APPENDIX M

LIMERICK GENERATING STATION

M-1

PROPRIETARY

TABLES

PROPRIETARY

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TABLE M-0.0. (continued)

PRA Event	ASEP Event	Component Description	Unavailability	ASEP Event Unavailability Type
ABGSA		Failure of ADS backup gas supply, Train A (Excluding ABGSA- AND gate)		
	ASDBGABA	AAVS2ADFI, failure of pressure regulator		
		AVV2BADWI, globe/check valve fail closed		
		ABVS2ADFI, failure of solenoid valve 157A, NC-FC		
	UACBGABC	AGB1A2DWI, ADS backup gas supply unavailable to Train A		
ABGSB		Failure of ADS backup gas supply, Train B (Excluding ABGSB- AND gate)		
	ASDBGBBA	AAVS2BDFI, failure of pressure regulator		
		ABVS2BDFI, failure of solenoid valve 152B, NC-FC		
		AVV2BBDWI, globe/check valves fail closed		
	UAOBGBBP	AGB1B2DWI, ADS backup gas supply unavailable		
ACMA		Failure of instrument gas system A (for ADS gas supply)		
	HSIGCAAS	APPIGADFI, instrument gas system A line rupture		
	HSIGSAAJ	ACMA11DWI, failure of instrument gas system A compressor		
	LOSPCMAA	EOSP, loss of offsite power		
ACMB		Failure of instrument gas system B (for ADS gas supply)		
	HSIGCBAR	APPIGBDFI, instrument gas system B, line rupture, fail plant instrument air Train B also		
	HSIGSBAI	ACMB11DWI, failure of instrument gas system B compressor		
	LOSPCMAA	EOSP, loss of offsite power		
ACPIADWI	HSIACAAH	ACPIADWI, failure of plant instrument air compressor A (for ADS gas supply)		
ACPIBDWI	HSIACBAG	ACPIBDWI, failure of plant instrument air compressor B (for ADS gas supply)		
ACV122DWI	HSINCBBT	ACV122DWI, failure of ADS gas supply check valve 1122		
ACV141DWI	HSINCABS	ACV141DWI, failure of ADS gas supply check valve 1141		
ACV24EDWI	HSDC4EBK	ACV24EDWI, ADS gas supply check valve 1024E fails to close		
ACV24HDWI	HSDC4HBD	ACV24HDWI, ADS gas supply check valve 1024H fails to close		
ACV24KDWI	HSDC4KBE	ACV24KDWI, ADS gas supply check valve 1024K fails to close		
ACV24MDWI	HSDC4MBF	ACV24MDWI, ADS gas supply check valve 1024M fails to close		
ACV24SDWI	HSDC4SBG	ACV24SDWI, ADS gas supply check valve 1024S fails to close		
ACV31EDWI	HSDC1EBH	ACV31EDWI, ADS gas supply check valve 1131E fails to close		
ACV31HDWI	HSDC1HBI	ACV31HDWI, ADS gas supply check valve 1131H fails to close		
ACV31KDWI	HSDC1KBJ	ACV31KDWI, ADS gas supply check valve 1131K fails to close		
ACV31MDWI	HSDC1MBK	ACV31MDWI, ADS gas supply check valve 1131M fails to close		
ACV31SDWI	HSDC1SBL	ACV31SDWI, ADS gas supply check valve 1131S fails to close		
AAHCA11		Failure of PG line B check valves (ADS gas supply)		
	HSADC3BA	ACV23EDWI, check valve 1023E fails to close		
		ACV23KDWI, check valve 1023K fails to close		
AHGA2		Containment isolation valve (29A) fails to closed (fails gas supply, header A, to ADS valve)		
	ACDC9AAT	AFAL29A, false isolation signal closes valve		
	HSDC9AAT	AISV29AHCI, isolation valve fails closed, NC-FC		

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PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
AHOB11		Failure of PG line A check valves (ADS gas supply)		
	HSADCAAE	ACV23HOAI, check valve 1023H fails to close		
		ACV23MOAI, check valve 1023M fails to close		
		ACV23SOAI, check valve 1023S fails to close		
AHOB2		Containment isolation valve (298) fails closed (fails gas supply, header B, to ADS valve)		
	ACDC9BAU	AFAL298, false isolation signal closes		
	HSDC9BAU	ASL298HOI, isolation valve fails closed, NO-FC		
APGSA		Failure of ADS normal gas supply, Train A (Portion which is common with other events)		
	HSNGRABU	APPH3AOFI, ADS normal gas supply, header A rupture		
APGSA		Failure of ADS normal gas supply, Train A (Excluding events ACMA and common event APPH3AOFI)		
	HSNGSABW	ASVSOAOOI, failure of solenoid valve 150-A, NO-FC		
		AVVP3ADWI, globe/check valve fails closed		
APGSB		Failure of ADS normal gas supply, Train B (Portion which is common with other events)		
	HSNGRBBV	APPH3BOFI, ADS normal gas supply, header B ruptures		
APGSB		Failure of ADS normal gas supply, Train B (Excluding events ACMB and common event APPH3BOFI)		
	HSNGSBBI	ASVSOBOOI, failure of solenoid valve 150-B, NO-FC		
		AVVP3BDWI, globe/check valves fail closed		
APIA1		Failure of plant instrument air system, Train A (for ADS gas supply) (Portion excluding the APIA2 AND gate)		
	ESIAIIAL	AHVOO1OXI, operator fails to open valve (common between both trains)		
	MMPIAAAP	AVVIZBOWI, globe valves 1094A and 1095A		
	HSIAABAQ	AVVIC3OWI, globe/check valve failure (common between both trains)		
	HSICSAAS	APPIGAOFI, instrument gas system line A rupture, fails plant instrument air Train A also		
	HSPIAAAA	ASV28AOPI, solenoid valve fails to open, NC-FC		
APIB1		Plant instrument air unavailable, Train B (for ADS gas supply) (Portion excluding the APIA2 AND gate)		
	ESIAIIAL	Defined under PRA event APIA1		
	MMPIABAO	AVVIZBOWI, globe valves 1094B and 1095B fail closed		
	HSIAABAQ	Defined under PRA event APIA1		
	HSIGCSAR	APPIGBOFI, instrument gas system B, line rupture, fails plant instrument air, Train B, also		
	HSPIABAM	ASV28BOPI, solenoid valve fails to open, NC-FC		
APPP3AOFI	HSADRAAO	APPP3AOFI, point gas A header rupture (for ADS)		
APPP3BOFI	HSADRBAZ	APPP3BOFI, point gas B header rupture (for ADS)		
APTA2		Containment isolation valve fails closed (fails point gas A, ADS gas supply)		
	ACDC1AAV	AFALS1A, false isolation signal closes valve		
	HSDC1AAV	ASVS1AHOI, isolation valve fails closed		
APTB2		Containment isolation valve fails closed (fails point gas B, ADS gas supply)		
	ACDC1BAW	AFALS1B, false isolation signal closes valve		
	HSDC1BAW	ASVS1BHOI, isolation valve fails closed		

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PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
AAC	ESRMC104	ARC, failure of normal HPCI/RCIC room cooling equipment and the operator fails to establish a natural ventilation path for these rooms in the two to four hour range		
ASV1AB1		ADS valve #1 solenoid A fails		
	HSDS1ADA	ASV1AADYI, solenoid A fails		
		ACA10ADWI, local signal failure (wire failure)		
	UNDG1BCC	AAS111DWI, ADS gas supply contaminated		
ASV1AB3		ADS valve #1 solenoid B unavailable		
	HSDS1BCP	ACA10BDWI, local signal failure (wire failure)		
		ASV1BCDYI, solenoid B fails		
	UNDG1BCC	Defined under PRA event ASV1AB1		
ASV2AB1		ADS valve #2 solenoid A fails		
	HSDS2ADC	ASV2AADYI, solenoid A fails		
		ACA20ADWI, local signal failure (wire failure)		
	UNDG2BCT	AAS211DWI, ADS gas supply contaminated		
ASV2AB3		ADS valve #2 solenoid B unavailable		
	HSDS2BCS	ACA20BDWI, local signal failure (wire failure)		
		ASV2BCDYI, solenoid B fails		
	UNDG2BCT	Defined under PRA event ASV2AB1		
ASV3AB1		ADS valve #3 solenoid A fails		
	HSDS3ADO	ASV3AADYI, solenoid A fails		
		ACA30ADWI, local signal failure (wire failure)		
	UNDG3BCV	AAS311DWI, ADS gas supply contaminated		
ASV3AB3		ADS valve #3 solenoid B unavailable		
	HSDS3BCU	ACA30BDWI, local signal failure (wire failure)		
		ASV3BCDYI, solenoid B fails		
	UNDG3BCV	Defined under PRA event ASV3AB1		
ASV4AB1		ADS valve #4 solenoid A fails		
	HSDS4ADE	ASV4AADYI, solenoid A fails		
		ACA40ADWI, local signal failure (wire failure)		
	UNDG4BCX	AAS411DWI, ADS gas supply contaminated		
ASV4AB3		ADS valve #4 solenoid B unavailable		
	HSDS4BCU	ACA40BDWI, local signal failure (wire failure)		
		ASV4BCDYI, solenoid B fails		
	UNDG4BCY	Defined under PRA event ASV4AB1		
ASV5AB1		ADS valve #5 solenoid A fails		
	HSDS5ADE	ASV5AADYI, solenoid A fails		
		ACA50ADWI, local signal failure (wire failure)		
	UNDG5BCZ	AAS511DWI, gas supply contaminated		
ASV5AB3		ADS valve #5 solenoid B unavailable		
	HSDS5BCY	ACA50BDWI, local signal failure (wire failure)		
		ASV5BCDYI, solenoid B fails		
	UNDG5BCZ	Defined under PRA event ASV5AB1		

PROTECT

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
ASVSCADRI	HSINVABO	ASVSCADRI, failure of solenoid valve 150A, NO-FO (ADS system)		
ASV50BDRI	HSIYVBBR	ASV50BDRI, failure of solenoid valve 150B, NO-FO (ADS system)		
ATKC1	TMADS1CH	ADS valve #1 unavailable due to T&M given that HPCI is not down for maintenance		
ATKC2	TMADS2CR	ADS valve #2 unavailable due to T&M given that HPCI and ADS valve #1 are not unavailable due to T&M		
ASTKC3	TMADS3DO	ADS valve #3 unavailable due to T&M given that HPCI and ADS valves #1 and #2 are not unavailable due to T&M		
ATKC4	TMADS4DP	ADS valve #4 unavailable due to T&M given that HPCI and ADS valves #1, #2 and #3 are not unavailable due to T&M		
ATKC5	TMADS5DQ	ADS valve #5 unavailable due to T&M given that HPCI and ADS valves #1, #2, #3 and #4 are not unavailable due to T&M		
AVVG11DWI	HSDP11CA	AVVG11DWI, check valve fails (fails ADS point gas supply)		
AVVG12DWI	HSDP12CB	AVVG12DWI, check valve fails (fails ADS point gas supply)		
AVVG13DWI	HSDP13CC	AVVG13DWI, check valve fails (fails ADS point gas supply)		
AVVG14DWI	HSDP14CD	AVVG14DWI, check valve fails (fails ADS point gas supply)		
AVVG15DWI	HSFP15CE	AVVG15DWI, check valve fails (fails ADS point gas supply)		
AVVH31DWI	HSDH31CF	AVVH31DWI, globe/check valves fail (fails header gas supply to ADS 1)		
AVVH32DWI	HSDH32CG	AVVH32DWI, globe/check valves fail (fails header gas supply to ADS 2)		
AVVH33DWI	HSDH33CH	AVVH33DWI, globe/check valves fail (fails header gas supply to ADS 3)		
AVVH34DWI	HSDH34CI	AVVH34DWI, globe/check valves fail (fails header gas supply to ADS 4)		
AVVH35DWI	HSDH35CJ	AVVH35DWI, globe/check valves fail (fails header gas supply to ADS 5)		
AVVH4ADWI	HSDGCBBB	AVVH4ADWI, globe/check valves fail closed (for ADS gas supply)		
AVVH4BDWI	HSADGCAF	AVVH4BDWI, globe/check valve fail closed (for ADS gas supply)		
AVVPZADWI	HSDGCABT	AVVPZADWI, globe/check valves fail closed, fails ADS point gas supply, Train A		
AVVPZBDWI	HSDGC3BZ	AVVPZBDWI, globe/check valves fails closed, fails ADS point gas supply, Train B		
AV1		ADS valve 1 fails to open if available (Portion excluding the ASV1AB AND gate and event AV1B)		
	EMADCYDG	AHU111DXI, operator error during maintenance, disables valve		
	HSADS1DH	AAV1PYOPI, pilot valve fails actuator		
		AAV1000PI, mechanical valve failure		
AV1AL		ADS valve 13E line or accumulator rupture		
	HSD13EAY	AAL103DFI, accumulator rupture		
		APPA310FI, valve 13E line rupture		
AV1B1		Gas supply to ADS valve #1 solenoids, blocked		
	HSD8V1CX	AXV18EDQI, manual globe valve fails closed		
		ACV36EDPI, check valve fails closed, NC-FC		
AV2		ADS valve #2 fails to open if available (Portion excluding the ASV2AB AND gate and event AV2B)		
	EMADCYDG	Defined under PRA event AV1		
	HSADS2DI	AAV2PYDPI, pilot valve fails (actuator)		
		AAV2000PI, mechanical valve failure		
AV2AL		ADS valve 13H line or accumulator rupture		
	HSD13HAA	AAL203DFI, accumulator rupture		
		APPA320FI, valve 13H line rupture		

