PMSTPCOL PEmails

From: Joseph, Stacy
Sent: Tuesday, February 22, 2011 2:34 PM
To: Gilles, Nanette; Dreisbach, Jason; Andrukat, Dennis
Cc: Foster, Rocky; STPCOL
Subject: FW: Draft RAI Response 1-20
Attachments: RAI%2001-20%20response%20final%20draft.pdf

Attached is the DRAFT RAI from STP on the AIA question. Please review and let me know if STP has hit the mark or if we need to have an additional telecon.

Thanks,
Stacy

From: Puleo, Frederick [mailto:fjpuleo@STPEGS.COM]
Sent: Tuesday, February 22, 2011 1:35 PM
To: Joseph, Stacy
Subject: Draft RAI Response 1-20

Stacy attached draft response for your use. We are reviewing the document for editorials however; technical content is pretty firm at this point.

Fred Puleo
Units 3 & 4 Regulatory Affairs
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Mail Envelope Properties (BBC4D3C29CD0E64E9FD6CE1AF26D84D561F61A9B35)

Subject: FW: Draft RAI Response 1-20
Sent Date: 2/22/2011 2:34:19 PM
Received Date: 2/22/2011 2:34:19 PM
From: Joseph, Stacy

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MESSAGE	587	2/22/2011 2:34:19 PM
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Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
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RAI 01-20

QUESTION

In your response to RAI 1-18, Item 1 (dated 8/4/2010), you stated that Revision 4 to the STP Units 3&4 COL application would incorporate by reference the ABWR DCD amendment application for aircraft impact. You have now revised your application to incorporate by reference the ABWR STP Aircraft Impact Assessment (AIA) Amendment, Revision 3, dated September 23, 2010. The NRC's proposed rulemaking certifying the amendment was published in the *Federal Register* on January 20, 2011 (76 FR 3540). The proposed revisions to Appendix A of 10 CFR Part 52 include the addition of provisions in Section VIII for controlling changes to AIA information included in the STP Nuclear Operating Company (STPNOC) DCD for the amendment. The new provisions in proposed paragraph VIII.B.5.d would require that applications referencing the STPNOC DCD and proposing to depart from AIA information shall consider the effect of the changes on the original assessment required by 10 CFR 50.150(a). In addition, applicants would also document how the modified design continues to meet the assessment requirements in 10 CFR 50.150(a)(1), in accordance with Section X of Appendix A.

Paragraph X.A.3 requires an applicant referencing Appendix A to prepare and maintain written evaluations which provide the bases for the determinations required by Section VIII. These evaluations must be retained throughout the period of application and for the term of the license. Furthermore, Paragraph IV.A.2 requires that applications referencing Appendix A include reports on departures from, and updates to, the plant-specific DCD required by Paragraph X.B of Appendix A. Paragraph X.B requires applicants referencing Appendix A to submit a report to the NRC "containing a brief description of any plant-specific departures from the DCD, including a summary of the evaluation of each."

In your response to RAI 1-18 Item 2, you stated that you identified a number of STP 3&4 application departures that related to key design features credited in the AIA assessment. Please provide a list of these departures, briefly describe them, and explain how you have met the provisions of paragraphs VIII.B.5.d and X.A.3 of the proposed rule certifying the ABWR STP AIA Amendment. Describe how you came to the conclusion that "none of these departures affects the overall conclusions in Appendix 19S relative to aircraft impact; that is, the key design features credited in the application are still valid for the aircraft assessment," as was stated in your response to RAI 1-18, Item 2. Finally, please document these conclusions in your Departures Report.

RESPONSE:

Table 01-20-1 provides a list and a brief description of the departures that relate to key design features that were credited for AIA as described in Appendix 19S.4 of the ABWR STP Aircraft Impact Assessment (AIA) Amendment, Revision 3, dated September 23, 2010. This list was developed by reviewing all of the departures in Part 7 of STP 3&4 COLA Revision 5 as well as all departures identified in RAI responses which have not yet been incorporated in the COLA, and identifying those that could be related to key design features credited for AIA as identified in

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Appendix 19S.4. An evaluation was then performed of each departure to determine if that departure would have changed the conclusion as stated in Section 19S.5, which states, "This assessment based upon NEI 07-13, concludes that the ABWR can continue to provide adequate protection of the public health and safety in the event of an impact of a large, commercial aircraft, as defined by the NRC. The aircraft impact would not inhibit the ABWR's core cooling capability and spent fuel pool integrity based on best estimate calculations."

