Step 7: Assemble Fire PRA Equipment List

Table 1: Fire PRA Equipment List Information (For Instructors)

Equipment ID	Equipment Description	Equipment Type	Location	Power Supply	PRA Event Identifier	PRA Event Description	Normal Position/ Status	Desired Position/ Status	Failed Electrical Position	Failed Air Position
HPI-A[1]	High pressure safety injection pump A	Pump	Aux Bldg. El. 0 Ft	SWGR-A	HPIA_FTS	HPIA fails to start				
					HPIA_FTR	HPIA fails to run				
HPI-B	High pressure safety injection pump B	Pump	Aux Bldg. El. 0 Ft	SWGR-B	HPIB_FTS	HPIB fails to start				
					HPIB_FTR	HPIB fails to run				
RHR-B	RHR-B pump	Pump	Aux Bldg. El. -20 Ft	SWGR-B	RHRB-FTS	RHRB fails to start				
					RHRB-FTR	RHRB fails to run				
AFW-A	Motor driven AFW pump A	Pump	Turbine Bldg. El. 0 Ft	SWGR-A	AFWA-FTS	AFWA fails to start				
					AFWA-FTR	AFWA fails to run				
AFW-B	Steam driven AFW pump B	Pump	Turbine Bldg. El. 0 Ft	N/A	AFWB-FTS	AFWB fails to start				
					AFWB-FTR	AFWB fails to run				
AFW-C	Diesel driven AFW pump C	Pump	Turbine Bldg. El. 0 Ft	N/A	AFWC-FTS	AFWC fails to start				
					AFWC-FTR	AFWC fails to run				
RCP-1	Reactor coolant pump	Pump	Containment	SWGR-1	RCP1-FTT	RCP 1 fails to trip				

Equipment ID	Equipment Description	Equipment Type	Location	Power Supply	PRA Event Identifier	PRA Event Description	Normal Position/ Status	Desired Position/ Status	Failed Electrical Position	Failed Air Position
COMP-1	Instrument air compressor	Compressor	Turbine Bldg. El. 0 Ft	LC-1	COMP-1_FTR	Instrument air compressor fails to run				
AOV-1[2] (SOV-1)	Power operated relief valve	AOV	Containment	VITAL-A	AOV-1_TO	PORV AOV-1 transfers open				
AOV-1 (SOV-1)	Power operated relief valve	AOV	Containment	VITAL-A	AOV-1_FTC	PORV AOV-1 fails to close				
AOV-1 (SOV-1)	Power operated relief valve	AOV	Containment	VITAL-A	AOV-1_FTO	PORV AOV-1 fails to open				
AOV-2[3] (SOV-2)	Letdown isolation valve	AOV	Aux Bldg. El. 0 Ft	DC BUS-B	AOV-2_TC	AOV-2 transfers closed				
AOV-2 (SOV-2)	Letdown isolation valve	AOV	Aux Bldg. El. 0 Ft	DC BUS-B	AOV-2_FTC	AOV-2 fails to closed				
AOV-3[4] (SOV-3)	Charging pump injection valve	AOV	Aux Bldg. El. 0 Ft	DC BUS-B	AOV-3_FTC	AOV-3 FAILS TO CLOSE				
AOV-3 (SOV-3)	Charging pump injection valve	AOV	Aux Bldg. El. 0 Ft	DC BUS-B	AOV-3_TC	AOV-3 transfers open				
AOV-4 (SOV-4)	Atmospheric dump valve	AOV	Turbine Bldg. El. 0 Ft	DC-BUS-1	AOV-4_TO	AOV-4 transfers open				
MOV-1	HPI discharge valve	MOV	Aux Bldg. El. 0 Ft	MCC-A1	MOV-1_FTO	MOV-1 FAILS TO OPEN				
MOV-2[5]	VCT isolation valve	MOV	Aux Bldg. El. 0 Ft	MCC-B1	MOV-2_FTC	MOV-2 fails to close				
MOV-3[6]	Containment sump recirculation valve	MOV	Aux Bldg. El. -20 Ft	MCC-A1	MOV-3_FTO	MOV-3 fails to open				
MOV-3	Containment sump recirculation valve	MOV	Aux Bldg. El. -20 Ft	MCC-A1	MOV-3_TO	MOV-3 TRANSFERS OPEN				
MOV-4	Containment sump recirculation valve	MOV	Aux Bldg. El. -20 Ft	MCC-B1	MOV-4_FTO	MOV-4 fails to open				
MOV-4	Containment sump recirculation valve	MOV	Aux Bldg. El. -20 Ft	MCC-B1	MOV-4 _TO	MOV-4 TRANSFERS OPEN				

