

**Table 19.1-42—U.S. EPR Risk-Significant Components based on FV Importance – Level 1 Internal Flooding  
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Rank	System US	Component ID	Component Description	FV	RAW
1	ESWS	30PEB20AP001	ESWS, Train 2 Motor Driven Pump PEB20AP001	<b>0.201</b>	4.1
2	ESWS	30PEB30AP001	ESWS, Train 3 Motor Driven Pump PEB30AP001	<b>0.186</b>	8.1
3	SIS/RHR	30JNG10AP001	LHSI, Train 1 Motor Driven Pump JNG10AP001	<b>0.130</b>	11.5
4	CCWS	30KAA12AA005	CCWS, Train 1 to LHSI HTX 10 Cooling MOV KAA12AA005	<b>0.087</b>	12.1
5	RCS	30JEB40AP001-BKR	ELEC, 13.8kV SWGR 34BDE Circuit Breaker to RCP JEB40AP001	<b>0.084</b>	33.2
6	RCS	30JEB30AP001-BKR	ELEC, 13.8kV SWGR 33BDE Circuit Breaker to RCP JEB30AP001	<b>0.084</b>	33.1
7	UHS	30PED10AN002	UHS, Cooling Tower Train 1 Cooling Fan PED10AN002	<b>0.061</b>	12.4
8	CCWS	30KAA32AA005	CCWS, Train 3 to LHSI HTX 30 Cooling MOV KAA32AA005	<b>0.051</b>	5.5
9	SCWS	30QKA40GH001	SCWS, Train 4 Chiller Unit QKA40GH001	<b>0.045</b>	2.8
10	SIS/RHR	30JNG20AP001	LHSI, Train 2 Motor Driven Pump JNG20AP001	<b>0.044</b>	3.5
11	SIS/RHR	30JNG30AA006	LHSI, LHSI CL3 Discharge Manual CHECK Valve JNG30AA006	<b>0.040</b>	5.9
12	RCS	30JEB10AA010	RCP, RCP1 Leakoff Isolation MOV JEB10AA010	<b>0.039</b>	12.3
13	RCS	30JEB10AA020	RCP Seal, RCP1 Seal Nitrogen Venting Isolation MOV JEB10AA020	<b>0.039</b>	12.3
14	RCS	30JEB40AA010	RCP, RCP4 Leakoff Isolation MOV JEB40AA010	<b>0.039</b>	12.3
15	RCS	30JEB30AA020	RCP Seal, RCP3 Seal Nitrogen Venting Isolation MOV JEB30AA020	<b>0.039</b>	12.3
16	RCS	30JEB30AA010	RCP, RCP3 Leakoff Isolation MOV JEB30AA010	<b>0.039</b>	12.3
17	RCS	30JEB20AA020	RCP Seal, RCP2 Seal Nitrogen Venting Isolation MOV JEB20AA020	<b>0.039</b>	12.3
18	RCS	30JEB20AA010	RCP, RCP2 Leakoff Isolation MOV JEB20AA010	<b>0.039</b>	12.3

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Rank	System US	Component ID	Component Description	FV	RAW
19	RCS	30JEB40AA020	RCP Seal, RCP4 Seal Nitrogen Venting Isolation MOV JEB40AA020	<b>0.039</b>	12.3
20	ESWS	30PEB30AA005	ESWS, Train 3 Pump Discharge Isolation MOV PEB30AA005	<b>0.038</b>	7.9
21	UHS	30PED30AA010	UHS, Cooling Tower Train 3 Spray MOV PED30AA010	<b>0.038</b>	7.9
22	CCWS	30KAA22AA005	CCWS, Train 2 to LHSI HTX 20 Cooling MOV KAA22AA005	<b>0.038</b>	3.8
23	SIS/RHR	30JNA10AA101	RHR, LHSI Train 1 HTX Bypass MOV JNA10AA101	<b>0.036</b>	11.5
24	ELEC	30XKA10	ELEC, Emergency Diesel Generator XKA10	<b>0.035</b>	1.4
25	ELEC	30XKA20	ELEC, Emergency Diesel Generator XKA20	<b>0.028</b>	1.4
26	ELEC	30XKA30	ELEC, Emergency Diesel Generator XKA30	<b>0.027</b>	1.4
27	SIS/RHR	30JNG10AA006	LHSI, LHSI CL1 Discharge Manual CHECK Valve JNG10AA006	<b>0.027</b>	4.2
28	UHS	30PED30AN001	UHS, Cooling Tower Train 3 Cooling Fan PED30AN001	<b>0.025</b>	5.7
29	UHS	30PED30AN002	UHS, Cooling Tower Train 3 Cooling Fan PED30AN002	<b>0.025</b>	5.7
30	CCWS	30KAA32AA013	CCWS, Train 3 LHSI Pump Seal Cooler MOV KAA32AA013	<b>0.024</b>	5.5
31	CCWS	30KAA30AP001	CCWS, Train 3 Motor Driven Pump KAA30AP001	<b>0.023</b>	7.4
32	SIS/RHR	30JNG30AP001	LHSI, Train 3 Motor Driven Pump JNG30AP001	<b>0.017</b>	5.2
33	EFWS	30LAS11AP001	EFWS, Train 1 Motor Driven Pump LAS11AP001	<b>0.017</b>	1.3
34	CCWS	30KAA42AA005	CCWS, Train 4 to LHSI HTX 40 Cooling MOV KAA42AA005	<b>0.017</b>	1.0
35	ESWS	30PEB20AA005	ESWS, Train 2 Pump Discharge Isolation MOV PEB20AA005	<b>0.016</b>	4.0
36	UHS	30PED20AA010	UHS, Cooling Tower Train 2 Spray MOV PED20AA010	<b>0.016</b>	4.0

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<b>Rank</b>	<b>System US</b>	<b>Component ID</b>	<b>Component Description</b>	<b>FV</b>	<b>RAW</b>
37	UHS	30PED20AN001	UHS, Cooling Tower Train 2 Cooling Fan PED20AN001	<b>0.015</b>	3.9
38	UHS	30PED20AN002	UHS, Cooling Tower Train 2 Cooling Fan PED20AN002	<b>0.015</b>	3.9
39	CCWS	30KAA22AA013	CCWS, Train 2 LHSI Pump Seal Cooler MOV KAA22AA013	<b>0.015</b>	3.8
40	SIS/RHR	30JNA30AA101	RHR, LHSI Train 3 HTX Bypass MOV JNA30AA101	<b>0.014</b>	5.2
41	EFWS	30LAS21AP001	EFWS, Train 2 Motor Driven Pump LAS21AP001	<b>0.014</b>	1.2
42	SIS/RHR	30JNG33AA005	LHSI, MHSI/LHSI Train 3 First SIS Isolation Check Valve JNG33AA005	<b>0.014</b>	4.5
43	EFWS	30LAS31AP001	EFWS, Train 3 Motor Driven Pump LAS31AP001	<b>0.014</b>	1.2
44	EFWS	30LAS41AP001	EFWS, Train 4 Motor Driven Pump LAS41AP001	<b>0.013</b>	1.1
45	FWDS	30SGB30AA001A	FWDS, Ring Header Train 1 Isolation MOV SGB30AA001A	<b>0.013</b>	4.7
46	FWDS	30SGB30AA009	FWDS, Ring Header Train 4 Isolation MOV SGB30AA009	<b>0.013</b>	4.7
47	FWDS	30SGB30AA009A	FWDS, Ring Header Train 4 Isolation MOV SGB30AA009A	<b>0.013</b>	4.7
48	FWDS	30SGB30AA001	FWDS, Ring Header Train 1 Isolation MOV SGB30AA001	<b>0.013</b>	4.7
49	SIS/RHR	30JNG13AA005	LHSI, MHSI/LHSI Train 1 First SIS Isolation Check Valve JNG13AA005	<b>0.012</b>	2.4
50	SIS/RHR	30JNG20AA006	LHSI, LHSI CL2 Discharge Manual CHECK Valve JNG20AA006	<b>0.012</b>	2.4
51	SIS/RHR	30JNG23AA005	LHSI, MHSI/LHSI Train 2 First SIS Isolation Check Valve JNG23AA005	<b>0.011</b>	1.6
52	ELEC	30XKA40	ELEC, Emergency Diesel Generator XKA40	<b>0.011</b>	1.0
53	CCWS	30KAA20AP001	CCWS, Train 2 Motor Driven Pump KAA20AP001	<b>0.010</b>	3.5
54	SCWS	30QKA40AA101	SCWS, Train 4 Chiller By-pass MOV QKA40AA101	<b>0.010</b>	2.8

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<b>Rank</b>	<b>System US</b>	<b>Component ID</b>	<b>Component Description</b>	<b>FV</b>	<b>RAW</b>
55	ELEC	30XKA50	ELEC, SBO Diesel Generator XKA50	<b>0.010</b>	1.1
56	RCS	30JEB30 SSSF	Stand Still Seal for RCP3	<b>0.010</b>	10.9
57	RCS	30JEB10 SSSF	Stand Still Seal for RCP1	<b>0.010</b>	10.9
58	RCS	30JEB40 SSSF	Stand Still Seal for RCP4	<b>0.010</b>	10.9
59	RCS	30JEB20 SSSF	Stand Still Seal for RCP2	<b>0.010</b>	10.9
60	SIS/RHR	30JNA20AA101	RHR, LHSI Train 2 HTX Bypass MOV JNA20AA101	<b>0.008</b>	3.5
61	RCS	30JEB10AP001-BKR	ELEC, 13.8kV SWGR 31BDE Circuit Breaker to RCP JEB10AP001	<b>0.008</b>	4.0
62	RCS	30JEB20AP001-BKR	ELEC, 13.8kV SWGR 32BDE Circuit Breaker to RCP JEB20AP001	<b>0.008</b>	4.0
63	UHS	30PED10AN001	UHS, Cooling Tower Train 1 Cooling Fan PED10AN001	<b>0.008</b>	10.1
64	SSS	30LAJ10AP001	SSS, SSS Motor Driven Pump LAJ10AP001	<b>0.007</b>	1.1
65	ELEC	33BUC	ELEC, 1E 250V DC Switchboard 33BUC	<b>0.007</b>	286.4
66	IRWST	30JNK10AT001	IRWST, SIS Sump Strainer to MHSI/LHSI Train 1 Pumps JNK10AT001	<b>0.006</b>	6.2
67	FWDS	30SGB30AA021	FWDS, MOV SGB30AA021	<b>0.006</b>	2.6
68	FWDS	30SGB30AA022	FWDS, MOV SGB30AA022	<b>0.006</b>	2.6
69	IRWST	30JNK11AT002	IRWST, SIS Sump Strainer to MHSI/LHSI Train 3 Pumps JNK11AT002	<b>0.006</b>	2.1
70	ELEC	30XKA80	ELEC, SBO Diesel Generator XKA80	<b>0.006</b>	1.1
71	ELEC	31BRU03	ELEC, Inverter 31BRU03	<b>0.005</b>	13.8
72	ELEC	32BRU03	ELEC, Inverter 32BRU03	<b>0.005</b>	13.8
73	IRWST	30JNK10AT002	IRWST, SIS Sump Strainer to MHSI/LHSI Train 2 Pumps JNK10AT002	<b>0.005</b>	1.5

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Rank	System US	Component ID	Component Description	RAW	FV
1	ELEC	33BUC	ELEC, 1E 250V DC Switchboard 33BUC	<b>286.4</b>	0.007
2	ELEC	31BUC	ELEC, 1E 250V DC Switchboard 31BUC	<b>70.5</b>	0.002
3	CCWS	30KAB30AA192	CCWS, RCP Thermal Barrier to CCWS CH2 Return Safety Valve KAB30AA192	<b>48.2</b>	0.003
4	CCWS	30KAB30AA191	CCWS, RCP Thermal Barrier to CCWS CH1 Return Safety Valve KAB30AA191	<b>47.7</b>	0.003
5	RCS	30JEB40AP001- BKR	ELEC, 13.8kV SWGR 34BDE Circuit Breaker to RCP JEB40AP001	<b>33.2</b>	0.084
6	RCS	30JEB30AP001- BKR	ELEC, 13.8kV SWGR 33BDE Circuit Breaker to RCP JEB30AP001	<b>33.1</b>	0.084
7	ELEC	31BDA	ELEC, 6.9kV Switchgear 31BDA	<b>32.2</b>	0.001
8	CLCWS	30PGB19AA191	CLCWS, Safety Valve PGB19AA191	<b>29.2</b>	0.002
9	FWS	30LAD71AC001	FWS, HP Heater LAD71AC001	<b>29.0</b>	0.001
10	MSS	30LCS72AC001	FW HP, Reheat 2 Condensate Cooler 2 LCS72AC001	<b>29.0</b>	0.001
11	FWS	30LAD72AC001	FWS, HP Heater LAD72AC001	<b>29.0</b>	0.001
12	FWS	30LAD62AC001	FWS, HP Heater LAD62AC001	<b>29.0</b>	0.001
13	FWS	30LAD61AC001	FWS, HP Heater LAD61AC001	<b>29.0</b>	0.001
14	MSS	30LCS71AC001	FW HP, Reheat 2 Condensate Cooler 1 LCS71AC001	<b>29.0</b>	0.001
15	FWS	30LAA10BB001	FWS, Feedwater Storage Tank LAA10BB001	<b>28.9</b>	0.000
16	MFWS	30LAB32AA001	FWS, HP Heater Train 2 Bypass MOV LAB32AA001	<b>28.7</b>	0.000
17	CLCWS	30PGB15AA001	CLCWS, HTX Bypass MOV PGB15AA001	<b>28.7</b>	0.000
18	MFWS	30LAB32AA002	FWS, HP Heater Train 2 Bypass MOV LAB32AA002	<b>28.7</b>	0.000
19	CLCWS	30PGD16AC001	CLCWS, Train 1 HTX PGD16AC001	<b>28.7</b>	0.000
20	CLCWS	30PGD17AC001	CLCWS, Train 2 HTX PGD17AC001	<b>28.7</b>	0.000
21	CLCWS	30PGD18AC001	CLCWS, Train 3 HTX PGD18AC001	<b>28.7</b>	0.000
22	MFWS	30LAB31AA002	FWS, HP Heater Train 1 Bypass MOV LAB31AA002	<b>28.7</b>	0.000

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Rank	System US	Component ID	Component Description	RAW	FV
23	MFWS	30LAB31AA001	FWS, HP Heater Train 1 Bypass MOV LAB31AA001	28.7	0.000
24	ELEC	31BMB	ELEC, 480V Load Center 31BMB	26.3	0.001
25	ELEC	31BDB	ELEC, 6.9kV SWGR 31BDB	26.3	0.001
26	ELEC	31BDC	ELEC, 6.9kV SWGR 31BDC	26.3	0.001
27	ELEC	31BMT02	ELEC, 6.9kV-480V Transformer 31BMT02	26.3	0.001
28	ELEC	34BUC	ELEC, 1E 250V DC Switchboard 34BUC	26.2	0.001
29	CCWS	30KAB60AA191	CCWS, CVCS HP Cooler 1 Return Safety Valve KAB60AA191	25.2	0.002
30	CCWS	30KAB10AA193	CCWS, FPCS Train 1 Cooling Header Safety Valve KAB10AA193	25.2	0.002
31	CCWS	30KAB10AA192	CCWS, CCWS CH1 Return Safety Valve KAB10AA192	25.2	0.002
32	CCWS	30KAB30AA050	CCWS, CCWS CH1 to RCP Thermal Barrier Common Supply MOV KAB30AA050	21.9	0.002
33	CCWS	30KAB30AA049	CCWS, CCWS CH1 to RCP Thermal Barrier Common Supply MOV KAB30AA049	21.9	0.002
34	CCWS	30KAB30AA052	CCWS, RCP Thermal Barrier to CCWS CH1 Common Return MOV KAB30AA052	21.9	0.002
35	CCWS	30KAB30AA053	CCWS, CCWS CH2 to RCP Thermal Barrier Common Supply MOV KAB30AA053	21.9	0.000
36	CCWS	30KAB30AA051	CCWS, RCP Thermal Barrier to CCWS CH1 Common Return MOV KAB30AA051	21.9	0.002
37	CCWS	30KAB30AA055	CCWS, RCP Thermal Barrier to CCWS CH2 Common Return MOV KAB30AA055	21.9	0.000
38	CCWS	30KAB30AA056	CCWS, RCP Thermal Barrier to CCWS CH2 Common Return MOV KAB30AA056	21.9	0.000

**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
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Rank	System US	Component ID	Component Description	RAW	FV
39	CCWS	30KAB30AA054	CCWS, CCWS CH2 to RCP Thermal Barrier Common Supply MOV KAB30AA054	21.9	0.000
40	ELEC	1BMT021BMB	ELEC, Transformer 31BMT02 to 480V Load Center 31BMB Circuit Breaker	19.5	0.000
41	ELEC	1BDC_1BDB2	ELEC, 6.9kV SWGR 31BDC to 6.9kV SWGR 31BDB Circuit Breaker	19.5	0.000
42	ELEC	1BDA_1BDC1	ELEC, 6.9kV SWGR 31BDA to 6.9kV SWGR 31BDC Circuit Breaker	19.5	0.000
43	ELEC	1BDA_1BDC2	ELEC, 6.9kV SWGR 31BDA to 6.9kV SWGR 31BDC Circuit Breaker	19.5	0.000
44	ELEC	1BDB1BMT02	ELEC, 6.9kV SWGR 31BDB to Transformer 31BMT02 Circuit Breaker	19.5	0.000
45	ELEC	1BDC_1BDB1	ELEC, 6.9kV SWGR 31BDC to 6.9kV SWGR 31BDB Circuit Breaker	19.5	0.000
46	ELEC	32BDA	ELEC, 6.9kV SWGR 32BDA	15.9	0.000
47	ELEC	32BUC	ELEC, 1E 250V DC Switchboard 32BUC	15.9	0.000
48	ELEC	32BDB	ELEC, 6.9kV SWGR 32BDB	15.0	0.000
49	ELEC	32BMB	ELEC, 480V Load Center 32BMB	15.0	0.000
50	ELEC	32BMT02	ELEC, 6.9kV-480V Transformer 32BMT02	15.0	0.000
51	ELEC	2BDB2BMT02	ELEC, 6.9kV SWGR 32BDB to Transformer 32BMT02 Circuit Breaker	14.0	0.000
52	ELEC	2BDA_2BDB2	ELEC, 6.9kV SWGR 32BDA to 6.9kV SWGR 32BDB Circuit Breaker	14.0	0.000
53	ELEC	2BDA_2BDB1	ELEC, 6.9kV SWGR 32BDA to 6.9kV SWGR 32BDB Circuit Breaker	14.0	0.000
54	ELEC	2BMT022BMB	ELEC, Transformer 32BMT02 to 480V Load Center 32BMB Circuit Breaker	14.0	0.000
55	ELEC	31BRU03	ELEC, Inverter 31BRU03	13.8	0.005
56	ELEC	32BRU03	ELEC, Inverter 32BRU03	13.8	0.005
57	UHS	30PED10AN002	UHS, Cooling Tower Train 1 Cooling Fan PED10AN002	12.4	0.061
58	RCS	30JEB10AA010	RCP, RCP1 Leakoff Isolation MOV JEB10AA010	12.3	0.039