The results of the evaluation show that all of the key design features credited in Appendix 19S.4 are either unaffected or enhanced by the identified departures, and therefore, the conclusions in Appendix 19S.5 are unaffected by these departures. These departures do not adversely impact the basic design and physical separation of the ECCS, and do not affect the alternate feedwater injection (AFI) system. These departures do not adversely affect the location and design of the reactor building, control building, turbine building, or the spent fuel pool and its supporting structure that are credited in the AIA assessment. These departures do not affect the ability of the primary containment to protect components inside the containment from the impact of a postulated aircraft impact. These departures do not change the design and location of fire barriers (including doors) as described in FSAR Sections 9.5.1 and 9A.4 for the reactor building and control building to limit the effects of internal fires created by a postulated aircraft impact.

The result of these departures is that no changes are required to the information provided in the AIA amendment (Rev 3) to the ABWR DCD and incorporated by reference in the STP 3 & 4 COLA.

The details of the evaluation of each departure are available for NRC review.

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Table 01-20-1 List of Departures Impacting Key AIA Design Features

Departure Number	Departure Name	Departure Description
T1 2.4-1	Residual Heat Removal System and Spent Fuel Pool Cooling	This departure adds a third RHR loop capability for supporting SFP cooling and fuel pool makeup.
T1 2.4-3	RCIC Turbine/Pump	This departure revises the turbine/pump to a single monoblock design (pump and turbine within the same casing) with no shaft seal, barometric condenser, oil lubrication, oil cooling system, steam bypass line, or vacuum pump required.
T1 2.4-4	RHR, HPCF and RCIC Turbine/Pump NPSH	This departure updates the Tier 2 text in Chapters 5, 6 and 14 and the ITAAC for RHR, RCIC and HPCF to reflect a revised basis for the determination of adequate ECCS pump NPSH. The original design basis of 50% blockage of the ECCS pump suction strainers based on RG 1.82, Rev. 0 is revised to use of a more deterministic basis for the head loss calculation based on RG 1.82, Rev. 3.
T1 2.15-2	Reactor Building Safety-Related Diesel Generator HVAC	This departure changes the maximum operating temperature limit in the diesel generator (DG) engine rooms during DG operation from 50°C to 60°C.

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Table 01-20-1 List of Departures Impacting Key AIA Design Features (Continued)

Departure Number	Departure Name	Departure Description
1.2-2	Turbine Building	This departure describes changes to the internal turbine building arrangement due to revised design of the turbine/generator and auxiliary support equipment, revised sizing of the condenser and circulating water piping due to changes in the UHS, and a revised electrical system design.
3.6-1	Main Steam Tunnel Concrete Thickness	DCD Tier 2 Section 3.6 specifies a minimum 2 meter wall thickness for the main steam tunnel. This departure provides that thicknesses less than 2 meters may be acceptable depending on meeting structural and shielding requirements. This design requirement is being changed to conform to Tier 1 Table 2.15.12, which specifies a minimum thickness of 1600 mm.
3B-1	Equation Error in Containment Impact Load	This departure corrects an error in the equation for calculating the pulse duration for a flat target (DCD Subsection 3B.4.2.3). A multiplying factor in the DCD equation had the wrong units. This is corrected in this departure.
3H-1	Liner Anchor Material	This departure corrects containment liner anchor material from ASTM A-633 Gr. C to ASME SA36. ASTM A-633 Gr. C is not an ASME code allowable material and is inconsistent with the material specified in DCD Subsection 19F.3.2.1 (ASTM A-36), which is used in the severe accident analysis for the containment. ASTM A-36 and ASME SA-36 have the same physical properties.

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Table 01-20-1 List of Departures Impacting Key AIA Design Features (Continued)