PROTECT

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
ASV5OADWI	HSINVABO	ASV5OADWI, failure of solenoid valve 150A, NO-FO (ADS system)		
ASV5OBDWI	HSINVB8R	ASV5OBDWI, failure of solenoid valve 150B, NO-FO (ADS system)		
ATWCI	TMADSION	ADS valve #1 unavailable due to T&M given that HPCI is not down for maintenance		
ATWC2	TMADS2OR	ADS valve #2 unavailable due to T&M given that HPCI and ADS valve #1 are not unavailable due to T&M		
ASTWC3	TMADS3OO	ADS valve #3 unavailable due to T&M given that HPCI and ADS valves #1 and #2 are not unavailable due to T&M		
ATWC4	TMADS4OP	ADS valve #4 unavailable due to T&M given that HPCI and ADS valves #1, #2 and #3 are not unavailable due to T&M		
ATWC5	TMADS5OO	ADS valve #5 unavailable due to T&M given that HPCI and ADS valves #1, #2, #3 and #4 are not unavailable due to T&M		
AVVG11DWI	HSDP11CA	AVVG11DWI, check valve fails (fails ADS point gas supply)		
AVVG12DWI	HSDP12CB	AVVG12DWI, check valve fails (fails ADS point gas supply)		
AVVG13DWI	HSDP13CC	AVVG13DWI, check valve fails (fails ADS point gas supply)		
AVVG14DWI	HSDP14CD	AVVG14DWI, check valve fails (fails ADS point gas supply)		
AVVG15DWI	HSDP15CE	AVVG15DWI, check valve fails (fails ADS point gas supply)		
AVVH31DWI	HSDH31CF	AVVH31DWI, globe/check valves fail (fails header gas supply to ADS 1)		
AVVH32DWI	HSDH32CG	AVVH32DWI, globe/check valves fail (fails header gas supply to ADS 2)		
AVVH33DWI	HSDH33CH	AVVH33DWI, globe/check valves fail (fails header gas supply to ADS 3)		
AVVH34DWI	HSDH34CI	AVVH34DWI, globe/check valves fail (fails header gas supply to ADS 4)		
AVVH35DWI	HSDH35CJ	AVVH35DWI, globe/check valves fail (fails header gas supply to ADS 5)		
AVVH4ADWI	HSDGCB8B	AVVH4ADWI, globe/check valves fail closed (for ADS gas supply)		
AVVH4BDWI	HSAOGCAF	AVVH4BDWI, globe/check valve fail closed (for ADS gas supply)		
AVVPZADWI	HSDGCABY	AVVPZADWI, globe/check valves fail closed, fails ADS point gas supply, Train A		
AVVPZBDWI	HSDGC38Z	AVVPZBDWI, globe/check valves fails closed, fails ADS point gas supply, Train B		
AV1		ADS valve 1 fails to open if available (Portion excluding the ASV1AB AND gate and event AV1B)		
	EMADCNOG	AHU111DXI, operator error during maintenance, disables valve		
	HSADS1OH	AAV1PVOPI, pilot valve fails actuator		
		AAV1OODPI, mechanical valve failure		
AV1AL		ADS valve 13E line or accumulator rupture		
	HSD13EAY	AAL103DFI, accumulator rupture		
		APPA31DFI, valve 13E line rupture		
AV1B1		Gas supply to ADS valve #1 solenoids, blocked		
	HSDBVICX	AXV18EDDI, manual globe valve fails closed		
		ACV36EDPI, check valve fails closed, NC-FC		
AV2		ADS valve #2 fails to open if available (Portion excluding the ASV2AB AND gate and event AV2S)		
	EMADCNOG	Defined under PRA event AV1		
	HSADS2OI	AAV29VOPI, pilot valve fails (actuator)		
		AAV2OODPI, mechanical valve failure		
AV2AL		ADS valve 13H line or accumulator rupture		
	HSD13HAX	AAL2O3DFI, accumulator rupture		
		APPA32DFI, valve 13H line rupture		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
AV2BI		Gas supply to ADS valve #2 solenoids, blocked	—	—
	HSD8V2CL	AIV18HOOI, manual globe valve fails closed		
		ACV18HOOI, check valve fails closed, NC-FC		
AV3		ADS valve #3 fails to open if available (Portion excluding the ASY3A8 AND gate and event AV3B)		
	HSADS3OU	AAV3PVOPI, pilot valve fails (actuator)		
		AAV3OOOPI, mechanical valve failure		
	EMADCMOG	Defined under PRA event AV1		
AV3AL		ADS valve 13K line or accumulator rupture		
	HSO13KAX	AAL3O3OFL, accumulator rupture		
		APPA33OFI, valve 13K line rupture		
AV2BI		Gas supply to ADS valve #3 solenoids, blocked		
	HSD8V3CM	AIV18KOOI, manual globe valve fails closed		
		ACV28KOPI, check valve fails closed, NC-FC		
AV4		ADS valve #4 fails is available (Portion excluding the ASV4A8 AND gate and event AV4B)		
	EMADCMOG	Defined under PRA event AV1		
	HSADS4OK	AAV4PVOPI, pilot valve fails (actuator)		
		AAV4OOOPI, mechanical valve failure		
AV4AL		ADS valve 13M line or accumulator rupture		
	HSO13MA8	AAL4O3OFI, accumulator rupture		
		APPA34OFI, valve 13M line rupture		
AV4BI		Gas supply to ADS valve #4 solenoids, blocked		
	HSD8V4CX	AIV18MOOI, manual globe valve fails closed		
		ACV18COPI, check valve fails closed, NC-FC		
AV5		ADS valve #5 fails is available (Portion excluding the ASV5A8 AND gate and event AV5B)		
	EMADCMOG	Defined under PRA event AV1		
	HSADS5OL	AAV5PVOPI, pilot valve fails (actuator)		
		AAV5OOOPI, mechanical failure		
AV5AL		ADS valve 13S line or accumulator rupture		
	HSO13SAC	AAL5O3OFI, accumulator rupture		
		APPA35OFI, valve 13S line rupture		
AV5BI		Gas supply blocked to ADS valve #5 solenoids		
	HSD8V5CO	AIV18SOOI, manual globe valve fails closed		
		ACV36SOPI, check valve fails closed, NC-FC		
CMDF	CMDGAL01	CMDF, common mode diesel failure		
DAT	TMC11ATO	DAT, LPCI pump Train A unavailable due to maintenance given that LPCS loops 1 and 2, and all diesels are not in maintenance		
DBT	TMC12STC	DBT, LPCI pump Train B unavailable due to maintenance given that LPCI pump Trains A and C, LPCS loops 1 and 2, and all diesels are not in maintenance		
DCROSSAB1		Failure of cooling tower crossover valves (ESW)		
	HSPESUEH	DMV17SOPI, motor operated butterfly valve, NC-FC		
		DMV17AOPI, motor operated butterfly valve, NC-FC		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Data
DCRCSSAB2		Failure of spray pond crossover valves (ESW)		
	HSRESAEG	DMWJ4BDPI, motor operated butterfly valve, NC-FC		
		DMWJ4ADPI, motor operated butterfly valve, NC-FC		
DCT	TMC11CTB	DCT, LPCI pump Train C unavailable due to maintenance given that LPCS loops 1 and 2, and all diesels are not in maintenance		
DDA2		Discharge valves to LPCI injection loop 1, pump Train A, fail closed (Excluding event EAC44QA)		
	HSC11ARI	DIV65AODI, discharge valve fails closed, MLO-FC		
		DCY41ADPI, discharge check valve stuck closed		
		DMW17ADPI, discharge MOV fails closed, NC-FC		
	HSC11ARJ	DPP02AHFI, pipe rupture occurs in discharge line of loop 1, pump Train A		
DDB2		Discharge valves to LPCI injection loop 2, pump Train B, fail closed (Excluding event EAC44OB)		
	HSC12BRF	DIV64bODI, discharge valve fails closed, MLO-FC		
		DCY41BDPI, discharge check valve stuck closed		
		DMW17BDPI, discharge MOV fails closed, NC-FC		
	HSC12BRG	DPP02BHFI, pipe rupture occurs in discharge line of loop 2, pump Train B		
DDC2		Discharge valves to LPCI injection, loop 1, pump Train C, fail closed (Excluding event EAC44OC)		
	HSC11CRW	DPP02CHFI, pipe rupture in discharge line of pump Train C		
		DIV65CODI, discharge valve fails closed, MLO-FC		
		DMW17CDPI, discharge MOV fails closed, NC-FC		
		DCY41CDPI, discharge check valve stuck closed		
DDD2		Discharge valves to LPCI injection, loop 2, pump Train D, fail closed (Excluding event EAC44OD)		
	HSC12DRU	DPP02DHFI, pipe rupture in discharge line of pump Train D		
		DIV65DODI, discharge valve fails closed, MLO-FC		
		DMW17DDPI, discharge MOV fails closed, NC-FC		
		DCY41DDPI, discharge check valve stuck closed		
DDIFFA		Failure of differential pressure permissive, fails LPCI pump Train A, loop 1		
	ENC11MFA	DHU919QII, miscalibration of pressure channels (channel 58)		
	HSC1PARA	DPR58AHWI, failure of pressure sensor 58A		
		DRE58AHWI, failure of pressure relay logic		
DDIFFB		Failure of differential pressure permissive, fails LPCI pump Train B, loop 2		
	ENC1CMRA	Defined under PRA event DDIFFA		
	HSC1P5RB	DPR58BHWI, failure of pressure sensor 58B		
		DRE58BHWI, failure of pressure relay logic		
DDIFFC		Failure of differential pressure permissive, fails pump Train C, loop 1		
	ENC1CMRA	Defined under PRA event DDIFFA		
	HSC1PCRC	DPR58CHWI, failure of pressure sensor 58C		
		DRE58CHWI, failure of pressure relay logic		

