

Facility: Callaway

Date Of Exam: 06/19/2009

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 & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A		3	18	0		0	0	
	2	1	2	1				2	2			1	9	0		0	0	
	Tier Totals	4	5	4				5	5			4	27	0		0	0	
2. Plant Systems	1	3	2	3	3	2	2	3	3	2	2	3	28	0		0	0	
	2	1	1	0	1	1	1	1	1	1	1	1	10	0	0	0	0	
	Tier Totals	4	3	3	4	3	3	4	4	3	3	4	38	0		0	0	
3. Generic Knowledge And Abilities Categories					1		2		3		4		10	1	2	3	4	0
					3		2		2		3			0	0	0	0	

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).
- 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 and justified; 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 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.

PWR RO Examination Outline

Facility: Callaway

ES - 401 Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1 Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000007 Reactor Trip - Stabilization - Recovery / 1	X						EK1.02 - Shutdown margin	3.4	1
000009 Small Break LOCA / 3		X					EK2.03 - S/Gs	3.0	1
000015/000017 RCP Malfunctions / 4			X				AK3.02 - CCW lineup and flow paths to RCP oil coolers	3.0	1
000022 Loss of Rx Coolant Makeup / 2	X						AK1.03 - Relationship between charging flow and PZR level	3.0	1
000025 Loss of RHR System / 4			X				AK3.01 - Shift to alternate flowpath	3.1	1
000026 Loss of Component Cooling Water / 8				X			AA1.05 - The CCWS surge tank, including level control and level alarms, and radiation alarm	3.1	1
000027 Pressurizer Pressure Control System Malfunction / 3	X						AK1.03 - Latent heat of vaporization/condensation	2.6	1
000038 Steam Gen. Tube Rupture / 3						X	2.1.20 - Ability to interpret and execute procedure steps.	4.6	1
000040 Steam Line Rupture - Excessive Heat Transfer / 4		X					AK2.02 - Sensors and detectors	2.6*	1
000056 Loss of Off-site Power / 6				X			AA1.31 - PZR heater group control switches	3.3	1
000057 Loss of Vital AC Inst. Bus / 6			X				AK3.01 - Actions contained in EOP for loss of vital ac electrical instrument bus	4.1	1
000058 Loss of DC Power / 6				X			AA1.03 - Vital and battery bus components	3.1	1
000062 Loss of Nuclear Svc Water / 4						X	2.4.31 - Knowledge of annunciator alarms, indications, or response procedures.	4.2	1
000065 Loss of Instrument Air / 8						X	2.2.44 - 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.	4.2	1
000077 Generator Voltage and Electric Grid Disturbances / 6					X		AA2.09 –Operational status of Emergency Diesel Generators	3.9	1
W/E04 LOCA Outside Containment / 3		X					EK2.2 - Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	3.8	1

PWR RO Examination Outline

Facility: Callaway

ES - 401 Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1 Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.4	1
W/E11 Loss of Emergency Coolant Recirc. / 4					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.4	1
K/A Category Totals:	3	3	3	3	3	3	Group Point Total:	18	

PWR RO Examination Outline

Facility: Callaway

ES - 401 Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2 Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000028 Pressurizer Level Malfunction / 2		X					AK2.03 - Controllers and positioners	2.6	1
000033 Loss of Intermediate Range NI / 7			X				AK3.01 - Termination of startup following loss of intermediate-range instrumentation	3.2	1
000068 Control Room Evac. / 8					X		AA2.08 - S/G pressure	3.9	1
000074 Inad. Core Cooling / 4					X		EA2.07 - The difference between a LOCA and inadequate core cooling, from trends and indicators	4.1	1
W/E03 LOCA Cooldown - Depress. / 4				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	4.0	1
W/E09 Natural Circ. / 4	X						EK1.3 - Annunciators and conditions indicating signals, and remedial actions associated with the Natural Circulation Operations	3.3	1
W/E13 Steam Generator Over-pressure / 4						X	2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
W/E15 Containment Flooding / 5				X			EA1.2 - Operating behavior characteristics of the facility	2.7	1
W/E16 High Containment Radiation / 9		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.0	1
K/A Category Totals:	1	2	1	2	2	1	Group Point Total:	9	

PWR RO Examination Outline

Facility: Callaway

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
003 Reactor Coolant Pump				X								K4.02 - Prevention of cold water accidents or transients	2.5	1
004 Chemical and Volume Control		X										K2.01 - Boric acid makeup pumps	2.9	1
005 Residual Heat Removal		X										K2.03 - RCS pressure boundary motor-operated valves	2.7*	1
006 Emergency Core Cooling						X						K6.01 - BIT/borated water sources	3.4	1
006 Emergency Core Cooling									X			A3.05 - Safety Injection Pumps	4.2	1
007 Pressurizer Relief/Quench Tank					X							K5.02 - Method of forming a steam bubble in the PZR	3.1	1
007 Pressurizer Relief/Quench Tank											X	2.1.28 - Knowledge of the purpose and function of major system components and controls.	4.1	1
008 Component Cooling Water							X					A1.01 - CCW flow rate	2.8	1
010 Pressurizer Pressure Control				X								K4.01 - Spray valve warm-up	2.7	1
012 Reactor Protection											X	2.1.17 - Ability to make accurate, clear, and concise verbal reports.	3.9	1
012 Reactor Protection			X									K3.04 - ESFAS	3.8*	1
013 Engineered Safety Features Actuation						X						K6.01 - Sensors and detectors	2.7*	1
022 Containment Cooling	X											K1.01 - SWS/cooling system	3.5	1
026 Containment Spray								X				A2.03 - Failure of ESF	4.1	1
039 Main and Reheat Steam							X					A1.09 - Main steam line radiation monitors	2.5*	1
059 Main Feedwater			X									K3.02 - AFW System	3.6	1
059 Main Feedwater										X		A4.12 - Initiation of automatic feedwater isolation	3.4	1
061 Auxiliary/Emergency Feedwater					X							K5.02 - Decay heat sources and magnitude	3.2	1
062 AC Electrical Distribution									X			A3.01 - Vital ac bus amperage	3.0	1
062 AC Electrical Distribution							X					A1.03 - Effect on instrumentation and controls of switching power supplies	2.5	1
063 DC Electrical Distribution	X											K1.03 - Battery charger and battery	2.9	1
064 Emergency Diesel Generator	X											K1.05 - Starting air system	3.4	1

