

ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Wednesday, January 23, 2013 3:43 PM
To: Snyder, Amy
Cc: WELLS Russell (AREVA); Ford, Tanya; DELANO Karen (AREVA); LEIGHLITER John (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); WILLS Tiffany (AREVA); Miernicki, Michael
Subject: Response to U.S. EPR Design Certification Application FINAL RAI No. 565 (6933), FSAR Ch. 19 - NEW PHASE 4 RAI - AIA Methodology
Attachments: RAI 565 Response US EPR DC.pdf

Amy,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 565 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the 7 questions cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 565 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 565 — 19-357	2	2
RAI 565 — 19-358	3	3
RAI 565 — 19-359	4	4
RAI 565 — 19-360	5	5
RAI 565 — 19-361	6	6
RAI 565 — 19-362	7	7
RAI 565 — 19-363	8	8

The schedule for a technically correct and complete response to these 7 questions is provided below.

Question #	Response Date
RAI 565 — 19-357	April 26, 2013
RAI 565 — 19-358	April 26, 2013
RAI 565 — 19-359	April 26, 2013
RAI 565 — 19-360	April 26, 2013
RAI 565 — 19-361	April 26, 2013
RAI 565 — 19-362	April 26, 2013
RAI 565 — 19-363	April 26, 2013

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.

7207 IBM Drive, Mail Code CLT 2B
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Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: Snyder, Amy [<mailto:Amy.Snyder@nrc.gov>]

Sent: Friday, December 14, 2012 3:19 PM

To: ZZ-DL-A-USEPR-DL

Cc: Ford, Tanya; Vettori, Robert; Lee, Samuel; ArevaEPRDCPEm Resource; Segala, John; McKenna, Eileen; Miernicki, Michael

Subject: U.S. EPR Design Certification Application FINAL RAI No. 565 (6933), FSAR Ch. 19 - NEW PHASE 4 RAI - AIA Methodology

Attached please find the subject request for additional information (RAI). A draft of the RAI was provided to you on November 23, 2012, and discussed with your staff on December 3, 2012. Draft RAI Question 19-363 was modified as a result of those discussions. On December 11, 2012, you informed us that the RAI does not contain AREVA Proprietary information or SGI information and that the draft RAI with the modifications is clear and no further clarification is needed. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs, excluding the time period of **December 24, 2011 thru January 2, 2012, to account for the holiday season** as discussed with AREVA NP Inc on November 28, 2012. For any RAIs that cannot be answered **within 40 days or January 23, 2012**, it is expected that a date for receipt of this information will be provided to the staff within the 40-day period so that the staff can assess how this information will impact the published schedule.”

Thank You,

Amy

Amy Snyder, U.S. EPR Design Certification Lead Project Manager

Licensing Branch 1 (LB1)

Division of New Reactor Licensing

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From: WILLIFORD Dennis (AREVA)

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RAI 565 Response US EPR DC.pdf		76470

Options

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Request for Additional Information 565

Issue Date: 12/14/2012

Application Title: U. S. EPR Standard Design Certification - Docket Number 52-020
Operating Company: AREVA NP Inc.
Docket No. 52-020

**Review Section: 19 - Probabilistic Risk Assessment and Severe Accident
Evaluation**

**Application Section: 19.2.7 Beyond Design Basis Large Commercial Aircraft
Impact Assessment**

Question 19-357:

US EPR FSAR Tier 2 Revision 3, Section 19.2.7.3, "Methodology," states that the methodology used for assessing effects of aircraft impact is described in NEI 07-13, "Methodology for Performing Aircraft Impact Assessments for New Plant Designs," Revision 7. The methodology of NEI 07-13, Revision 7 was followed with no exceptions.

Since the original FSAR submittal, Regulatory Guide 1.217, August 2011, "Guidance for the Assessment of Beyond-Design-Basis Aircraft Impact," references Revision 8 of NEI 07-13. The applicant should consider changing their FSAR to the latest NEI 07-13 revision (Revision 8) and provide applicable changes to Section 19.2.7.3 of the FSAR.

Response to Question 19-357:

A response to this question will be provided by April 26, 2013.

Question 19-358:

US EPR FSAR Tier 2 Revision 3, Section 19.2.7.4, "Design Features Credited for Conformance with 10 CFR 50.150," states that the location and design of the concrete sliding door in the Radioactive Waste Processing Building at Elevation 0 feet described in FSAR Section 1.2.3 and Reference 24 provides protection to portions of the Fuel Building.

Contrary to the requirements of paragraph (b)(1) of 10 CFR 50.150, Section 19.2.7.4 does not contain a description of design features nor functional capabilities relied upon for the concrete sliding door to ensure that the assessment requirements in paragraph (a)(1) of 10 CFR 50.150 are met.

The applicant should include in the FSAR how this protection is provided by describing, at a minimum, the following:

1. the normal position of this concrete sliding door during power operations and at shutdown conditions
2. controls in place that allow the door to be open/closed
3. the time it would take to close this concrete door
4. key design features that would potentially be affected or lost in the fuel building by a large commercial aircraft impact with the concrete door open, and the effects on the fuel pool, fuel pool cooling, or spent fuel pool liner.

Response to Question 19-358:

A response to this question will be provided by April 26, 2013.

Question 19-359:

The US EPR FSAR Tier 2 Revision 3, Section 19.2.7 submittal reviewed by the NRC should accurately reflect the results of the Aircraft Impact Assessment (AIA) performed by the applicant as required by 10 CFR 50.150. The submittal should include all key design features and functional capabilities credited in the AIA to meet the acceptance criteria. As such, the applicant is requested to verify that the submittal fully identified and described all key design features and functional capabilities credited in the AIA.

FSAR 19.2.7.5.2, "RCS Heat Removal Capability," states that the analyses performed demonstrated the ability of the U.S. EPR design, after the impact by a large commercial aircraft, to maintain functionality of one or more divisions of systems credited in U.S. EPR FSAR Tier 2, Chapter 15 with providing reactor core cooling under accident conditions. The U.S. EPR design has features such as hardened and isolated shield structures, a strategic site arrangement and plant structural design, fire barriers, and the physically separate and redundant trains. These features contribute to the success of one or more divisions of systems credited in Chapter 15 to maintain functionality to provide reactor core cooling after the impact of a large commercial aircraft.

The submittal should include all key design features for RCS heat removal capability (Tier 2 FSAR Section 19.2.7.5.2) and functional capabilities credited in the AIA to meet the acceptance criteria and not just reference SSCs credited in Chapter 15 of the FSAR. Support systems such as the ultimate heat sink (UHS), component cooling water (CCWS), essential service water systems (ESWS) are not described in Chapter 15 of the FSAR. As such, the applicant is requested to verify that the submittal fully identifies and describes all key design features and functional capabilities credited in the AIA for RCS heat removal capability.

The applicant should revise the submittal if it is found that there are key design features and functional capabilities credited in the AIA that are not clearly identified or described in the US EPR FSAR Section 19.2.7.

Response to Question 19-359:

A response to this question will be provided by April 26, 2013.

Question 19-360:

U S EPR FSAR Tier 2 Revision 3, Section 19.2.7.3, "Methodology," states that the methodology used to demonstrate compliance with 10 CFR 50.150 is NEI 07-13, "Methodology for Performing Aircraft Impact Assessments for New Plant Designs," Revision 7.

FSAR Section 19.2.7.4, "Design Features Credited for Conformance with 10 CFR 50.150," states that because the systems necessary to scram the reactor are housed in the hardened and isolated Shield Building structures, there is no potential for impact damage that would prevent a scram. Following shutdown, one or more trains of the safety related and support systems in this section are available to maintain core cooling and SFP cooling.

Tables 3-4 "Approach to Key Issues in Scenario Development," and 3-5 "Key Assumptions to be Used in Damage Footprint Assessment," of NEI 07-13 provides the guidance for treating reactor scram in the assessment. Item 3 in Table 3-4 states in part "However, in reviewing damage footprints in areas with equipment essential to reactor scram an assessment will be made of the potential for damage to prevent a scram should it have not occurred." In this regard, describe those design features that assure the reactor will be shutdown following an aircraft impact, including any features that protect equipment in the Reactor Trip System (Section 7.2.). Include in your discussion the necessary key design features needed for any core boration (reference FSAR Section 6.8, "Extra Borating System") to maintain the core subcritical during cooldown of the reactor coolant in FSAR Section 19.2.7.5.2, "RCS Heat Removal Capability."

The applicant should provide the staff with a marked-up copy of FSAR Section 19.2.7 that shows the required descriptions and include the descriptions in the next Revision of the FSAR. If detailed descriptions of the subject design features are described in sections of the FSAR other than FSAR 19.2.7, then in FSAR Section 19.2.7, identify the features and the sections of the FSAR containing the descriptions. Include descriptions of any success criteria in the US EPR design PRA that are associated with the key design features.