PRA Event	ASEP Event	Component Explanation	Unavailability	ASEP Event Unavailability Total
DOIFFD		Failure of differential pressure permissive, fails pump Train D, loop 2		
	ENC1CMRA	Defined under PRA event DOIFFA		
	HSC1PORD	DPP580HWI, failure of pressure sensor 580		
		DRES80HWI, failure of pressure relay logic		
DDT	TMC120TDA	DDT, LPCI pump Train D unavailable due to maintenance given that LPCI pump Trains A and C, LPCS loops 1 and 2, and all diesels are not in maintenance		
DFAPA		Failure of LPCI alternate path (through pump Train A) for pump Train C (Excluding events DRXZA, DFPMAD, EAC440A)		
	ESC11TRY	DHUO3CDII, failure of operator to realign valves		
	HSC11TRY	DCV31ADRI, pump discharge check valve fails to prevent flow		
	HSI1A1RY	DHV82ADPI, MOV crossover valve fails closed (F182A), NC-FC		
	HSI1A2RY	DHVO3ADDI, MOV fails closed (FO03A) NO-FC		
DFAPB		Failure of LPCI alternate path (through pump Train B) for pump Train D (Excluding events DRX2B, DFPMBD, EAC440B)		
	ESC12TRT	DHUO3DDII, failure of operator to realign valves		
	HSC12TRT	DCV31BDRI, pump discharge check valve fails to prevent flow		
	HSI2B1RT	DHV82SDPI, MOV crossover valve fails closed (F182B), NC-FC		
	HSI2B2RI	DHVO3BDDI, MOV fails closed (FO03B) NO-FC		
DFAPC		Failure of LPCI alternate path (through pump Train C) for pump Train A (Excluding events DFMPD and EAC440C)		
	ESC11ARZ	DHUO2ADII, failure of operator to manually realign valves		
	HSI1A1RY	Defined under PRA event DFAPA		
	HSI1A1RZ	DHV10ADDI, MOV FO10A fails open, NC-FO		
	HSI1A2RZ	DHV47ADDI, MOV FO47A fails closed, NO-FC		
	HSI1CTRZ	DCV31CDRI, pump discharge check valve fails to prevent flow		
DFAPD		Failure of LPCI alternate path (through pump Train D) for pump Train B (Excluding events DFMPD and EAC440D)		
	ESC12BRI	DHUO2YDII, failure of operator to manually realign valves		
	HSI2B1RT	Defined under PRA event DFAPB		
	HSI2B1RI	DHV10BDDI, MOV FO10B fails open, NC-FO		
	HSI2B2RI	DHV47BDDI, MOV FO47 fails closed, NO-FC		
	HSI2DTRI	DCV31DDRI, pump discharge check valve fails to prevent flow		
DFCTA1 DFCTB1		Valves to cooling tower unit 1 fails (ESW) (Portions excluding DCROSSAB event)		
	HSRESTEN	DHV11460D, cooling tower MOV butterfly valve, NO-FC		
		DHV111DPI, motor operated butterfly valve, NC-FC		
		DHV113DPI, motor operated butterfly valve, NC-FC		
DFCTA2 DFCTB2		Valves to cooling tower unit 2 fails (ESW) (Portions excluding DCROSSAB)		
	HSRESTEN	DHV214600, cooling tower MOV butterfly valve, NO-FC		
		DHV211DPI, motor operated butterfly valve, NC-FC		
		DHV213DPI, motor operated butterfly valve, NC-FC		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Used
DFF-1A		Failure of flow through LPCI heat exchanger A		
	HSIH1ASA	DHX01AHEI, heat exchanger A plugged		
	HSI1A2RV	Defined under PRA event DFAPA		
	HSI1A2RZ	Defined under PRA event DFAPC		
DFF-1B		Failure of flow through LPCI heat exchanger B		
	HSIH1BRT	DHX01BHEI, heat exchanger plugged		
	HSI2S2RT	Defined under PRA event DFAPB		
	HSI1B2RX	Defined under PRA event DFAPD		
DFL01AHEI	HSIP1ASE	DFL01AHEI, single strainer 1A blockage/failure (LPCI suction from SP)		
DFL02AHEI	HSIP2ASD	DFL02AHEI, single strainer 2A blockage/failure (LPCI suction from SP)		
DFL01BHEI	HSIP1BSH	DFL01BHEI, single strainer 1B blockage/failure (LPCI suction from SP)		
DFL02BHEI	HSIP2BSG	DFL02BHEI, single strainer 2B blockage/failure (LPCI suction from SP)		
DFL01CHEI	HSIP1CSK	DFL01CHEI, single strainer 1C blockage/failure (LPCI suction from SP)		
DFL02CHEI	HSIP2CSJ	DFL02CHEI, single strainer 2C blockage/failure (LPCI suction from SP)		
DFL01DHEI	HSIP1DSN	DFL01DHEI, single strainer 1D blockage/failure (LPCI suction from SP)		
DFL02DHEI	HSIP2DSM	DFL02DHEI, single strainer 2D blockage/failure (LPCI suction from SP)		
DFPH1BA		Flow diverted from LPCI pump Train A to suppression pool (SP)		
	HSC11ARR	DHV24ADOI, MOV, NC-FO		
		DHV27ADOI, valve to SP spray header, NC-FO		
DFPH1BB		Flow diverted from LPCI pump Train B to suppression pool (SP)		
	HSC12SRX	DHV24BDOI, MOV, NC-FO		
		DHV27BDOI, valve to SP spray header, NC-FO		
DHU102XXI	ESC1XXRE	DHU102XXI, failure to manually open discharge valves (loop 2, pump Train B and D) or operator fails to realign pump Train A and or B for injection via the recirculation loop (LPCI)		
DICT1		Failure of discharge valves from cooling tower #1 (ESW)		
	HSRESTEO	DPW112DPI, motor operated butterfly valve, NC-FC		
		DPW114DPI, motor operated butterfly valve, NC-FC		
DICT2		Failure of discharge valves from cooling tower #2 (ESW)		
	HSRESTEP	DPW212DPI, motor operated butterfly valve, NC-FC		
		DPW214DPI, motor operated butterfly valve, NC-FC		
DPW005DOI	HSRESAEF	DPW005DOI, failure of motor operated connecting sluice gate, NO-FC		
DPW03ADOI	HSRESAEB	DPW03ADOI, ESW sluice gate 1A to wet pit fails, NO-FC		
DPW03BDOI	HSRESAED	DPW03BDOI, ESW sluice gate 3B to wet pit fails, NO-FC		
DPW03CDOI	HSRESAEA	DPW03CDOI, ESW sluice gate 1C to wet pit fails, NO-FC		
DPW03DDOI	HSRESAEC	DPW03DDOI, ESW sluice gate 3D to wet pit fails, NO-FC		
DPW16ADOI	HSC11ARO	DPW16ADOI, LPCI MOV in loop #1, NC-FO		
DPW16BDOI	HSC12SRM	DPW16BDOI, LPCI MOV in loop #2, NC-FO		
DPW21ADOI	HSC11ARP	DPW21ADOI, LPCI MOV in loop #1, NC-FO		
DPW21BDOI	HSC12SRL	DPW21BDOI, LPCI MOV in loop #2, NC-FO		
DPW32ADOI	HSRESAEI	DPW32ADOI, ESW motor operated butterfly valve, NO-FC		
DPW32BDOI	HSRESAEL	DPW32BDOI, ESW motor operated butterfly valve, NO-FC		
DPW32CDOI	HSRESAEJ	DPW32CDOI, ESW motor operated butterfly valve, NO-FC		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
DHV3200CI	HSAE3WEX	DHV3200CI, ESW motor operated butterfly valve, NO-FC		
DHV48A00I	HSCIHASC	DHV48A00I, ESW motor operated butterfly valve fails closed, NO-FC		
DHV48B00I	HSCIH8S8	DHV48B00I, ESW motor operated butterfly valve fails closed, NO-FC		
DPHAUXA		Loss of LPCI pump A auxiliaries (Excluding events EAC440A and HSWA)		
	HMIR1ASY	KRMCLL1A, failure of pump A room cooling equipment		
	HSIL1ASY	DLUBE01A, loss of lubrication for pump A		
DPHAUXB		Loss of LPCI pump B auxiliaries (Excluding events EAC440B and HSWB)		
	HMIR2BSW	KRMCLL1B, failure of pump __ room cooling equipment		
	HSIL2BSW	DLUBE01B, loss of lubrication for pump B		
DPHC1		Failure of LPCI pump Train C to provide adequate head (Excluding events DPHC10)		
	HSCI1CSV	DCV31C0PI, pump C check valve fails, stuck closed		
		DPMO2CDWI, pump C fails to start or run		
DPHC10		Loss of LPCI pump C auxiliaries (Excluding events EAC440C and HSWA)		
	HMIR1CSU	KRMCLL1C, failure of pump C room cooling equipment		
	HSIL1CSU	DLUBE01C, loss of lubrication for pump C		
DPHD1		Failure of LPCI pump Train D to provide adequate head (Excluding events DPHD10)		
	HSCI2DSI	DCV31D0PI, pump D check valve fails, stuck closed		
		DPMO2DDWI, pump D fails to start or run		
DPHD10		Loss of LPCI pump D auxiliaries (Excluding events EAC440D and HSWB)		
	HMIR2DSS	KRMCLL1D, failure of pump D room cooling equipment		
	HSIL2DSS	DLUBE01, loss of lubrication for pump D		
DPHXA2		Failure of LPCI pump Train A to provide adequate head (Excluding events DPHAUXA)		
	HSCI1ASZ	DCV31A0PI, pump A check valve fails, stuck closed		
		DPMO2ADWI, pump A fails to start or run		
DPHXB2		Failure of LPCI pump Train B to provide adequate head (Excluding events DPHAUXB)		
	HSCI2BSI	DCV31B0PI, pump B check valve fails, stuck closed		
		DPMO2BDWI, pump B fails to start or run		
DPSLOW	UARES3EE	DPSLOW, spray pond water level insufficient (ESW)		
DRX1A		Failure of flow to enter Rx vessel via recirculation loop (loop 1, pump Train A, LPCI)		
	ESCIXXRE	Defined under PRA event DHU1020XI		
	HSCI1ARK	DIY60A00I, manual valve, NLO-FC		
		DCY50A0PI, air operated check valve fails, stuck closed		
		DHV15A0PI, MOV, NC-FC		
DRX1B		Failure of flow to enter Rx vessel via recirculation loop (loop 2, pump Train B, LPCI)		
	ESCIXXRE	Defined under PRA event DHU1020XI		
	HSCI2BRH	DIY60B00I, manual valve, NLO-FC		
		DCY50B0PI, air operated check valve fails, stuck closed		
		DHV15B0PI, MOV, NC-FC		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
DSTA		Insufficient flow from SP strainer to LPCI pump A (Excluding event LSP and the DSTA2 AND gate)		
	HSCIPASF	DPP01AHFI, pipe rupture in suction line		
		LHV04AODI, suction MOV, NO-FC		
DSTAB		LPCI alternate path A: failure to provide flow to pump B (Excluding event DSTA)		
	ESCICTSP	DHUO1AOXI, failure to manually initiate the opening of the crossover valves		
	HSITGASR	DHV06AOPI, crossover MOV, NC-FC		
	HSIT6BSD	DHV06BOPI, crossover MOV, NC-FC		
DSTAC		LPCI alternate path A: failure to provide flow to pump C (Excluding event)		
	ESCICTSP	Defined under PRA event DSTAB		
	HSIT6ASR	Defined under PRA event DSTAB		
	HSITTASP	DIV67AOPI, crossover manual valve (067A), NLC-FC		
DSTAD		LPCI alternate path A: failure to provide flow to pump D		
	ESCICTSP	Defined under PRA event DSTAB		
	HSIT7BSP	DIV67BOPI, crossover manual valve (067B), NLC-FC		
	HSIT6ASR	Defined under PRA event DSTAB		
DSTB		Insufficient flow from SP strainer to LPCI pump B (Excluding event LSP and the DSTB2 AND gate)		
	HSCIPBSI	DPP01BHFI, pipe rupture in suction line		
		LHV04BODI, suction MOV, NO-FC		
DSTBA		LPCI alternate path B: failure to provide flow to pump A (Excluding event DSTB)		
	ESCICTSP	Defined under PRA event DSTAB		
	HSIT6ASR	Defined under PRA event DSTAB		
	HSIT6BSD	Defined under PRA event DSTAB		
DSTBC		LPCI alternate path B: failure to provide flow to pump C		
	ESCICTSP	Defined under PRA event DSTAB		
	HSIT6BSD	Defined under PRA event DSTAB		
	HSIT7ASP	Defined under PRA event DSTAC		
DSTBD		LPCI alternate path B: failure to provide flow to pump D (Excluding event DSTB)		
	ESCICTSP	Defined under PRA event DSTAB		
	HSIT6BSD	Defined under PRA event DSTAB		
	HSIT7BSP	Defined under PRA event DSTAD		
DSTC		Insufficient flow from SP strainer to LPCI pump C (Excluding events LSP and the DSTC2 AND gate)		
	HSCIPCSL	DPP01CHFI, pipe rupture in suction line		
		LHV04CODI, suction MOV, NO-FC		
DSTCA		LPCI alternate path C: failure to provide flow to pump A (Excluding event DSTC)		
	ESCICTSP	Defined under PRA event DSTAB		
	HSIT6ASR	Defined under PRA event DSTAB		
	HSIT7ASP	Defined under PRA event DSTAC		

PRA Event	ASEP Event	Component Explanation	Unavailability	ASEP Event Unavailability Total
OSTC3		LPCI alternate path C: failure to provide flow to pump B (Excluding event OSTC)		
	ESCICTSP	Defined under PRA event OSTAB		
	HSIT6BSO	Defined under PRA event OSTAB		
	HSIT7ASP	Defined under PRA event OSTAC		
OSTCD		LPCI alternate path C: failure to provide flow to pump D (Excluding event OSTC)		
	ESCICTSP	Defined under PRA event OSTAB		
	HSIT7ASP	Defined under PRA event OSTAC		
	HSIT7BSP	Defined under PRA event OSTAD		
OSTD		Insufficient flow from SP strainer to LPCI pump D (Excluding event LSP and the OSTD2 AND gate)		
	HSCIPOSO	OPPO10HFI, pipe rupture in suction line		
		LMVO4000I, suction XOV, NO-FC		
OSTDA		LPCI alternate path D: failure to provide flow to pump A (Excluding event OSTD)		
	ESCICTSP	Defined under PRA event OSTAB		
	HSIT6ASR	Defined under PRA event OSTAB		
	HSIT7BSP	Defined under PRA event OSTAD		
OSTDB		LPCI alternate path D: failure to provide flow to pump B (Excluding event OSTD)		
	ESCICTSP	Defined under PRA event OSTAB		
	HSIT6BSO	Defined under PRA event OSTAB		
	HSIT7BSP	Defined under PRA event OSTAD		
OSTDC		LPCI alternate path D: failure to provide flow to pump C (Excluding event OSTD)		
	ESCICTSP	Defined under PRA event OSTAB		
	HSIT7ASP	Defined under PRA event OSTAC		
	HSIT7BSP	Defined under PRA event OSTAD		
EABUS	HSDIVXGS	EABUS, local electrical failure of ventilation system (fails ventilation system A and B for room cooling for DG 11)		
EACA2		Power from DG 11 unavailable (Excluding event EDGA)		
	ACDG11JA	ESW011DWI, failure to make automatic transfer for DG 11 start		
	HSDG11JA	ECAS070WI, short in power cable from generator		
		ECBS070WI, circuit breaker fails, NO-FO		
EACB2		Power from DG 12 unavailable (Excluding event EDGB)		
	ACDG12JC	ESW012DWI, failure to make automatic transfer for DG 12 start		
	HSDG12JC	ECA6070WI, short in power cable from generator		
		ECB6070WI, circuit breaker fails, NO-FO		
EACC2		Power from DG 13 unavailable (Excluding event EDGC)		
	ACDG13JE	ESW013DWI, failure to make automatic transfer for DG 13 start		
	HSDG13JE	ECA7070WI, short in power cable from generator		
		ECB7070WI, circuit breaker fails, NO-FO		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
EAC32		Power from DG 14 unavailable (Excluding event EDG2)		
	ACDG14JG	ESWO140WI, failure to make automatic transfer for DG 14 start		
	HSDG14JG	ECAB070WI, short in power from generator		
		EC3B070WI, circuit breaker fails, NO-FO		
EAC440A		Loss of 440 Vac bus, EPS Division I (Excluding event EACA)		
	HS4401JI	EXT102DWI, voltage transformer failure		
		EBS1140WI, 440 Vac bus or switchgear unavailable		
		EC35U50WI, bus transformer breaker failure, NC-FO		
EAC440B		Loss of 440 Vac bus, EPS Division II (Excluding event EACB)		
	HS4402JJ	EXT202DWI, voltage transformer failure		
		EC36050WI, bus transformer breaker failure, NC-FO		
		EBS1240WI, 440 Vac bus or switchgear unavailable		
EAC440C		Loss of 440 Vac bus, EPS Division III (Excluding event EACC)		
	HS4403JK	EXT303DWI, voltage transformer failure		
		EC9705DWI, bus transformer breaker failure, NC-FO		
		EBS1340WI, 440 Vac bus or switchgear unavailable		
EAC440D		Loss of 440 Vac bus, EPS Division IV		
	HS4404JL	EXT402DWI, voltage transformer failure		
		EC8805DWI, bus transformer breaker failure, NC-FO		
		EBS1440WI, 440 Vac bus or switchgear unavailable		
EALL	TMDGSDIM	EALL, all diesels fail to start during test, plant being shutdown		
E3BUS	HSD2VXH8	E3BUS, local electrical failure of ventilation system (fails ventilation system A and B for room cooling for DG 12)		
E3SO110WI	HSO1SGJ8	E3SO110WI, 4 KVac bus or switchgear for EPS Divisions I (DG 11) unavailable		
E3SO120WI	HSO2SGJD	E3SO120WI, 4 KVac bus or switchgear for EPS Divisions II (DG 12) unavailable		
E3SO130WI	HSO1SGJF	E3SO130WI, 4 KVac bus or switchgear for EPS Divisions III (DG 13) unavailable		
E3SO140WI	HSO3SGJF	E3SO140WI, 4 KVac bus or switchgear for EPS Divisions IV (DG 14) unavailable		
E3S25A0WI	HSDC01JU	E3S25A0WI, failure of 250/125 Vdc bus (EPS Division I)		
E3S25B0WI	HSDC02JV	E3S25B0WI, failure of 250/125 Vdc bus (EPS Division II)		
E3S25C0WI	HSDC03JS	E3S25C0WI, failure of 125 Vdc bus (EPS Division III)		
E3S2500WI	HSDC04JT	E3S2500WI, failure of 125 Vdc bus (EPS Division IV)		
EC8US	HSD3VXHJ	EC8US, local electrical failure of ventilation system (fails ventilation system A and B for room cooling for DG 13)		
ED8US	HSD4VXHR	ED8US, local electrical failure of ventilation system (fails ventilation system A and B for room cooling for DG 14)		
EDGA21		Failure of exhaust ventilation damper system A (applies to room cooling for DG 11)		
	HSD1VAGR	XDP100DPI, exhaust damper stuck closed		
		XDP100HWI, exhaust damper for room ventilation fails to function		