PWR RO Examination Outline

Facility: Callaway

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
073 Process Radiation Monitoring								X				A2.02 - Detector failure	2.7	1
076 Service Water								X				A2.01 - Loss of SWS	3.5*	1
078 Instrument Air										X		A4.01 - Pressure gauges	3.1	1
078 Instrument Air			X									K3.01 - Containment air system	3.1*	1
103 Containment											X	2.4.14 - Knowledge of general guidelines for EOP usage.	3.8	1
103 Containment				X								K4.06 – Containment isolation system	3.1	1
K/A Category Totals:	3	2	3	3	2	2	3	3	2	2	3	Group Point Total:	28	

PWR RO Examination Outline

Facility: Callaway

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
002 Reactor Coolant							X					A1.11 - Relative level indications in the RWST, the refueling cavity, the PZR and the reactor vessel during preparation for refueling	2.7	1
015 Nuclear Instrumentation	X											K1.08 - RCS (pump start)	2.6*	1
027 Containment Iodine Removal								X				A2.01 - High temperature in the filter system	3.0*	1
028 Hydrogen Recombiner and Purge Control						X						K6.01 - Hydrogen recombiners	2.6	1
029 Containment Purge									X			A3.01 - CPS isolation	3.8	1
033 Spent Fuel Pool Cooling											X	2.4.11 - Knowledge of abnormal condition procedures.	4.0	1
035 Steam Generator										X		A4.02 - Fill of dry S/G	2.7	1
068 Liquid Radwaste					X							K5.03 - Units of radiation, dose, and dose rate	2.6	1
075 Circulating Water		X										K2.03 - Emergency/essential SWS pumps	2.6*	1
086 Fire Protection				X								K4.03 - Detection and location of fires	3.1	1
K/A Category Totals:	1	1	0	1	1	1	1	1	1	1	1	Group Point Total:	10	

Generic Knowledge and Abilities Outline (Tier 3)

PWR RO Examination Outline

Facility: Callaway

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.25	Ability to interpret reference materials, such as graphs, curves, tables, etc.	3.9	1
	2.1.29	Knowledge of how to conduct system lineups, such as valves, breakers, switches, etc.	4.1	1
	2.1.32	Ability to explain and apply system limits and precautions.	3.8	1
	Category Total:			3
Equipment Control	2.2.14	Knowledge of the process for controlling equipment configuration or status.	3.9	1
	2.2.36	Ability to analyze the effect of maintenance activities such as degraded power sources, on the status of limiting conditions for operations.	3.1	1
	Category Total:			2
Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	3.2	1
	2.3.5	Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personal monitoring equipment, etc.	2.9	1
	Category Total:			2
Emergency Procedures/Plan	2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	3.7	1
	2.4.11	Knowledge of abnormal condition procedures.	4.0	1
	2.4.43	Knowledge of emergency communications systems and techniques.	3.2	1
	Category Total:			3
Generic Total:			10	

Facility: Callaway

Date Of Exam: 06/19/2009

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 & Abnormal Plant Evolutions	1	0	0	0	N/A			0	0	N/A		0	0	3		3	6	
	2	0	0	0				0	0			0	0	2		2	4	
	Tier Totals	0	0	0				0	0			0	0	0	5		5	10
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	3		2	5	
	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	3	
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	5		3	8	
3. Generic Knowledge And Abilities Categories					1		2		3		4		0	1	2	3	4	7
					0		0		0		0			1	2	2	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 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).
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 associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; 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' 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 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.

PWR SRO Examination Outline

Facility: Callaway

ES - 401 Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1 Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000008 Pressurizer Vapor Space Accident / 3					X		AA2.14 - Saturation temperature monitor	4.4	1
000011 Large Break LOCA / 3						X	2.3.4 - Knowledge of radiation exposure limits under normal or emergency conditions.	3.7	1
000029 ATWS / 1					X		EA2.01 – Reactor Nuclear Instrumentation	4.7	1
000054 Loss of Main Feedwater / 4						X	2.1.6 - Ability to manage the control room crew during plant transients.	4.8	1
000055 Station Blackout / 6					X		EA2.04 - Instruments and controls operable with only dc battery power available	4.1	1
W/E12 - Steam Line Rupture - Excessive Heat Transfer / 4						X	2.4.44 - Knowledge of emergency plan protective action recommendations.	4.4	1
K/A Category Totals:	0	0	0	0	3	3	Group Point Total:	6	

PWR SRO Examination Outline

Facility: Callaway

ES - 401 Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2 Form ES-401-2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
000001 Continuous Rod Withdrawal / 1						X	2.2.22 - Knowledge of limiting conditions for operations and safety limits.	4.7	1
000067 Plant Fire On-site / 9					X		AA2.17 – Systems that may be affected by the fire	4.3	1
W/E06 Inad. Core Cooling / 4						X	2.4.1 - Knowledge of EOP entry conditions and immediate action steps.	4.8	1
W/E14 Loss of CTMT Integrity / 5					X		EA2.2 - Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	3.8	1
K/A Category Totals:	0	0	0	0	2	2	Group Point Total:	4	

PWR SRO Examination Outline

Facility: Callaway

ES - 401

Plant Systems - Tier 2 / Group 1

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
026 Containment Spray								X				A2.08 – Safe securing of CS when it can be done	3.7	1
061 Auxiliary/Emergency Feedwater								X				A2.03 - Loss of dc power	3.4	1
063 DC Electrical Distribution								X				A2.02 - Loss of ventilation during battery charging	3.1	1
064 Emergency Diesel Generator											X	2.4.45 - Ability to prioritize and interpret the significance of each annunciator or alarm.	4.3	1
073 Process Radiation Monitoring											X	2.1.28 - Knowledge of the purpose and function of major system components and controls.	4.1	1
K/A Category Totals:	0	0	0	0	0	0	0	3	0	0	2	Group Point Total:	5	

PWR SRO Examination Outline

Facility: Callaway

ES - 401

Plant Systems - Tier 2 / Group 2

Form ES-401-2

Sys/Evol # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
016 Non-nuclear Instrumentation								X				A2.02 - Loss of power supply	3.2*	1
034 Fuel Handling Equipment	X											K1.03 - CVCS	2.7*	1
055 Condenser Air Removal											X	2.4.16 - Knowledge of EOP implementation hierarchy and coordination with other support procedures or guidelines such as, operating procedures, abnormal operating procedures, and severe accident management guidelines.	4.4	1
K/A Category Totals:	1	0	0	0	0	0	0	1	0	0	1	Group Point Total:	3	

Generic Knowledge and Abilities Outline (Tier 3)

PWR SRO Examination Outline

Facility: Callaway

Form ES-401-3

<u>Generic Category</u>	<u>KA</u>	<u>KA Topic</u>	<u>Imp.</u>	<u>Points</u>
Conduct of Operations	2.1.5	Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.	3.9	1
	Category Total:			1
Equipment Control	2.2.15	Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tagouts, etc.	4.3	1
	2.2.40	Ability to apply Technical Specifications for a system.	4.7	1
	Category Total:			2
Radiation Control	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.	3.8	1
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	3.8	1
	Category Total:			2
Emergency Procedures/Plan	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	4.6	1
	2.4.46	Ability to verify that the alarms are consistent with the plant conditions.	4.2	1
	Category Total:			2

Generic Total: 7

Facility:	Callaway	Date of Examination:	6/19/2009
Examination Level:	RO	Operating Test Number:	

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A1a	P, R	015 A1.04 (3.5) Ability to predict and/or monitor changes in parameters to prevent exceeding design limits associated with operating the NIS controls including Quadrant Power Tilt Ratio JPM: Perform a QPTR Calculation
Conduct of Operations RA2	N, R	2.1.25 (3.9/4.2) Ability to interpret reference materials such as graphs, curves, tables, etc. JPM: Determine RV Venting Time (EOP ADD 33)
Equipment Control RA3	D, R	2.2.13 (4.1) Knowledge of tagging and clearance procedures. JPM: Tag out "A" Reactor Makeup Water Transfer Pump (PBL01A)
Emergency Procedures/Plan RA4	M, R	2.4.39 (3.9) Knowledge of RO responsibilities in emergency plan implementation. JPM: Visitor Control During an Event

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)

RO Admin JPM Summary

- A1a This is previously used JPM ILE-A001-RO. It was used on the 2005 NRC Exam, but the values provided will differ from those given in 2005. In the 2005 exam, the candidate was cued as to the value of the NI detector currents. During this exam the candidate will be given a set of values that reflect what is being seen in the plant. He will then use this data to calculate Quadrant Power Tilt Ratio using the most current Curve Book and the surveillance procedure. Therefore, the values calculated will differ from those on the 2005 exam.
- RA2 This is a new JPM. The candidate is to determine the maximum RV Venting time using EOP Addendum 33. A marked up FR-I.3 will be provided.
- RA3 This is bank JPM ILE-A012-RO. Requires the candidate to prepare Workers Protection Assurance (WPA) / tagout on a Reactor Makeup Water Transfer Pump.
- RA4 This is a Modified JPM obtained from a Ft. Calhoun Station NRC exam and made to be Callaway specific. This JPM requires that the candidate, as a newly licensed Reactor Operator, state where to escort a visitor under his control while in the Protected area and then to state where he is required to report following the previous actions. This is in accordance with the Callaway Emergency Plan.

Facility: Callaway		Date of Examination: 6/19/2009
Examination Level: SRO		Operating Test Number: _____
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations A1a	P, R	015 A1.04 (3.5) Ability to predict and/or monitor changes in parameters to prevent exceeding design limits associated with operating the NIS controls including Quadrant Power Tilt Ratio JPM: Perform a QPTR Calculation
Conduct of Operations SA2	D, R	2.1.18 (3.8) Ability to make accurate, clear, and concise logs, records, status boards, and reports. JPM: Determine Reportability Requirements
Equipment Control SA3	D, R	2.2.13 (4.3) Knowledge of tagging and clearance procedures. JPM: Review WPA for "A" Reactor Makeup Water Transfer Pump
Radiation Control SA4	N, R	2.3.4 (3.7) Knowledge of radiation exposure limits under normal or emergency conditions. JPM: Select Volunteer for Emergency Exposure
Emergency Procedures/Plan SA5	D, R	2.4.41 (4.6) Knowledge of the emergency action level thresholds and classifications. JPM: Emergency Event Classification
<p>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.</p>		
<p>* Type Codes & Criteria:</p> <p>(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)</p>		

SRO Admin JPM Summary

- A1a This is previously used JPM ILE-A001-RO. It was used on the 2005 NRC Exam, but the values provided will differ from those given in 2005. In the 2005 exam, the candidate was cued as to the value of the NI detector currents. During this exam the candidate will be given a set of values that reflect what is being seen in the plant. He will then use this data to calculate Quadrant Power Tilt Ratio using the most current Curve Book and the surveillance procedure. Therefore, the values calculated will differ from those on the 2005 exam.
- SA2 This is bank JPM ILE-A025-SRO. Given a set of conditions, the SRO candidate will be required to inform the examiner of the time requirement and the agency requiring notification.
- SA3 This is bank JPM ILE-A013-SRO. Given a copy of Workers Protection Assurance (WPA) on a Reactor Makeup Water Transfer the Pump, the SRO candidate will review the package for any apparent errors in its preparation.
- SA4 This is a new JPM. The SRO candidate will be given a set of conditions and the appropriate procedures in an emergency radiological situation. The SRO candidate, acting as the Emergency Coordinator, will determine which volunteer is the most eligible to receive an emergency dose.
- SA5 This is bank JPM ILE-A008-SRO. Given a set of conditions and a timeline of events, the SRO candidate will determine the correct Emergency Action level using the EAL charts provided.

Facility: <u>Callaway</u>		Date of Examination: <u>6/19/2009</u>	
Exam Level (circle one): <u>RO (only)/SRO(I) / SRO (U)</u>		Operating Test No.: _____	
Control Room Systems® (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)			
	System / JPM Title	Type Code*	Safety Function
S1	001 Control Rod Drive System Perform Control Rod Partial Movement Test	D, S	1
S2	004 Chemical and Volume Control System Remove Excess Letdown From Service	D, S	2
S3	010 Pressurizer Pressure Control System Respond to a Master Pressure Controller Failure	N, S, A	3
S4	059 Main Feedwater System Transfer S/G Level Control From Mn Feed Reg Byp to Mn Feed Reg Valves	M, S, L	4S
S5	026 Containment Spray System Manually Actuate Containment Spray System	N, S, A, L, EN	5
S6	062 AC Electrical Distribution Energize / De-Energize Load Center NG01	D, S, L	6
S7	029 Containment Purge System Establish Containment Purge	N, S	8
S8	015 Nuclear Instrumentation System 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	064 Emergency Diesel Generators NE01 Pre-start Checks	D	6
P2	078 Instrument Air System Respond to Loss of Instrument Air	D, A, E	8
P3	103 Containment System Locally Close Valves for CIS-A	D, A, E, L, R	5

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 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
(A)lternate path	4-6 (4) / 4-6 (4) / 2-3 (3)
(C)ontrol room	
(D)irect from bank	$\leq 9 (7) / \leq 8 (6) / \leq 4 (3)$
(E)mergency or abnormal in-plant	$\geq 1 (2) / \geq 1 (2) / \geq 1 (2)$
(EN)gineered safety feature	- / - / $\geq 1 (1)$
(L)ow-Power / Shutdown	$\geq 1 (4) / \geq 1 (4) / \geq 1 (3)$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 (4) / \geq 2 (4) / \geq 1 (2)$
(P)revious 2 exams (randomly selected)	$\leq 3 (0) / \leq 3 (0) / \leq 2 (0)$
(R)CA	$\geq 1 (1) / \geq 1 (1) / \geq 1 (1)$
(S)imulator	

JPM Summary

- S1 - Bank JPM URO-SSF01C05J, Perform Control Rod Partial Movement Test. This JPM has the candidate operate the Control Rod Drive System by inserting rods in Shutdown Bank "A" at least 12 steps and then returning them to the their previous position.
- S2 - Bank JPM URO-SBG04C47J, Remove Excess Letdown From Service. This JPM starts with normal and excess letdown in service and requires the candidate to remove the excess letdown system from service and verify RCP Seal Water Leakoff is adequate.
- S3 - NEW JPM - 010 Pressurizer Pressure Control System Failed Master Pressure Controller. This Alternate Path JPM starts with the plant at power. A boron equalization evolution is performed that requires the master pressure controller to be taken to manual and then back to auto. When the controller is taken back to auto it fails to a condition that causes the pressurizer spray valves to open. This will require the candidate to take manual control and close the spray valves.
- S4 - Modified Bank JPM URO-SAE02C136J, Transfer S/G Level Control From Main Feed Regulating Bypass Valves to Main Feed Regulating Valve. This JPM starts at approximately 22% power. The candidate will be required to transfer to Main Feedwater Control on two of four S/Gs and stabilize level. This is a critical evolution during power ascension.
- S5 - NEW JPM - 026 Containment Spray System, Manually Actuate Containment Spray System. This Alternate Path JPM starts with the Reactor tripped and containment pressure elevated due to two faulted SGs. Containment pressure exceeds the Containment Spray Actuation System setpoint, but Containment spray does not actuate. The candidate will be given Attachment A of E-0, Reactor Trip or Safety Injection and told to complete Containment Spray verification.
- S6 - Bank JPM URO-SNG1C82J, Energize / De-Energize Load Center NG01. This JPM starts with the plant in a Mode that allows all loads to be stripped from NG01. The candidate will de-energize NG01 and then re-energize the bus.
- S7 - NEW JPM - 029 Containment Purge System, Re-establish Containment Purge After Isolation. This JPM has the candidate restore Containment Purge following an inadvertent Containment Purge Isolation. The candidate will end up re-establishing Containment Mini-purge to the containment.
- S8 - Bank JPM URO-SSE03C126J, Respond to a Failed Power Range Instrument. This JPM will start at some at power initial condition. Power Range Channel N42 will fail high. The candidate will operate the Nuclear Instrumentation system at the back panels in order to defeat the affected channel.
- P1 - Bank JPM EOS-SNE11048J, NE01 Pre-start Checks. This JPM has the candidate perform all of the local pre-start checks on the "A" Diesel Generator.
- P2 - Bank JPM EOS-SKA11040J, Respond to Loss in Instrument Air. This Alternate Path JPM has the candidate simulate the local actions at the Air Compressors for a Loss of Instrument Air. When the candidate is verifying all of the compressors running, he is

informed that the "B" Air Compressor has zero oil pressure and is making excessive noise. This will require the candidate to stop the air compressor and close its discharge valve as an alternate path. The candidate will then inform the control room of this status.