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Rank	System US	Component ID	Component Description	RAW	FV
59	RCS	30JEB40AA020	RCP Seal, RCP4 Seal Nitrogen Venting Isolation MOV JEB40AA020	12.3	0.039
60	RCS	30JEB10AA020	RCP Seal, RCP1 Seal Nitrogen Venting Isolation MOV JEB10AA020	12.3	0.039
61	RCS	30JEB20AA010	RCP, RCP2 Leakoff Isolation MOV JEB20AA010	12.3	0.039
62	RCS	30JEB30AA020	RCP Seal, RCP3 Seal Nitrogen Venting Isolation MOV JEB30AA020	12.3	0.039
63	RCS	30JEB20AA020	RCP Seal, RCP2 Seal Nitrogen Venting Isolation MOV JEB20AA020	12.3	0.039
64	RCS	30JEB30AA010	RCP, RCP3 Leakoff Isolation MOV JEB30AA010	12.3	0.039
65	RCS	30JEB40AA010	RCP, RCP4 Leakoff Isolation MOV JEB40AA010	12.3	0.039
66	CCWS	30KAA12AA005	CCWS, Train 1 to LHSI HTX 10 Cooling MOV KAA12AA005	12.1	0.087
67	RCS	30JEB20AA191	RCP, RCP2 Thermal Barrier Return Safety Valve JEB20AA191	11.7	0.001
68	RCS	30JEB40AA191	RCP, RCP4 Thermal Barrier Return Safety Valve JEB40AA191	11.7	0.001
69	RCS	30JEB30AA191	RCP, RCP3 Thermal Barrier Return Safety Valve JEB30AA191	11.7	0.001
70	RCS	30JEB10AA191	RCP, RCP1 Thermal Barrier Return Safety Valve JEB10AA191	11.7	0.001
71	RCS	30JEB40AA003	RCP, RCP4 Thermal Barrier SOV JEB40AA003	11.5	0.000
72	RCS	30JEB20AA003	RCP, RCP2 Thermal Barrier Return SOV JEB20AA003	11.5	0.000
73	RCS	30JEB10AA003	RCP, RCP1 Thermal Barrier Return SOV JEB10AA003	11.5	0.000
74	RCS	30JEB30AA003	RCP, RCP3 Thermal Barrier SOV JEB30AA003	11.5	0.000
75	SIS/RHR	30JNA10AA101	RHR, LHSI Train 1 HTX Bypass MOV JNA10AA101	11.5	0.036
76	SIS/RHR	30JNG10AP001	LHSI, Train 1 Motor Driven Pump JNG10AP001	11.5	0.130



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Rank	System US	Component ID	Component Description	RAW	FV
77	RCS	30JEB30AA001	RCP, RCP3 Thermal Barrier Supply Check Valve JEB30AA001	11.3	0.000
78	RCS	30JEB30AA021	RCP, RCP3 Thermal Barrier Supply MOV JEB30AA021	11.3	0.000
79	RCS	30JEB40AA001	RCP, RCP4 Thermal Barrier Supply Check Valve JEB40AA001	11.3	0.000
80	RCS	30JEB20AA001	RCP, RCP2 Thermal Barrier Supply Check Valve JEB20AA001	11.3	0.000
81	RCS	30JEB20AA021	RCP, RCP2 Thermal Barrier Supply MOV JEB20AA021	11.3	0.000
82	RCS	30JEB10AA021	RCP, RCP1 Thermal Barrier Supply MOV JEB10AA021	11.3	0.000
83	RCS	30JEB40AA021	RCP, RCP4 Thermal Barrier Supply MOV JEB40AA021	11.3	0.000
84	RCS	30JEB10AA001	RCP, RCP1 Thermal Barrier Supply Check Valve JEB10AA001	11.3	0.000
85	RCS	30JEB40 SSSF	Stand Still Seal for RCP4	10.9	0.010
86	RCS	30JEB30 SSSF	Stand Still Seal for RCP3	10.9	0.010
87	RCS	30JEB10 SSSF	Stand Still Seal for RCP1	10.9	0.010
88	RCS	30JEB20 SSSF	Stand Still Seal for RCP2	10.9	0.010
89	ELEC	31BRB	ELEC, 480V MCC 31BRB	10.7	0.001
90	ELEC	34BRB	ELEC, 480V MCC 34BRB	10.7	0.001
91	UHS	30PED10AN001	UHS, Cooling Tower Train 1 Cooling Fan PED10AN001	10.1	0.008
92	RCS	30JEB10AA018	RCP Seal, RCP1 Nitrogen Supply Solenoid Valve JEB10AA018	9.6	0.004
93	RCS	30JEB20AA018	RCP Seal, RCP2 Nitrogen Supply Solenoid Valve JEB20AA018	9.6	0.004
94	RCS	30JEB30AA018	RCP Seal, RCP3 Nitrogen Supply Solenoid Valve JEB30AA018	9.6	0.004
95	RCS	30JEB40AA018	RCP Seal, RCP4 Nitrogen Supply Solenoid Valve JEB40AA018	9.6	0.004
96	MFWS	30LAB14AA002	FWS, Pump 14 Discharge Pneumatic CHECK Valve LAB14AA002	9.6	0.000
97	ESWS	30PEB10AP001	ESWS, Train 1 Motor Driven Pump PEB10AP001	8.3	0.003

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Rank	System US	Component ID	Component Description	RAW	FV
98	CCWS	30KAA10AP001	CCWS, Train 1 Motor Driven Pump KAA10AP001	8.2	0.001
99	ELEC	34BHD02	ELEC, 480V MCC 34BHD02	8.1	0.001
100	ESWS	30PEB30AP001	ESWS, Train 3 Motor Driven Pump PEB30AP001	8.1	0.186
101	ELEC	31BHD02	ELEC, 480V MCC 31BHD02	8.1	0.001
102	ELEC	34BBA	ELEC, 13.8kV SWGR 34BBA	8.0	0.000
103	UHS	30PED30AA010	UHS, Cooling Tower Train 3 Spray MOV PED30AA010	7.9	0.038
104	ESWS	30PEB30AA005	ESWS, Train 3 Pump Discharge Isolation MOV PEB30AA005	7.9	0.038
105	ELEC	34BBC	ELEC, 13.8kV SWGR 34BBC	7.9	0.000
106	ELEC	31BBA	ELEC, 13.8kV SWGR 31BBA	7.9	0.000
107	ELEC	34BFD	ELEC, 480V Load Center 34BFD	7.9	0.000
108	ELEC	34BFT04	ELEC, 13.8kV-480V Transformer 34BFT04	7.9	0.000
109	ELEC	31BFT04	ELEC, 13.8kV-480V Transformer 31BFT04	7.9	0.000
110	ELEC	31BBC	ELEC, 13.8kV SWGR 31BBC	7.9	0.000
111	ELEC	31BFD	ELEC, 480V Load Center 31BFD	7.9	0.000
112	ELEC	31BNB02	ELEC, 480V MCC 31BNB02	7.8	0.001
113	SCWS	30QKC10AA026	SCWS, LHSI Pump 10 Motor Cooling Manual Valve QKC10AA026	7.8	0.001
114	SCWS	30QKC10AA027	SCWS, LHSI Pump 10 Sealing Fluid Cooling Manual Valve QKC10AA027	7.8	0.001
115	CCWS	30KAA12AA011	CCWS, Train 1 from LHSI HTX 10 Cooling Manual Valve KAA12AA011	7.8	0.001
116	ELEC	1BBC1BFT04	ELEC, 13.8kV SWGR 31BBC to Transformer 31BFT04 Circuit Breaker	7.8	0.000
117	ELEC	1BBA_1BBC2	ELEC, 13.8kV SWGR 31BBA Circuit Breaker 2 to 13.8kV SWGR 31BBC	7.8	0.000
118	ELEC	4BBA_4BBC1	ELEC, 13.8kV SWGR 34BBA Circuit Breaker 1 to 13.8kV SWGR 34BBC	7.8	0.000
119	ELEC	4BBA_4BBC2	ELEC, 13.8kV SWGR 34BBA Circuit Breaker 2 to 13.8kV SWGR 34BBC	7.8	0.000

**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
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Rank	System US	Component ID	Component Description	RAW	FV
120	ELEC	4BFD4BHD02	ELEC, 480V Load Center 34BFD to 480V MCC 34BHD02 Circuit Breaker	7.8	0.000
121	ELEC	4BBC4BFT04	ELEC, 13.8kV SWGR 34BBC to Transformer 34BFT04 Circuit Breaker	7.8	0.000
122	ELEC	4BFT044BFD	ELEC, Transformer 34BFT04 to 480V Load Center 34BFD Circuit Breaker	7.8	0.000
123	ELEC	1BFD1BHD02	ELEC, 480V Load Center 31BFD to 480V MCC 31BHD02 Circuit Breaker	7.8	0.000
124	ELEC	1BFT041BFD	ELEC, Transformer 31BFT04 to 480V Load Center 31BFD Circuit Breaker	7.8	0.000
125	ELEC	1BBA_1BBC1	ELEC, 13.8kV SWGR 31BBA Circuit Breaker 1 to 13.8kV SWGR 31BBC	7.8	0.000
126	CCWS	30KAA30AP001	CCWS, Train 3 Motor Driven Pump KAA30AP001	7.4	0.023
127	ELEC	31BNT01	ELEC, Constant Voltage Transformer 31BNT01	7.2	0.000
128	CLCWS	30PGB13AA002	CLCWS, Pump 13 Discharge Check Valve PGB13AA002	6.8	0.000
129	ELEC	33BRB	ELEC, 480V MCC 33BRB	6.7	0.001
130	ELEC	32BRB	ELEC, 480V MCC 32BRB	6.7	0.001
131	ELEC	31BUD	ELEC, Non 1E 250V DC Switchboard 31BUD	6.6	0.000
132	ELEC	32BUD	ELEC, Non 1E 250V DC Switchboard 32BUD	6.5	0.000
133	ELEC	31BRU0301	ELEC, Inverter 31BRU03 Static Switch 31BRU0301	6.4	0.000
134	ELEC	31BRC	ELEC, 480V MCC 31BRC	6.4	0.000
135	ELEC	32BRC	ELEC, 480V MCC 32BRC	6.4	0.000
136	ELEC	32BRU0301	ELEC, Inverter 32BRU03 Static Switch 32BRU0301	6.4	0.000
137	IRWST	30JNK10AT001	IRWST, SIS Sump Strainer to MHSI/LHSI Train 1 Pumps JNK10AT001	6.2	0.006
138	SIS/RHR	30JNG30AA006	LHSI, LHSI CL3 Discharge Manual CHECK Valve JNG30AA006	5.9	0.040
139	UHS	30PED30AN001	UHS, Cooling Tower Train 3 Cooling Fan PED30AN001	5.7	0.025

**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
**Sheet 8 of 15**

Rank	System US	Component ID	Component Description	RAW	FV
140	UHS	30PED30AN002	UHS, Cooling Tower Train 3 Cooling Fan PED30AN002	5.7	0.025
141	CCWS	30KAA32AA005	CCWS, Train 3 to LHSI HTX 30 Cooling MOV KAA32AA005	5.5	0.051
142	CCWS	30KAA32AA013	CCWS, Train 3 LHSI Pump Seal Cooler MOV KAA32AA013	5.5	0.024
143	SIS/RHR	30JNA30AA101	RHR, LHSI Train 3 HTX Bypass MOV JNA30AA101	5.2	0.014
144	SIS/RHR	30JNG30AP001	LHSI, Train 3 Motor Driven Pump JNG30AP001	5.2	0.017
145	CCWS	30KAA30AA140	CCWS, Pump 30 Cooling Manual Valve KAA30AA140	4.9	0.001
146	CCWS	30KAA30AA018	CCWS, Pump 30 Discharge Manual Valve KAA30AA018	4.9	0.001
147	CCWS	30KAA30AA015	CCWS, Pump 30 Suction Manual Valve KAA30AA015	4.9	0.001
148	CCWS	30KAA30AA011	CCWS, Pump 30 Suction from CCST Manual Valve KAA30AA011	4.9	0.001
149	ESWS	30PEB30AA029	ESWS, Train 2 Manual Valve PEB30AA029	4.9	0.001
150	ESWS	30PEB30AA027	ESWS, Train 2 Manual Valve PEB30AA027	4.9	0.001
151	ESWS	30PEB30AA007	ESWS, Train 3 Manual Valve PEB30AA007	4.9	0.001
152	CCWS	30KAA30AA008	CCWS, Pump 30 Cooling Manual Valve KAA30AA008	4.9	0.001
153	CCWS	30KAA30AA007	CCWS, Pump 30 Cooling Manual Valve KAA30AA007	4.9	0.001
154	CCWS	30KAA30AA005	CCWS, Discharge from CCW HTX 30 Manual Valve KAA30AA005	4.9	0.001
155	ESWS	30PEB30AA009	ESWS, Train 3 Manual Valve PEB30AA009	4.9	0.001
156	RCS	30JEB20AA019	RCP Seal, RCP2 Nitrogen Supply Check Valve JEB20AA019	4.7	0.000
157	RCS	30JEB30AA019	RCP Seal, RCP3 Nitrogen Supply Check Valve JEB30AA019	4.7	0.000

**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
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Rank	System US	Component ID	Component Description	RAW	FV
158	RCS	30JEB40AA019	RCP Seal, RCP4 Nitrogen Supply Check Valve JEB40AA019	4.7	0.000
159	RCS	30JEB10AA019	RCP Seal, RCP1 Nitrogen Supply Check Valve JEB10AA019	4.7	0.000
160	FWDS	30SGB30AA001A	FWDS, Ring Header Train 1 Isolation MOV SGB30AA001A	4.7	0.013
161	FWDS	30SGB30AA009	FWDS, Ring Header Train 4 Isolation MOV SGB30AA009	4.7	0.013
162	FWDS	30SGB30AA009A	FWDS, Ring Header Train 4 Isolation MOV SGB30AA009A	4.7	0.013
163	FWDS	30SGB30AA001	FWDS, Ring Header Train 1 Isolation MOV SGB30AA001	4.7	0.013
164	SIS/RHR	30JNG33AA005	LHSI, MHSI/LHSI Train 3 First SIS Isolation Check Valve JNG33AA005	4.5	0.014
165	CCWS	30KAA12AA012	CCWS, Train 1 from LHSI HTX 10 Discharge Check Valve KAA12AA012	4.4	0.001
166	SCWS	30QKC10AA028	SCWS, Train 1 Discharge of LHSI Pump Seal Cooler Check Valve QKC10AA028	4.4	0.000
167	SIS/RHR	30JNG10AA011	LHSI, LHSI Pump 10 Discharge Check Valve JNG10AA011	4.4	0.001
168	SIS/RHR	30JNG10AA004	LHSI, Train 1 Min Flow MOCV JNG10AA004	4.4	0.000
169	SIS/RHR	30JNG10AA009	LHSI, LHSI Pump 10 Discharge Check Valve JNG10AA009 (CIV)	4.4	0.001
170	SIS/RHR	30JNG10AA006	LHSI, LHSI CL1 Discharge Manual CHECK Valve JNG10AA006	4.2	0.027
171	ESWS	30PEB20AP001	ESWS, Train 2 Motor Driven Pump PEB20AP001	4.1	0.201
172	HVAC	30SAC01AN001	SAC, Normal Air Supply Fan SAC01AN001	4.1	0.001
173	HVAC	30SAC31AN001	SAC, Normal Air Exhaust Fan SAC31AN001	4.1	0.001
174	ESWS	30PEB20AA005	ESWS, Train 2 Pump Discharge Isolation MOV PEB20AA005	4.0	0.016
175	UHS	30PED20AA010	UHS, Cooling Tower Train 2 Spray MOV PED20AA010	4.0	0.016

**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
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Rank	System US	Component ID	Component Description	RAW	FV
176	ELEC	1BNT011BNB02	ELEC, Transformer 31BNT01 to 480V MCC 31BNB02 Circuit Breaker	4.0	0.000
177	ELEC	1BMB1BNT01	ELEC, 480V Load Center 31BMB to Transformer 31BNT01 Circuit Breaker	4.0	0.000
178	RCS	30JEB20AP001-BKR	ELEC, 13.8kV SWGR 32BDE Circuit Breaker to RCP JEB20AP001	4.0	0.008
179	RCS	30JEB10AP001-BKR	ELEC, 13.8kV SWGR 31BDE Circuit Breaker to RCP JEB10AP001	4.0	0.008
180	UHS	30PED20AN002	UHS, Cooling Tower Train 2 Cooling Fan PED20AN002	3.9	0.015
181	UHS	30PED20AN001	UHS, Cooling Tower Train 2 Cooling Fan PED20AN001	3.9	0.015
182	ELEC	33BRW50BUW51	ELEC, 24V DC I&C Power Rack 33BRW50/33BUW51	3.9	0.000
183	ELEC	33BNB02	ELEC, 480V MCC 33BNB02	3.8	0.000
184	CCWS	30KAA22AA005	CCWS, Train 2 to LHSI HTX 20 Cooling MOV KAA22AA005	3.8	0.038
185	CCWS	30KAA22AA013	CCWS, Train 2 LHSI Pump Seal Cooler MOV KAA22AA013	3.8	0.015
186	SSS	30LAH10AA003	SSS, SSS Pump Discharge Pneumatic CHECK Valve LAH10AA003	3.6	0.000
187	CCWS	30KAA20AP001	CCWS, Train 2 Motor Driven Pump KAA20AP001	3.5	0.010
188	SIS/RHR	30JNG20AP001	LHSI, Train 2 Motor Driven Pump JNG20AP001	3.5	0.044
189	SIS/RHR	30JNA20AA101	RHR, LHSI Train 2 HTX Bypass MOV JNA20AA101	3.5	0.008
190	ELEC	2BRC_4BRB1	ELEC, 480V MCC 32BRC to 480V MCC 34BRB Circuit Breaker	3.3	0.000
191	ELEC	1BUD1BRU03	ELEC, 250V DC Pnl 31BUD to Inverter 31BRU03 Circuit Breaker	3.3	0.000
192	ELEC	1BRU031BRC	ELEC, Inverter 31BRU03 to 480V MCC 31BRC Circuit Breaker	3.3	0.000
193	ELEC	1BRC_1BRB1	ELEC, 480V MCC 31BRC to 480V MCC 31BRB Circuit Breaker	3.3	0.000