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PRA Event	ASEP Event	Component Explanation	Unavailability	ASEP Event Unavailability Total
EDGA22		Failure of exhaust ventilation damper B (applies to room cooling for DG 11)		
	HSD1VBGO	KDP200DPI, exhaust damper closed		
		KDP200HWI, exhaust damper for room ventilation fails to function		
EDGB21		Failure of exhaust ventilation damper system A (applies to room cooling for DG 12)		
	HSD2YAHA	KDP101DPI, exhaust damper stuck closed		
		KDP101HWI, exhaust damper for room ventilation fails to function		
EDGB22		Failure of exhaust ventilation damper B (applies to room cooling for DG 12)		
	HSD2VBGX	KDP201DPI, exhaust damper closed		
		KDP201HWI, exhaust damper for room ventilation fails to function		
EDGC21		Failure of exhaust ventilation damper system A (applies to room cooling for DG 13)		
	HSD3VAHI	KDP102DPI, exhaust damper stuck closed		
		KDP102HWI, exhaust damper for room ventilation fails to function		
EDGC22		Failure of exhaust ventilation damper B (applies to room cooling for DG 13)		
	HSD3VBHF	KDP202DPI, exhaust damper closed		
		KDP202HWI, exhaust damper for room ventilation fails to function		
EDGD21		Failure of exhaust ventilation damper, system A (applies to room cooling for DG 14)		
	HSD4YAHQ	KDP103DPI, exhaust damper stuck closed		
		KDP103HWI, exhaust damper for room ventilation fails to function		
EDGD22		Failure of exhaust ventilation damper B (applies to room cooling for DG 14)		
	HSD4VBHR	KDP203DPI, exhaust damper closed		
		KDP203HWI, exhaust damper for room ventilation fails to function		
EDGC1A		Failure of the normal ESW loop for DG 11 (Excluding the transfer from the ESW fault tree)		
	HSD1NWHI	Failure of the SW inlet or outlet valve for the ESW loop to DG 11		
		WWV32ADDI, failure of the SW discharge valve, NO-FC		
		WWV31ADDI, failure of the SW inlet valve, NO-FC		
	HSD1SWHX	WEV05ADDI, failure of manual valve 1005A		
EDGC1B		Failure of the normal ESW loop for DG 12 (Excluding the transfer from the ESW fault tree)		
	HSD2NWID	Failure of the SW inlet or outlet valve for the ESW loop to DG 12		
		WWV34BDDI, failure of the SW discharge valve, NO-FC		
		WWV33BDDI, failure of the SW inlet valve, NO-FC		
	HSD2SWIB	WEV05BDDI, failure of manual valve 1005B		
EDGC1C		Failure of the normal ESW loop for DG 13 (Excluding the transfer from the ESW fault tree)		
	HSD3NWIH	Failure of the SW inlet or outlet valve for the ESW loop to DG 13		
		WWV32CDDI, failure of the SW discharge valve, NO-FC		
		WWV31CDDI, failure of the SW inlet valve, NO-FC		
	HSD3SWIF	WEV05CDDI, failure of manual valve 1005C		

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PRA Event	ASEP Event	Component Explanation	Unavailability	ASEP Event Unavailability Total
EDGC1D		Failure of the normal ESW loop for DG 14 (Excluding the transfer from the ESW fault tree)		
	HSD4AWIL	Failure of the SW inlet or outlet valve for the ESW loop to DG 14		
		MWV340QUI, failure of the SW discharge valve, MO-FC		
		MWV330OI, failure of the SW inlet valve, MO-FC		
	HSD4SWIJ	MEV0530OI, failure of manual valve 10050		
EDGC2A		Failure of the alternate ESW loop for DG 11 (Excluding the transfer from the ESW fault tree)		
	ESD1AWIW	WHUA, operator fails to make transfer		
	HSD1AWIY	Failure of the SW inlet or outlet valve for the ESW to DG 11		
		MWV34ADPI, failure of SW discharge valve, MC-FC		
		MWV33ADPI, failure of SW inlet valve, MC-FC		
	HSD1SWIX	Defined under PRA event EDGC1A		
EDGC2B		Failure of the alternate ESW loop for DG 12 (Excluding the transfer from the ESW fault tree)		
	ESD2AWIA	WHUB, operator fails to make transfer		
	HSD2AWIC	Failure of the SW inlet or outlet valve for the ESW to DG 12		
		MWV32SDPI, failure of SW discharge valve, MC-FC		
		MWV318DPI, failure of SW inlet valve, MC-FC		
	HSD2SWIB	Defined under PRA event EDGC1B		
EDGC2C		Failure of the alternate ESW loop for DG 13 (Excluding the transfer from the ESW fault tree)		
	ESD3AWIE	WHUC, operator fails to make transfer		
	HSD3AWIG	Failure of the SW inlet or outlet valve for the ESW to DG 13		
		MWV34CDPI, failure of SW discharge valve, MC-FC		
		MWV13CDPI, failure of SW inlet valve, MC-FC		
	HSD3SWIF	Defined under PRA event EDGC1C		
EDGC2D		Failure of the alternate ESW loop for DG 14 (Excluding the transfer from the ESW fault tree)		
	ESD4AWII	WHUD, operator fails to make transfer		
	HSD4AWIK	Failure of the SW inlet or outlet valve for the ESW to DG 14		
		MWV32DDPI, failure of SW discharge valve, MC-FC		
		MWV31DDPI, failure of SW inlet valve, MC-FC		
	HSD4SWIJ	Defined under PRA event EDGC1D		
EDGREPA	RCDG11IO	Failure to repair DG 11 given failure or maintenance		
EDGREPB	RCDG12IQ	Failure to repair DG 12 given failure or maintenance		
EDGREPC	RCDG13IS	Failure to repair DG 13 given failure or maintenance		
EDGREPD	RCDG14IU	Failure to repair DG 14 given failure or maintenance		
EDG11		DG 11 hardware failures		
	HSDG11IA	EGED110WI, generator failure		
		DHUD110XI, DG 11 in improper mode		
		ED11CNO, failure of DG 11 to start and run (from Appendix A of PRA text)		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
EDG12		DG 12 hardware failures		
	HSDG12IP	EGED12DWI, generator failure		
		EHUD12DII, DG 12 in improper mode		
		ED12CXO, failure of DG 12 to start and run (from Appendix A of PRA text)		
EDG13		DG 13 hardware failures		
	HSDG13IR	EGED13DWI, generator failure		
		EHUD13DII, DG 13 in improper mode		
		ED13CXO, failure of DG 13 to start and run (from Appendix A of PRA text)		
EDG14		DG 14 hardware failures		
	HSDG14IT	EGED14DWI, generator failure		
		EHUD14DII, DG 14 in improper mode		
		ED14CXO, failure of DG 14 to start and run (from Appendix A of PRA text)		
ELCCA1		Loss of charge circuit, EPS Division I, loop 1 (Excluding event EAC440A)		
	HSDC11JR	ECAZA1DWI, power cable from 440 Vac MCC to charger broken		
		EBCCA1DWI, charger unavailable		
ELCCA2		Loss of charge circuit, EPS Division I, loop 2 (Excluding event EAC440A)		
	HSDC21JM	ECAZA2DWI, power cable from 440 Vac MCC to charger broken		
		EBCCA2DWI, charger unavailable		
ELCCB1		Loss of charge circuit, EPS Division II, loop 1 (Excluding event EAC440B)		
	HSDC12JP	ECAZB1DWI, power cable from 440 Vac MCC to charger broken		
		EBCCB1DWI, charger unavailable		
ELCCB2		Loss of charge circuit, EPS Division II, loop 2 (Excluding event EAC440B)		
	HSDC22JO	ECAZB2DWI, power cable from 440 Vac MCC to charger broken		
		EBCCB2DWI, charger unavailable		
ELCCC		Loss of charge circuit, EPS Division III, loop 1 (Excluding event EAC440C)		
	HSDC13JU	ECAZC1DWI, power cable from 440 Vac MCC to charger broken		
		EBCCC1DWI, charger unavailable		
ELCCD		Loss of charge circuit, EPS Division IV, loop 1 (Excluding event EAC440D)		
	HSDC14JR	ECAZD1DWI, power cable from 440 Vac MCC to charger broken		
		EBCCD1DWI, charger unavailable		
EOSPA	HMMP01IY	EOSPA, loss of offsite power sources, EPS Division I		
EOSPB	HMMP02IW	EOSPB, loss of offsite power sources, EPS Division II		
EOSPC	HMMP03II	EOSPC, loss of offsite power sources, EPS Division III		
EOSPD	HMMP04IY	EOSPD, loss of offsite power sources, EPS Division IV		
EOSREC	RCLOSPIC	EOSREC, failure to recover offsite power given its loss		
E1M	TMEP11G4	E1M, DG 11 in maintenance		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
E125A		Insufficient power from EPS Division I batteries (fails DG 11)		
	HSDCD1GX	EBC1A, battery charge level insufficient		
		EBY1A1HWI, battery set unavailable		
E125B		Insufficient power from EPS Division II batteries (fails DG 12)		
	HSDCD2GL	EBC1B, battery charge level insufficient		
		EBY1B1HWI, battery set unavailable		
E125C		Insufficient power from EPS Division III batteries (fails DG 13)		
	HSDCD3GI	EBC1C, battery charge level insufficient		
		EBY1C1HWI, battery set unavailable		
E125D		Insufficient power from EPS Division IV batteries (fails DG 14)		
	HSDCD4GJ	EBC1D, battery charge level insufficient		
		EBY1D1HWI, battery set unavailable		
E2M	TMEP12GG	E2M, DG 12 in maintenance, given that DG 11 is not in maintenance		
E3M	TMEP13GF	E3M, DG 13 in maintenance, given that DG 11 and 12 are not in maintenance		
E4M	TMEP14GE	E4M, DG 14 in maintenance, given that DG 11, 12 and 13 are not in maintenance		
HBOTH	CMHRSDMA	HBOTH, both HPCI and RCIC out, Rx being shutdown		
HCS		Insufficient flow to Rx vessel through core spray (HPCI and UPCS)		
	HSHPCINE	HMOY006DPI, HPCI discharge isolation MOV, NC-FC		
	HSHPLPNE	LPP04BHFI, failure due to pipe rupture		
		LXY07BDDI, Core spray manual shutoff valve, NLO-FC		
		LCY10BDPI, AO core spray line discharge valve fails, stuck closed		
		LCY06ADPI, AO core spray line discharge valve fails, stuck closed		
HEXT		Failure in HPCI turbine steam exhaust to suppression pool		
	HSHPCTXI	HRDDD1HFI, failure of rupture disk		
		KXY02IDQI, steam discharge manual valve, locked open-fails closed		
		HPPOO2HEI, pipe blockage inhibits steam flow		
		HPPBOOHEI, exhaust sparger failure blocks flow		
		HMYO72DQI, steam discharge MOV, NO-FC		
	PHHPCTXI	HTR1, instability in HPCI steam exhaust line causes high exhaust pressure		
HFL100HEI	HSHCSPOW	HFL100HEI, HPCI SP strainer #1 clogged		
HFL200HEI	HSHCSPOV	HFL200HEI, HPCI SP strainer #2 clogged		
HFW		Insufficient flow to Rx vessel through feedwater loop (HPCI)		
	HSHCFWRD	FPP10AHFI, failure due to pipe rupture		
		FMV11ADDI, FW isolation MOV NO-FC		
		FCY10ADPI, check valve fails, stuck closed		
		FCY74ADPI, AO testable check valve fails, stuck closed		
	HSHPCIND	HMV105DPI, HPCI discharge isolation MOV, NC-FC		
HHUO690XI	ESHCCTOY	HHUO690XI, failure of operator to initiate transfer given CST line/ valve failure (HPCI)		
HHU500DID	ESHPCIRX	HHU500DID, manual actuation fails (first restart of HPCI)		
HHU600DII	ESHPCINY	HHU600DII, manual actuation fails (initial start of HPCI)		

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PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
HHU7000XI	ESHPCINZ	HHU7000XI, HPCI not reset for operation (initial start of HPCI)		
HINTA		Failure of CST low level indication and logic (prevents transfer from CST to SP, HPCI) (Excluding event HINTA1)		
	ACRCCSLT	HRE661HWI, failure of relay logic for CST level indication (common line with RCIC)		
	ENRCCSLT	HLE661DXI, miscalibration of low level sensors in CST (common line with RCIC)		
HINT2		Failure to provide manual transfer from CST to SP (HPCI) (Excluding event HINTA)		
	ESRCCTLR	HHU0790XI, human error, failure to transfer in sufficient time (common line with RCIC)		
	HSHCCPOO	HSW0010WI, manual transfer switch fails		
HIN1		Failure of CST lines and valves (HPCI)		
	HSHCCTDZ	HPPU01HFI, pipe rupture		
		HIV0100DI, manual isolation valve on suction line from CST, XLO-FC		
		HIV0040WI, CST shutoff valve, NO-FC		
		HCY0190PI, check valve fails, stuck closed		
	HSRHCTLY	Failure of CST MOV's (RCIC/HPCI/LPCS)		
		YMV1240DI, CST discharge MOV, NO-FC		
		YMV1250DI, CST discharge MOV, NO-FC		
HIN2		Failure of suppression pool to provide flow (HPCI) (Excluding events LSP and HIN3)		
	HSHPCIOX	HMV0410PI, SP isolation MOV, NC-FC		
		HMV0420DI, SP isolation MOV, NC-FC		
		HCY0450PI, check valve fails, stuck closed		
		HPP003HFI, pipe rupture in suction line to pump		
HLEV2B		Failure of level channel B (HPCI)		
	ACHP2BNO	HRE92BHWI, failure of level B relay logic		
		HLE92BHWI, failure of level B sensor		
HLEV2C		Failure of level channel C (HPCI)		
	ACHP2CNO	HRE92CHWI, failure of level C relay logic		
		HLE92CHWI, failure of level C sensor		
HLEV2F		Failure of level channel F (HPCI)		
	ACHP2FRS	HRE92FHWI, failure of level F relay logic		
		HLE92FHWI, failure of level F sensor		
HLEV2G		Failure of level channel G (HPCI)		
	ACHP2GNU	HRE92GHWI, failure of level G relay logic		
		HLE92GHWI, failure of level G sensor		
HLEV9200XI	ENHPCLNN	HLEV9200XI, miscalibration of level channels (HPCI initiation)		
HLE61BHWI	ACRCCSLO	HLE61BHWI, failure of CST low level indication, N661B (HPCI and RCIC		
HLE61FHWI	ACRCCSLP	HLE61FHWI, failure of CST low level indication, N661F (HPCI and RCIC		
HLE9200XI	ESRCICNN	HLE9200XI, miscalibration of level channels (HPCI and RCIC)		
HLE93BHWI	ACHCLSOM	HEL93BHWI, false signal indicates high Rx vessel water level (trips HPCI), N693B		
HLE93FHWI	ACHCLSOL	HLE93FHWI, false signal indicates high Rx vessel water level (trips HPCI), N693F		

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PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
HLUBE1		Failure of HPCI lube system after start		
	HSHPCLM1	HMV035DPI, isolation valve (MOV) fails, NO-FC		
		HMV059DPI, isolation valve (MOV) fails, NC-FC		
		HCV048DPI, check valve fails closed		
		HCV057DPI, check valve fails closed		
		HHE100HFI, lube oil cooler heat exchanger leaks		
HMOV01100I	HSRHCIMO	HMOV01100I, HPCI MOV test line valve fails, NC-FO		
HMV00800I	HSHCCTNG	HMV00800I, CST bypass isolation valve, NC-FO (HPCI)		
HMOV01100I	HSHCCTNF	HMOV1100I, CST bypass isolation valve, NC-FO (HPCI)		
HOT		Insufficient coolant to Rx vessel (HPCI) (Excluding HOT1 AND gate)		
	HSHPCINH	HCY005DPI, HPCI discharge valve fails, stuck closed		
		HMV007D0I, HPCI discharge isolation MOV, NO-FC		
		HPP100HFI, pipe rupture in coolant discharge line		
HOTD		Insufficient coolant to reactor vessel from HPCI		
	HSHCCSPD	LCY108DPD, core spray (CS) line discharge check valve fails/stuck closed (fails HPCI)		
		LCY06ADPD, core spray (CS) line discharge check valve fails/stuck closed (fails HPCI)		
	HSHPCIMC	FCY10ADPD, check valve fails, stuck closed		
		FCY74ADPD, AO testable check valve fails, stuck closed		
		HCY005DPD, HPCI discharge check valve fails, stuck closed		
		HMV105DPD, HPCI discharge isolation valve (MOV), NC-FC		
		HMV006DPD, HPCI discharge isolation valve (MOV), NC-FC		
HPM		Failure of HPCI pump to produce adequate head (Excluding event HPM1)		
	HSHPCPMM	HPM001DWI, failure to provide adequate flow through pump (HPCI) during subsequent starts		
HPM01A		HPCI turbine, loss of function (Excluding event HLUBE)		
	HSHPCTMA	HMV112DPD, turbine stop valve normally closed, fails closed		
		HMV111DPD, turbine control valve fails		
		HTU002DYD, turbine fails to start		
HPM001DWD	HSHPCPMC	HPP001DWD, failure to provide adequate flow through pump (HPCI)		
HPM1		Failure of HPCI pump motive force during subsequent starts (Excluding events HPM1B, HPM1A and HEXT)		
	HSHPCTXL	HPP002DFI, pipe rupture in steam piping for turbine		
	PHHPCTXL	HTR, transient steam flow during startup leads to isolation signal		
HPM1A		Insufficient steam supply to HPCI turbine		
	HSHPCTMK	HMV002D0I, steam supply line isolation MOV, NC-FC		
		HMV003D0I, steam supply line isolation MOV, NC-FC		
		HMV001D0I, steam supply line isolation MOV, NC-FC		
HPM1B		HPCI turbine loss of function (Excluding event HLUBE)		
	HSHPCTXJ	HMV112DPI, turbine stop valve normally closed, fails closed		
		HSHCC2DWI, turbine shaft, coupling fails		
		HMV111DPI, turbine control valve fails		
		HTU002DYI, turbine fails to start and run		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
HPKG000WI	HSHPCLN2	HPKG000WI, dc powered pump fails to provide starting lube for HPCI		
HPRES2		Failure of high drywell pressure indication, HPCI initiation (Excluding event HFT8F and HFT8E)		
	ENHPCDHY	HPR110DXI, miscalibration of pressure channels		
	PHHPCIHY	HPR, event does not cause high dry well pressure. For some events this event has a value of 1.0 and for others it has a value of 0.0. This event was assumed to have a value of 1.0 for the sequences analyzed by ASEP		
HPR18		Failure of containment pressure channel B (HPCI/LPCS/LPCI)		
	ACHP1BMA	HRE94BHWI, failure of pressure B relay logic		
		HPR94BHWI, failure of pressure B sensor		
HPR1D		Failure of containment pressure channel D (HPCI/LPCS/LPCI)		
	ACHP1DMP	HRE94DHWI, failure of pressure D relay logic		
		HPR94DHWI, failure of pressure D sensor		
HPR1F		Failure of containment pressure channel F (HPCI/LPCS/LPCI)		
	ACHP1FMR	HRE94FHWI, failure of pressure D relay logic		
		HPR94FHWI, failure of pressure D sensor		
HPR1H		Failure of containment pressure channel H (HPCI/LPCS/LPCI)		
	ACHP1HNT	HRE94HSI, failure of pressure H relay logic		
		HPR94HWI, failure of pressure H sensor		
HPRS5BHWI	ACHCPS00	HPRS5BHWI, false signal indicates high exhaust pressure (HPCI) N655B		
HPRS5DHWI	ACHCPS08	HPRS5DHWI, false signal indicates high exhaust pressure (HPCI) N655D		
HPRS5FHWI	ACHCPS0C	HPRS5FHWI, false signal indicates high exhaust pressure (HPCI) N655F		
HPRS5HHWI	ACHCPS0A	HPRS5HHWI, false signal indicates high exhaust pressure (HPCI) N655H		
HPRS8BHWI	ACHCPS0J	HPRS8BHWI, false signal, low pressure, N658B (Division 1, HPCI)		
HPRS8DHWI	ACHCPS0K	HPRS8DHWI, false signal, low pressure, N658D (Division 2, HPCI)		
HPRS8FHWI	ACHCPS0I	HPRS8FHWI, false signal, low pressure, N658F (Division 1, HPCI)		
HPRS8HHWI	ACHCPS0G	HPRS8HHWI, false signal, low pressure, N658H (Division 2, HPCI)		
HPRES3HWI	ACHCPS0P	HPR653HWI, false signal indicates low pressure on pump suction, N653, (HPCI)		
HRE660HWI	ACHCCLOS	HRE660HWI, failure of control logic to automatically actuate transfer of HPCI from CST to SP		
HRS1	HPCIN02	HRS1, failure of HPCI during first restart given that the initial start was successful		
HRS2	HPCIN03	HRS2, failure of HPCI during second restart given that the first restart was successful		
HRS2A	UNHC2SPB	HRS2A, failure of HPCI during second restart (probability is estimated based on PRA event HRS1A)		
HRS3	HPCIN04	HRS3, failure of HPCI during third restart given that the second restart was successful		
HRS3A	UNHC3SPC	HRS3A, failure of HPCI during second restart (probability is estimated based on PRA event HRS1A)		
HSPA		False signal indicating high steam line space temperature (HPCI)		
	ACHCTSOR	HTE03DHWI, false signal indicates high temperature, sensor 603D		
		HTE03HHWI, false signal indicates high temperature, sensor 603H		
		HTE03MHWI, false signal indicates high temperature, sensor 603M		
		HTE03SHWI, false signal indicates high temperature, sensor 603S		
		HTE03PHWI, false signal indicates high temperature, sensor 603P		
		HTE03XHWI, false signal indicates high temperature, sensor 603X		
		HTE03FHWI, false signal indicates high temperature, sensor 603F		
		HTE03BHWI, false signal indicates high temperature, sensor 603B		

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PRA Event	ASEP Event	Component Explanation	Unavailability	ASEP Event Unavailability Total
HSPC		False HPCI steam supply line high ΔP or line break signal	—	
	ACHCOPOE	HPR60DHWI, false signal indicates high ΔP, N660D		
		HPR60BHWI, false signal indicates high ΔP, N660D		
		HPR57DHWI, false signal indicates high ΔP, N660D		
		HPR57BHWI, false signal indicates high ΔP, N660D		
HSPE		False signal indicates high turbine exhaust pressure (HPCI)		
	ACHCPSOX	HPR56FHWI, false signal indicates high pressure, N656F		
		HPR56BHWI, false signal indicates high pressure, N656B		
HSPF		Emergency area cooler (HPCI) high temperature, false signal		
	ACHCTSOF	HTE02DHWI, false signal indicates high temperature N602D		
		HTE02BHWI, false signal indicates high temperature N602B		
HSW102HWI	ACHCGSOO	HSW102HWI, false signal indicates HPCI turbine overspeed		
HTMBOTH		HPCI unavailable due to maintenance or HPCI and RCIC out (reactor being shutdown)		
	CMHRSDHH	Defined under PRA event HBOTH		
	TMHPCIMW	HPCI in maintenance		
HTRID	PHHPCTRB	HTRID, instability in turbine exhaust causes HPCI to trip		
KCUA		Failure of RCIC pump room cooling unit A (Excluding events ULA, FTIA, and KLUOOA)		
	HSRRCAKX	KSD16AHWI, failure of solenoid valve A, NO-FC		
		KHV20ADDI, failure of manual outlet valve 1020A, NO-FC		
		HEXAHC, heat exchanger A plugs or clogs		
		KFA00ADWI, failure of fan A		
		KAV16AHWI, failure of fan interlock valve HV106A, NC-FC		
KCUB		Failure of RCIC pump room cooling Unit B (Excluding events ULB, FTIB, and KLUOOB)		
	HSRRCBKL	KSD16BHWI, failure of solenoid valve B, NO-FC		
		KHV20BDDI, failure of manual outlet valve 1020B, NO-FC		
		HEXBPC, heat exchanger B plugs or clogs		
		KFA00BDWI, failure of fan B		
		KAV16BHWI, failure of fan interlock valve HV106B, NC-FC		
KFX111HWI	HSD1VAGT	KFX111HWI, loss of function of ventilation system A (applies to room cooling for DG 11)		
KFX112HWI	HSD2YAHT	KFX112HWI, loss of function of ventilation system A (applies to room cooling for DG 12)		
KFX113HWI	HSD3VAHU	KFX113HWI, loss of function of ventilation system A (applies to room cooling for DG 13)		
KFX114HWI	HSD4VAHY	KFX114HWI, loss of function of ventilation system A (applies to room cooling for DG 14)		
KFX200HWI	HSD1VBGU	KFX200HWI, loss of function of ventilation system B (applies to room cooling for DG 11)		
KFX201HWI	HSD1VBHC	KFX201HWI, loss of function of ventilation system B (applies to room cooling for DG 12)		
KFX202HWI	HSD3VBHK	KFX202HWI, loss of function of ventilation system B (applies to room cooling for DG 13)		
KFX203HWI	HSD4VBHS	KFX203HWI, loss of function of ventilation system B (applies to room cooling for DG 14)		
KHS00ADWC	ACRRCAKE	KHS00ADWC, manual/auto switch A fails (RCIC room cooling)		

TABLE X-1. (Continued)