Response to Question 19-360:

A response to this question will be provided by April 26, 2013.

Question 19-361:

US EPR FSAR Tier 2 Revision 3, Section 19.2.7.4, "Design Features Credited for Conformance with 10 CFR 50.150," states that the use of hardened and isolated shield structures provides protection for the Containment, Fuel Building, and Safeguard Building 2/3 structures and the following credited SSCs that are housed in these structures. Component cooling water system (CCWS), trains 2/3 is one of these systems which protection is provided.

US EPR FSAR Section 19.2.7.5, "Evaluation of U.S. EPR Performance," states that the physically separate and redundant train design of the U.S. EPR provides for survival of supporting functions such as emergency power and ultimate heat sink capability.

US EPR FSAR Section 9.2.2, "Component Cooling Water System," state that the CCWS divisions are cross connected between various headers, for example; 1A, 1B, 2A, 2B and the thermal barrier. Cross connected trains also exists for the safety chilled water system (FSAR 9.2.8).

Describe in FSAR Section 19.2.7 the key design features that are credited and have cross connections between division/trains for aircraft impact in accordance with paragraph (b)(1) of 10 CFR 50.150. Specifically describe in the FSAR that the key design features which may physically be located in multiple structures, which are able to be cross connected with motor operated, automatic, hydraulic, or manual valves will be able to perform their intended function for core cooling or spent fuel pool cooling after the impact of a large commercial airplane.

The applicant should provide the staff with a marked-up copy of FSAR Section 19.2.7 that shows the required descriptions and include the descriptions in the next revision of the FSAR.

Response to Question 19-361:

A response to this question will be provided by April 26, 2013.

Question 19-362:

US EPR FSAR Tier 2 Revision 3, Section 9.1.4, "Fuel Handling System," describes a spent fuel cask transfer system which is connected to the underside of the spent fuel loading pit. One of the structures of concern in NEI-07-13, "Methodology for Performing Aircraft Impact Assessments for New Plant Designs," is the fuel handling building.

Describe in FSAR 19.2.7 the key design features for an aircraft impact assessment (AIA) postulating an impact of a large commercial airplane during spent fuel assemblies off loading from the spent fuel pool into a spent fuel cask. Describe if during an aircraft impact and during spent fuel assemblies off loading from the spent fuel pool if there is a leakage path below the minimum water level due to related vibrations/shock damage.

The applicant should provide the staff with a marked-up copy of FSAR Section 19.2.7 that shows the required descriptions and include the descriptions in the next revision of the FSAR.

Response to Question 19-362:

A response to this question will be provided by April 26, 2013.

Question 19-363:

It is stated in US EPR FSAR Tier 2 Revision 3, Section 19.2.7, "Beyond Design Basis Large Commercial Aircraft Impact Assessment," that the methodology used for assessing effects of aircraft impact is described in NEI 07-13, "Methodology for Performing Aircraft Impact Assessments for New Plant Designs," Revision 7 (NEI 07-13).

Detailed description for support systems related to key design features appear to be missing from FSAR 19.2.7 aircraft impact assessment including:

- Essential Service Water Pump Building Ventilation (9.4.11)
- Nuclear Auxiliary Building Ventilation (9.4.3)
- Safeguard Building Controlled-Area Ventilation System (9.4.5)
- Containment Building Ventilation System (9.4.7)
- Emergency Power Generating Building Ventilation System (9.4.9)
- Containment Isolation System (6.2.4)
- Cask loading pit/transfer compartment (9.1.3.2.4)
- Alternating Current Power (8.3)

The US EPR FSAR Tier 2 Revision 3, Section 19.2.7 submittal reviewed by the NRC should accurately reflect the results of the Aircraft Impact Assessment (AIA) performed by the applicant as required by 10 CFR 50.150. The submittal should include all key design features and functional capabilities credited in the AIA to meet the acceptance criteria. As such, the applicant is requested to verify that the submittal fully identified and described all key design features and functional capabilities credited in the AIA.

The applicant should provide an assessment of the above noted systems and provide the staff with a marked-up copy of FSAR Section 19.2.7 that shows the required descriptions and include the descriptions in the next revision of the FSAR.

Response to Question 19-363:

A response to this question will be provided by April 26, 2013.