**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
**Sheet 11 of 15**

Rank	System US	Component ID	Component Description	RAW	FV
194	ELEC	2BUD2BRU03	ELEC, 250V Pnl 32BUD to Inverter 32BRU03 Circuit Breaker	3.3	0.000
195	ELEC	2BRU032BRC	ELEC, Inverter 32BRU03 to 480V MCC 32BRC Circuit Breaker	3.3	0.000
196	ELEC	2BRC_4BRB2	ELEC, 480V MCC 32BRC to 480V MCC 34BRB Circuit Breaker	3.3	0.000
197	ELEC	1BRC_1BRB2	ELEC, 480V MCC 31BRC to 480V MCC 31BRB Circuit Breaker	3.3	0.000
198	CCWS	30KAA32AA127	CCWS, LHSI Pump 30 Sealing Fluid Cooling Manual Valve KAA32AA127	3.1	0.000
199	CCWS	30KAA32AA011	CCWS, LHSI HTX 30 Cooling Manual Valve KAA32AA011	3.1	0.000
200	CCWS	30KAA32AA010	CCWS, LHSI Pump 30 Cooling Manual Valve KAA32AA010	3.1	0.000
201	CCWS	30KAA32AA007	CCWS, LHSI Pump 30 Cooling Manual Valve KAA32AA007	3.1	0.000
202	CCWS	30KAA32AA116	CCWS, LHSI Pump 30 Motor Cooling Manual Valve KAA32AA116	3.1	0.000
203	ESWS	30PEB30AA204	ESWS, Train 3 Pump Discharge Check Valve, PEB30AA204	3.1	0.000
204	HVAC	30SAC01AA004	SAC, Div 1 Recirculation Motor Operated Damper SAC01AA004	3.1	0.000
205	SCWS	30QKC10AA101	SCWS, Return from SAC Div 1 MOV QKC10AA101	3.1	0.000
206	CCWS	30KAA30AA004	CCWS, Train 3 Discharge from CCW HTX 30 Check Valve KAA30AA004	3.1	0.000
207	CCWS	30KAA40AA006	CCWS, Train 4 Discharge from Common Header 2 Hydraulic Valve KAA40AA006	3.1	0.002
208	CCWS	30KAA40AA010	CCWS, Train 4 Return from Common Header 2 Hydraulic Valve KAA40AA010	3.1	0.002
209	CCWS	30KAA30AA006	CCWS, Train 3 Discharge to Common Header 2 Hydraulic Valve KAA30AA006	3.1	0.002

**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
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Rank	System US	Component ID	Component Description	RAW	FV
210	CCWS	30KAA30AA010	CCWS, Train 3 Return from Common Header 2 Hydraulic Valve KAA30AA010	3.1	0.002
211	SCWS	30QKA40GH001	SCWS, Train 4 Chiller Unit QKA40GH001	2.8	0.045
212	SCWS	30QKA40AA101	SCWS, Train 4 Chiller By-pass MOV QKA40AA101	2.8	0.010
213	SCWS	30QKA10GH001	SCWS, Train 1 Chiller Unit QKA10GH001	2.7	0.003
214	ELEC	31BRW12BUW13	ELEC, 24V DC I&C Power Rack 31BRW12/31BUW13	2.6	0.000
215	FWDS	30SGB30AA022	FWDS, MOV SGB30AA022	2.6	0.006
216	FWDS	30SGB30AA021	FWDS, MOV SGB30AA021	2.6	0.006
217	ELEC	34BTD01	ELEC, 250V 1E 2-hr Battery 34BTD01	2.5	0.001
218	CCWS	30KAB20AA192	CCWS, CCWS CH2 Return Safety Valve KAB20AA192	2.5	0.000
219	CCWS	30KAB70AA191	CCWS, CVCS HP Cooler 2 Return Safety Valve KAB60AA191	2.5	0.000
220	CCWS	30KAB20AA193	CCWS, FPCS Train 2 Cooling Header Safety Valve KAB20AA193	2.5	0.000
221	SIS/RHR	30JNG13AA005	LHSI, MHSI/LHSI Train 1 First SIS Isolation Check Valve JNG13AA005	2.4	0.012
222	SIS/RHR	30JNG20AA006	LHSI, LHSI CL2 Discharge Manual CHECK Valve JNG20AA006	2.4	0.012
223	SCWS	30QKA20AA102	SCWS, Train 2 Discharge Xtie MOV QKA20AA102	2.3	0.000
224	SCWS	30QKA20AA103	SCWS, Train 2 Suction Xtie MOV QKA20AA103	2.3	0.000
225	SCWS	30QKA10AA102	SCWS, Train 1 Discharge Xtie MOV QKA10AA102	2.3	0.000
226	SCWS	30QKA10AA103	SCWS, Train 1 Suction Xtie MOV QKA10AA103	2.3	0.000
227	ELEC	33BDA	ELEC, 6.9kV SWGR 33BDA	2.3	0.000
228	ELEC	31BDD	ELEC, 6.9kV SWGR 31BDD	2.2	0.000
229	ELEC	31BMD	ELEC, 480V Load Center 31BMD	2.2	0.000



**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
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Rank	System US	Component ID	Component Description	RAW	FV
230	ELEC	31BMT04	ELEC, 6.9kV-480V Transformer 31BMT04	2.2	0.000
231	SIS/RHR	30JNG10AC001	LHSI, LHSI Train 1 HTX JNG10AC001	2.2	0.000
232	ELEC	33BNT01	ELEC, Constant Voltage Transformer 33BNT01	2.2	0.000
233	ELEC	33BMD	ELEC, 480V Load Center 31BMD	2.2	0.000
234	ELEC	33BMB	ELEC, 480V Load Center 33BMB	2.2	0.000
235	ELEC	33BDD	ELEC, 6.9kV SWGR 33BDD	2.2	0.000
236	SIS/RHR	30JNG30AC001	LHSI, LHSI Train 3 HTX JNG30AC001	2.2	0.000
237	ELEC	33BMT04	ELEC, 6.9kV-480V Transformer 33BMT04	2.2	0.000
238	ELEC	33BMT02	ELEC, 6.9kV-480V Transformer 33BMT02	2.2	0.000
239	ELEC	33BDB	ELEC, 6.9kV SWGR 33BDB	2.2	0.000
240	ELEC	34BNB02	ELEC, 480V MCC 34BNB02	2.1	0.000
241	CCWS	30KAA20AA011	CCWS, Pump 20 Suction from CCST Manual Valve KAA20AA011	2.1	0.000
242	CCWS	30KAA22AA010	CCWS, LHSI Pump 20 Cooling Manual Valve KAA22AA010	2.1	0.000
243	ESWS	30PEB20AA007	ESWS, Train 2 Manual Valve PEB20AA007	2.1	0.000
244	ESWS	30PEB20AA009	ESWS, Train 2 Manual Valve PEB20AA009	2.1	0.000
245	ESWS	30PEB20AA027	ESWS, Train 2 Manual Valve PEB20AA027	2.1	0.000
246	ESWS	30PEB20AA029	ESWS, Train 2 Manual Valve PEB20AA029	2.1	0.000
247	CCWS	30KAA22AA127	CCWS, LHSI Pump 20 Sealing Fluid Cooling Manual Valve KAA22AA127	2.1	0.000
248	CCWS	30KAA20AA007	CCWS, Pump 20 Cooling Manual Valve KAA20AA007	2.1	0.000
249	CCWS	30KAA22AA011	CCWS, Train 2 from LHSI HTX 20 Cooling Manual Valve KAA22AA011	2.1	0.000
250	CCWS	30KAA22AA007	CCWS, LHSI Pump 20 Cooling Manual Valve KAA22AA007	2.1	0.000

**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
**Sheet 14 of 15**

Rank	System US	Component ID	Component Description	RAW	FV
251	CCWS	30KAA20AA140	CCWS, Pump 20 Cooling Manual Valve KAA20AA140	2.1	0.000
252	CCWS	30KAA20AA018	CCWS, Pump 20 Discharge Manual Valve KAA20AA018	2.1	0.000
253	CCWS	30KAA20AA015	CCWS, Pump 20 Suction Manual Valve KAA20AA015	2.1	0.000
254	CCWS	30KAA20AA008	CCWS, Pump 20 Cooling Manual Valve KAA20AA008	2.1	0.000
255	CCWS	30KAA20AA005	CCWS, Discharge from CCW HTX 20 Manual Valve KAA20AA005	2.1	0.000
256	CCWS	30KAA22AA116	CCWS, LHSI Pump 20 Motor Cooling Manual Valve KAA22AA116	2.1	0.000
257	IRWST	30JNK11AT002	IRWST, SIS Sump Strainer to MHSI/LHSI Train 3 Pumps JNK11AT002	2.1	0.006
258	ELEC	34BNC01	ELEC, 480V MCC 34BNC01	2.1	0.000
259	ELEC	31BTD01	ELEC, 250V 1E 2-hr Battery 31BTD01	2.1	0.001
260	UHS	30PED30AA011	UHS, Cooling Tower Train 3 Bypass Line MOV PED30AA011	2.0	0.000
261	ELEC	3BNT013BNB02	ELEC, Transformer 33BNT01 to 480V MCC 33BNB02 Circuit Breaker	2.0	0.000
262	ELEC	3BMT043BMD	ELEC, Transformer 33BMT04 to 480V Load Center 33BMD Circuit Breaker	2.0	0.000
263	ELEC	3BMT023BMB	ELEC, Transformer 33BMT02 to 480V Load Center 33BMB Circuit Breaker	2.0	0.000
264	ELEC	3BMB3BNT01	ELEC, 480V Load Center 33BMB to Transformer 33BNT01 Circuit Breaker	2.0	0.000
265	ELEC	3BDD3BMT04	ELEC, 6.9kV SWGR 33BDD to Transformer 33BMT04 Circuit Breaker	2.0	0.000
266	ELEC	3BDB3BMT02	ELEC, 6.9kV SWGR 33BDB to Transformer 33BMT02 Circuit Breaker	2.0	0.000
267	ELEC	3BDA_3BDD2	ELEC, 6.9kV SWGR 33BDA to 6.9kV SWGR 33BDD Circuit Breaker	2.0	0.000
268	ELEC	3BDA_3BDD1	ELEC, 6.9kV SWGR 33BDA to 6.9kV SWGR 33BDD Circuit Breaker	2.0	0.000
269	CCWS	30KAB60AA013	CCWS, RCP1/2 Motors CCWS CH1 Common Supply MOV KAB60AA013	2.0	0.000

**Table 19.1-43—U.S. EPR Risk-Significant Components based on RAW Importance - Level 1 Flooding**  
**Sheet 15 of 15**

Rank	System US	Component ID	Component Description	RAW	FV
270	ELEC	3BDA_3BDB1	ELEC, 6.9kV SWGR 33BDA to 6.9kV SWGR 33BDB Circuit Breaker	2.0	0.000
271	CCWS	30KAA30AA112	CCWS, Train 3 Heat Exchanger Bypass MOV KAA30AA112	2.0	0.000
272	ESWS	30PEB30AA002	ESWS, Train 3 Pump Recirc MOV PEB30AA002	2.0	0.000
273	CCWS	30KAB70AA019	CCWS, RCP3/4 Motors CCWS CH1 Common Return MOV KAB70AA019	2.0	0.000
274	CCWS	30KAB70AA018	CCWS, RCP3/4 Motors CCWS CH1 Common Return MOV KAB70AA018	2.0	0.000
275	CCWS	30KAB70AA013	CCWS, RCP3/4 Motors CCWS CH1 Common Supply MOV KAB70AA013	2.0	0.000
276	CCWS	30KAB60AA019	CCWS, RCP1/2 Motors CCWS CH1 Common Return MOV KAB60AA019	2.0	0.000
277	CCWS	30KAB60AA018	CCWS, RCP1/2 Motors CCWS CH1 Common Return MOV KAB60AA018	2.0	0.000
278	CCWS	30KAA30BB001	CCWS, Train 3 Surge Tank KAA30BB001	2.0	0.000
279	CCWS	30KAA30AC001	CCWS, Train 3 HTX 30 KAA30AC001	2.0	0.000
280	ELEC	3BDA_3BDB2	ELEC, 6.9kV SWGR 33BDA to 6.9kV SWGR 33BDB Circuit Breaker	2.0	0.000

**Table 19.1-44—U.S. EPR Risk-Significant Human Actions based on FV Importance - Level 1 Internal Flooding**

Rank	Basic Event	Description	Nominal Value	FV	RAW
1	OPF-RCP-30M	Operator Fails to Trip RCPs on a Loss of Bearing Cooling	4.0E-02	<b>0.188</b>	5.5
2	OPF-REC MOV	Operator Fails to Locally Isolate FWDS Ring Header	1.5E-01	<b>0.107</b>	1.6
3	OPD-AFS-S2-32H	Operator Fails to Isolate 1" FWDS Break Before Penetration in 32 Hours	1.0E+00	<b>0.066</b>	1.0
4	OPE-AFS-10H	Operator Fails to Isolate 1" FWDS Pipe Break Before Ground Level in 10 Hours	1.0E-05	<b>0.066</b>	6,595.4
5	OPF-SAC-2H	Operator Fails to Recover Room Cooling Locally	1.2E-02	<b>0.065</b>	6.4
6	OPD-FB-_90M-LOW	Operator fails to start F&B for transient or low DH transient - low dependency	5.0E-02	<b>0.045</b>	1.9
7	OPF-EFW RF-6H	Operator Fails to Refill EFW Tanks Through DWS/Fire Water Make Up	8.0E-04	<b>0.034</b>	43.1
8	OPF-RCP-10M	Operator Fails to Trip RCPs on a Loss of all thermal barrier cooling	6.0E-02	<b>0.031</b>	1.5
9	OPF-EFW-6H	Operator Fails to Manually Align EFW Tanks Within 6 Hrs	2.0E-05	<b>0.018</b>	907.8
10	OPD-EFWRF/XTIE	Failure to Refill EFW Tanks Within 6 Hrs Given Failure to Xtie Tanks	1.4E-01	<b>0.018</b>	1.1
11	OPF-TB CH SO	Operator Fails to Switch Common Header Supply to RCP TB Cooling (Given a CCW Train Loss)	2.2E-02	<b>0.018</b>	1.8
12	OPD-AFS-S2-120M	Operator Fails to Isolate Large (D>2") FWDS Pipe Break Before Penetration in 120 Minutes	2.0E-02	<b>0.009</b>	1.5
13	OPE-AFS-40M	Operator Fails to Isolate Large (D>2") FWDS Pipe Break Before Ground Level in 40 Minutes	1.0E-02	<b>0.009</b>	1.9
14	OPE-FB-90M	Operator Fails to Initiate Feed & Bleed for Transient	3.8E-04	<b>0.006</b>	18.2
15	OPE-FCD-40M	Operator Fails to Initiate Fast Cooldown for SLOCA	2.8E-02	<b>0.005</b>	1.2

**Table 19.1-45—U.S. EPR Risk-Significant Human Actions based on RAW Importance - Level 1 Internal Flooding**

<b>Rank</b>	<b>Basic Event</b>	<b>Description</b>	<b>Nominal Value</b>	<b>RAW</b>	<b>FV</b>
1	OPE-AFS-10H	Operator Fails to Isolate 1" FWDS Pipe Break Before Ground Level in 10 Hours	1.0E-05	<b>6,595.4</b>	0.066
2	OPF-EFW-6H	Operator Fails to Manually Align EFW Tanks Within 6 Hrs	2.0E-05	<b>907.8</b>	0.018
3	OPF-EFW RF-6H	Operator Fails to Refill EFW Tanks Through DWS/Fire Water Make Up	8.0E-04	<b>43.1</b>	0.034
4	OPE-FB-90M	Operator Fails to Initiate Feed & Bleed for Transient	3.8E-04	<b>18.2</b>	0.006
5	OPE-FB-L90M	Operator Fails to Initiate Feed & Bleed for Transient with Low Decay Heat	1.5E-04	<b>9.3</b>	0.001
6	OPF-SAC-2H	Operator Fails to Recover Room Cooling Locally	1.2E-02	<b>6.4</b>	0.065
7	OPF-RCP-30M	Operator Fails to Trip RCPs on a Loss of Bearing Cooling	4.0E-02	<b>5.5</b>	0.188
8	OPE-AFS-2H	Operator Fails to Isolate Small (D<2") FWDS Pipe Break Before Ground Level in 2 Hours	1.0E-04	<b>3.9</b>	0.000
9	OPF-SAC-1H	Operator Fails to Start Maintenance HVAC Trains After Failure of Normal SAC Safety Train	1.1E-04	<b>3.3</b>	0.000

**Table 19.1-46—U.S. EPR Risk-Significant Common Cause Events based on RAW – Level 1 Internal Flooding**  
**Sheet 1 of 2**

Rank	System	ID	Description	Normal Value	RAW
1	ELEC	BTD01_BAT_ST_D-ALL	CCF of Safety Related Batteries on Demand	1.6E-07	1,030.1
2	FWDS	SGB30AA001EFC_D-ALL	CCF to close FWDS header isolation MOV on train 1 and 4	9.6E-06	997.8
3	ESWS	PED10AN002EFS/FR_F-ALL	CCF to Start Standby/Run Cooling Tower Fans (At Power)	3.3E-05	712.0
4	IRWST	JNK10AT001SPG_P-ALL	CCF of IRWST Sump Strainers - Plugged	5.7E-06	692.9
5	SIS/ RHRS	JNG13AA005CFO_D-ALL	CCF to Open LHSI/MHSI Common Injection Check Valves (SIS First Isolation Valves)	4.1E-06	689.7
6	CCWS	KAA12AA005EFO_D-ALL	CCF to Open CCWS to LHSI HTX Cooling MOV	2.2E-05	687.2
7	SIS/ RHRS	JNG10AP001EFS/FR_D-ALL	CCF of LHSI Pumps to Start/Run	1.7E-06	665.9
8	CCWS	KAA12AA012CFO_D-ALL	CCF to Open CCWS from LHSI HTX Discharge Check Valve	4.5E-07	619.1
9	SIS/ RHRS	JNG10AA006CFO_D-ALL	CCF to Open LHSI Check Valves (SIS Second Isolation Valves)	2.3E-07	599.0
10	EFWS	LAS11AP001EFS/FR_D-ALL	CCF of EFWS Pumps to Start/Run	1.0E-05	262.4
11	ELEC	XKA10____DFR/FS_D-ALL	CCF of EDGs to Run/Start	1.0E-04	57.6
12	HVAC	SAC01/31AN001EFR_B-ALL	CCF to Run Normal Air Supply/Exhaust Fans (Trains 1 & 4)	5.1E-06	50.0
13	ESWS	PEB20AP001EFS/FR_B-ALL	CCF of ESWS Pumps 2 and 3 to Start (Standby)	8.1E-05	49.4
14	CCWS	KAA20AP001EFS_B-ALL	CCF of CCWS Pumps 2 and 3 to Start (Standby)	5.5E-05	45.0
15	CCWS	KAA22AA013EFO_B-ALL	CCF to Open CCWS to LHSI Pump Seal Cooler MOVs	1.2E-04	44.6
16	MSS	LBA11AA191SFO_H-ALL	CCF to Open Main Steam Safety Relief Valves	2.6E-05	43.1
17	MSS	LBA13AA001PFO_D-ALL	CCF to Open Main Steam Relief Isolation Valves	4.6E-05	33.6

**Table 19.1-46—U.S. EPR Risk-Significant Common Cause Events based on  
RAW – Level 1 Internal Flooding  
Sheet 2 of 2**

<b>Rank</b>	<b>System</b>	<b>ID</b>	<b>Description</b>	<b>Normal Value</b>	<b>RAW</b>
18	MFWS	LAB60AA003CFO_D-ALL	CCF to Open FW Lines to SG Check Valves	4.5E-07	28.7
19	RCPS	JEB10AP001BFO_D-ALL	CCF to Open Reactor Coolant Pump Bus Breakers	8.2E-06	25.1
20	ESWS	PEB10AA204CFO_D-ALL	CCF to Open ESWS Pump Discharge Check Valves	4.5E-07	23.5
21	SIS/ RHRS	JND10AP001EFR_D-ALL	CCF of MHSI Pumps to Run	3.0E-05	21.4

**Table 19.1-47—U.S. EPR Risk-Significant Common Cause I&C Events based on RAW Importance - Level 1 Internal Flooding**

<b>Rank</b>	<b>ID</b>	<b>Description</b>	<b>Nominal Value</b>	<b>RAW</b>
1	SG LVL CCG	Common Cause Failure of the SG Level Sensors (32)	4.9E-08	5,035.4
2	SAS CCF-ALL	CCF of SAS Divisions	5.0E-07	814.4
3	I/O MOD CCF	I/O Module Common Cause Failure	6.5E-06	273.3
4	EFW FLOW CCF-ALL	CCF of EFW pump discharge flow sensors	2.7E-06	249.4
5	SG PRESS CCG	Common Cause Failure of the SG Pressure Sensors (16)	2.5E-08	205.0
6	ALU/APU NS-ALL	CCF of ALU and APU Protection System Computer Processors (Non-Self-Monitored)	3.3E-07	197.1
7	CL-TXS-OSCCF	CCF of TXS Operating System or Other Common Software	1.0E-07	170.3
8	ALU/APU SM-ALL	CCF of ALU and APU Protection System Computer Processors (Self-Monitored)	9.0E-08	156.4
9	PAS	Process Automation System (PAS) Fails (Estimate)	1.0E-03	77.8
10	CL-PS-B-SWCCF	CCF of Protection System Diversity Group B Application Software	1.0E-05	64.7
11	CL-PS-EDG-SWCCF	CCF of EDG Start Function in PS Diversity Groups A&B Software	1.0E-05	53.0
12	BUS UV CCF-ALL	CCF of 6.9KV bus undervoltage sensors	4.3E-06	48.2



**Table 19.1-48—U.S. EPR Risk-Significant PRA Parameters -  
Level 1 Flooding  
Sheet 1 of 2**

Rank	ID	Description	Nominal Value	FV	RAW
<b>PRA Modeling Parameters</b>					
1	PROB SEAL LOCA	Probability of Seal LOCA Occurring Given a Loss of Seal Cooling	2.0E-01	0.455	2.8
2	BREAK 1IN	FWDS, Break in Pipe With 1" Flow	1.0E+00	0.170	1.0
3	DWS MAKEUP	DWS/FWDS Fails to Provide Make Up to EFW Tanks	5.0E-03	0.046	10.2
4	BREAK MORE 2IN	FWDS, Break in Pipe With More Than 2" Flow	9.0E-01	0.012	1.0
5	LOC24	Failure of Condensate System/Turbine Bypass Independent of Support Systems	2.5E-03	0.009	4.4
6	SUP UHS NS	Failure of the Ultimate Heat Sink (Non-Safety)	2.8E-05	0.001	29.0
<b>Maintenance Parameters</b>					
1	CCWS/ESWS PM2	CCWS/ESWS Train 2 Pump Unavailable due to Preventive Maintenance	1.0E-01	0.178	2.6
2	CCWS/ESWS PM3	CCWS/ESWS Train 3 Pump Unavailable due to Preventive Maintenance	1.0E-01	0.139	2.2
3	LHSI PM1	LHSI Train 1 Unavailable due to Preventive Maintenance	5.0E-02	0.100	2.9
4	LHSI PM2	LHSI Train 2 Unavailable due to Preventive Maintenance	5.0E-02	0.035	1.7
5	QKA40 PM4	Normal QKA40 Train Unavailable due to Preventive Maintenance	7.0E-02	0.031	1.4
6	EDG PM1	EDG Train 1 Unavailable due to Preventive Maintenance (Alt. Feed Alignment)	5.0E-02	0.011	1.2
7	EFWS PM1	EFWS Train 1 Unavailable due to Preventive Maintenance	5.0E-02	0.007	1.1
8	SSS PM4	SSS Unavailable due to Preventive Maintenance	7.0E-02	0.006	1.1
9	EFWS PM4	EFWS Train 4 Unavailable due to Preventive Maintenance	5.0E-02	0.006	1.1
10	EFWS PM2	EFWS Train 2 Unavailable due to Preventive Maintenance	5.0E-02	0.005	1.1

**Table 19.1-48—U.S. EPR Risk-Significant PRA Parameters -  
Level 1 Flooding  
Sheet 2 of 2**

Rank	ID	Description	Nominal Value	FV	RAW
<b>Offsite Power Related Events</b>					
1	LOOPCSD+REC	Consequential LOOP and Failure of Recovery Within 1 Hour for IEs Leading to a Controlled Shutdown	1.8E-04	0.040	223.3
2	LOOPCON+REC	Consequential LOOP and Failure of Recovery Within 1 Hour for IEs Leading to Auto Scram	1.8E-03	0.009	6.2
3	LOOP24+REC	Loss Of Offsite Power During Mission Time and Failure of Recovery Within 1 Hour	4.8E-05	0.008	171.2
4	LOOPCSD+REC 12H	Consequential LOOP and Failure of Recovery Within 12 Hours for IEs Leading to a Controlled Shutdown	7.1E-06	0.007	990.2
5	LOOP24+REC 12H	Loss Of Offsite Power During Mission Time and Failure of Recovery Within 12 Hours	3.9E-06	0.004	990.2

**Table 19.1-49—U.S. EPR Level 1 Flooding Events Sensitivity Studies**  
**Sheet 1 of 2**

<b>Sensitivity Case Group</b>	<b>Case #</b>	<b>Sensitivity Case Description</b>	<b>SC CDF (1/yr)</b>	<b>Delta CDF (%)</b>
0	0	Base Case (Flooding Events)	6.1E-08	0%
<b>1</b>	<b>Common Cause Assumption</b>			
	1b	EDGs & SBODGs in the same CC group	6.7E-08	10%
<b>2</b>	<b>LOOP Assumptions</b>			
	2a	No Credit was given for LOOP recoveries (DG MT also set back to 24 hours)	6.4E-08	6%
	2b	DG Mission Time set to 24 hours	6.4E-08	6%
	2c	SBO DG Mission Time set to 18 hours	6.1E-08	0%
	2d	Consequential LOOP events were not considered	5.8E-08	-4%
<b>3</b>	<b>Assumptions on Electrical Dependencies</b>			
	3a	MSRT Realignment to One Power Train per Train	6.0E-08	-0.5%
	3b	For CVCS seal injection, assume that a switchover from the VCT to the IRWST is always required (Div1 & Div4 required)	6.1E-08	0%
	3c	UHS 4 assumed unavailable during SBO Conditions (no credit for SBO x-tie for dedicated ESW)	6.1E-08	0%
<b>4</b>	<b>Assumptions on HVAC Recoveries</b>			
	4a	Room heat-up was not considered	5.7E-08	-6%
	4b	Operator recovery of HVAC not credited	4.9E-07	707%
<b>5</b>	<b>Sensitivity to HEPs Values</b>			
	5a	All HEPs Set to 5% Value	2.5E-08	-59%
	5b	All HEPs Set to 95% Value	3.0E-7	390%
<b>6</b>	<b>Assumptions on Probabilities of an RCP LOCA</b>			
	6a	RCP Seal LOCA Probability - 1.0	1.8E-07	194%
	6b	RCP Seal LOCA Probability - 0.5	1.0E-07	73%
	6c	RCP Seal LOCA Probability - 0.1	4.7E-08	-23%
<b>7</b>	<b>Assumptions on Long Term Cooling Mission Time</b>			
	7a	SAHR Mission Time set to 36 hours	6.1E-08	0%
	7b	SAHR Mission Time set to 72 hours	6.1E-08	0%
<b>8</b>	<b>Preventive Maintenance Assumptions</b>			
	8a	Train 2 assumed to be in Preventive Maintenance for all year	1.5E-07	142%

**Table 19.1-49—U.S. EPR Level 1 Flooding Events Sensitivity Studies**  
**Sheet 2 of 2**

<b>Sensitivity Case Group</b>	<b>Case #</b>	<b>Sensitivity Case Description</b>	<b>SC CDF (1/yr)</b>	<b>Delta CDF (%)</b>
	8b	W/o Preventive Maintenance	2.9E-08	-53%
<b>9</b>	<b>I&amp;C Software and Hardware Common Cause</b>			
	9a	Increase I&C CC parameters by factor of 10; include operator dependency	6.6E-08	9%
	9b	Increase I&C CC parameters by factor of 100	7.5E-08	23%
<b>10</b>	<b>Design Change after the PRA Model Freeze</b>			
	10	Design Change to RCP seal valves; type (SOV to MOV) and electrical supply (12 hr NUPS to 2 hr EUPS)	6.8E-08	12%
<b>11</b>	<b>Location of CCW Switchover Valves</b>			
	11	Flood in SAB14 doesn't disable CCWS SO	4.1E-08	-33%

**Table 19.1-50—Level 2 Flooding Events Release Category Results - LRF**  
**Sheet 1 of 3**

Internal Flood Release Category	Description	Internal Flood RC Frequency	Contribution to Internal Flood LRF	Conditional Containment Failure Probability
RC201	Containment fails before vessel breach due to isolation failure, melt retained in vessel	5.67E-12	0.07%	0.0001
RC202	Containment fails before vessel breach due to isolation failure, melt released from vessel, with MCCI, melt not flooded ex vessel, with containment spray	1.82E-15	0.00%	0.0
RC203	Containment fails before vessel breach due to isolation failure, melt released from vessel, with MCCI, melt not flooded ex vessel, without containment spray	9.67E-11	1.17%	0.0016
RC204	Containment fails before vessel breach due to isolation failure, melt released from vessel, without MCCI, melt flooded ex vessel with containment spray	1.05E-14	0.00%	0.0
RC205	Containment failures before vessel breach due to isolation failure, melt released from vessel, without MCCI, melt flooded ex vessel without containment spray	1.69E-11	0.21%	0.0003
RC206	Small containment failure due to failure to isolate 2" or smaller lines	2.25E-09	n/a	0.0371
RC301	Containment fails before vessel breach due to containment rupture, with MCCI, melt not flooded ex vessel, with containment spray	1.97E-14	0.00%	0.0
RC302	Containment fails before vessel breach due to containment rupture, with MCCI, melt not flooded ex vessel, without containment spray	8.39E-13	0.01%	0.0
RC303	Containment fails before vessel breach due to containment rupture, without MCCI, melt flooded ex vessel, with containment spray	1.26E-12	0.02%	0.0

**Table 19.1-50—Level 2 Flooding Events Release Category Results - LRF**  
**Sheet 2 of 3**

<b>Internal Flood Release Category</b>	<b>Description</b>	<b>Internal Flood RC Frequency</b>	<b>Contribution to Internal Flood LRF</b>	<b>Conditional Containment Failure Probability</b>
RC304	Containment fails before vessel breach due to containment rupture, without MCCI, melt flooded ex vessel, without containment spray	2.14E-11	0.26%	0.0004
RC401	Containment failures after breach and up through debris quench due to containment rupture, with MCCI, without debris flooding, with containment spray	9.02E-16	0.00%	0.0
RC402	Containment failures after breach and up through debris quench due to containment rupture, with MCCI, without debris flooding, without containment spray	6.70E-12	0.08%	0.0001
RC403	Containment failures after breach and up through debris quench due to containment rupture, without MCCI, with debris flooding, with containment spray	1.94E-13	0.00%	0.0
RC404	Containment failures after breach and up through debris quench due to containment rupture, without MCCI, with debris flooding, without containment spray	1.36E-11	0.17%	0.0002
RC501	Long term containment failure after debris quench due to rupture, with MCCI, without debris flooding, with containment spray	1.05E-14	n/a	0.0
RC502	Long term containment failure after debris quench due to rupture, with MCCI, without debris flooding, without containment spray	1.18E-10	n/a	0.0019
RC503	Long term containment failure after debris quench due to rupture, without MCCI, with debris flooding, with containment spray	8.40E-12	n/a	0.0001

**Table 19.1-50—Level 2 Flooding Events Release Category Results - LRF**  
**Sheet 3 of 3**

<b>Internal Flood Release Category</b>	<b>Description</b>	<b>Internal Flood RC Frequency</b>	<b>Contribution to Internal Flood LRF</b>	<b>Conditional Containment Failure Probability</b>
RC504	Long term containment failure after debris quench due to rupture, without MCCI, with debris flooding, without containment spray	3.06E-09	n/a	0.0504
RC601	Long term containment failure due to basemat failure, without debris flooding, with containment sprays	0.00E+00	n/a	0.0
RC602	Long term containment failure due to basemat failure, without debris flooding, without containment spray	1.15E-08	n/a	0.1896
RC701	Steam Generator Tube Rupture with Fission Product Scrubbing	0.00E+00	n/a	0.0
RC702	Steam Generator Tube Rupture without Fission Product Scrubbing	2.49E-10	3.02%	0.0041
RC801	Interfacing System LOCA with Fission Product Scrubbing	7.82E-09	n/a	0.1289
RC802	Interfacing System LOCA without Fission Product Scrubbing but with building deposition credited	7.82E-09	94.99%	0.1289
Flood LRF:		8.23E-09	100.00%	0.1357
RS Flood LRF:		8.23E-09		

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 1 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC201	2.42E-13	0.00%	IE FLD-SAB14 FB	Initiator - Flood in Safeguard Building 1 or 4 (Pump Room) Including Fuel Building	Level 1: Flood in Safeguard Building 1 or 4 (Pump Room) including Fuel Building disables all Div. 4 Pumps. A loss of running CCW pump Div. 4 and flooding of CCW switchover valves leads to a loss of CCW CH2 and division 3 HVAC. EFW 2 is in preventive maintenance. Failure of EDG1 and connecting the SBODGs leads to the loss of power in Div. 1 and failure of bleed.
			EFWS PM2	EFWS Train 2 Unavailable due to Preventive Maintenance	
			LOOPCSD+REC	Consequential LOOP and Failure of Recovery Within 1 Hour for IEs Leading to a Controlled Shutdown	
			OPF-SAC-2H	Operator Fails to Recover Room Cooling Locally	
			OPF-XTLDSBO-NSC	Operator Fails to Connect and Load SBO DGs During Non-SBO Conditions	
			XKA10____DFR	ELEC, Emergency Diesel Generator XKA10, Fails to Run	



