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) JPM:	Knowledge of procedures, guidelines, or limitations associated with reactivity management Perform a QPTR Calculation
Conduct of Operations A2	R, M	2.1.25 (3.9) JPM:	Ability to interpret reference materials such as graphs, curves, tables, etc. Determine RV Venting Time (EOP ADD 33)
Equipment Control A3	R, D, P	2.2.37 (3.6) JPM:	Ability to determine operability and/or availability of safety related equipment. Determine Amperage Limits for 480 VAC Safety Related busses.
Radiation Control A4	R, M	2.3.7 (3.5) JPM:	Ability to comply with radiation work permit requirements during normal or abnormal conditions. 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**
Protective Clothing Requirements	**Full set of Protective Clothing in Contaminated Areas.** **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) JPM:	Knowledge of procedures, guidelines, or limitations associated with reactivity management Review a QPTR Calculation
Conduct of Operations A6	R, M	2.1.25 (4.2) JPM:	Ability to interpret reference materials such as graphs, curves, tables, etc Determine RV Venting Time (EOP ADD 33)
Equipment Control A7	R, D, P	2.2.37 (4.6) JPM:	Ability to determine operability and/or availability of safety related equipment Determine Amperage Limits for 480 VAC Safety Related busses
Radiation Control A8	R, M	2.3.4 (3.7) JPM:	Knowledge of radiation exposure limits under normal or emergency conditions Select Volunteer for Emergency Exposure
Emergency Procedures/Plan A9	R, M	2.4.44 (4.4) JPM:	Make a Protective Action Recommendation 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).

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

A1

JPM No:	URO-SSE-04-A100J	KSA No:	2.1.37
Revision Date:	04/20/2016	KSA Rating:	4.3
Job Title:	URO/SRO		
Duty:	Nuclear Instrumentation		
Task Title:	Perform a QPTR Calculation		
Completion Time:	15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☐ Simulator/Lab ☐ Plant ☒ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: OSP-SE-00003, .QUADRANT POWER TILT RATIO, REVISION 22
CURVE BOOK TABLE 11-1, REVISION 257

Tools / Equipment: Calculator

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: Callaway Plant is at MOL, 100% power with the indicated axial flux difference (AFD) equal to 0%.

Control Room annunciators 78B, 78C, and 78F are not operable.

All power range nuclear instruments are operable.

The Control Room Plant Computer System is not available for use.

Initiating Cue: The Control Room Supervisor directs you to perform a QPTR calculation and complete Attachment 1 of OSP-SE-00003, Quadrant Power Tilt Ratio Calculation, using the NI detector currents provided.

CHANNEL	I_{top}	I_{bottom}
N41	185.8	195.2
N42	163.2	190.8
N43	191.6	198.3
N44	188.2	191.3

Provide completed Attachment 1of OSP-SE-00003 to the Examiner.

Curve Book Table 11-1 has been provided

Task Standard: Upon completion of this JPM, the applicant will have performed a manual QPTR calculation with a final QPTR tolerance of ± 0.01.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	Obtain a verified working copy of OSP-SE-00003, QPTR Calculation.		CANDIDATE OBTAINED A COPY OF OSP-SE-00003, QUADRANT POWR TILT RATIO CALCULATION PROVIDE CANDIDATE WITH COPY OF OSP-SE-00003 and Table 11-1	**S** **U** Comments:
2.	Review Precautions and Limitations STEP 4.0	If asked "**All Precautions and Limitations are satisfied.'**	Applicant reviewed Precautions and Limitations	**S** **U** Comments:
3.	Review Prerequisites STEP 5.0	If asked **"Prerequisites are satisfied."**	Applicant reviewed Prerequisites	**S** **U** Comments:
4.	Record each power range upper and lower current output on Attachment #1. STEP 6.2.1		Using the data sheet provided the Operator located the correct upper and lower current meters for the power range detectors and verified the values in the correct area of OSP-SE-00003, Attachment 1.	**S** **U** Comments:
*5.	Use Table 11.1 from the Curve Book to obtain the current values for the upper and lower detectors. AFD = 0% values should be used. STEP 6.2.2		Applicant used Table 11-1, AFD Calibration value Table, AFD = 0%, to record power range upper and lower current values. **SEE KEY**	**S** **U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*6.	Divide each upper and lower detector current by its 100%, 0% AFD power detector current value and enter it in the normalized detector current for each channel. STEP 6.2.3		Applicant divided each upper and lower detector current by its 100% power, 0% AFD detector current value and entered it as the normalized detector current for each channel. **The calculated values should be as shown in the Attachment 1 KEY.** **Values within ± 0.01 on each calculation are acceptable.**	**S U** Comments:
*7.	Add the normalized upper detector currents and divide by four (4) to derive the upper detector normalized current average and record it in Attachment #1. STEP 6.2.4		Applicant added up the normalized upper detector currents and divided by 4 to derive the upper detector normalized current averages and recorded it in Attachment #1. **The calculated values should be as shown in the Attachment 1 KEY.** **Values within ± 0.01 on each calculation are acceptable.**	**S U** Comments:
*8.	Add the normalized lower detector currents and divide by four (4) to derive the lower detector normalized current averages and record it in Attachment #1. STEP 6.2.5		Applicant added up the normalized lower detector currents and divided by 4 to derive the lower detector normalized current averages and recorded it in Attachment #1. **The calculated values should be as shown in the Attachment 1 KEY.** **Values within ± 0.01 on each calculation are acceptable.**	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
9.	NOTE: The QPTR should be calculated as two significant digits to the right of the decimal point. Note before 6.2.6		The applicant calculated the QPTR, to two (2) significant digits to the right of the decimal point.	**S** **U** Comments:
*10.	Divide each upper normalized detector current by the upper normalized detector current average to obtain the power tilt ration for each upper channel and RECORD on Attachment 1 STEP 6.2.6		Applicant divided each upper normalized detector current by the upper normalized detector average to obtain the power tilt ratio for each upper channel. **The calculated values should be as shown in the Attachment 1 KEY.** **Values within ± 0.01 on each calculation are acceptable.**	**S** **U** Comments:
*11.	Divide each lower normalized detector current by the lower normalized detector current average to obtain the power tilt ratio for each lower channel and RECORD on Attachment 1. STEP 6.2.7		Applicant divided each lower normalized detector current by the lower normalized detector current average to obtain the power tilt ratio for each lower channel. **The calculated values should be as shown in the Attachment 1 KEY.** **Values within ± 0.01 on each calculation are acceptable.**	**S** **U** Comments:
12.		**THE JPM IS COMPLETE**		

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

Callaway Plant is at MOL, 100% power with the indicated axial flux difference (AFD) equal to 0%.

Control Room annunciators 78B, 78C, and 78F are not operable.

All power range nuclear instruments are operable.

The Control Room Plant Computer System is not available for use.

Initiating Cue:

The Control Room Supervisor directs you to perform a QPTR calculation and complete Attachment 1 of OSP-SE-00003, Quadrant Power Tilt Ratio Calculation, using the NI detector currents provided.

CHANNEL	I_{top}	I_{bottom}
N41	185.8	195.2
N42	163.2	190.8
N43	191.6	198.3
N44	188.2	191.3

Provide completed Attachment 1of OSP-SE-00003 to the Examiner.

Curve Book Table 11-1 has been provided

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

A2

JPM Bank No:	RA2 2009 ILT NRC Exam	KSA No:	2.1.25
Revision Date:	02/13/2016	KSA Rating:	3.9
Job Title:	URO/SRO		
Duty:	Administrative		
Task Title:	Determine Reactor Vessel Venting Tims		
Completion Time:	15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☐ Simulator/Lab ☐ Plant ☒ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: EOP Addendum 33, Determine Reactor Vessel Venting Time, Rev 1

Tools / Equipment: Calculator

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The crew is responding to plant conditions using FR-I.3, Response to Voids in the Reactor Vessel.

The following conditions exist:

- Containment pressure is 3.8 psig.
- Containment Temperature is 167°F.
- Containment Hydrogen Concentration is 2.3%.
- RCS Pressure is 1925 psig.

Initiating Cues: The CRS now directs you to determine RV Venting Time in accordance with EOP Addendum 33.

Task Standard: Upon completion of this JPM, the applicant will have determined RV Venting time to be between 1.72 and 1.84 minutes.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	PROVIDE CANDIDATE WITH MATERIAL AND ALLOW TIME FOR REVIEW OF WORK TO BE PERFORMED		CANDIDATE REVIEWED ADMIN JPM INITIAL CONDITIONS AND INITIATING CUES	**S U** Comments:
*2.	DETERMINE CONTAINMENT AIR VOLUME AT STP = A STEP 1	See KEY	CANDIDATE DETERMINED CONTAINMENT AIR VOLUME IS BETWEEN 2.4 X 10^6 AND 2.5 X 10^6 FT^3	**S U** Comments:
*3.	CANDIDATE SHOULD DETERMINE MAXIMUM HYDROGEN VOLUME THAT CAN BE VENTED = B STEP 2	See KEY	CANDIDATE DETERMINED THAT BETWEEN 16800 AND 1.7500 FT^3 CAN BE VENTED	**S U** Comments
*4.	CANDIDATE SHOULD DETERMINE HYDROGEN FLOW RATE AS A FUNCTION OF RCS PRESSURE = C Step 3	See KEY	CANDIDATE DETERMINED THAT HYDROGEN FLOW RATE IS BETWEEN 9500 AND 9750 FT3/MINUTE USING FIGURE 1	**S U** Comments
*5.	CANDIDATE SHOULD DETERMINE MAXIMUM VENTING TIME STEP 4	See KEY	CANDIDATE DETERMINED THAT THE MAXIMUM VENTING TIME IS BETWEEN 1.72 AND 1.84 MINUTES	**S U** Comments
6.	**JPM IS COMPLETE**			**S U** Comments

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The crew is responding to plant conditions using FR-I.3, Response to Voids in the Reactor Vessel.

The following conditions exist:

- Containment pressure is 3.8 psig.
- Containment Temperature is 167°F.
- Containment Hydrogen Concentration is 2.3%.
- RCS Pressure is 1925 psig.

Initiating Cues: The CRS now directs you to determine RV Venting Time in accordance with EOP Addendum 33.

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

A3

JPM Bank No:	A3, Rev 2 from the 2013 ILT NRC exam	KSA No:	2.2.37
Revision Date:	02/13/2016	KSA Rating:	3.6
Job Title:	URO/SRO		
Duty:	Administrative		
Task Title:	Ability to determine operability and/or availability of safety related equipment: Determine amperage limits for 480 VAC safety related busses when cross-connecting for maintenance.		
Completion Time:	15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☐ Simulator/Lab ☐ Plant ☒ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: OTN-NG-00001, Class 1E 480 VAC Electrical System, Rev 16

Tools / Equipment: none

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The plant is at 100% power.

NG01 local ammeter indicates 712 amps.

NG03 local ammeter indicates 344 amps.

The following Train 'A' equipment is NOT in service:

- DG Vent Supply Fan A, CGM01A
- Air Compressor A, CKA01A
- Fuel Pool Clg Pump A, PEC01A
- CR A/C Unit A, SGK04A

Initiating Cues: The Control Room Supervisor (CRS) directs you to prepare to cross-connect Load Centers NG01 and NG03 for maintenance to replace Load Center NG01 feeder breaker, NG0101.

Prior to cross-connecting NG01 and NG03, the CRS wants to know which individual equipment not currently in service could be started after the load centers are cross-connected.

Provide your answer on the cue sheet below:

Task Standard: 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

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE

EXAMINER NOTE:

JPM refers to OTN-NG-00001, Section 5.10. This section will not be performed by the Applicant but does contain information that the Applicant will need to perform the assigned task. Though not expected to be performed by the Applicant, Section 5.10 steps will be contained in JPM A3.

1.			Applicant providedd working copy of OTN-NG-00001	**S U** Comments:
2.	Refers to Section 5.10, Cross-Connecting Load Centers NG01 And NG03		Applicant referred to Section 5.10, Cross-Connecting Load Centers NG01 And NG03	**S U** Comments:

*Critical Step

3.	The following cautions apply when cross-connecting load center NG01 and NG03, due to transformer and power supply limitations: • Cross Tie Breaker NG0116 is only allowed to be closed to repair failed or degraded equipment • Closing NG0116 makes all 4 degraded bus voltage channels for NB01 inoperable per T/S B 3.8.9, and requires entry into T/S ACT 3.3.5.B.1 and T/S ACT 3.8.1.F • Total amperage drawn by both load centers shall not exceed 1200 amps on local ammeters • Total allowed load of 1200 amps includes cycling loads • No major loads should be added without referring to Attachment 1 to account for additional load Caution prior to Step 5.10.1	If asked if the impact of starting current on cycling loads has been considered, respond that **"engineering has reviewed starting current for NG01 and NG03 loads and determined that it has no impact on limitations for current loading when cross connecting NG01 and NG03."**	Applicant read caution and understood that total amperage drawn by both load centers shall not exceed 1200 amps on local ammeters	**S U** Comments
4.	Initiate an EOSL item for inoperability of all 4 channels for Bus NB01 degraded voltage with reference to applicable T/S: Step 5.10.1		Step will not be performed	**S U** Comments

*Critical Step

5.	Check load centers NG01 and NG03 are energized Step 5.10.2		Given in Initiating Cue	**S U** Comments
6.	Using local ammeters, ensure combined total load amperage for NG01 and NG03 is less than 1200 amps Step 5.10.3		Local ammeter values given in Initiating Cue	**S U** Comments
7.	The bus transfer is a break-before-make operation which will cause a momentary power loss of approximately 8 to 10 cycles. Alarms may actuate and breakers may trip. Attachment 1 provides load lists to determine effects on plant operation. Note prior to Step 5.10.4		Note not read due to not being applicable to assigned task	**S U** Comments
8.	If removing the NG01 feeder from service, perform the following: Step 5.10.4		Step is not applicable	**S U** Comments
9.	If removing the NG03 feeder from service, perform the following: Step 5.10.5		Step is not applicable	**S U** Comments

*Critical Step

10.	Check loads on NG01 and NG03 for breaker trips than may have occurred during the transfer Step 5.10.6		Step is not applicable	**S U** Comments
11.	Using local ammeters, check combined total load amperage for NG01 and NG03 is less than 1200 amps Step 5.10.7		Step is not applicable	**S U** Comments
12.	If necessary to start loads on NG01 or NG03, ensure toal load will not exceed 1200 amps, by referring to Attachment 1 Step 5.10.8		Applicant determined loads that could be started – see JPM Step 15	**S U** Comments
13.	If necessary, start loads on NG01 and NG03 Step 5.10.9		Step is not applicable	**S U** Comments
14.	Refers to Attachment 1, Load Centers NG01 & NG03 Loads		Applicant referred to Attachment 1, Load Centers NG01 & NG03 Loads	**S U** Comments

*Critical Step

*15.	Using Att 1 and provided cues, determines what equipment can be started on NG01 and NG03 after they are cross-connected		Applicant determined that **CGM01A, SGK04A and PEC01A can be started** but that CKA01A could not be started, as based on the following calculations: Current amperage on both busses is 712 + 344 = 1056 (Provided in cue) Margin for starting additional equipment is 1200 – 1056 = 144 Amperage for equipment not running would be: • **DG Vent Supply Fan A, CGM01A – Acceptable** • Air Compressor A, CKA01A – Not Acceptable • **Fuel Pool Clg Pump A, PEC01A – Acceptable** • **CR A/C Unit A, SGK04A – Acceptable** **Acceptable equipment to start would be CGM01A <u>OR</u> PEC01A <u>OR</u> SGK04A.** Information is provided to the CRS (Examiner)	**S U** Comments
16.	**JPM IS COMPLETE**			**S U** Comments

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

The plant is at 100% power.

NG01 local ammeter indicates 712 amps.

NG03 local ammeter indicates 344 amps.

The following Train 'A' equipment is NOT in service:

- DG Vent Supply Fan A, CGM01A
- Air Compressor A, CKA01A
- Fuel Pool Clg Pump A, PEC01A
- CR A/C Unit A, SGK04A

Initiating Cues:

The Control Room Supervisor (CRS) directs you to prepare to cross-connect Load Centers NG01 and NG03 for maintenance to replace Load Center NG01 feeder breaker, NG0101.

Prior to cross-connecting NG01 and NG03, the CRS wants to know which individual equipment not currently in service could be started after the load centers are cross-connected.

Provide your answer on the cue sheet below:

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

A4

JPM Bank No:	Based on PVNGS 2013	KSA No:	2.3.7
Revision Date:	03/08/2016	KSA Rating:	3.5
Job Title:	URO/SRO		
Duty:	Radiation Exposure Control		
Task Title:	Determine entry requirements for in the RCA		
Completion Time:	12 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☐ Simulator/Lab ☐ Plant ☒ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: RWP 160501ROUTINE
HDP-ZZ-01500, RADIOLOGICAL POSTINGS
Survey CA-M-20160203-2, CA-M-20160308-1

Tools / Equipment: none

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: In room 1322 below the platform grating, a label needs to be replaced on penetration P39

Initiating Cues: Using the survey map and RWPs provided determine the following:

1. RWP to be used
2. Required Dosimetry
3. Dose Alarm
4. Dose Rate Alarm
5. Protective Clothing Requirements
6. Required RP briefing and/or authorization

Task Standard: 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**
Protective Clothing Requirements	**Full set of Protective Clothing in Contaminated Areas.** **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)**

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*1.	Applicant determines RWP to be used		Applicant determined RWP **160501ROUTINE** is to be used	**S U** Comments:
*2.	Applicant determines required Dosimetry		Applicant determined **OSLD and Electronic Dosimeter** is required	**S U** Comments:
*3.	Applicant determines Dose Alarm		Applicant determined Dose Alarm is **11 mRem**	**S U** Comments:
*4.	Applicant determines Dose Rate Alarm		Applicant determined Dose Rate Alarm **100 mRem**	**S U** Comments
*5.	Applicant determines Protective Clothing Requirements		Applicant determined Protective Clothing Requirements are **Full set of Protective Clothing in Contaminated Areas.** **OR** **Partial PC's allowed for tours, inspections, and work below grating as allowed by RP.**	**S U** Comments
*6.	Applicant determines Required RP briefing and/or authorization		Applicant determined the need **Contact RP for Survey Prior to Entry (CRP)**	**S U** Comments
7.	**JPM IS COMPLETE**			

*Critical Step

KEY

RWP to be used	**160501ROUTINE**
Required Dosimetry	**OSLD and Electronic Dosimeter**
Dose Alarm	**11 mRem**
Dose Rate Alarm	**100 mRem**
Protective Clothing Requirements	**Full set of Protective Clothing in Contaminated Areas.** **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)**

KEY

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: In room 1322 below the platform grating, a label needs to be replaced on penetration P39

Initiating Cues: Using the survey map and RWPs provided determine the following:

1. RWP to be used
2. Required Dosimetry
3. Dose Alarm
4. Dose Rate Alarm
5. Protective Clothing Requirements
6. Required RP briefing and/or authorization

Provide answers below

RWP to be used	
Required Dosimetry	
Dose Alarm	
Dose Rate Alarm	
Protective Clothing Requirements	
Required RP briefing and/or authorization	

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

A5

JPM No:	SRO-MAS-04-A006J	KSA No:	2.1.37
Revision Date:	02/13/2016	KSA Rating:	4.6
Job Title:	URO/SRO		
Duty:	Nuclear Instrumentation		
Task Title:	Review a QPTR Calculation		
Completion Time:	15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☐ Simulator/Lab ☐ Plant ☒ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: OSP-SE-00003, .QUADRANT POWER TILT RATIO, REVISION 22
CURVE BOOK TABLE 11-1, REVISION 257

Tools / Equipment: Calculator

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: Callaway Plant is at MOL, 100% power with the indicated axial flux difference (AFD) equal to 0%.

Control Room annunciators 78B, 78C, and 78F are not operable.

All power range nuclear instruments are operable.

The Control Room Plant Computer System is not available for use.

Initiating Cue: The RO has performed a QPTR calculation per OSP-SE-00003, Quadrant Power Tilt Ratio Calculation, using the NI detector currents provided.

The RO has submitted the results to you for a second check.

CHANNEL	I_{top}	I_{bottom}
N41	185.8	195.2
N42	163.2	190.8
N43	191.6	198.3
N44	188.2	196.1

Perform the second check of the RO's calculations and complete section 6.2 of OSP-SE-00003

Submit the data you have entered in OSP-SE-00003 to the Examiner.

Curve Book Table 11-1 has been provided

Task Standard: 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.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	Obtain a verified working copy of OSP-SE-00003, QPTR Calculation.		CANDIDATE OBTAINED A COPY OF OSP-SE-00003, QUADRANT POWR TILT RATIO CALCULATION PROVIDE CANDIDATE WITH COPY OF OSP-SE-00003 and Table 11-1	**S** **U** Comments:
2.	Review Precautions and Limitations STEP 4.0	If asked "**All Precautions and Limitations are satisfied.'**	Applicant reviewed Precautions and Limitations	**S** **U** Comments:
3.	Review Prerequisites STEP 5.0	If asked **"Prerequisites are satisfied."**	Applicant reviewed Prerequisites	**S** **U** Comments:
4.	Record each power range upper and lower current output on Attachment #1. STEP 6.2.1		Using the data sheet provided the Operator located the correct upper and lower current meters for the power range detectors and verified the values in the correct area of OSP-SE-00003, Attachment 1.	**S** **U** Comments:
*5.	Use Table 11.1 from the Curve Book to obtain the current values for the upper and lower detectors. AFD = 0% values should be used. STEP 6.2.2		Applicant used Table 11-1, AFD Calibration value Table, AFD = 0%, to record power range upper and lower current values. Applicant identified Lower Detector N44 100% Detector Current was recorded incorrectly as 193.4 instead of 192.7 **SEE KEY**	**S** **U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*6.	Divide each upper and lower detector current by its 100%, 0% AFD power detector current value and enter it in the normalized detector current for each channel. STEP 6.2.3		Applicant divided each upper and lower detector current by its 100% power, 0% AFD detector current value and entered it as the normalized detector current for each channel. The calculated values should be as shown in the Attachment 1 KEY. Values within ± 0.01 on each calculation are acceptable. Applicant identified Lower Detector N44 Normalized Detector Current was calculated incorrectly	**S** **U** Comments:
7.	Add the normalized upper detector currents and divide by four (4) to derive the upper detector normalized current average and record it in Attachment #1. STEP 6.2.4		Applicant added up the normalized upper detector currents and divided by 4 to derive the upper detector normalized current averages and recorded it in Attachment #1. The calculated values should be as shown in the Attachment 1 KEY. Values within ± 0.001 on each calculation are acceptable.	**S** **U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*8.	Add the normalized lower detector currents and divide by four (4) to derive the lower detector normalized current averages and record it in Attachment #1. STEP 6.2.5		Applicant added up the normalized lower detector currents and divided by 4 to derive the lower detector normalized current averages and recorded it in Attachment #1. The calculated values should be as shown in the Attachment 1 KEY. Values within ± 0.001 on each calculation are acceptable. Applicant identified Lower Detector Average Normalized Current was calculated incorrectly	**S** **U** Comments:
9.	NOTE: The QPTR should be calculated as two significant digits to the right of the decimal point. Note before 6.2.6		The applicant calculated the QPTR, to two (2) significant digits to the right of the decimal point.	**S** **U** Comments:
10.	Divide each upper normalized detector current by the upper normalized detector current average to obtain the power tilt ration for each upper channel and RECORD on Attachment 1 STEP 6.2.6		Applicant divided each upper normalized detector current by the upper normalized detector average to obtain the power tilt ratio for each upper channel. The calculated values should be as shown in the Attachment 1 KEY. Values within ± 0.01 on each calculation are acceptable.	**S** **U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*11.	Divide each lower normalized detector current by the lower normalized detector current average to obtain the power tilt ratio for each lower channel and RECORD on Attachment 1. STEP 6.2.7		Applicant divided each lower normalized detector current by the lower normalized detector current average to obtain the power tilt ratio for each lower channel. The calculated values should be as shown in the Attachment 1 KEY. Values within ± 0.01 on each calculation are acceptable. Applicant identified Lower Detector N44 Power Tilt Ratio was calculated incorrectly	**S** **U** Comments:
12.	IF the manual calculations do NOT confirm a QPTR of greater than 1.02, DECLARE the Plant Computer Points and QPTR alarm INOPERABLE. STEP 6.2.8		QPTR N44 Lower is Greater than 1.02. The Applicant should N/A this step.	**S** **U** Comments:
*13.	If any channel of QPTR is greater than 1.02, Refer to T/S Action 3.2.4.A and INITIATE Attachment 2. STEP 6.2.9		Applicant determines that N44 Lower QPTR is greater than 1.02, referred to T/S Action 3.2.4.A and INITIATED Attachment 2. Applicant RECORDED highest QPTR of 1.03 and Rx Power of 100% on Attachment 2. See KEY	**S** **U** Comments:
14.		**THE JPM IS COMPLETE**		

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

Callaway Plant is at MOL, 100% power with the indicated axial flux difference (AFD) equal to 0%.

Control Room annunciators 78B, 78C, and 78F are not operable.

All power range nuclear instruments are operable.

The Control Room Plant Computer System is not available for use.

Initiating Cue:

The RO has performed a QPTR calculation per OSP-SE-00003, Quadrant Power Tilt Ratio Calculation, using the NI detector currents provided.

The RO has submitted the results to you for a second check.

CHANNEL	I_{top}	I_{bottom}
N41	185.8	195.2
N42	163.2	190.8
N43	191.6	198.3
N44	188.2	196.1

Perform the second check of the RO's calculations and complete section 6.2 of OSP-SE-00003

Submit the data you have entered in OSP-SE-00003 to the Examiner.

Curve Book Table 11-1 has been provided

A6 See RO A2

A7 See RO A3

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

A8

JPM No:	SRO-RER-03-A203J	KSA No:	GEN 2.3.4
Revision Date:	02/15/2016	KSA Rating:	3.7
Job Title:	SRO		
Duty:	Administrative		
Task Title:	SELECT VOLUNTEER FOR EMERGENCY EXPOSURE		
Completion Time:	15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☒ Simulator/Lab ☐ Plant ☒ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: HDP-ZZ-01450, Authorization To Exceed Federal Occupational Dose, Rev 11
CA0276, Authorization to Exceed Federal Occupational Radiation Dose Limits

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

A LOCA has occurred.

An operator has a life threatening injury in the Train 'A' Residual Heat Removal Pump Room.

Extremely high radiation levels require a volunteer to attempt a rescue to extract the injured operator from the RHR pump room.

The estimated dose to the rescuer is 55 Rem.

Eight individuals have volunteered to attempt a rescue of the injured operator.

None of the volunteers have previously ever received a dose in excess of 10CFR20.1201 limits

Initiating Cues:

Select the best volunteer to attempt the rescue in accordance with HDP-ZZ-01450, Authorization To Exceed Federal Occupational Dose.

Complete Section 1 of CA0276, Authorization To Exceed Federal Occupational Dose Limits

Task Standard:

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

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	Operator obtains copy of HDP-ZZ-01450, Authorization To Exceed Federal Occupational Dose, CA0276, Authorization To Exceed Federal Occupational Dose Limits, and list of volunteers		Operator obtained copy of HDP-ZZ-01450, Authorization To Exceed Federal Occupational Dose, CA0276, Authorization To Exceed Federal Occupational Dose Limits, and list of volunteers	**S U** Comments:
*2.	Operator reviews data and selects volunteer		Operator selected mike Adams (Volunteer #5) from the list of volunteers	**S U** Comments:
*3.	Completes Section 1 CA0276 correctly		Operator completed Section 1CA0276 in accordance with the KEY (required items are circled)	**S U** Comments:
		Record stop time on Page 2 **The JPM is complete**		**S U** Comments:

*Critical Step

Authorization to Exceed Federal Occupational Radiation Dose Limits

KEY

1. Name: ***Mike Adams*** ID (SSN, PPN): ***56789***

Age (years): ***60*** Estimated lifetime whole body dose (rem TEDE) provided by worker: ***59.1***

Has worker ever received a dose in excess of 10CFR20.1201 limits? ☐ YES ☒ NO

Purpose of task: ☐ Accident Mitigation ☐ Personnel Safety ☒ Life Saving

Task to be performed and justification for dose in excess of the limits of 10cfr20.1201 (attach additional pages if needed):
Attempt a rescue to extract the injured operator from the RHR pump room.

