

Facility: Wolf Creek			Rev. 3			Date of Exam: 10/27/2021												
Tier	Group	RO K/A Category Points											SRO-Only Points					
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2	G*	Total		
1. Emergency and Abnormal Plant Evolutions	1	3	3	3				3	3				3	18	3	3	6	
	2	1	1	1				2	2				2	9	2	2	4	
	Tier Totals	4	4	4				5	5				5	27	5	5	10	
2. Plant Systems	1	3	3	3	3	2	2	2	2	3	3	2	28	3	2	5		
	2	0	1	1	1	1	1	1	1	1	1	1	10	1	1	1	3	
	Tier Totals	3	4	4	4	3	3	3	3	4	4	3	38	5	3	8		
3. Generic Knowledge and Abilities Categories				1		2		3		4		10		1	2	3	4	7
				3		2		2		3				2	2	1	2	
Note:	1.	Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outline sections (i.e., except for one category in Tier 3 of the SRO-only section, the "Tier Totals" in each K/A category shall not be less than two). (One Tier 3 radiation control K/A is allowed if it is replaced by a K/A from another Tier 3 category.)																
	2.	The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points, and the SRO-only exam must total 25 points.																
	3.	Systems/evolutions within each group are identified on the outline. Systems or evolutions that do not apply at the facility should be deleted with justification. Operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.																
	4.	Select topics from as many systems and evolutions as possible. Sample every system or evolution in the group before selecting a second topic for any system or evolution.																
	5.	Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.																
	6.	Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.																
	7.	The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.																
	8.	On the following pages, enter the K/A numbers, a brief description of each topic, the topics' IRs for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above. If fuel-handling equipment is sampled in a category other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2. (Note 1 does not apply). Use duplicate pages for RO and SRO-only exams.																
	9.	For Tier 3, select topics from Section 2 of the K/A catalog and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.																
G* Generic K/As	*	These systems/evolutions must be included as part of the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan. They are not required to be included when using earlier revisions of the K/A catalog.																
	**	These systems/evolutions may be eliminated from the sample (as applicable to the facility) when Revision 3 of the K/A catalog is used to develop the sample plan.																

Emergency and Abnormal Plant Evolutions—Tier 1/Group 1 (RO/SRO)

Item #	E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
1	000007 (EPE 7; BW-E02 & E10; CE-E02) Reactor Trip, Stabilization, Recovery / 1					X		EA2.04 Ability to determine and/or Interpret the following as they apply to a Reactor Trip: Interpret plant conditions, take immediate actions, and determine when transition requirements are met for the ATWS emergency procedure. [CFR: 43.5]	4.4	84
2	000007 (EPE 7; BW-E02 & E10; CE-E02) Reactor Trip, Stabilization, Recovery / 1						X	G2.1.20 Ability to interpret and execute procedure steps. [CFR: 41.10]	4.6	39
3	000008 (APE 8) Pressurizer Vapor Space Accident / 3						X	G2.4.47 Ability to diagnose and recognize trends in an accurate and timely manner using the appropriate control room reference material (reference potential). [CFR: 43.5]	4.2	85
4	000009 (EPE 9) Small Break LOCA / 3					X		EA2.13 Ability to determine and/or interpret the following as they apply to a Small-Break LOCA: HPI pump parameters. [CFR: 41.2]	3.2	40
5	000011 (EPE 11) Large Break LOCA / 3			X				EK3.08 Knowledge of the reasons for the following responses and/or actions as they apply to a Large-Break LOCA: Containment sump recirculation. [CFR: 41.10]	4.3	41
6	000015 (APE 15) Reactor Coolant Pump Malfunctions/4						X	G2.1.28 Knowledge of the purpose and function of major system components and controls. [CFR: 41.7]	4.1	42
7	000022 (APE 22) Loss of Reactor Coolant Makeup / 2			X				AK3.02 Knowledge of the reasons for the following responses and/or actions as they apply to a Loss of Reactor Coolant Makeup: Actions contained in AOPs. [CFR: 41.5]	3.7	43
8	000025 (APE 25) Loss of Residual Heat Removal System / 4			X				AK3.01 Knowledge of the reasons for the following responses and/or actions as they apply to Loss of Residual Heat Removal System: Shift to alternate flowpath. [CFR: 41.5]	3.8	44
9	000026 (APE 26) Loss of Component Cooling Water / 8		X					AK2.02 Knowledge of the relationship between Loss of Component Cooling Water and the following systems or components: RCPs. [CFR: 41.8]	4.2	45
10	000027 (APE 27) Pressurizer Pressure Control System Malfunction / 3					X		AA2.10 Ability to determine and/or interpret the following as they apply to Pressurizer Pressure Control System Malfunction: PZR heater energized/deenergized condition. [CFR: 41.7]	3.8	46
11	000029 (EPE 29) Anticipated Transient Without Scram / 1				X			EA1.16 Ability to operate and/or monitor the following as they apply to Anticipated Transient Without Scram (ATWS): CVCS. [CFR: 41.10]	3.6	47
12	000038 (EPE 38) Steam Generator Tube Rupture / 3						X	G2.2.37 Ability to determine operability or availability of safety related equipment (SRO Only). [CFR: 43.5]	4.6	86
13	000040 (APE 40; BW-E05; CE-E05; W-E12) Steam Line Rupture – Excessive Heat Transfer / 4						X	G2.4.4 Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures. [CFR: 41.10]	4.5	48
14	000054 (APE 54; CE-E06) Loss of Main Feedwater / 4		X					AK2.09 Knowledge of the relationship between Loss of Main Feed Water System and the following systems or components: AFW. [CFR: 41.7]	3.9	49

15	000055 (EPE 55) Station Blackout / 6		X					EK2.04 Knowledge of the relationship between Station Blackout and the following systems or components: AFW system. [CFR: 41.7]	4.2	50
16	000056 (APE 56) Loss of Offsite Power / 6	X						AK1.07 Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to Loss of Offsite Power: Long term core cooling. [CFR: 41.8]	4.0	51
17	000057 (APE 57) Loss of Vital AC Instrument Bus / 6					X		AA2.20 Ability to determine and/or interpret the following as they apply to Loss of Vital AC Electrical Instrument Bus: The plant automatic actions that will occur on the loss of a vital AC electrical instrument bus. [CFR: 41.5]	3.0	52
18	000058 (APE 58) Loss of DC Power / 6					X		AA2.02 Ability to determine and/or interpret the following as they apply to Loss of DC Power: 125 V DC bus voltage. [CFR: 43.2]	3.8	87
19	000062 (APE 62) Loss of Nuclear Service Water / 4					X		AA2.02 Ability to determine and/or interpret the following as they apply to Loss of Service Water: The cause of possible SWS loss. [CFR: 43.5]	3.3	88
20	000065 (APE 65) Loss of Instrument Air / 8						X	G2.2.44 Ability to interpret control room indications to verify the status and operation of a system and understand how operator actions and directives affect plant and system conditions. [CFR: 43.5]	4.7	89
21	000077 (APE 77) Generator Voltage and Electric Grid Disturbances / 6				X			AA1.02 Ability to operate and/or monitor the following as they apply to Generator Voltage and Electric Grid Disturbances: Turbine/generator controls. [CFR: 41.5]	3.6	53
22	(W E04) LOCA Outside Containment / 3				X			EA1.05 Ability to operate and/or monitor the following as they apply to LOCA outside Containment: RHRS. [CFR: 41.9]	3.8	54
23	(BW-E04; W E05) Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4	X						EK1.11 Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to Loss of Secondary Heat Sink. Controlling Feed Flow Rate. [CFR: 41.10]	4.0	55
24	(W E11) Loss of Emergency Coolant Recirculation / 4	X						EK1.09 Knowledge of the operational implications and/or cause and effect relationships of the following concepts as they apply to Loss of Emergency Coolant Recirculation: ECCS pump cavitation caused by sump blockage. [CFR: 41.8]	4.2	56
K/A Category Totals:		3	3	3	3	6	6	Group Point Total:		24

Emergency and Abnormal Plant Evolutions—Tier 1/Group 2 (RO/SRO)

