ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Wednesday, January 14, 2009 2:24 PM
To: Getachew Tesfaye
Cc: DUNCAN Leslie E (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 69 (773), Supplement 1
Attachments: RAI 69 Supplement 1 Response USEPRDC.pdf

Getachew,

AREVA NP Inc. provided responses to 5 of the 6 questions of RAI No. 69 on November 17, 2008. The attached file, "RAI 69 Supplement 1 Response US EPR DC.pdf" provides a technically correct and complete response to the remaining question, 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 69 Question 06.02.05-5.

The following table indicates the respective page in the response document, "RAI 69 Supplement 1 US EPR DC.pdf," that contains AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 69 — 06.02.05-5	2	2

This concludes the formal AREVA NP response to RAI 69, and there are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
AREVA NP Inc.
An AREVA and Siemens company
3315 Old Forest Road
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From: Pederson Ronda M (AREVA NP INC)
Sent: Monday, November 17, 2008 5:27 PM
To: 'Getachew Tesfaye'
Cc: 'John Rycyna'; DUNCAN Leslie E (AREVA NP INC); DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); SLIVA Dana (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 69 (773), FSAR Ch6

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 69 Response US EPR DC.pdf" provides technically correct and complete responses to 5 of the 6 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 69 Questions 06.02.05-2 and 06.02.05-6.

The following table indicates the respective pages in the response document, "RAI 69 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 69 — 06.02.05-1	2	10
RAI 69 — 06.02.05-2	11	13
RAI 69 — 06.02.05-3	14	15
RAI 69 — 06.02.05-4	16	18
RAI 69 — 06.02.05-5	19	19
RAI 69 — 06.02.05-6	20	20

A complete answer is not provided for 1 of the 6 questions. The schedule for a technically correct and complete response to this question is provided below.

Question #	Response Date
RAI 69 — 06.02.05-5	January 16, 2009

Sincerely,

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From: Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Thursday, October 16, 2008 11:34 AM
To: ZZ-DL-A-USEPR-DL
Cc: Anne-Marie Grady; Christopher Jackson; Michael Miernicki; Joseph Colaccino; John Rycyna
Subject: U.S. EPR Design Certification Application RAI No. 69 (773), FSAR Ch6

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on September 5, 2008, and discussed with your staff on September 16, 2008. Draft RAI Question 06.02.05-4 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/NARP
(301) 415-3361

Hearing Identifier: AREVA_EPR_DC_RAIs
Email Number: 122

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From: Pederson Ronda M (AREVA NP INC)

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Response to

Request for Additional Information No. 69 Supplement 1 (773), Revision 0

10/16/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 06.02.05 - Combustible Gas Control in Containment
Application Section: 6.2.5
SPCV Branch

Question 06.02.05-5:

Additions

Expand FSAR Tier 1 Table 2.3.1-2, CGCS ITAAC, to include the location of all the rupture and convection foils.

Complete FSAR Tier 1, Table 2.3.1-1, CGCS Equipment Design to include every PAR and the location of each.

Response to Question 06.02.05-5:

Combustible gas control system (CGCS) equipment locations have been described in previous RAI responses:

- Passive autocatalytic recombiner (PAR) locations are described in the Response to RAI 6 Question 19-95, Table 19-95h-1.

- Mixing damper locations are described in the Response to RAI 69 Question 06.02.05-1, Table 06.02.05-1-1.

- Rupture and convection foil locations are described in the Response to RAI 69 Question 06.02.05-1, Part C. The safety-significant foil performance is also described in the Response to RAI 69 Question 06.02.05-1, Part C; global hydrogen concentrations remain below 10 percent even with a 75 percent failure of the foils. The distribution of surface area between the individual foils is not safety-significant. However, the minimum foil surface area per containment area is safety-significant. Revised surface areas for rupture and convection foils listed in U.S. EPR FSAR Tier 2, Table 6.2.5-1 is provided in the Response to RAI 1 Question 6.2.1-07.

U.S. EPR FSAR Tier 1, Table 2.3.1-1 will be revised to provide the locations of PARs, mixing dampers, and rupture and convection foils.

U.S. EPR FSAR Tier 1, Table 2.3.1-2, Item 2.1 and associated design commitment will be revised:

"The CGCS contains PAR, mixing dampers, and rupture and convection foils."

FSAR Impact:

U.S. EPR FSAR Tier 1, Section 2.3.1 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

2.3 Severe Accident Systems

2.3.1 Combustible Gas Control System

1.0 Description

The combustible gas control system (CGCS) prevents damage to the containment or emergency equipment, in the event of a severe accident with core degradation, by controlling the combustible gas concentration in containment.