Equipment ID	Equipment Description	Equipment Type	Location	Power Supply	PRA Event Identifier	PRA Event Description	Normal Position/ Status	Desired Position/ Status	Failed Electrical Position	Failed Air Position
MOV-5	RWST isolation valve	MOV	Aux Bldg. El. 0 Ft	MCC-A1	MOV-5_FTO	MOV-5 fails to open				
					MOV-5_FTC	MOV-5 fails to close				
MOV-6	RWST isolation valve	MOV	Aux Bldg. El. 0 Ft	MCC-B1	MOV-6_FTO	MOV-6 fails to open				
					MOV-6_FTC	MOV-6 fails to close				
MOV-7[7]	RHR inboard suction valve	MOV	Containment	MCC-A1	MOV-7_TO	MOV-7 TRANSFERS OPEN				
MOV-8	RHR outboard suction valve	MOV	Aux Bldg. El. -20 Ft	MCC-B1	MOV-8_TO	MOV-8 TRANSFERS OPEN				
MOV-9	HPI discharge valve	MOV	Aux Bldg. El. 0 Ft	MCC-B1	MOV-9_FTO	MOV-9 FAILS TO OPEN				
MOV-10	AFW pump A discharge valve	MOV	Turbine Bldg. El. 0 Ft	MCC-A1	MOV-10_FTO	MOV-10 fails to open				
MOV-11	AFW pump B discharge valve	MOV	Turbine Bldg. El. 0 F	DC BUS-B	MOV-11_FTO	MOV-11 fails to open				
MOV-13	PORV block valve	MOV	Containment	MCC-A1	MOV-13_FTC	MOV-13 fails to close				
MOV-13	PORV block valve	MOV	Containment	MCC-A1	MOV-13_TC	MOV-13 transfers close				
MOV-14	AFW pump B turbine steam line isolation valve	MOV	Turbine Bldg. El. 0 Ft	DC BUS-B	MOV-14_FTO	MOV-14 FAILS TO OPEN				
MOV-15	AFW pump B steam inlet throttle valve	MOV	Turbine Bldg. El. 0 Ft	DC BUS-B	MOV-15_FTO	MOV-15 FAILS TO OPEN				
MOV-18	AFW pump C discharge valve	MOV	Turbine Bldg. El. 0 Ft	MCC-2	MOV-18_FTO	MOV-18 fails to open				
LI-1[8]	RWST level	Instrument	Yard	VITAL-A	LI-1_FL	RWST Level indication fails low				
					LI-1_FH	RWST Level indication fails high				

Equipment ID	Equipment Description	Equipment Type	Location	Power Supply	PRA Event Identifier	PRA Event Description	Normal Position/ Status	Desired Position/ Status	Failed Electrical Position	Failed Air Position
LI-2	RWST level	Instrument	Yard	VITAL-B	LI-2_FL	RWST Level indication fails low				
					LI-2_FH	RWST Level indication fails high				
LI-3	Cont. sump level	Instrument	Containment	VITAL-A	LI-3_FH	Cont sump Level indication fails high				
LI-4	Cont. sump level	Instrument	Containment	VITAL-B	LI-4_FH	Cont sump Level indication fails high				
LI-5	SG secondary level	Instrument	Containment	VITAL-A	LI-5_FH	SG level indicator fails high				
LI-6	SG secondary level	Instrument	Containment	VITAL-B	LI-6_FH	SG level indicator fails high				
TI-1[9]	Letdown heat exchanger outlet temp	Instrument	Aux Bldg. El. 0 Ft	VITAL-A	TI-1_FL	Letdown temperature indication fails low				
PT-1[10]	RCS pressure	Instrument	Containment	VITAL-B	PT-1_FH	RCS pressure indication fails high				
PT-1	RCS pressure	Instrument	Containment	VITAL-B	PT-1_FL	RCS pressure indication fails low				
A-1	AFW motor high temperature	Annunciator	SWG Access Room	VITAL-A	ANN-1_FH	AFW motor high temperature annunciator spuriously indicates high				
SWGR-A[11]	Train A 4160 V switchgear	Switchgear	Switchgear Room A	SUT-1 DC BUS-A	EPS-4VBUSAF	4KV BUS A FAULT				
				EDG-A DC BUS-A	EPS-4VBUSAF	4KV BUS A FAULT				