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
KMSOOBOWC	ACRRCBXC	KMSOOBOWC, manual/auto switch B fails (RCIC room cooling)		
KHUVENT1A	ESD1VAGP	KHUVENT1A, operator fails to start ventilation system A (applies to room cooling for DG 11)		
KHUVENT1B	ESD1VBGM	KHUVENT1B, operator fails to start ventilation system B (applies to room cooling for DG 11)		
KHUVENT2A	ESD2VAGY	KHUVENT2A, operator fails to start ventilation system A (applies to room cooling for DG 12)		
KHUVENT2B	ESD2VBGV	KHUVENT2B, operator fails to start ventilation system B (applies to room cooling for DG 12)		
KHUVENT3A	ESD3VAHG	KHUVENT3A, operator fails to start ventilation system A (applies to room cooling for DG 13)		
KHUVENT3B	ESD3VBHD	KHUVENT3B, operator fails to start ventilation system B (applies to room cooling for DG 13)		
KHUVENT4A	ESD4VAHC	KHUVENT4A, operator fails to start ventilation system A (applies to room cooling for DG 14)		
KHUVENT4B	ESD4VBHL	KHUVENT4B, operator fails to start ventilation system B (applies to room cooling for DG 14)		
KHU15ADIOA	ESRRCAKH	KHU15ADIO, operator fails to isolate RCIC pump room cooling unit A		
KHU15BDIOB	ESRRCBXC	KHU15BDIO, operator fails to isolate RCIC pump room cooling unit B		
KLJDLAA		RCIC pump room cooling unit A fails due to leakage		
	HSRRCAKI	KHV56AHOI, failure of drain valve 1056A, unit A NC-FO		
		KHIOOAHFI, failure due to heat exchanger (unit A) leakage		
		KHV57AHOI, failure of vent valve 1057A, unit A, NC-FO		
KLJDOBB		RCIC pump room cooling unit B fails due to leakage		
	HSRRCBKD	KHV56BHOI, failure of drain valve 1056B, unit B NC-FO		
		KHIOOBHFI, failure due to heat exchanger (unit B) leakage		
		KHV57BHOI, failure of vent valve 1057B, unit B, NC-FO		
KRMCJHPCI	HHHCRCPA	KRMCJHPCI, failure of pump room cooling equipment (the subtree for HPCI room cooling was not quantified by the PRA, the value evaluated for RCIC room cooling was used as a component input to the HPCI fault tree		
KRMCJRCIC		Failure of RCIC pump room cooling equipment (valve failures which fail both unit A and B) (Excluding the CUF AND gate)		
	HSRRCIKH	RHV11900I, failure of manual inlet valve 1019, NO-FC		
		RHV12100I, failure of manual outlet valve 1021, NC-FC		
KVENT1A	HSD1VAGO	KVENT1A, failure of ventilation system A auto start (applies to room cooling for DG 11)		
KVENT1B	HSD1VBGM	KVENT1B, failure of ventilation system B auto start (applies to room cooling for DG 11)		
KVENT2A	HSD2VAGZ	KVENT2A, failure of ventilation system A auto start (applies to room cooling for DG 12)		
KVENT2B	HSD2VBGW	KVENT2B, failure of ventilation system B auto start (applies to room cooling for DG 12)		
KVENT3A	HSD3VAHH	KVENT3A, failure of ventilation system A auto start (applies to room cooling for DG 13)		
KVENT3B	HSD3VBHE	KVENT3B, failure of ventilation system B auto start (applies to room cooling for DG 13)		
KVENT4A	HSD4VAHP	KVENT4A, failure of ventilation system A auto start (applies to room cooling for DG 14)		
KVENT4B	HSD4VBHM	KVENT4B, failure of ventilation system B auto start (applies to room cooling for DG 14)		
LCST	HPCILCST	LCST, loss of water from condensate storage tank (HPCI/RCIC LPCI)		

TABLE 4-1. (Continued)

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
LD1		Failure to discharge water from LPCS loop 1 (pump Trains A and C) to reactor (Excluding events EAC440A and LD1DIS)		
	HSCS11QZ	LXV07ADDI, discharge line manual isolation valve locked open, FC		
		LPP0AAHFI, discharge line rupture in loop 1		
		LCV06ADPI, discharge line check valve fails, stuck closed		
		LHV04ADDI, discharge line isolation MOV, NO-FC		
		LHV1SADDI, flow diverted to SP via test line MOV, NC-FO		
LD2		Failure to discharge water from LPCS loop 2 (pump Trains B and D) to reactor (Excluding events EAC440B and LD2DIS)		
	HSHPLPNE	Defined under PRA event HCS		
	HSCS2XDI	LHV04BDDI, discharge line isolation valve (MOV), NO-FC		
		LHV1SBDDI, flow diverted to SP via test line MOV, NC-FO		
LFL1A1HEI	HSCSPAQ0	LFL1A1HEI, failure of strainer #1 for LPCS pump A, strainer blocks flow		
LFL1A2HEI	HSCSPAQP	LFL1A2HEI, failure of strainer #2 for LPCS pump A, strainer blocks flow		
LFL1C1HEI	HSCSPCQU	LFL1C1HEI, failure of strainer #1 for LPCS pump C, strainer blocks flow		
LFL1C2HEI	HSCSPCQT	LFL1C2HEI, failure of strainer #2 for LPCS pump C, strainer blocks flow		
LFL2B1HEI	HSCSPBQC	LFL2B2HEI, failure of strainer #1 for LPCS pump B, strainer blocks flow		
LFL2B2HEI	HSCSPBQB	LFL2B2HEI, failure of strainer #2 for LPCS pump B, strainer blocks flow		
LFL2D1HEI	HSCSP0QG	LFL2D1HEI, failure of strainer #1 for LPCS pump D, strainer blocks flow		
LFL2D2HEI	HSCSP0QF	LFL2D2HEI, failure of strainer #2 for LPCS pump D, strainer blocks flow		
LHU111DXI	ESCSACPZ	LHU111DXI, failure to manually initiate LPCS		
LLCW		Loss of RCIC lube cooling water		
	HSRCLWMU	RSV018DDI, PCV 1F018 fails open, NO-FC		
		POV015DDI, PCV 1F015 fails closed, NO-FC		
		RPP001DEI, 2" water line plugged		
		RPP001DFI, 2" water line leaks/rupture		
LLEVA		Failure of level channel 691A, loop 1, LPCS pump A (Excluding event EDC125A)		
	ACCS1APH	LLE91AHWI, failure of level sensor		
		LRE91AHWI, failure of level relay logic		
	ENCSCMPH	LHU511DXI, miscalibration of level channels		
LLEVB		Failure of level channel 691B, loop 2, LPCS pump B (Excluding event EDC125D)		
	ACCS2BPK	LLE91BHWI, failure of level sensor		
		LRE91BHWI, failure of level relay logic		
	ENCSCMPH	Defined under PRA event LLEVA		
LLEVC		Failure of level channel 691C, loop 1, LPCS pump C (Excluding event EDC125C)		
	ACCS1CPN	LLE91CHWI, failure of level sensor		
		LRE91CHWI, failure of level relay logic		
	ENCSCMPH	Defined under PRA event LLEVA		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
LLEYD		Failure of level channel 691D, loop 2, LPCS pump D (Excluding event EDC125D)	—	
	ACCS2DPQ	LLE91DHWI, failure of level sensor		
		LRE91DHWI, failure of level relay logic		
	ENCSCMPH	Defined under PRA event LLEYA		
LLEYE		Failure of level channel 691E, loop 1, LPCS pump A (Excluding event EDC125A)		
	ACCS1APS	LLE91EHWI, failure of level sensor		
		LRE91EHWI, failure of level relay logic		
	ENCSCMPH	Defined under PRA event LLEYA		
LLEYF		Failure of level channel 691F, loop 2, LPCS pump B (Excluding event EDC125A)		
	ACCS2BPU	LLE91FHWI, failure of level sensor		
		LRE91FHWI, failure of level relay logic		
	ENCSCMPH	Defined under PRA event LLEYA		
LLEYG		Failure of level channel 691G, loop 1, LPCS pump C (Excluding event EDC125C)		
	ACCS1CPX	LLE91GHWI, failure of level sensor		
		LRE91GHWI, failure of level relay logic		
	ENCSCMPH	Defined under PRA event LLEYA		
LLEYH		Failure of level channel 691H, loop 2, LPCS pump D (Excluding event EDC125D)		
	ACCS2DPY	LLE91HHWI, failure of level sensor		
		LRE91HHWI, failure of level relay logic		
	ENCSCMPH	Defined under PRA event LLEYA		
LHVOO5DPI	HSCS1XQY	LHVOO5DPI, failure of LPCS loop 1 discharge line isolation valve 005		
LHVO37DOI	HSCS2XQW	LHVO37DOI, failure LPCS loop 2 of discharge line isolation valve 037		
LPREA		Failure of Rx low pressure permissive channel 690A, loop 1, LPCS pump A (Excluding event EDC125A)		
	ACCS1APG	LPR90AHWI, failure of pressure sensor		
		LRE90AHWI, failure of pressure relay logic		
	ENCSCMPG	LHUS12DX1, miscalibration of pressure sensors		
LPREB		Failure of Rx low pressure permissive channel 690B, loop 2, LPCS pump B (Excluding event EDC125D)		
	ACCS2BPJ	LPR90BHWI, failure of pressure sensor		
		LRE90BHWI, failure of pressure relay logic		
	ENCSCMPG	Defined under PRA event LPREA		
LPREC		Failure of Rx low pressure permissive channel 690C, loop 1, LPCS pump C (Excluding event EDC125C)		
	ACCS1CPX	LPR90CHWI, failure of pressure sensor		
		LRE90CHWI, failure of pressure relay logic		
	ENCSCMPG	Defined under PRA event LPREA		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
LPRED		Failure of Rx low pressure permissive channel 690D, loop 2, LPCS pump D (Excluding event EDC125D)		
	ACCS2DPP	LPR90DHWI, failure of pressure sensor		
		LRE90DHWI, failure of pressure relay logic		
	ENCSCMPG	Defined under PRA event LPREA		
LPREE		Failure of Rx low pressure permissive channel 690E, loop 1, LPCS pump A (Excluding event EDC125A)		
	ACCS1APR	LPR90EHWI, failure of pressure sensor		
		LRE90EHWI, failure of pressure relay logic		
	ENCSCMPG	Defined under PRA event LPREA		
LPREF		Failure of Rx low pressure permissive channel 690F, loop 2, LPCS pump B (Excluding event EDC125B)		
	ACCS2BPT	LPR90FHWI, failure of pressure sensor		
		LRE90FHWI, failure of pressure relay logic		
	ENCSCMPG	Defined under PRA event LPREA		
LPREG		Failure of Rx low pressure permissive channel 690G, loop 1, LPCS pump C (Excluding event EDC125C)		
	ACCS1CPY	LPR90GHWI, failure of pressure sensor		
		LRE90GHWI, failure of pressure relay logic		
	ENCSCMPG	Defined under PRA event LPREA		
LPREH		Failure of Rx low pressure permissive channel 690H, loop 2, LPCS pump D (Excluding event EDC125D)		
	ACCS2DPI	LPR90HHWI, failure of pressure sensor		
		LRE90HHWI, failure of pressure relay logic		
	ENCSCMPG	Defined under PRA event LPREA		
LPRIA		Failure of drywell high pressure channel 694A, loop 1, LPCS pump A (Excluding event EDC125A)		
	ACCS1APF	LPR94AHWI, failure of pressure sensor		
		LRE94AHWI, failure of pressure relay logic		
	ENHPCDMY	Defined under PRA event HPRES2		
LPRIG		Failure of drywell high pressure channel 694G, loop 1, LPCS pump C (Excluding event EDC125C)		
	ACCS1CPU	LPR94GHWI, failure of pressure sensor		
		LRE94GHWI, failure of pressure relay logic		
	ENHPCDMY	Defined under PRA event HPRES2		
LPRIC		Failure of drywell high pressure channel 694C, loop 1, LPCS pump C (Excluding event EDC125C)		
	ACCS1CPI	LPR94CHWI, failure of pressure sensor		
		LRE94CHWI, failure of pressure relay logic		
	ENHPCDMY	Defined under PRA event HPRES2		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
LPR3E		Failure of drywell high pressure channel 694E, loop 1, LPCS pump A (Excluding event EDC'2SA)		
	ACCS1APL	LPR94EHWI, failure of pressure sensor		
		LRE94EHWI, failure of pressure relay logic		
	ENWPCDNV	Defined under PRA event NPRES2		
LSP	HPCILSP	Loss of water supply from suppression pool (SP) (for HPCI and RCIC systems, from the PRA HPCI fault tree, sheet 8)		
LSP		Loss of water from suppression pool (for LPCS and LPCI systems)		
	HSRSPIPE	ITK100DFI, suppression pool water unavailable due to rupture		
	PHRSPIPD	ITK200DWI, suppression pool water unavailable due to high temperature (LPCI and CS pumps not wrok limited)		
L1PA		Inadequate head from LPCS pump A, loop 1 (Excluding events EACCAAOA and EACA)		
	HMCSRAOR	KRMCLCSD, failure of pump room cooling equipment for pump B		
	HSCS1AOR	LPP01AHFI, pump piping ruptures		
		LXV20ADQI, pump discharge manual valve locked open, FC		
		LCV03ADPI, pump discharge check valve stuck closed		
		LPMO1ADWI, pump A fails to start and run		
L1PC		Inadequate head from LPCS pump C, loop 1 (excluding events EACCAAOC and EACC)		
	HMCSRCOM	KRMCLCSC, failure of pump room cooling equipment for pump C		
	HSCS1COM	LPP01CHFI, pump piping ruptures		
		LXV20CDQI, pump discharge manual valve locked open, FC		
		LCV03CDPI, pump discharge check valve stuck closed		
		LPMO1CDWI, pump C fails to start and run		
L1SA1		Insufficient flow from SP to LPCS pump A suction (Excluding events LSP and L1SA1)		
	HSCSPAOR	LMVO1ADQI, suction MOV, NO-FC		
		LPP21AHFI, suction line pipe rupture		
L1SA2		Insufficient flow from CST to LPCS pump A suction		
	ESCSCTOA	LHU902QII, failure to manually open CST valves in time		
	ESCSRFOA	LHU522DII, failure to replenish CST in time to support LPCS operation		
	HSCSTBOO	LXV02ADPI, CST discharge valve 002A fails, XLC-FC (fails CST source to pump A)		
	HSCSTIOO	LXV09ADPI, CST discharge valve 009A fails, XLC-FC (valve is common to pump A and pump C CST suction)		
	HSRHCTLY	Defined under PRA event HIRI		
	L1SC1	Insufficient flow from SP to LPCS pump C suction		
	HSCSPCOV	LMVO1CDQI, suction MOV, NO-FC		
		LPP21CHFI, suction line pipe rupture		
L1SC2		Insufficient flow from CST to LPCS pump C suction		
	ESCSCTOA	Defined under PRA event L1SA2		
	ESCSRFOA	Defined under PRA event L1SA2		
	HSCSTCOS	LXV02CDPI, CST discharge valve ... (to pump C)		
	HSCSTIOO	Defined under PRA event L1SA2		
	HSRHCTLY	Defined under PRA event HIRI		

TABLE 4.1. (Continued)

