ArevaEPRDCPEm Resource

From: Pederson Ronda M (AREVA NP INC) [Ronda.Pederson@areva.com]
Sent: Tuesday, July 14, 2009 4:31 PM
To: Tesfaye, Getachew
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); DUNCAN Leslie E (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 163, FSAR Ch 9, Supplement 5
Attachments: RAI 163 Supplement 5 Response US EPR DC.pdf

Getachew,

AREVA NP Inc. provided responses to 1 of the 12 questions of RAI No. 163 on February 6, 2009. Supplement 1 response to RAI No. 163 was sent on March 20, 2009 to address 6 of the remaining 11 questions. Supplement 2 response to RAI No. 163 was sent on April 3, 2009 to provide a revised schedule for the remaining 5 questions. Supplement 3 response to RAI No. 163 was sent on May 7, 2009 to address 4 of the remaining 5 questions. Supplement 4 response to RAI No. 163 was sent on June 18, 2009 to provide a revised schedule for the remaining question. The attached file, "RAI 163 Supplement 5 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 163 Question 09.03.03-5.

The following table indicates the respective pages in the response document, "RAI 163 Supplement 5 Response US EPR DC.pdf," that contain AREVA NP's response to the subject question.

Question #	Start Page	End Page
RAI 163 — 09.03.03-5	2	2

This concludes the formal AREVA NP response to RAI 163. There are no questions from this RAI for which AREVA NP has not provided responses.

Sincerely,

Ronda Pederson
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From: WELLS Russell D (AREVA NP INC)
Sent: Thursday, June 18, 2009 5:07 PM
To: 'Getachew Tesfaye'
Cc: Pederson Ronda M (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. 163, FSAR Ch 9, Supplement 4

Getachew,

AREVA NP Inc. provided responses to 1 of the 12 questions of RAI No. 163 on February 6, 2009. Supplement 1 response to RAI No. 163 was sent on March 20, 2009 to address 6 of the remaining 11 questions. Supplement 2 response to RAI No. 163 was sent on April 3, 2009 to provide a revised schedule for the remaining 5 questions. Supplement 3 response to RAI No. 163 was sent on May 7, 2009 to address 4 of the remaining 5 questions.

The schedule for a technically correct and complete response to the remaining question has been changed and is provided below:

Question #	Response Date
RAI 163 — 09.03.03-5	July 16, 2009

Sincerely,

(Russ Wells on behalf of)
Ronda Pederson
ronda.pederson@areva.com
Licensing Manager, U.S. EPR Design Certification
New Plants Deployment
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From: Pederson Ronda M (AREVA NP INC)
Sent: Thursday, May 07, 2009 5:05 PM
To: Getachew Tesfaye
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); DUNCAN Leslie E (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 163, FSAR Ch 9, Supplement 3

Getachew,

AREVA NP Inc. provided responses to 1 of the 12 questions of RAI No. 163 on February 6, 2009. Supplement 1 response to RAI No. 163 was sent on March 20, 2009 to address 6 of the remaining questions. Supplement 2 response to RAI No. 163 was sent on April 3, 2009 to apprise the NRC of a revised schedule for the remaining 5 questions.

The attached file, "RAI 163 Supplement 3 Response US EPR DC.pdf" provides a technically correct and complete response to 4 of the 5 remaining questions, as committed.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the response to RAI 163 Questions 09.03.03-2, 09.03.03-3 and 09.03.03-4.

The following table indicates the respective pages in the response document, "RAI 163 Supplement 3 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 163 — 09.03.03-2	2	3
RAI 163 — 09.03.03-3	4	5
RAI 163 — 09.03.03-4	6	6

RAI 163 — 09.03.03-6	7	7

Since a response to the remaining question remains in process, a revised schedule is provided in this email.

The schedule for a technically correct and complete response to the remaining question has been changed as provided below:

Question #	Response Date
RAI 163 — 09.03.03-5	June 18, 2009

Sincerely,

Ronda Pederson
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From: Pederson Ronda M (AREVA NP INC)
Sent: Friday, April 03, 2009 5:24 PM
To: Getachew Tesfaye
Cc: KOWALSKI David J (AREVA NP INC); DELANO Karen V (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 163, Supplement 2

Getachew,

AREVA NP is unable to provide responses to the remaining questions today, as previously committed.

The schedule for a technically correct and complete response to the remaining questions has been revised as provided below.

