Summary of Elicitation Results -- BWR Engineered Safety Feature (Emergency Core Cooling Systems)

Subgroup Description		Degradation Mechanism													
		CREV	DEBOND	EC	FAC	FAT	FAT-HWC	FR	GALV	GC	MIC	PIT	SCC	SCC-HWC	WEAR
Group 10:	**Low Pressure Core Spray**														
10.1	SA105,106,216,234 - Carbon Steel Base														
10.2	SA105,106,216,234 - Carbon Steel Weld and HAZ														
10.3	SA105,106,234 - Carbon Steel Weldolet														
10.4	SA105,106,216,234 - Carbon Steel Valves														
10.5	Carbon Steel (higher strength bolts)									X					
10.6	Type 304 SS Strainer														
10.7	SA106,234 - Carbon Steel Base														
10.8	SA106,234 - Carbon Steel Weld and HAZ														
10.9	SA105,106,216,234 - Carbon Steel Valves														
10.10	A106,A516 Carbon & Low Alloy Steels														
Group 11:	**High Pressure Core Spray -SP Water**														
11.1	SA105,106,216,234 - Carbon Steel Base														
11.2	SA105,106,216,234 - Carbon Steel Weld and HAZ														
11.3	SA105,106,234 - Carbon Steel Base & Weldolet														
11.4	SA105,106,216,234 - Carbon Steel Valves														
11.5	SA106,234 - Carbon Steel Base														
11.6	SA106,234 - Carbon Steel Weld and HAZ														
11.7	A106,A516 Carbon & Low Alloy Steel Pump														
Group 11A:	**High Pressure Core Spray - CST Water**														
11A.1	SA105,106,216,234 - Carbon Steel Base	*								X	*	*			
11A.2	SA105,106,216,234 - Carbon Steel Weld and HAZ	*								X	*	*	X		
11A.3	SA105,106,234 - Carbon Steel Base & Weldolet														
11A.4	SA105,106,216,234 - Carbon Steel Valves	*													
11A.5	SA106,234 - Carbon Steel Base														
11A.6	SA106,234 - Carbon Steel Weld and HAZ														
11A.7	A106,A516 Carbon & Low Alloy Steel Pump	*								X	*	*			
11A.8	Type 304 SS Base Metal														
11A.9	Type 304 SS Weld Metal & HAZ														
Group 13:	**RHR Suction Line Piping to Pumps**														
13.1	All SS Components External Surfaces														
13.2	304 SS - Weld and Base Metal														
13.3	304 SS HAZ														
13.4	304 SS Components														
13.5	Welds SS 308														
13.6	Socket Welds														
13.7	All CS Components External Surfaces														
13.8	Carbon Steel Welds & HAZ														
13.9	SA234 Gr. WPB Components														
Group 14:	**RHR Pump Discharge Piping to HX**														
14.1	All CS Components External Surfaces														
14.2	Various Carbon Steel Components														
14.3	Carbon Steel Weld and HAZ														
14.4	SA234 Gr. WPB Weldolet/Sockolet														
14.5	HX Weld in SS, or CS with 1/8" Clad/overlay														
14.6	CS w/outside clad of SS														
14.7	Carbon Steel HX Components														
14.8	Carbon Steel HX Fittings											*			
14.9	All CS HX Components External Surfaces														

Summary of Elicitation Results -- BWR Engineered Safety Feature (Emergency Core Cooling Systems) - Contd.

Subgroup Description		Degradation Mechanism													
		CREV	DEBOND	EC	FAC	FAT	FAT-HWC	FR	GALV	GC	MIC	PIT	SCC	SCC-HWC	WEAR
Group 15:	**RHR Normal Shutdown Cooling**														
15.1	All CS Components External Surfaces														
15.2	Various Carbon Steel Components														
15.3	Carbon Steel Welds and HAZ														
15.4	Carbon Steel - Base Metal, Welds and HAZ														
15.5	CS SA234 Gr. WPB Weldolet/ Sockolet														
Group 16:	**RHR Cooling Water Spray Piping**														
16.1	All CS Components External Surfaces														
16.2	Various Carbon Steels - Base and Weld														
16.3	Carbon Steel Weld HAZ														
16.4	CS SA234 Gr. WPB Weldolet/ Sockolet														
16.5	Various Carbon Steel Components														
16.6	Various Carbon Steel HAZ & Welds														
16.7	Various Carbon Steel Spray Head (Cont.)														
16.8	Carbon Steel SA234 Gr. WPB														
16.9	Carbon Steel SA234 Gr. WPB Sockolet (Cont.)														
16.10	Carbon Steel - Brass joint (Drywell)														
16.11	Brass Spray Nozzle (Drywell)														
16.12	Various Carbon Steel Spray Head (SP)														
16.13	Carbon Steel SA234 Gr. WPB Sockolet (SP)														
16.14	Carbon Steel - Brass joint (Drywell)														
16.15	Nozzle Drywell														
Group 18:	**Cycled Condensate Storage Tank**														
18.1	6061-T6 & other Al alloys														
18.2	Stainless Steel Tank (OTHER PLANT)	*													