Item #	E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G*	K/A Topic(s)	IR	Q#
25	000001 (APE 1) Continuous Rod Withdrawal / 1					X		AA2.05 Ability to determine and/or interpret the following as they apply to Continuous Rod Withdrawal: Uncontrolled rod withdrawal. [CFR: 41.1]	4.2	57
26	000003 (APE 3) Dropped Control Rod / 1						X	G2.1.32 Ability to explain and apply system precautions, limitations, notes, or cautions. [CFR: 43.6]	4.0	90
27	000024 (APE 24) Emergency Boration / 1						X	G2.4.35 Knowledge of non-licensed operator responsibilities during an emergency. [CFR: 43.5]	4.0	91
28	000028 (APE 28) Pressurizer (PZR) Level Control Malfunction / 2				X			AA1.11 Ability to operate and/or monitor the following as they apply to Pressurizer Level Control System Malfunction: PZR backup heater status based on PZR level above/below program. [CFR: 41.7]	3.4	58
	000032 (APE 32) Loss of Source Range Nuclear Instrumentation / 7									
	000033 (APE 33) Loss of Intermediate Range Nuclear Instrumentation / 7									
	000036 (APE 36; BWA08) Fuel-Handling Incidents / 8									
29	000037 (APE 37) Steam Generator Tube Leak / 3		X					AK2.14 Knowledge of the relationship between Steam Generator Tube Leak and the following systems or components: Main steam system. [CFR: 41.11]	3.6	59
	000051 (APE 51) Loss of Condenser Vacuum / 4									
30	000059 (APE 59) Accidental Liquid Radwaste Release / 9					X		AA2.09 Ability to determine and/or interpret the following as they apply to an Accidental Liquid Radwaste Release: Implement TS and/or TRM actions (whatever is applicable) for an inoperable radioactive-liquid monitor. [CFR: 41.13]	3.8	60
	000060 (APE 60) Accidental Gaseous Radwaste Release / 9									
	000061 (APE 61) Area Radiation Monitoring System Alarms / 7									
	000067 (APE 67) Plant Fire On Site / 8									
31	000068 (APE 68 ; BWA06) Control Room Evacuation / 8						X	G2.2.40 Ability to apply TS with action statements of less than or equal to 1 hour. [CFR: 41.10]	3.4	61

	(CE-E00) Functional Recovery										
	(CE-E13*) Loss of Forced Circulation / LOOP / Blackout / 4										
K/A Category Totals:		1	1	1	2	4	4	Group Point Total:			13

Emergency and Abnormal Plant Evolutions—Tier 2/Group 1 (RO/SRO)

Item #	System / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	K/A Topic(s)	IR	Q#
38	003 (SF4P RCP) REACTOR COOLANT PUMP SYSTEM								X				A2.01 Ability to (a) predict the impacts of the following on the Reactor Coolant Pump System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Problems with RCP seals, especially seal leakoff rates. [CFR: 41.2]	4.0	2
39	004 (SF1; SF2 CVCS) CHEMICAL AND VOLUME CONTROL SYSTEM		X										K2.03 Knowledge of electrical power supplies to the following: Charging Pumps. [CFR: 41.6]	3.9	1
40	004 (SF1; SF2 CVCS) CHEMICAL AND VOLUME CONTROL SYSTEM									X			A3.01 Ability to monitor automatic features of the Chemical and Volume Control System, including: Water and boron inventory. [CFR: 41.6]	3.7	3
41	005 (SF4P RHR) RESIDUAL HEAT REMOVAL SYSTEM							X					A1.09 Ability to predict and/or monitor changes in parameters associated with operation of the Residual Heat Removal System, including: RCS temperature. [CFR: 41.5]	3.9	4
42	005 (SF4P RHR) RESIDUAL HEAT REMOVAL SYSTEM										X		A4.05 Ability to manually operate and/or monitor the (SF4P RHR) RESIDUAL HEAT REMOVAL SYSTEM in the control room: Raising or lowering refueling cavity level. [CFR: 41.3]	3.4	5
43	006 (SF2; SF3 ECCS) EMERGENCY CORE COOLING SYSTEM											X	G2.2.12 Knowledge of surveillance procedures. [CFR: 41.8]	3.7	6
44	006 (SF2; SF3 ECCS) EMERGENCY CORE COOLING SYSTEM											X	G2.4.2 Knowledge of system setpoints, interlocks, and automatic actions associated with emergency and abnormal operating procedure entry conditions. [CFR: 43.2]	4.6	76
45	007 (SF5 PRTS) PRESSURIZER RELIEF/QUENCH TANK SYSTEM			X									K3.01 Knowledge of the effect that a loss or malfunction of the Pressurizer Relief/Quench Tank System will have on the following systems or system parameters: Containment. [CFR: 41.9]	3.4	7

46	007 (SF5 PRTS) PRESSURIZER RELIEF/QUENCH TANK SYSTEM				X										K4.06 Knowledge of Pressurizer Relief / Quench Tank System design features and/or interlocks that provide for the following: Venting PRT/quench tank. [CFR: 41.10]	2.6	8
47	008 (SF8 CCW) COMPONENT COOLING WATER SYSTEM								X						A2.01 Ability to (a) predict the impacts of the following on the Component Cooling Water System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Loss of CCW pump. [CFR: 43.2]	4.0	77
48	008 (SF8 CCW) COMPONENT COOLING WATER SYSTEM								X						A2.07 Ability to (a) predict the impacts of the following on the Component Cooling Water System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Consequences of high/low CCW flow rates. [CFR: 41.7]	2.9	9
49	010 (SF3 PZR PCS) PRESSURIZER PRESSURE CONTROL SYSTEM			X											K3.03 Knowledge of the effect that a loss or malfunction of the Pressurizer Pressure Control System will have on the following systems or system parameters: ESFAS. [CFR: 41.5]	4.2	10
50	010 (SF3 PZR PCS) PRESSURIZER PRESSURE CONTROL SYSTEM				X										K4.05 Knowledge of Pressurizer Pressure Control System design features and/or interlocks that provide for the following: Low Temperature Overpressure Protection. [CFR: 41.7]	3.8	11
51	012 (SF7 RPS) REACTOR PROTECTION SYSTEM									X					A3.06 Ability to monitor automatic features of the Reactor Protection System, including: Trip logic. [CFR: 41.7]	4.1	12
52	013 (SF2 ESFAS) ENGINEERED SAFETY FEATURES ACTUATION SYSTEM						X								K6.11 Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Engineered Safety Features Actuation System: S/G tube rupture. [CFR: 41.10]	4.1	13
53	022 (SF5 CCS) CONTAINMENT COOLING SYSTEM			X											K3.04 Knowledge of the effect that a loss or malfunction of the Containment Cooling System will have on the following systems or system parameters: CNT. [CFR: 41.9]	3.9	14

54	022 (SF5 CCS) CONTAINMENT COOLING SYSTEM									X	G2.4.30 Knowledge of events related to system operation / status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator. [CFR: 41.10]	2.7	15
55	026 (SF5 CSS) CONTAINMENT SPRAY SYSTEM				X						K4.02 Knowledge of Containment Spray System (CSS) design features and/or interlocks that provide for the following: Corrosion control and/or iodine reduction / scavenging via the CSS. [CFR: 41.5]	3.5	16
56	026 (SF5 CSS) CONTAINMENT SPRAY SYSTEM									X	A2.04 Ability to (a) predict the impacts of the following on the Containment Spray System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Failure of spray pump. [CFR: 43.5]	4.0	78
57	039 (SF4S MSS) MAIN AND REHEAT STEAM SYSTEM							X			K6.11 Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Main and Reheat Steam System: SDS. [CFR: 41.10]	3.4	17
	053 (SF1; SF4P- ICS*) INTEGRATED												
58	059 (SF4S MFW) MAIN FEEDWATER SYSTEM									X	A2.01 Ability to (a) predict the impacts of the following on the Main Feedwater System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Actuation of AFW system. [CFR: 43.2]	4.1	79
59	059 (SF4S MFW) MAIN FEEDWATER SYSTEM									X	A4.09 Ability to manually operate and/or monitor the Main Feedwater System in the control room: Remote determination of operating feedwater pump turning gear. [CFR: 41.7]	2.5	18
60	061 (SF4S AFW) AUXILIARY / EMERGENCY FEEDWATER SYSTEM	X									K1.09 Knowledge of the physical connections and/or cause and effect relationships between the Auxiliary/ Emergency Feedwater System and the following systems: Emergency Water Source. [CFR: 41.4]	4.2	19
61	061 (SF4S AFW) AUXILIARY / EMERGENCY FEEDWATER SYSTEM									X	A3.04 Ability to monitor automatic features of the Auxiliary/Emergency Feedwater System, including: Automatic AFW. [CFR: 41.7]	4.0	20
62	062 (SF6 ED AC) AC ELECTRICAL DISTRIBUTION SYSTEM				X						K5.09 Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the AC Electrical Distribution System: Consequence of paralleling out-of-phase/mismatch in volts. [CFR: 41.5]	3.7	21

63	063 (SF6 ED DC) DC ELECTRICAL DISTRIBUTION SYSTEM		X										K2.03 Knowledge of electrical power supplies to the following: Battery chargers. [CFR: 41.7]	4.0	22
64	063 (SF6 ED DC) DC ELECTRICAL DISTRIBUTION SYSTEM												X G2.2.44 Ability to interpret control room indications to verify the status and operation of a system and understand how operator actions and directives affect plant and system conditions. [CFR: 43.2]	4.4	80
65	064 (SF6 EDG) EMERGENCY DIESEL GENERATOR SYSTEM					X							K5.10 Knowledge of the operational implications or cause and effect relationships of the following concepts as they apply to the Emergency Diesel Generator System: Effects (verification) of stopping an EDG under load on an isolated bus. [CFR: 41.5]	3.4	23
66	073 (SF7 PRM) PROCESS RADIATION MONITORING SYSTEM	X											K1.05 Knowledge of the physical connections and/or cause and effect relationships between the Process Radiation Monitoring System and the following systems: CCWS. [CFR: 41.11]	3.1	24
67	076 (SF4S SW) SERVICE WATER SYSTEM		X										K2.08 Knowledge of electrical power supplies to the following: ESF-actuated motor-operated valves. [CFR: 41.7]	3.5	25
68	078 (SF8 IAS) INSTRUMENT AIR SYSTEM							X					A1.02 Ability to predict and/or monitor changes in parameters associated with operation of the Instrument Air System, including: Instrument air compressor parameters. [CFR: 41.4]	2.9	26
69	078 (SF8 IAS) INSTRUMENT AIR SYSTEM										X		A4.03 Ability to manually operate and/or monitor in the control room: Isolation/restoration of instrument air to isolated components/systems. [CFR: 41.7]	3.2	27
70	103 (SF5 CNT) CONTAINMENT SYSTEM	X											K1.13 Knowledge of the physical connections and/or cause and effect relationships between the Containment System and the following systems: ESFAS. [CFR: 41.9]	4.1	28
K/A Category Totals:		3	3	3	3	2	2	2	5	3	3	4	Group Point Total:		33