Question #	Response Date
RAI 163 — 09.03.03-2	May 7, 2009
RAI 163 — 09.03.03-3	May 7, 2009
RAI 163 — 09.03.03-4	May 7, 2009
RAI 163 — 09.03.03-5	May 7, 2009
RAI 163 — 09.03.03-6	May 7, 2009

Sincerely,

Ronda Pederson
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From: Pederson Ronda M (AREVA NP INC)
Sent: Friday, March 20, 2009 6:26 PM
To: 'Getachew Tesfaye'
Cc: BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); KOWALSKI David J (AREVA NP INC)
Subject: Response to U.S. EPR Design Certification Application RAI No. 163, Supplement 1

Getachew,

AREVA NP Inc. provided a response to 1 of the 12 questions of RAI No. 163 on February 6, 2009. The attached file, "RAI 163 Supplement 1 Response US EPR DC.pdf" provides technically correct and complete responses to 6 of the remaining 11 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 163 Questions 09.02.02-1, 09.02.02-3, 09.02.02-4, 09.02.02-5 and 09.02.02-6.

The following table indicates the respective pages in the response document, "RAI 163 Supplement 1 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 163 — 09.02.02-1	2	3
RAI 163 — 09.02.02-2	4	5
RAI 163 — 09.02.02-3	6	6
RAI 163 — 09.02.02-4	7	8
RAI 163 — 09.02.02-5	9	10
RAI 163 — 09.02.02-6	11	12

The schedule for a technically correct and complete response to the remaining questions is unchanged and provided below.

Question #	Response Date
RAI 163 — 09.03.03-2	April 3, 2009
RAI 163 — 09.03.03-3	April 3, 2009
RAI 163 — 09.03.03-4	April 3, 2009
RAI 163 — 09.03.03-5	April 3, 2009
RAI 163 — 09.03.03-6	April 3, 2009

Sincerely,

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From: WELLS Russell D (AREVA NP INC)
Sent: Friday, February 06, 2009 1:00 PM
To: 'Getachew Tesfaye'
Cc: Pederson Ronda M (AREVA NP INC); BENNETT Kathy A (OFR) (AREVA NP INC); DELANO Karen V (AREVA NP INC); SLIVA Dana (EXT)
Subject: Response to U.S. EPR Design Certification Application RAI No. 163, FSAR Ch 9

Getachew,

Attached please find AREVA NP Inc.'s response to the subject request for additional information (RAI). The attached file, "RAI 163 Response US EPR DC.pdf" provides a technically correct and complete response to 1 of the 12 questions.

Appended to this file are affected pages of the U.S. EPR Final Safety Analysis Report in redline-strikeout format which supports the response to RAI 163 Question 09.03.03-1.

The following table indicates the respective pages in the response document, "RAI 163 Response US EPR DC.pdf," that contain AREVA NP's response to the subject questions.

Question #	Start Page	End Page
RAI 163 — 09.02.02-1	2	2
RAI 163 — 09.02.02-2	3	3
RAI 163 — 09.02.02-3	4	4
RAI 163 — 09.02.02-4	5	5
RAI 163 — 09.02.02-5	6	6
RAI 163 — 09.02.02-6	7	7
RAI 163 — 09.03.03-1	8	8
RAI 163 — 09.03.03-2	9	9
RAI 163 — 09.03.03-3	10	10
RAI 163 — 09.03.03-4	11	11
RAI 163 — 09.03.03-5	12	12
RAI 163 — 09.03.03-6	13	13

A complete answer is not provided for 11 of the 12 questions. The schedule for a technically correct and complete response to these questions is provided below.

Question #	Response Date
RAI 163 — 09.02.02-1	March 20, 2009
RAI 163 — 09.02.02-2	March 20, 2009
RAI 163 — 09.02.02-3	March 20, 2009
RAI 163 — 09.02.02-4	March 20, 2009
RAI 163 — 09.02.02-5	March 20, 2009
RAI 163 — 09.02.02-6	March 20, 2009
RAI 163 — 09.03.03-2	April 3, 2009
RAI 163 — 09.03.03-3	April 3, 2009
RAI 163 — 09.03.03-4	April 3, 2009
RAI 163 — 09.03.03-5	April 3, 2009
RAI 163 — 09.03.03-6	April 3, 2009

Sincerely,

(Russ Wells on behalf of)

Ronda Pederson
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From: Getachew Tesfaye [mailto:Getachew.Tesfaye@nrc.gov]
Sent: Friday, January 09, 2009 7:18 PM
To: ZZ-DL-A-USEPR-DL
Cc: Larry Wheeler; Peter Wilson; Chang Li; John Segala; Peter Hearn; Joseph Colaccino; John Rycyna; ArevaEPRDCPEm Resource
Subject: U.S. EPR Design Certification Application RAI No. 163 (1809, 1763),FSAR Ch. 9