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
L1T	TMCS1XOL	L1T, LPCS loop 1 (pump A and C) unavailable due to maintenance given that HPCI and all diesels are not in maintenance		
L2PB		Inadequate head from LPCS pump B, loop 2 (Excluding events EACC4AOB and EAC3)		
	HMCSRBUJ	KRMCLCSB, failure of pump room cooling equipment for pump B		
	HSCS2BOJ	LPPO1BHFI, pump piping ruptures		
		LXY20BDOI, pump discharge manual valve locked open, FC		
		LCYO3BOPI, pump discharge check valve stuck closed		
		LPHO1BOWI, pump B fails to start and run		
L2PD		Inadequate head from LPCS pump D, loop 2 (Excluding events EACC4AOD and EACD)		
	HMCSRDOI	KRMCLCSD, failure of pump room cooling equipment for pump D		
	HSCS2DOI	LPPO1DHFI, pump piping ruptures		
		LXY20DOOI, pump discharge manual valve locked open, FC		
		LCYO3DOPI, pump discharge check valve stuck closed		
		LPHO1DOWI, pump D fails to start and run		
L2SB1		Insufficient flow from SP to LPCS pump B suction (Excluding events LSP and L1SB11)		
	HSCSPBOO	LMVO1BOOI, suction MOV, MO-FC		
		LPP21BHFI, suction line pipe rupture		
L2SB2		Insufficient flow from CST to LPCS pump B suction		
	ESCSCTQA	Defined under PRA event L1SA2		
	ESCSRFOA	Defined under PRA event L1SA2		
	HSCSTBOA	LXY2BOPI, CST discharge valve 002B fails, NLC-FC (fails CST source to pump B)		
	HSCSTZOA	LXYO9BOPI, CST discharge valve 009B fails, NLC-FC (valve is common to pump B and pump D CST suction)		
	HSRHCTLY	Defined under PRA event HIR1		
L2SD1		Insufficient flow from SP to LPCS pump D suction (Excluding events LSP and L2SD11)		
	HSCSPDOH	LMVO1DOI, suction MOV, MO-FC		
		LPP21DHFI, suction line pipe rupture		
L2SD2		Insufficient flow from CST to LPCS pump D suction		
	ESCSCTQA	Defined under PRA event L1SA2		
	ESCSRFOA	Defined under PRA event L1SA2		
	HSCSTDOE	LXYO2DOPI, CST discharge valve 002D fails, NLC-FC (fails CST source to pump D)		
	HSCSTZOA	Defined under PRA event L2SB2		
	HSRHCTLY	Defined under PRA event HIR1		
L2T	TMCS2XOK	L2T, LPCS loop 2 (pumps B and D) unavailable due to maintenance given that LPCS loop 1, HPCI, and all diesels are not in maintenance		
RA1AA		Failure of automatic initiation action of unit A, RCIC pump room cooling		
	ACRRCAKA	KTE21AHWO, failure of sensor A		
		KTI21AHWO, failure of transmitter A		
		KRL21AHWO, failure of logic A		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
MIAB		Failure of automatic initiation action of unit B, RCIC pump room cooling	—	
	ACRRCBKF	KTE21BHWD, failure of sensor B		
		KTI21BHWD, failure of transmitter B		
		KRL21BHWD, failure of logic B		
MMIAA		Failure of manual initiation of RCIC pump room cooling unit A		
	ACRRCAKB	KAHOOADHD, failure of annunciator A		
	ESRRCAKB	KHU51ADXD, operator fails to manually initiate pump room cooling unit A or B		
MMIAB		Failure of manual initiation of RCIC pump room cooling unit B		
	ACRRCBKG	KAHOOADHD, failure of annunciator B		
	ESRRCBKG	KHU51ADXD, operator fails to manually initiate pump room cooling unit B or A		
RALOO1HWI	ACRCCTLU	RALOO1HWI, failure of auto transfer logic RCIC		
RCVO1700I	HSRCITMO	RCVO1700I, check valve 1017 stuck closed or plugged (RCIC)		
RCVO1800I	HSRCITMO	RCVO1800I, check valve 1018 stuck closed or plugged (RCIC)		
RCVO68OOI	HSRCITMR	RCVO68OOI, check valve IF068 stuck closed or plugged (RCIC)		
RCVO81OOI	HSRCITMF	RCVO81OOI, check valve IF081 stuck closed or plugged (RCIC)		
RDG1	RCDGA103	RDG1, non-recovery of diesel generators within 1/2 hour		
RDG2	RCDGA207	RDG2, the failure of Division I and III DG and their non-recovery within two hours for HPCI or RCIC room cooling power supplies (given the failure of normal and alternate room cooling)		
RDG2A	RCDGA297	RDG2A, failure to repair DG within two hours, given diesel failure at the 1/2 hour time point and the failure of normal and alternate room cooling		
RDG3	RCDGA309	RDG3, failure of Division I and III DG and their non-recovery, within four hours, given successful implementation of alternate room cooling		
RDG3A	RCDGA399	RDG3A, failure to recover the DG within four hours, given diesel failure at the 1/2 hour time point and the successful implementation of alternate room cooling		
RFL100MEI	HSRCSPLW	RFL100MEI, suppression pool strainer No. 1 clogged (RCIC)		
RFL200MEI	HSRCSPLY	RFL200MEI, suppression pool strainer No. 2 clogged (RCIC)		
RFTOP		Loss of flow from RCIC pump to reactor vessel (Excluding the RFTOP1 AND gate)		
	HSRCIPMF	FCV748DPI, containment isolation check valve stuck closed		
		FCV108DPI, containment isolation check valve stuck closed		
		RCVO14DPI, check valve in discharge line of RCIC stuck closed		
		FMV118DOI, inboard containment isolation valve, MO-FC		
		RMVO13DPI, isolation valve in discharge line of RCIC, MC-FC		
		RMVO12OOI, MOV in discharge line of RCIC, MO-FC		
		RPPOO1HFI, pipe rupture in discharge line of RCIC		
RFTT		RCIC fails due to false turbine trip (Excluding the RFTT1 OR gate and the RFTT2 AND gate)		
	ACRCIPLC	RPROO6HWI, sensor for low pump suction pressure of RCIC gives false signal		
	ACRCITLO	RCIC turbine trip due to overspeed		
		RSLOO2HWI, overspeed tachometer gives false signal		
		RSL100HWI, trip due to failed mechanical overspeed		
	ISRCITLU	RHU100XXI, miscalibration of turbine trip sensors: (a) level, (b) pressure		

RFTT1 — RCIC high turbine exhaust pressure channels gives false signal

ACRCITLR — RPRS68HWI, high turbine exhaust pressure channel gives false signal

RPRS6AHWI, high turbine exhaust pressure channel gives false signal

RHUC08RXI — ESRCACWH — RHU008DXI, failure to manually initiate RCIC start

RHUC690XI — ESRCCTLR — RHU0690XI, operator fails to transfer RCIC from CST in time

RHUC700XI — ESRCSPLX — RHUC700DXI, failure to manually transfer RCIC from CST to SP

RHU120DXD — ESRCICUR — RHU120DXD, operator fails to reset RCIC turbine stop valve for restart

RHU6000XI — ESRCICXU — RHU6000XI, operator fails to reset RCIC turbine stop valve

RHU7006XI — CNRCRPLJ — RHU7000XI, miscalibration of RCIC reactor low pressure channels

RHU7018XI — CNRCPSLI — RHU7010XI, miscalibration of RCIC turbine exhaust pressure channels

RIEFT — Failure due to excessive exhaust restriction
(Excluding the YFB OR gate)

HSRCITMT — RCY0010DI, globe stop check in turbine exhaust line, LO-FC

TELB, blockage in turbine exhaust line

RMV06000I, MOV in turbine exhaust line, NO-FC

UNRCITMT — KTR1, instability in steam exhaust line causes high exhaust pressure

RINTA — Failure of CST level indication
(Excluding RINTB AND gate)

ACRCCSLT — RRES61HWI, failure of CST indication level relay logic (HPCI and RCIC)

CNRCCSLT — RLE6610XI, miscalibration low level CST sensors (HPCI and RCIC)

RIN1 — Failure of CST lines and valves (RCIC)

HSRCCSLT — RMV010D0I, M.O. gate valve in CST discharge line, MO

RXY00900I, manual gate in pump suction line, LO-FC

RCY011DPI, check valve CST discharge line stuck closed

RPP009HFT, pipe rupture in CST discharge line

HSRHCTLT — Defined under PRA event HIN1

RIN4 — Failure of suppression pool supply source for RCIC
(Excluding event LSP and the RIN5 AND gate)

HSRCSPLX — RMV02900I, MO gate valve in suppression pool discharge line, NO-FC

RCY030DPI, check valve suppression pool discharge stuck closed

RPP031HFI, pipe rupture in suppression pool discharge line

RMV031DPI, MO gate valve in suppression pool discharge line, NC-FC

RIYC1 — False steam pipe area high temperature signal causes isolation valve closure (RCIC steam supply)

ACRCITCH — RTE63AHWI, steam pipe area high temperature sensor N603A gives false signal