77	041 (SF4S SDS) STEAM DUMP/TURBINE BYPASS CONTROL SYSTEM								X				A2.03 Ability to (a) predict the impacts of the following on the Steam Dump / Turbine Bypass Control System and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal operations: Loss of IAS. [CFR: 41.7]	3.6	33
78	045 (SF4S MTG) MAIN TURBINE GENERATOR SYSTEM				X								K4.26 Knowledge of Main Turbine Generator System design features and/or interlocks that provide for the following: Shifting of auxiliary buses between unit auxiliary transformer and service transformer during loading of MT/G (function of reactor power). [CFR: 41.4]	2.9	34
	050 (SF9 CRV*) CONTROL ROOM VENTILATION														
79	055 (SF4S CARS) CONDENSER AIR REMOVAL SYSTEM										X		A4.01 Ability to manually operate and/or monitor the Condenser Air Removal System in the control room: Sealing steam. [CFR: 41.4]	2.9	35
80	056 (SF4S CDS) CONDENSATE SYSTEM						X						K6.14 Knowledge of the effect of the following plant conditions, system malfunctions, or component malfunctions on the Condensate System: Steam dumps. [CFR: 41.4]	3.2	36
81	068 (SF9 LRS) LIQUID RADWASTE SYSTEM			X									K3.03 Knowledge of the effect that a loss or malfunction of the Liquid Radwaste System will have on the following systems or system parameters: Sources of LRS. [CFR: 41.7]	2.7	37
82	071 (SF9 WGS) WASTE GAS DISPOSAL SYSTEM											X	G2.1.32 Ability to explain and apply system precautions, limitations, notes, or cautions. [CFR: 43.4]	4.0	83
	072 (SF7 ARM) AREA RADIATION MONITORING SYSTEM														
83	075 (SF8 CW) CIRCULATING WATER SYSTEM									X			A3.05 Ability to monitor automatic operation of the Circulating Water System, including: Verification that the pump discharge valve closes when the circulating water pump stops. [CFR: 41.4]	2.9	38
	079 (SF8 SAS**) STATION AIR SYSTEM														
	086 (SF8 FPS) FIRE PROTECTION														
K/A Category Totals:		0	1	1	1	1	1	1	2	1	1	3	Group Point Total:		13

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Date of Exam: 10/27/2021

Category	K/A #	Topic	Item #	RO		SRO-Only		
				IR	Q#	IR	Q#	
1. Conduct of Operations	G2.1.2	Knowledge of operator responsibilities during any mode of plant operation. [CFR: 43.7]	84			4.4	94	
	G2.1.3	Knowledge of shift or short-term relief turnover practices. [CFR: 43.1]	85			3.9	95	
	G2.1.23	Ability to perform general and/or normal operating procedures during any plant condition. [CFR: 41.1]	86	4.3	66			
	G2.1.46	Ability to use integrated control systems to operate plant systems or components. [CFR: 41.5]	87	4.0	67			
	G2.1.47	Ability to direct non-licensed personnel activities inside the control room. [CFR: 41.10]	88	3.2	68			
	Subtotal					3		2
	G2.2.7	Knowledge of the process for conducting infrequently performed tests or evolutions. [CFR: 41.10]	89	2.9	69			
	G2.2.25	Knowledge of the bases in TS for limiting conditions for operation and safety limits (SRO Only). [CFR: 43.2]	90			4.2	96	
	G2.2.39	Knowledge of less than or equal to 1-hour TS action statements (does not include action statements of 1 hour or less that follow the expiration of a completion time for a TS condition for which an action statement has already been entered). [CFR: 43.2]	91			4.5	97	
	G2.2.42	Ability to recognize system parameters that are entry-level conditions for TS. [CFR: 41.2]	92	3.9	70			
	Subtotal					2		2
	G2.3.5	Ability to use RMSs, such as fixed radiation monitors and alarms or personnel monitoring equipment. [CFR: 41.11]	93	2.9	71			
	G2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities, such as analysis and interpretation of radiation and activity readings as they pertain to administrative, normal, abnormal, and emergency procedures or to analysis and interpretation of coolant activity, including comparison to emergency plan or regulatory limits (SRO Only). [CFR: 43.4]	94			3.8	98	
	G2.3.12	Knowledge of radiological safety principles and procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, or alignment of filters. [CFR: 41.12]	95	3.2	72			
	Subtotal					2		1
	G2.4.3	Ability to identify post-accident instrumentation. [CFR: 43.4]	96			3.9	99	
	G2.4.16	G2.4.16 Knowledge of emergency and abnormal operating procedures implementation hierarchy and coordination with other support procedures or guidelines, such as operating procedures, abnormal operating procedures, or severe accident management guidelines. [CFR: 43.5]	97			4.4	100	
	G2.4.45	G2.4.45 Ability to prioritize and interpret the significance of each annunciator or alarm. [CFR: 41.10]	98	4.1	73			
	G2.4.46	G2.4.46 Ability to verify that the alarms are consistent with the plant conditions. [CFR: 41.10]	99	4.2	74			
	G2.4.49	G2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. [CFR: 41.10]	100	4.6	75			
Subtotal					3		2	

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO T2/G1 061 K1.09	061 K1.07	<p>(Q#19) 061 – Auxiliary/Emergency Feedwater System (AFWS) Knowledge of the physical connections and/or cause and effect relationships between the AFWS and the following systems: PRMS.</p> <p>Replaced with 061 K1.07 due to lack of applicability. The AFWS is not monitored by the PRMS at Wolf Creek. K1.07 selected to maintain given outline question category.</p>
RO T2/G1 078 K1.07	078 A4.03	<p>(Q#27) 078 – Instrument Air System (IAS) Knowledge of the physical connections and/or cause and effect relationships between the IAS and the following systems: PVSs.</p> <p>Replaced with 078 A4.03 due to lack of applicability. There is no “Plant Ventilation System” at Wolf Creek. There are also no physical connections between the Instrument Air System and any building ventilation or air conditioning systems. A4.03 selected for outline balance since there is no Containment Vacuum System at Wolf Creek and no other applicable 103 A4 topics to sample.</p>
RO T2/G1 103 A4.09	103 K1.13	<p>(Q#28) 103 – Containment System Ability to manually operate and/or monitor in the control room: Containment Vacuum System.</p> <p>Replaced with 103 K1.13 due to lack of applicability. There is no “Containment Vacuum System” at Wolf Creek. K1.13 selected for outline balance since there are no applicable 103 A4 topics to sample.</p>
RO T2/G2 068 K3.01	068 K3.03	<p>(Q#37) 068 – Liquid Radwaste System (LRWS) Knowledge of the effect that a loss or malfunction of the LRWS will have on the following systems or system parameters: CVCS.</p> <p>Replaced with 068 K3.03 due to lack of applicability. There is no LRWS malfunction that will result in a cause/effect response in the CVCS at Wolf Creek. K3.03 selected to maintain given outline question category.</p>
RO T2/G2 075 A3.07	075 A3.05	<p>(Q#38) 075 – Circulating Water System (CSW) Ability to monitor automatic operation of the CWS, including: Makeup flow control valve controller and indicator.</p> <p>Replaced with 075 A3.05 due lack of applicability. Wolf Creek’s Circulating Water System source is a cooling lake with a suction bay and no “Makeup flow control valve controller and indicator.” A3.05 selected to maintain given outline question category.</p>

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO T1/G1 APE 026 AK2.01	APE 026 AK2.02	<p>(Q#45) APE 026 – Loss of Component Cooling Water Knowledge of the relationship between Loss of Component Cooling Water and the following systems or components: CVCS.</p> <p>Replaced with APE 026 AK2.02 due to oversampling / duplication of tested concept as #9 (008 A2.07) already covered the cause and effect relationship between CCWS and CVCS. AK2.02 selected in the interest of balance of coverage and to maintain given outline question category.</p>
RO T1/G1 APE 040 2.2.22	APE 040 2.4.4	<p>(Q#48) APE 040 – Steamline Rupture, Knowledge of limiting conditions for operation and safety limits.</p> <p>Replaced with APE 040 2.4.4 due to lack of applicability. There is no LCO or safety limit challenged during a steam line rupture. Generic K/A 2.4.4 selected to maintain the given outline question category.</p>
RO T1/G1 APE 057 AA2.11	APE 057 AA2.20	<p>(Q#52) APE 057 – LOSS OF VITAL AC ELECTRICAL BUS, Ability to determine and/or Interpret the following as they apply to the Loss of Vital AC Instrument Bus, MFP pump running.</p> <p>Replaced with APE 057 AA2.20 due to lack of applicability. A loss of 120 VAC Instrument Bus has no impact on MFW Pump run status at Wolf Creek. APE 057 AA2.20 selected to maintain given outline question category.</p>
RO T1/G1 WE05 EK1.10	WE05 EK1.11	<p>(Q#55) WE05 – Loss of Secondary Heat Sink, Knowledge of the operational implications and/or cause and effect relationships of the following as they apply to Loss of Secondary Heat sink: RHR pump operation without CCW cooling to RHR heat exchanger.</p> <p>Replaced with WE05 EK1.11 due to inability to write a question with discriminatory value at the appropriate RO level and due to oversampling of CCW System interrelationships. EK1.11 was selected in the interest of balance of coverage while maintaining the given outline question category.</p>
RO T1/G2 APE 059 AA2.06	APE 059 AA2.09	<p>(Q#60) APE 059 – Accidental Liquid Radwaste Release Ability to determine and/or interpret the following as they apply to an Accidental Liquid Radwaste Release: Verification that the flowrate of the liquid being released in less than or equal to that specified on the release permit.</p> <p>Replaced with APE 059 AA2.09 due to inability to write a question with discriminatory value at the appropriate RO level. AA2.09 selected to maintain given outline question category.</p>

Tier / Group	Randomly Selected K/A	Reason for Rejection
SRO T2/G1 063 2.1.31	063 2.2.44	<p>(Q#80) 063 – DC Electrical Distribution System Ability to locate control room switches, controls, and indications and to determine whether they correctly reflect the desired plant lineup.</p> <p>Replaced with 063 2.2.44 due to inability to write a discriminatory question at the appropriate SRO level. Specific systems knowledge, including location of control room controls, is RO knowledge. Generic K/A 2.2.44 selected to maintain given outline question category.</p>
SRO T2/G2 071 2.4.47	071 2.1.32	<p>(Q#83) 071 Waste Gas Disposal System, Ability to diagnose and recognize trends in an accurate and timely manner using the appropriate control room reference material (reference potential).</p> <p>Replaced with 071 2.1.32 due to inability to write a discriminatory question at the appropriate SRO Level. This K/A is better suited for an administrative JPM. Replaced with Generic 2.1.32 to maintain given outline question category.</p>
SRO T1/G1 APE 065 2.4.6	APE 065 2.2.44	<p>(Q#89) APE 065 Loss of Instrument Air System, Knowledge of emergency and abnormal operating procedures major action categories.</p> <p>Replaced with APE 065 2.2.44 due to inability to write a discriminatory question at the appropriate SRO Level. Knowing the procedure purpose, overall sequence of events, or overall mitigative strategy of a procedure is required RO knowledge. Replaced with APE 065 2.2.44 to maintain given outline generic question category.</p>
SRO T1/G1 WE03 EA2.05	WE03 EA2.03	<p>(Q#93) WE03 LOCA Cooldown and Depressurization, Ability to determine and/or interpret the following as they apply to LOCA Cooldown and Depressurization: Charging Flow.</p> <p>Replaced with WE03 EA2.03 due to oversampling /duplication of tested ECCS flow relationships during a LOCA event. #40 (EPE 009 A2.13) covered the change in expected ECCS flow during a Small break LOCA. WE03 EA2.03 was selected in the interest of balance of coverage while maintaining the given outline question category.</p>
SRO T1/G1 WE09 EA2.10	WE09 EA2.06	<p>(Q#94) WE09 Natural Circulation Operations, Ability to determine and/or interpret the following as they apply to Natural Circulation Operations: Condenser Availability.</p> <p>Replaced with WE09 EA2.06 due to oversampling / duplication of Condenser Availability concepts. #33 (041 A2.03), tested difference between use of SDS vs. ARV concept, while #36 (056 K6.12), tested C-9 Condenser Availability Signal based on given condenser pressures. EA2.06 was selected in the interest of balance of coverage while maintaining the given outline question category.</p>

Tier / Group	Randomly Selected K/A	Reason for Rejection
SRO T3 G2.3.6	G2.3.14	(Q#98) Radiation Control , Ability to approve liquid or gaseous release permits. Replaced with 2.3.14 due to inability to write a discriminatory question at the appropriate SRO Level. This K/A is better suited for an administrative JPM. Replaced with Generic 2.3.14 to maintain given outline question category.

Facility: <u>Wolf Creek</u>		Date of Examination: <u>Nov 2021</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: _____
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, N	A1 Given plant conditions calculate primary to secondary leak rate and determine OFN BB-07A, STEAM GENERATOR TUBE LEAKAGE Action Level. [2.1.7 – 4.4]
Conduct of Operations	R, N	A2 Given plant conditions, calculate Boron addition for power reduction. [2.1.25 – 3.9]
Equipment Control	R, M	A3 Given plant conditions, manually determine QPTR per STS RE-012. [2.2.12 – 3.7]
Radiation Control	R, M	A4 Given a Clearance Order for draining/venting a system in the RCA, determine the RWP, limits, and time allowed to complete the job. [2.3.12 – 3.2]
<p>NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).</p>		
<p>* Type Codes and Criteria: 4 (C)ontrol room, (S)imulator, or Class(R)oom 0 (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes) 4 (N)ew or (M)odified from bank (≥ 1) 0 (P)revious 2 exams (≤ 1, randomly selected)</p>		

Facility: <u>Wolf Creek</u>		Date of Examination: <u>Nov 2021</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: _____
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, N	A5 Given a calculated primary to secondary leak rate and OFN BB-07A, STEAM GENERATOR TUBE LEAKAGE Action Level recommendation, review for concurrence and determine required crew response. [2.1.7 - 4.7]
Conduct of Operations	R, N	A6 Given a boron addition calculation for downpower, review for approval and identify any errors. [2.1.37 – 4.6]
Equipment Control	R, N	A7 Given a prepared Clearance Order for NCP maintenance, review for approval and identify any errors. [2.1.13 – 4.3]
Radiation Control	R, M	A8 Given a Containment Purge Release Permit, review for approval and identify any errors. [2.3.11 – 4.3]
Emergency Plan	R, N	A9 Given plant conditions, classify the event and determine Protective Action Recommendation. [2.4.41 – 4.6]
NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).		
* Type Codes and Criteria: <ul style="list-style-type: none"> 5 (C)ontrol room, (S)imulator, or Class(R)oom 0 (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs and RO retakes) 5 (N)ew or (M)odified from bank (≥ 1) 0 (P)revious 2 exams (≤ 1, randomly selected) 		

Facility: Wolf Creek		Date of Examination: Nov 2021
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input checked="" type="checkbox"/>		Operating Test No.: _____
Control Room Systems:* 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U		
System/JPM Title	Type Code*	Safety Function
S1 Restore misaligned control rod per OFN SF-11. [001 A2.03 - 3.8]	L, N, S	1
S2 Perform EMG E-0, Attachment F to identify failures and manually initiate Red Train CISA. [013 A4.04 – 4.4]	A, EN, M, S	2
S3 Respond to loss of Service Water System Per ALR 00-008B. [076 A2.08 - 3.5]	A, M, S	4S
S4 Restore Control Room Ventilation System following an Inadvertent CRVIS per SYS GK-121. [050 A2.01 – 3.3]	EN, N, S	9
S5 Align Containment Mini-Purge for Containment Pressure Reduction per SYS GT-120. [103 A1.01 – 3.9]	L, EN, N, S	5
S6 Respond to high vibrations on 'C' RCP per OFN BB-005. [012 A2.06 – 4.8]	A, EN, N, S	7
S7 Place 'B' SFP Cooling Pump in service per SYS EC-120 for post maintenance testing. [033 A2.02 – 3.8]	A, N, S	8
<i>S8 Identify and isolate a leaking PORV per ALR 00-034E. [010 A2.03 – 4.3]</i>	M, S	3
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
P1 Locally Start 'A' EDG and energize AC Emergency Bus NB01 per OFN KJ-032. [064 A2.30 -3.4]	A, D, E	6
P2 Isolate leaking ESW system Vacuum Breakers per SYS EF-210. [076 A4.02 - 3.7]	D	4S
P3 Isolate RCS and PZR Sample lines to preserve RCS Inventory following a Station Blackout per EMG C-0. [002 A2.01 – 4.4]	N, E, R	4P
* All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions, all five SRO-U systems must serve different safety functions, and in-plant systems and functions may overlap those tested in the control room.		

* Type Codes	Criteria for R /SRO-I/SRO-U
(A)lternate path 5/5/2	4-6/4-6 /2-3
(C)ontrol room	
(D)irect from bank 2/2/2	≤ 9/≤ 8/≤ 4
(E)mergency or abnormal in-plant 2	≥ 1/≥ 1/≥ 1
(EN)gineered safety feature 4/4/1	≥ 1/≥ 1/≥ 1 (control room system)
(L)ow-Power/Shutdown 2	≥ 1/≥ 1/≥ 1
(N)ew or (M)odified bank including 1(A) 9/8/3	≥ 2/≥ 2/≥ 1
(P)revious 2 exams 0	≤ 3/≤ 3/≤ 2 (randomly selected)
(R)CA 1	≥ 1/≥ 1/≥ 1
(S)imulator	

S1: The unit is in MODE 2 at approximately 4% power with a misaligned control rod. I&C personnel have replaced a blown lift coil fuse. The applicant is tasked with aligning Control Rod M12 to the other Control Bank 'D' Rods in accordance with OFN SF-011, REALIGNMENT OF DROPPED, MISALIGNED ROD(S) AND ROD CONTROL MALFUNCTIONS, Steps 21 through 27. Performed Concurrently with S5.

S2: A LOCA resulted in a Reactor Trip and Safety Injection Actuation. The applicant is tasked with performing EMG E-0, REACTOR TRIP OR SAFETY INJECTION, Attachment F, to verify proper Automatic Actuations. The applicant must recognize the 'A' Train of Containment Isolation Phase A failed to Auto Actuate and take proper action to manually align the system for operation per step F3 and EMG E-0, Attachment B after manual actuation fails to open two valves.

S3: A loss of site bus SL41 has resulted in loss of Service Water System cooling. The applicant is tasked with performing ALR 00-08B, SERV WTR PRESS HILO. The applicant must recognize available Service water pumps are insufficient and start up the Essential Service Water System. Performed Concurrently with S4.

S4: An inadvertent CRVIS actuated. The applicant is tasked with restoring Control Room Ventilation System per SYS GK-121, CONTROL BUILDING HVAC OPERATIONS, Section 6.2.3. Performed Concurrently with S3.

S5: Containment Pressure has risen close to the Tech Spec Limit. The applicant is tasked to perform SYS GT-120, CONTAINMENT MINI PURGE SYSTEM OPERATION, Section 6.1, to reduce Containment Pressure. Performed Concurrently with S1 at low power.

S6: The unit is operating at full power with MCB Annunciator 071B, VIB/SYS ALERT LIT. The applicant is tasked with performing OFN BB-05, RCP MALFUNCTIONS. During performance of Steps 1-4, the 'C' RCP trips but the reactor fails to auto trip. The applicant must recognize the RPS failure and manually trip the reactor from SB HS-42 when SB HS-1 also fails to manually trip the reactor.

S7: Maintenance on 'A' SFP Cooling Pump is complete. The applicant is tasked with swapping Spent Fuel Pool cooling trains for post maintenance testing per SYS EC-120, Section 6.4. The applicant must identify abnormal flow conditions and place 'B' SFP Cooling Train back in service.

S8: With the unit in MODE 1 at 100%, multiple MCB alarms are received that indicate a leaking PORV or safety valve. The applicant is tasked to perform ALR 00-034E, PRT PRESS HI to identify and isolate the leaking valve.

P1: A loss of off-site power has just occurred, 'B' Emergency Diesel Generator automatically started and loaded onto bus NB02. 'A' Emergency Diesel Generator failed to automatically start and will not start from the control room. The applicant is tasked with locally starting and energizing bus NB01 per OFN KJ-032, LOCAL EMERGENCY DIESEL STARTUP. The applicant must reset the anti-pumping relay to successfully close the EDG Output Breaker.

P2: The unit operating at full power with 'A' ESW Pump running. The applicant is tasked with Isolating leaking ESW system vertical loop vacuum breakers in accordance with SYS EF-210, OPERATION OF ESW VERTICAL LOOP VACUUM BREAKERS ISOLATIONS, Section 6.2.2.

P3: The unit has experienced a Station Blackout. The applicant is tasked with Isolating RCS and PZR Sample lines to preserve RCS Inventory per EMG C-0, LOSS OF ALL AC POWER, Step 4e.

Facility: Wolf Creek		Date of Exam: November 2021									Operating Test No.: Crew A						
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M (*)		
		1			2			3			4						
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P		R	I	U
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U1 X	RX	0											0	1	1	0	
	NOR	0											0	1	1	1	
	I/C	6										N+3	6	4	4	2	
	MAJ	2											N+1	2	2	2	1
	TS	2											N	2	0	2	2
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U2 X	RX				0								0	1	1	0	
	NOR				0								0	1	1	1	
	I/C				6								N+3	6	4	4	2
	MAJ				1								N	1	2	2	1
	TS				2								N	2	0	2	2
RO-1 X SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX		0				0						0	1	1	0	
	NOR		0				0						0	1	1	1	
	I/C		5				5						N+4	10	4	4	2
	MAJ		2				1						N+1	3	2	2	1
	TS		0				0						0	0	2	2	
RO-2 X SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX			0		0							0	1	1	0	
	NOR			0		0							0	1	1	1	
	I/C			4		5							N+3	9	4	4	2
	MAJ			2		1							N+1	3	2	2	1
	TS			0		0							0	0	2	2	

Instructions:

- Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at-the-controls (ATC) and balance-of-plant (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional I/C malfunctions on a one-for-one basis.
- Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
- For new reactor facility licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: Wolf Creek		Date of Exam: November 2021									Operating Test No.: Crew B						
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		1			2			3			4						
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
												R	I	U			
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U3 <input checked="" type="checkbox"/>	RX	0															0
	NOR	0												0	1	1	1
	I/C	6											N+3	6	4	4	2
	MAJ	2											N+1	2	2	2	1
	TS	2											N	2	0	2	2
RO <input type="checkbox"/> SRO-I1 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX		0		0			0						0	1	1	0
	NOR		0		0			0						0	1	1	1
	I/C		5		6			6					N+11	17	4	4	2
	MAJ		2		1			1					N+2	4	2	2	1
	TS		0		2			2					N+2	4	0	2	2
RO-3 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX			0		0				0				0	1	1	0
	NOR			0		0				0				0	1	1	1
	I/C			4		5				4			N+7	13	4	4	2
	MAJ			2		1				1			N+2	4	2	2	1
	TS			0		0				0				0	0	2	2
RO-4 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX					0		0						0	1	1	0
	NOR					0		0						0	1	1	1
	I/C					5		4					N+3	9	4	4	2
	MAJ					1		1					N	2	2	2	1
	TS					0		0						0	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at-the-controls (ATC) and balance-of-plant (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional I/C malfunctions on a one-for-one basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
4. For new reactor facility licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: Wolf Creek		Date of Exam: November 2021									Operating Test No.: Crew C						
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		1			2			3			4						
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P		R	I	U
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U4 <input checked="" type="checkbox"/>	RX	0												0	1	1	0
	NOR	0												0	1	1	1
	I/C	6											N+3	6	4	4	2
	MAJ	2											N+1	2	2	2	1
	TS	2											N	2	0	2	2
RO <input type="checkbox"/> SRO-I2 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX		0		0			0						0	1	1	0
	NOR		0		0			0						0	1	1	1
	I/C		5		6			6					N+11	17	4	4	2
	MAJ		2		1			1					N+2	4	2	2	1
	TS		0		2			2					N+2	4	0	2	2
RO-5 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX			0		0				0				0	1	1	0
	NOR			0		0				0				0	1	1	1
	I/C			4		5				4			N+7	13	4	4	2
	MAJ			2		1				1			N+2	4	2	2	1
	TS			0		0				0				0	0	2	2
RO-6 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX					0		0						0	1	1	0
	NOR					0		0						0	1	1	1
	I/C					5		4					N+3	9	4	4	2
	MAJ					1		1					N	2	2	2	1
	TS					0		0						0	0	2	2

Instructions:

- Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at-the-controls (ATC) and balance-of-plant (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional I/C malfunctions on a one-for-one basis.
- Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
- For new reactor facility licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: Wolf Creek		Date of Exam: November 2021									Operating Test No.: Spare						
A P P L I C A N T	E V E N T T Y P E	Scenarios															
		1			2			3			4			T O T A L	M I N I M U M (*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P		R	I	U
RO <input type="checkbox"/>	RX	0											0	1	1	0	
SRO-I <input type="checkbox"/>	NOR	0											0	1	1	1	
SRO-U <input checked="" type="checkbox"/>	I/C	6											6	4	4	2	
	MAJ	1											1	2	2	1	
	TS	2											2	0	2	2	
RO <input type="checkbox"/>	RX	0											0	1	1	0	
SRO-I <input checked="" type="checkbox"/>	NOR	0											0	1	1	1	
SRO-U <input type="checkbox"/>	I/C	6											6	4	4	2	
	MAJ	1											1	2	2	1	
	TS	2											2	0	2	2	
RO <input checked="" type="checkbox"/>	RX		0										0	1	1	0	
SRO-I <input type="checkbox"/>	NOR		0										0	1	1	1	
SRO-U <input type="checkbox"/>	I/C		4										4	4	4	2	
	MAJ		1										1	2	2	1	
	TS		0										0	0	2	2	
RO <input checked="" type="checkbox"/>	RX			0									0	1	1	0	
SRO-I <input type="checkbox"/>	NOR			0									0	1	1	1	
SRO-U <input type="checkbox"/>	I/C			4									4	4	4	2	
	MAJ			1									1	2	2	1	
	TS			0									0	0	2	2	

Instructions:

- Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at-the-controls (ATC) and balance-of-plant (BOP) positions. Instant SROs (SRO-I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO-I *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional I/C malfunctions on a one-for-one basis.
- Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.
- For new reactor facility licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO-I applicants in either the ATC or BOP position to best evaluate the SRO-I in manipulating plant controls.

Facility: Wolf Creek Scenario No.: 1 Op-Test No.: November 2021

Examiners: _____ Operators: _____

Initial Conditions: Unit is in MODE 1, 100% Power, MOL, Yellow Train in Service, 'A' MDAFWP OOS for maintenance.

Turnover: The unit is operating in MODE 1 at 100% power, MOL with 'A' MDAFWP OOS for scheduled maintenance, return to service in 6 hours. Tech Spec 3.7.5 Condition B has been entered

Critical Tasks: CT-1 Unload the 'B' EDG prior to it tripping on high Jacket Water Temperature CT-2 Dispatch operator to open doors per EMG C-0, ATT B CT-3 Energize NB02 with SBO Diesels

Event No.	Malf. No.	Event Type*	Event Description
1		C (ATC/CRS)	NCP trip, restore letdown and charging using CCP ALR 00-042E
2		I (ATC/CRS) Tech Specs	PRNI 43 fails HI OFN SB-008, Attachment R LCO 3.3.1, Functions 2, 3, 6, 7, 18.b, 18.c, 18.d, 18.e Conditions A, D, E, S, T TRM 3.3.17, Condition D
3		I (BOP/CRS) Tech Specs	AE LI-528, S/G 'B' Protection Level Channel fails LOW OFN SB-008, Attachment F LCO 3.3.1, Function 14, Condition A & E LCO 3.3.2, Functions 5c & 6.d, Condition A, D, & I
4		C (All)	Main Turbine HIGH vibrations, power reduction required OFN AC-002 OFN MA-038
5		M (All)	Main Turbine Vibrations rise to require Reactor and Turbine trip EMG E-0
6		M (ALL)	LOOP on Reactor Trip EMG E-0
7		C (ALL)	NB01 bus lockout on Reactor Trip OFN NB-030
8		C (ALL)	'B' ESW pump trips on overcurrent OFN EF-033 EMG C-0 (Station Blackout) SYS KU-122

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Target Quantitative Attributes per Scenario (See Section D.5.d)		Actual Attributes	ES-301-5	CRS	ATC	BOP
1.	Malfunctions after EOP entry (1-2)	2	Rx	0	0	0
2.	Abnormal events (2-4)	4	Nor	0	0	0
3.	Major transients (1-2)	2	I/C	6	5	4
4.	EOPs entered/requiring substantive actions (1-2)	1	Maj	2	2	2
5.	Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	1	TS	2	0	0
6.	Preidentified critical tasks (≥ 2)	3				

Critical Task	Safety Significance	Cueing	Measurable Performance Indicators	Performance Feedback
CT1: Unload 'B' EDG before the Loaded 'B' EDG trips on HIGH Jacket Water temperature. (195°F)	Failure to unload the EDG manually, could result in severe damage to the Generator, which would represent a failure of the crew to prevent a significant reduction of safety margin beyond that irreparably introduced by the scenario.	On Panel RL021, AMBER light lit for EF HIS-56	On Panel RL015, Manipulation of NE HIS-26 in Pull to lock.	On Panel RL021, NB ZL-6 light out, NB EI-2 at 0 volts.
CT2: Dispatch an Operator to open doors per EMG C-0, ATT B within 14 minutes Station Blackout.	The associated equipment will heat above 120°F and possible fail without completion of this TCA. Per AI 21-016, this action is directed by WCAP-12231, Station Blackout Coping Assessment and Wolf Creek Letter NO 89-00072.	Loss of power to both NB01 and NB02. Only Emergency lighting in the control room.	Operator communicates with Simulator Operator to direct opening of the equipment cabinet doors listed in ATTACHMENT B.	Simulator Operator acknowledges request and records the time to verify <14 minutes has elapsed.
CT3: Energize NB02 from SBO DG per SYS KU-122 before the following conditions are met: * RCS Subcooling <30F [45F] <u>OR</u> * PZR Level <7% [34%]	Reenergizing an emergency bus allows transition to a recovery procedure for normal recovery.	* Indication and/or annunciation of station blackout <u>AND</u> * Indication that an SBO Power source is available	Manipulation of controls in the control room as required to establish power to NB02 AC Emergency Bus.	Normal voltage indicated on NB02 Emergency Bus

Note: Causing an unnecessary plant trip or ESF actuation may constitute a Critical Task failure. Actions taken by the applicant(s) will be validated using the methodology for critical tasks in Appendix D to NUREG-1021.

SCENARIO # 1 NARRATIVE

Turnover: The Unit is in MODE 1, operating at 100% power, MOL with MDAFWP 'A' tagged out for maintenance. Maintain current power level through the shift and restore the 'A' MDAFWP once maintenance is complete

Event 1: Normal Charging Pump trip (NCP): Multiple annunciators indicating a loss of charging flow and trouble with the charging pumps. The crew will recognize the trip of the NCP and the CRS will direct performance of ALR 00-042E, CHARGING PUMP TROUBLE. The ATC will isolate letdown and then restore charging using the 'B' Centrifugal Charging Pump (CCP). Once Charging is restored, the ATC will restore letdown (may use 120 gpm) and following completion the next event will start as directed by the Lead Examiner.

Event 2: PRNI 43 fails HI: Multiple alarms will be received, including 078A, PR CHANNEL DEV, which will indicate a Nuclear Instrument malfunction. The CRS will direct OFN SB-008, INSTRUMENT MALFUNCTIONS, ATT R. After evaluating Technical Specifications and at the direction of the Lead Examiner, the next event will start.

Event 3: AE LI-528, S/G 'B' Protection Level Channel, fails LOW. Annunciators 083C, RX PARTIAL TRIP & 055D, NSSS CONTROL TROUBLE will actuate. The crew will determine from NPIS, that a S/G 'B' Protection Level Channel, AE LI-528 has failed. The CRS will direct performance of OFN SB-008, Attachment F. The BOP will de-select the failed channel in the Ovation system and at the AMSAC terminal. Once the CRS evaluates Technical Specifications and at the direction of the Lead Examiner, the next event will start.

Event 4: Main Turbine HIGH Vibrations. Annunciator 112E, TSI TROUBLE, will actuate and the crew will determine that there are HIGH vibrations on Main Turbine Bearings 5, 6, & 7. The CRS will direct the performance of OFN AC-002, MAIN TURBINE HIGH VIBRATION. The crew will determine that the vibrations require plant power reduction and the CRS will direct the actions of OFN MA-038, RAPID PLANT SHUTDOWN. Once the power reduction is commenced and/or at the discretion of the Lead Examiner, the Major Events will start.

Event 5: Reactor and Turbine Trip required due to HIGH vibrations: Vibrations on the Main Turbine will rise sharply requiring Reactor & Turbine Trip. The CRS will direct Reactor & Turbine trip and enter EMG E-0, REACTOR TRIP OR SAFETY INJECTION, while continuing with the actions of OFN AC-002.

Event 6: Loss of Offsite Power: The unit trip will cause an electrical grid disturbance that results in a loss of offsite power. Normal lighting in the control room will go out and both Emergency Diesel Generators will start. The crew will continue to perform EMG E-0 Immediate Actions.

Event 7: NB01 bus lockout: Also, during unit trip, a fault on bus NB01 will occur. NB02 is still powered from the 'B' EDG, so the crew will continue performing EMG E-0 Immediate actions.

Event 8: 'B' ESW pump trips after starting and cannot be restarted: The 'B' ESW pump will start on the Shutdown Sequencer and then trip on overcurrent. This will result in a loss of cooling to the 'B' EDG. The crew will recognize the loss of cooling and take action to unload and stop the 'B' EDG to protect the diesel per OFN EF-033, LOSS OF ESSENTIAL SERVICE WATER. The crew will then enter EMG C-0, LOSS OF ALL AC POWER in response to the Station Blackout. Once the crew successfully restores power to bus NB02 from Station Blackout Diesel Generators per OFN NB-030, LOSS OF AC EMERGENCY BUS NB01 (NB02), and SYS KU-122, ENERGIZING NB02 FROM STATION BLACKOUT DIESEL GENERATORS, the scenario is complete.

CT 1: Unload 'B' EDG before the Loaded B EDG trips on HIGH Jacket Water temperature. (195°F)

CT 2: Dispatch an Operator to open doors per EMG C-0, ATT B within 14 minutes Station Blackout.

CT 3: Energize NB02 from SBO DG per SYS KU-122 before the following conditions are met:
* RCS Subcooling <30F [45F] OR * PZR Level <7% [34%]

Note: Causing an unnecessary plant trip or ESF actuation may constitute a Critical Task failure. Actions taken by the applicant(s) will be validated using the methodology for critical tasks in Appendix D to NUREG-1021.