Attached please find the subject requests for additional information (RAI). A draft of the RAI was provided to you on December 23, 2008, and on January 6, 2009, 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: 658

Mail Envelope Properties (5CEC4184E98FFE49A383961FAD402D310110F332)

Subject: Response to U.S. EPR Design Certification Application RAI No. 163, FSAR Ch 9, Supplement 5
Sent Date: 7/14/2009 4:31:10 PM
Received Date: 7/14/2009 4:31:13 PM
From: Pederson Ronda M (AREVA NP INC)

Created By: Ronda.Pederson@areva.com

Recipients:
"BENNETT Kathy A (OFR) (AREVA NP INC)" <Kathy.Bennett@areva.com>
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Tracking Status: None

Post Office: AUSLYNCMX02.adom.ad.corp

Files	Size	Date & Time
MESSAGE	11769	7/14/2009 4:31:13 PM
RAI 163 Supplement 5 Response US EPR DC.pdf	201226	

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

Response to

Request for Additional Information No. 163, Supplement 5

01/09/2009

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.02.02 - Reactor Auxiliary Cooling Water Systems
SRP Section: 09.03.03 - Equipment and Floor Drainage System

Application FSAR Ch. 9

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)
QUESTIONS for Balance of Plant Branch 2 (ESBWR/ABWR) (SBPB)

Question 09.03.03-5:

10 CFR 52.47(b)(1), which requires that a design certification (DC) application contain the proposed inspections, tests, analyses, and acceptance criteria (ITAAC) that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a plant that incorporates the design certification is built and will operate in accordance with the design certification, the provisions of the Atomic Energy Act, and the NRC's regulations. The FSAR Tier 2, Section 9.33 describes the NIDVS to meet GDC 2, GDC 4, and GDC 60. SRP Section 9.3.3 Acceptance Criteria 4 asks the applicant to provide an ITAAC to verify the plant is built in accordance with the design certification. The staff reviewed the FSAR and could not find such an ITAAC.

FSAR Tier 2, Table 14.3-8, ITAAC Screening Summary (Sheet 5 of 7) shows that the NIDVS is within the scope of Tier 1, but does not have an FSAR Tier 1 ITAAC. The NIDVS in Tier 1 identifies the system in the table of contents as Section 2.9.5, but there are no Tier 1 entries for the NIDVS. The applicant is requested to provide a design description and appropriate ITAAC table to verify the sizing and layout of the NIDVS to perform its essential functions.

Response to Question 09.03.03-5:

As described in the Response to RAI 163, Supplement 3, Question 09.03.03-2, Part 2, the sump level sensors in the nuclear island drain and vent system (NIDVS) are credited in flooding analyses to initiate operator action or automatic measures to isolate a flooding event in the Reactor Building (RB), Reactor Building Annulus (RBA), Safeguards Buildings (SBs), and Fuel Building (FB). The sump level sensors for the RB, RBA, SBs, and FB will be added to U.S. EPR FSAR Tier 1, Section 2.9.5. Information in U.S. EPR FSAR Tier 2, Table 3.2.2-1, Table 3.11-1, Section 9.3.3.1, and Table 14.3-8 will also be revised to reflect the new equipment classifications and NIDVS ITAAC.

As described in the Response to RAI 131, Supplement 1, Question 09.02.01-25, the SB sump level sensors are also credited in flooding analyses to trip the essential service water system (ESWS) pump and to close the ESWS pump discharge valve in a flooding event. U.S. EPR FSAR Tier 1, Section 2.9.5, Item 3.2 will be added for ESWS isolation in a SB flooding event. U.S. EPR FSAR Tier 2, Section 3.4.3.4 and Section 9.2.1.3.5 will be revised to clarify that there is only one safety-related NIDVS sump level sensor for each of the SBs. U.S. EPR FSAR Tier 2, Section 9.3.3.1 will be revised to specify the ESWS isolation for a SB flooding event.

FSAR Impact:

U.S. EPR FSAR Tier 1, Section 2.9.5 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR FSAR Tier 2, Table 3.2.2-1, Table 3.11-1, Section 3.4.3.4, Section 9.2.1.3.5, Section 9.3.3.1, and Table 14.3-8 will be revised as described in the response and indicated on the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

2.9.5 Nuclear Island Drain and Vent System

~~There are no Tier 1 entries for this system.~~

1.0 Description

The nuclear island drain and vent system (NIDVS) collects, temporarily stores, and transfers radioactive fluids from the nuclear island area to other plant systems in a controlled manner. Portions of the NIDVS are classified as safety-related. The NIDVS operates during normal power, start-up, and shutdown conditions.

The NIDVS provides the following safety-related functions:

- Provides alarms in the main control room (MCR) to indicate a flooding event.
- Trips the essential service water system (ESWS) pump and closes the ESWS pump discharge valve in a Safeguard Building (SB) flooding event.

2.0 Arrangement

2.1 The location of the sump level sensors is as listed in Table 2.9.5-1—NIDVS Equipment I&C and Electrical Design.

3.0 Instrumentation and Controls (I&C) Design Features, Displays, and Controls

3.1 Displays listed in Table 2.9.5-1 are retrievable in the main control room (MCR).

3.2 The sump level sensor in a Safeguard Building trips the ESWS pump and closes the pump discharge valve in response to a flooding signal.

4.0 Electrical Power Design Features

4.1 The sump level sensors designated as Class 1E in Table 2.9.5-1 are powered from the Class 1E division listed in Table 2.9.5-1.

5.0 Environmental Qualifications

5.1 The sump level sensors listed in Table 2.9.5-1 for EQ harsh environment can initiate an alarm in the MCR following exposure to the design basis environments for the time required.

6.0 Inspections, Tests, Analyses, and Acceptance Criteria

Table 2.9.5-2 lists the NIDVS ITAAC.

09.03.03-5

Next File

Table 2.9.5-1—NIDVS Equipment I&C and Electrical Design

Equipment Description	Equipment Tag Number (1)	Equipment Location	IEEE Class 1E	EQ –Harsh Env.	MCR Display
Level Sensors for Sump 30KTE20 BB001	30KTE20CL001	Safeguard Building 1	Division 1	Yes	Yes
Level Sensors for Sump 30KTE20 BB002	30KTE20CL003	Safeguard Building 2	Division 2	Yes	Yes
Level Sensors for Sump 30KTE20 BB003	30KTE20CL005	Safeguard Building 3	Division 3	Yes	Yes
Level Sensors for Sump 30KTE20 BB004	30KTE20CL007	Safeguard Building 4	Division 4	Yes	Yes
Level Sensors for Sump 30KTC30 BB001	30KTC30CL001	Fuel Building	Division 1	Yes	Yes
Level Sensors for Sump 30KTC30 BB002	30KTC30CL003	Fuel Building	Division 4	Yes	Yes
Level Sensors for Sump 30KTD10 BB002	30KTD10CL002	Reactor Building Annulus	Division 4	No	Yes
Level Sensors for Sump 30KTC10 BB001	30KTC10CL001	Reactor Building	Division 1	Yes	Yes
	30KTC10CL002	Reactor Building	Division 1	Yes	Yes
Level Sensors for Sump 30KTC10 BB002	30KTC10CL005	Reactor Building	Division 4	Yes	Yes

1) Equipment tag numbers are provided for information only and are not part of the certified design.

09.03.03-5

Table 2.9.5-2—Nuclear Island Drain and Vent System ITAAC (2 Sheets)

	Commitment Wording	Inspections, Tests, Analyses	Acceptance Criteria
2.1	The location of the sump level sensors is as listed in Table 2.9.5-1.	An inspection will be performed to verify the location of the sump level sensors listed in Table 2.9.5-1.	The location of the sump level sensors is as listed in Table 2.9.5-1.
3.1	Displays listed in Table 2.9.5-1 are retrievable in the MCR.	Tests will be performed for MCR displays listed in Table 2.9.5-1.	Displays listed in Table 2.9.5-1 are retrievable in the MCR.
3.2	The sump level sensor in a Safeguard Building trips the ESWS pump and closes the pump discharge valve in response to a flooding signal.	a. A test will be performed on the SB 1 sump level sensor (30KTE20CL001) listed in Table 2.9.5-1. b. A test will be performed on the SB 2 sump level sensor (30KTE20CL003) listed in Table 2.9.5-1. c. A test will be performed on the SB 3 sump level sensor (30KTE20CL005) listed in Table 2.9.5-1. d. A test will be performed on the SB 4 sump level sensor (30KTE20CL007) listed in Table 2.9.5-1.	a. ESWS pump 1 trips and ESWS pump 1 discharge valve closes on a SB 1 sump level signal. b. ESWS pump 2 trips and ESWS pump 2 discharge valve closes on a SB 2 sump level signal. c. ESWS pump 3 trips and ESWS pump 3 discharge valve closes on a SB 3 sump level signal. d. ESWS pump 4 trips and ESWS pump 4 discharge valve closes on a SB 4 sump level signal.
4.1	The sump level sensors designated as Class 1E in Table 2.9.5-1 are powered from the Class 1E division listed in Table 2.9.5-1.	Tests will be performed for sump level sensors designated as Class 1E in Table 2.9.5-1 by providing a test signal to the aligned Class 1E division.	The test signal provided in the aligned Class 1E division is present at the sump level sensors identified in Table 2.9.5-1.
5.1	Equipment in Table 2.9.5-1 that is designated as EQ-harsh environment can initiate an alarm in the MCR in the environments that exist before and during the time required to perform their function.	a. Type tests, analyses, or a combination of type tests and analyses will be performed to demonstrate the ability of the equipment listed as EQ-harsh environment in Table 2.9.5-1 to initiate an alarm in the MCR for the environmental conditions that could occur before and during a design basis accident.	a. Environmental Qualification Data Packages (EQDP) exist and conclude that the equipment listed as harsh environment in Table 2.9.5-1 can initiate an alarm in the MCR before and during design basis accidents for the time required to perform the listed function.

