ArevaEPRDCPEm Resource

From: BRYAN Martin (EXTERNAL AREVA) [Martin.Bryan.ext@areva.com]
Sent: Friday, January 28, 2011 1:08 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (AREVA); ROMINE Judy (AREVA); BENNETT Kathy (AREVA); WILLIFORD Dennis (AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 453, FSAR Ch. 2, NEW PHASE 4 RAI, Supplement 2
Attachments: RAI 453 Supplement 2 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 453 on December 6, 2010. AREVA NP submitted Supplement 1 to the response on December 16, 2010 to address 4 of the 8 questions. The attached file, "RAI 453 Supplement 2 Response US EPR DC.pdf" provides technically correct and complete responses to 2 of the remaining 4 questions, as committed.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 453 Questions 02.03.04-11 and 02.03.04-12.

The following table indicates the respective pages in the response document, "RAI 453 Supplement 2 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 453 — 02.03.04-11	2	2
RAI 453 — 02.03.04-12	3	4

The schedule for technically correct and complete responses to the remaining 2 questions is unchanged and provided below:

Question #	Response Date
RAI 453 — 02.03.04-10	February 14, 2011
RAI 453 — 02.03.05-9	February 14, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Thursday, December 16, 2010 3:33 PM
To: Tesfaye, Getachew
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); WILLIFORD Dennis (RS/NB); 'Miernicki, Michael'
Subject: Response to U.S. EPR Design Certification Application RAI No. 453, FSAR Ch. 2, NEW PHASE 4 RAI, Supplement 1

Getachew,

AREVA NP Inc. provided a schedule for a technically correct and complete response to RAI No. 453 on December 6, 2010. The attached file, "RAI 453 Supplement 1 Response US EPR DC.pdf" provides technically correct and complete responses to 4 of the 8 questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which support the response to RAI 453 Questions 02.03.01-17, 02.03.01-18, and 02.03.04-13.

The following table indicates the respective pages in the response document, "RAI 453 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 453 — 02.03.01-17	2	3
RAI 453 — 02.03.01-18	4	4
RAI 453 — 02.03.01-19	5	5
RAI 453 — 02.03.04-13	6	6

To provide additional time to interact with the NRC staff and address their concerns, a revised schedule is provided below (bolded dates have changed) for the remaining 4 questions.

Question #	Response Date
RAI 453 — 02.03.04-10	February 14, 2011
RAI 453 — 02.03.04-11	**January 28, 2011**
RAI 453 — 02.03.04-12	**January 28, 2011**
RAI 453 — 02.03.05-9	February 14, 2011

Sincerely,

Martin (Marty) C. Bryan
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
Tel: (434) 832-3016
702 561-3528 cell
Martin.Bryan.ext@areva.com

From: BRYAN Martin (External RS/NB)
Sent: Monday, December 06, 2010 5:10 PM
To: 'Tesfaye, Getachew'
Cc: DELANO Karen (RS/NB); ROMINE Judy (RS/NB); BENNETT Kathy (RS/NB); WILLIFORD Dennis (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 453, FSAR Ch. 2, 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 453 Response US EPR DC.pdf," provides a schedule since technically correct and complete responses to the 8 questions are not provided.

The following table indicates the respective pages in the response document, "RAI 453 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 453 — 02.03.01-17	2	2

RAI 453 — 02.03.01-18	3	3
RAI 453 — 02.03.01-19	4	4
RAI 453 — 02.03.04-10	5	5
RAI 453 — 02.03.04-11	6	6
RAI 453 — 02.03.04-12	7	8
RAI 453 — 02.03.04-13	9	9
RAI 453 — 02.03.05-9	10	10

The schedule for technically correct and complete responses to these questions is provided below.

Question #	Response Date
RAI 453 — 02.03.01-17	January 14, 2011
RAI 453 — 02.03.01-18	January 14, 2011
RAI 453 — 02.03.01-19	January 14, 2011
RAI 453 — 02.03.04-10	February 14, 2011
RAI 453 — 02.03.04-11	January 14, 2011
RAI 453 — 02.03.04-12	January 14, 2011
RAI 453 — 02.03.04-13	January 14, 2011
RAI 453 — 02.03.05-9	February 14, 2011

Sincerely,

Martin (Marty) C. Bryan
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Friday, November 05, 2010 8:55 AM
To: ZZ-DL-A-USEPR-DL
Cc: Harvey, Brad; Brown, David; Patel, Jay; Colaccino, Joseph; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 453(5109, 5110,5111), FSAR Ch. 2, NEW PHASE 4 RAI

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on October 25, 2010, and on November 2, 2010, you informed us that the RAI is clear and no further clarification is needed. As a result, no change is made to the draft RAI. 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/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 2494

Mail Envelope Properties (199EBB4D1CD9644D9472AA84D5D8EFA7164E85)

Subject: Response to U.S. EPR Design Certification Application RAI No. 453, FSAR Ch. 2, NEW PHASE 4 RAI, Supplement 2
Sent Date: 1/28/2011 1:07:41 PM
Received Date: 1/28/2011 1:07:43 PM
From: BRYAN Martin (EXTERNAL AREVA)

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Files	**Size**	**Date & Time**
MESSAGE	6260	1/28/2011 1:07:43 PM
RAI 453 Supplement 2 Response US EPR DC.pdf	168770	

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

Response to

Request for Additional Information No. 453(5109, 5110, 5111), Supplement 2, Revision 1

11/05/2010

U.S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 02.03.01 - Regional Climatology
SRP Section: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases
SRP Section: 02.03.05 - Long-Term Atmospheric Dispersion Estimates for Routine Releases

Application Section: FSAR Chapter 2

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

Question 02.03.04-11:

Follow-up to RAI 256, Question 02.03.04-7 and RAI 256, Question 02.03.04-8

This question is related to the applicant's response to RAIs 02.03.04-7 and 02.03.04-8.

a. Please justify not providing "direction to source" information in terms of degrees from plant north for each modeled source-receptor combination in FSAR Tier 2, Tables 2.3-1 and 2.3-2.

b. Please explain the apparent discrepancy in the stack release height values between FSAR Tier 2, Tables 2.3-1 (32.1 meters) and 2.3-2 (33.9 meters).

Response to Question 02.03.04-11:

a) Since the actual alignment of the plant is not known, ARCON96 calculations for the CR/TSC and the stack release point are performed by aligning the release-to-intake direction with each of the sixteen cardinal compass directions (N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, NNW). There are therefore sixteen cases executed for the stack release point, and the bounding case is selected. Since the meteorology is the same for all release points, the bounding wind direction from the sixteen stack cases is used for the other post-accident release points. The wind direction used for the U.S. EPR analysis does not correspond with the actual wind direction to move the plume from the release point to the control room air intake; as such, there is no value added for the COL applicant by including the wind direction explicitly in the U.S. EPR FSAR.

b) Conservative values are used in each of the two different scenarios provided in U.S. EPR FSAR Tier 2, Table 2.3-1 (control room air intake) and Table 2.3-2 (unfiltered inleakage) to reflect the different ingress pathways (the control room air intake is on the top part of the building wall; the assumed unfiltered ingress point is on top of the same building via the Safeguards Building intake). In U.S. EPR FSAR Tier 2, Table 2.3-1, the stack release point and the control room air intake are assumed to be at the same height of 32.1 meters (a conservative assumption, since it results in a shorter distance from the release point to the air intake). In U.S. EPR FSAR Tier 2, Table 2.3-2, the slant distance from the stack to the ingress point is approximately the same as the slant distance from the SG-3 silencer to the control room air intake; therefore, the SG-3 run, with a release height of 33.9 meters, is also used for the stack scenario. Footnotes will be added to U.S. EPR FSAR Tier 2, Tables 2.3-1 and 2.3-2 to clarify the basis for the different release heights used for the stack.

FSAR Impact:

U.S. EPR FSAR Tier 2, Tables 2.3-1 and 2.3-2 will be revised as described in the response and indicated on the enclosed markup.

Question 02.03.04-12:

OPEN ITEM

NEW PHASE RAI

This question is related to the applicant's response to RAI 37, Question 02.03.04-5.

FSAR Tier 2, Table 2.1-1 presents a set of site parameters which are the postulated physical, environmental, and demographic features of an assumed site which the U.S. EPR standard design is based. The intent of FSAR Tier 2, Table 2.1-1 is to list those assumed site features that are to be compared to a COL applicant's site characteristics pursuant to 10 CFR 52.79(d)(1).

The site parameters (i.e., assumed site features) listed in FSAR Tier 2, Table 2.1-1 includes accident atmospheric dispersion factors (χ/Q values) to the MCR/TSC intake and unfiltered inleakage locations for the following release pathways:

- Vent stack base
- Safeguard building canopy points #1 and #2
- Material lock (open equipment hatch)
- Depressurization shaft
- Main steam relief train silencers #1, #2, #3, and #4

The staff reviewed the description of the design basis accident radiological consequences analyses presented in FSAR Tier 2, Section 15.0.3 to determine if the assumed fission product transport to the environment for each design-basis accident was compatible with the χ/Q values used to model the release pathway. In performing this review, the staff noticed the following:

a. Only the χ/Q values for the main steam train silencer #3 are used for the design-basis accident analyses, presumably because the χ/Q values for the main steam train silencer #3 bound the χ/Q values for the main steam train silencers #1, #2, and #4. Therefore, please justify why the χ/Q site parameter values listed in FSAR Tier 2, Table 2.1-1 for the main steam train silencers #1, #2, and #4 should not be the same values as the χ/Q site parameter values listed for main steam train silencer #3.

b. Similarly, only the χ/Q values for the safeguard building canopy point #1 are used for the design-basis accident analyses, presumably because the χ/Q values for the safeguard building canopy point #1 bound the χ/Q values for the safeguard building canopy point #2. Therefore, please justify why the χ/Q site parameter values listed in FSAR Tier 2, Table 2.1-1 for the safeguard building canopy point #2 should not be the same values as the χ/Q site parameter values listed for safeguard building canopy point #1.

c. The χ/Q values for the material lock (open equipment hatch) and depressurization shaft release pathways do not appear to be used in any of the design basis accident radiological consequences analyses. Consequently, please justify why these χ/Q values are included as site parameters in FSAR Tier 2, Table 2.1-1.

Response to Question 02.03.04-12:

a) U.S. EPR FSAR Tier 2, Table 2.1-1 will be revised to provide only the SG-3 silencer χ/Q value, which is the highest of the four silencer values, as the χ/Q site parameter value for all four steam train silencers.

b) U.S. EPR FSAR Tier 2, Table 2.1-1, will be revised to provide only the canopy point 1 χ/Q value, which is the higher of the two canopy values, as the χ/Q site parameter value for both Safeguard Building canopy points.

c) While the material lock (open equipment hatch) and depressurization shaft χ/Q values are not required for design basis accident (DBA) analyses, they are potential accident release points. For this reason, χ/Q values were determined for these release points and they were included as site parameters. To avoid any possible confusion, U.S. EPR FSAR Tier 2, Table 2.1-1 will be revised to remove the χ /Q values for these two release points and a footnote will be added to those table cells that notes that the material lock (open equipment hatch) and depressurization shaft χ /Q values are bounded by the canopy point χ /Q value.

FSAR Impact:

U.S. EPR FSAR Tier 2, Table 2.1-1 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

Table 2.1-1—U.S. EPR Site Design Envelope
Sheet 6 of 7

U.S. EPR Site Design Envelope									
Main Control Room/Technical Support Center Intake Atmospheric Dispersion Factors for Onsite Accident Dose Analysis (χ/Q)									
Time Period	Vent Stack Base	Releases via Safe-guard Building Canopy ~~#1~~	~~Releases via Safe-guard Building Canopy #2~~	Equipment Hatch Releases via Material Lock	Depres-surization Shaft Releases	~~Main Steam Relief Train Silencer #1~~	~~Main Steam Relief Train Silencer #2~~	Main Steam Relief Train Silencer #3	~~Main Steam Relief Train Silencer #4~~
0–2 hours (s/m^3)	1.93E-03	6.52E-03	~~1.66E-03~~	(See Note 6)~~1.01E-03~~	(See Note 6)~~4.45E-03~~	~~1.57E-03~~	~~1.88E-03~~	4.30E-03	~~3.28E-03~~
2–8 hours (s/m^3)	1.73E-03	5.68E-03	~~1.47E-03~~	(See Note 6)~~8.97E-04~~	(See Note 6)~~3.95E-03~~	~~1.36E-03~~	~~1.63E-03~~	3.71E-03	~~2.83E-03~~
8–24 hours (s/m^3)	6.74E-04	2.34E-03	~~6.28E-04~~	(See Note 6)~~3.53E-04~~	(See Note 6)~~1.70E-03~~	~~5.44E-04~~	~~6.47E-04~~	1.46E-03	~~1.12E-03~~
1–4 days (s/m^3)	5.12E-04	1.63E-03	~~4.19E-04~~	(See Note 6)~~2.66E-04~~	(See Note 6)~~1.11E-03~~	~~4.11E-04~~	~~4.93E-04~~	1.12E-03	~~8.57E-04~~
4–30 days (s/m^3)	4.72E-04	1.50E-03	~~3.81E-04~~	(See Note 6)~~2.46E-04~~	(See Note 6)~~1.00E-03~~	~~3.78E-04~~	~~4.52E-04~~	1.03E-03	~~7.86E-04~~

02.03.04-12a
02.03.04-12b
02.03.04-12c

Table 2.1-1—U.S. EPR Site Design Envelope
Sheet 7 of 7

U.S. EPR Site Design Envelope									
Main Control Room/Technical Support Center Unfiltered Inleakage Atmospheric Dispersion Factors for Onsite Accident Dose Analysis (χ/Q)									
Time Period	Vent Stack Base	Releases via Safe-guard Building Canopy ~~#1~~	~~Releases via Safe-guard Building Canopy #2~~	Equip-ment Hatch Releases via Mate-rial Lock	Depres-surization Shaft Releases	~~Main Steam Relief Train Silencer #1~~	~~Main Steam Relief Train Silencer #2~~	Main Steam Relief Train Silencer #3	~~Main Steam Relief Train Silencer #4~~
0–2 hours (s/m^3)	4.30E-03	1.67E-02	~~3.03E-03~~	(See Note 6)~~1.65E-03~~	(See Note 6)~~7.52E-03~~	~~1.93E-03~~	~~2.43E-03~~	1.76E-02	~~8.65E-03~~
2–8 hours (s/m^3)	3.71E-03	1.47E-02	~~2.68E-03~~	(See Note 6)~~1.47E-03~~	(See Note 6)~~6.67E-03~~	~~1.66E-03~~	~~2.12E-03~~	1.48E-02	~~7.21E-03~~
8–24 hours (s/m^3)	1.46E-03	5.96E-03	~~1.15E-03~~	(See Note 6)~~5.74E-04~~	(See Note 6)~~2.88E-03~~	~~6.69E-04~~	~~8.28E-04~~	5.88E-03	~~2.96E-03~~
1–4 days (s/m^3)	1.12E-03	4.28E-03	~~7.59E-04~~	(See Note 6)~~4.37E-04~~	(See Note 6)~~1.89E-03~~	~~5.02E-04~~	~~6.38E-04~~	4.55E-03	~~2.22E-03~~
4–30 days (s/m^3)	1.03E-03	3.89E-03	~~6.89E-04~~	(See Note 6)~~4.00E-04~~	(See Note 6)~~1.71E-03~~	~~4.65E-04~~	~~5.85E-04~~	4.16E-03	~~2.06E-03~~

1. The effect of the extreme liquid winter precipitation event on roof loads is negligible due to the lack of parapets.~~The maximum 48-hour PMWP liquid of 32 inches is based on data obtained from National Oceanic and Atmospheric Administration Hydrometeorological Report No. 53 "Seasonal Variation of 10-square-mile Probable Maximum Precipitation Estimates, United States East of the 105th Meridian" for the three winter months—December through February. However, the effect of rainfall events on roof loads is negligible, due to the lack of parapets.~~

2. Deleted.~~COL applicant to determine wet bulb temperature correction factor to account for potential interference and recirculation effects. (Refer to COL Item 2.0-1 in Table 1.8-2—U.S. EPR Combined License Information Items).~~
3. By definition, zero percent exceedance temperature values exclude peaks of temperatures less than two hours in duration. The zero percent exceedance temperature values are based on conservative estimates of 100-year return period values and historic extreme values, whichever is bounding.
4. For maximum values, data from the summer months or June, July, and August are used. For minimum values, data from the winter months of December, January, and February are used.
5. Deleted.~~COL applicant to confirm potential UHS cooling tower interference effects on safety-related air intakes do not result in air intake inlet conditions that exceed the site design envelope ambient air conditions (refer to COL Item 2.0-1 in Table 1.8-2—U.S. EPR Combined License Information Items).~~
6. The atmospheric dispersion parameters for the equipment hatch and depressurization shaft releases are bounded by the parameters for the releases via the Safeguard Building canopy.

02.03.04-12c

Next File

Table 2.3-1—ARCON96 Input Parameters for Control Room χ/Q Values
Sheet 2 of 2

Parameter	Value(s)
Control Room air intake horizontal distance to Material Lock (for the Equipment Hatch release)	97.5 meters
Control Room air intake horizontal distance to the depressurization shaft of Safeguard Building Div. 4	31.4 meters
Release heights	Silencer – 33.9 meters Stack – 32.1 meters(1) Canopy Pt. 1 – 15.5 meters Canopy Pt. 2 – 11.5 meters elevation Material Lock (for Equipment Hatch release) – 32.1 meters Depressurization Shaft – 7 meters

02.03.04-11

Note:

1. Stack release height assumed to be the same as the mid-point of the control room air intake.

02.03.04-11

Table 2.3-2—ARCON96 Input Parameters for Unfiltered Inleakage Control Room χ/Q Values
Sheet 2 of 2

Parameter	Value(s)
Unfiltered inleakage air intake horizontal distance to the depressurization shaft of Safeguard Building Div. 4	17.3 meters
Release heights	Silencer – 33.9 meters Stack – 33.9 meters(1) Canopy Pt. 1 – 15.5 meters Canopy Pt. 2 – 11.5 meters elevation Material Lock (for Equipment Hatch release) – 32.1 meters Depressurization Shaft – 7.0 meters

02.03.04-11

Note:

1. The slant distance from the stack to the ingress point is approximately the same as the slant distance from the SG-3 silencer to the control room air intake; therefore, the SG-3 run, with a release height of 33.9 meters is also used for the stack scenario.

02.03.04-11

Next File