- P3 - Bank JPM URO-AEO05062J(A), Locally Close Valves for CIS-A. This Alternate Path JPM has the candidate simulate isolating valves Containment Isolation Valves in accordance with EOP Addendum 25. This JPM will take place inside the RCA. The alternate path comes when trying to isolate individual valves. The candidate will have to either manually isolate the air/motor operated valve or choose a valve upstream that can manually isolate the penetration.

Facility: Callaway		Scenario No.: 1 rev. 4		Op Test No.:
Examiners: _____		Operators: _____		
_____		_____		
_____		_____		
Initial Conditions:		The following is the plant /equipment status: <ul style="list-style-type: none"> • Operating at 100% steady state power • MDAFP "B" OOS for an oil change. Scheduled for completion on the PM shift. (Activate Lesson "a101b.lsn") TS 3.7.5 Condition C, 72 hours		
Event No.	Malf. No.	Event Type*	Event Description	
A	N/A	R (RO) N (SRO/BOP)	Reduce Power to 95% for turbine valve testing	
1	BBPT0455	I (RO) I-TS-SRO	Pressurizer Pressure Channel Failure Low Insert Malfunction (BB) BBPT0455, Value= 1700	
2	JEPS209L	C (all)	Loss of ESF Bus NB02 Insert Remote Function (NB) JEPS209L, Value= Trip	
3	ABPV0001_1	C (BOP) C-TS- SRO	"A" Atmospheric Steam Dump Fails Open Insert Malfunction (AB), ABV0001_1, Value = 1, ramp = 20s	
4	BBTE421A1	I (RO, SRO)	RCS Loop RTD Failure - High Insert Malfunction (BB) BBTE0421A1, Value = 650	
5	SF006	C (all)	Nuclear Power Generation Accident / ATWS Insert Malfunction (SF) SF006, Value = Both	
6	EBB01C	M (all)	Steam Generator Tube Rupture Insert Malfunction (BB) EBB01C, Value= 250, time delay = 10 sec, ramp = 300 secs, conditional of "jcrftr eq true"	
7	BG	C (RO)	CCP Auto Start Failure Insert Remote Function (BG) JLOASBI8_3, Value = Inhibit	
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor				

Callaway 2009 NRC Scenario #1

This unit is at 100% steady state power. MDAFP B is out of service for scheduled maintenance.

Reduce power to 95% to perform turbine valve testing IAW OSP-AC-00003, Turbine Valve Stroke Test.

Pressurizer Pressure Channel 455 fails low. The crew should respond per OTO-BB-00006, Pressurizer Pressure Control Malfunction, defeat control system channel input and stabilize RCS pressure. I&C should be contacted to trip protective bistables and repair the failed channel.

A bus lockout occurs on NB02. The emergency diesel NE02 starts but the output breaker will not close due to the lockout condition. The crew should respond per OTO-NB-00002, Loss of Power to NB02. They will ensure reactor power <100%, throttle Auxiliary Feedwater flow, refer to Tech Specs and direct Electrical Maintenance to perform required testing and repairs.

After the plant is stabilized "A" SG Atmospheric Steam Dump fails open with a 20 sec. ramp. The crew will respond using OTO-AB-00001, STEAM DUMP MALFUNCTION.

RCS Loop 2 Thot RTD fails high, resulting in an OTΔT trip signal. The reactor fails to trip automatically and manually. The crew should enter FR-S.1, Response to Nuclear Power Generation/ATWS. The reactor will be shutdown approximately two minutes after PG19 and PG20 feeder breakers are opened due to the rod drive MG set coast down.

10 seconds after the Reactor Trip, a Tube Rupture occurs on Steam Generator C. The tube rupture will ramp to 250 gpm resulting in a Safety Injection. The crew should complete FR-S.1 and transition to E-0, Rx Trip or Safety Injection. CCP A will fail to start automatically and will have to be started manually. The crew will then transition to E-3, Steam Generator Tube Rupture. The scenario is complete when RCS cooldown is commenced.

Scenario Event Description

NRC Scenario 1 rev. 4

Critical Tasks:

Event #5 CT – Insert negative Reactivity into the core by at least one of the following methods before completing immediate actions steps of FR-S.1

- De-energize PG19 and PG20
- Insert Control Rods
- Establish emergency boration flow

Event #7 CT – Establish flow from at least one high head ECCS pump before reporting E-0, Att. A complete.

Event #6 CT – Isolate Feedwater flow into and steam flow from SG C before a transition to ECA-3.1 occurs.

References
OTG-ZZ-00004
OTG-ZZ-00004, ADD 03
OSP-AC-00003
OTO-BB-00006
OTO-NB-00002
OTO-AB-00001
E-0
FR-S.1
E-3
EIP-ZZ-00101
CSF-1, Attachment A

Facility: Callaway	Scenario No.: 3 rev. 4	Op Test No.:
Examiners: _____	Operators: _____	
_____	_____	
_____	_____	
Initial Conditions:	The following is the plant /equipment status: <ul style="list-style-type: none"> 100% steady state power CCW Pump A OOS. (Activate Lesson "eg01a.lsn") TS 3.7.7 Info Only 	
Turnover:		

Event No.	Malf. No.	Event Type*	Event Description
1	ABPT0507	I (BOP, SRO)	Steam Header Pressure Channel Failure Low Insert Malfuction (AB) ABPT0507, Value = 0, ramp = 60 secs
2	BBLT0460_1	I (RO) I-TS-SRO	Pressurizer Level Channel 460 Failure Low Insert Malfuction BBLT0460_1, Value = 0, ramp = 15secs
3	JNN2XFR	C-TS-SRO	NN12 Inverter Trouble/Transfer Insert Remote Function (NN) JNN2XFR, Value = Bypass CVT
4	BBPCV0455	C (RO, SRO)	Stuck Open PZR Spray Valve Imf (BB) BBPCV0455C_2, Value = 0.3
5	AB001_B	M (All)	Steam Line Break Inside Containment Insert Malfuction (AB) AB001_B, Value = 750000, ramp = 30 secs, condition of "jcfr eq true"
6	JINHBSLIS	C (BOP, SRO)	Steam Line Isolation Signal Failure Insert Remote Function (SB) JINHBSLIS, Value = Both

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

Callaway 2009 NRC Scenario #3

The plant is operating at 100%, steady state power. CCW Pump A is Out of service pump bearing replacement. A 24 hour pump run will take place following maintenance.

Main Steam header pressure transmitter ABPT507 fails low, resulting in lowering Main Feedwater Pump speed and lowering SG levels. The crew should identify the failure and take manual control of Main Feedwater Pump speed to stabilize SG levels in accordance with OTO-AB-00004, Steam Header/Feedwater Header Pressure Channel Failure.

Following the ABPT507 failure, Pressurizer Level Channel 460 fails low. The crew should respond per OTO-BG-00001, Pressurizer Level Control Malfunctions, and restore PZR level. Technical Specification 3.3.1 applies.

NN12 inverter will fail and transfer to the Bypass Constant Voltage Transformer. Technical Specification 3.8.7 applies. The Control Room Supervisor should identify the TS requirement to restore the inverter to operable status within 24 hours.

Pressurizer Spray valve BB PCV-455C fails to 30% open. After attempts to close the spray valve and restore Pressurizer Pressure using Pressurizer Backup Heaters, the crew should trip the reactor and secure RCPs B and D, since these supply spray flow.

Immediately upon the reactor trip, a steam line break occurs on SG B inside Containment. The crew should continue the actions of E-0, Reactor Trip or Safety Injection, following the Safety Injection.

The Main Steamline Isolation Valves will fail to automatically close in response to the Low Steam Line Pressure. The crew should manually isolate the Main Steamlines and complete the isolation of SG B in accordance with E-2, Faulted S/G Isolation.

The crew should then transition to ES-1.1, SI Termination. The scenario is complete when the Boron Injection Header is isolated.

Scenario Event Description

NRC Scenario 3 rev. 4

Critical Tasks:

Event #7 CT – Fast close MSIVs before a severe challenge develops to either subcriticality or Integrity CSFs or before transition to ECA-2.1.

Event #6 CT – Isolate SG B before a transition out of E-2

- MSIV Closed
- AFW Isolated from SG B

References
OTO-AB-00004
OTA-RK-00016 Addendum 26B
OTO-NN-00001
OTO-BB-00006
OTO-BG-00001
E-0
E-2
ES-1.1
CSF-1, Attachment A
EIP-ZZ-00101

Facility:	Callaway	Scenario No.:	4 rev. 4	Op Test No.:	
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		
Initial Conditions:	<p>The following is the plant /equipment status:</p> <ul style="list-style-type: none"> 80% Power for last 6 hours due to Chemistry concerns PBG05B ("B" CCP) OOS for coupling lubrication and alignment check and oil change. Work should be complete in 4 to 5 hours. (Actuate lesson "bg01b.lsn") <p>TS 3.5.2, Cond A, 72 hours</p>				
Turnover:					

Event No.	Malf. No.	Event Type*	Event Description
A		R (RO) N (SRO/BOP)	Increase power to 100%
1	AELT0551	I (BOP) I – TS - SRO	SG Level Channel Failure to 75% Insert Malfunction (AE) AELT0551, Value = 75 , ramp over 1 minute
2	BBPT0455	I (RO) I – TS - SRO	Pressurizer Pressure Channel Failure High Insert Malfunction (BB) BBPT0455, Value = 2500, ramp over 10 secs
3	ACPT0506	I (All)	Turbine Impulse (1 st Stage) Pressure Channel Failure Insert Malfunction (AC) ACPT0506, Value = 0
4	EBB01B	M (All)	SG B Tube Leak/Rupture Insert Malfunction (BB) EBB01B, Value = 15
5	CEPV0013	C (BOP/SRO)	Loss of Stator Cooling Water – Manual Turbine Trip Insert Malfunction (CE) CEPV0013_C, Value = True Modify Malfunction (BB) EBB01B, Value = 450, ramp over 300 secs
6	SA	C (BOP)	FWIV Auto Closure Failure (IN SETUP) Insert Remote Function (SA) LOASAS10XX_2, Value = Fail
7	EF	C (BOP)	ESW Pump Auto Start Failure (IN SETUP) Insert Remote Function (EF) JLOASASB18_11, Value = Inhibit
8	AB002_B	M (All)	Faulted SG outside Containment w/existing SGTR Insert Malfunction (AB) AB002_B, Value = 750,000, ramp over 20 secs
<p>* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor</p>			

Callaway 2009 NRC Scenario #SB

The plant is at 80% power BOL and has been for the last 6 hours for Chemistry cleanup. Centrifugal Charging Pump B is out of service for preplanned maintenance. Work includes coupling lubrication and alignment check and oil change. Work should be completed in 4 to 5 hours. Shift direction is to increase power to 100%. Once the dilution and power increase has begun, proceed with scenario.

A circuit card failure causes SG "A" controlling level channel to slowly fail to 75%. The crew should take actions per OTO-AE-00002, Steam Generator Water Level Control Instrument Malfunctions. Tech Specs 3.3.1 should be applied and I&C contacted to trip bistables and troubleshoot.

Pressurizer Pressure Channel BB PT-455 fails high, causing spray valves to open and pressurizer heaters to turn off. The crew should respond per OTO-BB-00006, "Pressurizer Pressure Control Malfunction," and stabilize pressurizer pressure.

Turbine Impulse Pressure Channel AC PI-506 fails low. The crew should respond per OTO-AC-00003, Turbine Impulse Pressure Channel Failure, select an operable channel for control, reset C-7, and place the Condenser Steam Dumps in the Steam Pressure mode. TS 3.1.1 requires a permissive check within one hour.

A Tube Leak initiates on Steam Generator B. The crew should respond in accordance with OTO-BB-00001, Steam Generator Tube Leak. The tube leak will start out at 15 gpm.

Main Turbine Stator cooling water pressure control valve CEPV0013 fails closed. Attempts will be made to restore stator cooling by starting a second pump, but this will not help. The crew should trip the Reactor and trip the turbine due to being greater than 50% power (P-9). The SG Tube Leak will now be modified to build up to a value of 450 gpm following the Reactor Trip.

During trip recovery it will be determined that the S/G Tube leak is greater than 50 gpm by observing SG B level rising more rapidly. A manual or automatic safety injection will occur.

When the LOCA sequencer actuates, ESW Pump A fails to automatically start. The crew should manually start the pump. SG B Feedwater Isolation Valve does not close when a FWIS occurs. The crew should manually close the valve.

When Feed Flow is isolated to SG B per the foldout page, a non-isolable steam break develops on SG B outside containment. The crew should transition to E-2, Faulted Steam Generator Isolation, from the foldout page. They should later enter E-3 and then transition to ECA-3.1, SGTR with LOCA Subcooled Recovery Desired.

Scenario Event Description

NRC Scenario 4 rev. 4

Critical Tasks:

Event #7 CT – Establish ESW Train A cooling before a transition from E-0

Event #8 CT – Isolate the Faulted Steam Generator before Transition out of E-2

References
OTO-AE-00002
OTO-BB-00006
OTO-AC-00003
OTO-BB-00001
E-0
E-3
E-2
ECA-3.1
CSF-1, Attachment A

Facility: Callaway		Scenario No.: 2 rev. 4		Op Test No.:	
Examiners: _____		Operators: _____			
_____		_____			
_____		_____			
Initial Conditions:		The following is the plant/equipment status: <ul style="list-style-type: none"> 60% steady state power NE02 OOS (Activate Lesson "ne01b.lsn") TS 3.8.1.B, This Date, 0500 OSP-NE-00003, 72 hours due in 4 hours Ensure SG level channel 539 is selected for control 			
Turnover:		See Turnover Pages			
Event No.	Malf. No.	Event Type*	Event Description		
A		R (RO) N (SRO/BOP)	Increase power to 75%		
1	PBG04	C (RO/SRO)	Normal Charging Pump Trips Insert Malfunction (BG) PBG04, Value = True		
2	AELT0539	I (BOP) I-TS-SRO	Steam Generator Level Channel Fails High Insert Malfunction (AE) AELT0539, Value = 100, ramp=15 s		
3	SFF06_DR	C, (BOP/ RO/SRO) C-TS-SRO	Dropped Control Rod Insert Malfunction (SF) SFF06_DR, Value = stationary gripper		
4	BB002_A	M (All)	LOCA Insert Malfunction (BB) BB002_A, Value = 0-1300, Ramp in over 10 min.		
5	JINHBSI	C (RO, SRO)	Automatic Safety Injection Failure Insert Remote Function (SB) JINHBSI, Value = Both		
6	NEM8803B	C (RO, SRO)	BIH Valve Failure to Open Insert Remote Function (NG) NG04CKF2, Value = Tripped, Condition of "jpplsia eq 1" Insert Remote Function (NG) NG01BDR4, Value = Tripped, Condition of "jpplsia eq 1"		
7	PAL02_1 AL	C (BOP, SRO)	TDAFP Trip with MDAFP Auto Start Failure Insert Malfunction (AL) PAL02_1, Value = True Insert Remote Function (AL) JLOASBI8_1, Value = Inhibit		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

Callaway 2009 NRC Scenario #2

The crew takes the shift at 60% power with direction to increase power to 75%. Diesel Generator NE02 is out of service for preplanned maintenance. The crew should complete all control manipulations to increase power, including dilution and turbine controls. The crew should demonstrate the ability to monitor the power increase using diverse/redundant indications and conservative actions. Once the examiners are satisfied with the crew response the next event can be inserted.

Two minutes after power increase (dilution or rod withdrawal) has begun or when directed by the lead examiner, the Normal Charging Pump will trip. The crew will respond by shifting to the "B" CCP in accordance with OTO-BG-00001, Pressurizer Level Control Malfunction.

The controlling Steam Generator Level channel on SG "C" (AE LT-539) fails high. The crew should respond per OTO-AE-00002, Steam Generator Water Level Control Instrument Malfunctions, identify the failed channel, select an operable channel, and stabilize SG "C" level. Tech Specs 3.3.1 and 3.3.2 apply.

Approximately twelve (12) minutes into the scenario, Rod F-6 drops into the core causing RCS temperature, pressure, and pressurizer level to lower. The crew should respond per OTO-SF-0001, Rod Control Malfunctions. TS 3.2.4 for QPTR will apply requiring the crew to reduce power to less than 50%.

A small RCS leak then develops after Tech specs have been addressed, which will steadily increase in size to a maximum value of 1300 gpm. The crew should diagnose the RCS leak and respond per OTO-BB-00003, RCS Excessive Leakage. When it is determined that the leak exceeds 50 gpm, the reactor should be tripped.

The crew should respond to the reactor trip by entering E-0, Reactor Trip or Safety Injection. When the determination is made that pressurizer pressure will not be maintained greater than 1849 psig, a manual Safety Injection should be initiated, since the AUTO SI was inhibited.

When the Safety Injection occurs, BIH inlet valve EM-HV-8803A and B fails to open due to the breaker opening. The crew should take action to re-close the breaker and open EM-HV-8803A and B.

While performing the actions of E-0, the crew should recognize the automatic start failure of MDAFP A and manually start the pump. The trip of the TDAFP should be identified and investigated.

The crew should perform the applicable actions of E-0 and at step 16, transition to E-1, Loss of Reactor or Secondary Coolant. CSF monitoring should commence when E-0 is exited.