09.03.03-5

Table 2.9.5-2—Nuclear Island Drain and Vent System ITAAC
(2 Sheets)

Commitment Wording		Inspections, Tests, Analyses	Acceptance Criteria
		b. Equipment listed as EQ-harsh environment in Table 2.9.5-1 will be inspected to verify installation in accordance with the construction drawings including the associated wiring, cables, and terminations. Deviations to the construction drawings will be reconciled to the EQDP.	b. Inspection reports exist and conclude that the equipment listed in Table 2.9.5-1 as harsh environment has been installed per the construction drawings and deviations have been reconciled to the EQDP.

09.03.03-5

Table 3.2.2-1—Classification Summary
Sheet 118 of 182

KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KTB30 AP001/002	Process Drain Pumps - UFA	NS	D	NSC	No	UFA	Manufacturer Standards
30KTB20 BB002	Process Drain Tank - 2UJH	NS	D	NSC	No	2UJH	ASME VIII[8]
30KTB20 BB003	Process Drain Tank - 3UJH	NS	D	NSC	No	3UJH	ASME VIII[8]
30KTA10 BB002	Process Drain Tank - UJA	NS	D	NSC	No	UJA	ASME VIII[8]
30KTB30 BB001/002	Process Drain Tanks - UFA	NS	D	NSC	No	UFA	ASME VIII[8]
30KTB40 BB001	Process Drain UKA Relay Tank	NS	D	NSC	No	UKA	ASME VIII[8]
30KTC10 CL001/002	Reactor Building Sump Level Indicators	~~NS~~ AQS	~~D~~N/A	I	Yes	UJA	Manufacturer Standards, RG 1.45, IEEE 323, IEEE 344
30KTA10 BB001	Reactor Coolant Drain Tank	NS	D	NSC	No	UJA	ASME VIII[8]
30KTA30 AP001/002	Recyclable Effluents Pumps - UFA	NS	D	NSC	No	UFA	Manufacturer Standards
30KTA10 AP001/002	Recyclable Effluents Pumps - UJA	NS	D	NSC	No	UJA	Manufacturer Standards
30KTA20 AP001-004	Recyclable Effluents Pumps - UJH	NS	D	NSC	No	UJH	Manufacturer Standards

09.03.03-5

Table 3.2.2-1—Classification Summary
Sheet 119 of 182

KKS System or Component Code	SSC Description	Safety Classification (Note 15)	Quality Group Classification	Seismic Category (Note 16)	10 CFR 50 Appendix B Program (Note 5)	Location (Note 17)	Comments/ Commercial Code
30KTA40 AP001/002	Recyclable Effluents Pumps - UKA	NS	D	NSC	No	UKA	Manufacturer Standards
30KTA40 BB001	Recyclable Effluents Tank - UKA	NS	D	NSC	No	UKA	ASME VIII[8]
30KTA30 BB001/002	Recyclable Effluents Tanks - UFA	NS	D	NSC	No	UFA	ASME VIII[8]
30KTA20 BB001-004	Recyclable Effluents Tanks - UJH	NS	D	NSC	No	UJH	ASME VIII[8]
30KTE20 CL003/ 005/007~~CL001-008~~	Sump Level Sensors	S~~NS-AQ~~	~~D~~N/A	~~NSC~~I	~~No~~Yes	~~UKA~~UJH	Manufacturer Standards, IEEE 323, IEEE 344
30KTC10 CL005	Sump Level Sensors	S	N/A	I	Yes	UJA	Manufacturer Standards, IEEE 323, IEEE 344
30KTC30 CL001/003	Sump Level Sensors	S	N/A	I	Yes	UFA	Manufacturer Standards, IEEE 323, IEEE 344
30KTD10 CL002	Sump Level Sensors	S	N/A	I	Yes	UJB	Manufacturer Standards, IEEE 323, IEEE 344
KU	**Nuclear Sampling System**						
30KUA70 BB001	Active Sample Storage Tank	NS	D	NSC	No	UKA	ASME VIII[8]
KUA66	Argon/Nitrogen Bottles	NS	E	NSC	No	UKA	Manufacturer Standards

09.03.03-5

Relevant component and system piping failures considered in the analysis of these building levels include loss of one demineralized water pool, a leak in the SIS suction line from the IRWST, a pipe leak in the SIS/RHRS during normal operation, and a break in the fire water distribution system piping. The bounding flooding source below elevation +0 feet is considered to be a postulated break in the main piping of the fire water distribution system. The volume of released water is based on an assumed full break in the piping, a flow rate limited by the maximum pump capacity, and an operator action time of thirty minutes to isolate the system after receiving the first alarm in the MCR. At these levels, the rooms within one division have sufficient interconnections so that the maximum released water volume can be stored within the division. Based on the available free volume of these building levels in each division, the maximum released water volume can be contained within the affected division.

Elevation +0 Feet, 0 Inches

At elevation +0 feet, 0 inches there is no physical separation of divisions with respect to flooding. A corridor connects the SBs and the FB. To avoid water ingress into adjacent divisions at this elevation and above, a combination of watertight doors, existing openings (e.g., stairwells), and designed openings for water flow to the lower building levels are provided.

Relevant component and system piping failures considered in the analysis for this elevation include failures in the essential service water system (ESWS) and component cooling water system (CCWS) heat exchangers, leaks in the emergency feedwater system, leaks in the CCWS, and pipe failure in the fire water distribution system.

A postulated pipe break or erroneous valve alignment in the ESWS has the potential to impact more than one division. The ESWS piping penetrates the SBs at elevation -14 feet, 9-1/4 inches and is routed to the CCWS heat exchangers at elevation +0 feet. The worst case scenario assumed in the analysis is an erroneous valve alignment where the CCW heat exchanger is left open after plant maintenance, resulting in the entire cross section of the associated ESW line releasing water at elevation +0 feet. To cope with nonclosure of the heat exchanger or a large break in the ESWS piping, the pump must be stopped and the isolation valve in the discharge line of the affected ESWS train must be closed to limit the flooding volume in the affected SB.

Safety-related detection and isolation signals are provided in the nuclear island drain and vent system in each SB to isolate the ESWS. The level sensors that actuate the isolation are above the floor level so only large flooding events can initiate an isolation.

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~~Two level sensors in a one-out-of-two logic actuate the isolation. If a level sensor fails, that sensor is not considered for the voting, and the signal is activated when one sensor detects.~~

