ArevaEPRDCPEm Resource

From: WILLIFORD Dennis (AREVA) [Dennis.Williford@areva.com]
Sent: Tuesday, February 05, 2013 7:54 AM
To: Snyder, Amy
Cc: DELANO Karen (AREVA); LEIGHLITER John (AREVA); ROMINE Judy (AREVA); RYAN Tom (AREVA); WILLS Tiffany (AREVA); Hearn, Peter; KOWALSKI David (AREVA); LENTZ Tony (EXTERNAL AREVA)
Subject: Response to U.S. EPR Design Certification Application RAI No. 558 (6720), FSAR Ch. 9, Supplement 1
Attachments: RAI 558 Supplement 1 Response US EPR DC.pdf

Amy,

AREVA NP Inc. provided a schedule for a technically correct and complete response to the one question in RAI No. 558 on October 19, 2012.

The attached file, "RAI 558 Supplement 1 Response US EPR DC.pdf" provides a technically correct and complete final response to Question 09.04.05-5. 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 this question.

The following table indicates the respective pages in the response document, "RAI 558 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 558 — 09.04.05-5	2	3

This concludes the formal AREVA NP response to RAI 558, and there are no questions from this RAI for which AREVA NP has not provided responses.

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
Email: Dennis.Williford@areva.com

From: RYAN Tom (RS/NB)
Sent: Friday, October 19, 2012 12:32 PM
To: Amy.Snyder@nrc.gov
Cc: BENNETT Kathy (RS/NB); DELANO Karen (RS/NB); LEIGHLITER John (RS/NB); ROMINE Judy (RS/NB); WELLS Russell (RS/NB); KOWALSKI David (RS/NB); WILLIFORD Dennis (RS/NB)
Subject: Response to U.S. EPR Design Certification Application RAI No. 558 (6720), FSAR Ch. 9

Amy,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 558 Response US EPR DC," provides a schedule since a technically correct and complete response to Question 09.04.05-5 is not provided.

The following table indicates the respective pages in the response document, "RAI 558 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 558 — 09.04.05-5	2	2

The schedule for a technically correct and complete response to Question 09.04.05-5 is provided below.

Question #	Response Date
RAI 558 — 09.04.05-5	February 12, 2013

Sincerely,

Tom Ryan for
Dennis Williford, P.E.
U.S. EPR Design Certification Licensing Manager
AREVA NP Inc.
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From: Tesfaye, Getachew [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Wednesday, September 19, 2012 8:39 AM
To: ZZ-DL-A-USEPR-DL
Cc: ODriscoll, James; McKirgan, John; Hearn, Peter; Segala, John; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 558 (6720), FSAR Ch. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on August 31, 2012, and discussed with your staff on September 17, 2012. No change is made to the draft RAI 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: 4211

Mail Envelope Properties (554210743EFE354B8D5741BEB695E6560C1F23)

Subject: Response to U.S. EPR Design Certification Application RAI No. 558 (6720), FSAR Ch. 9, Supplement 1
Sent Date: 2/5/2013 7:53:40 AM
Received Date: 2/5/2013 7:53:44 AM
From: WILLIFORD Dennis (AREVA)

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Files	**Size**	**Date & Time**
MESSAGE	3635	2/5/2013 7:53:44 AM
RAI 558 Supplement 1 Response US EPR DC.pdf	185085	

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

Response to

Request for Additional Information 558(6720), Supplement 1

9/19/2012

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket Number 52-020

Review Section: 09.04.05 - Engineered Safety Feature Ventilation System

Application Section: 9.4.7

Question 09.04.05-5:

Open Item

Follow-up to RAI 509, Question 09.04.01-7

In your February 8, 2012 response to RAI 509, Question 09.04.01-7, you clarified the accident response and function of the Containment Low-flow Purge Exhaust Subsystem (CLFPS) for the rod ejection accident. In your response you proposed to revise the FSAR to clarify that the CLFPS is credited for post accident fission product removal. Based on review of Tier 2, Table 15.0-40, the staff understands that you have credited 10 seconds of post-accident fission product removal by an ESF filtration train in the CLFPS. The staff has reviewed your RAI response in which you have stated that this time is necessary to allow the associated containment isolation valves to close. However, the staff needs additional information to be included in Tier 2 of the FSAR describing the CLFPS and associated ESF filtration trains in order to determine whether the low flow purge exhaust subsystem will be capable of performing its intended safety functions in the event of a rod ejection accident, as described in the FSAR. Specifically the staff needs the following information.