SIMULATOR SCENARIO FILES

;2021 ILO NRC Exam, Scenario 1 (IC 301)

;Initial Conditions – IC301, 100% Power, MOL, MDAFWP 'A' OOS for maintenance
scn Tag A MDAFW

;Event 1 – Key 1 – NCP trip
ICM bkrPB00301.CMF t:1 k:1

;Event 2 – Key 2 – PRNI 43 fails HIGH (Tech Spec)
IMF mSE03C f:120 k:2

;Event 3 – Key 3 – AE LI-528, S/G 'B' Level Channel fails LOW (Tech Spec)
ICM trAELT0528 t:1 k:3

;Event 4 – Key 4 – Main Turbine vibrations rise
IMF mAC06E f:3 r:15 k:4
IMF mAC06F f:6 r:25 k:4
IMF mAC06G f:4 r:20 k:4

;Event 5 - Key 5 – Main Turbine vibrations rise to trip criteria (Major)
Modify IMF mAC06F f:12 r:30

;Event 6 – Loss of Off-Site Power (Major)
{jpplp4} IMF mSY01

;Event 7 – NB01 bus fault causes bus lockout
{jpplp4} IMF mNB03

;Event 8 – 'B' ESW pump trips on overcurrent
{jpplp4} ICM bkrDPEF01B.CMF

;Remote Action to isolate seals – Run Scenario **scn SimGroup\ISOSEALS**

;Remote Action to support SBO DG lineup - Run Scenario **scn SimGroup\N39B 8N28-1 – OFF**

;Remote Action to start SBO EDG. – Run Scenario **scn SimGroup\SBO Start and Energize NB02**

Booth Instructions

Ensure NRC Exam Security Established per AIF 30B-015-09, and AIF 30B-015-18

Ensure the following procedures are available, free of markings and are the most recent revision in Curator (06/3/21):

- SYS KU-122, ENERGIZING NB02 FROM STATION BLACKOUT DIESEL GENERATOR (Rev 11)**
- ALR 00-042E, CHARGING PMP TROUBLE (Rev 15)**
- OFN SB-008, INSTRUMENT MALFUNCTIONS (Rev 51)**
- OFN SB-008, INSTRUMENT MALFUNCTIONS, Attachment R (Rev 51)**
- OFN SB-008, INSTRUMENT MALFUNCTIONS, Attachment F (Rev 51)**
- OFN AC-002, MAIN TURBINE VIBRATION (Rev 28)**
- OFN NB-030, LOSS OF AC EMERGENCY BUS NB01 (NB02) (Rev 39A)**
- OFN MA-038, RAPID PLANT SHUTDOWN (Rev 31)**
- EMG E-0, REACTOR TRIP OR SAFETY INJECTION (Rev 44)**
- EMG C-0, LOSS OF ALL AC POWER (Rev 45)**

NOTE: All events are loaded into snap **IC301**

Ensure malfunctions, including severity levels match scenario.

Ensure scenario runs for at least 10-15 minutes to allow data trends to populate

Ensure all meters, lamps, bistables and annunciators are correct for the initial setup. **Blue Placard is on the 'A' CCP. Test caution tag on AL HIS-23A**

Ensure soft panel display in back is set to RP312 RCP Vibration on left screen and AMSAC on right screen.

Ensure no discernable history from RM11, Ovation screens, paper trend recorders.

Ensure all laminated brief sheets, foldout pages, E plan boards are wiped clean.

Ensure all follow-up buttons are removed from the boards and trash cans and recycle bins are free of any potential exam material.

Ensure communications are established with the lead examiner, fresh batteries, radio check sat.

Critical Parameter Data to be collected:

- **B EDG Jacket Water Temperature:** The crew must manually unload the 'B' EDG upon discovery of loss of ESW pump to prevent B EDG from tripping on HIGH Jacket Water temperature at 195°F.
- **Time after 'B' EDG is unloaded:** The crew must dispatch an operator to open doors per EMG C-0, ATTACHMENT B, within 14 minutes of a Station Blackout when crew opens NE HIS-26.
- **RCS Subcooling & PZR Level:** The crew must energize bus NB02 using SBO Diesels per SYS KU-12 and OFN NB-030 before either of the following conditions are met: RCS Subcooling <30F [45F] OR * PZR Level <7% [34%]

Ensure Horns are ON and machine is in RUN

Insert Key 1 for Event 1 (NCP Trip)

Insert Key 2 for Event 2 (PRNI 43 fails HI).

Insert Key 3 for Event 3 (AE LI-528, S/G 'B' Protection Level Channel, fails High)

Insert Key 4 for Event 4 (Rising Main Turbine Vibrations)

For Major Event (Turbine vibrations exceed turbine trip threshold)

Modify malfunction mAC06F f:12 r:30

When directed to isolate seals, run scenario file '**ISOSEALS**'

When directed to support SBO EDG lineup, run scenario file '**N39B 8N28-1 – OFF**'

When directed to start SBO EDG, run scenario file '**SBO Start and Energize NB02**'

Facility: Wolf Creek Scenario No.: 3 Op-Test No.: November 2021

Examiners: _____ Operators: _____

Initial Conditions: Unit is in MODE 2, 4% Power, BOL, Yellow Train In Service

Turnover: The unit is operating in MODE 2 at 4% power, BOL power ascension is currently on hold due to I&C and Engineering tuning of the Main Feedwater Regulating Bypass Valves. Crew is directed to maintain power until controller tuning is complete.

Critical Tasks: CT-1 Isolate feed and steam flow to the faulted S/G. CT-2 Isolate high head injection before PRT rupture disk opens.

Event No.	Malf. No.	Event Type*	Event Description
1		I (BOP/CRS) Tech Specs	AB PI-524A, 'B' S/G Pressure Channel, fails LOW. OFN SB-008, ATTACHMENT C LCO 3.3.2, Function 1.3 and 4.e, Conditions A & D
2		C (ALL)	Loss of PG14 with failure of 'A' Stator Cooling pump to auto start. OFN PG-051
3		I (ATC/CRS)	BG LI-112, VCT Level Channel, fails LOW OFN SB-008. ATTACHMENT U
4		C (ALL) Tech Specs	NB0209 trips, loss of normal supply to NB02 ALR 00-021C, OFN NB-030 LCO 3.8.1, COND A
5		M (ALL)	MSLB, 'D' S/G, inside containment EMG E-0, EMG E-2
6		C (BOP/CRS)	AE HIS-42, FWIV to 'D' S/G fails to close on FWIS EMG E-0, ATT F, Step F2
7		C (ATC/CRS)	'A' SI Pump fails to AUTO start on SIS EMG E-0, ATT F, Step F5
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Target Quantitative Attributes per Scenario (See Section D.5.d)		Actual Attributes	ES-301-5	CRS	ATC	BOP
1.	Malfunctions after EOP entry (1-2)	2	Rx	0	0	0
2.	Abnormal events (2-4)	4	Nor	0	0	0
3.	Major transients (1-2)	1	I/C	6	4	4
4.	EOPs entered/requiring substantive actions (1-2)	2	Maj	1	1	1
5.	Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0	TS	2	0	0
6.	Preidentified critical tasks (≥ 2)	2				

Critical Task	Safety Significance	Cueing	Measurable Performance Indicators	Performance Feedback
CT1: Isolate feed flow into and steam flow from the Faulted 'B' S/G before ANY RCS Cold Leg temperature reaches 240°F.	Failure to isolate steam from and feed to a faulted S/G causes an unnecessary and avoidable challenge to the Integrity CSF due only to improper response by the crew.	S/G pressures, flows and level indications will make it possible to identify S/G 'B' as the faulted S/G. EMG E-0 and EMG E-2 provide direction to isolate the faulted S/G.	Manipulates closed the following hand switches On Panel RL-006 <ul style="list-style-type: none"> ○ AL HK-6A ○ AL HK-5A On Panel RL-025 <ul style="list-style-type: none"> ○ AE HIS-42 	AL HK-5A and 6A in the left latch detent position. Indicated flow on AL FI-1A is 0 lbm/hr AE HIS-42 green light LIT.
CT2: Isolate high head ECCS flow through the BIT before overflow of the RCS results in a rupturing of the pressurizer relief tank (PRT) rupture disk at 91 psig.	Continued maximum injection causes RCS to go solid and PORV to open, passing excess inventory through PORVs to the PRT. Failure to terminate ECCS flow when it is possible to do so results in a rupture of the PRT, spread of radioactive coolant into Containment, and constitutes an avoidable degradation of a fission product barrier, as well as additional risk of stuck open PORV (SBLOCA).	RCS pressure and pressurizer level rise. PORVs open, flow indicated. PRT level, pressure, and temperature rise. When PRT ruptures at ~91 psig, PRT pressure drops and equalizes with Containment Pressure.	The Operator will isolate the BIT per EMG ES-03, Step 13, by Manipulation of the following handswitches on Panel RL018. *EM HIS-8803A *EM HIS-8803B *EM HIS-8801A *EM HIS-8801B	Green lights LIT and red lights extinguished for the following valves: *EM HIS-8803A *EM HIS-8803B *EM HIS-8801A *EM HIS-8801B CCP To BIT Flow indicators drop to 0 GPM. *EM FI-917A *EM FI-917B

Note: Causing an unnecessary plant trip or ESF actuation may constitute a Critical Task failure. Actions taken by the applicant(s) will be validated using the methodology for critical tasks in Appendix D to NUREG-1021.