Table 3.11-1—List of Environmentally Qualified Electrical/I&C Equipment
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Name Tag (Equipment Description)	Tag Number	Local Area KKS ID (Room Location)	EQ Environment (Note 1)	Radiation Environment Zone (Note 2)	EQ Designated Function (Note 3)	Safety Class (Note 4)	EQ Program Designation (Note 5)
SG3 2ndary sampling outer C I-V motor	30QUC13AA001	30UFA06083	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SG3 2ndary sampling inner C I-V motor	30QUC13AA011	30UJA11016	H	H	ES SI	S 1E EMC	Y (1) Y (5)
SG4 2ndary sampling outer C I-V motor	30QUC14AA001	30UFA10095	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
SG4 2ndary sampling inner C I-V motor	30QUC14AA011	30UJA11016	H	H	ES SI	S 1E EMC	Y (1) Y (5)
Compressed Air System (CAS)							
COMPRESSED AIR OURTER COTAINMENT ISOLATI	30SCB01AA001	30UFA13054	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
COMPRESSED AIR INNER COTAINMENT ISOLATIO	30SCB01AA002	30UJA15016	H	H	ES SI	S 1E EMC	Y (1) Y (5)
Fire Water Distribution System (FWDS)							
FIRE WATER DISTRIBUTION SYSTEM CI VALVE	30SGB30AA031	30UFA13054	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
FIRE WATER DISTRIBUTION SYSTEM CI VALVE	30SGB30AA032	30UJA15016	H	H	ES SI	S 1E EMC	Y (1) Y (5)
Nuclear Island Drain & Vent System (NI DVS)							
INNER CONT ISO VLV ACTUATOR	30KTA10AA017	30UJA07016	H	H	ES SI	S 1E EMC	Y (1) Y (5)
OUTER CONT ISO VALVE ACTUATOR	30KTA10AA018	30UFA06045	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
INNER CONT ISO VLV FLOOR DRN 1 ACTUATOR	30KTC10AA005	30UJA07016	H	H	ES SI	S 1E EMC	Y (1) Y (5)
OUTER CONT ISO VLV FLOOR DRN 1 ACTUATOR	30KTC10AA006	30UFA06095	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
OUTER CONT ISO VLV CHEM REINJ ACTUATOR	30KTC10AA010	30UFA06095	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
OUTER CONT ISO VLV FLOOR DRN 2 ACTUATOR	30KTD10AA015	30UFA06095	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
INNER CONT ISO VLV FLOOR DRN 2 ACTUATOR	30KTD10AA024	30UJA07016	H	H	ES SI	S 1E EMC	Y (1) Y (5)
OUTER CONT ISO VLV ANNULUS ACTUATOR	30KTD10AA025	30UFA10095	M	H	ES SI	S 1E EMC	Y (2) Y (5) Y (6)
Level Sensors for Sump KTE20 BB001	30KTE20CL001	31UJH01026	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Level Sensors for Sump KTE20 BB002	30KTE20CL003	32UJH01038	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Level Sensors for Sump KTE20 BB003	30KTE20CL005	33UJH01038	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Level Sensors for Sump KTE20 BB004	30KTE20CL007	34UJH01026	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Level Sensors for Sump 30KTC30 BB001	30KTC30CL001	30UFA01042	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Level Sensors for Sump 30KTC30 BB002	30KTC30CL003	30UFA01097	M	H	SI	S 1E EMC	Y (2) Y (5) Y (6)
Level Sensors for Sump 30KTD10 BB002	30KTD10CL002	30UJB05003	M	M	SI	S 1E EMC	Y (5) Y (6)
Level Sensors for Sump 30KTC10 BB001	30KTC10CL001	30UJA11013	H	H	SI	S 1E EMC	Y (1) Y (5)
Level Sensors for Sump 30KTC10 BB001	30KTC10CL002	30UJA11013	H	H	SI	S 1E EMC	Y (1) Y (5)
Level Sensors for Sump 30KTC10 BB002	30KTC10CL005	30UJA11016	H	H	SI	S 1E EMC	Y (1) Y (5)
Containment Penetrations - Electrical							
Electrical Containment Penetration JML10GD130	JML10GD130	30UJB18F0130B	H	H	RT ES PAM SI	S 1E	Y(1) Y(5)
Electrical Containment Penetration JML10GD131	JML10GD131	30UJB18F0131B	H	H	RT ES PAM SI	S 1E	Y(1) Y(5)
Electrical Containment Penetration JML10GD132	JML10GF132	30UJB18F0132B	H	H	RT ES PAM SI	S 1E	Y(1) Y(5)
Electrical Containment Penetration JML10GD133	JML10GF133	30UJB18F0133B	H	H	RT ES PAM SI	S 1E	Y(1) Y(5)
Electrical Containment Penetration JML10GD134	JML10GF134	30UJB18F0134B	H	H	RT ES PAM SI	S 1E	Y(1) Y(5)
Electrical Containment Penetration JML10GD135	JML10GF135	30UJB18F0135B	H	H	RT ES PAM SI	S 1E	Y(1) Y(5)
Electrical Containment Penetration JML10GD136	JML10GP136	30UJB18F0136B	H	H	RT ES PAM SI	S 1E	Y(1) Y(5)
Electrical Containment Penetration JML10GD137	JML10GF137	30UJB18F0137B	H	H	RT ES PAM SI	S 1E	Y(1) Y(5)

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operational point. The pressure relief backwash process of the filter is initiated by either the signal of the differential pressure measuring system, a timer after the start of the dedicated ESW pump or via a manual operator initiation.

The discharge and disposal of the collected debris must be treated in accordance with federal and state regulations relevant to the site location.

9.2.1.3.5 Piping, Valves, and Fittings

System materials must be selected that are suitable to the site location, ESW fluid properties and site installation. System materials that come into contact with one another must be chosen so as to minimize galvanic corrosion. All safety-related piping, valves, and fittings are in accordance with ASME Code Section III, Class 3 (Reference 1).

A COL applicant that references the U.S. EPR design certification will provide a description of materials that will be used for the essential service water system (ESWS) at their site location, including the basis for determining that the materials being used are appropriate for the site location and for the fluid properties that apply.

The general protection concept in case of pipe failures in the ESWS with regard to flooding is based on the principle of restricting the consequences to the affected division. In case of significant leakage from an ESWS train in a Safeguard Building (SB), the associated motor-driven ESWS pump discharge isolation valve is automatically closed and the ESWS pump is tripped. Another ESWS train is also put into operation. The detection and isolation signaling is done by safety-related means.