The staff notes that the CLFPS is an ESF system that is listed in generic technical specification (GTS) 5.5.10, "Ventilation Filter Testing Program." The staff considers that including the CLFPS in GTS 5.5.10 implies an implicit operability requirement for it in the GTS; however, TS should not contain "implicit" operability requirements for a front-line accident-consequence-mitigation system that is credited in the design's safety analyses. Therefore, since the rod ejection accident safety analysis credits operation of this system for post-accident fission product removal, the applicant is requested to justify the omission in the GTS of a TS limiting condition for operation (LCO), with associated action and surveillance requirements, for the Containment Building Ventilation System (CBVS) low–flow purge exhaust filtration system in accordance with 10 CFR 50.36 (c)(2)(ii) or revise GTS Section 3.6 to include an LCO, with associated action and surveillance requirements, and bases for the CLFPS.

Response to Question 09.04.05-5:

Credit is taken for the operation of the Containment Low Flow Purge Exhaust Subsystem (CLFPS) during a postulated rod ejection accident (REA). For a period of ten seconds, from the start of the postulated event until the CLFPS is isolated by containment isolation valves, the CLFPS is credited for post accident fission product removal.

U.S. EPR FSAR Tier 2, Chapter 16, Technical Specifications, will be revised to include a new Limiting Conditions for Operation (LCO) 3.7.21 and associated Bases for the CLFPS.

Two technical inconsistencies in U.S. EPR FSAR Tier 2, Chapter 15 have been identified and will be corrected. They both involve the filtration function of the CLFPS and are described below:

- U.S. EPR FSAR Tier 2, Figure 15.0-12–Model for the Loss of Coolant Accident Analysis, currently shows a filtered purge line between the primary containment and main stack. The purge line does not contain a filter. This figure will be revised to reflect the correct design configuration.

- U.S. EPR FSAR Tier 2, Table 15.0-42–MCR Composite X/Q and Filter-Bypass Fractions, Post-REA Primary Containment Leakage Pathway, currently describes the release pathway for the initial 10 seconds as an “unfiltered purge flow via vent stack.” This release pathway will be revised to indicate “filtered purge flow via vent stack.”

U.S. EPR FSAR Tier 2, Tables 15.0-42 and 15.0-51 will be revised for consistency between the Table units in the headings and the values in the column.

FSAR Impact:

U.S. EPR FSAR Tier 2, Figure 15.0-12, Table 15.0-42, Table 15.0-51, and Chapter 16 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

Table 15.0-42—MCR Composite χ/Q and Filter-Bypass Fractions, Post-REA Primary Containment Leakage Pathway

Time Interval-~~(hrs)~~		Release Pathway	SAB Division 3 Intake (Main Flow)		SAC Division 3 Intake (Unfiltered Inleakage)		Composite χ/Q (sec/m³)	MCR Filter Bypass Fraction
Start	End		χ/Q (s/m³)	Flow (cfm)	χ/Q (s/m³)	Flow (cfm)		
0	10 s	Filtered~~Unfiltered~~ purge flow via vent stack	1.93E-03	1.50E+03	4.30E-03	5.00E+01	2.01E-03	1.00E+00
10 s	60 s	Unfiltered leakage during drawdown, near SG 3 silencer	4.30E-03	1.50E+03	1.76E-02	5.00E+01	4.73E-03	1.00E+00
60 s~~min~~	305 s		4.30E-03	1.00E+03	1.76E-02	5.00E+01	4.93E-03	1.70E-01
305 s	2 hrs	Post drawdown primary containment filtered leakage via vent stack	1.93E-03	1.00E+03	4.30E-03	5.00E+01	2.04E-03	1.00E-01
2 hr	8 hrs		1.73E-03	1.00E+03	3.71E-03	5.00E+01	1.82E-03	9.68E-02
8 hrs	24 hrs		6.74E-04	1.00E+03	1.46E-03	5.00E+01	7.11E-04	9.77E-02
24 hrs	96 hrs		5.12E-04	1.00E+03	1.12E-03	5.00E+01	5.41E-04	9.86E-02
96 hrs	720 hrs		4.72E-04	1.00E+03	1.03E-03	5.00E+01	4.99E-04	9.84E-02