RTE63JHWI, steam pipe area high temperature sensor N603J gives false signal

RTE63CHWI, steam pipe area high temperature sensor N603C gives false signal

RTE63HHWI, steam pipe area high temperature sensor N603J gives false signal

RTE63EHWI, steam pipe area high temperature sensor N603E gives false signal

RTE63THWI, steam pipe area high temperature sensor N603T gives false signal

RTE63GHWI, steam pipe area high temperature sensor N603G gives false signal

RTE63LHWI, steam pipe area high temperature sensor N603L gives false signal

RTE63RHWI, steam pipe area high temperature sensor N603F gives false signal

RTE63YHWI, steam pipe area high temperature sensor N603Y gives false

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
RIVC1 (continued)	ENRCITKJ	RHU800DII, miscalibration of one of ten channels		
RIVC2		False equipment room ventilation air inlet and outlet high ΔT signal causes isolation valve closure (RCIC)		
	ACRCIVKI	RTE61AHWI, equipment room ventilation air inlet and outlet high ΔT gives false signal		
		RTE61BHWI, equipment room ventilation air inlet and outlet high ΔT gives false signal		
	ENRCIVKI	RHU801DII, miscalibration of one of two channels		
RIVC3		False emergency area cooler high temperature signal causes isolation valve closure (RCIC)		
	ACRCIRKY	RTE62AHWI, emergency area cooler high temperature sensor N602A gives false signal		
		RTE62CHWI, emergency area cooler high temperature sensor N602C gives false signal		
	ENRCIRKY	RHU802DII, miscalibration of one of two channels		
RIVC4		False steam line high ΔP or instrument line break signal causes isolation valve closure (RCIC)		
	ACRCISKI	RPR57AHWI, steam line high ΔP sensor N057A gives false signal or instrument line break		
		RPR57CHWI, steam line high ΔP sensor N057C gives false signal or instrument line break		
	ENRCISKI	RHU803DII, miscalibration of one of two channels		
RLEV2A		Failure of level 2 channel 697A		
	ACRC2AMK	RLE97AHWI, failure of sensor		
		RRE97AHWI, failure of relay logic		
RLEV2A1		Failure of level 2, channel 692A (RCIC)		
	ACRC2AML	RLE92AHWI, failure of sensor		
		RRE92AHWI, failure of relay logic		
RLEV2E		Failure of level 2 channel 697E (RCIC)		
	ACRC2EMI	RLE97EHWI, failure of sensor		
		RRE97EHWI, failure of relay logic		
RLEV2E1		Failure of level 2 channel 692E (RCIC)		
	ACRC2EMJ	RLE92EHWI, failure of sensor		
		RRE92EHWI, failure of relay logic		
RLE24AHWI	ACRCFAJM	RLE24AHWI, reactor high water level sensor gives false signal (RCIC)		
RLE24CHWI	ACRCFMLL	RLE24CHWI, reactor high water level sensor gives false signal (RCIC)		
RLE61BHWI	ACRCTSLO	RLE61BHWI, failure of CST level indicator N661B (RCIC)		
RLE61FHWI	ACRCCSLP	RLE61FHWI, failure of CST level indicator N661F (RCIC)		
RLUBE		RCIC lube system fails		
	HSRCLSMV	RMV046DDI, HV1F046, NC-FC		
		RHX001DFI, lube cooling heat exchanger leaks		
		RLP001DWI, shaft drive lube pump fails		
		RLF001DEI, lube filter plugs/leaks		
RMV022DDI	HSRHCIME	RMV022DDI, RCIC MOV globe valve to CST, NC-FO		
RMAV1	TMRCICMD	RMAV1, RCIC unavailable due to maintenance given that HPCI is not in maintenance		
ROP1	RCOSP1DI	ROP1, non-recovery of offsite power within 1/2 hr		
ROP2	RCOSP2DM	ROP2, recovery of offsite power within 2 hr		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
ROP3	RCOSP3G8	ROP3, non-recovery of offsite power within 4 hr		
ROTD		Insufficient coolant from RCIC discharge during restart		
	HSRCIPKS	FCV7480PO, containment isolation check valve stuck closed		
		FCV108OPO, containment isolation check valve stuck closed		
		RCY0110PO, check valve fails, stuck closed		
		RHV013DPO, isolation valve in discharge line of RCIC, RC-FC		
RPHO1A		RCIC turbine loss of function (Excluding TSVHRR AND gate)		
	HSRCITKP	RTUOO02DMD, turbine fails to start		
		RHV045DPO, steam line valve, RC-FC		
RPHOO1DMD	HSRCIPKR	RPHOO1DMD, failure of RCIC pump to start		
RPR55AHWI	ACRCPSLD	RPR55AHWI, RCIC turbine exhaust pressure sensor NO55A gives false signal (high)		
RPR55CHWI	ACRCPSLC	RPR55CHWI, RCIC turbine exhaust pressure sensor NO55C gives false signal (high)		
RPR55EHWI	ACRCPSLB	RPR55EHWI, RCIC turbine exhaust pressure sensor NO55E gives false signal (high)		
RPR55GHWI	ACRCPSLA	RPR55GHWI, RCIC turbine exhaust pressure sensor NO55G gives false signal (high)		
RPR58AHWI	ACRCRPLH	RPR58AHWI, reactor low pressure sensor NO58A gives false signal (RCIC)		
RPR58CHWI	ACRCRPLG	RPR58CHWI, reactor low pressure sensor NO58C gives false signal (RCIC)		
RPR58EHWI	ACRCRPLF	RPR58EHWI, reactor low pressure sensor NO58E gives false signal (RCIC)		
RPR58GHWI	ACRCRPLE	RPR58GHWI, reactor low pressure sensor NO58G gives false signal (RCIC)		
RSID	ACRCIOXT	RSID, failure of manual actuation to initiate RCIC		
RSWOO1HWI	ACRCCTLS	RSWOO1HWI, manual transfer switch failure (RCIC)		
RSWO45HWI	ACRCRWLX	RSWO45HWI, permissive when steam supply valve FO45 is fully open (RCIC)		
RTDP		Loss of flow through RCIC turbine-driven pump (Excluding the RTDP1 OR gate)		
	HSRCIPMC	RPHOO1DWI, failure of pump		
		RPPOO1HFI, piping rupture in pump discharge or suction		
RTDP1		Failure of the RCIC turbine (Excluding events RIEFT, RLTA, and the RTDP1A OR gate)		
	HSRCITMB	RRDOOTDOI, failure of turbine exhaust rupture disk		
		RTUOO2DWI, failure of the turbine to start and run		
RTDP1A		Loss of steam supply to RCIC turbine		
	HSRCITMA	RHV113DOI, turbine governing valve, NO-FC		
		RHV112DOI, turbine trip throttle valve, NO-FC		
		RHV045DFI, M.O. globe valve in steam line to turbine, NO-FC		
		RPPOO2HFI, piping in steam line to turbine ruptures		
		RHVOO8DOI, M.O. gate valve in steam line to turbine, NO-FC		
		RHVOO7DOI, M.O. gate valve in steam line to turbine, NO-FC		
RTRID	UHRCITXO	Instability in RCIC turbine exhaust causes trip		
RTIT	RCIC01	RHUSOOOXI, operator fails to take manual control of HPCI and if HPC is successful on its initial demand, results in RCIC trip		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
TSVT	ACRICXC	TSVT, RCIC turbine stop valve tripped		
U		High pressure injection system		
	HPCI	U, failure of HPCI and RCIC system (used to calculate $\bar{U}$ for the TgUX sequence only)		
U		High pressure injection system		
	URHPI3CS	U, failure of HPCI and RCIC systems (for TgUX sequence only)		
Y		LP ECCS, failure of		
	URLPCI11	Y, failure of ADS due to hardware faults or the failure of LPCS and LPCS due to various reasons given that onsite or offsite power is recovered within 1/2 hr.		
Y		LP ECCS, failure of		
	URLPCI12	Y, failure of ADS due to hardware faults or the failure of LPCS and LPCI due to various reasons given that HPCI or RCIC was initially successful and that offsite power or the diesels are not recovered within 4 hr.		
Y		LP ECCS, failure of		
	URLPCI13	Y, failure of ADS due to hardware faults or the failure of LPCS and LPCI due to various reasons given the HPCI and RCIC failed initially and offsite power is not recovered within 1/2 hr.		
YFB		Vacuum breaker failed, RCIC exhaust high pressure on start (Excluding the CYBS1 and the CYBS2 AND gates)		
	HSRCITMS	RHY030001, MOV 030, NO-FC		
		RHY084001, MOV 084, NO-FC		
WAVO41DPI	HSCWAAEQ	WAVO41DPI, CW (ESW) discharge valve 041 fails, NC-FC		
WAVO42DPI	HSCWCBDY	WAVO42DPI, CW (ESW) discharge valve 042 fails, NC-FC		
WAVO43DWI	HSESC3FM	WAVO43DWI, ESW return block valve 043, NO-FO		
WAVO44DPI	HSCWBBDW	WAVO44DPI, CW (ESW) discharge valve 044 fails, NC-FC		
WAVO71DPI	HSCWABER	WAVO71DPI, ESW discharge valve 071 fails, NC-FC		
WAVO72DPI	HSCWCADI	WAVO72DPI, ESW discharge valve 072 fails, NC-FC		
WAVO73DWI	HSESCAFL	WAVO73DWI, ESW return block valve 073, NO-FO		
WAVO74DPI	HSCWBADY	WAVO74DPI, ESW discharge valve 074 fails, NC-FC		
WAV121DWI	HSESABFI	WAV121DWI, ESW return block valve 121, NO-FO		
WAV123DWI	HSESAAFH	WAV123DWI, ESW return block valve 123, NO-FO		
WAV125DWI	HSESBBFK	WAV125DWI, ESW return block valve 125, NO-FO		
WAV126DWI	HSESBAFJ	WAV126DWI, ESW return block valve 126, NO-FO		
WCYO07DWI	HSESWAGB	WCYO07DWI, check valve 1007 failure, ESW flow diverted to spray pond		
WCYO09DWI	HSESWBGC	WCYO09DWI, check valve 1009 failure, ESW flow diverted to spray pond		
WCYO11DWI	HSESWAFN	WCYO11DWI, failure of check valve 1011 (ESW)		
WCYO12DWI	HSESWBFO	WCYO12DWI, failure of check valve 1012 (ESW)		
WCYO62DWI	HSESWCFP	WCYO62DWI, failure of check valve 1062 (ESW)		
WCYO69DWI	HSESWCGD	WCYO69DWI, ESW check valve 1069 failure, flow diverted to spray pond		
WESWPASA	ACESWAFB	WESWPASA, failure of auto start control and logic, ESW pump A		
WESWPASB	ACESWBFC	WESWPASB, failure of auto start control and logic, ESW pump B		
WESWPASC	ACESWCFD	WESWPASC, failure of auto start control and logic, ESW pump C		
WESWPASD	ACESWDFE	WESWPASD, failure of auto start control and logic, ESW pump D		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
WEWGA		ESW loop A fails to provide water through system (Excluding the AA and WA1 AND gates)		
	HSESWAES	WPP01AHFI, pipe rupture		
		WIV1060OI, CW isolation valve 1006 fails, NO-FC		
		WIV1070OI, CW check valve 1007 fails, stuck closed		
WEWGB		ESW loop B fails to provide water through systems (Portion not including the WB and WB1 AND gates)		
	HSESBCDZ	WPP01BHFI, pipe rupture		
		WIV1080OI, CW isolation valve 1008 fails, NO-FC		
		WCY1090PI, CW isolation check valve 1009 fails, stuck closed		
WEWGC		ESW loop C fails to provide water through system (Excluding the WB and WC1 AND gates)		
	HSESBCDZ	Defined for PRA event WEWGB above		
WEW1A		ESW pump A fails to supply water (Excluding events DIW1P1 and WPSTA)		
	HSESACFF	WPP48AHFI, pump piping ruptures		
	HSESWAET	WCY01ADPI, pump discharge check valve fails, stuck closed		
		WPM48AONI, pump fails to start and run		
		WIV02AOOI, pump discharge valve fails, NO-FC		
		WFL48AHEI, pump suction plugged		
WEW1C		ESW pump C fails to supply water (Excluding events DIW1WP1 and WPSTC)		
	HSESACFF	Defined under PRA event WEW1A		
	HSESWCEU	WCY01CDPI, pump discharge check valve fails, stuck closed		
		WPM48CONI, pump fails to start and run		
		WIV02COOI, pump discharge valve fails, NO-FC		
		WFL48CHEI, pump suction plugged		
WEW2B		ESW pump B fails to supply water (Excluding events DIW1WP2 and WPSTB)		
	HSESBOFG	WPP48BHFI, pump piping ruptures		
	HSESWBEY	WCY01BDPI, pump discharge check valve fails, stuck closed		
		WPM48BONI, pump fails to start and run		
		WIV02BOOI, pump discharge valve fails, NO-FC		
		WFL48BHEI, pump suction plugged		
WEW2D		ESW pump D fails to supply water (Excluding events DIW1WP2 and WPSTD)		
	HSESWDEW	WCY01DDPI, pump discharge check valve fails, stuck closed		
		WPM48DONI, pump fails to start and run		
		WIV02DOOI, pump discharge valve fails, NO-FC		
		WFL48DHEI, pump suction plugged		
	HSESBOFG	Defined under PRA event WEW2B		
WHUMPMSA	ESESWAEX	WHUMPMSA, operator fails to start ESW pump A given auto start failure		
WHUMPMSB	ESESWBEY	WHUMPMSB, operator fails to start ESW pump B given auto start failure		
WHUMPMSC	ESESWCEU	WHUMPMSC, operator fails to start ESW pump C given auto start failure		
WHUMPMSD	ESESWDFA	WHUMPMSD, operator fails to start ESW pump D given auto start failure		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
ANCT		Insufficient flow from cooling towers to ESW pumps		
	HSESCTFZ	ACT, cooling tower fails		
		WIVO52DOI, cooling tower isolation valve fails, NO-FC		
ANMC		Standby ESW pump C fails or is unavailable (Excluding the WPMC OR gate)		
	ENESPCFY	WMUSEP, operator fails to start standby pump		
	TMESPCFY	WMTMC, standby pump unavailable due to maintenance		
WRWDA		ESW loop A fails to deliver water, hardware failures		
	HSESWAFU	WIVO100DI, loop isolation valve fails, NO-FC		
		WCYO11DPI, loop check valve fails, stuck closed		
		WCYO29DPI, loop discharge check valve fails, stuck closed		
		WAV121DOI, loop discharge isolation valve fails, NO-FC		
		WAV123DOI, loop discharge isolation valve fails, NO-FC		
		WPP123HFI, pipe rupture		
WRWDB		ESW loop B fails to deliver water, hardware failures		
	HSESWBFT	WIVO13DOI, loop isolation valve fails, NO-FC		
		WCYO12DPI, loop check valve fails, stuck open		
		WAV125DOI, loop discharge valve fails, NO-FC		
		WAV125DOI, loop discharge valve fails, NO-FC		
		WPP125HFI, pipe rupture		
WRWDC		ESW loop C fails to deliver water, hardware failures		
	HSESWCFS	WIVO10HDI, loop isolation valve fails, NO-FC		
		WCYO62HDI, loop check valve fails, stuck closed		
		WCYO35HDI, loop discharge check valve fails, stuck closed		
		WAVO43HDI, loop discharge isolation valve fails, NO-FC		
		WAVO73HDI, loop discharge isolation valve fails, NO-FC		
		WPPO23HFI, pipe rupture		
WPMA		Failure of operating ESW pump A		
	HSESPAFV	WIV44ADOI, butterfly suction valve fails, NO-FC		
		WPM50ADWI, pump unavailable due to failure		
		WCY45ADPI, discharge check valve fails, stuck closed		
		WIV40ADOI, discharge butterfly valve fails, NO-FC		
		WPP50AHFI, piping rupture		
	LOSPCMAX	ECSP, failure to provide electric power due to the loss of offsite power		
WPMB		Failure of operating ESW pump B		
	HSESPBFV	WIV44BDOI, butterfly suction valve fails, NO-FC		
		WPM50BDWI, pump unavailable due to failure		
		WCY45BDPI, discharge check valve fails, stuck closed		
		WIV40BDOI, discharge butterfly valve fails, NO-FC		
		WPP50BHFI, piping rupture		
	LOSPCMAX	Defined under PRA event WPMA		

PRA Event	ASEP Event	Component/Explanation	Unavailability	ASEP Event Unavailability Total
WPWS		Standby ESW pump leg C fails to provide adequate head		
	WSESPCF1	WIY44CDO1, butterfly suction valve fails, NO-FC		
		WPWSOCCW1, standby pump fails to start and run		
		WCY45CDP1, discharge check valve fails, stuck closed		
		WIY40CDO1, discharge butterfly valve fails, NO-FC		
		WPWSOCHF1, pipe rupture		
	LOSPCWAK	Defined under PRA event WPWA		
WSWD1A		ESW discharge valves in header 1A fail		
	WSSW1ADT	WCY65ADPT, discharge check valve fails, stuck closed		
		WWW1SADO1, discharge butterfly valve fails, NLO-FC		
WSWD1B		ESW discharge valves in header 1B fail		
	WSSW1BDR	WWW1SBDO1, discharge butterfly valve fails, NLO-FC		
		WCY65BDP1, discharge check valve fails, stuck closed		
WSWD2A		ESW discharge valves in header 2A fail		
	WSSW2ADU	WCY64ADPT, discharge check valve fails, stuck closed		
		WWW11ADO1, discharge butterfly valve fails, NLO-FC		
WSWD2B		ESW discharge valves in header 2B fail		
	WSSW2BDS	WWW11BDO1, discharge butterfly valve fails, NLO-FC		
		WCY64BDPT, discharge check valve fails, stuck closed		
WTWA	WSESWAFQ	WTWA, ESW loop A down for maintenance		
WTWB	WSESWBFR	WTWB, ESW loop B down for maintenance (fails loop C, also)		
WIY002DO1	WSESCTGA	WIY002DO1, failure of ESW to discharge back to cooling tower, butterfly valve fails, NO-FC		
I		Timely ADS actuation		
	ESADSMAN	ADSYPER1, supervisor overrules operator to avoid ADS		
		ADSPROC, operating procedures unclear		
		ADSOPER1, operator distracted during critical phase of accident		
		ADSOPER2, operator busy trying to restore high pressure injection system to operation		
	ADSTRANS	ADSTRANS, transient results in loss of indication of the need for ADS		
I	ESADSI10	I, failure of the operator to manually actuate ADS (use to calculate I for T_EUV sequence only)		

a. The ANDed combination of these two events leads to a top event described as the failure to isolate leak in Unit A, fails Unit B.

b. The ANDed combination of these two events leads to a top event described as the failure to isolate leak in Unit B, fails Unit A.

c. The unavailability of this event (RTE62CWI) given in the PRA fault tree is 7.0E-6. This was assumed to be a typographical error based on the following facts: (a) event RTE62AWI has an unavailability of 7.0E-5. This event is the same as RTE62CWI except that it is in a different train, (b) the top event unavailability of OR gate RIYCD is the same as that for RICY2. RICY2 has two similar events each with an unavailability of 7.0E-5.