ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Tuesday, August 14, 2012 11:38 AM
To: Tesfaye, Getachew
Cc: BENNETT Kathy (AREVA); DELANO Karen (AREVA); LEIGHLITER John (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); TOLLEY Tracey (AREVA); VANCE Brian (AREVA); WELLS Russell (AREVA); LENTZ Tony (EXTERNAL AREVA); BALLARD Bob (AREVA)
Subject: DRAFT Response to U.S. EPR Design Certification Application RAI No. 543 (6323), FSAR Ch. 14, Question 14.03.08-4
Attachments: RAI 543 Question 14.03.08-4 DRAFT Response - US EPR DC.pdf

Getachew,

Attached is a DRAFT response to Question 14.03.08-4 for RAI No. 543 (FSAR Ch. 14) in advance of the September 13, 2012 final date.

Please let me know if the staff has any questions or if this response can be sent as final.

Thanks,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
Email: Dennis.Williford@areva.com

From: WILLIFORD Dennis (RS/NB)
Sent: Wednesday, July 18, 2012 4:36 PM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 543 (6323), FSAR Ch. 14 - NEW PHASE 4 RAI, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the 2 questions in RAI No. 543 on May 18, 2012.

The schedule for a technically correct and complete response to Question 14.03.08-5 has been changed as provided below.

Question #	Response Date
RAI 543 — 14.03.08-4	September 13, 2012
RAI 543 — 14.03.08-5	**August 16, 2012**

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
7207 IBM Drive, Mail Code CLT 2B
Charlotte, NC 28262
Phone: 704-805-2223
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From: WILLIFORD Dennis (RS/NB)
Sent: Friday, May 18, 2012 9:46 AM
To: Getachew.Tesfaye@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); ROMINE Judy (RS/NB); RYAN Tom (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 543 (6323), FSAR Ch. 14 - NEW PHASE 4 RAI

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 543 Response US EPR DC.pdf," provides a schedule since a technically correct and complete response to the two questions cannot be provided at this time.

The following table indicates the respective pages in the response document, "RAI 543 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 543 — 14.03.08-4	2	2
RAI 543 — 14.03.08-5	3	4

A complete answer is not provided for the two questions. The schedule for a technically correct and complete final response to these questions is provided below.

Question #	Response Date
RAI 543 — 14.03.08-4	**September 13, 2012**
RAI 543 — 14.03.08-5	**July 18, 2012**

Sincerely,

Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, April 19, 2012 11:27 AM
To: ZZ-DL-A-USEPR-DL
Cc: Stutzcage, Edward; Schaaf, Robert; Jaffe, David; Segala, John; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 543 (6323), FSAR Ch. 14 - NEW PHASE 4 RAI

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on April 5, 2012, and discussed with your staff on April 18, 2012. Draft RAI Question 14.03.08-5 (e) was modified as a result of that discussion. The schedule we have established for review of your application assumes technically correct and complete responses within 30 days of receipt of RAIs. For any RAIs that cannot be answered within 30 days, it is expected that a date for receipt of this information will be provided to the staff within the 30 day period so that the staff can assess how this information will impact the published schedule.

Thanks,

Getachew Tesfaye
Sr. Project Manager
NRO/DNRL/LB1
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 3985

Mail Envelope Properties (2FBE1051AEB2E748A0F98DF9EEE5A5D4D7F679)

Subject: DRAFT Response to U.S. EPR Design Certification Application RAI No. 543 (6323), FSAR Ch. 14, Question 14.03.08-4
Sent Date: 8/14/2012 11:37:49 AM
Received Date: 8/14/2012 11:38:15 AM
From: WILLIFORD Dennis (AREVA)

Created By: Dennis.Williford@areva.com

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Files	**Size**	**Date & Time**	
MESSAGE	4269	8/14/2012 11:38:15 AM	
RAI 543 Question 14.03.08-4 DRAFT Response - US EPR DC.pdf			755841

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Response to

Request for Additional Information No. 543, Question 14.03.08-4

4/19/2012

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 14.03.08 - Radiation Protection Inspections, Tests, Analyses, and Acceptance Criteria
Application Section: Tier 1, Section 2.2.8

QUESTIONS for Health Physics Branch (CHPB)

Question 14.03.08-4:

OPEN ITEM

New Phase 4 RAI

General Design Criterion 61 and 63 state that the fuel handling system shall be designed with suitable shielding for radiation protection and that a system is in place to initiate appropriate safety actions if a high radiation signal is detected.