**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 2 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
			JMM23 01/02 SCFL	Probability that Secondary Containment/Annulus Venting Fails	Level 2: -Sequence enters CET LO PRESSURE -Depressurization is failed due to a loss of electrical Divisions 1 and 4 -Hot leg rupture occurs precluding creep induced SGTR and leading to a low pressure sequence - Large containment isolation failure because the leak off system lines are open and fail to close due to loss of electrical Divisions 1 and 4 followed by a containment annulus venting failure -In-vessel recovery is successful
			L2PH CPIHLR-TR,TP=Y	Induced hot leg rupture. Conditional probability given no ISGTR. TR, TRD, TP, TPD cases.	
			L2PH INVREC(T-DEP)=Y	In-vessel recovery success - hot leg rupture or operator depressurization during transient CDES	
			L2PH ISGTR-TR=N	Induced SGTR. Transients, secondary not depressurized	
			P JMM23 01/02 OP-P	Probability that Leak Off System Line JMM23 is Open (Pwr)	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets  
Sheet 3 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC202	1.60E-15	0.00%	IE FLD-TB	Initiator - Flood in the Turbine Building	Level 1: Failure of I&C and operator to trip the plant results in an ATWS event. CCF of I/O module results in failure to start EFW.
			DAS	Diverse Actuation System (DAS) fails (estimate)	
			I/O MOD CCF	I/O Module Common Cause Failure	
			OPF-RT-6M	Operator Fails to Trip the Reactor Manually	
			JMM23 01/02 SCFL	Probability that Secondary Containment/Annulus Venting Fails	Level 2: - Large containment isolation failure because the leak off system lines are open and fail to close due to loss of I&C signal and failure of operator backup manual signal followed by a containment annulus venting failure. -no pit failure with ex-vessel steam explosion avoided - in-vessel recovery phenomenological failure -dependent operator failure to open the MOVs on the passive flooding lines leading to significant MCCI (debris not flooded) -SAHRS sprays are successful
			L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	
			L2PH INVREC(T-DEP)=N	In-vessel recovery fails - hot leg Rupture or operator depressurization during transient CDES	
			L2PH STMEXP EXV=N	Level 2 Phenomena: Steam explosion avoided in dry pit sequences	
			OPD-L2-SAHRSPF-HIGH	Operator fails to open MOVs to enable passive cooling -high dependency	
			OPF-L2-CI-30M	Operators Fails to Initiate Manual Containment Isolation Signal	
P JMM23 01/02 OP-P	Probability that Leak Off System Line JMM23 is Open (Pwr)				

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 4 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC203	9.73E-12	0.12%	IE FLD-ANN	Initiator - Flood in the RB Annulus	Level 1: 1" equivalent pipe break in annulus, operator failure to isolate the break (modeled in two actions: before and after ground level) leads to flooding of annulus penetrations.
			BREAK 1IN	FWDS, Break in Pipe With 1" Flow	
			OPD-AFS-S2-32H	Operator Fails to Isolate 1" FWDS Break Before Penetration in 32 Hours	
			OPE-AFS-10H	Operator Fails to Isolate 1" FWDS Pipe Break Before Ground Level in 10 Hours	
			JMM23 01/02 SCFL	Probability that Secondary Containment/Annulus Venting Fails	Level 2: - Large containment isolation failure because the leak off system lines are open and fail to close due to loss of I&C signal due to the flooding initiator and failure of operator backup manual signal followed by a containment annulus venting failure - Hot leg rupture occurs precluding creep induced SGTR and leading to a low pressure sequence - No pit failure following ex-vessel steam explosion - Signal failure following the flooding initiator to open the MOVs on the passive flooding lines leading to significant MCCI (debris not flooded) - SAHRS sprays are failed due to signal failure following the initiator
			L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	
			L2PH CP STMEXP	Probability of ex-vessel steam explosion given a wet pit.	
			L2PH CPIHLR-TR,TP=Y	Induced hot leg rupture. Conditional probability given no ISGTR. TR, TRD, TP, TPD cases.	
			L2PH ISGTR-TR=N	Induced SGTR. Transients, secondary not depressurized	
			L2PH STMEXP EX=N	Level 2 phenomena: Pit damage given ex-vessel steam explosion	
OPF-L2-CI-30M	Operators Fails to Initiate Manual Containment Isolation Signal				
P JMM23 01/02 OP-P	Probability that Leak Off System Line JMM23 is Open (Pwr)				

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets  
Sheet 5 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC203	1.23E-11	0.15%	IE FLD-SAB14 FB	Initiator - Flood in Safeguard Building 1 or 4 (Pump Room) Including Fuel Building	<p>Level 1: Flood in Safeguard Building 1 or 4 (Pump Room) including Fuel Building disables all Div. 4 Pumps, CVCS and EBS pumps. A loss of running CCW pump Div. 4 and flooding of CCW switchover valves leads to a loss of CCW CH2 and given that thermal battier (TB) is provided by CH2, a loss of TB cooling to all RCP pumps. Seal injection from CVCS is also lost. The loss of CH2 and QKA40 in maintenance will result in the loss of HVAC for Div. 3 &amp; 4 and electrical power to RCP isolation valves (Nitrogen venting or any seal leakoff) and would result in a RCP seal LOCA with a probability of 0.2. PCD and bleed fail due to failure of power needed to operate MSRTs and PDVs.</p>
			31BMB____OFL	ELEC, 480V Load Center 31BMB, Fails During Operation	
			CONF CH2 TO TB	Configuration 2: CH2 Supplying All RCP TB. Maintenance on CCW 2 Only.	
			OPF-SAC-2H	Operator Fails to Recover Room Cooling Locally	
			PROB SEAL LOCA	Probability of Seal LOCA Occurring Given a Loss of Seal Cooling	
			QKA40 PM4	Normal QKA40 Train Unavailable due to Preventive Maintenance	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 6 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
			JMM23 01/02 SCFL	Probability that Secondary Containment/Annulus Venting Fails	Level 2: - Large containment isolation failure because the leak off system lines are open and fail to close due to loss of outboard containment isolation valves (fuel building) following the flooding initiator -no pit overpressure failure in case where complete circumferential failure of the vessel does not occur - SAHRS failure due to flooding in the mechanical room - Significant MCCI occurs with failure to open the MOVs on the passive flooding lines
			L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	
			L2PH PF-VF NO-CBV=N	Level 2 phenomena. Pit overpressure failure (not CBV case)	
			P JMM23 01/02 OP-P	Probability that Leak Off System Line JMM23 is Open (Pwr)	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 7 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC203	9.28E-12	0.11%	IE FLD-ANN	Initiator - Flood in the RB Annulus	Level 1: 1" equivalent pipe break in annulus, a CCF of FWDS isolation MOVs to close on demand, and operator failure to close valves locally, leads to a flooding of annulus penetrations.
			BREAK 1IN	FWDS, Break in Pipe With 1" Flow	
			OPF-REC MOV	Operator Fails to Locally Isolate FWDS Ring Header	
			SGB30AA001EFC_D-12	CCF to close FWDS header isolation MOV on train 1 and 4	
			JMM23 01/02 SCFL	Probability that Secondary Containment/Annulus Venting Fails	Level 2: - Sequence enters CET LO PRESSURE - Hot leg rupture occurs precluding creep induced SGTR and leading to a low pressure sequence - Large containment isolation failure because the leak off system lines are open and fail to close due to a loss of signal from the flood initiator and failure of the operator manual recovery of the signal followed by a containment annulus venting failure - No pit overpressure failure following ex-vessel steam explosion - SAHRS failure due to the loss of signal from the flooding initiator - Significant MCCI occurs with failure to open the MOVs on the passive flooding lines
			L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	
			L2PH CP STMEXP	Probability of ex-vessel steam explosion given a wet pit.	
			L2PH CPIHLR-TR,TP=Y	Induced hot leg rupture. Conditional probability given no ISGTR. TR, TRD, TP, TPD cases.	
			L2PH ISGTR-TR=N	Induced SGTR. Transients, secondary not depressurized	
			L2PH STMEXP EX=N	Level 2 phenomena: Pit damage given ex-vessel steam explosion	
			OPF-L2-CI-30M	Operators Fails to Initiate Manual Containment Isolation Signal	
P JMM23 01/02 OP-P	Probability that Leak Off System Line JMM23 is Open (Pwr)				

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets  
Sheet 8 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC203	2.02E-12	0.02%	IE FLD-SAB14 FB	Initiator - Flood in Safeguard Building 1 or 4 (Pump Room) Including Fuel Building	Level 1: Flood in Safeguard Building 1 or 4 (Pump Room) including Fuel Building disables all Div. 4 Pumps, CVCS and EBS pumps. A loss of running CCW pump Div. 4 and flooding of CCW switchover valves leads to a loss of CCW CH2. Failure of the train 1 exhaust fan and the Maintenance HVAC train in preventive maintenance leads to the loss of the running CCW train 1 and operator failure to switch to the standby train leads to a total loss of HVAC.
			OPF-CCWS TR SO	Operator Fails to Switch CH Supply to Standby CCW Train Before A Loss of the Running Train	
			OPF-SAC-2H	Operator Fails to Recover Room Cooling Locally	
			SAC05 PM5	Maintenance SAC Safety System Train 5 Unavailable due to Preventive Maintenance	
			SAC31AN001EFR_B-ALL	CCF to Run Normal Air Exhaust Fans (Trains 1 & 4)	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets  
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Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
			JMM23 01/02 SCFL	Probability that Secondary Containment/Annulus Venting Fails	Level 2: - Sequence enters CET LO PRESSURE - Hot leg rupture occurs precluding creep induced SGTR and leading to a low pressure sequence - Large containment isolation failure because the leak off system lines are open and fail to close due to a loss of electrical divisions 1 and 4 followed by a containment annulus venting failure - No pit overpressure failure following ex-vessel steam explosion - SAHRS failure due to the flooding initiator - Significant MCCI occurs with failure to open the MOVs on the passive flooding lines
			L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	
			L2PH CP STMEXP	Probability of ex-vessel steam explosion given a wet pit.	
			L2PH CPIHLR-TR,TP=Y	Induced hot leg rupture. Conditional probability given no ISGTR. TR, TRD, TP, TPD cases.	
			L2PH ISGTR-TR=N	Induced SGTR. Transients, secondary not depressurized	
			L2PH STMEXP EX=N	Level 2 phenomena: Pit damage given ex-vessel steam explosion	
			P JMM23 01/02 OP-P	Probability that Leak Off System Line JMM23 is Open (Pwr)	



**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
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Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC204	2.96E-15	0.00%	IE FLD-TB	Initiator - Flood in the Turbine Building	Level 1: Failure of I&C and operator to trip the plant results in an ATWS event. Failure of DAD and CCF of I/O module results in failure to start EFW.
			DAS	Diverse Actuation System (DAS) fails (estimate)	
			I/O MOD CCF	I/O Module Common Cause Failure	
			OPF-RT-6M	Operator Fails to Trip the Reactor Manually	
			JMM23 01/02 SCFL	Probability that Secondary Containment/Annulus Venting Fails	Level 2: - Large containment isolation failure because the leak off system lines are open and fail to close due to loss of I&C signal and failure of operator backup manual signal followed by a containment annulus venting failure. - No ex-vessel steam explosion leading to pit failure - No MCCI following successful opening of the MOVs on the passive flooding lines - SAHRS sprays are successful
			L2PH NO CCI	Level 2 phenomena: NO MCCI, no system failures	
			L2PH STMEXP EXV=N	Level 2 Phenomena: Steam explosion avoided in dry pit sequences	
			OPD-L2-STRTSI-HIGH	Operator fails to start LHSI for in-vessel cooling - high dependency	
			OPF-L2-CI-30M	Operators Fails to Initiate Manual Containment Isolation Signal	
			P JMM23 01/02 OP-P	Probability that Leak Off System Line JMM23 is Open (Pwr)	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 11 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC205	1.84E-12	0.02%	IE FLD-TB	Initiator - Flood in the Turbine Building	Level 1: A flood in the Turbine Building fails MFW and SSS. A consequential LOOP and failure of the safety 1E 2-hr batteries prevents the starting the EDGs and connecting the SBOs to the safety divisions leading to a total loss of HVAC.
			BTD01_BAT_ST_D-ALL	CCF of Safety Related Batteries on Demand	
			LOOPCON+REC	Consequential LOOP and Failure of Recovery Within 1 Hour for IEs Leading to Auto Scram	
			JMM23 01/02 SCFL	Probability that Secondary Containment/Annulus Venting Fails	Level 2: - Large containment isolation failure because the leak off system lines are open and fail to close due to loss of electrical divisions 1 and 4 followed by a containment annulus venting failure - No ex-vessel steam explosion leading to pit failure - No MCCI following successful opening of the MOVs on the passive flooding lines - SAHRS sprays failure
			L2PH NO CCI	Level 2 phenomena: NO MCCI, no system failures	
			L2PH STMEXP EXV=N	Level 2 Phenomena: Steam explosion avoided in dry pit sequences	
			P JMM23 01/02 OP-P	Probability that Leak Off System Line JMM23 is Open (Pwr)	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 12 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC301	8.88E-15	0.00%	IE FLD-TB	Initiator - Flood in the Turbine Building	<p>Level 1:</p> <p>A flood in the Turbine Building fails MFW and SSS. EFW Div 4 is in preventive maintenance and operator failure to align or refill EFW tanks results in an inadequate EFW inventory for 24 hour mission time. Operator failure to initiate feed &amp; bleed, after EFW tanks inventory runs out, results in a total loss of heat removal.</p>
			EFWS PM4	EFWS Train 4 Unavailable due to Preventive Maintenance	
			OPD-EFWR/XTIE	Failure to Refill EFW Tanks Within 6 Hrs Given Failure to Xtie Tanks	
			OPD-FB-_90M-LOW	Operator fails to start F&B for transient or low DH transient - low dependency	
			OPF-EFW-6H	Operator Fails to Manually Align EFW Tanks Within 6 Hrs	
			L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	<p>Level 2:</p> <ul style="list-style-type: none"> <li>- High pressure sequence</li> <li>- Very early containment failure due to hydrogen flame acceleration loads</li> <li>- Extensive MCCI with failed basemat flooding due to failure of operator to open the MOVs on basemat flooding lines</li> <li>- No ex-vessel steam explosion pit failure</li> <li>- In-vessel cooling recovery failed due to a phenomenological condition</li> <li>- Successful SAHRS sprays</li> </ul>
			L2PH INVREC(T-DEP)=N	In-vessel recovery fails - hot leg Rupture or operator depressurization during transient CDES	
			L2PH STMEXP EXV=N	Level 2 Phenomena: Steam explosion avoided in dry pit sequences	
			L2PH VECF-FA(H)	Very early containment failure due to H2 Flame Acceleration (Hi pressure sequences)	
			OPD-L2-SAHRSPF-LOW	Operator fails to open MOVs to enable passive cooling - low dependency	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 13 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC302	1.26E-13	0.00%	IE FLD-ANN	Initiator - Flood in the RB Annulus	Level 1: 1" equivalent pipe break in annulus, operator failure to isolate the break (modeled in two actions: before and after ground level) leads to flooding of annulus penetrations.
			BREAK 1IN	FWDS, Break in Pipe With 1" Flow	
			OPD-AFS-S2-32H	Operator Fails to Isolate 1" FWDS Break Before Penetration in 32 Hours	
			OPE-AFS-10H	Operator Fails to Isolate 1" FWDS Pipe Break Before Ground Level in 10 Hours	
			L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	Level 2: - High pressure sequence without hot leg rupture and without induced SGTR - Very early containment failure due to hydrogen flame acceleration loads - Extensive MCCI due to failure of signal to open the MOVs on basemat flooding lines following the flooding initiator - No pit overpressure failure in cases without complete circumferential break - In-vessel cooling recovery failed due to signal failure following the flooding initiator - SAHRS sprays failure following the flooding initiator
			L2PH CPIHLR-TR,TP=N	No induced hot leg rupture. Conditional probability given no ISGTR. TP, TR cases (sec not D)	
			L2PH ISGTR-TR=N	Induced SGTR. Transients, secondary not depressurized	
			L2PH PF-VF NO-CBV=N	Level 2 phenomena. Pit overpressure failure (not CBV case)	
L2PH VECF-FA(H)	Very early containment failure due to H2 Flame Acceleration (Hi pressure sequences)				

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 14 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC303	4.08E-13	0.00%	IE FLD-TB	Initiator - Flood in the Turbine Building	<p>Level 1:                      A flood in the Turbine Building fails MFW and SSS. EFW Div 4 is in preventive maintenance and operator failure to align or refill EFW tanks results in an inadequate EFW inventory for 24 hour mission time. Operator failure to initiate feed &amp; bleed, after EFW tanks inventory runs out, results in a total loss of heat removal.</p>
			EFWS PM3	EFWS Train 3 Unavailable due to Preventive Maintenance	
			OPD-EFWR/XTIE	Failure to Refill EFW Tanks Within 6 Hrs Given Failure to Xtie Tanks	
			OPD-FB-_90M-LOW	Operator fails to start F&B for transient or low DH transient - low dependency	
			OPF-EFW-6H	Operator Fails to Manually Align EFW Tanks Within 6 Hrs	
			L2PH INVREC(T-DEP)=Y	In-vessel recovery success - hot leg rupture or operator depressurization during transient CDES	<p>Level 2:                      - High pressure sequence                      - Very early containment failure due to hydrogen flame acceleration loads                      - No MCCI with successful opening of the MOVs on basemat flooding lines                      - No pit failure                      - In-vessel cooling recovery is successful                      - SAHRS sprays are successful</p>
			L2PH VECF-FA(H)	Very early containment failure due to H2 Flame Acceleration (Hi pressure sequences)	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 15 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC304	1.41E-13	0.00%	IE FLD-SAB14 FB	Initiator - Flood in Safeguard Building 1 or 4 (Pump Room) Including Fuel Building	Level 1: Flood in Safeguard Building 1 or 4 (Pump Room) including Fuel Building disables all Div. 4 Pumps. PAS fails MFW and SSS. Failure to refill EFW tanks results in an inadequate EFW inventory for 24 hour mission time. Operator failure to initiate feed & bleed, after EFW tanks inventory runs out, results in a total loss of heat removal.
			OPD-FB-_90M-LOW	Operator fails to start F&B for transient or low DH transient - low dependency	
			OPF-EFW RF-6H	Operator Fails to Refill EFW Tanks Through DWS/Fire Water Make Up	
			PAS	Process Automation System (PAS) Fails (Estimate)	
			L2PH INVREC(T-DEP)=Y	In-vessel recovery success - hot leg rupture or operator depressurization during transient CDES	Level 2: - High pressure sequence - Very early containment failure due to hydrogen flame acceleration loads - No MCCI with successful opening of the MOVs on basemat flooding lines - No pit failure - In-vessel cooling recovery is successful - SAHRS sprays are failed by the initiator
			L2PH VECF-FA(H)	Very early containment failure due to H2 Flame Acceleration (Hi pressure sequences)	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 16 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC401	2.25E-17	0.00%	IE FLD-TB	Initiator - Flood in the Turbine Building	Level 1: ATWS events, failure to actuate EBS fails reactivity control.
			OPF-EBS-30M	Operator Fails to Manually Actuate EBS (SLB & ATWS)	
			STUCK ROD	CCF of 38 out of 89 Control Rods being stuck - NUREG/CR-5500, 50% control rods CCF	
			L2PH CBV HP	Complete circumferential rupture of vessel (gives vessel rocket in HP sequences)	Level 2: - High pressure sequence due to operator failures to depressurize - Early containment failure due to vessel rocketing at the time of vessel rupture - MCCI with operator failure to open the MOVs on the basemat flooding lines - No pit failure - SAHRS sprays are successful
			L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	
			L2PH PF-VF CBV=N	Pit overpressure at high pressure vessel failure fails melt plug given CBV occurs	
			OPD-L2-DEPRESS-40M	Operator Fails to Open Sufficient RCS Depressurization Valves	
			OPD-L2-SAHRSPF-HIGH	Operator fails to open MOVs to enable passive cooling -high dependency	
			OPF-L2-DEPRESS-65M	Operator fails to open sufficient RCS depressurization valves (in EOP space)	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 17 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC402	2.00E-12	0.02%	IE FLD-ANN	Initiator - Flood in the RB Annulus	Level 1: 1" equivalent pipe break in annulus, operator failure to isolate the break (modeled in two actions: before and after ground level) leads to flooding of annulus penetrations.
			BREAK 1IN	FWDS, Break in Pipe With 1" Flow	
			OPD-AFS-S2-32H	Operator Fails to Isolate 1" FWDS Break Before Penetration in 32 Hours	
			OPE-AFS-10H	Operator Fails to Isolate 1" FWDS Pipe Break Before Ground Level in 10 Hours	
			L2PH CBV HP	Complete circumferential rupture of vessel (gives vessel rocket in HP sequences)	Level 2: - High pressure sequence without hot leg rupture and without induced SGTR - Early containment failure due to vessel rocketing at the time of vessel rupture - MCCI with signal failure to open the MOVs on the basemat flooding lines following the flooding initiator - No pit failure with complete circumferential break of the vessel - SAHRS sprays are failed due to the initiator
			L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	
			L2PH CPIHLR-TR,TP=N	No induced hot leg rupture. Conditional probability given no ISGTR. TP, TR cases (sec not D)	
			L2PH ISGTR-TR=N	Induced SGTR. Transients, secondary not depressurized	
			L2PH PF-VF CBV=N	Pit overpressure at high pressure vessel failure fails melt plug given CBV occurs	



**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 18 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC403	7.12E-14	0.00%	IE FLD-TB	Initiator - Flood in the Turbine Building	Level 1: A flood in the Turbine Building fails MFWS and SSS. EFW Div 4 is in preventive maintenance and operator failure to align or refill EFW tanks results in an inadequate EFW inventory for 24 hour mission time. Operator failure to initiate feed & bleed, after EFW tanks inventory runs out, results in a total loss of heat removal.
			EFWS PM4	EFWS Train 4 Unavailable due to Preventive Maintenance	
			OPD-EFWR/XTIE	Failure to Refill EFW Tanks Within 6 Hrs Given Failure to Xtie Tanks	
			OPD-FB-_90M-LOW	Operator fails to start F&B for transient or low DH transient - low dependency	
			OPF-EFW-6H	Operator Fails to Manually Align EFW Tanks Within 6 Hrs	
			L2PH CBV HP	Complete circumferential rupture of vessel (gives vessel rocket in HP sequences)	Level 2: - High pressure sequence due to operator failure to depressurize - Early containment failure due to vessel rocketing at the time of vessel rupture - No MCCI with successful opening of the MOVs on the basemat flooding lines following the flooding initiator - No pit failure with complete circumferential break of the vessel - SAHRS sprays are successful
			L2PH NO CCI	Level 2 phenomena: NO MCCI, no system failures	
			L2PH PF-VF CBV=N	Pit overpressure at high pressure vessel failure fails melt plug given CBV occurs	
			OPD-L2-DEPRESS-40M	Operator Fails to Open Sufficient RCS Depressurization Valves	
			OPD-L2-DEPRESS-LOW	Operator fails to open PDS to depressurize RCS - low dependency	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 19 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC404	1.61E-13	0.00%	IE FLD-SAB14 FB	Initiator - Flood in Safeguard Building 1 or 4 (Pump Room) Including Fuel Building	<p>Level 1:  Flood in Safeguard Building 1 or 4 (Pump Room) including Fuel Building disables all Div. 4 Pumps, CVCS and EBS pumps. A loss of running CCW pump Div. 4 and flooding of CCW switchover valves leads to a loss of CCW CH2 and given that thermal battier (TB) is provided by CH2, a loss of TB cooling to all RCP pumps. Seal injection from CVCS is also lost. The loss of CH2 and failure of the train 4 chiller will result in the loss of HVAC for Div. 3 &amp; 4 and electrical power to RCP isolation valves (Nitrogen venting or any seal leakoff) and would result in a RCP seal LOCA with a probability of 0.2. Failure of DWS makeup results in inadequate EFW inventory. The loss of Safe Guard Building 4 HVAC results in the failure of the bleed function.</p>
			CONF CH2 TO TB	Configuration 2: CH2 Supplying All RCP TB. Maintenance on CCW 2 Only.	
			DWS MAKEUP	DWS/FWDS Fails to Provide Make Up to EFW Tanks	
			OPF-SAC-2H	Operator Fails to Recover Room Cooling Locally	
			PROB SEAL LOCA	Probability of Seal LOCA Occurring Given a Loss of Seal Cooling	
			QKA40GH001_FS	SCWS, Train 4 Chiller Unit QKA40GH001, Fails to Start on Demand	
			SAC08 PM8	Maintenance SAC Safety System Train 8 Unavailable due to Preventive Maintenance	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 20 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
			L2PH CBV HP	Complete circumferential rupture of vessel (gives vessel rocket in HP sequences)	Level 2: - High pressure sequence - Early containment failure due to vessel rocketing at the time of vessel rupture - No MCCI with successful opening of the MOVs on the basemat flooding lines following the flooding initiator - No pit failure with complete circumferential break of the vessel - SAHRS sprays are failed due to the initiator
			L2PH NO CCI	Level 2 phenomena: NO MCCI, no system failures	
			L2PH PF-VF CBV=N	Pit overpressure at high pressure vessel failure fails melt plug given CBV occurs	
RC702	6.06E-11	0.74%	IE FLD-ANN	Initiator - Flood in the RB Annulus	Level 1: 1" equivalent pipe break in annulus, operator failure to isolate the break (modeled in two actions: before and after ground level) leads to flooding of annulus penetrations.
			BREAK 1IN	FWDS, Break in Pipe With 1" Flow	
			OPD-AFS-S2-32H	Operator Fails to Isolate 1" FWDS Break Before Penetration in 32 Hours	
			OPE-AFS-10H	Operator Fails to Isolate 1" FWDS Pipe Break Before Ground Level in 10 Hours	
			L2PH ISGTR-TRD=Y	Induced SGTR. Transient, secondary depressurized.	Level 2: - High pressure sequence - Containment bypass via induced SGTR with a depressurized secondary
			LBA43AA001PFC	MSS, Train 4 MSRIV LBA43AA001, Fails to Close on Demand	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 21 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC702	4.97E-11	0.60%	IE FLD-ANN	Initiator - Flood in the RB Annulus	Level 1: 1" equivalent pipe break in annulus, a CCF of FWDS isolation MOVs to close on demand, and operator failure to close valves locally, leads to a flooding of annulus penetrations.
			BREAK 1IN	FWDS, Break in Pipe With 1" Flow	
			OPF-REC MOV	Operator Fails to Locally Isolate FWDS Ring Header	
			SGB30AA001EFC_D-12	CCF to close FWDS header isolation MOV on train 1 and 4	Level 2: - High pressure sequence - Containment bypass via induced SGTR with a depressurized secondary
			L2PH ISGTR-TRD=Y	Induced SGTR. Transient, secondary depressurized.	
			LBA23AA001PFC	MSS, Train 2 MSRIV LBA23AA001, Fails to Close on Demand	

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 22 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC802	5.48E-09	66.56%	IE FLD-SIS	Initiator - SIS Pipe Break	Level 1: Flood due to a SIS pipe break in SAB4 fails IRWST and all division 4 pumps. A loss of the running CCW pump (Div. 4), with the standby CCW pump (Div. 3) in PM, leads to a loss of CCW CH2 and a loss of cooling to RCP pump 3 & 4 motor bearings. Failure to trip either pump, auto (priority module failure) or manually (operator failure) leads to a RCP seal LOCA, which cannot be mitigated without the IRWST (failure of all injection).
			CCWS/ESWS PM3	CCWS/ESWS Train 3 Pump Unavailable due to Preventive Maintenance	
			JEB30AP001PMNS	RCP, Train 3 Pump JEB30AP001, Priority Module Fails (Non-Self-Monitored)	
			OPF-RCP-30M	Operator Fails to Trip RCPs on a Loss of Bearing Cooling	
			L2CP FLD-SIS SCRUB=N	NO Scrubbing of pipe breaks following IE FLD-SIS	Level 2: - Containment bypass due to a break in the SIS piping outside of containment

**Table 19.1-51—Level 2 Flooding Events Large Release Significant Cutsets**  
**Sheet 23 of 23**

Release Category	Freq/yr	Contribution to LRF (%)	Event Identifier	Event Description	Sequence of events that lead to CD and to Containment Failure
RC802	5.64E-10	6.86%	IE FLD-SIS	Initiator - SIS Pipe Break	Level 1: Flood due to a SIS pipe break in SAB4 fails IRWST and all division 4 pumps. The loss of the Condensate System/Turbine Bypass fails MFW, SSS in PM. Failure of DWS makeup results in inadequate EFW inventory.
			DWS MAKEUP	DWS/FWDS Fails to Provide Make Up to EFW Tanks	
			LOC24	Failure of Condensate System/Turbine Bypass Independent of Support Systems	
			SSS PM4	SSS Unavailable due to Preventive Maintenance	
			L2CP FLD-SIS SCRUB=N	NO Scrubbing of pipe breaks following IE FLD-SIS	Level 2: - Containment bypass due to a break in the SIS piping outside of containment
RC802	3.31E-11	0.40%	IE FLD-SIS	Initiator - SIS Pipe Break	Level 1: Flood due to a SIS pipe break in SAB4 fails IRWST and all division 4 pumps. CCF of I/O modules fails MFW/SSS and operator fails to control EFW flow.
			I/O MOD CCF	I/O Module Common Cause Failure	
			OPF-EFW-MSRT-CNTL	Operator Fails to Control EFW/MSRT for Long-Term Cooling Given PS Failure	
			L2CP FLD-SIS SCRUB=N	NO Scrubbing of pipe breaks following IE FLD-SIS	Level 2: - Containment bypass due to a break in the SIS piping outside of containment

**Table 19.1-52—U.S. EPR Core Damage End States Contributions - Level 2  
Internal Flooding**

<b>CDES</b>	<b>LRF (1/yr)</b>	<b>Contribution (Total)</b>
IS	7.8E-09	95.0%
TRANN	2.1E-10	2.6%
SSD	7.8E-11	0.9%
SS	7.0E-11	0.8%
TR	5.2E-11	0.6%
AT	1.9E-16	0.0%
RV	2.0E-18	0.0%
Total	8.2E-09	100%

**Table 19.1-53—U.S. EPR Initiating Event Contributions - Level 2 Internal Flooding**

<b>Flood IE</b>	<b>Description</b>	<b>Frequency</b>	<b>LRF (1/yr)</b>	<b>Contribution (Total)</b>
IE FLD-SIS	Initiator - SIS Pipe Break	2.9E-04	7.8E-09	95%
IE FLD-ANN	Initiator - Flood in the RB Annulus	4.0E-04	2.1E-10	3%
IE FLD-SAB14 FB	Initiator - Flood in Safeguard Building 1 or 4 (Pump Room) Including Fuel Building	8.0E-03	1.8E-10	2%
IE FLD-TB	Initiator - Flood in the Turbine Building	3.3E-02	1.1E-11	<1%
IE FLD-EFW	Initiator - EFW Pipe Break	1.7E-03	6.6E-12	<1%
IE FLD-ESW	Initiator - Flood in the Essential Service Water Pump Building	7.4E-04	4.1E-12	<1%
IE FLD-SAB23	Initiator - Flood in Safeguard Building 2 or 3 (Pump Room)	1.9E-03	4.5E-13	<1%
		Total	8.2E-09	100%



**Table 19.1-54—U.S. EPR Risk-Significant Phenomena Based on FV Importance - Level 2 Internal Flooding**

Rank	ID	Description	Nominal Value	FV	RAW
1	L2PH ISGTR-TRD=Y	Induced SGTR. Transient, secondary depressurized.	3.8E-01	<b>0.021</b>	1.0
2	L2PH CCI-DRY	Significant MCCI occurs, debris not flooded. P = 1.0	1.0E+00	<b>0.013</b>	1.0
3	L2PH ISGTR-TR=N	Induced SGTR. Transients, secondary not depressurized	1.0E+00	<b>0.009</b>	1.0
4	L2PH CP STMEXP	Probability of ex-vessel steam explosion given a wet pit.	1.0E+00	<b>0.009</b>	1.0
5	L2PH STMEXP EX=N	Level 2 phenomena: Pit damage given ex-vessel steam explosion	1.0E+00	<b>0.009</b>	1.0
6	L2PH CPIHLR-TR,TP=Y	Induced hot leg rupture. Conditional probability given no ISGTR. TR, TRD, TP, TPD cases.	9.5E-01	<b>0.008</b>	1.0
7	L2PH NO CCI	Level 2 phenomena: NO MCCI, no system failures	1.0E+00	<b>0.006</b>	1.0
8	L2PH ISGTR-SS2D=Y	Induced SGTR. 2" Seal LOCA (Pwr)	7.9E-01	<b>0.005</b>	1.0
9	L2PH PF-VF NO-CBV=N	Level 2 phenomena. Pit overpressure failure (not CBV case)	1.0E+00	<b>0.005</b>	1.0

**Table 19.1-55—U.S. EPR Risk-Significant Phenomena based on RAW Importance - Level 2 Internal Flooding**

Rank	ID	Description	Nominal Value	RAW	FV
1	L2PH STM EXP INV LP	Level 2 phenomena: containment failure due to in-vessel steam explosion. Low pressure CET sequences.	5.6E-06	5.6	0.000
2	L2PH VECF-FA(H)	Very early containment failure due to H2 Flame Acceleration (Hi pressure sequences)	6.3E-04	5.5	0.003
3	L2PH VECF-H2DEF(HL)	V Early CF due to hydrogen deflagration.High pressure CDES with Induced Hot Leg Rupture	3.0E-06	2.3	0.000

**Table 19.1-56—U.S. EPR Risk-Significant Equipment based on FV Importance - Level 2 Internal Flooding**  
**Sheet 1 of 2**

Rank	System	Component ID	Component Description	FV	RAW
1	ESWS	30PEB30AP001	ESWS, Train 3 Motor Driven Pump PEB30AP001	0.511	9.2
2	RCS	30JEB40AP001-BKR	ELEC, 13.8kV SWGR 34BDE Circuit Breaker to RCP JEB40AP001	0.250	94.8
3	RCS	30JEB30AP001-BKR	ELEC, 13.8kV SWGR 33BDE Circuit Breaker to RCP JEB30AP001	0.250	94.7
4	ESWS	30PEB30AA005	ESWS, Train 3 Pump Discharge Isolation MOV PEB30AA005	0.047	9.2
5	UHS	30PED30AA010	UHS, Cooling Tower Train 3 Spray MOV PED30AA010	0.047	9.2
6	CCWS	30KAA30AP001	CCWS, Train 3 Motor Driven Pump KAA30AP001	0.028	9.2
7	ESWS	30PEB20AP001	ESWS, Train 2 Motor Driven Pump PEB20AP001	0.026	1.2
8	SSS	30LAJ10AP001	SSS, SSS Motor Driven Pump LAJ10AP001	0.022	1.3
9	ELEC	33BUC	ELEC, 1E 250V DC Switchboard 33BUC	0.019	773.0
10	SCWS	30QKA40GH001	SCWS, Train 4 Chiller Unit QKA40GH001	0.017	1.5
11	RCS	30JEB20AA010	RCP, RCP2 Leakoff Isolation MOV JEB20AA010	0.013	4.8
12	RCS	30JEB20AA020	RCP Seal, RCP2 Seal Nitrogen Venting Isolation MOV JEB20AA020	0.013	4.8
13	RCS	30JEB30AA010	RCP, RCP3 Leakoff Isolation MOV JEB30AA010	0.013	4.8
14	RCS	30JEB30AA020	RCP Seal, RCP3 Seal Nitrogen Venting Isolation MOV JEB30AA020	0.013	4.8
15	RCS	30JEB40AA010	RCP, RCP4 Leakoff Isolation MOV JEB40AA010	0.013	4.8
16	RCS	30JEB40AA020	RCP Seal, RCP4 Seal Nitrogen Venting Isolation MOV JEB40AA020	0.013	4.8
17	RCS	30JEB10AA010	RCP, RCP1 Leakoff Isolation MOV JEB10AA010	0.013	4.8
18	RCS	30JEB10AA020	RCP Seal, RCP1 Seal Nitrogen Venting Isolation MOV JEB10AA020	0.013	4.8
19	CCWS	30KAB30AA192	CCWS, RCP Thermal Barrier to CCWS CH2 Return Safety Valve KAB30AA192	0.013	177.0
20	CCWS	30KAB30AA191	CCWS, RCP Thermal Barrier to CCWS CH1 Return Safety Valve KAB30AA191	0.013	175.0
21	RCS	30JEB10AP001-BKR	ELEC, 13.8kV SWGR 31BDE Circuit Breaker to RCP JEB10AP001	0.009	3.2

**Table 19.1-56—U.S. EPR Risk-Significant Equipment based on FV Importance - Level 2 Internal Flooding**  
**Sheet 2 of 2**

Rank	System	Component ID	Component Description	FV	RAW
22	CCWS	30KAB30AA049	CCWS, CCWS CH1 to RCP Thermal Barrier Common Supply MOV KAB30AA049	0.009	83.7
23	CCWS	30KAB30AA050	CCWS, CCWS CH1 to RCP Thermal Barrier Common Supply MOV KAB30AA050	0.009	83.7
24	CCWS	30KAB30AA051	CCWS, RCP Thermal Barrier to CCWS CH1 Common Return MOV KAB30AA051	0.009	83.7
25	CCWS	30KAB30AA052	CCWS, RCP Thermal Barrier to CCWS CH1 Common Return MOV KAB30AA052	0.009	83.7
26	CCWS	30KAA40AA010	CCWS, Train 4 Return from Common Header 2 Hydraulic Valve KAA40AA010	0.009	9.0
27	CCWS	30KAA40AA006	CCWS, Train 4 Discharge from Common Header 2 Hydraulic Valve KAA40AA006	0.008	9.0
28	CCWS	30KAA30AA010	CCWS, Train 3 Return from Common Header 2 Hydraulic Valve KAA30AA010	0.008	9.0
29	CCWS	30KAA30AA006	CCWS, Train 3 Discharge to Common Header 2 Hydraulic Valve KAA30AA006	0.008	9.0
30	RCS	30JEB20AP001-BKR	ELEC, 13.8kV SWGR 32BDE Circuit Breaker to RCP JEB20AP001	0.008	3.2
31	CLCWS	30PGB19AA191	CLCWS, Safety Valve PGB19AA191	0.007	105.0
32	CCWS	30KAB10AA192	CCWS, CCWS CH1 Return Safety Valve KAB10AA192	0.006	91.0
33	CCWS	30KAB10AA193	CCWS, FPCS Train 1 Cooling Header Safety Valve KAB10AA193	0.006	91.0
34	CCWS	30KAB60AA191	CCWS, CVCS HP Cooler 1 Return Safety Valve KAB60AA191	0.006	91.0
35	EFWS	30LAS11AP001	EFWS, Train 1 Motor Driven Pump LAS11AP001	0.006	1.2

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
Importance - Level 2 Internal Flooding  
Sheet 1 of 11**

Rank	System	Component ID	Component Description	RAW	FV
1	ELEC	33BUC	ELEC, 1E 250V DC Switchboard 33BUC	773.0	0.019
2	CCWS	30KAB30AA192	CCWS, RCP Thermal Barrier to CCWS CH2 Return Safety Valve KAB30AA192	177.0	0.013
3	CCWS	30KAB30AA191	CCWS, RCP Thermal Barrier to CCWS CH1 Return Safety Valve KAB30AA191	175.0	0.013
4	FWS	30LAD61AC001	FWS, HP Heater LAD61AC001	105.0	0.002
5	FWS	30LAD62AC001	FWS, HP Heater LAD62AC001	105.0	0.002
6	FWS	30LAD71AC001	FWS, HP Heater LAD71AC001	105.0	0.002
7	FWS	30LAD72AC001	FWS, HP Heater LAD72AC001	105.0	0.002
8	MSS	30LCS71AC001	FW HP, Reheat 2 Condensate Cooler 1 LCS71AC001	105.0	0.002
9	MSS	30LCS72AC001	FW HP, Reheat 2 Condensate Cooler 2 LCS72AC001	105.0	0.002
10	CLCWS	30PGB19AA191	CLCWS, Safety Valve PGB19AA191	105.0	0.007
11	FWS	30LAA10BB001	FWS, Feedwater Storage Tank LAA10BB001	104.0	0.001
12	MFWS	30LAB31AA001	FWS, HP Heater Train 1 Bypass MOV LAB31AA001	104.0	0.001
13	MFWS	30LAB31AA002	FWS, HP Heater Train 1 Bypass MOV LAB31AA002	104.0	0.001
14	MFWS	30LAB32AA001	FWS, HP Heater Train 2 Bypass MOV LAB32AA001	104.0	0.001
15	MFWS	30LAB32AA002	FWS, HP Heater Train 2 Bypass MOV LAB32AA002	104.0	0.001
16	CLCWS	30PGB15AA001	CLCWS, HTX Bypass MOV PGB15AA001	104.0	0.001
17	CLCWS	30PGD16AC001	CLCWS, Train 1 HTX PGD16AC001	104.0	0.001
18	CLCWS	30PGD17AC001	CLCWS, Train 2 HTX PGD17AC001	104.0	0.001
19	CLCWS	30PGD18AC001	CLCWS, Train 3 HTX PGD18AC001	104.0	0.001
20	RCS	30JEB40AP001-BKR	ELEC, 13.8kV SWGR 34BDE Circuit Breaker to RCP JEB40AP001	94.8	0.250
21	RCS	30JEB30AP001-BKR	ELEC, 13.8kV SWGR 33BDE Circuit Breaker to RCP JEB30AP001	94.7	0.250
22	ELEC	34BUC	ELEC, 1E 250V DC Switchboard 34BUC	93.1	0.002
23	CCWS	30KAB10AA192	CCWS, CCWS CH1 Return Safety Valve KAB10AA192	91.0	0.006

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
Importance - Level 2 Internal Flooding  
Sheet 2 of 11**

Rank	System	Component ID	Component Description	RAW	FV
24	CCWS	30KAB10AA193	CCWS, FPCS Train 1 Cooling Header Safety Valve KAB10AA193	91.0	0.006
25	CCWS	30KAB60AA191	CCWS, CVCS HP Cooler 1 Return Safety Valve KAB60AA191	91.0	0.006
26	CCWS	30KAB30AA049	CCWS, CCWS CH1 to RCP Thermal Barrier Common Supply MOV KAB30AA049	83.7	0.009
27	CCWS	30KAB30AA050	CCWS, CCWS CH1 to RCP Thermal Barrier Common Supply MOV KAB30AA050	83.7	0.009
28	CCWS	30KAB30AA051	CCWS, RCP Thermal Barrier to CCWS CH1 Common Return MOV KAB30AA051	83.7	0.009
29	CCWS	30KAB30AA052	CCWS, RCP Thermal Barrier to CCWS CH1 Common Return MOV KAB30AA052	83.7	0.009
30	CCWS	30KAB30AA053	CCWS, CCWS CH2 to RCP Thermal Barrier Common Supply MOV KAB30AA053	83.7	0.001
31	CCWS	30KAB30AA054	CCWS, CCWS CH2 to RCP Thermal Barrier Common Supply MOV KAB30AA054	83.7	0.001
32	CCWS	30KAB30AA055	CCWS, RCP Thermal Barrier to CCWS CH2 Common Return MOV KAB30AA055	83.7	0.001
33	CCWS	30KAB30AA056	CCWS, RCP Thermal Barrier to CCWS CH2 Common Return MOV KAB30AA056	83.7	0.001
34	ELEC	31BDA	ELEC, 6.9kV Switchgear 31BDA	47.9	0.001
35	RCS	30JEB10AA191	RCP, RCP1 Thermal Barrier Return Safety Valve JEB10AA191	40.7	0.003
36	RCS	30JEB20AA191	RCP, RCP2 Thermal Barrier Return Safety Valve JEB20AA191	40.7	0.003
37	RCS	30JEB30AA191	RCP, RCP3 Thermal Barrier Return Safety Valve JEB30AA191	40.7	0.003
38	RCS	30JEB40AA191	RCP, RCP4 Thermal Barrier Return Safety Valve JEB40AA191	40.7	0.003
39	RCS	30JEB10AA003	RCP, RCP1 Thermal Barrier Return SOV JEB10AA003	40.3	0.000
40	RCS	30JEB20AA003	RCP, RCP2 Thermal Barrier Return SOV JEB20AA003	40.3	0.000
41	RCS	30JEB30AA003	RCP, RCP3 Thermal Barrier SOV JEB30AA003	40.3	0.000
42	RCS	30JEB40AA003	RCP, RCP4 Thermal Barrier SOV JEB40AA003	40.3	0.000
43	RCS	30JEB10AA021	RCP, RCP1 Thermal Barrier Supply MOV JEB10AA021	40.0	0.000

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
Importance - Level 2 Internal Flooding  
Sheet 3 of 11**

Rank	System	Component ID	Component Description	RAW	FV
44	RCS	30JEB20AA021	RCP, RCP2 Thermal Barrier Supply MOV JEB20AA021	40.0	0.000
45	RCS	30JEB30AA021	RCP, RCP3 Thermal Barrier Supply MOV JEB30AA021	40.0	0.000
46	RCS	30JEB40AA021	RCP, RCP4 Thermal Barrier Supply MOV JEB40AA021	40.0	0.000
47	RCS	30JEB10AA001	RCP, RCP1 Thermal Barrier Supply Check Valve JEB10AA001	39.8	0.000
48	RCS	30JEB20AA001	RCP, RCP2 Thermal Barrier Supply Check Valve JEB20AA001	39.8	0.000
49	RCS	30JEB30AA001	RCP, RCP3 Thermal Barrier Supply Check Valve JEB30AA001	39.8	0.000
50	RCS	30JEB40AA001	RCP, RCP4 Thermal Barrier Supply Check Valve JEB40AA001	39.8	0.000
51	ELEC	31BDB	ELEC, 6.9kV SWGR 31BDB	39.3	0.001
52	ELEC	31BDC	ELEC, 6.9kV SWGR 31BDC	39.3	0.001
53	ELEC	31BMB	ELEC, 480V Load Center 31BMB	39.3	0.001
54	ELEC	31BMT02	ELEC, 6.9kV-480V Transformer 31BMT02	39.3	0.001
55	ELEC	1BDA_1BDC1	ELEC, 6.9kV SWGR 31BDA to 6.9kV SWGR 31BDC Circuit Breaker	35.0	0.000
56	ELEC	1BDA_1BDC2	ELEC, 6.9kV SWGR 31BDA to 6.9kV SWGR 31BDC Circuit Breaker	35.0	0.000
57	ELEC	1BDB1BMT02	ELEC, 6.9kV SWGR 31BDB to Transformer 31BMT02 Circuit Breaker	35.0	0.000
58	ELEC	1BDC_1BDB1	ELEC, 6.9kV SWGR 31BDC to 6.9kV SWGR 31BDB Circuit Breaker	35.0	0.000
59	ELEC	1BDC_1BDB2	ELEC, 6.9kV SWGR 31BDC to 6.9kV SWGR 31BDB Circuit Breaker	35.0	0.000
60	ELEC	1BMT021BMB	ELEC, Transformer 31BMT02 to 480V Load Center 31BMB Circuit Breaker	35.0	0.000
61	MFWS	30LAB14AA002	FWS, Pump 14 Discharge Pneumatic CHECK Valve LAB14AA002	33.3	0.000
62	CLCWS	30PGB13AA002	CLCWS, Pump 13 Discharge Check Valve PGB13AA002	22.6	0.000
63	SSS	30LAH10AA003	SSS, SSS Pump Discharge Pneumatic CHECK Valve LAH10AA003	11.8	0.000
64	ELEC	31BNB02	ELEC, 480V MCC 31BNB02	11.8	0.000

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
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Rank	System	Component ID	Component Description	RAW	FV
65	ELEC	31BNT01	ELEC, Constant Voltage Transformer 31BNT01	11.8	0.000
66	ELEC	33BRW50BUW51	ELEC, 24V DC I&C Power Rack 33BRW50/ 33BUW51	11.7	0.000
67	ELEC	1BMB1BNT01	ELEC, 480V Load Center 31BMB to Transformer 31BNT01 Circuit Breaker	10.1	0.000
68	ELEC	1BNT011BNB02	ELEC, Transformer 31BNT01 to 480V MCC 31BNB02 Circuit Breaker	10.1	0.000
69	ESWS	30PEB30AA005	ESWS, Train 3 Pump Discharge Isolation MOV PEB30AA005	9.2	0.047
70	ESWS	30PEB30AP001	ESWS, Train 3 Motor Driven Pump PEB30AP001	9.2	0.511
71	UHS	30PED30AA010	UHS, Cooling Tower Train 3 Spray MOV PED30AA010	9.2	0.047
72	CCWS	30KAA30AP001	CCWS, Train 3 Motor Driven Pump KAA30AP001	9.2	0.028
73	CCWS	30KAA30AA006	CCWS, Train 3 Discharge to Common Header 2 Hydraulic Valve KAA30AA006	9.0	0.008
74	CCWS	30KAA30AA010	CCWS, Train 3 Return from Common Header 2 Hydraulic Valve KAA30AA010	9.0	0.008
75	CCWS	30KAA40AA006	CCWS, Train 4 Discharge from Common Header 2 Hydraulic Valve KAA40AA006	9.0	0.008
76	CCWS	30KAA40AA010	CCWS, Train 4 Return from Common Header 2 Hydraulic Valve KAA40AA010	9.0	0.009
77	CCWS	30KAA30AA005	CCWS, Discharge from CCW HTX 30 Manual Valve KAA30AA005	8.7	0.002
78	CCWS	30KAA30AA007	CCWS, Pump 30 Cooling Manual Valve KAA30AA007	8.7	0.002
79	CCWS	30KAA30AA008	CCWS, Pump 30 Cooling Manual Valve KAA30AA008	8.7	0.002
80	CCWS	30KAA30AA011	CCWS, Pump 30 Suction from CCST Manual Valve KAA30AA011	8.7	0.002
81	CCWS	30KAA30AA015	CCWS, Pump 30 Suction Manual Valve KAA30AA015	8.7	0.002
82	CCWS	30KAA30AA018	CCWS, Pump 30 Discharge Manual Valve KAA30AA018	8.7	0.002
83	CCWS	30KAA30AA140	CCWS, Pump 30 Cooling Manual Valve KAA30AA140	8.7	0.002



**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW Importance - Level 2 Internal Flooding**  
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Rank	System	Component ID	Component Description	RAW	FV
84	ESWS	30PEB30AA007	ESWS, Train 3 Manual Valve PEB30AA007	8.7	0.002
85	ESWS	30PEB30AA009	ESWS, Train 3 Manual Valve PEB30AA009	8.7	0.002
86	ESWS	30PEB30AA027	ESWS, Train 2 Manual Valve PEB30AA027	8.7	0.002
87	ESWS	30PEB30AA029	ESWS, Train 2 Manual Valve PEB30AA029	8.7	0.002
88	ELEC	33BNB02	ELEC, 480V MCC 33BNB02	8.3	0.001
89	CCWS	30KAB20AA192	CCWS, CCWS CH2 Return Safety Valve KAB20AA192	8.2	0.001
90	CCWS	30KAB20AA193	CCWS, FPCS Train 2 Cooling Header Safety Valve KAB20AA193	8.2	0.001
91	CCWS	30KAP60AA191	CCWS, CVCS HP Cooler 2 Return Safety Valve KAB60AA191	8.2	0.001
92	ESWS	30PEB10AP001	ESWS, Train 1 Motor Driven Pump PEB10AP001	8.1	0.001
93	CCWS	30KAA30AA004	CCWS, Train 3 Discharge from CCW HTX 30 Check Valve KAA30AA004	8.1	0.000
94	ESWS	30PEB30AA204	ESWS, Train 3 Pump Discharge Check Valve, PEB30AA204	8.1	0.000
95	CCWS	30KAA10AP001	CCWS, Train 1 Motor Driven Pump KAA10AP001	7.7	0.001
96	ELEC	33BDA	ELEC, 6.9kV SWGR 33BDA	6.8	0.000
97	SIS/RHR	30JNG10AC001	LHSI, LHSI Train 1 HTX JNG10AC001	6.7	0.000
98	ELEC	31BDD	ELEC, 6.9kV SWGR 31BDD	6.7	0.000
99	ELEC	31BMD	ELEC, 480V Load Center 31BMD	6.7	0.000
100	ELEC	31BMT04	ELEC, 6.9kV-480V Transformer 31BMT04	6.7	0.000
101	ELEC	33BDB	ELEC, 6.9kV SWGR 33BDB	6.6	0.000
102	ELEC	33BMB	ELEC, 480V Load Center 33BMB	6.6	0.000
103	ELEC	33BMT02	ELEC, 6.9kV-480V Transformer 33BMT02	6.6	0.000
104	SIS/RHR	30JNG30AC001	LHSI, LHSI Train 3 HTX JNG30AC001	6.5	0.000
105	ELEC	33BDD	ELEC, 6.9kV SWGR 33BDD	6.5	0.000
106	ELEC	33BMD	ELEC, 480V Load Center 31BMD	6.5	0.000
107	ELEC	33BMT04	ELEC, 6.9kV-480V Transformer 33BMT04	6.5	0.000
108	ELEC	33BNT01	ELEC, Constant Voltage Transformer 33BNT01	6.5	0.000
109	CCWS	30KAA30AA112	CCWS, Train 3 Heat Exchanger Bypass MOV KAA30AA112	6.5	0.000

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
Importance - Level 2 Internal Flooding  
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Rank	System	Component ID	Component Description	RAW	FV
110	CCWS	30KAA30AC001	CCWS, Train 3 HTX 30 KAA30AC001	6.5	0.000
111	CCWS	30KAA30BB001	CCWS, Train 3 Surge Tank KAA30BB001	6.5	0.000
112	ESWS	30PEB30AA002	ESWS, Train 3 Pump Recirc MOV PEB30AA002	6.5	0.000
113	UHS	30PED30AA011	UHS, Cooling Tower Train 3 Bypass Line MOV PED30AA011	6.5	0.000
114	ELEC	3BDA_3BDB1	ELEC, 6.9kV SWGR 33BDA to 6.9kV SWGR 33BDB Circuit Breaker	6.5	0.000
115	ELEC	3BDA_3BDB2	ELEC, 6.9kV SWGR 33BDA to 6.9kV SWGR 33BDB Circuit Breaker	6.5	0.000
116	ELEC	3BDA_3BDD1	ELEC, 6.9kV SWGR 33BDA to 6.9kV SWGR 33BDD Circuit Breaker	6.5	0.000
117	ELEC	3BDA_3BDD2	ELEC, 6.9kV SWGR 33BDA to 6.9kV SWGR 33BDD Circuit Breaker	6.5	0.000
118	ELEC	3BDB3BMT02	ELEC, 6.9kV SWGR 33BDB to Transformer 33BMT02 Circuit Breaker	6.5	0.000
119	ELEC	3BDD3BMT04	ELEC, 6.9kV SWGR 33BDD to Transformer 33BMT04 Circuit Breaker	6.5	0.000
120	ELEC	3BMB3BNT01	ELEC, 480V Load Center 33BMB to Transformer 33BNT01 Circuit Breaker	6.5	0.000
121	ELEC	3BMT023BMB	ELEC, Transformer 33BMT02 to 480V Load Center 33BMB Circuit Breaker	6.5	0.000
122	ELEC	3BMT043BMD	ELEC, Transformer 33BMT04 to 480V Load Center 33BMD Circuit Breaker	6.5	0.000
123	ELEC	3BNT013BNB02	ELEC, Transformer 33BNT01 to 480V MCC 33BNB02 Circuit Breaker	6.5	0.000
124	CCWS	30KAA10BB001	CCWS, Train 1 Surge Tank KAA10BB001	6.3	0.000
125	CCWS	30KAA10AA112	CCWS, Train 1 Heat Exchanger Bypass MOV KAA10AA112	6.0	0.000
126	ESWS	30PEB10AA002	ESWS, Train 1 Pump Recirc MOV PEB10AA002	6.0	0.000
127	ESWS	30PEB10AA005	ESWS, Train 1 Pump Discharge Isolation MOV, PEB10AA005	6.0	0.000
128	UHS	30PED10AA010	UHS, Cooling Tower Train 1 Spray MOV PED10AA010	6.0	0.000
129	UHS	30PED10AA011	UHS, Cooling Tower Train 1 Bypass Line MOV PED10AA011	6.0	0.000