SCENARIO # 3 NARRATIVE

Turnover: The Unit is in MODE 2, operating at 4% power, BOL. Temperature is being controlled using Steam Dumps in Automatic, 'B' MFP is in service. GEN-003, HOT STANDBY TO MINIMUM LOAD, is in progress, on step 6.10. Power ascension is on hold due to I&C and Engineering tuning of the Main Feedwater Regulating Bypass Valves. The crew is directed to maintain steady power level until controller tuning is complete.

Event 1: AB PI-524A, 'B' S/G Pressure Channel fails LOW. Annunciators 083C, RX PARTIAL TRIP & 055D, NSSS CONTROL TROUBLE will actuate. The crew will determine from NPIS that AB PI-524A, S/G 'B' Pressure Channel, has failed LOW. The CRS will direct performance of OFN SB-008, ATTACHMENT C. After de-selecting the failed channel in the Ovation System, the CRS will evaluate Technical Specifications. At the direction of the Lead Examiner, the next event will start.

Event 2: Loss of bus PG14, with failure of 'A' Stator Water cooling water pump to Auto Start. Multiple annunciators will actuate, 'B' Closed Cooling Water Pump will trip, 'B' Stator Cooling Water pump will trip, and the 'A' Stator Water cooling will fail AUTO start. The crew should determine a loss of PG14 occurred after referencing ALR 00-017D, PG XFMR UV. The CRS will enter OFN PG-051, LOSS OF NON-VITAL 480 VAC PG LOAD CENTER. After restoring lost components and stabilizing the plant, the next event will begin at the direction of the Lead Examiner.

Event 3: BG LI-112, VCT Level Channel fails LOW. CCP Suction will swap to the RWST from the VCT. The crew will perform OFN SB-008, ATTACHMENT U and isolate letdown and charge to seals only. Upon restoration of normal valve lineup, letdown flow, and evaluation of technical specifications, the next event will start at the direction of the Lead Examiner.

Event 4: NB0209 trips, loss of Normal supply to NB02: NB02 bus voltage drops to 0v due to a fault on breaker NB0209. The crew will address the interruption of power to NB02 per ALR 00-021C and OFN NB-030, ATT B. Once the crew has stabilized plant conditions, determined applicable Technical Specifications, and secured the TDAFW Pump, the major event will start at the direction of the Lead Examiner.

Event 5: MSLB 'D' S/G inside containment: Multiple annunciators will actuate with rapidly lowering Pressurizer Pressure, Pressurizer Level, RCS temperature, and 'D' S/G level. The Reactor will trip and SI will auto actuate on low S/G pressure. The CRS will direct entry to EMG E-0, REACTOR TRIP OR SAFETY INJECTION and then transition to EMG E-2, FAULTED STEAM GENERATOR ISOLATION before transitioning to EMG ES-03, SI TERMINATION.

Event 6: AE HIS-42, FWIV on 'D' train fails to AUTO close: Upon reactor trip the 'D' FW Isolation Valve will fail to AUTO close on FWIS. Operator action will be required to close the valve locally using AE HIS-42 to ensure feedwater isolation.

CT1: Isolate feed flow into and steam flow from the Faulted 'B' S/G before ANY RCS Cold Leg temperature reaches 240°F.

Event 7: 'A' Safety Injection pump fails to AUTO start: Following initiation of Safety Injection the 'A' Safety Injection will fail to AUTO start. Operator action will be required to start the pump using handswitch EM HIS-5 to ensure the maximum amount of Safety Injection flow.

CT2: Isolate high head ECCS flow through the BIT before overflow of the RCS results in a rupturing of the pressurizer relief tank (PRT) at 91 psig.

Note: Causing an unnecessary plant trip or ESF actuation may constitute a Critical Task failure. Actions taken by the applicant(s) will be validated using the methodology for critical tasks in Appendix D to NUREG-1021.

SIMULATOR SCENARIO FILES

;2021 ILO NRC Exam, Scenario 3 (IC 303)

;Initial Conditions – IC303, 4% Power, BOL

;Event 1 – Key 1 – 'B' S/G Pressure Channel, AB PI-524 fails low (Tech Spec)

ICM trABPT0524.CMF t:3 f:-13 k:1

;Event 2 – Key 2 – Loss of PG14, 'A' Stator Cooling Pump fails to AUTO start

IMF mPG04 k:2

ICM swCEPS0001.cmf t:34

ICM swCEPS0002.cmf t:34

;Event 3 – Key 3 – VCT Level Channel LI-112 fails LOW

ICM trBGLT0112 t:3 k:3

;Event 4 – Key 4 – NB0209 trips, loss of normal supply to NB02 (Tech Spec)

ICM bkrNB0209.CMF t:1 k:4

;Event 5 - Key 5 – MSLB 'D' S/G inside containment (Major)

IMF mAB03D f:1.6e+07 r:60 k:5

;Event 6 – FWIV on 'D' train fails to CLOSE

ICM vmodAEFV0042 t:1

;Valve will close manually

{x25i145c} ICM vmodAEFV0042.CMF t:2

;Event 7 –'B' Safety Injection Pump fails to AUTO start

{jpplp4} IMF mEM01A

;Remote Action – Key 8 – Locally reset ISOPHASE trouble alarm

IRF rMA04 f:ACK k:8

;Remote Action – Key 9 – To open VCT outlet valve breaker (NG01AFF2)

ICR movBGLCV0112B.CRF t:0 k:9

;Remote Action – Key 10 – To close BN HIS-112D

ICM movBNLCV0112D.CMF t:4 r:20 f:0 k:10

;Remote Action – Key 11 – To open BN HIS-112D Breaker (NG01AEF1)

ICR movBNLCV0112D.CRF t:0 K:11

;Remote Action – Key 12 – Close AB-V052

IRF rAB03D f:0 r:60 k:12

Booth Instructions

Ensure NRC Exam Security Established per AIF 30B-015-09, and AIF 30B-015-18

Ensure the following procedures are available, free of markings and are the most recent revision in Curator (06/03/21):

- GEN 00-003, HOT STANDBY TO MINIMUM LOAD (Rev 106)**
- ALR 00-017D, PG XFMR UV (Rev 14)**
- ALR 00-021C, NF039B S/D SEQ ACTUATED (Rev 17)**
- OFN SB-008, INSTRUMENT MALFUNCTIONS (Rev 51)**
- OFN SB-008, INSTRUMENT MALFUNCTIONS, Attachment C (Rev 51)**
- OFN SB-008, INSTRUMENT MALFUNCTIONS, Attachment U (Rev 51)**
- OFN PG-051, LOSS OF NON-VITAL 480 VAC PG LOAD CENTER (Rev 2)**
- OFN NB-030, LOSS OF AC EMERGENCY BUS NB01(NB02) (Rev 39A)**
- EMG E-0, REACTOR TRIP OR SAFETY INJECTION (Rev 44)**
- EMG E-2, FAULTED STEAM GENERATOR ISOLATION (Rev 24)**
- EMG ES-03, SI TERMINATION (Rev 29)**

NOTE: All events are loaded into snap **IC303**

Ensure malfunctions, including severity levels match scenario.

Ensure scenario runs for at least 10-15 minutes to allow data trends to populate

Ensure marked up copy of GEN 00-003 is available to the CRS, up to step 6.10

Ensure critical parameter white board is displayed with RCS T_{avg} control band 555°F – 560°F

Ensure all meters, lamps, bistables and annunciators are correct for the initial setup. **Blue Placard is on the 'A' CCP.**

Ensure soft panel display in back is set to RP312 RCP Vibration on left screen and AMSAC on right screen.

Ensure no discernable history from RM11, Ovation screens, paper trend recorders, 7300 monitors reset, etc.

Ensure all laminated brief sheets, foldout pages, E plan boards are wiped clean.

Ensure all follow-up buttons are removed from the boards and trash cans and recycle bins are free of any potential exam material.

Ensure communications are established with the lead examiner, fresh batteries, radio check sat.

Critical Parameter Data to be collected:

- **RCS Temperature:** The crew must isolate feedwater flow and steam flow to the faulted S/G prior to any RCS cold leg temperature reaches 240°F.
- **PRT Pressure** The crew must isolate ECCS flow through the BIT before the PRT reaches 91 psig.

Ensure Horns are ON and machine is in RUN

Insert Key 1 for Event 1 (AB PI-524A, 'B' S/G Pressure Channel fails LOW)

Insert Key 2 for Event 2 (Loss of PG14, with failure of A Stator Water Cooling Pump to autostart).

When directed to acknowledge local alarm **Insert Key 8**

Insert Key 3 for Event 3 (BG LI-112, VCT Level Channel fails LOW)

When directed to open breaker for the VCT Outlet Valve **Insert Key 9**

When directed to close RWST Suction valve **Insert Key 10**

When directed to open breaker for RWST suction valve **Insert Key 11**

Insert Key 4 for Event 4 (NB0209 trips)

Insert Key 5 for Major Event (MSLB 'D' S/G inside containment, AE HIS-42, 'D' FWIV fails to close, and 'A' SI pump fails to AUTO start)

When directed to close the Main Steamline low point drain for the 'D' S/G **Insert Key 12**