SRP Section 14.3.8 states that, "the reviewer should ensure that Tier 1 identifies and describes, commensurate with their safety significance, those SSCs that provide radiation shielding, confinement or containment of radioactivity." FSAR Tier 1, Section 2.2.8 contains a description of the Fuel Handling System (FHS) and Table 2.2.8-2 lists the associated FHS ITAAC. In reviewing this section, staff noted that there is no description or ITAAC related to any electrical interlocks, limit switches, or mechanical stops which will be used to assure that a spent fuel assembly being transferred by either the refueling machine or the spent fuel handling machine will be maintained at a level under water appropriate to ensure a maximum dose rate of 2.5 mrem/hr to workers. This is consistent with ANSI/ANS-57.1-1992, which the applicant references. Therefore, please revise FSAR Tier 1 to include descriptions and ITAAC for the above information. This is consistent with the Tier 1 information contained in other designs.

In addition, FSAR Tier 2, Section 9.1.4.3.1 states that the spent fuel transfer machine is provided with a dose rate measurement device and limit switch that prevents farther lifting of a fuel assembly once a personnel dose rate of greater than 2.5 mrem/hour is reached. However, while FSAR Section 9.1.4.3.1 also states that the refueling machine is provided with a dose rate measurement device, and lifting is stopped in case of exceeding the allowable dose rate limit, it does not specify the dose limit at which the lifting will be stopped. Please specify at what dose rate to personnel the lifting of a fuel assembly by the refueling machine will be stopped and if there is a mechanical interlock which stops it, and include the information in FSAR Section 9.1.4.3.1.

Response to Question 14.03.08-4:

A commitment will be added to U.S. EPR FSAR Tier 1, Section 2.2.8, and in the ITAAC Table 2.2.8-2, requiring that the lift height of the refueling machine and spent fuel machine be limited such that the calculated minimum required depth-of-water shielding is maintained.

Clarification will also be added to the text in U.S. EPR FSAR Tier 2, Section 9.1.4.3.1, for the refueling machine indicating that a limit switch prevents further lifting of an irradiated fuel assembly such that personnel exposure will not be greater than 2.5 mrem/hr.

FSAR Impact:

U.S. EPR FSAR Tier 1, Section 2.2.8 and Table 2.2.8-2, and U.S. EPR FSAR Tier 2, Section 9.1.4.3.1, will be revised as described in the response and indicated in the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

3.5 Components and connecting piping listed in Table 2.2.8-1 as ASME Code Section III are ~~fabricated~~ reconciled in accordance with ASME Code Section III design requirements.

3.6 Pressure boundary welds on components and connecting piping listed in Table 2.2.8-1 as ASME Code Section III ~~are in accordance with~~meet ASME Code Section III non-destructive examination requirements.

3.7 Components and connecting piping listed in Table 2.2.8-1 as ASME Code Section III retain pressure boundary integrity at design pressure.

3.8 The new and spent fuel storage racks maintain the effective neutron multiplication factor less than the required limits during normal operations, during and after design basis seismic events, and during and after design basis dropped fuel assembly accidents.

3.9 Components and connecting piping listed in Table 2.2.8-1 as ASME Code Section III are fabricated, installed, and inspected in accordance with ASME Code Section III requirements.

3.10 Transfer Tube piping inside the RCB is designed in accordance with ASME Code Section III requirements.

3.11 Transfer Tube piping inside the RCB is reconciled in accordance with an ASME Code Section III Design Report.

3.12 Transfer Tube piping inside the RCB is fabricated, installed and inspected in accordance with ASME Code Section III requirements.

3.13 Pressure boundary welds in Transfer Tube piping inside the RCB meet ASME Code Section III non-destructive examination requirements.

3.14 Transfer Tube piping inside the RCB retains pressure boundary integrity at design pressure.

3.15 The lift height of the Refueling Machine and Spent Fuel Machine gripper masts is limited such that the dose rate is less than 2.5 mrem/hr at the normal operating water level.

4.0 System Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.2.8-2 lists the FHS ITAAC.

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Table 2.2.8-2—Fuel Handling System ITAAC (~~4~~ 5 Sheets)

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
3.12	Transfer Tube piping inside the RCB is fabricated, installed, and inspected in accordance with ASME Code Section III requirements.	An inspection of Transfer Tube piping inside the RCB will be performed.	For Transfer Tube piping inside the RCB, ASME Code Data Report(s) (certified, when required by ASME Code) and inspection reports (including N–5 Data Reports where applicable) conclude that the piping is fabricated, installed, and inspected in accordance with ASME Code Section III requirements.
3.13	Pressure boundary welds in Transfer Tube piping inside the RCB meet ASME Code Section III non-destructive examination requirements.	Inspections of pressure boundary welds will be performed in accordance with ASME Code Section III requirements.	ASME Code Section III Data Reports conclude that non-destructive examination of pressure boundary welds in Transfer Tube piping inside the RCB comply with ASME Code Section III requirements.
3.14	Transfer Tube piping inside the RCB retains pressure boundary integrity at design pressure.	Hydrostatic tests will be performed.	For Transfer Tube piping inside the RCB, ASME Code Section III Data Reports conclude that hydrostatic test results comply with ASME Code Section III requirements.
3.15	The lift height of the Refueling Machine and Spent Fuel Machine gripper masts is limited such that the dose rate is less than 2.5 mrem/hr at the normal operating water level.	a. An analysis will be performed. b. A test will be performed on the Refueling Machine. c. A test will be performed on the Spent Fuel Machine.	a. A radiological analysis determines the minimum depth-of-water shielding required to limit the dose rate to less than 2.5 mrem/hr at the normal operating water level. b. The Refueling Machine gripper mast limit switch prevents lifting the mast above the level required to maintain the calculated minimum depth of water above a fuel assembly.