NOTES

*** Susceptibility at interface between colors with one or more scores higher than this interface.**

x **Susceptibility inside color box with one or more scores higher than this color box upper interface.**

Summary of Elicitation Results -- BWR Steam and Power Conversion System

Subgroup Description		Degradation Mechanism													
		CREV	DEBOND	EC	FAC	FAT	FAT-HWC	FR	GALV	GC	MIC	PIT	SCC	SCC-HWC	WEAR
Group 17:	**Main Steam**														
17.1	All CS & LAS Components External Surfaces														
17.2	A106B, A234, A105, A216, A672B70 MS														
17.3	A234, A106, A105 MS Components					*									
17.4	A234, A106, A105 Weldolet														
17.5	A540 B21 (Hatch 2) T-Quencher	X													
17.6	Austenitic SS Bimetallic Joint												*		
17.7	CASS, A351 Type 304, Venturi														
Group 19:	**Feedwater**														
19.1	SA105,A106,SA216,A234,A672 Components														
19.2	Carbon Steel - Base, Weld and HAZ														
19.3	Carbon Steel - Weldolet														
19.4	304 SS Heater Pipes & Flow Elements														
Group 21:	**Main Condenser**														
21.1	Carbon Steel - Base, Weld and HAZ														
21.2	Carbon Steel - Base, Weld and HAZ														
21.3	Stainless Steel, outside of tube														
21.4	Stainless Steel, inside of tube														
21.5	Titanium tubes, inside of tube														
21.6	Titanium tubes, outside of tube			*											
Group 22:	**Main Condenser Discharge Piping**														
22.1	SA105,A106,SA106,A234,A672,SA216				*										
22.2	A234 Carbon Steel - Base, Weld and HAZ				*										
22.3	A105,A216 Carbon Steel - Base, Weld and HAZ				*										
22.4	Pump Carbon Steel - Base, Weld and HAZ														
22.5	Ejector Carbon Steel - Base, Weld and HAZ														
22.6	Stainless Steel Flow Restrictor														
Group 23:	**Condensate Piping to Booster Pump**														
23.1	SA105,A106,SA216,A234,A672 Components														
23.2	SA106,SA216,A234,A672 Sockolet														
23.3	SA105,SA216,A672 Valves														
Group 24:	**Condensate Piping to FW Pump**														
24.1	SA105,A106,SA216,A234,A672 (low T)														
24.2	SA105,A106,SA216,A234,A672 (high T)														
24.3	SA106,SA216,A234,A672 Sockolet														
24.4	SA105,SA216,A672 Valves														
24.5	Pump Carbon Steel - Base, Weld and HAZ														
24.6	304 SS Heater Tubes														

NOTES

***** **Susceptibility at interface between colors with one or more scores higher than this interface.**

x **Susceptibility inside color box with one or more scores higher than this color box upper interface.**