The CGCS does not provide any safety related functions.

The CGCS provides the following non-safety related functions:

- Mixing of the containment atmosphere.
- Controlling combustible gases concentrations.
- Ensuring containment structural integrity by limiting the pressure to within the containment design pressure resulting from a combustible gas ignition from the most severe accident.

06.02.05-5

2.0 ~~Arrangement~~Mechanical Design Features

2.1 ~~The location of the CGCS equipment is as listed in Table 2.3.1-1—CGCS Equipment Design.~~The CGCS contains the passive autocatalytic recombiners (PAR), mixing dampers, and hydrogen foils.

3.0 Electrical Power Design Features

3.1 Mixing dampers listed in Table 2.3.1-1 fail open on loss of power.

4.0 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.3.1-2—CGCS Inspections, Tests, Analyses, and Acceptance Criteria, specifies the inspections, tests, analyses, and acceptance criteria for the CGCS.

06.02.05-5

Table 2.3.1-1—CGCS Equipment Design

Equipment Description	Equipment Location
Recombiner 30JMT10 AT001	Room 30UJA18-019, surge line area
Recombiner 30JMT10 AT002	Room 30UJA18-007, SG loop 3 area
Recombiner 30JMT10 AT003	Room 30UJA18-008, SG loop 4 area
Recombiner 30JMT10 AT004	Room 30UJA18-003, SG loop 1 area
Recombiner 30JMT10 AT005	Room 30UJA18-004, SG loop 2 area
Recombiner 30JMT10 AT006	Room 30UJA18-018, spray valves area
Recombiner 30JMT10 AT007	Room 30UJA23-019, pressurizer area
Recombiner 30JMT10 AT008	Room 30UJA23-006, RCP loop 3 area
Recombiner 30JMT10 AT009	Room 30UJA23-015, annual space accumulator tank loop 3 (0°-90°) area
Recombiner 30JMT10 AT010	Room 30UJA23-006, RCP loop 3 area
Recombiner 30JMT10 AT011	Room 30UJA23-007, SG loop 3 area
Recombiner 30JMT10 AT012	Room 30UJA23-008, SG loop 4 area
Recombiner 30JMT10 AT013	Room 30UJA23-016, annual space accumulator tank loop 4 (90°-180°) area
Recombiner 30JMT10 AT014	Room 30UJA23-009, RCP loop 4 area
Recombiner 30JMT10 AT015	Room 30UJA23-009, RCP loop 4 area
Recombiner 30JMT10 AT016	Room 30UJA15-001, reactor cavity
Recombiner 30JMT10 AT017	Room 30UJA23-002, RCP loop 1 area
Recombiner 30JMT10 AT018	Room 30UJA23-002, RCP loop 1 area
Recombiner 30JMT10 AT019	Room 30UJA23-013, annual space accumulator tank loop 1 (180°-270°) area
Recombiner 30JMT10 AT020	Room 30UJA23-003, SG loop 1 area
Recombiner 30JMT10 AT021	Room 30UJA23-004, SG loop 2 area
Recombiner 30JMT10 AT022	Room 30UJA23-005, RCP loop 2 area
Recombiner 30JMT10 AT023	Room 30UJA23-014, annual space accumulator tank loop 2 (270°-0°) area
Recombiner 30JMT10 AT024	Room 30UJA23-005, RCP loop 2 area
Recombiner 30JMT10 AT025	Room 30UJA29-019, pressurizer area
Recombiner 30JMT10 AT026	Room 30UJA29-016, access area (equipment hatch)
Recombiner 30JMT10 AT027	Room 30UJA29-013, set down area operating floor

06.02.05-5

Table 2.3.1-1—CGCS Equipment Design

Equipment Description	Equipment Location
Recombiner 30JMT10 AT028	Room 30UJA29-018 operating floor access area
Recombiner 30JMT10 AT029	Room 30UJA34-019, pressurizer heat safety relief valves
Recombiner 30JMT10 AT030	Room 30UJA34-007, SG loop 3 area
Recombiner 30JMT10 AT031	Room 30UJA34-007, SG loop 3 area
Recombiner 30JMT10 AT032	Room 30UJA34-008, SG loop 4 area
Recombiner 30JMT10 AT033	Room 30UJA34-008, SG loop 4 area
Recombiner 30JMT10 AT034	Room 30UJA34-003, SG loop 1 area
Recombiner 30JMT10 AT035	Room 30UJA34-003, SG loop 1 area
Recombiner 30JMT10 AT036	Room 30UJA34-004, SG loop 2 area
Recombiner 30JMT10 AT037	Room 30UJA34-004, SG loop 2 area
Recombiner 30JMT10 AT038	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT039	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT040	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT041	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT042	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT043	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT044	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT045	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT046	Room 30UJA40-001, dome area
Recombiner 30JMT10 AT047	Room 30UJA40-001, dome area
Mixing damper 30JMT20AA001	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA002	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA003	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA004	Room 30UJA07015, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA005	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA006	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA007	Room 30UJA07014, separation of IRWST air space and the lower part of the annular rooms
Mixing damper 30JMT20AA008	Room 30UJA07014, separation of IRWST air