Equipment ID	Equipment Description	Equipment Type	Location	Power Supply	PRA Event Identifier	PRA Event Description	Normal Position/ Status	Desired Position/ Status	Failed Electrical Position	Failed Air Position
SWGR-B	Train B 4160 V switchgear	Switchgear	Switchgear Room B	SUT-1 DC BUS-B	EPS-4VBUSBF	4KV BUS A FAULT				
				EDG-B DC BUS-B	EPS-4VBUSBF	4KV BUS A FAULT				
SWGR-1	Non-safety 4160 V switchgear	Switchgear	Turbine Bldg. El. 0ft	UAT-1 SUT-1	EPS-4VBUS1F	4KV BUS 1 FAULT				
SUT-1	Startup transformer	Transformer	Yard	OSP	SUTF	FAILURE OF START-UP TRANSFORMER (SUT)				
UAT-1	Auxiliary transformer	Transformer	Yard	Main generator	UATF	FAILURE OF UNIT AUXILIARY TRANSFORMER (UAT)				
EDG-A	Train A emergency diesel generator	Diesel Generator	DG Bldg.	DC BUS-A	EPS-DGAF	FAILURE OF DIESEL GENERATOR A				
EDG-B	Train B emergency diesel generator	Diesel Generator	DG Bldg.	DC BUS-B	EPS-DGBF	FAILURE OF DIESEL GENERATOR B				
LC-1	Non-safety 480 V load center	Load Center	Turbine Bldg. El. 0 ft	SST-1	EPS-480VLC1F	480V LOAD CENTER 1 FAULT				
LC-A	Train A 480 V load center	Load Center	Switchgear Room A	SST-A PNL-A	EPS-480VLCAF	480V LOAD CENTER A FAULT				
LC-B	Train B 480 V load center	Load Center	Switchgear Room B	SST-B PNL-B	EPS-480VLCBF	480V LOAD CENTER B FAULT				
SST-1	Non-safety station service transformer	Transformer	Turbine Bldg. El. 0 F	SWGR-1	EPS-480VLC1XTF	480V LOAD CENTER 1 TRANSFORMER FAILS				

Equipment ID	Equipment Description	Equipment Type	Location	Power Supply	PRA Event Identifier	PRA Event Description	Normal Position/ Status	Desired Position/ Status	Failed Electrical Position	Failed Air Position
SST-A	Train A station service transformer	Transformer	Switchgear Room A	SWGR-A	EPS-480VLCAXTF	480V LOAD CENTER A TRANSFORMER FAILS				
SST-B	Train B station service transformer	Transformer	Switchgear Room B	SWGR-B	EPS-480VLCBXTF	480V LOAD CENTER B TRANSFORMER FAILS				
MCC-1	Non-safety 480 V motor control center	Motor Control Center	Turbine Bldg. El. 0 Ft	LC-1	EPS-480VMCC1F	480V MCC 1 FAULT				
MCC-A1	Train A 480 V motor control center	Motor Control Center	SWG Access Room	LC-A	EPS-480VMCCA1F	480V MCC A1 FAULT				
MCC-B1	Train B 480 V motor control center	Motor Control Center	SWG Access Room	LC-B	EPS-480VMCCB1F	480V MCC B1 FAULT				
BC-1	Non-safety swing battery charger	Battery Charger	Turbine Bldg. El. 0 Ft	ATS-1	EPS-BC1F	FAILURE OF BATTERY CHARGER 1				
BC-A	Train A battery charger	Battery Charger	Switchgear Room A	MCC-A1	EPS-BCAF	FAILURE OF BATTERY CHARGER A				
BC-B	Train B battery charger	Battery Charger	Switchgear Room B	MCC-B1	EPS-BCBF	FAILURE OF BATTERY CHARGER B				
BAT-1	Non-safety battery	Battery	Turbine Bldg. El. 0 Ft	N/A	EPS-SB	FAILURE OF STATION BATTERY				
BAT-A	Train A battery	Battery	Battery Room A	N/A	EPS-BATA	FAILURE OF BATTERY A				
BAT-B	Train B battery	Battery	Battery Room B	N/A	EPS-BATB	FAILURE OF BATTERY B				
DC BUS-1	Non-safety 125 VDC bus	DC Bus	Turbine Bldg. El. 0 Ft	BC-1 BAT-1	EPS-125VNSDCBUSF	FAULT ON 125V NON-SAFETY DC BUS				
DC BUS-A	Train A 125 VDC bus	DC Bus	Switchgear Room A	BC-A BAT-A	EPS-125VDCBUSAF	FAULT ON 125V DC BUS A				
DC BUS-B	Train B 125 VDC bus	DC Bus	Switchgear Room B	BC-B BAT-B	EPS-125VDCBUSBF	FAULT ON 125V DC BUS B				

Equipment ID	Equipment Description	Equipment Type	Location	Power Supply	PRA Event Identifier	PRA Event Description	Normal Position/ Status	Desired Position/ Status	Failed Electrical Position	Failed Air Position
PNL-A	Train A 125 VDC panel	Panel board	Switchgear Room A	DC BUS-A	EPS-125VDCPNLAF	FAULT ON 125V DC PANEL A				
PNL-B	Train B 125 VDC panel	Panel board	Switchgear Room B	DC BUS-B	EPS-125VDCPNLBF	FAULT ON 125V DC PANEL A				
INV-A	Train A inverter	Inverter	Switchgear Room A	DC BUS-A	EPS-120VBUSAINVF	FAILURE OF 120V BUS A INVERTER				
INV-B	Train B inverter	Inverter	Switchgear Room B	DC BUS-B	EPS-120VBUSAINVF	FAILURE OF 120V BUS B INVERTER				
VITAL-A	Train A 120 VAC vital bus	120VAC Bus	SWG Access Room	INV-A	EPS-120VBUSAF	120V BUS A FAULT				
VITAL-B	Train B 120 VAC vital bus	120VAC Bus	SWG Access Room	INV-B	EPS-120VBUSBF	120V BUS A FAULT				

Notes:

Legend (pertains to whether component failure mode is included in the model)

In PRA only; included in Fire PRA Model	
In Appendix R only; included in Fire PRA Model	
In PRA and Appendix R; included in Fire PRA Model	
Components not in PRA or Appendix R; added to Fire PRA Model	

[1] HPI pumps A & B are in Appendix R for normal charging function; not for HPI.
[2] AOV-1 closed to prevent LOCA /Open for feed and bleed. Appendix R has valve only to ensure remains closed.
[3] AOV-2 in Appendix R only, for normal letdown function.
[4] AOV-3 in PRA for isolation of letdown when switching to HPI, in Appendix R for normal charging function.
[5] MOV-2 in PRA only for isolation of letdown
[6] MOV-3 and MOV-4 need to be closed when using RWST water supply for HPI / Open for recirculation mode of injection. MOVs 5 & 6 are correspondingly open for RWST use and closed for recirculation.

[7] MOV-7 electrically blocked closed. Control power fuses are supposed to be removed.

[8] If RWST level indication fails high the operator will fail to establish recirculation. If the RWST level fails low and containment sump level fails high, the operator will establish suction to dry sump and fail the HPI the pumps due to insufficient suction.

[9] If letdown temperature indication fails low, the operator will fail to isolate the letdown line on loss of CCW. This will cause HPI pumps to cavitate due to high temperature in the suction line.

[10] If RCS pressure instrument fails high, the low pressure signal to initiate emergency safeguards actuation during a fire-induced LOCA will not be initiated.

[11] For SWGR-A or SWGR-B, only one basic event is used in the model. However, the circuit analysis impact to the switchgear is a function of the power supply