Summary of Elicitation Results -- BWR Reactor Coolant System

Subgroup Description		Degradation Mechanism													
		CREV	DEBOND	EC	FAC	FAT	FAT-HWC	FR	GALV	GC	MIC	PIT	SCC	SCC-HWC	WEAR
Group 1:	**Reactor Vessel Top Head**														
1.1	SA 508 Cl.2 Forging														
1.2	SA-533 Gr.B Rolled Plate						*								
1.3	309 SS Cladding														
1.4	SA 540 CS Studs, Nuts and Washers														
1.5	SA508 Nozzle to SA 533 Plate Welds							*							
1.6	A533B Plate to Plate Welds														
1.7	A508 Nozzle to 304 SS Flange 182 Weld														
1.8	304 SS Flange HAZ												*		
1.9	A508 Cl.1 Nozzle Flanges														
1.10	304 SS Dryer Hold Down Bracket														
1.11	A533 Gr. B LAS Dryer Hold Down Bracket														
1.12	Dryer Hold Down Bracket 182 Weld														
1.13	Lifting Lug Welds														
Group 2:	**Reactor Vessel Shell**														
2.1	SA 508 Cl.2 Forging						*								
2.2	SA-533 Gr.B Rolled Plate						*								
2.3	SA508 Nozzle/Flange to SA 533 Plate Welds						*								
2.4	SA508 Nozzle to SA 533 Plate Welds						*								
2.5	SA 533 to SA 533 Plate Welds						*								
2.6	SA533 to SA 533 Plate Welds (high fluence)						*								
2.7	SA 533Gr. B Plate						*								
2.8	Alloy 600 Feedwater Safeend														
2.9	Alloy 600 Feedwater Thermal Sleeve														
2.10	FW Thermal Sleeve/A508 Nozzle 182 Weld	*													
2.11	SS 316 Safeends and Thermal Sleeves														
2.12	82/182 Weld Between CS and Alloy 600														
2.13	82/182 Weld Pad Bet. A508 and Alloy 600	*													
2.14	CS Safe End Extension														
2.15	309 SS Cladding														
2.16	A 508 MS Nozzle and Safe End			*											
2.17	Alloy 182 Attachment Pads														
2.18	CF8M Brackets and Guide Rods														
2.19	304 SS HAZ Jet Pump Riser Bracket														
2.20	CRD Return Nozzle Cap Weld					*	*	*							
2.21	Stabilizer Lug Welds														
Group 3:	**Reactor Vessel Bottom Head**														
3.1	SA 508 Cl.2 Forging						*							*	
3.2	SA-533 Gr.B Rolled Plate						*							*	
3.3	SA508 Nozzle to SA 533 Plate Welds						*							*	
3.4	Dissimilar Metal Nozzle Weld 182/82														
3.5	Dissimilar Metal J-Weld 182/82														
3.6	316NG or 316L SS HAZ												*	*	
3.7	304 SS HAZ Safe End						*								
3.8	308 Weldments														
3.9	82/182 Weld Pad Bet.Thermal Sleeve and Nozzle	*					*								
3.10	Alloy 600 HAZ CRD Stubtube						*								
3.11	Dissimilar 82/182 Welds						*								
3.12	Alloy 600 HAZ						*								
3.13	182 Weldments of Inconel to Inconel					X									
3.14	SA533B to A508 Forgings Support Skirt							X							
3.15	309 SS Cladding														

Summary of Elicitation Results -- BWR Reactor Coolant System - Contd.

Subgroup Description		Degradation Mechanism													
		CREV	DEBOND	EC	FAC	FAT	FAT-HWC	FR	GALV	GC	MIC	PIT	SCC	SCC-HWC	WEAR
Group 4:	**Core Shroud**														
4.1	308/308L Vertical Weld						*							*	
4.2	Type 304 SS Vertical HAZ						*							X	
4.3	308/308L Circumferential Weld						*							*	
4.4	Type 304 SS Circumferential HAZ						*							X	
4.5	Type 308/308L Weld Metal (low fluence)						*							*	
4.6	Type 304 SS Vertical HAZ (low fluence)						*							X	
4.7	Type 308/308L Weld Metal (moderate fluence)						*							*	
4.8	Type 304 SS HAZ (moderate fluence)													*	
4.9	Alloy 182 Shroud Weld Metal														
4.10	Type 304 SS Shroud HAZ													X	
4.11	Type 304 SS Ring Material												X		
4.12	Type 304 SS Shell Material (low fluence)												X	*	
4.13	Type 304 SS Shell Material - Beltline (moderate fluence)												X		
4.14	Type 304 SS (with 308L welds)													*	
4.15	Type 304 SS Guide Structure (moderate to high fluence)													X	
4.16	Type 304 SS Top Guide Wedge												X		
4.17	Type 304 SS Core Plate Structure												*	*	
4.18	Type 304 SS Core Plate Bolt						*						X		
4.19	Type 304 SS Flow Plug							*					X		
4.20	X750 Flow Plug Spring													*	
Group 5:	**Core Control**														
5.1	Wrought or Cast SS Fuel Support												X		
5.2	304/316 SS Control Rod Blade (4-6 dpa)													X	
5.3	CF3 A351 Control Rod Guide (low to moderate fluence)						*							*	
5.4	Type 304 SS Fuel Bundle Alignment Pin												X	*	
5.5	Type 304 SS CRD Housing Flange												X	*	
5.6	Type 308/L or 309 CRD Weld Metal													*	
5.7	Type 304 SS CRD Housing HAZ													*	
5.8	Alloy 182 RPV Stub Weld Metal														
5.9	Type 304 SS RPV Stub HAZ													X	
5.10	Alloy 600 RPV Stub HAZ														
5.11	Type 304 SS Penetrations												X		
5.12	Type 304 SS In-Core Guide (high fluence)														
5.13	ASTM A36 & A235 CRD Outside Structure														
5.14	Type 304 SS In-Vessel Structures												X	*	
5.15	308/L SS In-Vessel Weld Metal													*	
5.16	182 Weld Metal In-Vessel Structures														
5.17	Type 304 SS In-Vessel HAZ														
Group 6:	**Jet Pump Assembly**														
6.1	304 SS Components (low fluence)												X	*	
6.2	308/L SS Weld Metal (low fluence)						*								
6.3	304SS Component HAZ (low fluence)						*							X	
6.4	XM-19 (Nitronic 50) Bracket Support (low fluence)						*						X		
6.5	X750 (mostly HTH) Holddown Beam (low fluence)														
6.6	Alloy 600 Access Hole Cover (low fluence)												*		
6.7	Alloy 182 Weld Metal (AHC) (low fluence)														
6.8	304 SS Slip Fit														
6.9	308L Riser Brace Weld Metal (low fluence)						*							*	
6.10	304 SS Riser Brace HAZ (low fluence)						*							X	
6.11	SS Adapter HAZ (low fluence)						*							X	
6.12	Alloy 182 Adapter Weld Metal (low fluence)														
6.13	SS HAZ on Adapter and Diffuser (low fluence)						*							X	
6.14	308/L SS Diffuser Weld Metal (low fluence)						*						X	*	