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Table 2.2.8-2—Fuel Handling System ITAAC (~~4~~ 5 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
			c. The Spent Fuel Machine gripper mast limit switch prevents lifting the mast above the level required to maintain the calculated minimum depth of water above a fuel assembly.

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Q. 14.03.08-4

Next File

and analyses of fuel handling accidents are provided in Section 15.0.3.10.

The fuel storage pool, loading pit, and transfer pit are supplied by the fuel building ventilation system (FBVS) (Section 9.4.2). The loading hall is provided with a separate supply and exhaust duct. The FBVS is provided with isolation provisions which can isolate the fuel pool room and the loading hall from the rest of the building, if necessary. In the event radioactivity above limits is present in the FB during normal operation, the system is switched to filtration through the nuclear auxiliary building ventilation system (NABVS). Information on the NABVS is provided in Section 9.4.3.

Doses to operators are maintained ALARA by remote operation of the SFCTM. This precludes the need for operators to enter the loading hall containing a loaded cask until the biological lid is placed on the cask. The underpool loading design also precludes the need to decontaminate the outer surface of the cask after loading.

9.1.4.3.1 Safety Provisions for the Major Fuel Handling System Components

Refueling Machine

The refueling machine (RM) hoisting mechanism is equipped with an operational brake, an auxiliary brake, and a safety brake which acts on the drum in case of overspeed detection, chain failure, or reverse rotation. The brakes are designed to engage when de-energized. They engage in case of a malfunction of the loop drive train configuration.

The gripper mast assembly is suspended via two cables, with an equalizing system and break detector. A limit switch stops the lifting movement when the telescopic gripper mast reaches its upper end position. A load cell measures the weight of the suspended load and control circuits associated with the load cell allow for the brake actuation.

A load limiting device protects the fuel assembly during normal lifting movements in the core when contact occurs between two fuel assemblies. It limits the loads applied to the grids of the fuel assemblies and to the nozzles of the fuel assemblies.

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During normal operation, the refueling machine can only travel within a defined "travel route", thereby avoiding the possibility of inadvertent contacts. This route is determined by encoders and limit switches.

~~The RM is provided with a dose rate measurement device, and lifting is stopped in case of exceeding the allowable dose rate limit.~~ A limit switch prevents further lifting such that personnel exposure from an irradiated fuel assembly will not be > 2.5 mrem/hour. The RM is also provided with a dose rate measurement device and the lifting is stopped in case of exceeding the allowable dose rate limit.

The RM is provided with interlocks related to:

Spent Fuel Machine

The SFM hoisting mechanism is equipped with an operational brake, an auxiliary brake, and a safety brake, which acts on the drum in case of overspeed, chain failure or reverse rotation. The brakes are designed to be engaged when de-energized. They engage in case of malfunction of the loop drive train configuration.

The gripper mast assembly is suspended via two cables with an equalizing system and break detector. A limit switch stops the lifting movement when the telescopic gripper mast reaches the upper end position. A load cell prevents hoisting operation in the event of overload.

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The spent fuel machine travel is limited to avoid a fuel assembly contacting the SFP walls, the FB transfer pit walls, and the loading pit walls.

The limit switch prevents further lifting such that personnel exposure from an irradiated fuel assembly will not be >2.5 mrem/hour. The SFM is also provided with a dose rate measurement device and the lifting is stopped in case of exceeding the allowable dose rate limit.

The SFM is provided with interlocks related to:

- Traveling or traversing.
- Lowering or lifting.
- Engaging or disengaging of the latches.
- Functioning of the FTTF, auxiliary crane, and NFE.
- Access to the fuel pool transfer pit.

New Fuel Elevator

The NFE hoisting mechanism is equipped with an operational brake, and a safety brake on the drum. The brakes are designed to be engaged when de-energized. The hoisting mechanism is provided with a cable equalizing system and a cable break detector. The movement is stopped if a cable break is detected. The hoisting mechanism is equipped with a load detection device and the movement is stopped in the event of a threshold overrun.

The NFE is designed to accommodate only one fuel assembly at a time and is provided with a radiation monitor that stops the NFE in the event of exceeding the radiation limits.

The NFE is provided with interlocks related to: