

Facility: Callaway Plant (RO, Rev. 2)														Date of Exam: 2016				
Tier	Group	RO K/A Category Points											SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G*	Total	A2	G*	Total		
1. Emergency & Abnormal Plant Evolutions	1	2	2	4	N/A			3	4	N/A			3	18			6	
	2	1	1	1	N/A			2	2	N/A			2	9			4	
	Tier Totals	3	3	5	N/A			5	6	N/A			5	27			10	
2. Plant Systems	1	2	2	2	3	3	3	3	2	3	2	3	28			5		
	2	1	1	0	1	1	1	1	1	1	1	1	10			3		
	Tier Totals	3	3	2	4	4	4	4	3	4	3	4	38			8		
3. Generic Knowledge and Abilities Categories				1	2	3	4	10										
				3	2	2	3							1	2	3	4	7

- Note:
- Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two). [\(One Tier 3 Radiation Control K/A is allowed if the K/A is replaced by a K/A from another Tier 3 Category\).](#)
 - 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.
 - Systems/evolutions within each group are identified on the associated 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.
 - 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.
 - 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.
 - Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
 - 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.
 - On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (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.
 - 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

ES-401		PWR Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 1 (RO / SRO)						Form ES-401-2	
E/APE # / Name / Safety Function	K 1	K 2	K 3	A 1	A 2	G*	K/A Topic(s)	IR	#
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1		X					EK2.02 - Knowledge of the interrelations between a reactor trip and the following: Breakers, relays and disconnects (CFR 41.7/45.7)	2.6	1
000008 Pressurizer Vapor Space Accident / 3						X	2.4.11 - Knowledge of abnormal condition procedures. (CFR: 41.10/43.5/45.13)	4.0	2
000009 Small Break LOCA / 3	X						EK1.02 - Knowledge of the operational implications of the following concepts as they apply to the small break LOCA: Use of steam tables (CFR 41.8/41.10/45.3)	3.5	3
000011 Large Break LOCA / 3			X				EK3.02 - Knowledge of the reasons for the following responses as the apply to the Large Break LOCA: Feedwater isolation (CFR 41.5/41.10/45.6/45.13)	3.5	4
000015/17 RCP Malfunctions / 4									
000022 Loss of Rx Coolant Makeup / 2									
000025 Loss of RHR System / 4			X				AK3.01 - Knowledge of the reasons for the following responses as they apply to the Loss of Residual Heat Removal System: Shift to alternate flowpath (CFR 41.5,41.10/45.6/45.13)	3.1	5
000026 Loss of Component Cooling Water / 8					X		AA2.06 - Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The length of time after the loss of CCW flow to a component before that component may be damaged (CFR: 43.5/45.13)	2.8	6
000027 Pressurizer Pressure Control System Malfunction / 3					X		A2.10 - Ability to determine and interpret the following as they apply to the Pressurizer Pressure Control Malfunction: PZR Heater energized/ de energized condition (CFR 43.5/45.13)	3.3	7
000029 ATWS / 1			X				EK3.12 - Knowledge of the reasons for the following responses as the apply to the ATWS: Actions contained in EOP for ATWS (CFR 41.5 / 41.10 /45.6 / 45.13)	4.4	8
000038 Steam Gen. Tube Rupture / 3			X				EK3.01 - Knowledge of the reasons for the following responses as the apply to the SGTR: Equalizing pressure on primary and secondary sides of ruptured S/G (CFR 41.5/41.10/45.6/45.13)	4.1	9
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4				X			W/E12, EA1.3 - Ability to operate and / or monitor the following as they apply to the (Uncontrolled Depressurization of all Steam Generators): Desired operating results during abnormal and emergency situations. (CFR: 41.7 / 45.5 / 45.6)	3.4	10
000054 (CE/E06) Loss of Main Feedwater / 4					X		AA2.02 - Ability to determine and interpret the following as they apply to the Loss of Main Feedwater (MFW): Differentiation between loss of all MFW and trip of one MFW pump (CFR: 43.5 / 45.13)	4.1	11

000055 Station Blackout / 6				X			EA1.02 Ability to operate and monitor the following as they apply to a Station Blackout: Manual ED/G start (CFR 41.7 / 45.5 / 45.6)	4.3	13
000056 Loss of Off-site Power / 6				X			AA1.08 - Ability to operate and/or monitor the following as they apply to the Loss of Offsite Power: HVAC chill water pump and unit (CFR 41.7/45.5/45.6)	2.5	12
000057 Loss of Vital AC Inst. Bus / 6									
000058 Loss of DC Power / 6									
000062 Loss of Nuclear Svc Water / 4									
000065 Loss of Instrument Air / 8						X	2.1.28 - Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)	4.1	14
W/E04 LOCA Outside Containment / 3		X					EK2.1 - Knowledge of the interrelations between the (LOCA Outside Containment) and the following: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. (CFR: 41.7 / 45.7)	3.5	15
W/E11 Loss of Emergency Coolant Recirc. / 4	X						EK1.3 - Knowledge of the operational implications of the following concepts as they apply to the (Loss of Emergency Coolant Recirculation): Annunciators and conditions indicating signals, and remedial actions associated with the (Loss of Emergency Coolant Recirculation). (CFR: 41.8 / 41.10 / 45.3)	3.6	16
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X		W/E05, EA2.1 - Ability to determine and interpret the following as they apply to the (Loss of Secondary Heat Sink): Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (CFR: 43.5 / 45.13)	3.4	17
000077 Generator Voltage and Electric Grid Disturbances / 6						X	2.1.19 - Ability to use plant computers to evaluate system or component status. (CFR: 41.10 / 45.12)	3.9	18
K/A Category Totals:	2	2	4	3	4	3	Group Point Total:	18/6	

BW/A04 Turbine Trip / 4										
BW/A05 Emergency Diesel Actuation / 6										
BW/A07 Flooding / 8										
BW/E03 Inadequate Subcooling Margin / 4										
BW/E08; W/E03 LOCA Cooldown - Depress. / 4			X					EK3.2 - Knowledge of the reasons for the following responses as they apply to the (LOCA Cooldown and Depressurization): Normal, abnormal and emergency operating procedures associated with (LOCA Cooldown and Depressurization). (CFR: 41.5 / 41.10, 45.6 / 45.13)	3.4	25
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4							X	2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm. (CFR: 41.10 / 43.5 / 45.3 / 45.12)	4.1	26
BW/E13&E14 EOP Rules and Enclosures										
CE/A11; W/E08 RCS Overcooling - PTS / 4							X	EA2.1 - Ability to determine and interpret the following as they apply to the (Pressurized Thermal Shock): Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (CFR: 43.5 / 45.13)	3.1	27
CE/A16 Excess RCS Leakage / 2										
CE/E09 Functional Recovery										
K/A Category Point Totals:	1	1	1	2	2	2		Group Point Total:		9/4

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO)											Form ES-401-2	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G*	K/A Topic(s)	IR	#
003 Reactor Coolant Pump						X						K6.04 - Knowledge of the effect of a loss or malfunction on the following will have on the RCPS: Containment isolation valves affecting RCP operation (CFR: 41.7 / 45/5)	2.8	28
004 Chemical and Volume Control			X									K3.04 - Knowledge of the effect that a loss or malfunction of the CVCS will have on the following: RCPS (CFR: 41.7/45/6)	3.7	29
005 Residual Heat Removal			X									K3.01 - Knowledge of the effect that a loss or malfunction of the RHRS will have on the following: RCS (CFR: 41.7 / 45.6)	3.9	30
005 Residual Heat Removal										X		A4.03 - Ability to manually operate and/or monitor in the control room: RHR temperature, PZR heaters and flow, and nitrogen (CFR: 41.7 / 45.5 to 45.8)	2.8	31
006 Emergency Core Cooling					X							K5.08 - Knowledge of the operational implications of the following concepts as they apply to ECCS: Operation of pumps in parallel (CFR: 41.5 / 45.7)	2.9	32
007 Pressurizer Relief/Quench Tank							X					A1.03 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the PRTS controls including: Monitoring quench tank temperature (CFR: 41.5 / 45.5)	2.6	33
008 Component Cooling Water									X			A3.04 - Ability to monitor automatic operation of the CCWS, including: Requirements on and for the CCWS for different conditions of the power plant (CFR: 41.7 / 45.5)	2.9	34
010 Pressurizer Pressure Control								X				A2.02 - Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Spray valve failures (CFR: 41.5 / 43.5 / 45.3 / 45.13)	3.9	36
012 Reactor Protection											X	G2.2.22 Knowledge of limiting conditions for operations and safety limits. (CFR: 41.5 / 43.2 / 45.2)	4.0	37

013 Engineered Safety Features Actuation		X																		K2.01 - Knowledge of bus power supplies to the following: ESFAS/safeguards equipment control (CFR: 41.7)	3.6	38
013 Engineered Safety Features Actuation						X														K6.01 - Knowledge of the effect of a loss or malfunction on the following will have on the ESFAS: Sensors and detectors (CFR: 41.7 / 45.5 to 45.8)	2.7	39
022 Containment Cooling				X																K4.04 - Knowledge of CCS design feature(s) and/or interlock(s) which provide for the following: Cooling of control rod drive motors (CFR: 41.7)	2.8	40
025 Ice Condenser																				Not part of the plant design		
026 Containment Spray		X																		K1.01 - Knowledge of the physical connections and/or cause/effect relationships between the CSS and the following systems: ECCS (CFR: 41.2 to 41.9 / 45.7 to 45.8)	4.2	41
026 Containment Spray			X																	K2.01 - Knowledge of the bus power supplies to the following: Containment Spray Pumps (CFR: 41.7)	3.4	42
039 Main and Reheat Steam					X															K5.08 - Knowledge of the operational implications of the following concepts as they apply to the MRSS: Effect of steam removal on reactivity (CFR: 41.5 / 45.7)	3.6	43
059 Main Feedwater							X													A1.07 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the MFW controls including: Feed Pump speed, including normal control speed for ICS (CFR: 41.5 / 45.5)	2.5	44
059 Main Feedwater										X										A3.06 - Ability to monitor automatic operation of the MFW, including: Feedwater isolation (CFR: 41.7 / 45.5)	3.2	45
061 Auxiliary/Emergency Feedwater					X															K5.02 - Knowledge of the operational implications of the following concept as they apply to the AFW: Decay Heat Sources and Magnitude. (CFR: 41.5 / 45.7)	3.2	46
061 Auxiliary/Emergency Feedwater								X												A1.01 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the AFW controls including: S/G level (CFR: 41.5 / 45.5)	3.9	47
062 AC Electrical Distribution				X																K4.10 - Knowledge of ac distribution system design feature(s) and/or interlock(s) which provide for the following: Uninterruptable ac power sources (CFR: 41.7)	3.1	48

063 DC Electrical Distribution											X			A3.01 - Ability to monitor automatic operation of the DC electrical system, including: Meters, annunciators, dials, recorders, and indicating lights (CFR: 41.7 / 45.5)	2.7	49
063 DC Electrical Distribution												X		A4.03 Ability to manually operate and / or monitor in the control room: Battery Discharge Rate (CFR: 41.7 / 45.5 to 45.8)	3.0	35
064 Emergency Diesel Generator													X	K6.08 - Knowledge of the effect of a loss or malfunction of the following will have on the ED/G system: Fuel oil storage tanks (CFR: 41.7 / 45.7)	3.2	50
073 Process Radiation Monitoring													X	2.4.31 - Knowledge of annunciator alarms, indications, or response procedures. (CFR: 41.10 / 45.3)	4.2	51
076 Service Water	X													K1.21 - Knowledge of the physical connections and/or cause- effect relationships between the SWS and the following systems: Auxiliary backup SWS (CFR: 41.2 to 41.9 / 45.7 to 45.8)	2.7	52
076 Service Water				X										K4.02 - Knowledge of SWS design feature(s) and/or interlock(s) which provide for the following: Automatic start features associated with SWS pump controls (CFR: 41/7)	2.9	53
078 Instrument Air													X	2.4.18 - Knowledge of the specific bases for EOPs. (CFR: 41.10 / 43.1 / 45.13)	3.3	54
103 Containment												X		A2.03 - Ability to (a) predict the impacts of the following malfunctions or operations on the containment system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Phase A and B isolation (CFR: 41.5 / 43.5 / 45.3 / 45.13)	3.5	55
K/A Category Point Totals:		2	2	2	3	3	3	3	2	3	2	3	Group Point Total:			28/5

ES-401		PWR Examination Outline Plant Systems - Tier 2/Group 2 (RO / SRO)											Form ES-401-2	
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G*	K/A Topic(s)	IR	#
001 Control Rod Drive								X				A2.14 Ability to (a) predict the impacts of the following malfunction or operations on the CRDS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Urgent failure alarm, including rod-out-of-sequence and motion-inhibit alarms. (CFR: 41.5 / 43.5 / 45.3 / 45.13)	3.7	56
002 Reactor Coolant					X							K5.07 Knowledge of the operational implications of the following concepts as they apply to the RCS: Reactivity effects of RCS boron, pressure and temperature (CFR: 41.5 / 45.7)	3.3	65
011 Pressurizer Level Control														
014 Rod Position Indication							X					A1.02 - Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RPIS controls, including: Control rod position indication on control room panels. (CFR: 41.5 / 45.5)	3.2	57
015 Nuclear Instrumentation	X											K1.01 - Knowledge of the physical connections and/or cause/effect relationships between the NIS and the following systems: RPS (CFR: 41.2 to 41.9 / 45.7 to 45.8)	4.1	58
016 Non-Nuclear Instrumentation														
017 In-Core Temperature Monitor														
027 Containment Iodine Removal		X										K2.01 - Knowledge of bus power supplies to the following: Fans (CFR: 41.7)	3.1	59
028 Hydrogen Recombiner and Purge Control														
029 Containment Purge														
033 Spent Fuel Pool Cooling														
034 Fuel Handling Equipment														
035 Steam Generator						X						K6.01 - Knowledge of the effect of a loss or malfunction on the following will have on the S/GS: MSIVs (CFR: 41.7 / 45.7)	3.2	62
041 Steam Dump/Turbine Bypass Control									X			A4.05 Ability to manually operate and/or monitor in the control room: Main steam header pressure (CFR: 41.7 / 45.5 to 45.8)	3.1	63

045 Main Turbine Generator				X																		K4.02 Knowledge of MT/G system design feature(s) and/or interlock(s) which provide for the following: Automatic shut of reheat stop valves as well as main control valves when tripping turbine (CFR: 41.7)	2.5	60		
055 Condenser Air Removal																						X	G2.1.28 Knowledge of the purpose and function of major system components and controls. (CFR 41.7)	4.1	61	
056 Condensate																										
068 Liquid Radwaste																										
071 Waste Gas Disposal																										
072 Area Radiation Monitoring																										
075 Circulating Water																										
079 Station Air																										
086 Fire Protection																						X		A3.01 Ability to monitor automatic operation of the Fire Protection System including: Starting mechanisms of the fire water pumps (CFR 41.7 / 45.5)	2.9	64
K/A Category Point Totals:																										
		1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			Group Point Total:		10/3

Facility: Callaway Plant (RO, Rev. 2)		Date of Exam: 2016				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.13	(CFR: 41.10 / 43.5 / 45.9 / 45.10)	2.5	66		
	2.1.36	Knowledge of procedures and limitations involved in core alterations. (CFR: 41.10 / 43.6 / 45.7)	3.0	67		
	2.1.3	Knowledge of shift or short-term relief turnover practices (CFR: 41.10 / 45.13)	3.7	68		
	Subtotal			3		
2. Equipment Control	2.2.14	Knowledge of the process for controlling equipment configuration or status. (CFR: 41.10 / 43.3 / 45.13)	3.9	69		
	2.2.23	Ability to track Technical Specification limiting conditions for operations. (CFR: 41.10 / 43.2 / 45.13)	3.1	70		
	Subtotal			2		
3. Radiation Control	2.3.11	Ability to control radiation releases. (CFR: 41.11 / 43.4 / 45.10)	3.8	71		
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities. (CFR: 41.12 / 43.4 / 45.10)	3.4	72		
	Subtotal			2		
4. Emergency Procedures / Plan	2.4.8	Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (CFR: 41.10 / 43.5 / 45.13)	3.8	73		
	2.4.29	Knowledge of the emergency plan. (CFR: 41.10 / 43.5 / 45.11)	3.1	74		
	2.4.42	Knowledge of emergency response facilities. (CFR: 41.10 / 45.11)	2.6	75		
	Subtotal			3		
Tier 3 Point Total				10		7

Facility: Callaway Plant (SRO, Rev. 2)													Date of Exam: 2016					
Tier	Group	RO K/A Category Points											SRO-Only Points					
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G*	Total	A2	G*	Total		
1. Emergency & Abnormal Plant Evolutions	1												18	2	4	6		
	2				N/A					N/A			9	2	2	4		
	Tier Totals												27	5	5	10		
2. Plant Systems	1												28	3	2	5		
	2												10	1	2	3		
	Tier Totals												38	4	4	8		
3. Generic Knowledge and Abilities Categories					1	2	3	4	10	1	2	3	4	1	2	2	2	7

- Note:
- Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two). [\(One Tier 3 Radiation Control K/A is allowed if the K/A is replaced by a K/A from another Tier 3 Category\).](#)
 - 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.
 - Systems/evolutions within each group are identified on the associated 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.
 - 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.
 - 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.
 - Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
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 - On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (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.
 - 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

BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X	2.4.6 - Knowledge of EOP mitigation strategies. (CFR: 41.10 / 43.5 / 45.13)	4.7	81
000077 Generator Voltage and Electric Grid Disturbances / 6								
K/A Category Totals:				2	4	Group Point Total:		18/6

BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4					X		EA2.2 - Ability to determine and interpret the following as they apply to the (Natural Circulation with Steam Void in Vessel with/without RVLIS): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments. (CFR: 43.5 / 45.13)	3.9	85
BW/E13&E14 EOP Rules and Enclosures									
CE/A11; W/E08 RCS Overcooling - PTS / 4									
CE/A16 Excess RCS Leakage / 2									
CE/E09 Functional Recovery									
K/A Category Point Totals:					2	2	Group Point Total:		9/4

062 AC Electrical Distribution																				
063 DC Electrical Distribution																				
064 Emergency Diesel Generator																				
073 Process Radiation Monitoring																				
076 Service Water																				
078 Instrument Air								X									A2.01 - Ability to (a) predict the impacts of the following malfunctions or operations on the IAS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Air dryer and filter malfunctions (CFR: 41.5 / 43.5 / 45.3 / 45.13)	2.9	90	
103 Containment																				
K/A Category Point Totals:								3									2	Group Point Total:		28/5

086 Fire Protection															
K/A Category Point Totals:											1	2	Group Point Total:		10/3

Facility: Callaway Plant (SRO, Rev. 2)		Date of Exam: 2016				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. (CFR: 41.10 / 43.5 / 45.12)			3.9	94
	Subtotal					1
2. Equipment Control	2.2.7	Knowledge of the process for conducting special or infrequent tests. (CFR: 41.10 / 43.3 / 45.13)			3.6	95
	2.2.5	Knowledge of the process for making design or operating changes to the facility. (CFR: 41.10 / 43.3 / 45.13)			3.2	96
	Subtotal					2
3. Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 41.12 / 43.4 / 45.10)			3.7	97
	2.3.13	Knowledge of radiological safety 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, aligning filters, etc. (CFR: 41.12 / 43.4 / 45.9 / 45.10)			3.8	98
	Subtotal					2
4. Emergency Procedures / Plan	2.4.28	Knowledge of procedures relating to a security event (non-safeguards information). (CFR: 41.10 / 43.5 / 45.13)			4.1	99
	2.4.25	Knowledge of fire protection procedures. (CFR: 41.10 / 43.5 / 45.13)			3.7	100
	Subtotal					2
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO 1/1	00027 AA2.10	Question #7 – 00027 AK1.01 was replaced using random selection process within the same safety function. Unable to write question to meet K/A with plausible distractors.
RO 1/1	00029 EK3.12	Question #8 – EK2.06 was replaced using random selection process within the same safety function. Unable to write question to meet K/A with plausible distractors.
RO 1/1	000055 EA1.02	Question #13 – 00058 AA1.02 was replaced due to overlap with questions #48 and #49 and their associated K/As. Random selection from same tier and group on topic not yet selected.
RO 1/2	00051 G2.4.11	Question #20 – 00059 G2.4.21 was replaced due to overlap with question #71. Selected previous topic and random selection of generic K/A within the emergency procedure/plan area.
RO 1/2	000060 AA1.02	Question #21 – 000060 AA1.01 was replaced as PRMs not ARMs are associated with isolation logic etc. To maintain category spread, the A1 category was retained and AA1.02 is the only other K/A in this area.
RO 1/2	W/E 15 EA1.2	Question #24 – W/E 15 EK3.1 was randomly replaced within same topic due to inability to write operationally valid question to k/a.
RO 2/1	00063 A4.03	Question #35 – 00010 K1.01 was replaced due to overlap with the operating test and the inability to write question to meet K/A with plausible distractors.
RO 2/1	00012 G2.2.22	Question #37 – 012 A4.03 was replaced due to the inability to write question to meet K/A with plausible distractors.
RO 2/1	026 K1.01	Question #41 026 K1.02 was randomly reselected due to the fact that there is No physical connection. Maintained same topic and K1 area while maintaining >2.5 importance.
RO 2/1	00026 K2.01	Question #42 – 00026 K3.01 was replaced due to difficulty writing a RO level question on the malfunction of CSS effects on CCS. Random selection from same topic, 00026.
RO 2/1	00061 K5.02	Question #46 – 00061 K2.01 Audit Overlap. Unable to write another question to K/A and maintain separation from NRC and Audit exams. Random selection from within same safety function.
RO 2/1	103 A2.03	Question #55 – 103 A2.05 – was randomly replaced within same topic and ability due to overlap with SRO question #98.
RO 2/2	001 A2.14	Question #56 – 001 A3.04 was randomly replaced within the topic due to the inability to write question to meet K/A with plausible distractors.

RO 2/2	014 A1.02	Question #57 – 014 A4.02 - was randomly replaced within same topic due to overlap with the operating exam and inability to develop plausible distractors
RO 2/2	045 K4.02	Question #60 – 033 A1.01 was randomly replaced due to inability to write a question with 3 plausible distractors and overlap with SRO question and to maintain an even K&A spread among tier 2 group 2.
RO 2/2	055 G2.1.28	Question #61 – 034 K4.03 was randomly replaced due to inability to write a question with 3 plausible distractors and to maintain an even K&A spread among tier 2 group 2.
RO 2/2	035 K6.01	Question #62 - 035 K6.03 was randomly replaced due to inability to write a question with 3 plausible distractors but maintained within the same K6 area to maintain an even K&A spread among tier 2 group 2.
RO 2/2	041 A4.05	Question #63 – 068 A2.03 was randomly replaced due to operational validity while maintain spread of question between K &A's. .
RO 2/2	086 A3.01	Question #64 – 072 K3.01 was randomly reselected as a malfunction of an ARM did not impact Containment ventilation. PRM failures would have an effect but not ARMs.
RO 2/2	002 K5.07	Question #65 – 086 K5.03 was randomly reselected due to the inability to write a question to this topic that has 3 plausible distractors. Randomly reselected system and knowledge in the K5 category in order to maintain an even K&A spread among tier 2 group 2
RO 3	G2.1.13	Question #66 – G2.1.7 was replaced due to the inability to write a generic question about topic. Selected next generic from same category.
RO 3	G2.1.3	Question #68 – G2.1.44 was replaced due to the inability to write question to meet K/A with plausible distractors.
RO 3	G2.4.8	Question #73 – G2.4.6 was replaced due to the inability to write a generic question about specific EOP mitigation strategy. Selected next generic from same category.
RO 3	G2.4.42	Question #75 – G2.4.46 was replaced due to the inability to write a generic question that would "verify that alarms are consistent with the plant conditions" Random selection from same category.

Tier / Group	Randomly Selected K/A	Reason for Rejection
SRO 1/1	00022 AA2.01	Question #76 – 00008 AA2.19 was randomly replaced due to the inability to write a SRO level question on the topic.
SRO 1/1	00038 G4.4.41	Question #78 – 00038 G2.1.25 was randomly replaced due to the inability to write a SRO level question on the topic.
SRO 1/1	00009 EA2.36	Question #79 – 00054 AA2.07 was randomly replaced due to the inability to write a SRO level question on the topic.
SRO 1/1	W/E 05 G2.4.6	Question #81- W/E 05 G2.4.9 was randomly reselected within the same generic tier due to no different procedural actions at low power versus full power.
SRO 1/2	00076 G2.2.40	Question #84 –W/E 16 G2.2.40 - topic was randomly replaced as technical specification during original topic; same generic maintained.
SRO 2/1	005 G2.4.9	Question #86 – 005 G2.4.35 was randomly reselected within the same generic tier due to inability to write a SRO level question on the topic.
SRO 2/1	006 G2.1.32	Question #88 – 008 G2.4.41 was randomly replaced due to the inability to write a SRO level question on the topic.
SRO 2/1	003 A2.02	Question #89 – 039 A2.02 was randomly replaced because the system does not response the way the K/A assumes it does. Randomly reselected the system while maintaining the same A2.02.
SRO 3	G2.2.5	Question #96 – G2.2.35 replaced due to the inability to write a SRO level question on the topic. Randomly reselected generic from same category.
SRO 3	G2.3.4	Question #97 - G2.3.5 replaced due to the inability to write a SRO level question on the topic. Randomly reselected generic from same category.
SRO 3	G2.4.25	Question #100 – G2.4.47 replaced due to inability to write a generic question on the selected k/a. Randomly reselected generic from same category.

Facility: Callaway	Date of Examination: 5/23/2016	
Examination Level: RO	Operating Test Number: 2016-1	
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A1	R, D	2.1.37 (4.3) Knowledge of procedures, guidelines, or limitations associated with reactivity management JPM: Perform a QPTR Calculation
Conduct of Operations A2	R, M	2.1.25 (3.9) Ability to interpret reference materials such as graphs, curves, tables, etc. JPM: Determine RV Venting Time (EOP ADD 33)
Equipment Control A3	R, D, P	2.2.37 (3.6) Ability to determine operability and/or availability of safety related equipment. JPM: Determine Amperage Limits for 480 VAC Safety Related busses.
Radiation Control A4	R, M	2.3.7 (3.5) Ability to comply with radiation work permit requirements during normal or abnormal conditions. JPM: Determine entry requirements for the RCA.
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 & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

*The JPMs from the 2013 exam were randomly selected by placing 4 slips of paper labeled "A1.a 2013" through "A4 2013" in a hardhat. "A2 2013" was drawn from the hardhat.

- A1 This is a BANK JPM. The parent JPM (URO-SSE-04-A100J) was last used on an ILT NRC Exam administered at Callaway in 2009. Upon completion of this JPM, the applicant will have performed a manual QPTR calculation with a final QPTR tolerance of ± 0.01 .
- A2 This is a MODIFIED JPM. The parent JPM was used on the 2009 ILT NRC exam. The candidate is to determine the maximum RV Venting time using EOP Addendum 33. Upon completion of this JPM, the applicant will have determined RV Venting time to be between 1.72 and 1.84 minutes.
- A3 This BANK JPM was used on the 2013 ILT NRC Exam. The applicant will review planned maintenance which requires load centers NG01 and NG03 to be cross-connected. The applicant will be required to determine what equipment can be started on the cross-connected load centers without overloading the buses. Upon completion of this JPM, the applicant reported that the following equipment could be started: CGM01A, DG Vent Sply Fan A, SGK04A, Ctrl Rm A/C Unit A, PEC01A, Fuel Pool Clg Pmp A.
- A4 This is a MODIFIED JPM from the 2013 Palo Verde ILT NRC Exam. This JPM requires the RO to review given conditions and determine RWP to be used, required dosimetry. Dose and dose rate alarm, protective clothing required, and required RP briefing or authorization for the task will be performed; in accordance with APA-ZZ-01004, Radiological Work standards, and HDP-ZZ-01500, Radiological Postings. Upon completion of the JPM the applicant will have identified the following:
- | | |
|---|--|
| RWP to be used | 160501ROUTINE |
| Required Dosimetry | OSLD and Electronic Dosimeter |
| Dose Alarm | 11 mRem |
| Dose Rate Alarm | 100 mRem |
| | Full set of Protective Clothing in Contaminated Areas. |
| Protective Clothing Requirements | OR |
| | Partial PC's allowed for tours, inspections, and work below grating as allowed by RP. |
| Required RP briefing and/or authorization | Contact RP for Survey Prior to Entry (CRP) |

Facility: Callaway	Date of Examination: 5/23/2016	
Examination Level: SRO	Operating Test Number: 2016 - 1	
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A5	R, M	2.1.37 (4.6) Knowledge of procedures, guidelines, or limitations associated with reactivity management JPM: Review a QPTR Calculation
Conduct of Operations A6	R, M	2.1.25 (4.2) Ability to interpret reference materials such as graphs, curves, tables, etc JPM: Determine RV Venting Time (EOP ADD 33)
Equipment Control A7	R, D, P	2.2.37 (4.6) Ability to determine operability and/or availability of safety related equipment JPM: Determine Amperage Limits for 480 VAC Safety Related busses
Radiation Control A8	R, M	2.3.4 (3.7) Knowledge of radiation exposure limits under normal or emergency conditions JPM: Select Volunteer for Emergency Exposure
Emergency Procedures/Plan A9	R, M	2.4.44 (4.4) Make a Protective Action Recommendation JPM: Determine the Protective Action Recommendation (PAR)
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

*No JPMs from the last 2 SRO exams (including the 2013 re-exam) were selected for this exam. JPM A7 was on the 2013 RO exam. This JPMs was randomly selected by placing 4 slips of paper labeled "A1.a 2013" through "A4 2013" in a hardhat. "A2 2013" was drawn from the hardhat.

- A5 This is a MODIFIED JPM. The parent JPM (SRO-MAS-04-A006J) has not been used on an NRC Exam administered at Callaway between 2004 and 2014. Upon completion of this JPM, the applicant will have reviewed a manual QPTR calculation with a final QPTR tolerance of ± 0.01 and determined that N44 Lower detector is greater than 1.02 and entered T/S 3.2.4.A, and entered the data on Attachment 2.
- A6 This is a MODIFIED JPM. The parent JPM (RA2) was used on the 2009 ILT NRC exam. The candidate is to determine the maximum RV Venting time using EOP Addendum 33. Upon completion of this JPM, the applicant will have determined RV Venting time to be between 1.72 and 1.84 minutes.
- A7 This BANK JPM was used on the 2013 ILT NRC Exam. The applicant will review planned maintenance which requires load centers NG01 and NG03 to be cross-connected. The applicant will be required to determine what equipment can be started on the cross-connected load centers without overloading the buses. Upon completion of this JPM, the Applicant reported that the following equipment could be started: CGM01A, DG Vent Sply Fan A, SGK04A, Ctrl Rm A/C Unit A, PEC01A, Fuel Pool Clg Pmp A
- A8 This is a MODIFIED JPM. The parent JPM (SRO-RER-03-A203J) was used on the 2009 ILT NRC exam. The applicant will be given a set of conditions and the appropriate procedures in an emergency radiological situation need to determine which volunteer may receive and emergency exposure. Upon completion of this JPM, Candidate selected Volunteer #5 to attempt the rescue of the injured operator in accordance with HDP-ZZ-01450 and completed Section 1 of CA0276 correctly in accordance with the KEY.
- A9 This is a MODIFIED JPM. The parent JPM (SRO-RER-02-A031J(TC)) was used on the 2011 ILT NRC exam. The applicant will be assigned the task of determining the Protective Action Recommendation (PAR) within the allotted amount of time. Upon completion of this JPM the applicant will have identified the PAR as Evacuate 2 Mile Radius and 10 miles downwind (Sectors G, H, J).

Rev 2

Facility: <u>Callaway</u>		Date of Examination: <u>5/23/2016</u>	
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2016-1</u>	
Control Room Systems:* 8 for RO; 7 for SRO-I; 2 or 3 for SRO-U			
	System / JPM Title	Type Code*	Safety Function
S1	001 Control Rod Drive System (SF) / Perform Control Rod Partial Movement Test	D, S	1
S2	004 CVCS (BG) / Swap From the NCP to 'B' CCP	A, D, S	2
S3	010 Pressurizer Pressure Control System (BB) / Respond to a Master Pressure Controller Failure	A, D, S	3
S4	059 Main Feedwater System (AE) / Transfer Steam Generator Water Level Control	A, N, S	4S
S5	005 Residual Heat Removal System (EJ) / Transfer to Hot Leg Recirculation	A, D, L, EN, S	4P
S6	062 A.C. Electrical Distribution (PA) / Perform Operational Testing of the Alternate Emergency Power Source	D, P ¹ , S	6
S7	015 Nuclear Instrumentation System (SE) / Respond to a Failed Power Range Instrument	D, S	7
S8	Containment Purge System (GT) / Remove Shutdown Purge System From Service	N, L, S	8
In-Plant Systems* (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
P1	006 Emergency Core Cooling System (EP) / Secure Safety Injection Accumulators	D, L	2
P2	035 Main and Reheat Steam System (AB) / Isolate a Failed Open Atmospheric Steam Dump	A, M, E, R	4S
P3	062 AC Electrical Distribution System (NN) / Transfer NN01 from Manual Bypass to Normal	M	6
* 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; in-plant systems and functions may overlap those tested in the control room.			
* Type Codes		Criteria for RO / SRO-I / SRO-U	

Rev 2

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

Note 1. The JPMs from the 2013 exam were randomly selected by placing 11 slips of paper labeled “S1” through “P3” in a hardhat. S6 was drawn from the hardhat.

S1 This is a BANK JPM. The JPM (URO-SSF-01-C005J) was used on the 2009 ILT NRC Exam. The applicant will be assigned the task of performing control rod partial movement for all shutdown banks, per OSP-SF-00002, Control Rod Partial Movement, beginning at step 6.1 Upon completion of this JPM, the applicant will have inserted all shutdown bank ‘A’ control rods at least 12 steps into the core and restored them to their pretest position per procedural requirements.

S2 This is an ALTERNATE PATH, BANK JPM. The JPM (URO-SBG-02-C160J (A)) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will perform the actions of OTN-BG-00001, Addendum 1 to shift from the NCP to the B CCP. After the B CCP is started and during the transition from the NCP flow controller to the B CCP flow controller, the B CCP will Trip, requiring the applicant to restore charging flow. Upon completion of this JPM the applicant will have restored charging flow to normal.

S3 This is an ALTERNATE PATH, BANK JPM. The JPM (URO-SBB-04-C166J(A)) was used on the 2009 ILT NRC Exam. The applicant will be directed to to equalize RCS and Pressurizer Boron Concentration using OTG-ZZ-00004, Addendum 03. When the master pressure controller is taken to AUTO the PZR spray valves fail open requiring the applicant to manually close the spray valves. Upon completion of this JPM, the master pressure controller failure has been addressed prior to a Reactor Trip being generated on low pressurizer pressure.

Rev 2

- S4 This is an ALTERNATE PATH, NEW JPM. The applicant will be assigned the task transferring Steam Generator Water Level Control from the MFRV Bypass Valves to the Main Feedwater Regulating Valves using OTN-AE-00001, Feedwater System. During the transfer the 'D' MFRV will not open. The applicant will abort the automatic valve transfer and manually maintain SGWL. Upon completion of this JPM, the applicant will have transferred Steam Generator Water Level Control from the MFRV Bypass Valves to the MFRVs for SG 'A', 'B', and 'C' and taken manual control of SG 'D' water level without causing a Reactor Trip or Feedwater Isolation Signal due to high or low Steam Generator water level.
- S5 This is an ALTERNATE PATH, The JPM (URO-AEO-02-C201J(A)) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The simulator will be set up following a large Loss of Coolant Accident. The applicant will be directed to transfer the Emergency Core Cooling System to the recirculation mode in accordance with ES-1.4, Transfer to Hot Leg Recirculation. During performance, the applicant determines that HV8840 will not open and must use the alternate line up to achieve hot leg recirc. Upon completion of this JPM, the applicant will have aligned SI pumps to inject into the RCS hot legs.
- S6 This is a BANK JPM that was used on the 2013 ILT NRC Exam (S6 on 2013 exam). It was randomly selected using the method described above. The applicant will be assigned the task of performing an online test of Alternate Emergency Power Source Diesel Generator #4 from the Control Room. Upon completion of this JPM, the applicant will have started AEPS Diesel Generator #4, taken readings and secured the diesel.
- S7 This is a BANK JPM. The JPM (URO-SSE-03-C126J) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will perform the actions of OTO-SE-00001, Nuclear Instrument Malfunction, Attachment A to bypass the Power Range NIS Channel N41 current comparator and rod stop inputs. Upon Completion of this JPM, Power Range NIS channel N41 current comparator and rod stop inputs will be bypassed.
- S8 This is a NEW JPM. The applicant will perform the actions of OTN-GT-00001, Containment Purge System, to remove containment shutdown purge from service. Upon completion of this JPM, the applicant will have removed containment shutdown purge from service IAW OTN-GT-00001.
- P1 This is a BANK JPM. The JPM (RO-SRO Au j) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will be assigned the task of locally securing Safety Injection accumulators per OTG-ZZ-00006, Addendum. Upon completion of this JPM, the applicant will have closed the SI Accumulator Outlet Isolation Valves and opened the feeder breakers to the SI accumulator outlet isolation valves.

Rev 2

- P2 This is an ALTERNATE PATH, MODIFIED JPM. The parent JPM (EOP-SAB08077J(A)) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will be assigned the task of locally closing Atmospheric Steam Dumps, AB PV-3 AND AB PV-4. Upon completion of this JPM, the applicant will have closed AB PV-3 and isolated AB PV-4. AB PV-3 was closed by isolating Air/N2 from the valve. AB PV-4 was isolated by closing the manual isolation valve, ABV0007.
- P3 This is a MODIFIED JPM. The parent JPM (EOS-SNN-03-P010J) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will be assigned the task of transferring NN01 to the normal power source per OTN-NN-00001. Upon completion of this JPM the applicant will have transferred NN01 to the normal power supply (inverter and NK01) without a loss of voltage.

Rev 1

Facility: <u>Callaway</u>		Date of Examination: <u>5/23/2016</u>	
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test No.: <u>2016-1</u>	
Control Room Systems:* 8 for RO; 7 for SRO-I; 2 or 3 for SRO-U			
	System / JPM Title	Type Code*	Safety Function
S1	001 Control Rod Drive System (SF) / Perform Control Rod Partial Movement Test	D, S	1
S2	004 CVCS (BG) / Swap From the NCP to 'B' CCP	A, D, S	2
S3	010 Pressurizer Pressure Control System (BB) / Respond to a Master Pressure Controller Failure	A, D, S	3
S4	059 Main Feedwater System (AE) / Transfer Steam Generator Water Level Control	A, N, S	4S
S5	005 Residual Heat Removal System (EJ) / Transfer to Hot Leg Recirculation	A, D, L, EN, S	4P
S6	062 A.C. Electrical Distribution (PA) / Perform Operational Testing of the Alternate Emergency Power Source	D, P ¹ , S	6
S7	015 Nuclear Instrumentation System (SE) / Respond to a Failed Power Range Instrument	D, S	7
In-Plant Systems* (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)			
P1	006 Emergency Core Cooling System (EP) / Secure Safety Injection Accumulators	D, L, R	2
P2	035 Main and Reheat Steam System (AB) / Isolate a Failed Open Atmospheric Steam Dump	A, M, E, R	4S
P3	062 AC Electrical Distribution System (NN) / Transfer NN01 from Manual Bypass to Normal	M	6
* 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; in-plant systems and functions may overlap those tested in the control room.			
* Type Codes		Criteria for RO / SRO-I / SRO-U	

Rev 1

A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	$\geq 1 / \geq 1 / \geq 1$ (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

Note 1. The JPMs from the 2013 exam were randomly selected by placing 11 slips of paper labeled "S1" through "P3" in a hardhat. S6 was drawn from the hardhat.

- S1 This is a BANK JPM. The JPM (URO-SSF-01-C005J) was used on the 2009 ILT NRC Exam. The applicant will be assigned the task of performing control rod partial movement for all shutdown banks, per OSP-SF-00002, Control Rod Partial Movement, beginning at step 6.1 Upon completion of this JPM, the applicant will have inserted all shutdown bank 'A' control rods at least 12 steps into the core and restored them to their pretest position per procedural requirements.
- S2 This is an ALTERNATE PATH, BANK JPM. The JPM (URO-SBG-02-C160J (A)) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will perform the actions of OTN-BG-00001, Addendum 1 to shift from the NCP to the B CCP. After the B CCP is started and during the transition from the NCP flow controller to the B CCP flow controller, the B CCP will Trip, requiring the applicant to restore charging flow. Upon completion of this JPM the applicant will have restored charging flow to normal.
- S3 This is an ALTERNATE PATH, BANK JPM. The JPM (URO-SBB-04-C166J(A)) was used on the 2009 ILT NRC Exam. The applicant will be directed to to equalize RCS and Pressurizer Boron Concentration using OTG-ZZ-00004, Addendum 03. When the master pressure controller is taken to AUTO the PZR spray valves fail open requiring the applicant to manually close the spray valves. Upon completion of this JPM, the master pressure controller failure has been addressed prior to a Reactor Trip being generated on low pressurizer pressure.

Rev 1

- S4 This is an ALTERNATE PATH, NEW JPM. The applicant will be assigned the task transferring Steam Generator Water Level Control from the MFRV Bypass Valves to the Main Feedwater Regulating Valves using OTN-AE-00001, Feedwater System. During the transfer the 'D' MFRV will not open. The applicant will abort the automatic valve transfer and manually maintain SGWL. Upon completion of this JPM, the applicant will have transferred Steam Generator Water Level Control from the MFRV Bypass Valves to the MFRVs for SG 'A', 'B', and 'C' and taken manual control of SG 'D' water level without causing a Reactor Trip or Feedwater Isolation Signal due to high or low Steam Generator water level.
- S5 This is an ALTERNATE PATH, The JPM (URO-AEO-02-C201J(A)) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The simulator will be set up following a large Loss of Coolant Accident. The applicant will be directed to transfer the Emergency Core Cooling System to the recirculation mode in accordance with ES-1.4, Transfer to Hot Leg Recirculation. During performance, the applicant determines that HV8840 will not open and must use the alternate line up to achieve hot leg recirc. Upon completion of this JPM, the applicant will have aligned SI pumps to inject into the RCS hot legs.
- S6 This is a BANK JPM that was used on the 2013 ILT NRC Exam (S6 on 2013 exam). It was randomly selected using the method described above. The applicant will be assigned the task of performing an online test of Alternate Emergency Power Source Diesel Generator #4 from the Control Room. Upon completion of this JPM, the applicant will have started AEPS Diesel Generator #4, taken readings and secured the diesel.
- S7 This is a BANK JPM. The JPM (URO-SSE-03-C126J) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will perform the actions of OTO-SE-00001, Nuclear Instrument Malfunction, Attachment A to bypass the Power Range NIS Channel N41 current comparator and rod stop inputs. Upon Completion of this JPM, Power Range NIS channel N41 current comparator and rod stop inputs will be bypassed.
- P1 This is a BANK JPM. The JPM (RO-SRO Au j) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will be assigned the task of locally securing Safety Injection accumulators per OTG-ZZ-00006, Addendum 06. Upon completion of this JPM, the applicant will have closed the SI Accumulator Outlet Isolation Valves and opened the feeder breakers to the SI accumulator outlet isolation valves.

Rev 1

- P2 This is an ALTERNATE PATH, MODIFIED JPM. The parent JPM (EOP-SAB08077J(A)) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will be assigned the task of locally closing Atmospheric Steam Dumps, AB PV-1 AND AB PV-4. Upon completion of this JPM, the Applicant will have closed AB PV-1 and isolated AB PV-4. AB PV-1 was closed by isolating Air/N2 from the valve. AB PV-4 was isolated by closing the manual isolation valve, ABV0007.
- P3 This is a MODIFIED JPM. The parent JPM (EOS-SNN-03-P010J) has not been used on an NRC ILT Exam administered at Callaway between 2004 and 2014. The applicant will be assigned the task of transferring NN01 to the normal power source per OTN-NN-00001. Upon completion of this JPM the applicant will have transferred NN01 to the normal power supply (inverter and NK01) without a loss of voltage.