The crew should perform the applicable actions of E-1 and at step 12, transition to ES-1.2, Post LOCA Cooldown and Depressurization. The scenario may be terminated when RCS cooldown is initiated.

Scenario Event Description

NRC Scenario 2 rev. 4

Critical Tasks:

Event #5 CT – Manually actuate one train of SIS prior to reporting E-0, Attachment A complete.

Event #6 CT – Establish flow from at least one high head ECCS pump before transitioning out of E-0

Event #7 – Start MDAFP Pump A to establish total AFW flow rate greater than 355,000 lbm/hr to the SGs before transition out of E-0.

References
OTO-BB-00002
OTO-AE-00002
OTO-SF-00001
OTO-BB-00003
E-0
E-1
ES-1.2
EIP-ZZ-00101
OTG-ZZ-00004

Facility: Callaway		Date of Exam: 6/19/2009		Operating Test No.: 2009-1		Rev. 4											
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			4			3			BU						
		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
SROU-1	RX													0			0
	NOR	A			A									2			1
	I/C	1 2 3 5			1 2 3 5									8			2
	MAJ	6			4 8									3			1
	TS	1 3			1 2									4			2
SROU-2	RX													0			0
	NOR	A			A									2			1
	I/C	1 2 3 5			1 2 3 5									8			2
	MAJ	6			4 8									3			1
	TS	1 3			1 2									4			2
SROI-1	RX					A								1		1	
	NOR	A												1		1	
	I/C	1 2 3 5				2 3		1 2 3 4 6						11		4	
	MAJ	6				4 8		5						4		2	
	TS	1 3						2 3						4		2	
SROI-2	RX		A											1		1	
	NOR				A									1		1	
	I/C		1 2 4 5 7		1 2 3 5									9		4	
	MAJ		6		4 8									3		2	
	TS				1 2									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 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 Instant SRO *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 instrument or component malfunctions on a 1-for-1 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.

Facility: Callaway		Date of Exam: 6/19/2009		Operating Test No.: 2009-1		Rev. 4											
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			4			3			BU						
		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
SROI-3	RX													0		1	
	NOR			A	A									2		1	
	I/C			2 3 5	1 2 3 5				2 4					9		4	
	MAJ			6	4 8				5					4		2	
	TS				1 2									2		2	
SROI-4	RX					A								1		1	
	NOR	A												1		1	
	I/C	1 2 3 5				2 3								6		4	
	MAJ	6				4 8								3		2	
	TS	1 3												2		2	
RO-1	RX		A											1	1		
	NOR						A							1	1		
	I/C		1 2 4 5 7				1 3 5 6 7							10	4		
	MAJ		6				4 8							3	2		
	TS														0		
RO-2	RX		A											1	1		
	NOR						A							1	1		
	I/C		1 2 4 5 7				1 3 5 6 7							10	4		
	MAJ		6				4 8							3	2		
	TS														0		

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 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 Instant SRO *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 instrument or component malfunctions on a 1-for-1 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.

Facility: Callaway		Date of Exam: 6/19/2009		Operating Test No.: 2009-1		Rev. 4												
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			4			3			BU							
		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-3	RX					A								1	1			
	NOR			A										1	1			
	I/C			2 3 5		2 3								5	4			
	MAJ			6		4 8								3	2			
	TS													0				
RO-4	RX					A								1	1			
	NOR			A										1	1			
	I/C			2 3 5		2 3								5	4			
	MAJ			6		4 8								3	2			
	TS													0				
RO-5	RX		A											1	1			
	NOR						A							1	1			
	I/C		1 2 4 5 7			1 3 5 6 7			1 6					12	4			
	MAJ		6			4 8			5					4	2			
	TS													0				
	RX																	
	NOR																	
	I/C																	
	MAJ																	
	TS																	

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 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 Instant SRO *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 instrument or component malfunctions on a 1-for-1 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.

Callaway Proposed Simulator Exam Schedule

<u>SRO</u>	<u>ATC</u>	<u>BOP</u>	<u>Scenario #</u>
U1	R2	R3	1
U2	R1	R4	1
I1	R5	I3	1
I4	I2	SU	1
<hr/>			
U1	R3	R2	4
U2	R4	R1	4
I3	I1	R5	4
I2	I4	SU	4
<hr/>			
I1	I3	R5	3

Standby scenario used as needed

Facility: Callaway		Date of Examination: 6/19/2009				Operating Test No.: 2009-1						
Competencies	APPLICANTS											
	SRO				RO				BOP			
	SCENARIO				SCENARIO				SCENARIO			
	1	4	3	2	1	4	3	2	1	4	3	2
Interpret/Diagnose Events and Conditions	1-7	1-8	1-6	N/A	1, 2, 4-7	2-4, 8	2, 4, 5	N/A	2-6	1, 3-8	1, 5, 6	N/A
Comply With and Use Procedures (1)	A, 1-7	A, 1-8	1-6	N/A	A, 1, 2, 4-7	A, 2-4, 8	2, 4, 5	N/A	A, 2, 3, 5, 6	A, 1, 3-8	1, 5, 6	N/A
Operate Control Boards (2)	N/A	N/A	N/A	N/A	A, 1, 2, 4-7	A, 2-4, 8	2, 4, 5	N/A	A, 2, 3, 5, 6	A, 1, 3-8	1, 5, 6	N/A
Communicate and Interact	A, 1-7	A, 1-8	1-6	N/A	A, 1, 2, 4-7	A, 2-4, 8	2, 4, 5	N/A	A, 1-6	A, 1, 3-8	1, 5, 6	N/A
Demonstrate Supervisory Ability (3)	A, 1-7	A, 1-8	1-6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Comply With and Use Tech. Specs. (3)	1, 3	1, 2	2, 3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Instructions:

Circle the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant.