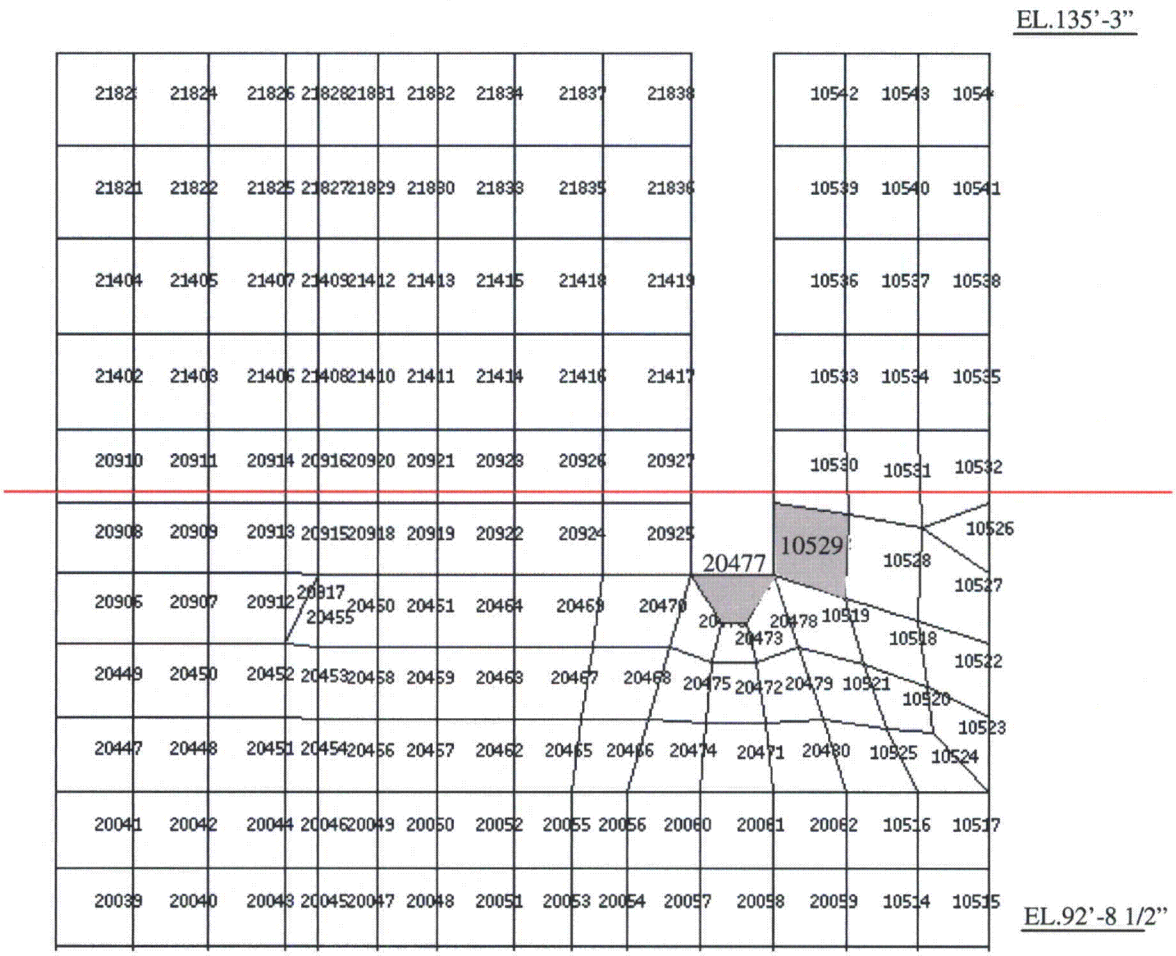
(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~

Replace Table 3H.5-13, "Design Summary Of Floor At Elevation 135'-3" Area 1 (Main Control Room Ceiling)," as follows:

~~Table 3H.5-13~~ ~~*[DESIGN SUMMARY OF FLOOR AT ELEVATION 135'-3" AREA 1 (MAIN CONTROL ROOM CEILING)]**~~
~~*The design of the bottom plate with fins is governed by the construction load.*~~
~~*The design evaluation results are summarized below:*~~ • ~~*The actual area of the tension steel is 9.0 in^2, which provides a design strength of 518.5 kips-ft bending moment capacity. This is larger than the required capacity.*~~ • ~~*The design shear strength is 23.22 kips. This is larger than the required capacity.*~~ • ~~*The shear studs are spaced 9 inches c/c, in both directions. The calculated required spacing is 9.06 inches.*~~

Table 3H.5-13 *[DESIGN SUMMARY OF FLOOR AT ELEVATION 135'-3" AREA 1 (MAIN CONTROL ROOM CEILING)]*(1)*
The design of the bottom plate with fins is governed by the construction load.
For the composite floor, the design forces used for the evaluation of a typical 9-inch-wide strip of the slab are as follows: *Maximum bending moment = +35.0 (-24.4) kips-ft* *Maximum shear force = 22.3 kips*
The design evaluation results are summarized below: • *The actual area of the tension steel is 9.0 in^2, which provides a design strength of 518.5 kips-ft bending moment capacity.* • *The design shear strength is 23.22 kips.* • *The shear studs are spaced 9 inches c/c, in both directions. The calculated required spacing is 9.06 inches.*

(1) See Subsection 3H.1 for reporting requirements for changes to Tier 2* information in Appendix 3H.
~~*NRC Staff approval is required prior to implementing a change in this information; see DCD Introduction Section 3.5.~~


EL.135'-3"
21823 21824 21826 21828 21831 21832 21834 21837 21838
21821 21822 21825 21827 21829 21830 21833 21835 21836
21404 21405 21407 21409 21412 21413 21415 21418 21419
21402 21403 21406 21408 21410 21411 21414 21416 21417
20910 20911 20914 20916 20920 20921 20923 20926 20927
20908 20909 20913 20915 20918 20919 20922 20924 20925
20905 20907 20912 20917 20455 20450 20451 20464 20469 20470
20449 20450 20452 20453 20458 20459 20463 20467 20468 20475 20472 20479 10521
20447 20448 20451 20454 20456 20457 20462 20465 20466 20474 20471 20480 10525 10524
20041 20042 20044 20046 20049 20050 20052 20055 20056 20060 20061 20062 10516 10517
20039 20040 20043 20045 20047 20048 20051 20053 20054 20057 20058 20059 10514 10515
10542 10543 10544
10539 10540 10541
10536 10537 10538
10533 10534 10535
10530 10531 10532
20477
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10523
EL.92'-8 1/2"

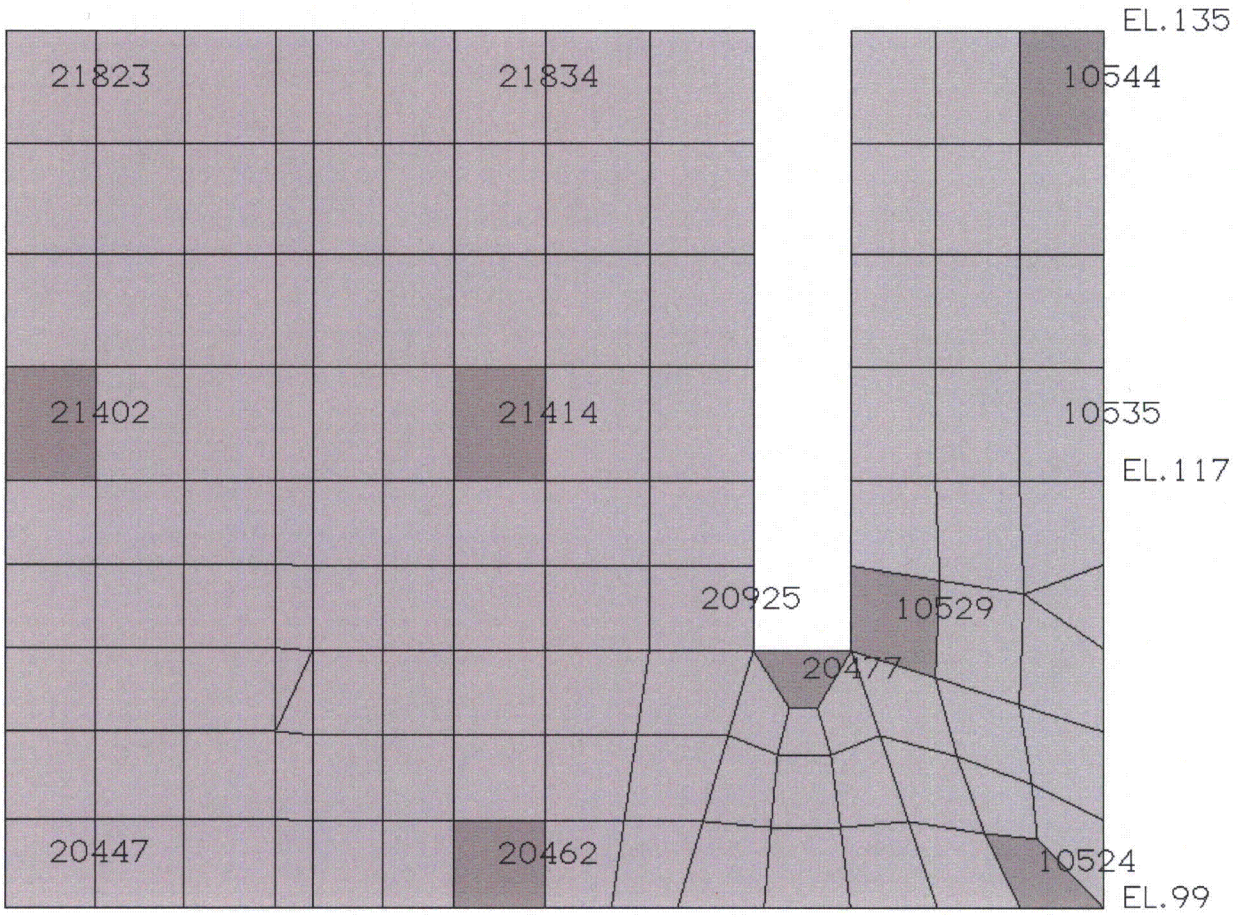

Figure 3H.5-10

*[Spent Fuel Pool Wall Divider Wall Element Locations]**