Summary of Elicitation Results -- BWR Reactor Coolant System - Contd.

	Subgroup Description	Degradation Mechanism													
		CREV	DEBOND	EC	FAC	FAT	FAT-HWC	FR	GALV	GC	MIC	PIT	SCC	SCC-HWC	WEAR
Group 7:	**ECCS Connections**														
7.1	Type 308/L SS FW Weld Metal						*							*	
7.2	Type 304 SS FW HAZ						*								
7.3	Type 304 SS FW Sparger												X	*	
7.4	Type 308/L FW Sparger Weld Metal						*							*	
7.5	Type 304 SS FW Sparger HAZ						*								
7.6	Type 304 SS Core Spray Components												X		
7.7	Type 308/L SS Core Spray Weld Metal						*							*	
7.8	Type 304 SS Core Spray HAZ						*							X	
7.9	Type 304 SS LPCI Components														
7.10	Type 308/L LPCI Weld Metal						*							*	
7.11	Type 304 SS LPACI HAZ						*							X	
Group 8:	**Steam Separator and Dryer**														
8.1	304 SS Steam Seaparator and Dryer					*							X		
8.2	Type 308/L Steam Dryer Weld Metal					*							X		
8.3	304SS Steam Dryer HAZ					*									
8.4	ASTM A193, Gr. B8 Steam Dryer												X		
8.5	304 SS Guide Pin												X		
8.6	304 SS RCIC Nozzle												X		
Group 9:	**Reactor Recirculation System**														
9.1	All SS Components External Surfaces														
9.2	LAS, SA-508 Cl.2 (Forged Ring)	*											X		
9.3	LAS, SA-508 Cl.2 HAZ	*											X		
9.4	Dissimilar metal welds LAS to SS 308														
9.5	Safe-end, SS 316NG						*						X	*	
9.6	316 Component HAZ						*								
9.7	Welds SS 308						*							*	
9.8	Straight pipe SS Type 316						*						X	*	
9.9	Component HAZ 304						*							X	
9.10	Straight pipe SS Type 304						*						X	*	
9.11	Elbows SS Type 304						*						X		
9.12	Tee SS Type 304						*						X		
9.13	Socket Welds SS 308 on 304 and 316	*													
9.14	Flange SA 182, GR F316 - Carbon Steel												X	*	
9.15	Cast SS CF-8 and CF-8M														
9.16	Reducing Branch SS 304						*						X	*	
9.17	Cap SS 304, 308/L Weld, and HAZ						*								
9.18	Pump Casing Bolting SA 193 GR B7														

NOTES

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x **Susceptibility inside color box with one or more scores higher than this color box upper interface.**

Summary of Elicitation Results -- BWR Support and Auxiliary Systems

Subgroup Description		Degradation Mechanism													
		CREV	DEBOND	EC	FAC	FAT	FAT-HWC	FR	GALV	GC	MIC	PIT	SCC	SCC-HWC	WEAR
Group 12:	**Reactor Core Isolation Cooling**														
12.1	SA105,106,234 - Carbon Steel														
12.2	SA105,106,234 - Carbon Steel Weld Metal														
12.3	SA105 - Carbon Steel Base & Weld					*									
12.4	SA105,106,216,234 - Carbon Steel														
12.5	SA105,106,216,234 - Carbon Steel Weld														
12.6	SA216 - Carbon Steel														
12.7	SA105,106,216,234 - Carbon Steel														
12.8	SA105,106,216,234 - Carbon Steel Weld														
12.9	SA105,106,234 - Carbon Steel Base & Weld														
12.10	SA216 - Carbon Steel														
12.11	A516 Gr 70 LAS Pump Casing														
12.12	SA105,106,216,234 - Carbon Steel														
12.13	SA105,106,216,234 - Carbon Steel Weld														
12.14	SA105,106,234 - Carbon Steel Base & Weld														
12.15	SA216 - Carbon Steel	*													
12.16	304 SS RCIC Strainer														
Group 20:	**Control Rod Drive**														
20.1	All SS Components External Surfaces														
20.2	SS Type 304 Components														
20.3	308 SS Welds and HAZ														
20.4	Cast SS CF8 Components														
20.5	SS Type 316 Components														
20.6	CS A 515 Unclad Pump Outlet														
20.7	Carbon Steel Welds														
20.8	Cast SS CF8 Valves														
20.9	Welds SS 308														
20.10	SS Type 304 Tee														
20.11	Cast CS Nozzles					*									
20.12	Pump Casing Cast CS														
Group 25:	**RWCU Piping to Pumps**														
25.1	SA105,106,216,234 - Components														
25.2	SA105,106,216,234 - CS Weld & HAZ														
25.3	304 Stainless Steel														
25.4	304 Stainless Steel - Weld Metal														
25.5	304 Stainless Steel - HAZ														
25.6	SA105,106,216,234 - Carbon Steel														
25.7	304 Stainless Steel - Base, Weld & HAZ														
25.8	SA105,106,216,234 - Carbon Steel												X		
25.9	A106,A516 Carbon & Low Alloy Steels														
Group 26:	**RWCU Piping to R/NR HXs**														
26.1	SA105,106,216,234 - Carbon Steel														
26.2	SA105,106,216,234 - Welds and HAZ														
26.3	SA105,106,216,234 - Sockolet												X		
26.4	SA105,106,216,234 - Valves												X		
26.5	SA105,106,216,234 - HX Nozzle												X		
26.6	304 Stainless Steel - HX Nozzle												X		
26.7	304 stainless steel (assume welds annealed)														
26.8	304 Stainless Steel - Reg. HX Tubesheet														
26.9	304 Stainless Steel - Reg. HX Tubes														
26.10	304 Stainless Steel - Reg. HX Baffles														
26.11	SA105,106,216,234 - NR HX Baffles												X		
26.12	304 Stainless Steel - Reg. HX Piping														
26.13	SA105,106,216,234 - NR HX Piping														
26.14	SA105,106,216,234 - Carbon Steel (low T)														
26.15	304 Stainless Steel (low T)														

Summary of Elicitation Results -- BWR Support and Auxiliary Systems - Contd.

Subgroup Description		Degradation Mechanism													
		CREV	DEBOND	EC	FAC	FAT	FAT-HWC	FR	GALV	GC	MIC	PIT	SCC	SCC-HWC	WEAR
Group 27:	**RWCU Piping to/from Filters**														
27.1	304 Stainless Steel and Weld Metal														
27.2	304 Stainless Steel HAZ														
27.3	SA106,216,234 - Carbon Steel Base, Weld, HAZ														
27.4	SA216 - Valves														
27.5	304 SS - Base, Weld and HAZ Sockolet														
27.6	304 SS - Base, Weld and HAZ Nozzle														
27.7	SA106 - Carbon Steel Nozzle														
27.8	Stainless Steel - Base, Weld and HAZ														
Group 28:	**RWCU Piping to Feedwater**														
28.1	SA105 - Carbon Steel Nozzle														
28.2	SA106,216,234 - Carbon Steel Piping														
28.3	SA216 - Carbon Steel Valves														
28.4	SA234 - Carbon Steel Weldolet														

NOTES

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x **Susceptibility inside color box with one or more scores higher than this color box upper interface.**