06.02.05-5

Table 2.3.1-1—CGCS Equipment Design

Equipment Description	Equipment Location
	space and the lower part of the annular rooms
Rupture and convection foils, combined minimum area of 107ft^2.[1]	SG (Loop 1 and Loop 2) pressure equalization ceiling
Rupture and convection foils, combined minimum area of 107ft^2.[1]	SG (Loop 3 and Loop 4) pressure equalization ceiling
~~Passive Autocatalytic Recombiner (PAR) (One or more)~~	~~Pressurizer Area~~
~~PAR (One or more)~~	~~Reactor Cavity Area~~
~~PAR (One or more)~~	~~Containment Dome Area~~
~~PAR (One or more)~~	~~Steam Generator (SG) Loop 1 Area~~
~~PAR (One or more)~~	~~SG Loop 2 Area~~
~~PAR (One or more)~~	~~SG Loop 3 Area~~
~~PAR (One or more)~~	~~SG Loop 4 Area~~
~~PAR (One or more)~~	~~Reactor Coolant Pump (RCP) Loop 1 Area~~
~~PAR (One or more)~~	~~RCP Loop 2 Area~~
~~PAR (One or more)~~	~~RCP Loop 3 Area~~
~~PAR (One or more)~~	~~RCP Loop 4 Area~~
~~PAR (One or more)~~	~~Annulus Space Accumulator Tank Loop 3 (0º to 90º)~~
~~PAR (One or more)~~	~~Annulus Space Accumulator Tank Loop 4 (90º to 180º)~~
~~PAR (One or more)~~	~~Annulus Space Accumulator Tank Loop 4 1 (180º to 270º)~~
~~PAR (One or more)~~	~~Annulus Space Accumulator Tank Loop 4 2 (270º to 0º)~~
~~PAR (One or more)~~	~~Access Area (Equipment Hatch)~~
~~PAR (One or more)~~	~~Set Down Area Operating Floor~~
~~PAR (One or more)~~	~~Operating Floor Access~~
~~Mixing Damper~~	~~Reactor Coolant Loop 3 Area~~
~~Mixing Damper~~	~~Reactor Coolant Loop 4 Area~~
~~Mixing Damper~~	~~Reactor Coolant Loop 1 Area~~
~~Mixing Damper~~	~~Reactor Coolant Loop 2 Area~~
~~Rupture Disks Foils and Convection Foils~~	~~SG Loop 1 and Loop 2~~
~~Rupture Disks Foils and Convection Foils~~	~~SG Loop 3 and Loop 4~~

Note:

1. The combined minimum area of 214ft^2 (107ft^2 per SG pressure equalization ceiling) is based on analyses that safety significant CGCS performance is maintained with 75% of foils failing to open. Therefore, (0.25)*(375ft^2 rupture foils) + (0.25)*(480ft^2 convection foils) = 214ft^2.

06.02.05-5

06.02.05-5

Table 2.3.1-2—CGCS Inspections, Tests, Analyses, and Acceptance Criteria

	Commitment Wording	Inspection, Test or Analysis	Acceptance Criteria
2.1	~~The location of the CGCS equipment is as listed in Table 2.3.1-1.~~The CGCS contains PAR, mixing dampers, and rupture and convection foils.	An inspection will be performed ~~of the location~~ of the equipment listed in Table 2.3.1-1.	~~The equipment listed in Table 2.3.1-1 is located as listed in Table 2.3.1-1.~~The CGCS contains the PAR, mixing dampers, and rupture and convection foils listed in Table 2.3.1-1.
3.1	Mixing dampers listed in Table 2.3.1-1 fail open on loss of power.	Testing will be performed for the mixing dampers listed in Table 2.3.1-1 to fail open on loss of power.	Following loss of power, the mixing dampers listed in Table 2.3.1-1 fail open.

Next File