Facility: Callaway	Scenario No.: 1, Rev 1	Op-Test No.: 2016-1	
Examiners: _____	Operators: _____	_____	
Initial Conditions: 100%			
Turnover: Centrifugal Charging Pump 'B' was taken Out of Service 12 hours ago to replace a shaft seal. The applicable Tech Spec is 3.5.2 A (72 hours). The Balance of Plant (BOP) is directed to shift the CCW service loop from 'A' Train to 'B' Train and swap Fuel Pool Cooling.			
Event No.	Malf. No.	Event Type*	Event Description
1	NA	BOP (N)	Shift CCW service loop from 'A' Train to 'B' Train OTN-EG-00001, Component Cooling Water System
2	BBLT459	SRO (I) RO (I)	Pressurizer Level Transmitter BB LT-459 Fails Low OTO-BG-00001, Pressurizer Level Control Malfunction (Tech Spec 3.3.1)
3	ABPT0514	SRO (I) BOP (I)	'A' S/G Steam Pressure Channel PT-514 Fails Low OTO-AE-00002, Steam Generator Water Level Control Malfunctions (Tech Spec 3.3.2)
4	PEG01B_1	SRO (C) BOP (C)	'B' CCW Pump Trip / 'D' CCW Pump Failure to Auto Start OTO-EG-00001, CCW System Malfunction
5	KAL03	SRO (R) RO (C) BOP (R)	Loss of Instrument Air to Containment OTO-KA-0001, Partial or Total Loss of Instrument Air
6	BB002_C	SRO (M) RO (M) BOP (M)	RCS Leak – LOCA E-1, Loss of Reactor or Secondary Coolant
7	NF039A_1	SRO (C) BOP (C)	LOCA Sequencer Train A Failure E-0, Reactor Trip or Safety Injection, Attachment A, Automatic Action Verification
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	6
2. Malfunctions after EOP entry (1-2)	1
3. Abnormal events (2-4)	4
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	1
6. EOP contingencies requiring substantive actions (0-2)	0
7. Critical tasks (2-3)	2

Facility: Callaway	Scenario No.: 2, Rev 1	Op-Test No.: 2016-1	
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
Initial Conditions: 100%			
Turnover: Maintain current plant conditions. Perform Control Valve Partial Stroke Test on CV-1 in accordance with OSP-AC-00003, Turbine Control Valve Stroke Test			
Event No.	Malf. No.	Event Type*	Event Description
1	NA	BOP (N)	Perform Control Valve Partial Stroke Test on CV-1 OSP-AC-00003, Turbine Control Valve Stroke Test
2	ACPT0505	SRO (I) RO (R) BOP (I)	First Stage Turbine Pressure Indicator Failure OTO-AC-00003, Turbine Impulse Pressure Channel Failure (Tech Spec 3.3.1)
3	M04_DA	SRO (I) RO (I)	Loss of DRPI (Rod M-4) OTA-RK-00022, ADD 80A Rod Position Indication Urgent Alarm (Tech Spec 3.1.7)
4	FCSI0132	SRO (C) BOP (C)	'B' Failure MFP Speed Failure OTO-AE-00001, Feedwater System Malfunctions
5	CRCPV2	SRO (C) RO (C)	"C" RCP High Vibration OTO-BB-00002, RCP Off Normal
6	SF006	SRO (M) RO (M) BOP (M)	Nuclear Power Generation / ATWS FR-S.1, Response to Nuclear Power Generation / ATWS
7	SA075A	SRO (C) BOP (C)	S/G C ASD Sticks Open E-2, Faulted Steam Generator Isolation
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	6
2. Malfunctions after EOP entry (1-2)	1
3. Abnormal events (2-4)	4
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	1
6. EOP contingencies requiring substantive actions (0-2)	1
7. Critical tasks (2-3)	2

Facility: Callaway	Scenario No.: 3, Rev 1	Op-Test No.: 2016-1	
Examiners: _____	Operators: _____	_____	
Initial Conditions: 100%			
Turnover: The "A" MD Auxiliary Feedpump has been out of service for 1 hour. Work is scheduled to complete next shift.			
Event No.	Malf. No.	Event Type*	Event Description
1	BBTE0411A1	SRO (I) RO (I)	RTD Fails High OTO-BB-00004, RCS RTD Channel Failures (Tech Spec 3.3.1)
2	PCE01A	SRO (C) BOP (C)	Stator Cooling Pump Trip with AUTO Start Failure OTA-RK-00026 Add 132C, Generator Protection Runback Circuit
3	EAD05A	SRO (R) BOP (R) RO (R)	Partial Loss of Condenser Vacuum OTO-AD-00001, Loss of Condenser Vacuum
4	SF/SFB08_DR	SRO (C) RO (C)	Dropped rod OTO-SF-00001, Rod Control Malfunctions (Tech Specs 3.1.4)
5	AB003 9XX_2 & 6	SRO (M) RO (M) BOP (M)	Large Steam Line Rupture in Turbine Building with "B" MSIV failing open E-2, Faulted S/G Isolation
6	PAL02_3 PAL01B_1	SRO (C) BOP (C)	MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start E-0, Reactor Trip or Safety Injection
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	6
2. Malfunctions after EOP entry (1-2)	2
3. Abnormal events (2-4)	4
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	1
6. EOP contingencies requiring substantive actions (0-2)	0
7. Critical tasks (2-3)	2

Facility: Callaway	Scenario No.: 4, Rev 1	Op-Test No.: 2016-1	
Examiners: _____	Operators: _____	_____	
<p>Initial Conditions: Reactor Start up preparations in progress, Mode 3 with S/D Banks Withdrawn</p> <p>Turnover: The plant is in MODE 3 with shutdown banks withdrawn in preparation for a reactor startup. AEPS is OOS for breaker repair on PB0501. The crew is to maintain plant conditions until the oncoming crew completes Just In Time Training.</p>			
Event No.	Malf. No.	Event Type*	Event Description
1	HWXST1E21 A	SRO	NE01 Starting Air Receiver air pressure low (Tech Spec 3.8.3)
2	NIS02B	SRO (I) RO (I)	Source Range Channel Failure OTO SE-00001, Nuclear Instrument Malfunction (Tech Spec 3.3.1)
3	MSS09A	SRO (C) BOP (C)	Steam Dump Valves fail open OTO-AB-00001, Steam Dump Malfunction
4	Loss of switch yard.Isn	SRO (C) RO (C) BOP (C)	Loss of Offsite Power E-0, Reactor Trip or Safety Injection
5	PEF01B	SRO (M) RO (M) BOP (M)	"B" ESW Pump Trip / Loss of All AC Power ECA-0.0, Loss of All AC Power
6	NE01	SRO (C) BOP (C)	"A" EDG Fails to Start (Local Start Available 5 minutes after Loss of All AC) A ESW pump fails to AUTO start ECA-0.0, Loss of All AC Power
7	PCV455A	SRO (C) RO (C)	PZR PORV PCV-455 Fails Open with Manual Control Available ECA-0.0, Loss of All AC Power
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5-8)	7
2. Malfunctions after EOP entry (1-2)	2
3. Abnormal events (2-4)	3
4. Major transients (1-2)	1
5. EOPs entered/requiring substantive actions (1-2)	1
6. EOP contingencies requiring substantive actions (0-2)	1
7. Critical tasks (2-3)	2