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~~One-out-of-two logic from two~~The nuclear island drain and vent system (NIDVS) sump level instrument~~s~~ in the non-controlled areas of the SBs provide~~s~~ a MAX alarm in the MCR and isolate~~s~~ the affected ESWS train. No operator action is required to isolate the ESWS in a large flooding event.

Primary overpressure protection on the ESWS side of the CCWS HXs is provided by thermal relief valves.

Secondary overpressure protection on the ESWS side of the CCWS HXs is provided by manual opening of the valve (located upstream of the relief valve) before isolation of the particular HX.

To make sure the performance of the safety-related functions, all manually operated valves in the main lines of the safety-related ESWS divisions are mechanically locked in the proper position.

In-service testing of valves shall be performed as described in Section 3.9.6.3. Leakage rates for boundary isolation valves that require testing are based on ASME OM Code, 2004 Edition, Subsection ISTC.

9.3.3 Equipment and Floor Drainage System

The nuclear island drain/vent system (NIDVS) collects, temporarily stores and discharges radioactive fluids from the nuclear island (NI) area to other plant systems in a controlled manner. Portions of the NIDVS are classified safety-related. The NIDVS operates during normal power, start-up and shutdown conditions.

9.3.3.1 Design Bases

The NIDVS performs the following safety-related function:

- Maintain containment isolation. NIDVS lines penetrating containment are capable of isolation upon receipt of a containment isolation signal (CIS) from the reactor protection system. (Refer to Section 6.2.4 and Section 7.3.)

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- Flooding detection inside the RB (containment and annulus), SBs, and FB. (Refer to Section 9.3.3.3 and Section 9.3.3.5).
- Trips the essential service water system (ESWS) pump and closes the ESWS pump discharge valve in a Safeguard Building (SB) flooding event. (Refer to Section 9.3.3.3 and Section 9.3.3.5.)

The NIDVS has the following design basis requirements:

- Safety-related portions of the NIDVS are designed to withstand the effects of natural phenomena such as earthquakes, tornadoes, hurricanes, floods, tsunami and seiches without loss of capability to perform their safety functions (GDC 2).
- Safety-related portions of the NIDVS are designed to accommodate the effects of and be compatible with the environmental conditions associated with normal operation, maintenance, surveillance testing and postulated accidents. These portions of the NIDVS are protected against dynamic effects, including the effects of missiles, pipe whipping and discharging fluids that may result from equipment failures and from events and conditions outside the nuclear power unit (GDC 4).
- Safety-related portions of the NIDVS design includes means to suitably control the release of radioactive materials in gaseous and liquid effluents produced during normal reactor operation, including anticipated operational occurrences (AOO) (GDC 60).

The NIDVS is designed to meet the following functional criteria:

- Facilitate optimized treatment of liquid and gaseous radioactive effluents.
- Evacuate potentially radioactive gases in the reactor coolant system (RCS).
- Cool primary system effluent to a temperature safe for the demineralizer resins contained in the coolant purification system (CPS).

Table 14.3-8—ITAAC Screening Summary
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Structure, System, or Component	System KKS Code(s)	Within Scope of Tier 1	Has ITAAC in Tier 1	Tier 1 Section
Auxiliary Systems				
Emergency Diesel Generator	XJA, XKA, XJN, XJV, XJG, XJQ, XJR, XJX, CXN	X	X	2.5.4
Gaseous Waste Management System	KPL	X		2.9.3
Leak-off System	JMM	X	09.03.03-5	2.7.7
Liquid Waste Management System	KPK, KPF	X		2.9.1
Nuclear Island Drain and Vent Systems	KT	X	X	2.9.5
Nuclear Sampling System	KU	X		2.9.6
Sampling Activity Monitoring Systems	KLK	X	X	2.9.4
Severe Accident Sampling System	KUL	X		2.3.4
Solid Waste Management System	KPC	X		2.9.2
Station Blackout Alternate AC Source	XJA, XKA, XJN, XJV, XJG, XJQ, XJR, XJX, CXN	X	X	2.5.3
Electrical Systems				
12-Hour Uninterruptible Power Supply System	BRB, BRV, BRW, BRX, BUV, BUX, BRC, BRV03, BTB, BTM, BUD, BUE	X	X	2.5.11
Class 1E Uninterruptible Power Supply	BRA, BRU01, BRW, BTD, BTP, BUC, BUW, BGA	X	X	2.5.2
Class 1E Emergency Power Supply System	BD, BM, BN	X	X	2.5.1
Lighting System	BG, BJ, BL, BZL	X	X	2.5.9
Lightning Protection and Grounding	BAW	X	X	2.5.8