ArevaEPRDCPEm Resource

From: BRYAN Martin (EXTERNAL AREVA) [Martin.Bryan.ext@areva.com]
Sent: Tuesday, October 26, 2010 7:49 AM
To: Tesfaye, Getachew
Cc: Hearn, Peter; KOWALSKI David (AREVA)
Subject: FW: DRAFT RESPONSES FOR FSAR Chapter 9 Weekly NRC Telecon
Attachments: Blank Bkgrd.gif; DRAFT RESPONSE RAI 345 Q.09.02.01-35(e+g).pdf

Importance: High

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Sent: Tuesday, October 26, 2010 7:47 AM
To: BRYAN Martin (External RS/NB)
Cc: BALLARD Bob (EP/PE); HUDDLESTON Stephen (EP/PE); HARTSELL Jody (EP/PE); GARDNER Darrell (RS/NB); SLOAN Sandra (RS/NB); MCINTYRE Brian (RS/NB)
Subject: DRAFT RESPONSES FOR FSAR Chapter 9 Weekly NRC Telecon
Importance: High

Marty:

Please transmit to Getachew Tesfaye the attached partial set of DRAFT responses to RAI 345 questions. These responses will be discussed at today's (10/26/10) FSAR Chapter 9 Weekly Telecon/GoToMeeting with the NRC.

Attached are the following DRAFT response(s):

- Response to RAI 345 - Question 09.02.01-35 (Parts e + g) and supporting FSAR changes.
- NOTE: This response addresses Larry Wheeler's comments in Getachew Tesfaye's e-mail dated 10-21-10.

Note that these DRAFT responses have not been through the final Licensing review/approval process; nor do they reflect technical editing.

Please call me if you have any questions. Thanks.

David J. Kowalski, P.E.

Principal Engineer
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From: BRYAN Martin (EXTERNAL AREVA)

Created By: Martin.Bryan.ext@areva.com

Recipients:
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Tracking Status: None
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Tracking Status: None
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Tracking Status: None

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Options
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Response to

Request for Additional Information No. 345

3/04/2010

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 09.02.01 - Station Service Water System
Application Section: 9.2.1

QUESTIONS for Balance of Plant Branch 1 (AP1000/EPR Projects) (SBPA)

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Question 09.02.01-35:

Follow-up to RAI 119, Question 9.2.1-09

The ESWS must be capable of removing heat from SSCs important to safety during normal operating and accident conditions over the life of the plant in accordance with GDC 44 requirements. System design features, operating procedures, and surveillance testing must provide adequate assurance that the ESWS safety functions will not be compromised due to damaging water hammer events. Two of the four safety-related trains are normally in operation with the remaining two trains in standby. All valves in the main flow path of each train, including the two trains in standby, are kept open (Tier 2 FSAR Section 9.2.1.4). Since the cooling tower spray nozzles are located at an elevation that is well above the cooling tower basin water level, there is a potential for the standby loops to drain to their respective cooling tower basins and create a large air void in the piping of the ESWS standby trains. If this occurs, an automatic actuation of the standby ESWS trains could result in a water hammer.

Any loop seals in the ESWS that are caused by component design or piping configuration would tend to result in a much more severe water hammer event. The ESWS description does not adequately consider and address water hammer vulnerabilities (such as this) in the FSAR and does not explain how system design features, operating procedures, and periodic surveillance testing provide adequate assurance that the ESWS safety functions will not be compromised by water hammer events. Accordingly, the applicant needs to provide additional information in Tier 2 FSAR Section 9.2.1 to address water hammer considerations. If system valves are relied upon to prevent excessive back-leakage, the ESWS description in the FSAR needs to fully explain and justify the maximum amount of back-leakage that is allowed, and specify the leakage acceptance criteria that will be established in the in-service testing program for these valves along with the basis for this determination.

Based on the staff's review of response to RAI 119, Question 9.2.1-09 and an audit by the staff conducted on October 27, 2009, this item remains open and requires further resolution and/or clarification by the applicant. The following description provides the results of the staff's evaluation of the applicant's initial response and justification for the item remaining open.

The staff found the applicant's response, proposed actions and conclusions to be reasonable, but not complete. The applicant should address the following items.

e. FSAR Tier 2 Section 3.9.6.3 presently indicates that both MOVs 30PEB10/20/30/40 AA005 and 30PED 10/20/30/40AA010 are listed as ASME 0M Code Category "B," for which seat leakage in the closed position is inconsequential to fulfill their required functions. The concerned that such seat leakage could create a system drain down that may lead to water hammer vulnerability. Therefore, the applicant should consider revising Tier 2 Table 3.9.6-2 "In-service Valve Testing Requirements," for pump discharge check valve 30PEB10/20/30/40 AA204 as well as for MOVs 30PEB10/20/30/40 AA005 and 30PED 10/20/30/40 AA010 by adding Leakage Testing (LT).

g. The staff noted that Rev 1 of the U.S. EPR FSAR revised the description in FSAR 9.2.1.4.1 from "during standby...valves in the main line are open" to "during standby...manual valves in the main line are open." The RAI-response 9.2.1-09 or the

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related FSAR markup did not explain this change in wording. The change to the FSAR should be explained.

Response to Question 09.02.01-35:

Part (e)

Valve seat leak testing (LT) has been specified for MOVs 30PEB10/20/30/40 AA005 and 30PED 10/20/30/40AA010 in the In-service Valve Testing Program in FSAR Tier 2 Table 3.9.6-2. LT has been added as a Required Test for these isolation valves and the ASME OM Code Category has been changed from B to A.

U.S. EPR Tier 2, Table 3.9.6-2, "In-service Valve Testing Requirements," will be revised for pump discharge check valve 30PEB10/20/30/40 AA204 by adding Leakage Testing (LT). LT has been added as a Required Test and the ASME OM Code Category has been changed from C to A/C.

Part (g)

The FSAR revision to Section 9.2.1.4.1 from "during standby...valves in the main line are open" to "during standby...manual valves in the main line are open" was necessary because during standby only the in-line manual valves remain open. Motor-operated valves in the main line are in the closed position during standby.

FSAR Impact:

U.S. EPR FSAR Tier 2, Table 3.9.6-2 will be revised as described in the response and indicated on the enclosed markup.

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Table 3.9.6-2—Inservice Valve Testing Program Requirements
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Valve Identification Number[1]	Description/ Valve Function	Valve Type[2]	Valve Actuator[3]	ASME Code Class[4]	ASME OM Code Category[5]	Active / Passive[6]	Safety Position[7]	Test Required[8,10]	Test Frequency[9]	Comments
30PEB10AA005	Pump discharge isolation PEB10 AP001	BF	MO	3	~~B~~ A	A	O	ET ~~PI~~ LT	Q ~~2Y~~ 2Y	
30PEB10AA007	Isolation upstreamKAA10 AC001	BF	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB10AA009	Isolation downstream KAA10 AC001	BF	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB10AA015	Filter blowdown isolation PEB10 AP001	GT	MO	3	~~B~~ A	A	C	ET PI LT	Q 2Y 2Y	
30PEB10AA016	Blowdown isolation PEB10	GB	MO	3	~~B~~ A	A	C	ET PI LT	Q 2Y	2Y
30PEB10AA190	Air release downstream PEB10 AP001	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30PEB11AA191	Vacuum breaker downstream SAQ10 AC001	RV	SA	3	C	A	O/C	ET LT PI	2Y 10Y 2Y	
30PEB10AA192	Thermal relief downstream KAA10 AC001	RV	SA	3	C	A	O/C	ET LT ~~PI~~	10Y 10Y ~~2Y~~	
30PEB10AA204	Pump discharge check PEB10 AP001	CK	SA	3	~~C~~ A/C	A	O	ET LT	Q 2Y	

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Valve Identification Number[1]	Description/ Valve Function	Valve Type[2]	Valve Actuator[3]	ASME Code Class[4]	ASME OM Code Category[5]	Active / Passive[6]	Safety Position[7]	Test Required[8,10]	Test Frequency[9]	Comments
30PEB20AA005	Pump discharge Isolation PEB20 AP001	BF	MO	3	~~B~~ A	A	O	ET ~~PI~~ LT	Q ~~2Y~~ 2Y	
30PEB20AA007	Isolation upstream KAA20 AC001	BF	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB20AA009	Isolation downstream KAA20 AC001	BF	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB20AA015	Filter blowdown Isolation PEB20 AP001	GT	MO	3	~~B~~ A	A	C	ET ~~PI~~ LT	Q ~~2Y~~ 2Y	
30PEB20AA016	Blowdown Isolation PEB20	GB	MO	3	~~B~~ A	A	C	ET ~~PI~~ LT	Q ~~2Y~~ 2Y	2Y
30PEB20AA190	Air release downstream PEB20 AP001	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30PEB21AA191	Vacuum breaker downstream SAQ20 AC001	RV	SA	3	C	A	O/C	ET LT PI	2Y 10Y 2Y	
30PEB20AA192	Thermal relief downstream KAA20 AC001	RV	SA	3	C	A	O/C	ET LT ~~PI~~	10Y 10Y ~~2Y~~	
30PEB20AA204	Pump Discharge Check PEB20 AP001	CK	SA	3	~~C~~ A/C	A	O	ET LT	Q 2Y	

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Table 3.9.6-2—Inservice Valve Testing Program Requirements
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Valve Identification Number[1]	Description/ Valve Function	Valve Type[2]	Valve Actuator[3]	ASME Code Class[4]	ASME OM Code Category[5]	Active / Passive[6]	Safety Position[7]	Test Required[8,10]	Test Frequency[9]	Comments
30PEB23AA195	Air release 30XJG30 AC001	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30PEB23AA196	Thermal relief downstream 30XJG30 AC001	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30PEB30AA002	Recirculation Isolation PEB30 AP001	BF	MO	3	B	A	C	ET PI	Q 2Y	
30PEB30AA003	Emergency Blowdown Isolation PEB30	BF	MO	3	~~B~~ A	A	C	ET PI LT	Q ~~2Y~~ 2Y	
30PEB30AA005	Pump Discharge Isolation PEB30 AP001	BF	MO	3	~~B~~ A	A	O	ET PI LT	Q ~~2Y~~ 2Y	
30PEB30AA007	Isolation upstream KAA30 AC001	BF	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB30AA009	Isolation downstream KAA30 AC001	BF	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB30AA015	Filter blowdown Isolation PEB30 AP001	GT	MO	3	B A	A	C	ET PI LT	Q ~~2Y~~ 2Y	
30PEB30AA016	Blowdown Isolation PEB30	GB	MO	3	B A	A	C	ET PI LT	Q 2Y	2Y

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Table 3.9.6-2—Inservice Valve Testing Program Requirements
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Valve Identification Number[1]	Description/ Valve Function	Valve Type[2]	Valve Actuator[3]	ASME Code Class[4]	ASME OM Code Category[5]	Active / Passive[6]	Safety Position[7]	Test Required[8,10]	Test Frequency[9]	Comments
30PEB30AA190	Air release downstream PEB30 AP001	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30PEB31AA191	Vacuum breaker downstream SAQ30 AC001	RV	SA	3	C	A	O/C	ET LT PI	2Y 10Y 2Y	
30PEB30AA192	Thermal relief downstream KAA30 AC001	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30PEB30AA204	Pump Discharge Check PEB30 AP001	CK	SA	3	~~C~~ A/C	A	O	ET LT	Q 2Y	
~~30PEB30AA205~~	~~Blowdown check PEB30~~	~~CK~~	~~SA~~	~~3~~	~~C~~	~~A~~	~~C~~	~~ET~~	~~Q~~	-
30PEB31AA001	Isolation upstream SAQ30 AC001	GB	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB31AA002	Isolation downstream SAQ30 AC001	GB	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB24AA001	Isolation upstream XJG40 AC002	BF	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB24AA002	Isolation downstream XJG40 AC001	BF	MA	3	B	A	O	ET PI	5Y 2Y	

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Valve Identification Number[1]	Description/ Valve Function	Valve Type[2]	Valve Actuator[3]	ASME Code Class[4]	ASME OM Code Category[5]	Active / Passive[6]	Safety Position[7]	Test Required[8,10]	Test Frequency[9]	Comments
30PEB24AA195	Air release 30XJG40 AC001	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30PEB24AA196	Thermal relief downstream 30XJG40 AC001	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30PEB40AA002	Recirculation Isolation PEB40 AP001	BF	MO	3	B	A	C	ET PI	Q 2Y	
30PEB40AA003	Emergency Blowdown Isolation PEB40	BF	MO	3	B A	A	C	ET PI LT	Q 2Y 2Y	
30PEB40AA005	Pump Discharge Isolation PEB40 AP001	BF	MO	3	~~B~~ A	A	O	ET PI LT	Q 2Y 2Y	
30PEB40AA007	Isolation upstream KAA40 AC001	BF	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB40AA009	Isolation downstream KAA40 AC001	BF	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB40AA015	Filter blowdown Isolation PEB40 AP001	GT	MO	3	B A	A	C	ET PI LT	Q 2Y 2Y	
30PEB40AA016	Blowdown Isolation PEB40	GB	MO	3	B A	A	C	ET PI LT	Q 2Y	2Y

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Table 3.9.6-2—Inservice Valve Testing Program Requirements
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Valve Identification Number[1]	Description/ Valve Function	Valve Type[2]	Valve Actuator[3]	ASME Code Class[4]	ASME OM Code Category[5]	Active / Passive[6]	Safety Position[7]	Test Required[8,10]	Test Frequency[9]	Comments
30PEB40AA190	Air release downstream PEB40 AP001	RV	SA	3	C	A	O/C	ET LT PI	10Y 10Y 2Y	
30PEB41AA191	Vacuum breaker downstream SAQ40 AC001	RV	SA	3	C	A	O/C	ET LT PI	2Y 10Y 2Y	
30PEB40AA192	Thermal relief downstream KAA40 AC001	RV	SA	3	C	A	O/C	ET LT ~~PI~~	10Y 10Y ~~2Y~~	
30PEB40AA204	Pump Discharge Check PEB40 AP001	CK	SA	3	~~C~~ A/C	A	O	ET LT	Q 2Y	
~~30PEB40AA205~~	~~Blowdown check PEB40~~	~~CK~~	~~SA~~	~~3~~	~~C~~	~~A~~	~~C~~	~~ET~~	~~Q~~	-
30PEB41AA001	Isolation upstream SAQ40 AC001	GB	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB41AA002	Isolation downstream SAQ40 AC001	GB	MA	3	B	A	O	ET PI	5Y 2Y	
30PEB41AA011	DED SYSTEM Check upstream SAQ40 AC001	CK	SA	3	~~C~~ A/C	A	~~O~~ C	ET ~~PI~~ LT	Q ~~2Y~~ 2Y	
30PEB80AA002	Pump Discharge Check PEB80 AP001	CK	SA	3	C	A	O	ET	Q	

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Valve Identification Number[1]	Description/ Valve Function	Valve Type[2]	Valve Actuator[3]	ASME Code Class[4]	ASME OM Code Category[5]	Active / Passive[6]	Safety Position[7]	Test Required[8,10]	Test Frequency[9]	Comments
30PED10AA010	V Tower Isolation	BF	MO	3	~~B~~ A	A	O	ET PI LT	Q 2Y 2Y	
30PED10AA011	V Tower Bypass Isolation	BF	MO	3	B	A	C	ET PI	Q 2Y	
30PED10AA019	V Makeup Water Isolation	BF	MO	3	B	A	C	ET PI	Q 2Y	
30PED10AA021	V Emergency Makeup Water Isolation	BF	MO	3	B	A	O	ET PI	Q 2Y	
30PED10AA220	V Makeup Water Check	CK	SA	3	C	A	C	ET	Q	
30PED20AA010	V Tower Isolation	BF	MO	3	~~B~~ A	A	O	ET PI LT	Q 2Y 2Y	
30PED20AA011	V Tower Bypass Isolation	BF	MO	3	B	A	C	ET PI	Q 2Y	
30PED20AA019	V Makeup Water Isolation	BF	MO	3	B	A	C	ET PI	Q 2Y	
30PED20AA021	V Emergency Makeup Water Isolation	BF	MO	3	B	A	O	ET PI	Q 2Y	
30PED20AA220	V Makeup Water Check	CK	SA	3	C	A	C	ET	Q	
30PED30AA010	V Tower Isolation	BF	MO	3	~~B~~ A	A	O	ET PI LT	Q 2Y 2Y	

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Valve Identification Number[1]	Description/ Valve Function	Valve Type[2]	Valve Actuator[3]	ASME Code Class[4]	ASME OM Code Category[5]	Active / Passive[6]	Safety Position[7]	Test Required[8,10]	Test Frequency[9]	Comments
30PED30AA011	V Tower Bypass Isolation	BF	MO	3	B	A	C	ET PI	Q 2Y	
30PED30AA019	V Makeup Water Isolation	BF	MO	3	B	A	C	ET PI	Q 2Y	
30PED30AA021	V Emergency Makeup Water Isolation	BF	MO	3	B	A	O	ET PI	Q 2Y	
30PED30AA220	V Makeup Water Check	CK	SA	3	C	A	C	ET	Q	
30PED40AA010	V Tower Isolation	BF	MO	3	~~B~~ A	A	O	ET PI	Q 2Y 2Y	
30PED40AA011	V Tower Bypass Isolation	BF	MO	3	B	A	C	LT ET ~~PI~~ A	Q 2Y	
30PED40AA019	V Makeup Water Isolation	BF	MO	3	B	A	C	ET PI	Q 2Y	
30PED40AA021	V Emergency Makeup Water Isolation	BF	MO	3	B	A	O	ET PI	Q 2Y	
30PED40AA220	V Makeup Water Check	CK	SA	3	C	A	C	ET	Q	
30QKA10AA003	QK pump #1 Disch Check Valve, Div 1	CK	SA	3	C	A	O/C	ET	Q	
30QKA10AA011	QK QCB Check Valve, Div 1	CK	SA	3	C	A	O/C	ET	Q	

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