Departure Number	Departure Name	Departure Description
4.5-1	Reactor Materials	The DCD description of the materials for the control rod drive (CRD) mechanisms, the reactor internals, and the reactor coolant pressure boundary has been revised (1) to reflect the materials successfully used in operating ABWR designs over the last 10 years; (2) to clarify some data and provide equivalent materials, as appropriate; and (3) to clarify some fabrication and material issues for reactor internals materials. In addition, changes have been made to clarify product form and material type and to clarify a component definition, and to Subsections 4.5.1 and 4.5.2 to remove classes F304L and F316L for ASME Grade SA336/336M because these classes were not listed for use in Section III, Appendix I, Table I-1.2 of the ASME code. The description of Code Case applied to RPV, Reactor Internals and the reactor coolant pressure boundary materials has been revised in Section 5.2 and Table 5.2-4 to reflect the issuance by ASME of "N-580-2". In addition, some non-technical editorial corrections are incorporated, which include corrections to typographical errors, changes in terminology for correctness, insertion of omissions, and to clarify material categorization.
5.4-3	RHR System Interlock	This departure corrects the DCD text to reflect the RHR design as described in the DCD figures. These corrections are in the areas of; (1) operation of wetwell sprays in conjunction with the LPFL mode, (2) minimum flow valve open logic, and (3) relief valve design pressure.

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Table 01-20-1 List of Departures Impacting Key AIA Design Features (Continued)

Departure Number	Departure Name	Departure Description
5B-1	RHR Flow and Heat Capacity Analysis	This departure increases the heat removal capacity of the RHR heat exchangers.
6.2-3	Containment Penetrations and Isolation	This departure corrects primary containment penetration errors and inconsistencies in Section 6.2 of the reference ABWR DCD and provides additional design detail that was not present in the reference ABWR DCD. Changes to the tables include the correction of containment penetration elevation, azimuth, offset, and diameter. In addition, containment isolation barrier type information is provided for valves that did not contain this level of detail in the reference ABWR DCD.
6C-1	Containment Debris Protection for ECCS Suction Strainers	This departure incorporates a new ECCS suction strainer cassette design. This departure changes the type of ECCS suction strainers and provides design methodology for these strainers. The cassette type strainer improves upon the conical type strainer in alleviating strainer blockage. The strainer design incorporates requirements outlined in the latest Regulatory Guide 1.82 (Rev.3).
7.3-2	ADS Operator	This departure clarifies that the SRV's are powered by pneumatic actuation based on an electrical signal to the solenoid valve.

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Table 01-20-1 List of Departures Impacting Key AIA Design Features (Continued)

Departure Number	Departure Name	Departure Description
7.3-4	ADS Logic	This departure clarifies that ADS initiation can occur on low water level (Level 1) in the RPV without a coincident high drywell pressure signal in the event an 8-minute (nominal) bypass timer times out. Tier 2 Subsection 7.3.2.1.1 is also corrected to remove the reference to an 8-minute exact value for this timer in order to be consistent with Tier 1 information regarding the setting of less than or equal to 8 minutes for this timer.
7.3-6	SRV Position Indication	This departure changes the control room indication of SRV position from indication of solenoid pilot valves energized to a limit switch. The limit switch replaces the LVDT to provide a more reliable direct and positive indication of SRV position.
7.3-7	ADS Manual Operation	This departure changes the ADS inhibit switch from the keylock type to a normal manual switch.
7.3-9	Shutdown Cooling Operation	This departure deletes reference to automatic closure of the RHR suction valves for the SCS mode on receipt of an LPFL initiation signal on Level 1. These valves are already automatically closed on a Level 3 signal. This departure further clarifies that the shutdown cooling isolation valves must be closed to permit suction from the Suppression Pool.

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Table 01-20-1 List of Departures Impacting Key AIA Design Features (Continued)

Departure Number	Departure Name	Departure Description
7.3-10	ESF Logic and Control System (ELCS) Mode Automation	This departure describes logic changes made to Figure 7.3-4 and the text which describes the Mode switches in the main control room (MCR) to initiate various functions of the RHR, such as containment sprays. Initiation of these modes requires arming and then pushbutton initiation as well as the presence of mode specific permissives. This departure also modifies information in Figure 7.3-1, which assures proper implementation of the diverse hard-wired HPCF "C" manual initiation capability described in Appendix 7C.5.
7.3-14	RHR Suppression Pool Cooling (SPC) Logic	This departure provides further clarification regarding the SPC mode of RHR including: (1) repositioning of valves in other RHR modes when SPC is initiated, (2) a description of the SPC mode switch, (3) further description of operator actions to terminate the SPC mode, and (4) description of conditions in which SPC can be entered automatically. In addition, this departure changes the SPC mode manual actuation switch from an "On/Off" to an "Arm/Disarm" switch.
7.3-16	Testing Safety Relief Valve Solenoid Valves	This departure provides for testing of the safety/relief valve pilot solenoid valves at any pressure. The restrictions that were discussed in the reference ABWR DCD are no longer applicable and have been removed.
7.3-17	ADS Electrical Interface	This departure clarifies that sensor input signals are in four divisions while control logic is provided in three divisions to conform to the three divisions of ECCS.