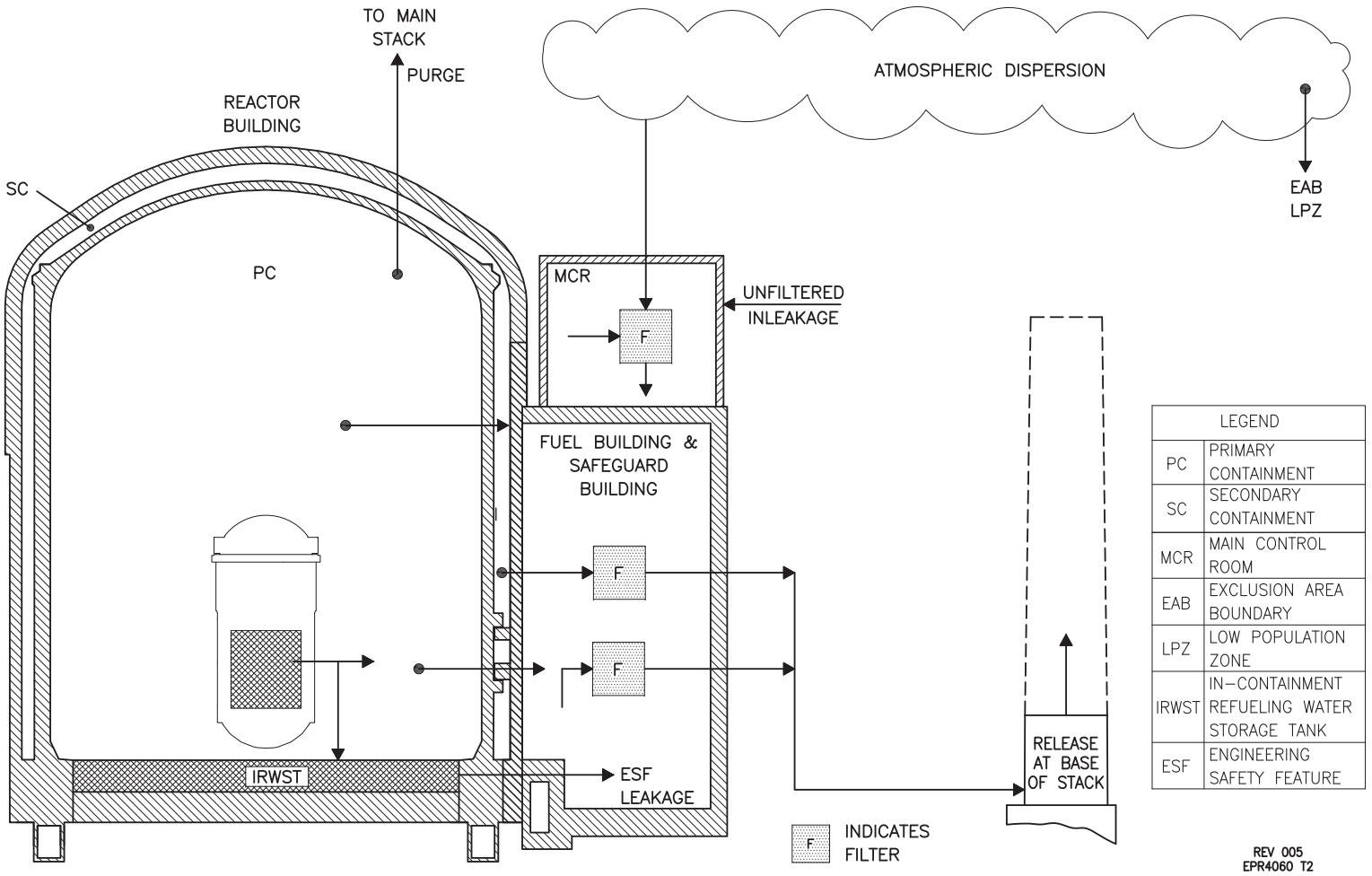
Table 15.0-51—MCR Composite χ/Q and Filter-Bypass Fractions LOCA Releases at the Vent Stack Base[1]

Time Interval ~~(hrs)~~		Release Pathway	SAB Div. 3 Intake (Main Flow)		SAC Div. 3 Intake (Unfiltered Inleakage)		Composite χ/Q (s/m^3)	MCR Filter Bypass Fraction
Start	End		χ/Q (s/m^3)	Flow (cfm)	χ/Q (s/m^3)	Flow (cfm)		
0	60 s	Unfiltered purge and leakage during drawdown, near SG 3 silencer.	4.30E-03	1.50E+03	1.76E-02	5.00E+01	4.73E-03	1.00E+00
60 s	305 s		4.30E-03	1.00E+03	1.76E-02	5.00E+01	4.93E-03	1.70E-01
305 s	1.5 hrs	Post drawdown primary containment filtered leakage via vent stack.	1.73E-03	1.00E+03	3.71E-03	5.00E+01	1.82E-03	9.68E-02
1.5 hrs	3.5 hrs		1.93E-03	1.00E+03	4.30E-03	5.00E+01	2.04E-03	1.00E-01
3.4 hrs	8 hrs		1.73E-03	1.00E+03	3.71E-03	5.00E+01	1.82E-03	9.68E-02
8 hrs	24 hrs		6.74E-04	1.00E+03	1.46E-03	5.00E+01	7.11E-04	9.77E-02
24 hrs	96 hrs		5.12E-04	1.00E+03	1.12E-03	5.00E+01	5.41E-04	9.86E-02
96 hrs	720 hrs		4.72E-04	1.00E+03	1.03E-03	5.00E+01	4.99E-04	9.84E-02

Note:

1. The composite χ/Q and filter bypass fractions apply to both release points (PC leakage and ESF component leakage).

Figure 15.0-12—Model for the Loss of Coolant Accident Analysis



Next File

3.7 PLANT SYSTEMS

3.7.21 Containment Low Flow Purge Subsystem (CLFPS)

LCO 3.7.21 Two CLFPS filtration trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4 during low flow purge.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One CLFPS filtration train inoperable.	A.1 Initiate action to close CLFPS filtration train inlet damper.	Immediately
B. Two CLFPS filtration trains inoperable.	B.1 Initiate action to suspend low flow purging operations. AND B.2 Initiate action to close CLFPS supply and exhaust containment isolation valve.	Immediately Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.21.1	Operate each CLFPS filtration train for ≥ 15 minutes with heaters energized.	31 days
SR 3.7.21.2	Perform required CLFPS filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.21.3	Verify each CLFPS filtration train inlet damper can be closed.	24 months

B 3.7 PLANT SYSTEMS

B 3.7.21 Containment Low Flow Purge Subsystem (CLFPS) Filtration Trains

BASES

BACKGROUND

The CLFPS contains two 100% capacity redundant filtration trains located in the Fuel Building as discussed in Reference 1. Each train consists of an inlet motor operated damper, moisture separator, electric heater, prefilter, HEPA filter, iodine filter with carbon adsorber, postfilter, exhaust fan, and outlet dampers. Radiation monitors are located upstream of the filtration trains for monitoring the containment exhaust air prior to filtration.

The CLFPS can be used during normal operation and outage conditions. The CLFPS operates to:

a) Reduce the concentration of noble gases within containment prior to and during personnel access, and

b) Equalize internal and external pressures.

The CLFPS supply and exhaust containment isolation valves are addressed in LCO 3.6.3, Containment Isolation Valves. Testing of the CLFPS filters is addressed in Section 5.5.10, Ventilation Filter Testing Program.

The CLFPS is not normally in operation and is used intermittently to control containment pressure during normal operation and to reduce radioactivity levels prior to personnel access. However, it is conservatively assumed that the CLFPS is in operation during a postulated Rod Ejection Accident (REA) (Reference 2). For 10 seconds from the start of the postulated event until the CLFPS is isolated by containment isolation valves, the CLFPS iodine filters reduce the activity level released from the containment .

APPLICABLE SAFETY ANALYSES

The design basis of the CLFPS is to filter air released from the containment in the event of a REA during low flow purging operations. The CLFPS is not credited for filtration during a LOCA.

The CLFPS satisfies Criterion 2 of 10 CFR 50.36(c)(2)(ii).

BASES

LCO

Two filtration trains are required to be OPERABLE during containment low flow purge. Filtration of containment air during low flow purge is required to limit offsite doses in the event of a REA.

A CLFPS filtration train is considered OPERABLE when the associated:

a. HEPA filter and iodine filter with carbon adsorber are not excessively restricting flow, and are capable of performing their filtration functions, and

b. Heater, prefilter, postfilter, ductwork, fan, and dampers are OPERABLE.

APPLICABILITY

During low flow purge in MODES 1, 2, 3, and 4, two CLFPS filtration trains must be OPERABLE to limit off site dose following a REA.

In MODE 5 or 6, the CLFPS filtration trains are not credited in any dose evaluation and are not required to be OPERABLE.

ACTIONS

A.1

When one CLFPS filtration train is inoperable, action must be taken immediately to isolate the filtration train. In this Condition, the remaining OPERABLE CLFPS filtration train is adequate to perform the offsite dose protection function. Continued containment low flow purge is acceptable because a 100% capacity CLFPS filtration train remains available.

B.1 and B.2

When two CLFPS filtration trains are inoperable, action must be taken immediately to suspend low flow purging operations and to close one low flow purge supply and exhaust containment isolation valve. This places the unit in a condition that precludes an unfiltered release through the CLFPS.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.21.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not too severe, testing each train once every month provides an adequate check of this system. Monthly heater operations dry out any moisture accumulated in the activated carbon from humidity in the ambient air. Systems with heaters must be operated for ≥ 15 minutes with the heaters energized. The 31 day Frequency is based on the known reliability of the equipment and the two train redundancy availability and is consistent with Reference 3.

SR 3.7.21.2

This SR verifies that the required CLFPS filter testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The VFTP includes testing HEPA filter performance, carbon adsorber efficiency, minimum flow rate, and the physical properties of the activated carbon. Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.21.3

This SR verifies that each CLFPS filtration train inlet damper can be closed to isolate flow through its respective filtration train. Operating experience has shown that these components usually pass the Surveillance when performed at the 24 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

REFERENCES

1. FSAR, Section 9.4.7.

2. FSAR, Section 15.4.

3. Regulatory Guide 1.52, Rev. 3.