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
Importance - Level 2 Internal Flooding  
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Rank	System	Component ID	Component Description	RAW	FV
130	ELEC	1BDA_1BDD1	ELEC, 6.9kV SWGR 31BDA to 6.9kV SWGR 31BDD Circuit Breaker	6.0	0.000
131	ELEC	1BDA_1BDD2	ELEC, 6.9kV SWGR 31BDA to 6.9kV SWGR 31BDD Circuit Breaker	6.0	0.000
132	ELEC	1BDD1BMT04	ELEC, 6.9kV SWGR 31BDD to Transformer 31BMT04 Circuit Breaker	6.0	0.000
133	ELEC	1BMT041BMD	ELEC, Transformer 31BMT04 to 480V Load Center 31BMD Circuit Breaker	6.0	0.000
134	CCWS	30KAA10AC001	CCWS, Train 1 HTX 10 KAA10AC001	6.0	0.000
135	CCWS	30KAA10AA004	CCWS, Train 1 Discharge from CCW HTX 10 Check Valve KAA10AA004	5.6	0.000
136	ESWS	30PEB10AA204	ESWS, Train 1 Pump Discharge Check Valve PEB10AA204	5.6	0.000
137	ELEC	32BDA	ELEC, 6.9kV SWGR 32BDA	5.6	0.000
138	HVAC	30SAC01AN001	SAC, Normal Air Supply Fan SAC01AN001	5.5	0.002
139	HVAC	30SAC31AN001	SAC, Normal Air Exhaust Fan SAC31AN001	5.5	0.002
140	ELEC	31BRU03	ELEC, Inverter 31BRU03	5.5	0.002
141	ELEC	32BRU03	ELEC, Inverter 32BRU03	5.5	0.002
142	CCWS	30KAB60AA013	CCWS, RCP1/2 Motors CCWS CH1 Common Supply MOV KAB60AA013	5.4	0.000
143	CCWS	30KAB60AA014	CCWS, RCP1/2 Motors CCWS CH1 Common Supply Check Valve KAB60AA01	5.4	0.000
144	CCWS	30KAB60AA018	CCWS, RCP1/2 Motors CCWS CH1 Common Return MOV KAB60AA018	5.4	0.000
145	CCWS	30KAB60AA019	CCWS, RCP1/2 Motors CCWS CH1 Common Return MOV KAB60AA019	5.4	0.000
146	CCWS	30KAB70AA013	CCWS, RCP3/4 Motors CCWS CH1 Common Supply MOV KAB70AA013	5.4	0.000
147	CCWS	30KAB70AA014	CCWS, RCP3/4 Motors CCWS CH1 Common Supply Check Valve KAB70AA014	5.4	0.000
148	CCWS	30KAB70AA018	CCWS, RCP3/4 Motors CCWS CH1 Common Return MOV KAB70AA018	5.4	0.000
149	CCWS	30KAB70AA019	CCWS, RCP3/4 Motors CCWS CH1 Common Return MOV KAB70AA019	5.4	0.000
150	RCS	30JEB10AA010	RCP, RCP1 Leakoff Isolation MOV JEB10AA010	4.8	0.013

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
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Rank	System	Component ID	Component Description	RAW	FV
151	RCS	30JEB10AA020	RCP Seal, RCP1 Seal Nitrogen Venting Isolation MOV JEB10AA020	4.8	0.013
152	RCS	30JEB20AA010	RCP, RCP2 Leakoff Isolation MOV JEB20AA010	4.8	0.013
153	RCS	30JEB20AA020	RCP Seal, RCP2 Seal Nitrogen Venting Isolation MOV JEB20AA020	4.8	0.013
154	RCS	30JEB30AA010	RCP, RCP3 Leakoff Isolation MOV JEB30AA010	4.8	0.013
155	RCS	30JEB30AA020	RCP Seal, RCP3 Seal Nitrogen Venting Isolation MOV JEB30AA020	4.8	0.013
156	RCS	30JEB40AA010	RCP, RCP4 Leakoff Isolation MOV JEB40AA010	4.8	0.013
157	RCS	30JEB40AA020	RCP Seal, RCP4 Seal Nitrogen Venting Isolation MOV JEB40AA020	4.8	0.013
158	RCS	30JEB10 SSSF	Stand Still Seal for RCP1	4.7	0.004
159	RCS	30JEB20 SSSF	Stand Still Seal for RCP2	4.7	0.004
160	RCS	30JEB30 SSSF	Stand Still Seal for RCP3	4.7	0.004
161	RCS	30JEB40 SSSF	Stand Still Seal for RCP4	4.7	0.004
162	ELEC	31BRB	ELEC, 480V MCC 31BRB	4.7	0.000
163	ELEC	34BRB	ELEC, 480V MCC 34BRB	4.7	0.000
164	SCWS	30QKC10AA101	SCWS, Return from SAC Div 1 MOV QKC10AA101	4.6	0.000
165	HVAC	30SAC01AA004	SAC, Div 1 Recirculation Motor Operated Damper SAC01AA004	4.6	0.000
166	RCS	30JEB10AA018	RCP Seal, RCP1 Nitrogen Supply Solenoid Valve JEB10AA018	4.6	0.002
167	RCS	30JEB20AA018	RCP Seal, RCP2 Nitrogen Supply Solenoid Valve JEB20AA018	4.6	0.002
168	RCS	30JEB30AA018	RCP Seal, RCP3 Nitrogen Supply Solenoid Valve JEB30AA018	4.6	0.002
169	RCS	30JEB40AA018	RCP Seal, RCP4 Nitrogen Supply Solenoid Valve JEB40AA018	4.6	0.002
170	ELEC	32BRB	ELEC, 480V MCC 32BRB	4.2	0.000
171	ELEC	33BRB	ELEC, 480V MCC 33BRB	4.2	0.000
172	ELEC	31BUD	ELEC, Non 1E 250V DC Switchboard 31BUD	3.8	0.000
173	ELEC	32BUD	ELEC, Non 1E 250V DC Switchboard 32BUD	3.8	0.000

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
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Rank	System	Component ID	Component Description	RAW	FV
174	ELEC	31BRC	ELEC, 480V MCC 31BRC	3.8	0.000
175	ELEC	31BRU0301	ELEC, Inverter 31BRU03 Static Switch 31BRU0301	3.8	0.000
176	ELEC	32BRC	ELEC, 480V MCC 32BRC	3.8	0.000
177	ELEC	32BRU0301	ELEC, Inverter 32BRU03 Static Switch 32BRU0301	3.8	0.000
178	RCS	30JEB10AA019	RCP Seal, RCP1 Nitrogen Supply Check Valve JEB10AA019	3.7	0.000
179	RCS	30JEB20AA019	RCP Seal, RCP2 Nitrogen Supply Check Valve JEB20AA019	3.7	0.000
180	RCS	30JEB30AA019	RCP Seal, RCP3 Nitrogen Supply Check Valve JEB30AA019	3.7	0.000
181	RCS	30JEB40AA019	RCP Seal, RCP4 Nitrogen Supply Check Valve JEB40AA019	3.7	0.000
182	ELEC	32BDB	ELEC, 6.9kV SWGR 32BDB	3.3	0.000
183	ELEC	32BMB	ELEC, 480V Load Center 32BMB	3.3	0.000
184	ELEC	32BMT02	ELEC, 6.9kV-480V Transformer 32BMT02	3.3	0.000
185	RCS	30JEB10AP001- BKR	ELEC, 13.8kV SWGR 31BDE Circuit Breaker to RCP JEB10AP001	3.2	0.009
186	RCS	30JEB20AP001- BKR	ELEC, 13.8kV SWGR 32BDE Circuit Breaker to RCP JEB20AP001	3.2	0.008
187	HVAC	30SAC01AA003	SAC, Normal Air Inlet Motor Operated Damper SAC01AA003	3.2	0.001
188	HVAC	30SAC31AA002	SAC, Normal Air Exhaust Motor Operated Damper SAC31AA002	3.2	0.000
189	ELEC	2BDB2BMT02	ELEC, 6.9kV SWGR 32BDB to Transformer 32BMT02 Circuit Breaker	3.1	0.000
190	ELEC	2BMT022BMB	ELEC, Transformer 32BMT02 to 480V Load Center 32BMB Circuit Breaker	3.1	0.000
191	ELEC	2BDA_2BDB1	ELEC, 6.9kV SWGR 32BDA to 6.9kV SWGR 32BDB Circuit Breaker	3.0	0.000
192	ELEC	2BDA_2BDB2	ELEC, 6.9kV SWGR 32BDA to 6.9kV SWGR 32BDB Circuit Breaker	3.0	0.000
193	ELEC	34BRA	ELEC, 480V MCC 34BRA	2.7	0.000
194	HVAC	30SAC01AA005	SAC, Normal Air Inlet Supply Fan Discharge Check Damper SAC01AA005	2.6	0.000

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
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Rank	System	Component ID	Component Description	RAW	FV
195	HVAC	30SAC31AA003	SAC, Normal Air Exhaust Supply Fan Discharge Check Damper SAC31AA003	2.6	0.000
196	ELEC	31BUC	ELEC, 1E 250V DC Switchboard 31BUC	2.6	0.000
197	MFWS	30LAB12AA002	FWS, Pump 12 Discharge Pneumatic CHECK Valve LAB12AA002	2.6	0.000
198	MFWS	30LAB13AA002	FWS, Pump 13 Discharge Pneumatic CHECK Valve LAB13AA002	2.6	0.000
199	ELEC	1BRU031BRC	ELEC, Inverter 31BRU03 to 480V MCC 31BRC Circuit Breaker	2.3	0.000
200	ELEC	1BUD1BRU03	ELEC, 250V DC Pnl 31BUD to Inverter 31BRU03 Circuit Breaker	2.3	0.000
201	ELEC	2BRU032BRC	ELEC, Inverter 32BRU03 to 480V MCC 32BRC Circuit Breaker	2.3	0.000
202	ELEC	2BUD2BRU03	ELEC, 250V Pnl 32BUD to Inverter 32BRU03 Circuit Breaker	2.3	0.000
203	MFWS	30LAB11AA002	FWS, Pump 11 Discharge Pneumatic CHECK Valve LAB11AA002	2.3	0.000
204	ELEC	34BBA	ELEC, 13.8kV SWGR 34BBA	2.2	0.000
205	SCWS	30QKA10AA102	SCWS, Train 1 Discharge Xtie MOV QKA10AA102	2.1	0.000
206	SCWS	30QKA10AA103	SCWS, Train 1 Suction Xtie MOV QKA10AA103	2.1	0.000
207	SCWS	30QKA20AA102	SCWS, Train 2 Discharge Xtie MOV QKA20AA102	2.1	0.000
208	SCWS	30QKA20AA103	SCWS, Train 2 Suction Xtie MOV QKA20AA103	2.1	0.000
209	ELEC	1BRC_1BRB1	ELEC, 480V MCC 31BRC to 480V MCC 31BRB Circuit Breaker	2.1	0.000
210	ELEC	1BRC_1BRB2	ELEC, 480V MCC 31BRC to 480V MCC 31BRB Circuit Breaker	2.1	0.000
211	ELEC	2BRC_4BRB1	ELEC, 480V MCC 32BRC to 480V MCC 34BRB Circuit Breaker	2.1	0.000
212	ELEC	2BRC_4BRB2	ELEC, 480V MCC 32BRC to 480V MCC 34BRB Circuit Breaker	2.1	0.000
213	ELEC	32BUC	ELEC, 1E 250V DC Switchboard 32BUC	2.1	0.000
214	ELEC	31BHD02	ELEC, 480V MCC 31BHD02	2.0	0.000

**Table 19.1-57—U.S. EPR Risk-Significant Equipment based on RAW  
Importance - Level 2 Internal Flooding  
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<b>Rank</b>	<b>System</b>	<b>Component ID</b>	<b>Component Description</b>	<b>RAW</b>	<b>FV</b>
215	CCWS	30KAA10AA006	CCWS, Train 1 Discharge to Common Header 1 Hydraulic Valve KAA10AA006	2.0	0.000
216	CCWS	30KAA10AA010	CCWS, Train 1 Return from Common Header 1 Hydraulic Valve KAA10AA010	2.0	0.000

**Table 19.1-58—U.S. EPR Risk-Significant Human Actions based on FV Importance - Level 2 Internal Flooding**

Rank	ID	Description	Nominal Value	FV	RAW
1	OPF-RCP-30M	Operator Fails to Trip RCPs on a Loss of Bearing Cooling	4.0E-02	<b>0.598</b>	15.3
2	OPF-TB CH SO	Operator Fails to Switch Common Header Supply to RCP TB Cooling (Given a CCW Train Loss)	2.2E-02	<b>0.069</b>	4.1
3	OPF-EFW RF-6H	Operator Fails to Refill EFW Tanks Through DWS/Fire Water Make Up	8.0E-04	<b>0.023</b>	29.9
4	OPF-SAC-2H	Operator Fails to Recover Room Cooling Locally	1.2E-02	<b>0.023</b>	2.9
5	OPF-REC MOV	Operator Fails to Locally Isolate FWDS Ring Header	1.5E-01	<b>0.015</b>	1.1
6	OPD-RCP-10M-MED	Operator fails to trip RCP on loss of seal inj - medium dependency	1.9E-01	<b>0.015</b>	1.1
7	OPD-AFS-S2-32H	Operator Fails to Isolate 1" FWDS Break Before Penetration in 32 Hours	1.0E+00	<b>0.009</b>	1.0
8	OPE-AFS-10H	Operator Fails to Isolate 1" FWDS Pipe Break Before Ground Level in 10 Hours	1.0E-05	<b>0.009</b>	935.0
9	OPF-RCP-10M	Operator Fails to Trip RCPs on a Loss of Seal Injection	6.0E-02	<b>0.008</b>	1.1
10	OPD-SAC-2H-LOW	Operator fails to start local room cooling - low dependency	6.0E-02	<b>0.008</b>	1.1



**Table 19.1-59—U.S. EPR Risk-Significant Human Actions based on RAW Importance - Level 2 Internal Flooding**

<b>Rank</b>	<b>ID</b>	<b>Description</b>	<b>Nominal Value</b>	<b>RAW</b>	<b>FV</b>
1	OPE-AFS-10H	Operator Fails to Isolate 1" FWDS Pipe Break Before Ground Level in 10 Hours	1.0E-05	<b>935.0</b>	0.009
2	OPF-EFW-RF-6H	Operator Fails to Refill EFW Tanks Through DWS/Fire Water Make Up	8.0E-04	<b>29.9</b>	0.023
3	OPF-RCP-30M	Operator Fails to Trip RCPs on a Loss of Bearing Cooling	4.0E-02	<b>15.3</b>	0.598
4	OPF-EFW-6H	Operator Fails to Manually Align EFW Tanks Within 6 Hrs	2.0E-05	<b>12.0</b>	0.000
5	OPF-SAC-1H	Operator Fails to Start Maintenance HVAC Trains After Failure of Normal SAC Safety Train	1.1E-04	<b>4.1</b>	0.000
6	OPF-TB-CH SO	Operator Fails to Switch Common Header Supply to RCP TB Cooling (Given a CCW Train Loss)	2.2E-02	<b>4.1</b>	0.069
7	OPF-SAC-2H	Operator Fails to Recover Room Cooling Locally	1.2E-02	<b>2.9</b>	0.023

**Table 19.1-60—U.S. EPR Risk-Significant Common Cause Events based on RAW - Level 2 Internal Flooding**

Rank	System	ID	Description	Nominal Value	RAW
1	ELEC	BTD01_BAT__ST_D-ALL	CCF of Safety Related Batteries on Demand	1.6E-07	1,020.0
2	FWDS	SGB30AA001EFC_D-ALL	CCF to close FWDS header isolation MOV on train 1 and 4	9.6E-06	142.0
3	HVAC	SAC31AN001EFR_B-ALL	CCF to Run Normal Air Exhaust Fans (Trains 1 & 4)	5.1E-06	127.0
4	HVAC	SAC01AN001EFR_B-ALL	CCF to Run Normal Air Supply Fans (Trains 1 & 4)	5.1E-06	127.0
5	MFWS	LAB60AA003CFO_D-ALL	CCF to Open FW Lines to SG Check Valves	4.5E-07	103.0
6	RCS	JEB10AP001BFO_D-ALL	CCF to Open Reactor Coolant Pump Bus Breakers	8.2E-06	91.5
7	EFWS	LAS11AP001EFS_D-ALL	CCF of EFWS Pumps to Start	1.0E-05	35.8
8	EFWS	LAS11AP001EFR_D-ALL	CCF of EFWS Pumps to Run	7.7E-06	35.7
9	CLCWS	PGC11AP001EFR_B-ALL	CCF of CLCWS Pumps 11 and 12 to Run (Normally Running)	2.1E-06	22.4

Next File