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Table 01-20-1 List of Departures Impacting Key AIA Design Features (Continued)

Departure Number	Departure Name	Departure Description
7.4-2	RHR Alarm	This departure replaces the alarm for "RHR Logic Power Failure" with the more general alarm "ELCS Out of Service." The FSAR is also changed to clarify that the only time the "Manual Initiation Armed" alarm is activated is when the RHR system is in the Low Pressure Flooder (LPFL) Mode of operation.
7.6-2	Suppression Pool Temperature Monitoring (SPTM) Subsystem of Reactor Trip and Isolation System	This departure clarifies the reference ABWR DCD description for the Suppression Pool Temperature Monitoring (SPTM) System in Subsection 7.6.1.7.1 to add that the SPTM System is a subsystem of the Reactor Trip and Isolation System (RTIS).
7.6-3	SPTM Sensor Arrangement	This departure clarifies that the suppression pool temperature sensors are located in the direct sight of the SRV quenchers, and not the SRV's as stated in the DCD.
7.7-2	SRV Discharge Pipe Temperature Data Recording	This departure revises the FSAR to state that the discharge temperatures of all the safety/relief valves are shown on an historian function in the control room. Recording SRV discharge temperature data is now performed in a more accurate manner and is easily retrievable. The parameters being recorded remains the same.

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Table 01-20-1 List of Departures Impacting Key AIA Design Features (Continued)

Departure Number	Departure Name	Departure Description
9.1-1	Update of Fuel Storage and Handling Equipment	This departure describes changes to fuel handling equipment and special tools, which are essentially material, weight, and dimensional changes; corrections or clarifications (e.g., for wrenches and grapples, Steamline Plug, RIP motors, Blade Guide); use of the Fuel Assembly Sampler instead of the Fuel Vacuum Sipper; design changes to the RPV Stud Tensioner System, and Refueling Machine Auxiliary Hoist (for increased capacity) to adapt previous ABWR or other BWR plant experience; the addition of sealing to the Steamline Plug for more effective and reliable sealing; and the deletion of the In-Vessel Rack to minimize potential for objects to drop in the reactor during temporary moves.
9.5-1	Diesel Generator Jacket Cooling Water System	The reference ABWR DCD stated that the Diesel Generator Jacket Cooling Water System conformed to the inspection and testing requirements in Regulatory Guide (RG) 1.108. RG 1.108 was withdrawn in August 1993 with the issuance of RG 1.9, Rev. 3, which endorses IEEE-387 and addresses qualification, preoperational and periodic testing of the diesel generators. As a result, references to RG 1.108 are superseded by the requirements of RG 1.9.

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Part 7 of the STP 3&4 COLA will be revised in Revision 6 of the COLA as shown below with the addition of new Subsection 1.5. Changed portions from Revision 5 of the COLA are highlighted with gray shading.

1.0 Introduction

1.5 Evaluation of AIA Key Design Features Relative to Departures

All of the departures in Part 7 that relate to key design features credited for AIA as identified in Part 2, Tier 2, Appendix 19S.4 were identified. An evaluation was then performed of each departure to determine if that departure would have changed the conclusion as stated in Section 19S.5, which states "This assessment, based upon NEI 07-13, concludes that the ABWR can continue to provide adequate protection of the public health and safety in the event of an impact of a large, commercial aircraft, as defined by the NRC. The aircraft impact would not inhibit the ABWR's core cooling capability and spent fuel pool integrity based on best estimate calculations."

The results of the evaluation show that all of the key design features credited in Appendix 19S.4 are either unaffected or enhanced by the identified departures and therefore, the conclusions in Appendix 19S.5 are unaffected by these departures. These departures do not adversely impact the basic design and physical separation of the ECCS, and do not affect the alternate feedwater injection (AFI) system. These departures do not adversely affect the location and design of the reactor building, control building, turbine building, or the spent fuel pool and its supporting structure that are credited in the AIA assessment. These departures do not affect the ability of the primary containment to protect components inside the containment from the impact of a postulated aircraft impact. These departures do not change the design and location of fire barriers (including doors) as described in FSAR Sections 9.5.1 and 9A.4 for the reactor building and control building to limit the effects of internal fires created by a postulated aircraft impact.

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