2. ATTESTATION:
I am aware of the risks involved in receiving a dose within the authorized limits and I have not previously received a dose in excess of the federal limits. For life saving dose limits above the Category 2 limits, I certify that I have volunteered.

Signature PIN Date

WOMEN ONLY:
I have read and understand the potential effects on the fetus/embryo from doses in excess of the Occupational Dose Limits of 10CFR20.1201, and I voluntarily accept this assignment. I understand that I am encouraged to <u>not</u> volunteer for this task, and that there will be no repercussions if I elect to not volunteer.

Signature PIN Date

3. AUTHORIZATION:
The above individual is authorized to receive a dose in excess of the limits of 10CFR20.1201 within the following limits:

☐ Category 1 – Life Saving
100 rem DDE (guideline)

☐ Category 2 – Accident Mitigation/Personnel or Public Safety
10 rem DDE
30 rem LDE
100 rem SDE
100 rem TODE

APPROVED BY: ☐ Sr. Vice President Generation and Chief Nuclear Officer ☐ Vice President-Nuclear Operations

☐ Emergency Coordinator ☐ Recovery Manager

Signature PIN Date

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

A LOCA has occurred.

An operator has a life threatening injury in the Train ‘A’ Residual Heat Removal Pump Room.

Extremely high radiation levels require a volunteer to attempt a rescue to extract the injured operator from the RHR pump room.

The estimated dose to the rescuer is 55 Rem.

Eight individuals have volunteered to attempt a rescue of the injured operator.

None of the volunteers have previously ever received a dose in excess of 10CFR20.1201 limits

Initiating Cues:

Select the best volunteer to attempt the rescue in accordance with HDP-ZZ-01450, Authorization To Exceed Federal Occupational Dose.

Complete Section 1 of CA0276, Authorization To Exceed Federal Occupational Dose Limits

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

List of Volunteers

1. Abe Ross (PPN 12345) is a 50 year old male with a lifetime dose of 54.5 Rem
2. Sue Smith (PPN 23456) is a 45 year old female with a lifetime exposure of 46.5 Rem
3. Cindy Jones (PPN 34567) is a 42 year old female with a lifetime exposure of 44.0 Rem
4. Jim Jay (PPN 45678) is a 36 year old male with a lifetime exposure of 44.0 Rem
5. Mike Adams (PPN 56789) is a 60 year old male with a lifetime dose of 59.1 Rem
6. Margo Rodriguez (PPN 67890) is a 22 year old female with a lifetime exposure of 29.5 Rem
7. Halley Faust (PPN 78901) is a 25 year old female with a lifetime exposure of 26.0 Rem
8. Nate Russell (PPN 89012) is a 63 year old male with a lifetime exposure of 64.0 Rem

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

A9

JPM Bank No:	SRO-RER-02-A031(TC)	KSA No:	2.4.44
Revision Date:	03/17/2016	KSA Rating:	4.4
Job Title:	SRO		
Duty:	ADMINISTRATIVE		
Task Title:	MAKE PROTECTIVE ACTION RECOMMENDATION DURING A GENERAL EMERGENCY (TIME CRITICAL)		
Completion Time:	Less than 15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☐ Simulator/Lab ☐ Plant ☒ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☒ Time Critical ☐ RCA

References: EIP-ZZ-00212, Protective Action Recommendations Rev 28

Tools / Equipment: None (Sentry computer use is NOT allowed during this JPM)

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

This JPM is **TIME CRITICAL** from the moment you acknowledge understanding of the Initiating Conditions and Initiating Cues.

Callaway Plant has been shutdown following a Reactor Trip due to indications of failed fuel and a Large Beak LOCA.

A minipurge was in progress when the LOCA occurred, and the minipurge Containment Outlet Isolation Valves could not be closed. Because of this, an on-going release to the atmosphere is occurring from the Containment. Attempts to control the release have failed and it is not known when the release will be terminated.

A General Emergency has been declared due to EAL FG1.1, Loss of any two barriers AND loss or potential loss of a third barrier.

- Containment radiation on GT RE-59 and GT RE-60 indicate 1.02E+05 Rem/hr.
- There are no indications of travel conditions that would present an extreme hazard during any recommended evacuation.
- Wind speed is 5 mph heading from 337°
- The Dose Assessment Technician has informed you there is a RELEASE ABOVE NORMAL OPERATING LIMITS with dose readings at the site boundary of 0.2 rem TEDE and 0.5 CDE Thyroid.

The SENTRY Computer is NOT working

Initiating Cues:

Make the Initial Protective Action Recommendation (PAR) based on the above conditions including affected sectors.

Task Standard: 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).

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	OPERATOR MAY USE THE EIP PROCEDURES		Applicant reviewed copies of the various required procedures.	**S U** Comments:
2.	Determine PAR		Applicant will have determined this is a Rapidly Progressing accident	**S U** Comments:
*3.	Determine PAR		Applicant determined "EVACUATE 2 mile radius and 10 miles downwind" due to no impediments	**S U** Comments:
*4	Include affected sectors		Applicant determined the affected sectors are G, H, and J using the table on page 6 of EIP-ZZ-00212	**S U** Comments:
4.	**JPM IS COMPLETE**	**JPM must be completed within 15 minutes from the time the applicant acknowledged the cues**		**S U** Comments

*Critical Step

KEY

PAR: <u>Evacuate 2 mile radius and 10 miles downwind, affected sectors are G, H, and J</u>

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

This JPM is **TIME CRITICAL** from the moment you acknowledge understanding of the Initiating Conditions and Initiating Cues.

Callaway Plant has been shutdown following a Reactor Trip due to indications of failed fuel and a Large Beak LOCA.

A minipurge was in progress when the LOCA occurred, and the minipurge Containment Outlet Isolation Valves could not be closed. Because of this, an on-going release to the atmosphere is occurring from the Containment. Attempts to control the release have failed and it is not known when the release will be terminated.

A General Emergency has been declared due to EAL FG1.1, Loss of any two barriers AND loss or potential loss of a third barrier.

The Control Room Communicator arrived and made the correct Emergency Announcement using Attachment 1, of EIP-ZZ-00102 (provided).

- Containment radiation on GT RE-59 and GT RE-60 indicate 1.02E+05 Rem/hr.
- There are no indications of travel conditions that would present an extreme hazard during any recommended evacuation.
- Wind speed is 5 mph heading from 337°
- The Dose Assessment Technician has informed you there is a RELEASE ABOVE NORMAL OPERATING LIMITS with dose readings at the site boundary of 0.2 rem TEDE and 0.5 CDE Thyroid.

The SENTRY Computer is NOT working

Initiating Cues:

Make the Initial Protective Action Recommendation (PAR) based on the above conditions including affected sectors and document below.

PAR: _____
(include affected sectors)

Facility: Callaway Date of Examination: 5/23/2016

Exam Level: RO ☒ SRO-I ☐ SRO-U ☐ Operating Test No.: 2016-1

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

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.

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.

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.

Facility: Callaway Date of Examination: 5/23/2016

Exam Level: RO ☐ SRO-I ☒ SRO-U ☐ Operating Test No.: 2016-1

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

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.

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.

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.

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

S1

JPM Bank No:	URO-SSF-01-C005J	KSA No:	001A4.03
Revision Date:	04/27/2016	KSA Rating:	4.0 / 3.7
Job Title:	URO/SRO		
Duty:	CONTROL ROD DRIVE SYSTEM		
Task Title:	PERFORM CONTROL ROD PARTIAL MOVEMENT TEST		
Completion Time:	12 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☒ Simulator/Lab ☐ Plant ☐ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: OSP-SF-00002, CONTROL ROD PARTIAL MOVEMENT Rev 22

Tools / Equipment: none

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: Callaway plant is in Mode 1, 100% steady state power. There are no special physics tests in progress, no boron concentration changes being made or planned, and control rods are in normal configuration.

Initiating Cues: The CRS has directed you to perform control rod partial movement for shutdown bank A, per OSP-SF-00002, Control Rod Partial Movement, beginning at step 6.1

The Primary OT has been briefed and is at the power cabinets.

Note: Use any MODE 1 IC

Task Standard: Upon completion of this JPM all shutdown bank 'A' control rods will have been inserted at least 12 steps into the core and restored to their pretest position per procedural requirements.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.		Provide applicant with procedure copy	Applicant obtained procedure copy	**S U** Comments:
2.	Review Precautions and Limitations Section 4.0	Precautions and Limitations are satisfied NOTE: If asked, the monthly rod position test has not been performed yet.	Applicant reviewed Precautions and Limitations	**S U** Comments:
3.	Review Prerequisites Section 5.0	Prerequisites are satisfied If asked **"The CRS has Key #149 for the Rod Control Cabinets, replacement neon bulbs for Group Select, Group Hold and Power ON, and replacement 28 VDC bulbs for the failure lamps (Urgent and P.S.) and the Group cycling lamp"**	Applicant reviewed Prerequisites	**S U** Comments
4.	NOTE: A cabinet without any Group Select Light illuminated may indicate a bad light bulb OR a blown multiplexer fuse. Moving rods without the correct Group Select Light illuminated could result in dropped or mispositioned rods. Note prior to Step 6.1		Applicant read note	**S U** Comments

*Critical Step

*5.	PLACE SE HS-9, ROD BANK AUTO/MAN SEL, in the Shutdown Bank to be tested and INITIAL Attachment 1. Step 6.1.1		Applicant PLACED SE HS-9, ROD BANK AUTO/MAN SEL, in the Shutdown Bank A position and INITIALED Attachment 1.	**S U** Comments
6.	At Power Cabinets, ENSURE the proper lights are on for the selected bank and INITIAL Attachment 1: Step 6.1.2	Respond as the Primary OT: **"At Power Cabinet 1AC and 2AC, Group Select Light 'C' is ON"**	Applicant ENSURED the proper lights (Group Select Light 'C') are on for the selected bank and INITIALED Attachment 1:	**S U** Comments
7.	RECORD the Shutdown Bank Step Counter position for the selected bank on Attachment 1. Step 6.1.3		Applicant RECORDED the Shutdown Bank Step Counter position for the selected bank on Attachment 1.	**S U** Comments
8.	IF the selected bank is parked at a fully withdrawn position of other than 228 steps, INSERT or WITHDRAW the bank to 228 steps as indicated by the step counters and Digital Rod Position Indication. Step 6.1.4		Applicant IDENTIFIES the selected bank is parked at a fully withdrawn position of 228 steps, and does not move the rods at this step	**S U** Comments
9.	RECORD SF 074, ROD POS INDICATION (DRPI) and Shutdown Bank Step Counter positions on Attachment 1. Step 6.1.5		Applicant RECORDED SF 074, ROD POS INDICATION (DRPI) and Shutdown Bank Step Counter positions on Attachment 1.	**S U** Comments
*10.	INSERT the selected bank two (2) steps per step counter indication. Step 6.1.6		Applicant INSERTED the selected bank two (2) steps per step counter indication.	**S U** Comments

*Critical Step

*11.	WITHDRAW the selected bank to 228 steps per step counter indication. Step 6.1.7		Applicant WITHDREW the selected bank to 228 steps per step counter indication.	**S** **U** Comments
12.	CHECK that no rod control alarms are present. Step 6.1.8		Applicant CHECKED that no rod control alarms are present.	**S** **U** Comments
*13.	INSERT the selected bank 10 steps and CHECK that DRPI is indicating properly. Step 6.1.9	Annunciator 79C will alarm during this step. This information is given in the Precautions and Limitation Step 4.6	Applicant INSERTED the selected bank 10 steps and CHECK that DRPI is indicating properly.	**S** **U** Comments
*14.	INSERT the selected bank at least two (2) more steps as indicated by the step counters and DRPI. Step 6.1.10		Applicant INSERTED the selected bank at least two (2) more steps as indicated by the step counters and DRPI.	**S** **U** Comments
15.	RECORD DRPI and Shutdown Bank Step Counter positions for the selected bank on Attachment 1. Step 6.1.11		Applicant RECORDED DRPI and Shutdown Bank Step Counter positions for the selected bank on Attachment 1.	**S** **U** Comments
*16.	RETURN selected bank to the position recorded at Step 6.1.3. Step 6.1.12		Applicant RETURNED selected bank to the position recorded at Step 6.1.3.	**S** **U** Comments

*Critical Step

17.	RECORD DRPI and Shutdown Bank Step Counter positions for selected bank and INITIAL on Attachment 1. Step 6.1.13		Applicant RECORDED DRPI and Shutdown Bank Step Counter positions for selected bank and INITIAL on Attachment 1.	**S** **U** Comments
18.	REPEAT steps 6.1.1 through 6.1.13 as necessary to test the remaining Shutdown Banks. Step 6.1.14	Only testing Shutdown Bank A per the CUE	Applicant reported to the CRS that Shutdown Bank A has been tested Step 6.1.14	**S** **U** Comments
19.	**JPM IS COMPLETE**	RECORD STOP TIME ON PAGE 2.		

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: Callaway plant is in Mode 1, 100% steady state power. There are no special physics tests in progress, no boron concentration changes being made or planned, and control rods are in normal configuration.

Initiating Cues: The CRS has directed you to perform control rod partial movement for shutdown bank A, per OSP-SF-00002, Control Rod Partial Movement, beginning at step 6.1

The Primary OT has been briefed and is at the power cabinets.

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

S2

JPM No:	URO-SBG-02-C160J(A)	KSA No:	004A4.08
Revision Date:	04/02/2014	KSA Rating:	3.8 / 3.4
Job Title:	URO/SRO		
Duty:	CVCS		
Task Title:	Swap from the NCP to 'B' CCP		
Completion Time:	15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☒ Simulator/Lab ☐ Plant ☐ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☒ Alternate Path ☐ Time Critical ☐ RCA

References: OTN-BG-00001 ADD 1, Shifting from the NCP to One of the CCPs Rev 11

Tools / Equipment: none

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The NCP is running with 75 GPM letdown flow.

Preparations have been made to tag out the NCP.

Initiating Cues: The CRS has directed you to place the B CCP in service and secure the NCP per OTN-BG-00001 ADD 1, Shifting from the NCP to one of the CCP's, and beginning at step 5.1. Inform the CRS when complete.

The boron concentration when the B CCP was run last week was 5 PPM higher than the existing boron concentration.

An OT has been briefed and is standing by to perform local actions

Notes: USE IC-10, ENSURE THE NCP AND 'B' CCW ARE RUNNING. ENSURE LETDOWN FLOW IS 75 GPM AND BG HV-8111 IS OPEN ('B' CCP MINIFLOW).

AFTER the applicant has performed Step 5.1.3 (JPM step 8) and lowered CCP discharge flow control to minimum:

- **Insert Malfunction (BG) PBG05B, Value = Trip; condition HWX01D148M GE 0.30**
  (This will trip the 'B' CCP after flow is increased)

Task Standard: Upon completion of this JPM the applicant will have restored charging flow to normal

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	OBTAIN A VERIFIED WORKING COPY OF OTN-BG-00001 ADD 1, Shifting from the NCP to one of the CCP's		APPLICANT OBTAINED PROCEDURE COPY	**S U** Comments:
2.	REVIEW PRECAUTIONS AND LIMITATIONS SECTIONS 3.1 AND 3.2	ALL PRECAUTIONS AND LIMITATIONS ARE SATISFIED	APPLICANT REVIEWED PRECAUTIONS AND LIMITATIONS	**S U** Comments:
3.	REVIEW GENERAL NOTES SECTION 3.3		APPLICANT REVIEWED APPLICABLE GENERAL NOTES	**S U** Comments:
4.	REVIEW PREREQUISITES SECTION 4.0	ALL PREREQUISITE CONDITIONS ARE SATISFIED	APPLICANT REVIEWED PREREQUISITE CONDITIONS	**S U** Comments:
5.	NOTE: ALL HAND SWITCHES REFERENCED IN THIS SECTION ARE LOCATED ON RL001 OR RL002 UNLESS NOTED OTHERWISE. TRANSFERRING CHARGING PUMPS WILL CAUSE AREA RADIATION LEVELS TO CHANGE IN BOTH PUMP ROOMS. NOTE PRIOR TO STEP5.1.1		APPLICANT READ NOTE.	**S U** Comments:

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
6.	NOTIFY RP THAT 'B' CCP WILL BE STARTED AND THE NCP WILL BE SECURED. STEP 5.1.1	RP ACKNOWLEDGES	APPLICANT INFORMED RP THAT 'B' CCP WILL BE STARTED AND NCP WILL BE SECURED	**S U** Comments:
7.	ENSURE 'B' CCP IS SUPPLIED BY 'B' CCW TRAIN IN SERVICE STEP 5.1.2		APPLICANT VERIFIED 'B' CCW TRAIN IS IN SERVICE	**S U** Comments:
***8**.	PLACE BG FK-121, CCP DISCH FLOW CTRL, IN "MANUAL" AND SET AT MINIMUM FLOW STEP 5.1.3		APPLICANT PLACED BG FK-121, CCP DISCH FLOW CTRL, IN "MANUAL" AND SET TO MINIMUM FLOW. BG FK-121 "MANUAL" LIGHT COMES ON AND "AUTO" LIGHT GOES OFF.	**S U** Comments:
9.	CAUTION: The CCPs should NOT be run at less than 130 gpm, (including recirc flow), for more than 30 minutes. The CCPs should NOT be run at less than 60 gpm. The CCP recirculation valves ensure 60 gpm recirc to the VCT. [Ref: 6.2.7]. CAUTION PRIOR TO STEP 5.1.4		APPLICANT READ CAUTION.	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
10.	CHECK THE CHARGING PUMP RECIRCULATION VALVE FOR THE PUMP TO BE STARTED IS OPEN: BG HIS-8111, CCP B RECIRC VLV STEP 5.1.4		APPLICANT VERIFIED BG HV-8111 IS OPEN BY VERIFYING BG HIS-8111 RED LIGHT IS ON AND GREEN LIGHT IS OFF	**S U** Comments:
11.	PLACE THE AUXILIARY LUBE OIL PUMP HANDSWITCH FOR THE CCP TO BE STARTED IN AUTO AND ENSURE THE RUN LIGHT IS ON. BG HIS-2AX, CCP B AUX L-O PUMP STEP 5.1.5		APPLICANT STARTED 'B' CCP AUXILIARY LUBE OIL PUMP BG HIS-2AX RED LIGHT IS ON AND GREEN LIGHT GOES OFF	**S U** Comments:
12.	NOTE: IT IS RECOMMENDED THAT THE AUXILIARY LUBE OIL PUMP BE ALLOWED TO RUN FOR AT LEAST 5 MINUTES PRIOR TO STARTING THE ASSOCIATED CCP. NOTE PRIOR TO STEP5.1.6	**Cue "5 MINUTES HAS ELAPSED"**	APPLICANT READS NOTE AND STATES THEY WILL WAIT 5 MINUTES BEFORE STARTING THE CCP	**S U** Comments:
*13.	START 'B' CCP USING BG HIS-2A STEP 5.1.6		APPLICANT STARTED 'B' CCP PLACING BG HIS-2A TO RUN. BG HIS-2A RED LIGHT GOES ON AND GREEN LIGHT GOES OFF	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
14.	Locally VERIFY that the Room Cooler has started for the CCP that was started. SGL12B, AUX BLD CCP B RM CLR, for CCP B STEP 5.1.7 NOTE: STEP 5.1.8 IS NOT REQUIRED	When the applicant contacts an OT to locally verify that the room cooler has started: CUE: **"SGL12B, AUX BLD CCP B RM CLR has started."**	APPLICANT VERIFIED SGL12B, AUX BLD CCP B RM CLR IS IN SERVICE	**S U** Comments:
15.	IF THIS ADDENDUM WAS ENTERED FROM SECTION FOR CHARGING PUMP BREAKER NB0104 OR NB0201 OPERABILITY CHECK IN OTN-BG-00001, CHEMICAL AND VOLUME CONTROL SYSTEM, CHECK THE CCP BREAKER CLOSED PROPERLY STEP 5.1.8		APPLICANT DETERMINES THIS STEP IS NOT APPLICABLE.	**S U** Comments:
16.	NOTE: If the Aux Lube Oil Pump remains in service following the next step, the system engineer should be notified.		APPLICANT READ NOTE.	**S U** Comments:
17.	VERIFY 'B' AUXILIARY LUBE OIL PUMP HANDSWITCH BG HIS-2AX RED LIGHT HAS GONE OUT AND STOP LIGHT HAS LIT STEP 5.1.9		APPLICANT VERIFIED 'B' AUX LUBE OIL PUMP HAS STOPPED WITH HANDSWITCH BG HIS-2AX BG HIS-2AX GREEN LIGHT IS ON AND RED LIGHT IS OFF	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*18.	PLACE THE NCP FLOW CONTROLLER, BG FK-124 IN "MANUAL" STEP 5.1.10		APPLICANT PLACED BG FK-124 IN "MANUAL" and observes BG FK-124 "MANUAL" LIGHT COMES ON AND "AUTO" LIGHT GOES OFF	**S U** Comments:
19.	NOTE: IF BGHV8109, NCP RECIRC VLV, is closed and flow through the NCP drops below 100 gpm, Annunciator Window 41F, NCP FLOW HI/LO, will alarm. IF flow through the NCP drops below 65 gpm, Annunciator Window 41F, NCP FLOW HI/LO, will reflash and BGHV8109, NCP RECIRC VLV, will open. BGHV8109, NCP RECIRC VLV, is opened when lowering NCP flow to prevent a transient in seal injection flow. Steps 5.1.11 through 5.1.13 should be performed together to enable transfer of the pumps.		APPLICANT READ NOTE.	**S U** Comments:
20.	WHEN FLOW THROUGH THE NCP IS LESS THAN 100 GPM, AS INDICATED BY ANNUNCIATOR WINDOW 41F, USE BG HIS-8109, NCP RECIRC VLV AND OPEN BGHV8109. STEP 5.1.11		APPLICANT ENSURED BGHV8109 WAS OPEN	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
21.	RAISE CCP flow using BG FK-121, CCP DISCH FLOW CTRL, while LOWERING NCP flow using BG FK-124, NCP DISCH FLOW CTRL, to maintain a constant charging flow as indicated on BG FI-121A, CHG HDR FLOW. STEP 5.1.12	**WHEN BG FK-124, NCP DISCH FLOW CTRL HAS BEEN ADJUSTED TO LOWER NCP FLOW,** **Start of Alternate path** **Simulator operator verifies the conditional malfunction to trip the 'B' CCP is inserted.**	APPLICANT RAISED CCP flow using BG FK-121, CCP DISCH FLOW CTRL, and LOWERED NCP flow using BG FK-124, NCP DISCH FLOW CTRL **ANNOUNCED THAT 'B' CCP HAS TRIPPED**	**S U** Comments:
*****22.	ADJUST BG FK-124 AND BG HC-182 AS REQUIRED TO MAINTAIN THE FOLLOWING: • SEAL INJ FLOW 8-13 GPM / RCP • CHARGING FLOW MAINTAINING STABLE PZR	IF the applicant asks the CRS what to do, respond "**What actions do you recommend?"** After the applicant describes the actions they will take state **"Take the actions you have described"** (Do not tell the applicant what to do. Agree with whatever actions the applicant describes) Note: At this point the Applicant will stop performing steps of OTN-BG-00001 ADD1	APPLICANT INCREASED NCP FLOW USING BG FK-124	**S U** Comments:
23.	INFORM THE CONTROL ROOM SUPERVISOR THE NCP HAS BEEN RESTORED TO SERVICE	**THE CONTROL ROOM SUPERVISOR ACKNOWLEDGES** **THE JPM IS COMPLETE**	APPLICANT INFORMED THE CONTROL ROOM SUPERVISOR THE NCP HAS BEEN RESTORED TO SERVICE	**S U** Comments:

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The NCP is running with 75 GPM letdown flow.

Preparations have been made to tag out the NCP.

Initiating Cues: The CRS has directed you to place the B CCP in service and secure the NCP per OTN-BG-00001 ADD 1, Shifting from the NCP to one of the CCP's, and beginning at step 5.1. Inform the CRS when complete.

The boron concentration when the B CCP was run last week was 5 PPM higher than the existing boron concentration.

An OT has been briefed and is standing by to perform local actions

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

S3

JPM No:	URO-SBB-04-C166J(A)	KSA No:	010A4.01
Revision Date:	03/09/2016	KSA Rating:	3.7 / 3.5
Job Title:	URO/SRO		
Duty:	PZR Pressure Control		
Task Title:	Respond to a Master Pressure Controller Failure		
Completion Time:	8 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☒ Simulator/Lab ☐ Plant ☐ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☒ Alternate Path ☐ Time Critical ☐ RCA

References: OTG-ZZ-00004, Addendum 03, Planned Power Changes From Full Power Revision 008

Tools / Equipment: None

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: Callaway Plant is in Mode 1 at 100% Power.

Initiating Cues: The Control Room Supervisor (CRS) directs you to equalize RCS and Pressurizer Boron Concentration using OTG-ZZ-00004, Addendum 03, Steps 5.4.1.h.1 through 3.

Notes: Insert the following to fail the master pressure controller:
INSERT the malfunction AFTER the controller is taken to MANUAL.

- Insert malfunction BBPC0455A_1, Value = 10
  - Ramp = 30 seconds
  - Conditional = hwx02o58A eq 1
    (This will fail both spray valves open when BB PK-455A is returned to auto.)

Task Standard: Upon completion of this JPM, the master pressure controller failure has been addressed prior to a Reactor Trip being generated on low pressurizer pressure.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	OBTAIN A VERIFIED WORKING COPY OF OTG-ZZ-00004, Addendum 03		APPLICANT OBTAINED PROCEDURE COPY	**S U** Comments:
2.	REVIEW PRECAUTIONS AND LIMITATIONS SECTION 3		APPLICANT REVIEWED PRECAUTIONS AND LIMITATIONS	**S U** Comments:
3.	REVIEW PREREQUISITES SECTION 4		APPLICANT REVIEWED PREREQUISITES	**S U** Comments:
*4.	ENSURE AT LEAST ONE GROUP OF PRESSURIZER BACKUP HEATERS ARE ENERGIZED Step 5.4.1.h.1	PZR BACKUP HEATERS ARE ENERGIZED	OPERATOR PLACED BB HIS-51A AND/OR BB HIS-52A IN CLOSE (ONLY ONE SWITCH REQUIRED TO BE PLACED IN CLOSE)	**S U** Comments:
*5.	PLACE BB PK-455A IN MANUAL AND LOWER TO 40% Step 5.4.1.h.2		OPERATOR PLACED BB PK-455A IN MANUAL AND LOWERS TO 40%	**S U** Comments:
*6.	PLACE BB PK-455A IN AUTO Step 5.4.1.h.3		OPERATOR PLACED BB PK-455A IN AUTO **Start of ALTERNATE PATH**	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*7.	BOTH PRESSURIZER SPRAY VALVES, BBPCV0455B AND BBPCV0455C, FAIL OPEN WHEN BB PK-455A IS PLACED INTO AUTO		OPERATOR RECOGNIZED SPRAY VALVES HAVE FAILED OPEN AND CLOSES BOTH SPRAY VALVES PRIOR TO A REACTOR TRIP BEING GENERATED ON LOW PRESSURIZER PRESSURE This can be accomplished by using either the Master Controller or taking the individual spray valves to manual and closing the valves	**S U** Comments:
8.	JPM COMPLETE			**S U** Comments:

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: Callaway Plant is in Mode 1 at 100% Power.

Initiating Cues: The Control Room Supervisor (CRS) directs you to equalize RCS and Pressurizer Boron Concentration using OTG-ZZ-00004, Addendum 03, Steps 5.4.1.h.1 through 3.

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

S4

JPM Bank No:	N/A	KSA No:	059A2.12
Revision Date:	04/27/2016	KSA Rating:	3.1 / 3.4
Job Title:	URO/SRO		
Duty:	Main feedwater		
Task Title:	Transferring from MFRV Bypass Valves to MFRVs- AUTOMATIC METHOD with valve failure		
Completion Time:	15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☒ Simulator/Lab ☐ Plant ☐ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☒ Alternate Path ☐ Time Critical ☐ RCA

References: OTN-AE-00001, FEEDWATER SYSTEM Rev 54

Tools / Equipment: none

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The Callaway Plant is in Mode 1 at 22-25% Reactor Power. The Control Room Crew is performing a power ascension.

Initiating Cues: The Control Room Supervisor directs you to transfer Steam Generator Water Level Control from the MFRV Bypass Valves to the Main Feedwater Regulating Valves using OTN-AE-00001, Feedwater System, Section 5.10.

Steps 5.10.1 through 5.10.15 of OTN-AE-00001 have been completed.

An OT is at the MFRVs.

Note: Use Any IC (IC 5) approx. 22-25% power with Bypass FRV's in service

- Insert Malfunction AEFCV0540_A , Value = 0.0
  (prevents the 'D' MFRV from opening)

Task Standard: 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.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.		Provide Applicant with procedure copy	Applicant obtained procedure copy	**S** **U** Comments:
2.	Review Precautions and Limitations Section 3.0	All Precautions and Limitations are satisfied	Applicant reviewed Precautions and Limitations	**S** **U** Comments:
3.	Review Prerequisites Section 4.0	There are no Prerequisites		**S** **U** Comments
4.	NOTE: Attachment 1 contains a list of plant computer points that may be used to monitor low range feed/steam flows or SG levels. Steps 5.10.1 through 5.10.15 can be performed at any power level. Note prior to Step 5.10.1		Applicant read note	**S** **U** Comments
NOTE	The initiating cues staes steps 5.10.1 through 5.10.15 have been completed			
5.	<u>NOTE:</u> MFRV Bypass choked flow occurs at approximately 600 psid. Note prior to Step 5.10.16		Applicant read note	**S** **U** Comments
6.	VERIFY FC SK-509A, MFP TURBS MASTER SPEED CTRL is in AUTO Step 5.10.16		Applicant verified FC SK-509A is in AUTO	**S** **U** Comments

*Critical Step

7.	VERIFY operating MFP Turbine Speed Control is in AUTO • A MFP – AE SK-509B • B MFP – AE SK-509C Step 5.10.17		Applicant verified AE SK-509B is in AUTO Applicant verified AE SK-509C is in MANUAL	**S U** Comments
8.	NOTE: To abort an AUTOMATIC Valve Transfer, PLACE the affected Steam Generator's MFRV/ MFRBV valve controller in MANUAL and HOLD until both MFRV and MFRBV valve controllers' MANUAL buttons are lit and not blinking. The non-affected Steam Generator valve transfers will continue. To stop/reset the 720-second automatic valve transfer timer, place ALL MFRV/MFRBV controllers in MANUAL. An AUTOMATIC valve transfer will be again possible when all permissives are satisfied. Refer to Attachment 3 for a list of Automatic Valve Transfer Permissives. Note prior to Step 5.10.18		Applicant read note	**S U** Comments:
9.	Caution: If any AUTO Sequence Step does not complete as expected, then take MANUAL Control as needed and complete remaining transfer functions per section 5.10, Transferring from MFRV Bypass Valves to MFRVs - MANUAL METHOD Caution prior to Step 5.10.18		Applicant read caution	**S U** Comments

*Critical Step

10.	IF MFRVs will be transferred separately, perform steps 5.10.25 through 5.10.28 for AUTO transfer of INDIVIDUAL Steam Generator Control Valves. Step 5.10.18	**CUE "CRS directs transfer AUTO transfer to be performed simultaneously instead of separately"**	Applicant does not perform steps 5.10.25 through 5.10.28.	**S U** Comments
11.	ENSURE SG Level Control Valve Selection AE SS-500A XFR Buttons are ENABLED • SG A • SG B • SG C • SG D • ALL SGs Step 5.10.19		Applicant ensured SG Level Control Valve Selection AE SS-500A XFR Buttons are ENABLED • SG A • SG B • SG C • SG D • ALL SGs	**S U** Comments
12.	ENSURE MFP DELTA P Control Selector FC PS-509 is in LOW POWER and the XFR Button is ENABLED. Step 5.10.20		Applicant ensured MFP DELTA P Control Selector FC PS-509 is in LOW POWER and the XFR Button is ENABLED.	**S U** Comments
*13.	ACTUATE "ALL Steam Generators" XFR button on SG Level Control Valve Selector, AE SS-500A. Step 5.10.21		Applicant actuated "ALL Steam Generators" XFR button on SG Level Control Valve Selector, AE SS-500A.	**S U** Comments

*Critical Step

14.	VERIFY the following sequence occurs: a. AE SS-500A, SG Level Control Valve Selection, each SG XFR button GREYS out. b. ALL SG MFRV and MFRV Bypass Valves controllers AUTO/MAN indicators begin FLASHING c. ALL MFRV Bypass Valves begin CLOSING d. ALL MFRVs begin OPENING Step 5.10.22 (partial)	**This is the start of the Alternate Path. The applicant should recognize that the 'D' MFRV does not start to open**	Applicant verified the following sequence: a. AE SS-500A, SG Level Control Valve Selection, each SG XFR button GREYS out. b. ALL SG MFRV and MFRV Bypass Valves controllers AUTO/MAN indicators begin FLASHING c. ALL MFRV Bypass Valves begin CLOSING d. ALL MFRVs begin OPENING	**S U** Comments:
*15.	PLACE the 'D' Steam Generator's MFRV/ MFRBV valve controller in MANUAL and HOLD until both MFRV and MFRBV valve controllers' MANUAL buttons are lit and not blinking. The "A', "B', and "C" Steam Generator valve transfers will continue. Note prior to Step 5.10.18		Applicant PLACED the 'D' Steam Generator's MFRV/ MFRBV valve controller in MANUAL and HOLD until both MFRV and MFRBV valve controllers' MANUAL buttons are lit and not blinking.	**S U** Comments:
*16	If any AUTO Sequence Step does not complete as expected or is terminated by operator action, then take MANUAL Control as needed and complete remaining transfer functions for the 'D' Steam Generator(s)per section 5.11, Transferring from MFRV Bypass Valves to MFRVs – MANUAL METHOD. Caution prior to Step 5.10.18		Applicant took manual control of "D" SG level and did not allow a SG isolation signal to develop.	**S U** Comments:

*Critical Step

17.	VERIFY the following sequence occurs: e. WHEN MFRV Bypass Valves CLOSE, MFRV Bypass Valve controllers transfers to MANUAL f. WHEN MFRV Bypass Valves CLOSED, MFRV Valve controllers transfer to AUTOMATIC g. FC PS-509 MFP DELTA P Control Selector, HIGH Power and LOW Power both FLASHING. h. FC SK-509A, Feed Pump Master Control, DELTA P Setpoint LOWERS to HIGH Power Program Setpoint. i. MFP in OPERATION Speed Lowering. j. FC SK-509A, Feed Pump Master Control, DELTA P LOWERING. k. The FC PS-509 MFP DELTA P Control Selector HIGH POWER light comes ON, and LOW POWER light goes OFF, When DELTA P reaches approximately 3-5 psid of the High Power Program setpoint. Step 5.10.22		Applicant verified the following sequence for the 'A', 'B', and 'C' SGs e. WHEN MFRV Bypass Valves CLOSE, MFRV Bypass Valve controllers transfers to MANUAL f. WHEN MFRV Bypass Valves CLOSED, MFRV Valve controllers transfer to AUTOMATIC Steps g thru k will not occur due to aborted transfer	**S U** Comments:
18.	The JPM is complete after the applicant has transferred the 'A', 'B', and 'C' SGs to the MFRVs and the 'D" SG level is being manually controlled	**THIS JPM IS COMPLETE**	Applicant informed CRS that the 'A', 'B', and 'C' FRVs have transferred and that the 'D' SG level is being manually controlled using the MFRV Bypass valve due to the 'D' MFRV not opening.	**S U** Comments

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The Callaway Plant is in Mode 1 at 22-25% Reactor Power. The Control Room Crew is performing a power ascension.

Initiating Cues: The Control Room Supervisor directs you to transfer Steam Generator Water Level Control from the MFRV Bypass Valves to the Main Feedwater Regulating Valves using OTN-AE-00001, Feedwater System, Section 5.10.

Steps 5.10.1 through 5.10.15 of OTN-AE-00001 have been completed.

An OT is at the MFRVs.

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

S5

JPM No:	URO-AEO-02-C201J(A)	KSA No:	011EA1.13
Revision Date:	06/03/2015	KSA Rating:	4.1 / 4.2
Job Title:	URO/SRO		
Duty:	EMERGENCY ACTIONS		
Task Title:	TRANSFER TO HOT LEG RECIRCULATION – No RHR Flow		
Completion Time:	15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☒ Simulator/Lab ☐ Plant ☐ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☒ Alternate Path ☐ Time Critical ☐ RCA

References: ES-1.4, TRANSFER TO HOT LEG RECIRCULATION, REVISION 9

Tools / Equipment: None

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: THE PLANT HAS EXPERIENCED A LARGE BREAK LOCA.

TRANSFER TO COLD LEG RECIRC WAS COMPLETED APPROXIMATELY 12 HOURS AGO.

IT HAS NOW BEEN 13 HOURS SINCE EVENT INITIATION.

Initiating Cues: THE CONTROL ROOM SUPERVISOR HAS DIRECTED YOU TO TRANSFER TO HOT LEG RECIRC PER ES-1.4, TRANSFER TO HOT LEG RECIRCULATION

INFORM THE CONTROL ROOM SUPERVISOR WHEN STEP 2 OF ES-1.4 HAS BEEN COMPLETED.

Notes:

1. SELECT A MODE 2 OR ABOVE IC. (IC 169 contains step 2 thru 5 inserted below)
2. Insert a large RCS leak
    - MALFUNCTION (BB) BB001_B, Value = 75000, ramp 10 sec
3. CHANGE PARAMETER RWST LEVEL TO 16%
    - (BN) TBN01TAZTLIL, Value = 16%
4. SWAP ECCS TO COLD LEG RECIRC PER ES-1.3
5. FRZ SIMULATOR UNTIL READY TO PERFORM JPM
6. Secured containment spray
7. Fail HV8840 closed
    - ME Schematic (EJ) m22ej01, select valve HV8840, Fail to specified position, EJHV8840_MTVFAILSP, value = 0

Task Standard: UPON COMPLETION OF THIS JPM, THE APPLICANT WILL HAVE ALIGNED SI PUMPS TO INJECT INTO THE RCS HOT LEGS.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.		Provide Applicant with Procedure copy	APPLICANT OBTAINED PROCEDURE COPY	**S U** Comments:
2.	Check NG02 ENERGIZED STEP 1.a		APPLICANT CHECKED NG02 IS ENERGIZED NG HIS-12 RED LIGHT IS ON AND GREEN LIGHT IS OFF	**S U** Comments:
3.	PLACE POWER LOCKOUT SWITCH for EJ HIS-8809B, IN NON ISO POSITION • EJ HIS-8809BA STEP 1.b.1)		APPLICANT PLACED EJ HIS-8809BA IN NON ISO NON ISO LIGHT COMES ON FOR EJ HIS 8809BA	**S U** Comments:
4.	CLOSE RHR TO ACCUMULATOR INJECTION LOOPS 3 AND 4 valve • EJ HIS-8809B STEP 1.b.2)		APPLICANT DEPRESSED CLOSE PUSHBUTTON FOR RHR TO ACCUMULATOR INJECTION LOOPS 3 AND 4, EJ HIS-8809B EJ HIS 8809B GREEN LIGHT GOES ON AND RED LIGHT GOES OFF	**S U** Comments:
5.	PLACE POWER LOCKOUT for, EJ HIS-8809B, IN ISO POSITION • EJ HIS-8809BA STEP 1.b.3)		APPLICANT PLACED EJ HIS-8809BA IN ISO NON ISO LIGHT GOES OFF FOR EJ HIS-8809BA	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
6.	OPEN RHR TRAIN 'B' HOT LEG RECIRC VALVE • EJ HV-8716B STEP 1.c		APPLICANT DEPRESSED OPEN PUSHBUTTON FOR RHR TRAIN 'B' HOT LEG RECIRC VALVE, EJ HIS-8716B EJ HIS-8716B RED LIGHT GOES ON AND GREEN LIGHT GOES OFF	**S U** Comments:
7.	PLACE POWER LOCKOUT SWITCH, EJ HIS-8840, IN NON ISO POSITION • EJ HIS-8840A STEP 1.d.1)		APPLICANT PLACED EJ HIS-8840A IN NON ISO NON ISO LIGHT COMES ON FOR EJ HIS 8840A	**S U** Comments:
8.	OPEN RHR HOT LEG RECIRC VALVE EJ HV-8840 AND ENSURE RHR FLOW ON EJ FI-988 STEP 1.d.2	**START OF ALTERNATE PATH**	APPLICANT DEPRESSED RHR HOT LEG RECIRC VALVE EJ HIS-8840 OPEN PUSHBUTTON EJ HIS-8840 RED LIGHT DOES NOT GO ON AND GREEN LIGHT STAYS ON EJ FI-988 INDICATES 0 GPM	**S U** Comments:
*9.	PLACE POWER LOCKOUT SWITCH, EJ HIS-8840, IN ISO POSITION • EJ HIS-8840A STEP 1.d.2) RNO 2)a)		APPLICANT PLACED EJ HIS-8840A IN ISO NON ISO LIGHT GOES OFF FOR EJ HIS 8840A	**S U** Comments:
*10.	CLOSE RHR TRAIN 'B' HOT LEG RECIRC VALVE • EJ HV-8716B STEP 1.d.2) RNO 2)b)		APPLICANT DEPRESSED CLOSE PUSHBUTTON FOR RHR TRAIN 'B' HOT LEG RECIRC VALVE, EJ HIS-8716B EJ HIS-8716B RED LIGHT GOES OFF AND GREEN LIGHT GOES ON	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*11.	PLACE POWER LOCKOUT for, EJ HIS-8809B, IN NON ISO POSITION • EJ HIS-8809BA STEP 1.d.2) RNO 2)c)1.		APPLICANT PLACED EJ HIS-8809BA IN NON ISO NON ISO LIGHT COMES ON FOR EJ HIS-8809BA	**S U** Comments:
*12.	OPEN RHR TO ACCUMULATOR INJECTION LOOPS 3 AND 4 valve • EJ HIS-8809B STEP 1.d.2) RNO 2)c)2.		APPLICANT DEPRESSED OPEN PUSHBUTTON FOR RHR TO ACCUMULATOR INJECTION LOOPS 3 AND 4, EJ HIS-8809B EJ HIS 8809B GREEN LIGHT GOES OFF AND RED LIGHT GOES ON	**S U** Comments:
*13.	PLACE POWER LOCKOUT for, EJ HIS-8809B, IN ISO POSITION • EJ HIS-8809BA STEP 1.d.2) RNO 2)c)3.		APPLICANT PLACED EJ HIS-8809BA IN ISO NON ISO LIGHT GOES OFF FOR EJ HIS-8809BA	**S U** Comments:
14.	Go To Step 2. STEP 1.d.2) RNO 2)d)		APPLICANT PROCEEDED to STEP 2	**S U** Comments:
*15.	STOP SI PUMP 'A': • EM HIS-4 STEP 2.a		APPLICANT STOPPED 'A' SI PUMP USING EM HIS-4 THE GREEN LIGHT GOES ON AND THE RED LIGHT GOES OFF ON EM HIS 4 DISCHARGE PRESSURE AND FLOW DECAY TO 0	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*16.	CLOSE SI PUMP 'A' DISCHARGE TO COLD LEG INJECTION VALVE: • EM HV-8821A STEP 2.b		APPLICANT DEPRESSED CLOSE PUSHBUTTON EM HIS-8821A, SI PUMP 'A' DISCHARGE TO COLD LEG INJECTION EM HIS-8821A GREEN LIGHT GOES ON AND FOUR (4) SECONDS LATER, THE RED LIGHT GOES OFF	**S U** Comments:
*17.	PLACE POWER LOCKOUT SWITCH FOR EM HIS-8802A IN NON ISO POSITION • EM HIS-8802AA STEP 2.c.1)		APPLICANT PLACED EM HIS-8802AA IN NON ISO NON ISO LIGHT COMES ON FOR EM HIS 8802AA	**S U** Comments:
*18.	OPEN SI PUMP 'A' DISCHARGE TO HOT LEG INJECTION VALVE: • EM HV-8802A STEP 2.c.2)		APPLICANT DEPRESSED OPEN PUSHBUTTON EM HIS-8802A, SI PUMP 'A' DISCHARGE TO HOT LEG INJECTION EM HIS-8802A RED LIGHT GOES ON AND THE GREEN LIGHT GOES OFF	**S U** Comments:
19.	PLACE POWER LOCKOUT SWITCH, EM HIS-8802A IN ISO POSITION: • EM HIS-8802AA STEP 2.c.3)		APPLICANT PLACED EM HIS-8802AA IN ISO NON ISO LIGHT GOES OFF FOR EM HIS 8802AA	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*20.	START SI PUMP 'A': • EM HIS-4 STEP 2.d		APPLICANT STARTED 'A' SI PUMP USING EM HIS-4 RED LIGHT GOES ON AND GREEN LIGHT GOES OFF FOR EM HIS 4 DISCHARGE PRESS AND FLOW RETURN TO PREVIOUS VALUES	**S U** Comments:
*21.	STOP SI PUMP 'B': • EM HIS-5 STEP 2.e		APPLICANT STOPPED 'B' SI PUMP USING EM HIS-5 THE GREEN LIGHT GOES ON AND THE RED LIGHT GOES OFF FOR EM HIS 5 DISCHARGE PRESS AND FLOW DECAY TO 0	**S U** Comments:
*22.	CLOSE SI PUMP 'B' DISCHARGE TO COLD LEG INJECTION VALVE • EM HV-8821B STEP 2.f		APPLICANT CLOSED 'B' DISCHARGE TO COLD LEG INJECTION USING EM HIS-8821B EM HIS-8821B GREEN LIGHT GOES ON AND FOUR (4) SECONDS LATER, THE RED LIGHT GOES OFF	**S U** Comments:
*23.	PLACE POWER LOCKOUT FOR EM HIS-8802B, IN NON ISO POSITION STEP 2.g.1)		APPLICANT PLACED EM HIS-8802BA IN NON ISO NON ISO LIGHT COMES ON FOR EM HIS 8802BA	**S U** Comments:
*24.	OPEN SI PUMP 'B' DISCHARGE TO HOT LEG INJECTION VALVE: • EM HV-8802B, STEP 2.g.2)		APPLICANT OPENED SI PUMP 'B' DISCHARGE TO HOT LEG INJECTION USING EM HIS-8802B EM HIS 8802B RED LIGHT GOES ON AND THE GREEN LIGHT GOES OFF	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
25.	PLACE POWER LOCKOUT SWITCH FOR EM HIS-8802B, IN ISO POSITION: • EM HIS-8802BA STEP 2.g.3)		APPLICANT PLACED EM HIS-8802BA IN ISO NON ISO LIGHT GOES OFF FOR EM HIS 8802BA	**S U** Comments:
*26.	START SI PUMP 'B': • EM HIS-5 STEP 2.h		APPLICANT STARTED 'B' SI PUMP USING EM HIS-5 EM HIS-5 RED LIGHT GOES ON AND GREEN LIGHT GOES OFF DISCHARGE PRESS AND FLOW RETURN TO PREVIOUS VALUES	**S U** Comments:
28.	INFORM THE CONTROL ROOM SUPERVISOR WHEN STEP 2 OF ES-1.4 HAS BEEN COMPLETED	**RESPOND as the CRS**	APPLICANT REPORTED TO CRS STEP 2 IS COMPLETE.	**S U** Comments:

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

THE PLANT HAS EXPERIENCED A LARGE BREAK LOCA.

TRANSFER TO COLD LEG RECIRC WAS COMPLETED APPROXIMATELY 12 HOURS AGO.

IT HAS NOW BEEN 13 HOURS SINCE EVENT INITIATION.

Initiating Cues:

THE CONTROL ROOM SUPERVISOR HAS DIRECTED YOU TO TRANSFER TO HOT LEG RECIRC PER ES-1.4, TRANSFER TO HOT LEG RECIRCULATION

INFORM THE CONTROL ROOM SUPERVISOR WHEN STEP 2 OF ES-1.4 HAS BEEN COMPLETED.

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

S6

JPM Bank No:	Sim S6, Rev 1	KSA No:	062K1.04
Revision Date:	02/05/2016	KSA Rating:	3.7 / 4.2
Job Title:	URO/SRO		
Duty:	Station Blackout		
Task Title:	Perform Operational Testing of the Alternate Emergency Power Source		
Completion Time:	15 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☒ Simulator/Lab ☐ Plant ☐ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: OTS-PA-00001, Operation And Testing Of The Alternate Emergency Power Source, Rev 19

Tools / Equipment: none

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The plant is at 100% power

Initiating Cues: The Control Room Supervisor (CRS) directs you to perform an offline test of EDGPA5004, AEPS Diesel Generator #4, in accordance with OTS-PA-00001, Operation And Testing Of The Alternate Emergency Power Source, Section 5.6.

The CRS directs you to take one (1) set of readings on Attachment 5 and then secure EDGPA5004.

The Outside OT has been briefed and is at EDGPA5004 to assist in the diesel test.

All Precautions and Limitiations and Prerequisites are satisfied.

All pre-start checks per sections 5.1 and 5.2 are complete

Note: Use any IC that has AEPS available

Task Standard: Upon completion of this JPM, the applicant will have started AEPS Diesel Generator #4, taken readings and secured the diesel

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.		Provide applicant with procedure copy	Applicant obtained working copy of OTS-PA-00001	**S U** Comments:
2.	Review Precautions and Limitations		Applicant reviewed Precautions and Limitations	**S U** Comments:
3.	Review Prerequisites		Applicant reviewed Prerequisites	**S U** Comments:
4.	Diesels are operated from PBXY0001, AEPS COMPUTER INTERFACE, in the Control Room. Similar controls are available on the Master HMI (PA50102 cubicle) in the PA501 building. The local control panel on the switchgear requires Key Tag 263 (individual key number 0) to place it in service. Sections 5.3 through 5.6 may be performed concurrently. Prior to 5.6.1		Applicant read note	**S U** Comments:
5.	Check Pre-start checks have been performed Step 5.6.1	Examiner Cue: **Pre-start checks are complete**	Applicant checked that pre-start checks were complete	**S U** Comments:

*Critical Step

*6.	On the Main Screen on PBXY0001, press icon for PA50107 for AEPS Diesel Generator #4 Step 5.6.2		Applicant pressed icon for PA50107 on PBXY0001 Generator #4 EDGPA5004 Control Panel is now displayed	**S U** Comments:
7.	Check the diesel status lights are green under the alarm monitoring section of the pop-up screen. Any status light not green must be evaluated by the CRS prior to continuing. Step 5.6.3		Applicant checked status lights were green under the alarm monitoring section of the pop-up screen	**S U** Comments:
*8.	START EDGPA5004, AEPS DIESEL GENERATOR 4, by performing the following: a. In the pop-up window, PRESS the button “Off Line Gen Test Start”. Step 5.6.4a		Applicant pressed the button “Off Line Gen Test Start” in the pop-up window	**S U** Comments:
*9.	START EDGPA5004, AEPS DIESEL GENERATOR 4, by performing the following: b. In the confirmation pop-up window, PRESS “Yes Start Generator” to start the diesel. Step 5.6.4b		Applicant pressed the button “Yes Start Generator” in the confirmation pop-up window	**S U** Comments:

*Critical Step

10.	Check the diesel started Step 5.6.5		Applicant checked that the diesel started Engine speed indicates approximately1800 RPM and MegaWatts indicate 0 MW	**S U** Comments:
11.	Locally check the ventilation dampers have opened Step 5.6.6	Examiner Cue: **The OT reports the ventilation dampers are open**	Applicant contacted the Outside Operations Technician (OOT) to verify the ventilation dampers were open	**S U** Comments:
12.	Check diesel parameters come into normal range per Attachment 5 Step 5.6.7		Applicant checked diesel parameters came into normal range All Attachment 5 parameters are within their normal range	**S U** Comments:

*Critical Step

*13.	Record readings on Attachment 5 at 15 minute intervals Step 5.6.8	Examiner Cue: You are directed to take the Attachment 5 readings from Panel PBXY0001 in the Control Room	Applicant recorded 1 set of Attachment 5 readings as directed in Initiating Cues Indications are approximately: Oil Press 57 Water Temp 140 (will trend up the longer the JPM last) Battery Volt 26 Engine RPM 1800 Volts A 13.8 Volts B 13.8 Volts C 13.8 Hz 60.0 Amps A 0 or NA Amps B 0 or NA Amps C 0 or NA KiloWatts 0 or NA KiloVars 0 or NA Power Factor 0 or NA	**S U** Comments:
14.	NOTE: AEPS diesels go into a 5-minute cooldown period after Stop command is given. A "Cool Down Time Left" timer shows the time remaining in the 5-minute period (in seconds). CAUTION: The 286 relay must be reset prior to shutting down any of the remaining diesels to ensure a minimum of three diesels remain functional at all times. Prior to 5.6.9		Applicant read note and caution	**S U** Comments:

*Critical Step

*15.	Press the button "Generator Normal Stop" Step 5.6.9		Applicant pressed the button "Generator Normal Stop"	**S U** Comments:
*16.	Confirm the command by pressing the button "Yes Stop Generator" Step 5.6.10		Applicant confirmed the command by pressing the button "Yes Stop Generator"	**S U** Comments:
17.	After the 5-minute cooldown period, CHECK the diesel STOPPED. Step 5.6.11	Examiner Cue **"The 5 minute cooldown is complete and the diesel has stopped"**	After the 5-minute cooldown period, the applicant CHECKED the diesel STOPPED.	**S U** Comments:
18.	IF the 286 Lockout Relay is tripped, PERFORM Section 5.11 of this procedure. Step 5.6.12	Examiner Cue **"The 286 Lockout Relay is NOT tripped"**	Applicant checked IF the 286 Lockout Relay is tripped,	
19		**The JPM is complete**		**S U** Comments:

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The plant is at 100% power

Initiating Cues: The Control Room Supervisor (CRS) directs you to perform an offline test of EDGPA5004, AEPS Diesel Generator #4, in accordance with OTS-PA-00001, Operation And Testing Of The Alternate Emergency Power Source, Section 5.6.

The CRS directs you to take one (1) set of readings on Attachment 5 and then secure EDGPA5004.

The Outside OT has been briefed and is at EDGPA5004 to assist in the diesel test.

All Precautions and Limitiations and Prerequisites are satisfied.

All pre-start checks per sections 5.1 and 5.2 are complete

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

S7

JPM No:	URO-SSE-03-C126J	KSA No:	015A4.03
Revision Date:	02/06/2016	KSA Rating:	3.8/3.9
Job Title:	URO		
Duty:	Off Normal Nuclear Instrumentation		
Task Title:	Respond to a failed power range instrument		
Completion Time:	10 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☒ Simulator/Lab ☐ Plant ☐ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: OTO-SE-00001, Nuclear Instrument Malfunction, Rev 25

Tools / Equipment: None

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: Callaway Plant is in Mode 1. Power Range NIS channel N41 failed high. The actions of OTO-SE-00001, Nuclear Instrument Malfunction, have been performed through step A4 of Attachment 'A'.

Initiating Cues: The Control Room Supervisor directs you to perform step 5 of OTO-SE-00001, Attachment 'A', Power Range Instrument Malfunction.

Note:

Use any full power IC (IC 10)

Verify:

- Main Feedwater Reg Valves in service.
- Rod Control is in Manual
- Insert malfunction (SE)SEN0041, value = 200, ramp = 10 seconds

Task Standard: Upon Completion of this JPM, Power Range NIS channel N41 current comparator and rod stop inputs will be bypassed.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	Obtain a verified copy of OTO-SE-00001, Nuclear Instrument Malfunction		Applicant obtained a copy of procedure	**S U** Comments:
*2.	Bypass the malfunctioning channel by selecting it on the following switches: Detector Current Comparator drawer: Place Upper Section switch to the failed channel Step A5.a		Applicant placed the Upper Section switch, on the Detector Current Comparator drawer, in the N41 position The Upper Section switch on the Detector Current Comparator drawer is in the N41 position	**S U** Comments:
*3.	Detector Current Comparator drawer: Place Lower Section switch to the failed channel Step A5.a		Applicant placed the Lower Section switch, on the Detector Current Comparator drawer, in the N41 position The Lower Section switch on the Detector Current Comparator drawer is in the N41 position	**S U** Comments:
*4.	Detector Current Comparator drawer: Place Rod Stop Bypass switch to the failed channel Step A5.a		Applicant placed the Rod Stop Bypass switch, on the Detector Current Comparator drawer, in the N41 position The Rod Stop Bypass switch on the Detector Current Comparator drawer is in the N41 position	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*5.	Detector Current Comparator drawer: Place Power Mismatch Bypass switch to the failed channel Step A5.a		Applicant placed the Power Mismatch Bypass switch, on the Detector Current Comparator drawer, in the N41 position The Power Mismatch Bypass switch on the Detector Current Comparator drawer is in the N41 position	**S U** Comments:
*6.	On the Comparator and Rate drawer, Place Comparator Channel Defeat switch to the failed channel Step A5.b		Applicant placed the Comparator Channel Defeat switch, on the Comparator and Rate drawer, in the N41 position The Comparator Channel Defeat switch on the Comparator and Rate drawer is in the N41 position	**S U** Comments:
7.	Ensure the following Annunciators are extinguished: 78A, PR CH DEV 78B, UP DET DEV 78C, LO DET DEV 82A, PR ROD STOP Step A5.c		Applicant ensured the following Annunciators are extinguished: 78A, PR CH DEV 78B, UP DET DEV 78C, LO DET DEV 82A, PR ROD STOP 78A, PR CH DEV 78B, UP DET DEV 78C, LO DET DEV 82A, PR ROD STOP are extinguished:	**S U** Comments:
		THE JPM IS COMPLETE		**S U** Comments:

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:	Callaway Plant is in Mode 1. Power Range NIS channel N41 failed high. The actions of OTO-SE-00001, Nuclear Instrument Malfunction, have been performed through step A4 of Attachment 'A'.
Initiating Cues:	The Control Room Supervisor directs you to perform step 5 of OTO-SE-00001, Attachment 'A', Power Range Instrument Malfunction.

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

S8

JPM No:	NEW	KSA No:	029G2.1.29
Revision Date:	02/06/2016	KSA Rating:	4.1 / 4.0
Job Title:	URO/SRO		
Duty:	CTMT Purge System		
Task Title:	Remove Shutdown Purge System from Service		
Completion Time:	11 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☒ Simulator/Lab ☐ Plant ☐ Classroom

Method of Performance: ☐ Simulated ☒ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: OTN-GT-00001, Containment Purge System, Rev 31

Tools / Equipment: None

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: The plant is in Mode 5.

The Containment Equipment Hatch is closed.

The Control Room Supervisor (CRS) has the Gaseous Rad Release Permit.

Initiating Cues: The maintenance activities inside containment and core alterations have been completed.
The CRS directs you to remove Shutdown Purge from service in accordance with OTN-GT-00001, Containment Purge System, Section 5.5 through step 5.5.7 and inform the CRS date and time dampers were closed.

Notes: Use any Mode 5 or 6 (IC 23).
Remove Mini Purge from service IAW OTN-GT-00001, Section 5.3
Place Shutdown Purge in service IAW OTN-GT-00001, Section 5.4
Place the GT system on display

Task Standard: Upon completion of this JPM, the Applicant will have removed Shutdown Purge from service IAW OTN-GT-00001.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	Obtain a verified working copy of OTN-GT-00001	Provide applicant with procedure copy	Applicant obtained working copy of OTN-GT-00001	**S U** Comments:
2.	Review Precautions and Limitations Section 3.0		Applicant reviewed Precautions and Limitations	**S U** Comments:
3.	Review Prerequisites Section 4.0	If asked: **"Scaffolding is available for the valves listed in step 4.2"**	Applicant reviewed Prerequisites	**S U** Comments:
4.	If containment equipment hatch is open during core alterations and mini-purge exhaust must be secured, perform one of the following: Step 5.1.1		Applicant read step and determined that it was N/A for the given initial conditions and went to Step 5.5.2	**S U** Comments:
*5.	IF Equipment Hatch is CLOSED, PERFORM the following: a. Using GT HIS-7, CTMT S/D PURGE AIR SPLY CTMT ISO, CLOSE GTHZ0007. Step 5.5.2.a		Applicant closed GTHZ0007 using GT HIS-7, CTMT S/D PURGE AIR SPLY CTMT ISO GT HIS-7 green light is lit and the red light is not lit	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*6.	IF Equipment Hatch is CLOSED, PERFORM the following: b. Using GT HIS-6, CTMT S/D PURGE AIR SPLY CTMT ISO, CLOSE GTHZ0006. Step 5.5.2.b		Applicant closed GTHZ0006 using GT HIS-6, CTMT S/D PURGE AIR SPLY CTMT ISO GT HIS-6 green light is lit and the red light is not lit	**S U** Comments:
*7.	IF Equipment Hatch is CLOSED, PERFORM the following: c. Using GT HIS-1, CTMT S/D PURGE AIR SPLY UNIT, STOP SGT01. Step 5.5.2.c		Applicant stopped SGT01 using GT HIS-1, CTMT S/D PURGE AIR SPLY UNIT GT HIS-1 green light is lit and the red light is not lit	**S U** Comments:
*8.	IF Equipment Hatch is CLOSED, PERFORM the following: d. Using GT HIS-26, CTMT PURGE SYS AIR SPLY DAMPER, CLOSE GTHZ0026. Step 5.5.2.d	(H) indicates the switch must be held	Applicant closed GTHZ0026 using GT HIS-26, CTMT PURGE SYS AIR SPLY DAMPER GT HIS-26 green light is lit and the red light is not lit	**S U** Comments:
*9.	IF Equipment Hatch is CLOSED, PERFORM the following: e. Using GT HIS-27, CTMT PURGE SYS AIR SPLY DAMPER, CLOSE GTHZ0027. Step 5.5.2.e	(H) indicates the switch must be held	Applicant closed GTHZ0027 using GT HIS-27, CTMT PURGE SYS AIR SPLY DAMPER GT HIS-27 green light is lit and the red light is not lit	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*10.	Using GT HIS-34, CTMT S/D PURGE EXH FAN & DAMPER, STOP CGT01 Step 5.5.3		Applicant stoped CGT01 using Using GT HIS-34, CTMT S/D PURGE EXH FAN & DAMPER GT HIS-34 green light is lit and the red light is not lit	**S U** Comments:
*11.	Using GT HIS-8, CTMT S/D PURGE EXH INNER CTMT ISO, CLOSE GTHZ0008 Step 5.5.4		Applicant closed GTHZ0008 GT HIS-8, CTMT S/D PURGE EXH INNER CTMT ISO GT HIS-8 green light is lit and the red light is not lit	**S U** Comments:
*12.	Using GT HIS-9, CTMT S/D PURGE EXH OUTER CTMT ISO, CLOSE GTHZ0009 Step 5.5.5		Applicant closed GTHZ0009 using GT HIS-9, CTMT S/D PURGE EXH OUTER CTMT ISO GT HIS-9 green light is lit and the red light is not lit	**S U** Comments:
*13.	Using GT HIS-28, CTMT PURGE EXH DAMPER, close GTHZ0028 Step 5.5.6	(H) indicates the switch must be held	Applicant closed GTHZ0028 using GT HIS-28, CTMT PURGE EXH DAMPER GT HIS-28 green light is lit and the red light is not lit	**S U** Comments:
*14.	Using GT HIS-29, CTMT PURGE EXH DAMPER, CLOSE GTHZ0029 Step 5.5.7	(H) indicates the switch must be held	Applicant closed GTHZ0029 using GT HIS-29, CTMT PURGE EXH DAMPER GT HIS-29 green light is lit and the red light is not lit	**S U** Comments:
15.	Record date and time dampers were closed on Gaseous Rad Release Permit and Control Room Log Step 5.5.8	**CRS acknowledges**	Applicant informed CRS of date and time dampers were closed	**S U** Comments:

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
16.	Informs CRS Shutdown Purge has been removed from service in accordance with OTN-GT-00001, Containment Purge System, Section 5.5 through step 5.5.11.	**THE JPM IS COMPLETE**	Applicant informed CRS Shutdown Purge has been removed from service in accordance with OTN-GT-00001, Containment Purge System, Section 5.5 through step 5.5.7.	**S U** Comments:

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:	The plant is in Mode 5. The Containment Equipment Hatch is closed. The Control Room Supervisor (CRS) has the Gaseous Rad Release Permit.
Initiating Cues:	The maintenance activities inside containment and core alterations have been completed. The CRS directs you to remove Shutdown Purge from service in accordance with OTN-GT-00001, Containment Purge System, Section 5.5 through step 5.5.7 and inform the CRS date and time dampers were closed.

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

P1

JPM Bank No:	RO-SRO Au j	KSA No:	006 A4.02
Revision Date:	02/06/2016	KSA Rating:	4.0*/3.8
Job Title:	URO/SRO		
Duty:	ECCS		
Task Title:	Secure Safety Injection Accumulators		
Completion Time:	10 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☐ Simulator/Lab ☒ Plant ☐ Classroom

Method of Performance: ☒ Simulated ☐ Performed

☐ Alternate Path ☐ Time Critical ☒ RCA

References: OTG-ZZ-00006, Addendum 06, Securing Safety Injection Accumulator, Rev 4

Tools / Equipment: PPE

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: Callaway Plant is in Mode 4.

A Plant Cooldown using OTG-ZZ-00006, Plant Cooldown Ht Standby to Cold Shutdown is in progress

RCS pressure is 900 psig

Initiating Cues: The Control Room Supervisor directs you to secure the Safety Injection Accumulators per OTG-ZZ-00006, Addendum 06.

The CRS has given you key PA40

An RO is standing by in the control room to close the SI Accumulator Outlet Valves

Task Standard: 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.

Start Time: _____

Stop Time: _____

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.	Obtain a verified working copy of OTG-ZZ-00006, Addendum 06	Provide Applicant with procedure copy	Applicant obtained procedure copy	**S U** Comments:
2.	Review the Purpose, Scope, and Prerequisites. Sections 1.0, 2.0, and 4.0		Applicant reviewed the Purpose, Scope, and Prerequisites.	**S U** Comments:
3.	MAINTAIN Continuous Actions per OTG-ZZ-00006, Plant Cooldown Hot Standby to Cold Shutdown. Step 5.1		Applicant reviewed step. (step was initial by CRS)	**S U** Comments:
4.	Ensure RCS pressure is below 1000 psig. Step 5.2.1	Given in cue	Applicant contacted the control room to verify RCS pressure	**S U** Comments:
*5.	Locally REMOVE locks from the following breakers and CLOSE the breaker: • NG01BGF3, FDR BKR TO EPHV8808A SI ACC A OUT ISO • NG01BGF2, FDR BKR TO EPHV8808C SI ACC C OUT ISO • NG02BGF3, FDR BKR TO EPHV8808B SI ACC B OUT ISO • NG02BHF2, FDR BKR TO EPHV8808D SI ACC D OUT ISO Step 5.2.2	As each breaker is identified and operation is described, respond that the breaker is in the operated position	Applicant demonstrated the ability to locate and operate the below breakers • NG01BGF3, FDR BKR TO EPHV8808A SI ACC A OUT ISO • NG01BGF2, FDR BKR TO EPHV8808C SI ACC C OUT ISO • NG02BGF3, FDR BKR TO EPHV8808B SI ACC B OUT ISO • NG02BHF2, FDR BKR TO EPHV8808D SI ACC D OUT ISO	**S U** Comments:

*Critical Step

*6.	Using the following hand switches, CLOSE the SI Accumulator Outlet Isolation Valves: • EP HIS-8808A, ACCUM TANK A OUTLET VLV • EP HIS-8808B, ACCUM TANK B OUTLET VLV • EP HIS-8808C, ACCUM TANK C OUTLET VLV • EP HIS-8808D, ACCUM TANK D OUTLET VLV Step 5.2.3	Respond as the RO in the Control Room **"EP HIS-8808A, ACCUM TANK A OUTLET VLV** **EP HIS-8808B, ACCUM TANK B OUTLET VLV** **EP HIS-8808C, ACCUM TANK C OUTLET VLV** **AND** **EP HIS-8808D, ACCUM TANK D OUTLET VLV** **Are closed"**	Applicant contacted the Control Room and directed them to close the below switches: • EP HIS-8808A, ACCUM TANK A OUTLET VLV • EP HIS-8808B, ACCUM TANK B OUTLET VLV • EP HIS-8808C, ACCUM TANK C OUTLET VLV • EP HIS-8808D, ACCUM TANK D OUTLET VLV	**S U** Comments:
*7.	Locally OPEN the following breakers and LOCK them open: • NG01BGF3, FDR BKR TO EPHV8808A SI ACC A OUT ISO • NG01BGF2, FDR BKR TO EPHV8808C SI ACC C OUT ISO • NG02BGF3, FDR BKR TO EPHV8808B SI ACC B OUT ISO • NG02BHF2, FDR BKR TO EPHV8808D SI ACC D OUT ISO Step 5.2.4	As each breaker is identified and operation is described, respond that the breaker is in the operated position	Applicant demonstrated the ability to locate and operate the below breakers • NG01BGF3, FDR BKR TO EPHV8808A SI ACC A OUT ISO • NG01BGF2, FDR BKR TO EPHV8808C SI ACC C OUT ISO • NG02BGF3, FDR BKR TO EPHV8808B SI ACC B OUT ISO • NG02BHF2, FDR BKR TO EPHV8808D SI ACC D OUT ISO	**S U** Comments:
8.	INDEPENDENTLY VERIFY each breaker in Step 5.2.4 is locked open. Step 5.2.5	Inform the Applicant that another operator will complete the independent verification.	Applicant informed CRS breakers need to be IVed.	**S U** Comments:

*Critical Step

9.	NOTE any exceptions to the execution of this procedure AND return to OTG-ZZ-00006, Plant Cooldown Hot Standby to Cold Shutdown. Step 5.2.6		Applicant informed CRS there were no exceptions to the procedure	**S U** Comments
10	OBTAIN procedure completion signature from SM/CRS: Step 5.2.7		Applicant informed CRS the procedure is complete	**S U** Comments
13.	**JPM IS COMPLETE**			**S U** Comments

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

Callaway Plant is in Mode 4.

A Plant Cooldown using OTG-ZZ-00006, Plant Cooldown Ht Standby to Cold Shutdown is in progress

RCS pressure is 900 psig

Initiating Cues:

The Control Room Supervisor directs you to secure the Safety Injection Accumulators per OTG-ZZ-00006, Addendum 06.

The CRS has given you key PA40

An RO is standing by in the control room to close the SI Accumulator Outlet Valves

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

P2

JPM No:	EOP-SAB08077J(A)	KSA No:	041A2.02
Revision Date:	02/06/2016	KSA Rating:	3.6 / 3.9
Job Title:	OT/URO/SRO		
Duty:	Main Steam System		
Task Title:	Isolate a Failed Open Atmospheric Steam Dump		
Completion Time:	10 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☐ Simulator/Lab ☒ Plant ☐ Classroom

Method of Performance: ☒ Simulated ☐ Performed

☒ Alternate Path ☐ Time Critical ☒ RCA

References: OTO-AB-00001, Steam Dump Malfunction, Rev 18

Tools / Equipment: PPE

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: A Reactor trip occurred from 100% power.

The crew has entered E-2, Faulted Steam Generator Isolation, due to Atmospheric Steam Dumps, AB PV-1 AND AB PV-4, failing open.

The valves cannot be closed from the Control Room.

Initiating Cues: The Control Room Supervisor (CRS) directs you to go to Area 5 and close AB PV-1 and AB PV-4.

Close AB PV-1 (SG A) first, then AB PV-4 (SG D) using Step 3 RNO of OTO-AB-00001, Steam Dump Malfunction.

Inform the CRS when both valves are closed.

Task Standard: 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.

Start Time: _____

Stop Time: _____

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*1.	Close the Air/N2 Isolation Valve for the affected SG ASD: • ABV0733 (SG A) Step 3 RNO a.	**ABV0733 is in the position you described**	Applicant closed ABV0733	**S U** Comments:
*2.	Open the Air/N2 Drain Valve for the affected SG ASD: • ABV0734 (SG A) Step 3 RNO b.	**ABV0734 is in the position you described** **AB PV-1 indicates closed and steam flow can NOT be heard through the ASD** May contact the control room at this time	Applicant opened ABV0734	**S U** Comments:
3.	Close the Air/N2 Isolation Valve for the affected SG ASD: • ABV0739 (SG D) Step 3 RNO a.	**ABV0739 is in the position you described**	Applicant closed ABV0739	**S U** Comments:
4.	Open the Air/N2 Drain Valve for the affected SG ASD: • ABV0740 (SG D) Step 3 RNO b.	**ABV0740 is in the position you described** **"AB PV-4 indicates open and steam flow can be heard through the ASD"**	Applicant opened ABV0740	**S U** Comments:
		The next step is the start of the alternate path. The student must recognize that AB-PV-4 is NOT closed and take additional actions to close the valve		

*Critical Step

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
*5.	If the SG ASD is not closed, then unlock and close the manual isolation valve for the affected SG ASD: • ABV0007 (SG D) Step 3 RNO	After ABV0007 is unlocked and closed: **"ABV0007 is in the position you described"** After ABV0007 is closed **"steam flow can NOT be heard through the ASD"** May contact the control room at this time	Applicant determined AB PV-4 is NOT closed and unlocked and closed ABV0007.	**S U** Comments:
6.	Notify CRS that AB PV-1 and 4 have been closed/isolated	CRS acknowledges	Applicant notified CRS that AB PV-1 was closed and AB PV-4 had been manually isolated	**S U** Comments:
7.		**THE JPM IS COMPLETE**		**S U** Comments:

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions:

A Reactor trip occurred from 100% power.

The crew has entered E-2, Faulted Steam Generator Isolation, due to Atmospheric Steam Dumps, AB PV-1 AND AB PV-4, failing open.

The valves cannot be closed from the Control Room.

Initiating Cues:

The Control Room Supervisor (CRS) directs you to go to Area 5 and close AB PV-1 and AB PV-4.

Close AB PV-1 (SG A) first, then AB PV-4 (SG D) using Step 3 RNO of OTO-AB-00001, Steam Dump Malfunction.

Inform the CRS when both valves are closed.

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

P3

JPM Bank No:	EOS-SNN-03-P010J	KSA No:	062A4.01
Revision Date:	02/06/2016	KSA Rating:	3.3 / 3.1
Job Title:	OT/URO/SRO		
Duty:	SAFETY RELATED ELEC AND DIST (NN)		
Task Title:	SHIFT AN INSTRUMENT BUS FROM ALTERNATE TO NORMAL POWER		
Completion Time:	12 minutes		

The performance of this task was evaluated against the standards contained in this JPM and determined to be:

☐ SATISFACTORY ☐ UNSATISFACTORY

Reason, if UNSATISFACTORY:

_____

_____

Evaluator Signature: _____ Date: _____

Task Performer: _____

Location of Performance:

☐ Control Room ☐ Simulator/Lab ☒ Plant ☐ Classroom

Method of Performance: ☒ Simulated ☐ Performed

☐ Alternate Path ☐ Time Critical ☐ RCA

References: OTN-NN-00001, 120V VITAL AC INST. POWER - CLASS 1E (NN), REV 19

Tools / Equipment: PPE

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: THE PLANT IS IN MODE 6. INSTRUMENT BUS NN01 IS BEING SUPPLIED BY ITS MANUAL BYPASS SOURCE NG01A FOR MAINTENANCE ON INVERTER NN11.

INVERTER NN11 MAINTENANCE IS COMPLETE. A CREW BRIEFING HAS BEEN CONDUCTED FOR THE RESTORATION.

Initiating Cues: YOU HAVE BEEN DIRECTED TO TRANSFER NN01 TO THE NORMAL POWER SOURCE FROM THE MANUAL BYPASS SOURCE, PER OTN-NN-00001, SECTION 5.4 and 5.5.

Task Standard: Upon completion of this JPM the applicant will have transferred NN01 to the normal power supply (inverter and NK01) without a loss of voltage.

Start Time: _____

Stop Time: _____

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

JPM STEP	TASK ELEMENT	EXAMINER CUE	PERFORMANCE STANDARD	SCORE
1.		Provide Applicant with procedure copy	Applicant obtained procedure copy	**S U** Comments:
2.	Review Scope, Precautions and Prerequisites Section 2.0, 3.0, and 4.0	Precautions and Prerequisites are satisfied	Applicant reviewed Scope, Precautions and Prerequisites	**S U** Comments:
3.	NOTE: This section places the Static Transfer Switch in service bypassing the inverter. Performance of this section should result in a bumpless transfer of power to the NN01 Bus. No voltage loss should occur. Note prior to Step 5.4.1		Applicant read note	**S U** Comments
4.	NOTIFY the Control Room that power to NN01 will be transferred and Step 3.7 should be reviewed for T/S applicability. Step 5.4.1	Respond as the Control Room	Applicant NOTIFIED the Control Room that power to NN01 will be transferred and Step 3.7 should be reviewed for T/S applicability	**S U** Comments
5.	At NN11, CHECK S1, MANUAL BYPASS SWITCH, in BYPASS SOURCE. Step 5.4.2	After the applicant correctly locates S1 at NN11 and describes the MANUAL BYPASS SWITCH position **"S1, MANUAL BYPASS SWITCH, is in BYPASS SOURCE."**	Applicant CHECKED S1, MANUAL BYPASS SWITCH, in BYPASS SOURCE.	**S U** Comments

*Critical Step

6.	At NN11, CHECK the following breakers are CLOSED: • B1, DC INPUT • B2, INVERTER OUTPUT • B3, BYPASS SOURCE INPUT TO STATIC SWITCH • B4, BYPASS SOURCE INPUT TO MBS • B800, BYPASS CVT INPUT Step 5.4.3	After the applicant correctly describes how to check the breakers closed **"B1, DC INPUT** **B2, INVERTER OUTPUT** **B3, BYPASS SOURCE INPUT TO STATIC SWITCH** **B4, BYPASS SOURCE INPUT TO MBS** **B800, BYPASS CVT INPUT** **Are CLOSED"**	Applicant, CHECKED the following breakers are CLOSED: • B1, DC INPUT • B2, INVERTER OUTPUT • B3, BYPASS SOURCE INPUT TO STATIC SWITCH • B4, BYPASS SOURCE INPUT TO MBS • B800, BYPASS CVT INPUT	**S U** Comments
7.	NOTE: On NN11, the IN SYNC amber light (P11) is on when the Normal Power Supply from the inverter and the Alternate Power Supply from NG01ABR1 are both available and in sync. Note prior to Step 5.4.4		Applicant read note	**S U** Comments
8.	At NN11, CHECK the IN SYNC light (P11) is on. Step 5.4.4	**"The IN SYNC light (P11) is ON"**	Applicant CHECKED the IN SYNC light (P11) is on.	**S U** Comments
*9.	IF the BYPASS SOURCE SUPPLYING LOAD red light (P202), is off at NN11: a. PRESS S202, BYPASS SOURCE SUPPLYING LOAD. b. CHECK the BYPASS SOURCE SUPPLYING LOAD red light (P202) is on. Step 5.4.5	After the applicant locates the BYPASS SOURCE SUPPLYING LOAD red light (P202), at NN11 **"The BYPASS SOURCE SUPPLYING LOAD red light (P202), at NN11 is OFF** After the applicant presses the S202, BYPASS SOURCE SUPPLYING LOAD **"the BYPASS SOURCE SUPPLYING LOAD red light (P202) is on."**	Applicant PRESSED S202, BYPASS SOURCE SUPPLYING LOAD and CHECKED the BYPASS SOURCE SUPPLYING LOAD red light (P202) is on.	**S U** Comments

*Critical Step

10	CAUTION: The IN SYNC light (P11) must be on before shifting the Manual Bypass Switch to NORMAL SOURCE.	If the applicant re-checks the IN-Sync light, **"The IN SYNC light (P11) is ON"**	Applicant read caution	**S U** Comments:
*11.	At NN11, PLACE S1, MANUAL BYPASS SWITCH, in NORMAL SOURCE. Step 5.4.6	After the applicant moves the S1 switch **"S1, MANUAL BYPASS SWITCH is in NORMAL SOURCE."**	Applicant PLACED S1, MANUAL BYPASS SWITCH, in NORMAL SOURCE.	**S U** Comments
12.	INFORM the Control Room that NN01 is supplied by the alternate power source (NG01ABR1) via the Static Transfer Switch. Step 5.4.7	Respond as the Control Room	Applicant INFORMED the Control Room that NN01 is supplied by the alternate power source (NG01ABR1) via the Static Transfer Switch.	**S U** Comments
13.	IF it is desired to transfer NN01 from Alternate to Normal, PERFORM Section 5.5. Step 5.4.8		Applicant transitioned to Section 5.5	**S U** Comments
14.	NOTE: This section places inverter NN11 in service from the normal power source (NK01) and transfers NN01 to the inverter output. Performance of this section should result in a bumpless transfer of power to the NN01 Bus. No voltage loss should occur. Note prior to Step 5.5.1		Applicant read note	**S U** Comments:
15.	NOTIFY the Control Room that power to NN01 will be transferred and Step 3.7 should be reviewed for T/S applicability. Step 5.5.1	Respond as the Control Room	Applicant NOTIFIED the Control Room that power to NN01 will be transferred and Step 3.7 should be reviewed for T/S applicability.	**S U** Comments:

*Critical Step

16.	IF S1, MANUAL BYPASS SWITCH, is in BYPASS SOURCE, PERFORM Section 5.4. Step 5.5.2		Applicant determined these step were just completed	**S U** Comments:
17.	At NN11, CHECK the following breakers CLOSED: • B1, DC INPUT • B2, INVERTER OUTPUT Step 5.5.3	After the applicant describes how they would check breakers closed **"B1, DC INPUT and B2, INVERTER OUTPUT are closed"**	Applicant CHECKED the following breakers CLOSED: • B1, DC INPUT • B2, INVERTER OUTPUT	**S U** Comments:
18.	NOTE: The BYPASS SOURCE SUPPLYING LOAD red light (P202) indicates that the alternate power source (NG01ABR1) is in service. Note prior to Step 5.5.4		Applicant read note	**S U** Comments:
19.	At NN11, CHECK the BYPASS SOURCE SUPPLYING LOAD red light (P202) is on. Step 5.5.4	**"BYPASS SOURCE SUPPLYING LOAD red light (P202) is on."**	Applicant CHECKED the BYPASS SOURCE SUPPLYING LOAD red light (P202) is on.	**S U** Comments:
20.	At NN11, CHECK the INVERTER SUPPLYING LOAD amber light (P201) is off. Step 5.5.5	**"INVERTER SUPPLYING LOAD amber light (P201) is off."**	Applicant CHECKED the INVERTER SUPPLYING LOAD amber light (P201) is off.	**S U** Comments:
21.	NOTE: On NN11, the IN SYNC amber light (P11) is on when the Normal Power Supply from the inverter and the Alternate Power Supply from NG01ABR1 are both available and in sync. NOTE: prior to Step 5.5.6		Applicant read note	**S U** Comments:
22.	At NN11, CHECK the IN SYNC light (P11) is on. Step 5.5.6	**"IN SYNC light (P11) is on."**	Applicant CHECKED the IN SYNC light (P11) is on.	**S U** Comments:

*Critical Step

23.	CAUTION: The IN SYNC Light (P11) must be on to operate the Static Transfer Switch. Caution prior to Step 5.5.7		Applicant read caution	**S U** Comments:
*24.	At NN11, PRESS S201, INVERTER TO LOAD. Step 5.5.7	After the applicant describes how they would press PRESS S201, INVERTER TO LOAD **"S201 has been pressed"**	Applicant PRESSED S201, INVERTER TO LOAD.	**S U** Comments:
25.	At NN11, CHECK the following: a. The INVERTER SUPPLYING LOAD amber light (P201) is on. b. The BYPASS SOURCE SUPPLYING LOAD red light (P202) is off. Step 5.5.8	After the applicant describes how they would check the lights **"The INVERTER SUPPLYING LOAD amber light (P201) is on and the BYPASS SOURCE SUPPLYING LOAD red light (P202) is off.'**	Applicant CHECKED the following: a. The INVERTER SUPPLYING LOAD amber light (P201) is on. b. The BYPASS SOURCE SUPPLYING LOAD red light (P202) is off.	**S U** Comments:
26.	At NN11, PRESS NN11S2, ALARM RESET. Step 5.5.9	After the applicant describes how they would reset the alarm **"NN11S2, ALARM RESET has been pressed"**	Applicant PRESSED NN11S2, ALARM RESET.	**S U** Comments:
27.	NOTIFY the Control Room: a. To check that Annunciator 25B, NN11 INV TRBL/XFER, is off. b. That Inverter NN11 is supplied by the normal power source (NK0111). Step 5.5.10	Respond as the Control Room **JPM IS COMPLETE**	Applicant NOTIFIED the Control Room: a. To check that Annunciator 25B, NN11 INV TRBL/XFER, is off. b. That Inverter NN11 is supplied by the normal power source (NK0111).	**S U** Comments:

*Critical Step

CALLAWAY ENERGY CENTER
JOB PERFORMANCE MEASURE

Initial Conditions: THE PLANT IS IN MODE 6. INSTRUMENT BUS NN01 IS BEING SUPPLIED BY ITS MANUAL BYPASS SOURCE NG01A FOR MAINTENANCE ON INVERTER NN11.

INVERTER NN11 MAINTENANCE IS COMPLETE. A CREW BRIEFING HAS BEEN CONDUCTED FOR THE RESTORATION.

Initiating Cues: YOU HAVE BEEN DIRECTED TO TRANSFER NN01 TO THE NORMAL POWER SOURCE FROM THE MANUAL BYPASS SOURCE, PER OTN-NN-00001, SECTION 5.4 and 5.5.

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

Scenario Event Description
Callaway 2016-1 NRC Scenario #1, rev. 1

The plant is stable at 100%. 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.

After the CCW service loop has been swapped, Pressurizer Level Channel BB LT-459 fails low, resulting in a loss of letdown. The crew will respond IAW OTO-BG-00001, Pressurizer Level Control Malfunction, select an operable pressurizer level channel and restore letdown to service. Tech Spec 3.3.1 applies.

After Tech Specs have been addressed, Steam Generator A Pressure Channel 514 fails low. This causes a feedwater flow reduction and a lowering SG level. The crew should respond per OTO-AE-00002, Steam Generator Water Level Control Malfunctions, select an operable channel for control, and stabilize SG level. Tech Spec 3.3.2 applies.

After Tech Specs have been addressed, the 'B' CCW pump trips due to breaker failure, and the 'D' CCW pump fails to start automatically. The crew should respond per OTO-EG-00001, CCW System Malfunction, and start the 'D' CCW pump manually. The CRS should review Tech Spec 3.7.7 for "B" CCW Train and determine it is not applicable

When plant conditions are stable, the crew will experience a failure of instrument air in CTMT. The initial indication will be a loss of letdown. The crew may respond with OTO-BG-00001, Pressurizer Level Control Malfunction. When it is recognized that a loss of air to containment has occurred the crew should then enter OTO-KA-0001, Partial or Total Loss of Instrument Air, to respond to the loss of air inside CTMT. The crew will begin a rapid down power per OTO-KA-00001, Attachment A. When a sufficient downpower (MWe < 1200 or as directed by the NRC Chief Examiner) is achieved, the scenario continues with the next event.

Once Turbine Load is reduced, a leak in the RCS develops which will be seen by the crew as PZR level lowering and containment pressure rising. The crew may enter OTO-BB-00003, RCS Excessive Leakage, prior to determining the need to trip the reactor. The crew will manually trip the reactor based on these plant conditions. The crew should enter E-0, Reactor Trip or Safety Injection.

The "A" train of the LOCA sequencer fails to actuate. This will be indicated to the crew by the "A" CCP, SI pump, and RHR pump not stating. The crew should manually start these pumps in accordance with E-0, Reactor Trip or Safety Injection, Attachment A.

The crew will transition to E-1, Loss of Reactor or Secondary Coolant. The crew will then stop all RCPs within 5 minutes of meeting the RCP trip criteria. This action may be completed in E-0 per the foldout page or per step 12.

The scenario will end after the crew has performed E-1 and is preparing to transition to ES-1.2, Post LOCA Cooldown and Depressurization

Scenario Critical Tasks
Callaway 2016-1 NRC Scenario #1, rev. 1

Critical Tasks:

Critical Tasks	Trip all RCPs within 5 minutes of meeting RCP trip criteria.	Establish flow from 'A' CCP within 5 minutes of meeting RCP trip criteria
EVENT	7	8
Safety significance	Failure to trip the RCPs under the postulated plant conditions leads to core uncovery and to fuel cladding temperatures in excess of 2200°F, which is the limit specified in the ECCS acceptance criteria. Thus, failure to perform the task represents misoperation or incorrect crew performance in which the crew has failed to prevent "degradation of...{the fuel cladding} ...barrier to fission product release" and which leads to "violation of the facility license condition."	The acceptable results obtained in the FSAR analysis of a small-break LOCA are predicated on the assumption of minimum ECCS pumped injection. The analysis assumes that a minimum pumped ECCS flow rate, which varies with RCS pressure, is injected into the core. The flow rate values assumed for minimum pumped injection are based on operation of one each of the following ECCS pumps: Charging/SI pump (HP plants only), high-head SI pump, and low-head SI pump. Operation of this minimum required complement of ECCS injection pumps is consistent with the FSAR assumption that only minimum safeguards are actuated. Because compliance with the assumptions of the FSAR is part of the facility license condition, failure to perform the critical task (under the postulated plant conditions) constitutes a violation of the license condition.
Cueing	Indications of a SBLOCA AND Indication and/or annunciation of safety injection AND Indication and/or annunciation that only one train of actuates AND Indication that RCS pressure	Indication and/or annunciation that Charging/SI pump injection is required • SI actuation • RCS pressure below the shutoff head of the Charging/SI pump Indication and/or annunciation that no Charging/SI pump is injecting into the core • Control switch indication that the circuit breakers or contactors for both Charging/SI pumps are open • All Charging/SI pump discharge pressure indicators read zero • All flow rate indicators for Charging/SI pump injection read zero
Performance indicator	Manipulation of controls as required to trip all RCPs • RCP breaker position lights indicate breaker open	Manipulation of controls in the control room as required to start the 'A' CCP
Performance feedback	Indication that all RCPs are stopped: • RCP breaker position lights • RCP flow decreasing • RCP motor amps decreasing	Indication and/or annunciation that the 'A' CCP is injecting Flow rate indication of injection from the 'A' CCP
Justification for the chosen performance limit	In a letter to the NRC titled "Justification of the Manual RCP Trip for Small Break LOCA Events" (OG-117, March 1984) (also known as the Sheppard letter), the WOG provided the required assurance based on the results of the analyses performed in conjunction with WCAP-9584. The WOG showed that for all Westinghouse plants, more than two minutes were available between onset of the trip criteria and depletion of RCS inventory to the critical inventory. In fact, additional analyses sponsored by the WOG in connection with OG-117 conservatively showed that manual RCP trip could be delayed for five minutes beyond the onset of the RCP trip criteria without incurring any adverse consequence.	This allows enough time for the crew to take the correct action while at the same time preventing avoidable adverse consequences of a small-break LOCA.
PWR Owners Group Appendix	CT- 16, Manually Trip RCPS	CT-6, Establish flow from at least one Charging/SI pump

Scenario Procedure References
Callaway 2016-1 NRC Scenario #1, rev. 1

References
OTN-EG-00001,Component Cooling Water System
OTN-EC-00001, Fuel Pol Cooling and Cleanup System
OTO-BG-00001, Pressurizer Level Control Malfunction
OTO-AE-00002, Steam Generator Water Level Control Malfunctions
OTO-EG-00001, CCW System Malfunction
OTO-KA-00001, Partial or Total Loss of Instrument Air
OTO-BB-00003, RCS Excessive Leakage
E-0, Reactor Trip or Safety Injection
E-1, Loss of Reactor or Secondary Coolant
Tech Spec 3.3.1
Tech Spec 3.3.2
ODP-ZZ-00025, EOP/OTO User's Guide

PRA Systems, Events or Operator Actions

1. Small LOCA (S(2))
    a. Manually start one CCP

Scenario #1 Setup Guide:

Establish the initial conditions of IC-10, MOL 100% power: (may set an exam specific IC

- RCS boron concentration 857 ppm
- CCP A 862 ppm minus 5 days
- CCP B 863 ppm minus 15 days
- Rod Control Bank D 215 steps, Other banks 228 steps
- CCP "B" Handswitch / WPA tags hanging
- ENSURE CCW Service Loop is aligned to 'A' CCW Train and 'A' SFP and Fuel Pool Cleanup is secured.
- ENSURE BB-LT-459 is selected on BB-LS459D and E on (both controller and recorder)

==========SCENARIO PRELOADS / SETUP ITEMS==========

Tag Out "B" CCP

- ME Schematics (BG) e23bg01b, insert BG02NB0201_BKRTA_BKPOS 3

"D" CCW Pump Auto Start Failure (Event 5)

- Insert Malfunction (EG) PEG01D_A, Value = Inhibit

LOCA Sequencer Train "A" Fails to Actuate (Event 8)

- Insert Malfunction(NF) NF039A_1, Value = Step0_fail_to_Start

========== EVENT 1 ==========

Shift CCW service loop from "A" Train to "B" Train

========== EVENT 2 ==========

Pressurizer Level Channel BB LT-459 fails Low

- Insert Malfunction (BB) BBLT0459, Value= 466.1

==========EVENT 3 ==========

Steam Pressure Channel Fails Low

- Insert Malfunction (AB) ABPT0514, value = 0, ramp = 20 sec

==========EVENT 4 ==========

"B" CCW Pump Trip / "D" CCW Pump Auto Start Failure:

- Insert Malfunction (EG) PEG01B_1, Value = Trip
- SEE PRELOADS ABOVE

==========EVENT 5 ==========

Loss of Instrument Air to Containment

- Insert Malfunction (KA) KAL03, Value = 525, Ramp = 30 sec

==========EVENT 6==========

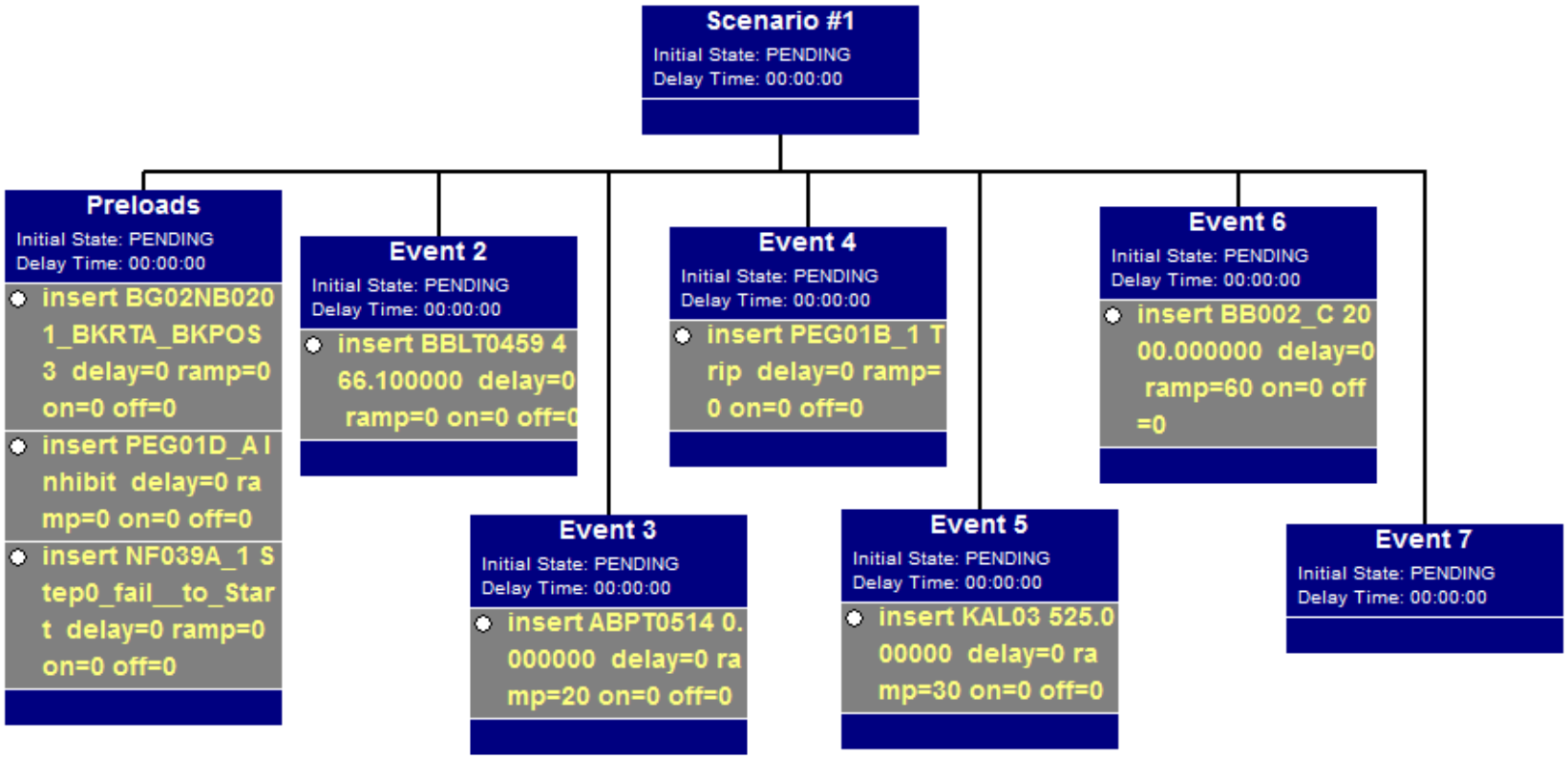
RCS Leak – LOCA

- Insert Malfunction (BB) BB002_C, Value = 2000, ramp = 1 min

==========EVENT 7 PRELOADED==========

LOCA Sequencer Train "A" Fails to Actuate

- SEE PRELOADS ABOVE


Scenario #1
Initial State: PENDING
Delay Time: 00:00:00
Preloads
Initial State: PENDING
Delay Time: 00:00:00
insert BG02NB0201_BKRTA_BKPOS3 delay=0 ramp=0 on=0 off=0
insert PEG01D_Inhibit delay=0 ramp=0 on=0 off=0
insert NF039A_1 Step0_fail__to_Start delay=0 ramp=0 on=0 off=0
Event 2
Initial State: PENDING
Delay Time: 00:00:00
insert BBLT0459 466.100000 delay=0 ramp=0 on=0 off=0
Event 3
Initial State: PENDING
Delay Time: 00:00:00
insert ABPT0514 0.000000 delay=0 ramp=20 on=0 off=0
Event 4
Initial State: PENDING
Delay Time: 00:00:00
insert PEG01B_1 Trip delay=0 ramp=0 on=0 off=0
Event 5
Initial State: PENDING
Delay Time: 00:00:00
insert KAL03 525.000000 delay=0 ramp=30 on=0 off=0
Event 6
Initial State: PENDING
Delay Time: 00:00:00
insert BB002_C 2000.000000 delay=0 ramp=60 on=0 off=0
Event 7
Initial State: PENDING
Delay Time: 00:00:00

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 1	Page 7 of 36
Event Description:	Shift CCW service loop from “A” Train to “B” Train		

Proc /Time	Position	Applicant’s Actions or Behavior

Booth Operator:

- Respond as Primary OT that you have been briefed and are standing by
  - When asked **“ECV0010, FUEL POOL COOL PMP B SUCT ISO is OPEN”**
  - If asked **“ECFI0018B, FUEL POOL COOLING PUMP B DISCH FLOW indicates 1.7 x 10^6 lbm/hr”**
  - When directed to STOP the Spent Fuel Pool Pump Room Cooler for the pump that was secured, report back after 2 minutes report back **“A SFP Cooling pump room cooler has been stopped”** (no simulator operator actions are required)
- Respond as Chemistry when informed that CCW Train B is in service

Shift CCW service loop IAW OTN-EG-00001

Indications Available

OTN-EG-00001, Section 5.6		
OTN-EG-00001	**BOP**	(Step 5.6.1) ENSURE that SW/ESW cooling water is in service to the B CCW Heat Exchanger with EF HIS-52, ESW TRN B TO CCW HX B, open.
	BOP	(Step 5.6.2.a) Ensure B CCW surge tank level is > 50%
	BOP	(Step 5.6.2.b) Using the following, DETERMINE the pump with the least run time on the major equipment log: ‘B’ CCW was directed in the turnover sheet
	BOP	(Step 5.6.2.c) Start CCW pump B using EG HIS-22
	BOP	(Step 5.6.3) a. Using EG HIS-9, CCW SURGE TANK A VENT VLV, CLOSE EGRV0009. b. Using EG HIS-10, CCW SURGE TANK B VENT VLV, CLOSE EGRV0010. c. Using EG HS-16, CCW TRN B SPLY/RETURN VLVS, OPEN EGHV0016 and EGHV0054. d. Using EG HS-15, CCW TRN A SPLY/RETURN VLVS, CLOSE EGHV0015 and EGHV0053. e. Using EG HIS-9, CCW SURGE TANK A VENT VLV, OPEN EGRV0009. f. Using EG HIS-10, CCW SURGE TANK B VENT VLV, OPEN EGRV0010.

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 1	Page 8 of 36
Event Description:	Shift CCW service loop from “A” Train to “B” Train		

Proc /Time	Position	Applicant’s Actions or Behavior
OTN-EG-00001	**BOP**	(Step 5.6.4) Using EC HIS-12, SFP HX B CCW OUTLET VLV, THROTTLE ECHV0012 as needed to clear flow alarms.
	CRS	Direct transition to OTN-EC-00001, Section 5.3
OTN-EC-00001, Section 5.3		
OTN-EC-00001	**BOP**	(Step 5.3.1) IF Refuel Pool cleanup is in progress, PERFORM Section for Swapping Refuel Pool Purification Trains in OTN-EC-00001 ADD 4, Refuel Pool Cleanup Operations. **Step is NA**
	BOP	(Step 5.3.2) RECORD currently running Trains of Fuel Pool Cooling and, if it’s in service, Fuel Pool Cleanup: _____ Fuel Pool Cooling Train _____ Fuel Pool Cleanup Train
	BOP	(Step 5.3.3) ENSURE a Component Cooling Water pump is RUNNING to support oncoming train of SFP cooling.
	BOP	(Step 5.3.4) IF in service, STOP running Fuel Pool Cleanup Pump(s): **Step is NA**
	BOP	(Step 5.3.5) IF SFP Cleanup was in service, ENSURE in-service Fuel Pool Cleanup Pump ISO valve is CLOSED: **Step is NA**
	BOP	(Step 5.3.6) ENSURE suction valve is OPEN for oncoming Fuel Pool Cooling Pump: • ECV0010, FUEL POOL COOL PMP B SUCT ISO
	BOP	(Step 5.3.7) Using applicable switch below, START oncoming Fuel Pool Cooling Pump: • EC HIS-28, SFP COOL PUMP B

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 1	Page 9 of 36
Event Description:	Shift CCW service loop from “A” Train to “B” Train		

Proc /Time	Position	Applicant’s Actions or Behavior
OTN-EC-00001	**BOP**	(Step 5.3.8) Using applicable switch, STOP off-going Fuel Pool Cooling Pump: • EC HIS-27, SFP COOL PUMP A
	BOP	(Step 5.3.9) IF desired to place SFP Cleanup in service, OPEN SFP Cleanup Pump isolation valve to in-service SFP cooling train: **Step is NA**
	BOP	(Step 5.3.10) IF required, THROTTLE valve in oncoming train to obtain flow between 1.65 x 10^6 and 1.95 x 10^6 lbm/hr, on indicator shown: • ECV0018, FUEL POOL HX B TO SFP ISO, (using ECFI0018B, FUEL POOL COOLING PUMP B DISCH FLOW IND)
	BOP	(Step 5.3.11) IF it is desired to place a Fuel Pool Cleanup pump in service, PERFORM OTN-EC-00001 ADD 1, Spent Fuel Pool Cleanup Operations, “Fuel Pool Cleanup **Step is NA**
	BOP	(Step 5.3.12) Using the applicable pushbutton, STOP off-going Spent Fuel Pool Pump Room Cooler: • GGHS0080, START/STOP PUSHBUTTON FOR SGG04A (At NG03CKF1, FDR BKR TO SGG04A SFP COOL PMP RM COOLER)
	CRS	Direct transition back to OTN-EG-00001, Section 5.3
OTN-EG-00001, Section 5.6		
OTN-EG-00001	**BOP**	(Step 5.6.5) IF NOT required for the safety loop loads (CCP, SFP, SI, RHR), using the applicable switch below, STOP the running train A CCW pump and ENSURE the handswitches are in AUTO: • EG HIS-21, CCW PUMP A
	BOP	(Step 5.6.6) Inform Chemistry that CCW Train B is in service

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 1	Page 10 of 36
Event Description:	Shift CCW service loop from “A” Train to “B” Train		

Proc /Time	Position	Applicant’s Actions or Behavior
	BOP	(Step 5.6.7) As necessary for coarse adjustment, using EG HIS-102, CCW TO RHR HX B, THROTTLE EGHV0102 to maintain annunciator 75D, SFP TEMP HI, clear.
	BOP	(Step 5.6.8) ENSURE the CCW Heat Exchanger being removed from service is either in the winter or summer alignment as appropriate per Step 3.2.10.
NOTE		**At Lead Examiner’s discretion move to the next Event after the ‘A’ CCW pump is secured**

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 2	Page 11 of 36
Event Description:	Pressurizer Level Transmitter BB LT-459 Fails Low(Tech Spec) and restore Letdown		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 2: (Pressurizer Level Channel BB LT-459 fails Low_ • Malfunction (BB) BBLT0459, Value= 466.1 • When contacted, respond as I&C. Acknowledge the request to investigate the instrument/channel failure. • When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO		
Indications Available		
		ANN 32B, PZR 17% HTRS OFF LTDN ISO ANN 32C, PZR LO LEV DEV ANN 39E, LTDN HX DISCH FLOW HILO ANN 41F, NCP FLOW HILO
OTO-BG-00001, Pressurizer Level Control Malfunction		
	CRS	Implement OTO-BG-00001, Pressurizer Level Control Malfunction
OTO-BG-00001	**RO**	(Step 1) CHECK Charging Pumps – At Least One Running • NCP is running
		Step 1 is an immediate action step
	RO	(Step 2) Verify at least ONE method of RCP Seal Cooling to All RCPs in progress • Seal Injection • CCW to Thermal Barrier Heat Exchanger
	RO	(Step 3) CHECK for Failed Pressurizer Level Indicator • BB-LI-459A is failed LOW

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 2	Page 12 of 36
Event Description:	Pressurizer Level Transmitter BB LT-459 Fails Low(Tech Spec) and restore Letdown		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-BG-00001	**RO**	(Step 4) Check Pressurizer Level • Trending to Program Level OR • At Program Level

	RO	(Step 4 RNO) Perform the following:
		a. STABILIZE Pressurizer Level:
		• Place Pressurizer Level Master Controller in MANUAL
		  • BB LK-459
		OR
		• Manually THROTTLE appropriate Charging Discharge Flow Control valve for the running charging pump:
		  ○ BG FK-124 (NCP)
		b. RESTORE Pressurizer level to Program Level

	RO	(Step 5) Transfer Pressurizer Level Control Selector to Remove Failed Channel from Control • BB LS-459D to L461/L469 position
	RO	(Step 6) CHECK Pressurizer Heater Control Group C - ON • BB HIS-50

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 2	Page 13 of 36
Event Description:	Pressurizer Level Transmitter BB LT-459 Fails Low(Tech Spec) and restore Letdown		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-BG-00001	**RO**	(Step 7) CHECK Letdown - IN SERVICE - **NO** (Step 7 RNO) Perform the following: a. Slowly Close Charging Header Back Pressure Control Valve while THROTTLING appropriate charging Discharge Valve to maintain 8-13 gpm to RCP seals • BG HC-182 • BG FK-124 (NCP) b. Ensure BG HC-182 is CLOSED c. Restore Letdown as follows: 1) Ensure Letdown Containment Isolation Valves are OPEN • BG HIS-8152 • BG HIS-8160 2) OPEN RCS Letdown to Regen Heat Exchanger Valves • BG HIS-459 • BG HIS-460 3) Establish 85 gpm to 90 gpm Charging Header Flow while maintaining seal injection flow • BG HC-182 • BG FK-134 (NCP) 4) PLACE Letdown Hx Outlet Pressure Controller in Manual and RAISE setpoint to greater than 75% open: • BG PK-131 5) OPEN Orifice Isolation Valve(s) to establish desired letdown flow: • BG HIS-8149AA • BG HIS 8149BA • BG HIS 8149CA 6) ADJUST Letdown Hx Outlet Press Controller to maintain between 300 psig and 350 psig and PLACE in Automatic: • BG PK-131 7) ADJUST Charging flow to maintain Pressurizer Level. 8) WHEN Pressurizer Level is at program level and the PZR LEV MASTER CTRL output has been adjusted per OTN-BG-00001, ADD04, Operation of CVCS Letdown, 1) THEN Place Charging control in AUTO.

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 2	Page 14 of 36
Event Description:	Pressurizer Level Transmitter BB LT-459 Fails Low(Tech Spec) and restore Letdown		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-BG-00001	**RO**	#(Step 8) CHECK Pressurizer Level Trending to or at Program Level
		(Step 9) WHEN Pressurizer Level Is At Program Level: • PLACE Pressurizer Level Master Controller in AUTO o BB LK-459 OR • PLACE Charging Discharge Flow Control valve for the running charging pump in AUTO o BG FK-124 (NCP)
	RO	(Step 10) CHECK Operable Pressurizer Level Channel – USED FOR RECORDER • BB LS-459E
	CRS	(Step 11) Review Applicable Technical Specifications • TS 3.3.1, Cond A • TS 3.3.1, Item 9 Cond M o Place channel in trip within 72 hrs
	CRS	(Step 12) Review Attachment A, Effects of Pressurizer Level Instrument Failure
	CRS	(Step 13) Perform Notifications Per ODP-ZZ-00001 Addendum 13, Shift Manager Communications
NOTE		**At Lead Examiner's discretion move to the next Event any time after Letdown is restored and TS have been identified**

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 3	Page 15 of 36
Event Description:	'A' S/G Steam Pressure Channel PT-514 Fails Low (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 3 ('A' S/G Steam Pressure Channel PT-514 Fails Low) o Malfunction (AB) ABPT0514, Value = 0, ramp = 20 secs • When contacted, respond as I&C. Acknowledge the request to investigate the instrument/channel failure. • When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO.		
Indications Available		
		ANN 108D, SG A FLOW MISMATCH ANN 83C, RX Partial Trip
OTO-AE-00002, Steam Generator Water Level Control Malfunctions		
	CRS	Implement OTO-AE-00002, SG Water Level Control Malfunctions
OTO-AE-00002	**BOP**	(Step 1) CHECK SG Water Level Control Instruments - NORMAL • SG A: o AB PI-514A / AB PI-515A - **NO**
	BOP	(Step 1 RNO) Take MANUAL Control of Affected SG MFRV or MFRV Bypass and MAINTAIN SG Level: • SG A: o AE FK-510, SG A MFW REG VLV CTRL
	BOP	(Step 2) For The Failed Instrument, SELECT An Operable Channel: • SG A: AB FS-513C • On DFWCS, SELECT appropriate Steam Flow on AE SS-500 (changes grey to white)

Op Test No.: 2016-1 Scenario # 1 rev.1 Event # 3 Page 16 of 36

Event Description: 'A' S/G Steam Pressure Channel PT-514 Fails Low (Tech Spec)

Proc /Time	Position	Applicant's Actions or Behavior
	BOP	(Step 3) RESTORE Affected SG NR Level to between 45% and 55%
OTO-AE-00002	**BOP**	(Step 4) RETURN Affected SG MFRV to Automatic • SG A: AE FK-510
	CRS	(Step 5) Review Attachment A, Effects of Instrument Failure Steam Press Transmitter AB PT-514 compensates Steam Flow Transmitter AB FT-512
	CRS	(Step 6) Review Applicable Tech Specs-Refer to Attachment F • TS 3.3.2, Condition A • TS 3.3.2, Item 1.e, Condition D o 72 hours to place channel in trip • TS 3.3.2, Item 4.e, Condition D o 72 hours to place channel in trip
	CRS	(Step 7) Perform Notifications per ODP-ZZ-00001 Addendum 13
	CRS	(Step 8) Direct I&C to trip bistables for failed channel
	CRS	(Step 9) Place inoperable channel in EOSL
	CRS	(Step 10) Initiate actions to repair failed channel
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 4	Page 17 of 36
Event Description:	'B' CCW Pump Trip / 'D' CCW Pump Failure to Auto Start		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 4 ('B' CCW Pump Trip / 'D' CCW Pump Failure to Auto Start) o Malfunction (EG) PEG01B_1, Value = Trip o (PRELOADED) Insert Malfunction (EG) PEG01D_A, Value = Inhibit • When contacted as an OT to 'B' CCW pump, wait 5 minutes and report back "**It is warm to the touch**" • When contacted as an OT to go to NB02 to check out the 'B' CCW pump breaker wait 5 minutes and report back **"The breaker for the 'B' CCW pump overcurrent trip flag dropped"** • When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO.		
Indications Available		
		ANN 52A, CCW TO RCP FLOW LOW ANN 53B, CCW Pmp B/D Press Lo ANN 54F, CCW SEAL HEAT EXCHANGER FLOW HIGH/LOW AND Other annunciator
OTO-EG-00001, CCW SYSTEM MALFUNCTION		
		An applicant may start the 'D' CCW pump using the guidance in ODP-ZZ-00001, OPERATIONS DEPARTMENT - CODE OF CONDUCT, Section 4.5, Prudent Operator Action to manually start a component that failed to automatically function as designed then enter OTO-EG-00001, CCW SYSTEM MALFUNCTION
	CRS	OTO-EG-00001, CCW SYSTEM MALFUNCTION

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 4	Page 18 of 36
Event Description:	'B' CCW Pump Trip / 'D' CCW Pump Failure to Auto Start		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-EG-00001	**BOP**	(Step 1) CHECK One CCW Pump Running For Each Operating Train: • Train B: o EG HIS-22 (CCW Pump B) – **NO** o EG HIS-24 (CCW Pump D) – **NO** (Step 1 RNO) PERFORM the following: ENSURE at least one CCW pump running in each operating train. Starts EG HIS-24 (CCW Pump D)
	BOP	(Step 2) CHECK CCW Flow - REDUCED OR LOST – **NO** (Step 2 RNO) Go to step 8
OTO-EG-00001	**BOP**	(Step 8) CHECK CCW Surge Tank Level(s) – LOWERING – **NO** (Step 8 RNO) Go to step 13
	CRS	(Step 13) REVIEW Technical Specifications 3.6.3 and 3.7.7 – Not Applicable
	CRS	(Step 14) Perform Notifications per ODP-ZZ-00001 Addendum 13
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 5	Page 19 of 36
Event Description:	Loss of Instrument Air to Containment		

Proc /Time	Position	Applicant's Actions or Behavior

Booth Operator:

- Insert Event 5 (Loss of Instrument Air to Containment)
  - Malfunction (KA) KAL03, Value = 525, Ramp = 30 sec
- If contacted as an OT to check out the IA compressors or dryers wait 5 minutes and report back **"IA compressors and air dryers appear to be working properly"**
- If contacted as an OT or FS to check for IA leaks wait 5 minutes and report back **"I have not identified any IA leaks** (wherever you were directed to look)**"**
- If asked if the Fuel Building gated is installed respond that it is not.
- If contacted as SM to reduce load, concur with the load reduction
- If contacted as SM to establish Excess Letdown, concur with establishing excess letdown
- When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO.
- Respond as the following when informed of power reduction. (no other response needed)
  - Power Dispatcher
  - Chemistry
  - Count Room Technician
  - Radiation Protection
  - Radwaste

Indications Available

		ANN 39E, LETDOWN HEAT EXCHANGER DISCHARGE FLOW HIGH OR LOW Letdown Isolates
OTO-KA-00001, Partial or Total Loss of Instrument Air		
	CRS	OTO-KA-00001, Partial or Total Loss of Instrument Air

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 5	Page 20 of 36
Event Description:	Loss of Instrument Air to Containment		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-KA-00001	**BOP**	(Step 1) ANNOUNCE Message Notifying Personnel Of The Following: • Loss of Instrument Air • Anyone using Instrument Air or Service Air to secure and notify the Control Room
	BOP	(Step 2) DISPATCH Ops Tech To Perform Any Of The Following As Applicable:
	CRS	(Step 3) CHECK Reactor Power - LESS THAN 80% - **NO**
	CRS	(Step 3 RNO) IF plant conditions cannot be maintained AND the Shift Manager concurs, THEN REDUCE Reactor Power to less than 80% using Attachment A, Load Reduction. Continue with Step 5. (OTO-KA-00001 Step 5 is on page 24 of scenario guide)
	RO	(Step A1) PLACE Rod Control In AUTO: • SE HS-9
	CRS	(Step A2) MANAGE Reactivity: PERFORM Reactivity Management Brief: • DISCUSS Amount And Rate of Turbine Load reduction • DETERMINE amount of boric acid needed

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 5	Page 21 of 36
Event Description:	Loss of Instrument Air to Containment		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-KA-00001	**BOP**	(Step A3) REDUCE Turbine Load At Less Than Or Equal To 5% Per Minute Using Any Of The Following: • REDUCE Turbine load using the %/Min Loading Rate: a. SLOWLY LOWER Load using the DECREASE LOAD pushbutton until all of the following are met: ▪ Load Limit Limiting Light – EXTINGUISHED ▪ Decrease Loading Rate "OFF" Light – LIT ▪ Loading Rate Limit %/MIN "1/2" Light – LIT b. ROTATE Load Limit Set potentiometer fully clockwise c. SELECT Decrease Loading Rate – ON d. SET Loading Rate Limit %/Min to desired value e. LOWER load set MW toward desired load using the DECREASE LOAD pushbutton OR • REDUCE Turbine load using the Load Limit Potentiometer

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 5	Page 22 of 36
Event Description:	Loss of Instrument Air to Containment		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-KA-00001	**RO**	(Step A4) BORATE From The BAST By Performing Any Of The Following: • BORATE using OTN-BG-00002 Attachment 8 OR • BORATE to the VCT: a. PLACE RCS Makeup Control in STOP: ▪ BG HS-26 b. PLACE RCS Makeup Control Selector in BORATE: ▪ BG HS-25 c. SET Boric Acid Flow Controller to the desired flow rate ▪ BG FK-110 d. PLACE BG FK-110 in AUTO e. RESET Boric Acid Counter to 000: ▪ BG FY-110B f. SET BG FY-110B for the desired gallons of boric acid to be added g. PLACE BG HS-26 in RUN h. WHEN desired boration is complete, THEN PLACE BG HS-26 in STOP i. REPEAT Boration as necessary OR

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 5	Page 23 of 36
Event Description:	Loss of Instrument Air to Containment		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-KA-00001		(Step A4 continued) BORATE From The BAST By Performing Any Of The Following: OR • BORATE using Emergency Boration: a. START at least one Boric Acid Transfer Pump: ▪ BG HIS-5A ▪ BG HIS-6A b. OPEN Emergency Borate To Charging Pump Suction: ▪ BG HIS-8104 c. CHECK Emergency Borate Flowrate - GREATER THAN 30 GPM ▪ BG FI-183A d. WHEN desired boration is complete, THEN: 1) CLOSE Emergency Borate to Charging Pump Suction: o BG HIS-8104 2) STOP Boric Acid Transfer Pumps: o BG HIS-5A o BG HIS-6A e. REPEAT Boration as necessary
OTN-BG-00002, Att. 8	**RO**	(Attachment 8) Borate Mode of RMCS Operation 1. Place BG HS-26 , RCS M/U CTRL, in STOP 2. Place BG HS-25, RCS M/U CTRL SEL, in BOR 3. RESET BG FY-110B, BA Counter, to 000 4. ENSURE BG-FY-110B is set to deliver the desired amount of boron 5. Place BG HS-26, RCS M/U CTRL, in RUN 6. When the desired amount of borated water has been added, PLACE BG HS-26, RCS M/U CTRL, in STOP. 7. If required, PERFORM the following: a. Place BG HS-25, RCS M/U CTRL SEL, in AUTO b. Place BG HS-26, RCS M/U CTRL, in RUN

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 5	Page 24 of 36
Event Description:	Loss of Instrument Air to Containment		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-KA-00001	**RO**	(Step A5) IF Instrument Air Is Available To Pressurizer Spray Valves, THEN INITIATE Boron Equalization By Performing the Following: IA is not available
	CRS	(Step A6) NOTIFY The Power Dispatcher Of The Following: • Load reduction is in progress • Rate of load reduction • Amount of load reduction
	CRS	(Step A7) NOTIFY The Following Departments That Load Reduction Is In Progress And The Rate Of Load Reduction: • Chemistry • Count Room Technician • Radiation Protection • Radwaste
	RO	(Step A8) CHECK Rod Control System Responding To RCS Tavg/Tref Deviation By Ensuring One Of The Following: • Control Rods are inserting AND RCS Tavg trending to within 3°F of Tref OR • RCS Tavg within 3°F of Tref
	CRS	(Step 5) CHECK Letdown - ISOLATED
	CRS	(Step 6) CHECK Instrument Air Available In Auxiliary Building

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 5	Page 25 of 36
Event Description:	Loss of Instrument Air to Containment		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-KA-00001	**RO**	(Step 7) REDUCE Charging To RCPs Seals Only By Performing The Following Concurrently: a. Slowly CLOSE Charging Header Back Pressure Control valve: • BG HC-182 b. THROTTLE appropriate charging pump discharge flow control valve to maintain RCP seal injection flow between 8 gpm and 13 gpm per pump while reducing charging flow: • BG FK-124 (NCP) OR • BG FK-121 (CCP) c. CHECK BG HC-182 - FULL CLOSED
	RO	(Step 8) CHECK Pressurizer Level Within One Of The Following: • Trending to Program Level OR • At Program Level
NOTE		**After load has been reduced to approximately 1200 MWe or at Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 6 and 7	Page 26 of 36
Event Description:	RCS Leak – LOCA / LOCA Sequencer Train A Failure		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 6 (RCS Leak – LOCA) o Malfunction (BB) BB002_C, Value = 2000, ramp = 1 min, o Event 7 is preloaded (LOCA Sequencer Train A Failure) o (Preloaded) Malfunction(NF) NF039A_1, Value = Step0_fail_to_Start • If contacted as an OT or FS to perform EOP ADD 8 acknowledge request (no simulator booth operator actions need to be taken) • Respond as Chemistry when directed to sample SGs • Respond as RP when directed to perform surveys		
Indications Available		
		ANN 60E, CTMT Sump A/B Lev Hi ANN 60F, CTMT Sump C/D Lev Hi
OTO-BB-00003, RCS Excessive Leakage		
OTO-BB-00003	**CRS**	Implement OTO-BB-00003, RCS Excessive Leakage
	RO	(Step 1) Check if PZR level can be maintained
	RO	(Step 2) Check PZR level stable or rising – **NO** (Step 2 RNO) a. Manually Trip the Reactor b. When reactor trip is verified, Then actuate SI c. Got to E-0
E-0, Reactor Trip or Safety Injection		
	CRS	Implement E-0, Reactor Trip or Safety Injection

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 6 and 7	Page 27 of 36
Event Description:	RCS Leak – LOCA / LOCA Sequencer Train A Failure		

Proc /Time	Position	Applicant's Actions or Behavior
E-0	**RO**	(Step 1) Check Reactor Trip • Rod Bottom Lights – All Lit • Reactor Trip and Bypass Breakers – Open • Neutron Flux - Lowering
	BOP	(Step 2) Check Turbine Trip a. Turbine Stop Valves - Closed
	BOP	(Step 3) Check Power to AC Emergency Buses a. AC Emergency Buses - At Least One Energized • NB01 OR • NB02 b. AC Emergency Buses – BOTH Energized
	RO	(Step 4) Check SI Status: a. CHECK if SI is actuated: • Any SI annunciator 88A through 88D ‑ LIT OR • SB069 SI Actuate RED light ‑ LIT OR • LOCA Sequencer annunciators 30A or 31A ‑ LIT b. CHECK both Trains of SI ‑ACTUATED • LOCA Sequencer annunciator 30A ‑ LIT • LOCA Sequencer annunciator 31A ‑ LIT • SB069 SI Actuate RED light ‑ LIT SOLID (NOT blinking)
	RO/BOP	(Step 5) Perform Attachment A, Automatic Action Verification, while continuing with this procedure
	RO/BOP	(Step A1) Check Charging Pumps – Both CCPs running – **NO** (Step A1 RNO) START 'A' CCP

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 6 and 7	Page 28 of 36
Event Description:	RCS Leak – LOCA / LOCA Sequencer Train A Failure		

Proc /Time	Position	Applicant's Actions or Behavior
CRITICAL TASK	**RO/BOP**	**Establish flow from 'A' CCP within 5 minutes of meeting RCP trip criteria (RCS pressure LESS THAN 1425 PSIG)** Time RCS pressure less than 1425 psig: _____ Time 'A' CCP started: _____
E-0 Att A	**RO/BOP**	(Step A2) Check SI and RHR Pumps – All running – **NO** (Step 2A RNO) Start the 'A' SI and RHR pumps
	RO/BOP	(Step A3) Check ECCS Flow a. CCPs To Boron Inj Header ‑FLOW INDICATED • EM FI‑917A • EM FI‑917B b. RCS pressure ‑ LESS THAN 1700 PSIG (at this time pressure might be below 1700 psig. If it the applicant will contine with the step, if not the applicant will go to step A4) c. SI Pump Discharge ‑ FLOW INDICATED d. RCS pressure ‑ LESS THAN 325 PSIG – **NO** Go To Step A4.
	RO/BOP	(Step A4) CHECK ESW Pumps – BOTH RUNNING – **NO** (Step 3A RNO) Start 'A' ESW pump

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 6 and 7	Page 29 of 36
Event Description:	RCS Leak – LOCA / LOCA Sequencer Train A Failure		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A5) CHECK CCW Alignment: a. CCW Pumps – ONE RUNNING IN EACH TRAIN • Red Train: ▪ EG HIS-21 or EG HIS-23 • Yellow Train: ▪ EG HIS-22 or EG HIS-24 b. CCW Service Loop Supply and Return valves for one operating CCW pump – OPEN • EG ZL-15 AND EG ZL-53 OR • EG ZL-16 AND EG ZL-54 c. OPEN CCSW To RHR HX valves: • EG HIS-101 • EG HIS-102 d. CLOSE Spent Fuel Pool HX CCW Outlet Valves: • EC HIS-11 • EC HIS-12 e. STOP Spent Fuel Pool Cooling Pump(s): • EC HIS-27 • EC HIS-28 f. RECORD The Time Spent Fuel Pool Cooling Pump Secured g. MONITOR Time Since CCW Flow Isolated to SFP HX LESS THAN 4 HOURS
	RO/BOP	(Step A6) CHECK Containment Cooler Fans – RUNNING IN SLOW SPEED • GN HIS-9 • GN HIS-17 • GN HIS-5 - **NO** • GN HIS-13 – **NO** (Step A6 RNO) PLACE Containment CoolerFan Speed Selector switch(es) in SLOW and start: • GN HS-5 • GN HS-13

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 6 and 7	Page 30 of 36
Event Description:	RCS Leak – LOCA / LOCA Sequencer Train A Failure		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A7) CHECK Containment Hydrogen Mixing Fans – RUNNING IN SLOW SPEED • GN HIS-2 • GN HIS-4 • GN HIS-1 • GN HIS-3
	RO/BOP	(Step A8) CHECK If Containment Spray should Be Actuated: a. CHECK the following: • Containment pressure – GREATER THAN 27 PSIG OR • GN PR-934 indicates containment pressure – HAS BEEN GREATER THAN 27 PSIG OR • Annunciator 59A CSAS LIT OR • Annunciator 59B CISB – LIT b. Containment Spray Pumps - • EN HIS-3 • EN HIS-9 c. ESFAS status panels CSAS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT d. ESFAS status panels CISB sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT e. STOP all RCPs
CRITICAL TASK	**RO/BOP**	**Trip all RCPs within 5 minutes of meeting RCP trip criteria (RCS pressure LESS THAN 1425 PSIG)** Time RCS pressure less than 1425 psig: _____ Time RCPs tripped: _____

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 6 and 7	Page 31 of 36
Event Description:	RCS Leak – LOCA / LOCA Sequencer Train A Failure		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A9) CHECK If Main Steamlines Should Be Isolated: a. CHECK for any of the following: • Containment pressure – GREATER THAN 17 PSIG OR • GN PR-934 indicates containment pressure – HAS BEEN GREATER THAN 17 PSIG OR • Steamline pressure – LESS THAN 615 PSIG OR • AB PR-514 or AB PR-535 indicates steamline pressure – HAS BEEN LESS THAN 615 PSIG b. CHECK MSIVs and Bypass valves - CLOSED
	RO/BOP	(Step A10) CHECK ECCS Valves – PROPER EMERGENCY ALIGNMENT a. ESFAS status panels SIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT – **NO** due to 'B' CCP tagged out
	RO/BOP	(Step A11) CHECK Containment Isolation Phase A: a. ESFAS status panels CISA sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A12) CHECK SG Blowdown Isolation: a. ESFAS status panels SGBSIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT

Op Test No.: 2016-1 Scenario # 1 rev.1 Event # 6 and 7 Page 32 of 36

Event Description: RCS Leak – LOCA / LOCA Sequencer Train A Failure

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A13) CHECK Both Trains of Control Room Ventilation Isolation: a. ESFAS status panels CRVIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A14) CHECK Containment Purge Isolation: a. ESFAS status panels CPIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A15) NOTIFY CRS of the following: • Unanticipated Manual actions taken. • Failed Equipment status • Attachment A, Automatic Action Verification, completed.
E-0, REACTOR TRIP OR SAFETY INJECTION		
E-0		
	BOP	(Step 6) Check Generator Output Breakers – Open
	BOP	(Step 7) Check Feedwater Isolation a. Main Feedwater Pumps – Tripped b. Main Feedwater Reg Valves – Closed c. Main Feedwater Reg Bypass Valves – Closed d. Feedwater Isolation Valves – Closed
	BOP	(Step 8) Check AFW Pumps a. MD AFW Pumps – Both Running b. TD AFW Pump – Running if Necessary
	BOP	(Step 9) Check AFW Valves – Proper Alignment • MD AFP Flow Control Valves – Throttled • TD AFP Flow Control Valves – Full Open

Op Test No.: 2016-1 Scenario # 1 rev.1 Event # 6 and 7 Page 33 of 36

Event Description: RCS Leak – LOCA / LOCA Sequencer Train A Failure

Proc /Time	Position	Applicant's Actions or Behavior
E-0	**BOP**	(Step 10) Check Total AFW Flow > 285,000 lbm/hr
	RO	(Step 11) Check PZR PORVs and Spray Valves a. PZR PORVs – Closed b. PZR PORVs – Both in AUTO c. PORV Block Valves – Both Open d. Normal PZR Spray Valves – Closed
	RO	(Step 12) Check if RCPs should be Stopped a. RCPs – Any Running b. ECCS Pumps – At least One Running c. RCS Pressure – Less than 1425 psig **YES** d. Stop all RCPs
CRITICAL TASK	**RO/BOP**	**Trip all RCPs within 5 minutes of meeting RCP trip criteria (RCS pressure LESS THAN 1425 PSIG)** Time RCS pressure less than 1425 psig: _____ Time RCPs tripped: _____
	RO	(Step 13) Check RCS Temperatures • RCPs Running – Tavg 557 Deg F • No RCPs Running – Tcold 557 Deg F
	RO/BOP	(Step 14) Check if any SG is Faulted: a. CHECK pressures in all SGs: • Any SG pressure lowering uncontrollably • Any SG completely depressurized

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 6 and 7	Page 34 of 36
Event Description:	RCS Leak – LOCA / LOCA Sequencer Train A Failure		

Proc /Time	Position	Applicant's Actions or Behavior
E-0	**BOP**	(Step 15) Check if SG Tubes are intact: • Levels in all SGs – none rising in uncontrolled manner • SG Steamline N16 radiation – Normal • Condenser air removal radiation – Normal • SG blowdown and sample radiation – Normal • SG ASD radiation – Normal • TDAFW pump exhaust radiation - Normal
	RO/BOP	(Step 16) Check if RCS is Intact • Containment pressure – Normal – **NO** • Containment normal sump level – Normal – **NO** • Containment radiation – Normal – **NO** RNO – Go to E-1, Loss of Reactor or Secondary Coolant
E-1, LOSS OF REACTOR OR SECONDARY COOLANT		
		Initiate CSF Monitoring
E-1	**RO/BOP**	(Step 1) Check if RCPs should be stopped: Any running- **NO** RNO - Go To Step 2. OBSERVE NOTE prior to Step 2.
	BOP	(Step 2) Check if any SG is Faulted - **NO**
	BOP	(Step 3) Check intact SG levels a. Narrow range levels greater than 7% [25%] b. Control feed flow to maintain levels between 7% and 52%

Op Test No.: 2016-1 Scenario # 1 rev.1 Event # 6 and 7 Page 35 of 36

Event Description: RCS Leak – LOCA / LOCA Sequencer Train A Failure

Proc /Time	Position	Applicant's Actions or Behavior
E-1	**BOP**	(Step 4) Check secondary radiation – Normal a. Perform the following: • Perform EOP Addendum 11 • Direct Chem to periodically sample all SGs for activity • Direct RP to survey steamlines in Area 5 as necessary b. Check unisolated secondary radiation monitors: • SG sample radiation • SG ASD radiation • TDAFW pump exhaust radiation c. Secondary radiation - Normal
	BOP/RO	(Step 5) Check PZR PORVs and block valves: a. Power to block valves – Available b. PZR PORVs – Closed c. Block valves – Both Open
	BOP/RO	(Step 6) Check is ECCS flow should be reduced: a. RCS subcooling – greater than 30° b. Secondary heat sink: • Narrow range level in at least on SG greater than 7% • Total feed flow to SGs greater than 285,000 lbm/hr c. RCS pressure – stable or rising RNO – Go to Step 7
	BOP/RO	(Step 7) Check if Containment Spray should be stopped: (NOT IN SERVICE) RNO – Go to Step 8
	BOP/RO	(Step 8) Check if RHR pumps should be stopped: a. Check RCS pressure: 1) Greater than 325 psig RNO – Go To Step 10

Op Test No.: 2016-1	Scenario # 1 rev.1	Event # 6 and 7	Page 36 of 36
Event Description:	RCS Leak – LOCA / LOCA Sequencer Train A Failure		

Proc /Time	Position	Applicant's Actions or Behavior
E-1	**BOP/RO**	(Step 10) Check if Diesel Generators should be stopped: a. AC emergency buses – energized by offsite power b. Reset SI if necessary c. Perform EOP Addendum 8 d. Stop any unloaded DG and place in standby
	BOP/RO	(Step 11) Check Ultimate Heat Sink – Normal - YES
	BOP/RO	(Step 12) Initiate evaluation of plant status a. Check Cold Leg recirculation capability • Train A – Available – YES • Train B – Available – Yes b. CHECK Auxiliary Building radiation - NORMAL –YES c. OBTAIN samples: d. EVALUATE plant equipment for long term recovery as necessary: e. START additional plant equipment to assist in recovery as directed by SM/CRS
	CRS	(Step 13) CHECK If RCS Cooldown And Depressurization Is Required: a. RCS pressure - GREATER THAN 325 PSIG b. Go To ES-1.2, Post LOCA Cooldown And Depressurization, Step 1
The scenario can be terminated at the discretion of the Lead Examiner		

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

Scenario Event Description
Callaway 2016-1 NRC Scenario #2, rev. 1

The plant is stable at 100%. The Balance of Plant (BOP) is directed to perform Control Valve Partial Stroke Test on CV-1 in accordance with Section 6.2, OSP-AC-00003, Turbine Control Valve Stroke Test.

After Turbine Control Valve testing is complete, Turbine First Stage Pressure Indicator AC PI-505 fails low. This causes the control rods to step in. The crew should respond per OTO-AC-00003, Turbine Impulse Pressure Channel Failure, take manual control of control rods, select and operable turbine first stage pressure channel, and restore RCS Tavg to within 1°F of Tref and returns rod control to AUTO. Tech Spec 3.3.1 applies.

After Tech Specs have been addressed, DRPI for rod M-4 will fail. The crew will be alerted to the failure by annunciator 80A and 80B. The crew should take actions per OTA-RK-00022 Addendum 80A to place rod control in Manual and record RCS Tavg once per hour. Technical Specification 3.1.7 applies.

After Tech Specs have been addressed, 'B' MFP speed probes fails over 5 minutes. The crew should respond per OTO-AE-00001, Feedwater System Malfunctions, and take manual control of the ‘B’ MFP restore SG NR level to between 45 and 55%.

After SG level has been returned to between 45% and 55%, a mechanical failure causes ‘C’ RCP vibrations to rise rapidly above the immediate trip setpoint. This will drive the crew to enter OTO-BB-00002, RCP Off Normal. The crew will recognize the need to immediately trip the Reactor and the C RCP. When the crew attempts to trip the reactor it will NOT trip. The crew should enter E-0 and transition to FR-S.1, Response to Nuclear Power Generation / ATWS, at step 1 of E-0. The C RCP should NOT be tripped until Reactor power is Less than 5%.

During the performance of FR-S.1, rods will drop into the core after PG19 and PG20 feeder breakers are opened to deenergize the rod drive MG sets. The crew will return to E-0 and continue with the recovery.

During FR-S.1, the C S/G ASD will Fail to Close after opening during the ATWS. An SI will occur and the crew will continue through E-0. The crew will isolate steam flow from and feed flow to the C S/G per fold out page of E-0. The ASD will NOT be able to be manually closed from the Control Room and Local Operator action will be required to close the isolation valve for the ASD. The crew will transition to E-2, Faulted Steam Generator, and then transition to ES-1.1, SI Termination. The scenario may be terminated after the crew determines they will transition to ES-1.1, SI Termination

Scenario Critical Tasks
Callaway 2016-1 NRC Scenario #2, rev. 1

Critical Tasks:

Critical Tasks	Insert negative reactivity into the core by at least one of the following methods before dispatching operators to locally Trip the Reactor • Deenergize PG19 and PG20 • Insert Control Rods • Establish emergency boration flow to the RCS	Isolate feed flow to 'C' Steam Generator prior to: Intermediate Range having a positive SUR OR Obtaining an INTEGRITY RED or Orange Path
EVENT	6	7
Safety significance	In the scenario, failure to insert negative reactivity by one of the methods listed previously can result in the needless continuation of an extreme or a severe challenge to the subcriticality CSF. Although the challenge was not initiated by the crew (was not initiated by operator error), continuation of the challenge is a result of the crew's failure to insert negative reactivity.	Failure to isolate a faulted SG that can be isolated causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Failure to isolate a faulted SG can result in challenges to the following CSFs: • Integrity • Subcriticality
Cueing	In the scenario, failure to insert negative reactivity by one of the methods listed previously can result in the needless continuation of an extreme or a severe challenge to the subcriticality CSF. Although the challenge was not initiated by the crew (was not initiated by operator error), continuation of the challenge is a result of the crew's failure to insert negative reactivity.	Both of the following: • Steam pressure and flow rate indications that make it possible to identify 'C' SG as faulted AND • Valve position and flow rate indication that AFW continues to be delivered to the faulted 'C' SG
Performance indicator	Manipulation of controls in the control room as required to initiate the insertion of negative reactivity into the core (at least one of the following) • Open supply breakers to PG19 and PG20. o PG HIS-16 and PG HIS-18 • Insert Control Rods at the Maximum Rate. • ALIGN emergency boration flow path: o Start boric acid transfer pumps ▪ BG HIS-5A and BG HIS-6A o OPEN Emergency Borate To Charging Pump Suction valve: ▪ BG HIS-8104	ISOLATE AFW flow to faulted SG(s): • CLOSE associated MD AFP Flow Control Valve(s): o AL HK-11A (SG C) • CLOSE associated TD AFP Flow Control Valve(s): o AL HK-12A (SG C) • FAST CLOSE all MSIVs and Bypass valves: o AB HS-79 o AB HS-80
Performance feedback	Crew will observe the following: • Indication of a negative SUR on the intermediate range of the excore NIS • Indication of less than 5% power on the power range of the excore NIS	Crew will observe the following: • Any depressurization of intact SGs stops • AFW flow rate indication to faulted SG of zero
Justification for the chosen performance limit	Local operator actions would result in reactor trip, which would shut down the reactor faster than boration (and faster than rod insertion). However, it is anticipated that effecting the local actions will be time-consuming and that actions that can be implemented from the control room should be given precedence. Thus, before dispatching operators to perform local actions to trip the reactor, the crew should perform or initiate performance of at least one of the three methods listed previously for shutting down the reactor and providing shutdown margin.	"before transition out of E-2" is in accordance with the PWR Owners Group Emergency Response Guidelines. It allows enough time for the crew to take the correct action while at the same time preventing avoidable adverse consequences.
PWR Owners Group Appendix	CT- 52, Insert negative reactivity into the core	CT-17 Isolate faulted SG

Scenario Procedure References
Callaway 2016-1 NRC Scenario #2, rev. 1

References
OSP-AC-00003, Turbine Control Valve Stroke Test
OTN-BB-00005, Pressurizer and Pressurizer Pressure Control
OTO-SF-00001, Rod Control Malfunctions
OTO-AC-00003, Turbine Impulse Pressure Channel Failure
OTA-RK-00022 Addendum 80A, Rod Position Indication Urgent Alarm
OTO-AE-00001, Feedwater System Malfunction
OTO-BB-00002, RCP Off Normal
OTO-AB-00001, Steam Dump Malfunction
E-0, Reactor Trip or Safety Injection
E-2, Faulted Steam Generator Isolation
FR-S.1, Response to Nuclear Power Generation / ATWS
Tech Spec 3.3.2
Tech spec 3.1.7
ODP-ZZ-00025, EOP/OTO User's Guide

PRA Systems, Events or Operator Actions

1. ATWS TAT3
    a. Manual Control Rod Insertion

Scenario #2 Setup Guide:

Establish the initial conditions of IC-10, MOL 100% power:

- RCS boron concentration 862 ppm
- CCP A 863 ppm minus 5 days
- CCP B 865 ppm minus 15 days
- Rod Control Bank D 215 steps, Other banks 228 steps

==========SCENARIO PRELOADS / SETUP ITEMS==========

ATWS (Event 6):

- Insert Malfunction (SF) SF006, value = Both_modes

S/G "C" ASD Sticks Open (Event 7):

- Insert Malfunction (AB) ABPV0003A_2, Value = 1.0, Condition = HWX06O39R eq 1

========== EVENT 1 ==========

Perform Control Valve Partial Stroke Test

==========EVENT 2 ==========

First Stage Turbine Pressure Indicator Failure

- Insert Malfunction (AC) ACPT0505, value = 0, ramp = 0 min

==========EVENT 3 ==========

Loss of DRPI (Rod M-4)

- Insert Malfunction (SF) M04_DA, value = True
- Insert Malfunction (SF) M04_DB, value = True

==========EVENT 4 ==========

'B' Failure MFP Speed Failure

- Insert Malfunction (FC) FCSI0132ATVSP, Value = 0, ramp = 5 min
- Insert Malfunction (FC) FCSI0132BTVSP, Value = 0, ramp = 5 min
- Insert Malfunction (FC) FCSI0132CTVSP, Value = 0, ramp = 5 min

==========EVENT 5 ==========

"C" RCP High Vibration

- Insert Malfunction (BB) CRCPV1_3, value = 5, ramp = 1 min
- Insert Malfunction (BB) CRCPV2_3, value = 20, ramp = 1 min

==========EVENT 6==========

Nuclear Power Generation / ATWS

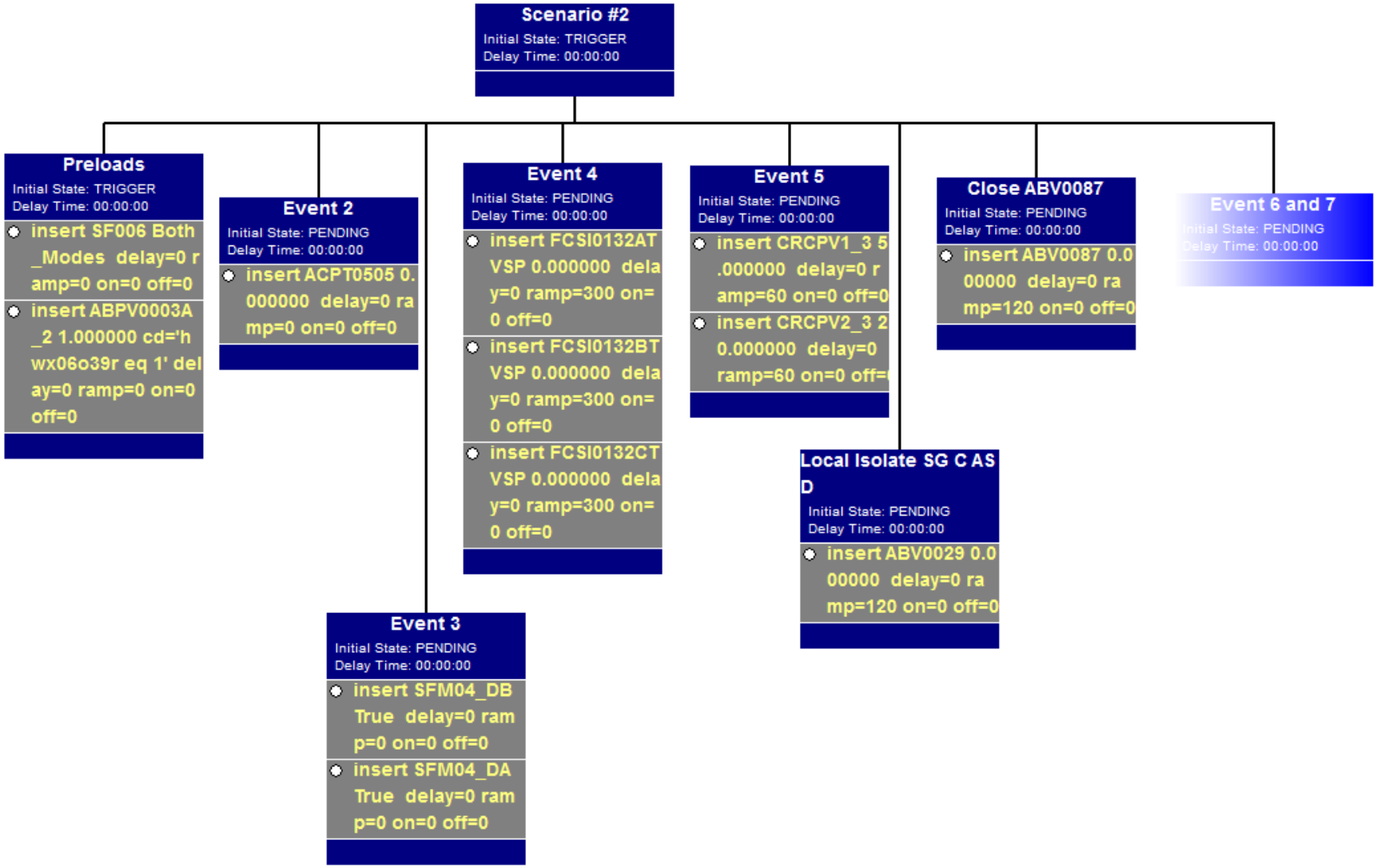
- SEE PRELOADS ABOVE

==========EVENT 7 PRELOADED==========

S/G "C" ASD Sticks Open

- SEE PRELOADS ABOVE

Scenario#2 Simulator Lesson Plan
Callaway 2016-1 NRC Scenario #2, rev. 1



Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 1	Page 7 of 33
Event Description:	Perform Control Valve Partial Stroke Test on CV-1		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator Perform the following communications/role playing as requested • Respond as Chemistry if contacted PZR backup heaters are being operated • Respond as the Power Dispatcher when notified that CV testing will be performed/completed • Respond as an OT that you are standing by to observe CV stroking • Respond as an extra RO that **"at SB029B, TRAIN A SSPS LOGIC CABINET, the Multiplexer Test switch is in the A+B position"** (this panel is in the back of the control room and not modeled in the simulator) • Respond as OT if asked if CV-1 stroked smoothly **"CV-1 stroked smoothly"** **Perform Control Valve Partial Stoke Test on CV-1 in accordance with Section 6.2., OSP-AC-00003, Turbine Control Valve Stroke Test.**		
Indications Available		
Perform Control Valve Partial Stroke Test on CV-1		
	CRS	Determines that to perform a partial stroke test of CV-1 the crew must perform Section 6.2 of OSP-AC-00003, Turbine Control Valve Stroke Test. To prepare for this test the crew will also have to perform section 5.1 of OTN-BB-00005,Pressurizer and Pressurizer Pressure Control
OTN-BB-00005	**CRS**	Implement OTN-BB-00005,Pressurizer and Pressurizer Pressure Control Section 5.1
	RO	(Step 5.1.1) ENSURE one OR both of the following in the CLOSED position: • BB HIS-51A, PZR HTR B/U GROUP A • BB HIS-52A, PZR HTR B/U GROUP B
	RO	(Step 5.1.2) ENSURE BB PK-455A, PZR PRESS MASTER CTRL, in MANUAL and LOWER to 40%.
	RO	(Step 5.1.3) ENSURE BB PK-455A, PZR PERSS MASTER CTRL, in AUTO.

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 1	Page 8 of 33
Event Description:	Perform Control Valve Partial Stroke Test on CV-1		

Proc /Time	Position	Applicant's Actions or Behavior
	RO	(Step 5.1.4) IF the Pressurizer backup heaters will be operated for an extended period of time (greater than 2 hours), INFORM Chemistry as increased Pressurizer spray may reduce RCS Hydrogen concentration
OSP-AC-00003,Turbine Control Valve Stroke Test		
OSP-AC-00003	**BOP**	(Step 6.2.1.) Preparations a. CHECK the following CV position meters are approximately equal: • CV-1 • CV-2 • CV-3 b. At SB069, REACTOR PARTIAL TRIP STATUS PANEL, CHECK the status lights are NOT energized: • TURB AUTO STOP 63 AST 1 for CV-1 • TURB AUTO STOP 63 AST 2 for CV-2 • TURB AUTO STOP 63 AST 3 for CV-3 c. In SB029B, TRAIN A SSPS LOGIC CABINET, IF Multiplexer Test switch is in any position other than A+B, CONTACT I&C prior to proceeding. d. PERFORM the following: 1. ENSURE the turbine is OFF the limiter of load set as follows: a) RECORD Load Limit Set potentiometer setting. _____ b) Using EHC Panel DECREASE LOAD pushbutton, SLOWLY LOWER load until the following conditions are met: • LOAD LIMIT LIMITING light is off • DECREASE LOADING RATE "OFF" light is lit • LOADING RATE LIMIT %/MIN "1/2" light is lit 2. TURN LOAD LIMIT SET potentiometer fully clockwise. 3. Using DECREASE LOADING RATE ON pushbutton, PRESS ON. e. CHECK LOAD LIMIT panel light is NOT illuminated. f. ESTABLISH communications between the URO (BOP) and the Local Observer.

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 1	Page 9 of 33
Event Description:	Perform Control Valve Partial Stroke Test on CV-1		

Proc /Time	Position	Applicant's Actions or Behavior
OSP-AC-00003	**BOP**	(Step 6.2.2) Control Valve 1 a. RECORD turbine load. _____ MWe b. RECORD the NO. 1 valve position from position meter. _____ % c. PERFORM the following to test CV-1: • MONITOR turbine load decrease. NOTE: Steps 6.2.2.c.2 through 6.2.2.c.4 may be performed concurrently. • PRESS and HOLD the CV-1 TEST pushbutton. • OBSERVE CV-1 strokes smoothly. • WHEN the NO. 1 valve position meter indicates approximately 20% travel in the closed direction, RELEASE the CV-1 TEST pushbutton. d. RECORD lowest turbine load. _____ MWe e. CHECK that CV-1 returns to the position recorded in Step 6.2.2.b. f. RECORD on Attachment 2 whether the following Acceptance Criteria have been met for CV-1: • Stroked approximately 20% in the closed direction • Stroked smoothly g. CHECK the following CV position meters are approximately equal and RECORD on Attachment 2: • CV-1 • CV-2 • CV-3 h. CALCULATE turbine load decrease. _____ - _____ = _____ MWe Step 6.2.2.a Step 6.2.2.d
	BOP	(Step 7) Restoration
	BOP	(Step 7.2) IF Partial Stroke Testing was performed, RECORD the following on Attachment 2: 7.2.1. Turbine load. 7.2.2. Largest turbine load decrease (Step 6.2.2.h, 6.2.3.h, 6.2.4.h). 7.2.3. Surveillance results.

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 1	Page 10 of 33
Event Description:	Perform Control Valve Partial Stroke Test on CV-1		

Proc /Time	Position	Applicant's Actions or Behavior
OSP-AC-00003	**BOP**	(Step 7.3) IF desired, to place the turbine on the load set limiter, PERFORM the following: 7.3.1. At LOAD MONITORING section, ENSURE AT SET LOAD light is lit. 7.3.2. Slowly TURN the LOAD LIMIT SET potentiometer Counter Clockwise until the LOAD LIMIT LIMITING light is ON. 7.3.3. CHECK all LOADING RATE LIMIT % / MIN lights are off. 7.3.4. Using LOAD SELECTOR INCREASE LOAD pushbutton, INCREASE load until LOAD SET MW indication stops increasing.
	BOP	(Step 7.4) As needed, ADJUST Turbine load per OTG-ZZ-00004, Power Operation.
	CRS	(Step 7.5) NOTIFY Power Dispatcher that testing has been completed.
	CRS	(Step 7.6) IF energized per Step 5.9, RESTORE back-up heaters per Automatic Heater Operation section of OTN-BB-00005, Pressurizer And Pressurizer Pressure Control.
OTN-BB-00005, Pressurizer And Pressurizer Pressure Control		
OTN-BB-00005	**RO**	(Step 5.2.1) ENSURE the following heaters in AUTO: • BB HIS-51A, PZR HTR B/U GROUP A • BB HIS-52A, PZR HTR B/U GROUP B
		(Step 5.2.2) ENSURE BB HIS-50, PZR HTR CTRL GROUP C, in NORMAL AFTER CLOSE
		(Step 5.2.3) Using MANUAL control, RAISE BB PK-455A, PZR PRESS MASTER CTRL, to 50%.
		(Step 5.2.4) ENSURE BB PK-455A, PZR PRESS MASTER CTRL, in AUTO.

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 1	Page 11 of 33
Event Description:	Perform Control Valve Partial Stroke Test on CV-1		

Proc /Time	Position	Applicant's Actions or Behavior
OSP-AC-00003,Turbine Control Valve Stroke Test		
OSP-AC-00003	**BOP**	(Step 7.7) PLACE control rods in mode of control as required per SM/CRS.
	CRS	(Step 7.8) SEND copies of test data sheets to AC system engineer.
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 2	Page 12 of 33
Event Description:	First Stage Turbine Pressure Indicator Failure (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator • Insert Event 2: First Stage Turbine Pressure Indicator Failure o Malfunction (AB) ABPT0505, value = 0, ramp = 0 sec • When contacted, respond as DUTY MANAGER. Acknowledge the channel failure, OTO entry, and Tech Spec entry.		
Indications Available		
		ANN 65E, T REF / T AUCT LO ANN 77A, REACT DEV
OTO-SF-00001, Rod Control Malfunctions		
OTO-SF-00001	**CRS**	Implement OTO-SF-00001, Rod Control Malfunctions
	RO	(Step 1) CHECK Both Of The Following Are Met For Indication Of Multiple Dropped Rods: - **NO** Step 1 RNO Go To Step 3.
	RO	(Step 3) CHECK Main Turbine Runback Or. Load Reject - IN PROGRESS Step 3 RNO Go To Step 5
	RO	(Step 5) PLACE Rod Control in MANUAL: • SE HS-9
	RO	(Step 6) CHECK Control Rods Motion - STOPPED
	RO	(Step 7) CHECK Instruments Indications - NORMAL b. HP Turbine First Stage Pressure • AC PI-505 Step 7.b RNO Go To OTO-AC-00003, Turbine Impulse Pressure Channel Failure.

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 2	Page 13 of 33
Event Description:	First Stage Turbine Pressure Indicator Failure (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-AC-00003, TURBINE IMPULSE PRESSURE CHANNEL FAILURE		
	CRS	Implement OTO-AC-00003, TURBINE IMPULSE PRESSURE CHANNEL FAILURE
OTO-AC-00003	**RO**	(Step 1) PLACE Rod Control in MANUAL: • SE HS-9
	BOP	(Step 2) CHECK HP Turbine First Stage Pressure Indicator - FAILED • AC PI-505 • AC PI-506
	BOP	(Step 3) SELECT HP Turbine First Stage Pressure Selector To Operable • AC PS-505Z
	RO	(Step 4) CHECK RCS Tavg Within 1.5°F Of Tref
	RO	(Step 5) CHECK Rod Control - IN AUTO • SE HS-9 At this time the crew may determine that they are going to return rods to their original position prior to continuing with the procedure
	BOP	(Step 6) PLACE Steam Dump Bypass Interlock Switches To OFF/RESET: • AB HS-63 • AB HS-64
	BOP	(Step 7) CHECK The Following Permissives Are In The Correct State Within One Hour Of The Channel Failure Per Attachment B, Permissives: • P-7 • P-13

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 2	Page 14 of 33
Event Description:	First Stage Turbine Pressure Indicator Failure (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior

	CRS	(Step 8) Review Applicable Tech Specs, Attachment C
		• 3.3.1, Cond A
		• 3.3.1, Table 3.3.1-1 Item 18.b Cond T
		  ○ 1 hour to Verify interlock is in required state for existing conditions
		• 3.3.1, Table 3.3.1-1 Item 18.f Cond T
		  ○ 1 hour to Verify interlock is in required state for existing conditions

	CRS	(Step 9) REVIEW Attachment A, Effects of Turbine Impulse Pressure Instrument Failure
	CRS	(Step 10) Place Inoperable Turbine Impulse Pressure Channel in the EOSL
NOTE		The AMSAC Test/Bypass panel is not modeled in the simulator

	BOP	(Step 11) At AMSAC Test/Bypass Panel, (SS001), PLACE Turbine Impulse Pressure Channel In The Proper Condition For AMSAC:
		a. PLACE SW12, Operating Bypass switch, to the position associated with failed pressure channel:
		  • PTI 1 (PT-505)
		  • PTI 2 (PT-506)
		b. CHECK Reactor Power - GREATER THAN OR EQUAL TO 40%
		c. PLACE SW11, Operating Bypass toggle switch, to the right hand position

	CRS	(Step 12) RECORD Permissives Are In The Correct State In The Control Room Log
	CRS	(Step 13) Initiate Action to Repair the failed component
	CRS	(Step 14) PERFORM Notifications Per ODP-ZZ-00001 Addendum 13, Shift Manager Communications
NOTE		**At Lead Examiner's discretion move to the next Event after Control Rods are in AUTO**

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 3	Page 15 of 33
Event Description:	Loss of DRPI (Rod M-4) (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator • Insert Event 3: Loss of DRPI (Rod M-4) o Malfunction (SF) M04_DA, value = True o Malfunction (SF) M04_DB, value = True • When contacted, respond as I&C. Acknowledge the request to investigate the instrument/channel failure. • When contacted, respond as DUTY MANAGER. Acknowledge entry into the Tech Spec		
Indications Available		
		ANN 79C, PR LOWER DETECTOR FLUX DEV ANN 80A, ROD POSITION INDICATION URGENT ALARM ANN 80B, ROD POSITION INDICATION NON-URGENT ALARM ANN 80C, ROD POSITION INDICATION ROD DEVIATION
OTA-RK-00022, ADD 80A Rod Position Indication Urgent Alarm		
OTA-RK-00022	**CRS**	Implements OTA-RK-00022, ADD 80A Rod Position Indication Urgent Alarm
	BOP	(Step 3.1) ENSURE SE HS-9, ROD BANK AUTO/MAN SEL is in MANUAL.
	BOP	(Step 3.2) STOP any evolutions that would require Control Rod motion.
	BOP	(Step 3.3) 3.3. MONITOR and RECORD RCS Tavg once per hour.
	BOP	(Step 3.4) REQUEST I&C Department to investigate.
OTA-RK-00022	**CRS**	(Step 3.5) Refer To T/S 3.1.7, FSAR 16.1.3.1 and FSAR 16.3.3.8. • 3.1.7 Cond A o 8 hour to Verify the position of the rods with inoperable position indicators indirectly by using core power distribution measurement information. OR o Reduce THERMAL POWER to ≤ 50% RTP.

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 3	Page 16 of 33
Event Description:	Loss of DRPI (Rod M-4) (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-SF-00001, ROD CONTROL MALFUNCTIONS (Crew might not enter this OTO)		
OTO-SF-00001	**CRS**	Implements OTO-SF-00001, ROD CONTROL MALFUNCTIONS
	RO	(Step 1) CHECK Both Of The Following Are Met For Indication Of Multiple Dropped Rods: • Annunciator 81A, Two/More Rods At Bottom – LIT - **NO** • Rod Bottom lights for greater than one rod – LIT - **NO** RNO Go To Step 3.
	BOP	(Step 3) CHECK Main Turbine Runback Or Load Reject - IN PROGRESS - **NO** RNO Go To Step 5.
	RO	(Step 5) PLACE Rod Control in MANUAL: • SE HS-9
	RO	(Step 6) CHECK Control Rods Motion STOPPED
	RO	(Step 7) CHECK Instruments Indications - NORMAL
OTO-SF-00001	**RO**	(Step 8) CHECK Annunciator 79A, Rod Ctrl Urg Fail – LIT - **NO** RNO - PERFORM The Following: a. MAINTAIN RCS Tavg/Tref Deviation Within 1.5°F Using Any Of The Following: • ADJUST Turbine load. • ADJUST RCS boron concentration. • ADJUST Control Rods. b. Go To Step 10.

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 3	Page 17 of 33
Event Description:	Loss of DRPI (Rod M-4) (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
	RO	(Step 10) CHECK Both Of The Following Are - EXTINGUISHED • Annunciator 81B, Rod At Bottom • All Rod Bottom lights
	RO	(Step 11) CHECK Rods Misaligned - LESS THAN 12 STEPS
	RO	(Step 12) CHECK Rods Status - OPERABLE PER Technical Specification 3.1.4
	CRS	(Step 13) DIRECT I&C To Perform ITM-ZZ-0015, Rod Control Troubleshooting Guidelines
	CRS	(Step 14) REVIEW Applicable Technical Specifications: • Refer To Attachment C,Technical Specifications
	CRS	(Step 15) PERFORM Notifications Per ODP-ZZ-00001 Addendum 13, Shift Manager Communications
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 4	Page 18 of 33
Event Description:	'B' Failure MFP Speed Failure		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator • Insert Event 4: 'B' Failure MFP Speed Failure o Malfunction (FC) FCSI0132ATVSP, Value = 0, ramp = 5 min o Malfunction (FC) FCSI0132BTVSP, Value = 0, ramp = 5 min o Malfunction (FC) FCSI0132CTVSP, Value = 0, ramp = 5 min • When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO.		
Indications Available		
		SG levels rising 'B' MFP Speed indication goes to zero
OTO-AE-00001, FEEDWATER SYSTEM MALFUNCTION		
	CRS	Implements OTO-AE-00001, FEEDWATER SYSTEM MALFUNCTION
	BOP	(Step 1) CHECK BOTH MFP Tripped – **NO** RNO – Go to Step 2
	BOP	(Step 2) CHECK ONE MFP Tripped – **NO** RNO – Go to Step 10
	BOP	(Step 10) Maintain MFP Suction Pressure Greater Than The Following: • 240 psig
	BOP	(Step 11) Check DFWCS Operator Station on RL005 Available

Op Test No.: 2016-1 Scenario # 2 rev.1 Event # 4 Page 19 of 33

Event Description: 'B' Failure MFP Speed Failure

Proc /Time	Position	Applicant's Actions or Behavior
	BOP	(Step 12) Check Running Main Feed Pumps Speed – MEETS BOTH of the Following: • Controlling in AUTO - **NO** • Stable – **NO** RNO – Perform the Following: a. Place the affected MFP Turbine Speed Control in Manual • FC SK-509C b. Manually CONTROL MFP speed to restore SG NR level between 45% and 55%
	BOP	(Step 13) Check if MFW Reg Valves – In Service
	BOP	(Step 14) Check MFW Reg Valves – Controlling in AUTO
		The team will continue in OTO-AE-00001, FEEDWATER SYSTEM MALFUNCTION. After SG level is stable and the 'B' MFP is being controlled in Manual the evaluation can continue with the next event.
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 5	Page 20 of 33
Event Description:	"C" RCP High Vibration		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator • Insert Event 5: "C" RCP High Vibration o Malfunction (BB) CRCPV1_3, value = 5 o Malfunction (BB) CRCPV2, value = 20 • Act as DUTY MANAGER and acknowledge the OTO entry • Act as Power Dispatch to acknowledge load reduction.		
Indications Available		
		70A RCP VIB DANGER 70B RCP VIB / SYS ALERT
OTO-BB-00002, RCP OFF-NORMAL		
	CRS	Implement OTO-BB-00002, RCP OFF-NORMAL
OTO-BB-00002	**RO**	(Step 1) Check All RCPs - Running
	CRS	(Step 2) Go to one of the following attachments: • Attachment A, RCP High Vibration
OTO-BB-00002, Attachment A, RCP High Vibration		
	BOP	Step A1)Check RCP Vibration Level: • All RCPs vibration on the frame – less than 5 mils • All RCPs vibration on the shaft – less than 20 mils RNO: Perform one of the following: • IF reactor power is greater than or equal to 48%(P-8 Lit), Then Go to Attachment D, RCP and Reactor Trip.
OTO-BB-00002, Attachment D, RCP and Reactor Trip		

Op Test No.: 2016-1 Scenario # 2 rev.1 Event # 5 Page 21 of 33

Event Description: "C" RCP High Vibration

Proc /Time	Position	Applicant's Actions or Behavior
	CRS	Implement OTO-BB-00002, Attachment D, RCP and Reactor Trip
	RO	(Step D1) Manually Trip the Reactor.
	RO	(Step D2) Verify the Reactor has tripped. – **NO** The C RCP should NOT be tripped at this time. After the reactor is tripped the team will need to complete OTO-BB-00002, Attachment D, RCP and Reactor Trip actions
NOTE		**The applicants will transition to E-0/FR-S.1 at this time**
	RO	(Step D3) Trip the affected RCP
	CRS	(Step D4) Perform E-0, while continuing in the procedure
	RO	(Step D5) Check RCP A - Running
	RO	(Step D6) Check RCP B - Running
	RO	(Step D7) Defeat Tavg and ΔT for idle RCS Loop
	RO	(Step D8) Check No. 1 Seal Leakoff Flow was less than 6 gpm prior to securing the RCP Step D8 RNO Close BB HIS-8141C
	CRS	Step (D10) Return to step in effect

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 22 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Booth Operator

- Event 6: ATWS (PRELOADED):
  - Malfunction (SF) SF006, value = Both_modes
- Event 7: S/G C ASD Sticks Open (PRELOADED):
  - Malfunction (AB) ABPV0003A_2, value = 1.0, Condition = HWX06O39R eq 1

- Act as Primary OT and Locally Open the Reactor Trip Breakers. After being dispatched, wait 3 minutes
  - Delete Malfunction (SF) SF006, value = Both_modes.
  - Report to Control Room when complete.

- After 5 minutes report that you are attempting to isolate S/G C ASD. Wait 1 minute and report that bleeding Air to the ASD failed and the Manual Isolation is galled and very difficult to operate. You are getting a tool to aid with operation of the valve.

- After the crew makes the transition to E-2, then Isolate S/G C ASD.
  - Insert Event "Local Isolate SG C ASD".
    - Remote (AB) ABPV0029, value = 0, ramp = 2 minutes
  - Report to Control Room when complete.

- If directed to locally close ABV0087 wait 5 minutes the close ABV0087
  - Insert Event "Close ABV0087"
    - Remote (AB) ABV0087, value = 0, ramp = 2 minutes
  - Report to Control Room when complete.

Proc /Time	Position	Applicant's Actions or Behavior
E-0, Reactor Trip or Safety Injection		
	CRS	Implement E-0, Reactor Trip or Safety Injection
E-0	**RO**	(Step 1) Check Reactor Trip • Rod Bottom Lights – All Lit - **NO** • Reactor Trip and Bypass Breakers – Open • Neutron Flux – Lowering – **NO** RNO: Manually Trip Reactor. If Reactor power is greater than or equal to 5% or Intermediate Range SUR is positive, Then Go To FR-S.1, Response to Nuclear Power Generation / ATWS Step 1.

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 23 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
FR-S.1, Response to Nuclear Power Generation / ATWS		
	CRS	Implement FR-S.1, Response to Nuclear Power Generation / ATWS
FR-S.1	**CRS**	CAUTION: RCPs should NOT be tripped with reactor power greater than 5%. NOTE: Steps 1 and 2 are immediate action steps.
	RO	(Step 1) Check Reactor Trip • Rod Bottom Lights – All Lit • Reactor Trip and Bypass Breakers – Open • Neutron Flux – Lowering RNO– Manually Trip the Reactor. • Insert Control Rods at the Maximum Rate • Open supply breakers to PG19 and PG20
Critical Task		**Insert negative reactivity into the core by at least one of the following methods before dispatching operators to locally Trip the Reactor** • **Deenergize PG19 and PG20** • **Insert Control Rods** • **Establish emergency boration flow to the RCS**
	RO/BOP	(Step 2) Check Turbine Trip • All Stop Valves – Closed RNO – Manually TRIP Turbine
	RO/BOP	(Step 3) Check AFW Pumps Running • MDAFPs – Both running • TDAFP – Running if necessary

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 24 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
FR-S.1	**RO/BOP**	(Step 4) Initiate Emergency Boration of RCS a. At least one charging pump running b. ALIGN emergency boration flow path: 1) Start boric acid transfer pumps 2) Open BG HIS 8104 3) Check Emergency Boration Flow – Greater Than 30 GPM 4) Maintain charging Flow greater than boration flow c. Check PZR Oressure less than 2335 psig
	RO/BOP	(Step 5) Check Containment Purge Isolation a. ESFAS status panels CPIS sections: • SA066X WHITE lights - ALL LIT • A066Y WHITE lights - ALL LIT
	RO/BOP	(Step 6) Check if the Following Trips Have Occurred a. Reactor Trip RNO – Locally trip reactor trip breakers b. Close Supply Breakers to PG19 and PG20 c. Turbine Trip
	RO/BOP	(Step 7) Check if the Reactor is Subcritical YES – Go To Step 16
	CRS	(Step 16) Return to procedure and step in effect (E-0, step 1)
E-0, Reactor Trip or Safety Injection		
	CRS	Implement E-0, Reactor Trip or Safety Injection

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 25 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
E-0	**RO**	(Step 1) Check Reactor Trip • Rod Bottom Lights – All Lit • Reactor Trip and Bypass Breakers – Open • Neutron Flux - Lowering
	BOP	(Step 2) Check Turbine Trip a. Turbine Stop Valves - Closed
	BOP	(Step 3) Check Power to AC Emergency Buses a. AC Emergency Buses - At Least One Energized • NB01 OR • NB02 b. AC Emergency Buses – BOTH Energized
	RO	(Step 4) Check SI Status: a. CHECK if SI is actuated: • Any SI annunciator 88A through 88D - LIT OR • SB069 SI Actuate RED light - LIT OR • LOCA Sequencer annunciators 30A or 31A - LIT b. CHECK both Trains of SI -ACTUATED • LOCA Sequencer annunciator 30A - LIT • LOCA Sequencer annunciator 31A - LIT • SB069 SI Actuate RED light - LIT SOLID (NOT blinking)
	RO/BOP	(Step 5) Perform Attachment A, Automatic Action Verification, while continuing with this procedure
E-0 Att A	**RO/BOP**	(Step A1) Check Charging Pumps – Both CCPs running
	RO/BOP	(Step A2) Check SI and RHR Pumps – All running

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 26 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A3) Check ECCS Flow a. CCPs To Boron Inj Header ‑FLOW INDICATED • EM FI‑917A • EM FI‑917B b. RCS pressure ‑ LESS THAN 1700 PSIG (at this time pressure might be below 1700 psig. If it the applicant will contine with the step, if not the applicant will go to step A4) c. SI Pump Discharge ‑ FLOW INDICATED d. RCS pressure ‑ LESS THAN 325 PSIG – **NO** Go To Step A4.
	RO/BOP	(Step A4) CHECK ESW Pumps – BOTH RUNNING

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 27 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A5) CHECK CCW Alignment: a. CCW Pumps – ONE RUNNING IN EACH TRAIN • Red Train: ▪ EG HIS-21 or EG HIS-23 • Yellow Train: ▪ EG HIS-22 or EG HIS-24 b. CCW Service Loop Supply and Return valves for one operating CCW pump – OPEN • EG ZL-15 AND EG ZL-53 OR • EG ZL-16 AND EG ZL-54 c. OPEN CCSW To RHR HX valves: • EG HIS-101 • EG HIS-102 d. CLOSE Spent Fuel Pool HX CCW Outlet Valves: • EC HIS-11 • EC HIS-12 e. STOP Spent Fuel Pool Cooling Pump(s): • EC HIS-27 • EC HIS-28 f. RECORD The Time Spent Fuel Pool Cooling Pump Secured g. MONITOR Time Since CCW Flow Isolated to SFP HX LESS THAN 4 HOURS
	RO/BOP	(Step A6) CHECK Containment Cooler Fans – RUNNING IN SLOW SPEED • GN HIS-9 • GN HIS-17 • GN HIS-5 • GN HIS-13

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 28 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A7) CHECK Containment Hydrogen Mixing Fans – RUNNING IN SLOW SPEED • GN HIS-2 • GN HIS-4 • GN HIS-1 • GN HIS-3
	RO/BOP	(Step A8) CHECK If Containment Spray should Be Actuated: a. CHECK the following: • Containment pressure – GREATER THAN 27 PSIG OR • GN PR-934 indicates containment pressure – HAS BEEN GREATER THAN 27 PSIG OR • Annunciator 59A CSAS LIT OR • Annunciator 59B CISB – LIT (Step A8.a RNO) Go To Step A9
	RO/BOP	(Step A9) CHECK If Main Steamlines Should Be Isolated: a. CHECK for any of the following: • Containment pressure – GREATER THAN 17 PSIG OR • GN PR-934 indicates containment pressure – HAS BEEN GREATER THAN 17 PSIG OR • Steamline pressure – LESS THAN 615 PSIG OR • AB PR-514 or AB PR-535 indicates steamline pressure – HAS BEEN LESS THAN 615 PSIG b. CHECK MSIVs and Bypass valves - CLOSED

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 29 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A10) CHECK ECCS Valves – PROPER EMERGENCY ALIGNMENT a. ESFAS status panels SIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A11) CHECK Containment Isolation Phase A: a. ESFAS status panels CISA sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A12) CHECK SG Blowdown Isolation: a. ESFAS status panels SGBSIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A13) CHECK Both Trains of Control Room Ventilation Isolation: a. ESFAS status panels CRVIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A14) CHECK Containment Purge Isolation: a. ESFAS status panels CPIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A15) NOTIFY CRS of the following: • Unanticipated Manual actions taken. • Failed Equipment status • Attachment A, Automatic Action Verification, completed.

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 30 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
E-0, REACTOR TRIP OR SAFETY INJECTION		
E-0		
	BOP	(Step 6) Check Generator Output Breakers – Open
	BOP	(Step 7) Check Feedwater Isolation a. Main Feedwater Pumps – Tripped b. Main Feedwater Reg Valves – Closed c. Main Feedwater Reg Bypass Valves – Closed d. Feedwater Isolation Valves – Closed
	BOP	(Step 8) Check AFW Pumps a. MD AFW Pumps – Both Running b. TD AFW Pump – Running if Necessary
	BOP	(Step 9) Check AFW Valves – Proper Alignment • MD AFP Flow Control Valves – Throttled • TD AFP Flow Control Valves – Full Open • AFW may be isolated to SG C per foldout page
	BOP	(Step 10) Check Total AFW Flow > 285,000 lbm/hr
	RO	(Step 11) Check PZR PORVs and Spray Valves a. PZR PORVs – Closed b. PZR PORVs – Both in AUTO c. PORV Block Valves – Both Open d. Normal PZR Spray Valves – Closed
	RO	(Step 12) Check if RCPs should be Stopped a. RCPs – Any Running b. ECCS Pumps – At least One Running c. RCS Pressure – Less than 1425 psig RNO – Go to Step 13

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 31 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
E-0	**RO**	(Step 13) Check RCS Temperatures • RCPs Running – Tavg 557 Deg F
	RO/BOP	(Step 14) Check if any SG is Faulted: a. CHECK pressures in all SGs: • Any SG pressure lowering uncontrollably • Any SG completely depressurized Go to E-2, Faulted Steam Generator Isolation, Step 1.
E-2, Faulted Steam Generator Isolation		
	CRS	Implement E-2, Faulted Steam Generator Isolation, Initiate CSF Monitoring
E-2	**RO/BOP**	(Step 1) Check MSIV's and Bypass Valves – Closed
	BOP	(Step 2) Check if any SG Secondary Pressure Boundary is Intact
	BOP	(Step 3) Identify Faulted SG(s) Any SG pressure lowering uncontrollably Any SG completely depressurized Identifies 'C' as faulted SG

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 32 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
E-2	**BOP**	(Step 4) Isolate Faulted SG(s) • **Isolate AFW flow (AL HK-11A and AL HK-12A)** • Check ASD closed (AB PIC-3A) RNO: Close valve as necessary. If valves cannot be closed, then locally close or isolate valves. • Locally close TDAFP steam supply (ABV0087) • Check MFRV closed (AE ZL-530) • Check MFRBV closed (AE ZL-570) • Check MFIV closed (AE HIS-41) • Check SGBD CTMT iso valve closed (BM HIS-3A) • Close Steamline Low Point Drain valve (AB HIS-7)
NOTE		The CT may be performed on foldout page of E-0
Critical Task	**RO/BOP**	**Isolate feed flow to 'C' Steam Generator prior to developing a RED or ORANGE path to either Integrity or Subcriticality CSF**
	BOP/RO	(Step 5) Check CST to AFP Suction Header Pressure – Greater than 2.75 psig
	BOP/RO	(Step 6) Check Secondary Radiation • Perform EOP Addendum 11, Restore SG sampling • Direct Chem. to sample All SG's • Direct RP to survey steamlines Check unisolated secondary rad monitors Secondary Radiation – Normal Level in all SGs
	BOP/RO	(Step 7) Check If ECCS Flow Should be Reduced a. RCS Subcooling > 30 Deg F [50 Deg F] b. Secondary heat sink: • NR level in one SG > 5% [25%] OR • Total AFW low > 285,000 lbm/hr c. RCS Pressure stable or rising d. PZR level > 9% [29%]

Op Test No.: 2016-1	Scenario # 2 rev.1	Event # 6 and 7	Page 33 of 33
Event Description:	Nuclear Power Generation / ATWS - S/G C ASD Sticks Open		

Proc /Time	Position	Applicant's Actions or Behavior
E-2	**BOP/RO**	(Step 8) Reset SI
	BOP/RO	(Step 9)Stop All But One CCP
	BOP/RO	(Step 10) Go To ES-1.1, SI Termination, Step 3
The scenario can be terminated at the discretion of the Lead Examiner		

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

Scenario Event Description
Callaway 2016-1 NRC Scenario #3, rev. 1

The plant is steady at 100% power. The “A” MD Auxiliary Feedpump is tagged out for maintenance and will not be returned until next shift.

Once the crew takes the watch, the Loop 1 Hot Leg RTD will fail high causing the control rods to drive in. The Reactor Operator will take manual control of the control rods and respond in accordance with OTO-BB-00004, RCS RTD Channel Failures. Tech Specification 3.3.1 applies.

After Tech Specs have been addressed, the running SCW Pump trips and the standby pump does not auto-start. A turbine runback begins as indicated by load reduction & annunciator 132C. The crew will take action to start the standby SCW Pump (prudent action, OTA directed, or OTO-MA-00001 directed). OTO-MA-00001, Turbine Load Rejection, will be entered with actions taken to stabilize the plant and initiate recovery.

When plant conditions are stable, a partial loss of Condenser vacuum will occur. The crew will perform actions per OTO-AD-00001, Loss of Condenser Vacuum. The crew will commence a down power in an attempt to restore vacuum. When a sufficient downpower (approximately 50 MWe) is achieved, the scenario continues with the next event.

While the crew is lowering power, a dropped rod occurs as indicated by DRPI and Control Rod Alarms. The ROs will perform the immediate actions of OTO-SF-00001 to place rods in manual. The crew will establish conditions for rod recovery, identify Technical Specifications and begin restoration. Tech Specification

Once the crew has addressed the dropped control and addressed Tech Specs, a steam leak develops in the Turbine Building which will be seen by the crew as RCS pressure and temperature rapidly lower. The crew may Manually trip the reactor based on these plant conditions. The crew should enter E-0, Reactor Trip or Safety Injection.

The automatic steamline isolation fails to occur. The crew should manually initiate MSLIS. The “B” Main Steamline Isolation Valve remains open. The crew should make efforts to complete the isolation of SG ‘B’ in accordance with E-2, Faulted S/G Isolation, but the “B” SG cannot be isolated.

The “B” MDAFP starts normally and then trips after running for 2 minutes. The TDAFP must be started manually due to malfunction inserted during the setup. The crew will then restore adequate feed to the intact Steam Generators.

The scenario will end after the crew has completed E-2 and starts to transition to ES-1.1, SI Termination

Scenario Critical Tasks
Callaway 2016-1 NRC Scenario #3, rev. 1

Critical Tasks:

Critical Tasks	Manually actuate main steamline isolation before a severe (ORANGE path) challenge develops to either the subcriticality or the integrity CSF or before transition to ECA-2.1 (whichever happens first)	Establish 285,000 lbm/hr to the intact SGs before intact SG level indicates less than 10% WR
EVENT	5	6
Safety significance	Failure to isolate the SGs from the steamline break such that all SGs are allowed to blow down uncontrollably significantly worsens the power excursion. This worsening of the power excursion is unnecessary; it could be prevented simply by closing the MSIVs	Under the postulated plant conditions, failure to manually establish the minimum required AFW flow rate (when it is possible to do so) results in a "significant reduction of safety margin beyond that irreparably introduced by the scenario." Finally, failure to manually actuate AFW under the postulated conditions is a "violation of the facility license condition."
Cueing	Indication that main steamline isolation is required AND Indication that main steamline isolation has not actuated automatically • MSIVs indicate open • Indication of uncontrolled depressurization of all SGs	Indication and/or annunciation that SI is actuated AND Indication and/or annunciation that the AFW flow rate is less than the minimum required • Total AFW flow rate indicates less than the minimum required • Control switch indication that the circuit breakers or contactors for the motor-driven AFW pumps are open • Control switch indication that the steam supply valves to the turbine-driven AFW pump are closed
Performance indicator	Manipulation of controls as required to manually actuate steamline isolation MSIVs undergo fast-closure MSIVs (except B) indicate closed	Manipulation of controls in the control room as required to establish the minimum required AFW flow rate to the SGs
Performance feedback	Crew will observe the following: • Steam flow indication from all SGs except B decreases to zero • All SGs except B stop depressurizing • RCS cooldown rate slows	Indication that at least the minimum required AFW flow rate is being delivered to the SGs SG levels increasing
Justification for the chosen performance limit	Uncontrolled depressurization of all SGs causes an excessive rate of RCS cooldown, well beyond the conditions typically analyzed in the FSAR. The excessive cooldown rate creates large thermal stresses in the reactor pressure vessel and causes rapid insertion of a large amount of positive reactivity. Thus, failure to close the MSIVs under the postulated conditions can result in challenges to the following CSFs: • Integrity • Subcriticality	The acceptable results obtained in the FSAR analyses are predicated on the assumption that, at the very least, one train of safeguards actuates. If AFW flow commensurate with minimum safeguards actuation is not established, the FSAR assumptions and results are invalid. Because compliance with the assumptions of the FSAR is part of the facility license condition, failure to manually establish at least the minimum required AFW flow rate (under the postulated conditions and when it is possible to do so) constitutes a violation of the license condition.
PWR Owners Group Appendix	CT- 12, Manually actuate main steamline isolation	CT-4, Establish AFW flow to SGs

Scenario Procedure References
Callaway 2016-1 NRC Scenario #3, rev. 1

References
OTO-SF-00001, Rod Control Malfunctions
OTO-BB-00004, RCS RTD Channel Failures
OTA-RK-00026 Add 132C, Generator Protection Runback Circuit
OTO-MA-00001, Turbine Load Rejection
OTO-AD-00001, Loss of Condenser Vacuum
E-0, Reactor Trip or Safety Injection
E-2, Faulted S/G Isolation
Tech Spec 3.3.1 for Reactor Trip System Instrumentation
Tech spec 3.3.2 for ESFAS Instrumentation
ODP-ZZ-00025, EOP/OTO User's Guide

PRA Systems, Events or Operator Actions

1. Main Steam Line Break Outside Containment (T(MSI))
    a. MSIV Closure
    b. AFW Pump Start

Scenario #3 Setup Guide:

Establish the initial conditions of IC-10, MOL 100% power:

- RCS boron concentration 862 ppm
- CCP A 863 ppm minus 5 days
- CCP B 865 ppm minus 15 days
- Rod Control Bank D 215 steps, Other banks 228 steps
- "A" MD Auxiliary Feedpump is tagged out for maintenance

==========SCENARIO PRELOADS / SETUP ITEMS==========

Remove from Service and then place Tags on "A" MDAFP

- (Preloaded) Insert ME Schematic (AL) e23al01a AL01NB0105TA_BKPOS, value =3

Stator Cooling Pump AUTO Start Failure (Event 2)

- (Preloaded) Insert ME Schematic (CE) m22ce01, CEPS0002TFASIS, value = 1
- (Preloaded) Insert ME Schematic (CE) e23ce05, CE05RL_63_C57TVSP, value = 0

MSIVs dot not auto close and B MSIV fails open (Event 6)

- Insert Malfunction (SA) SAS9XX_1, value = Enable,
- Insert Malfunction (SA) SAS9XX_2, value = Enable,
- Insert Malfunction (SA) SAS9XX_3, value = Enable,
- Insert Malfunction (SA) SAS9XX_4, value = Enable
- Insert Malfunction (SA) SAS9XX_6, value = Enable
- Insert Remote Function (AB) ABHV0017_AuxM, value = Connected

MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start (Event 7)

- Insert Remote Function (AL) PAL02_3, value = TRUE
- Insert Malfunction (AL) PAL01B_1, value = Trip, Condition = rec0009 eq 1, Delay = 2 min

========== EVENT 1 ==========

RTD Fails High

- Insert Malfunction (BB) BBTE411A1, value = 650, ramp = 10 sec

========== EVENT 2 ==========

Stator Cooling Pump Trip with AUTO Start Failure

- Insert Malfunction (CE) PCE01A, value = Trip
- SEE PRELOADS ABOVE

==========EVENT 3 ==========

Partial Loss of Condenser Vacuum

- Insert Malfunction (AD) EAD05, value = 75

==========EVENT 4 ==========

Dropped Rod

- Insert Malfunction (SF) SFB08_DR, value = stationary_gripper

==========EVENT 5 PRELOADED==========

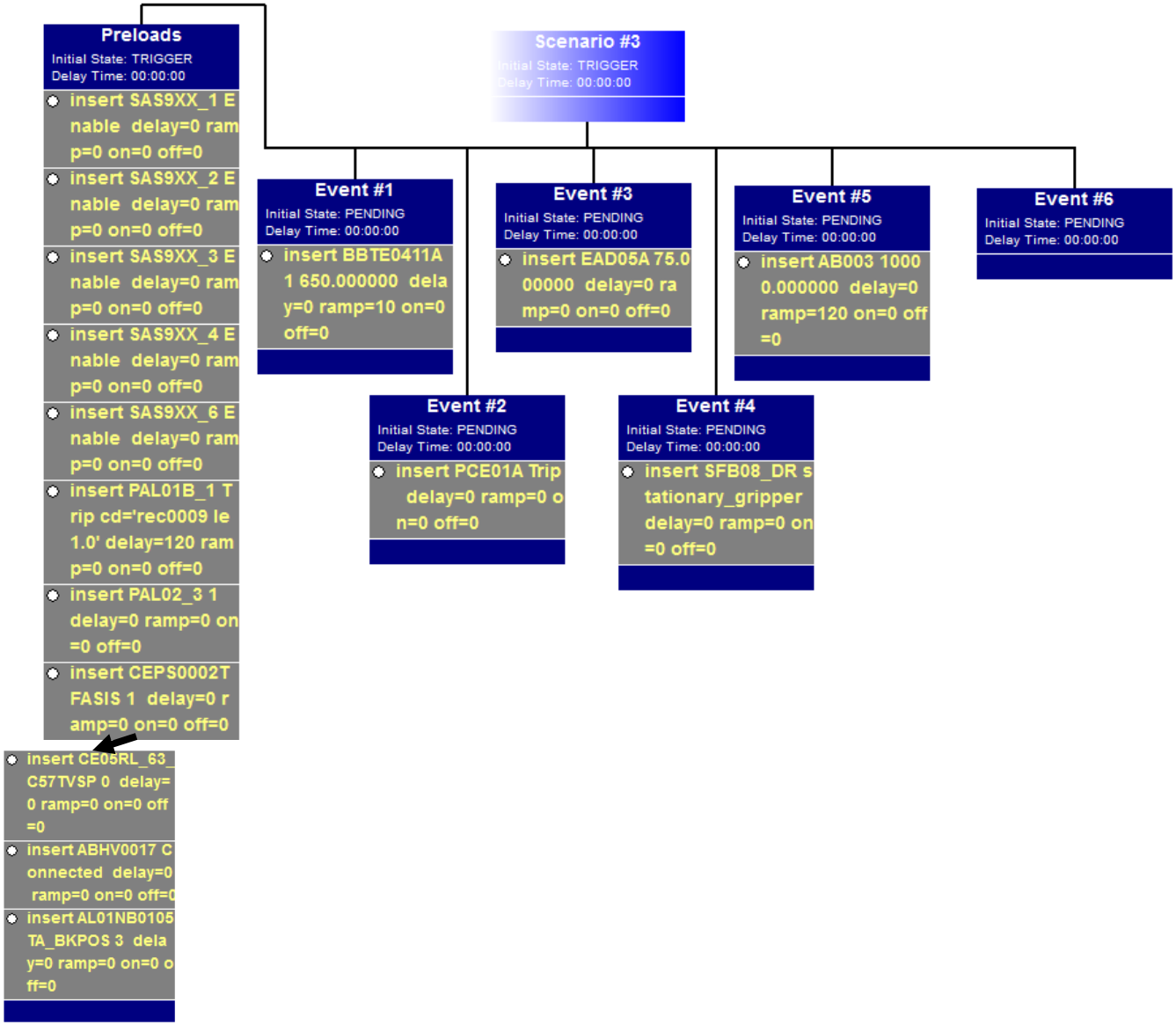
Large Steam Line Rupture in Turbine Building with "B" MSIV failing open

- Insert Malfunction (AB) AB003, value = 6000, ramp = 60 secs
- SEE PRELOADS ABOVE

==========EVENT 6 PRELOADED==========

MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start

- SEE PRELOADS ABOVE


Preloads
Initial State: TRIGGER
Delay Time: 00:00:00
insert SAS9XX_1 Enable delay=0 ramp=0 on=0 off=0
insert SAS9XX_2 Enable delay=0 ramp=0 on=0 off=0
insert SAS9XX_3 Enable delay=0 ramp=0 on=0 off=0
insert SAS9XX_4 Enable delay=0 ramp=0 on=0 off=0
insert SAS9XX_6 Enable delay=0 ramp=0 on=0 off=0
insert PAL01B_1 Trip cd='rec0009 le 1.0' delay=120 ramp=0 on=0 off=0
insert PAL02_3 1 delay=0 ramp=0 on=0 off=0
insert CEPS0002T FASIS 1 delay=0 ramp=0 on=0 off=0
insert CE05RL_63_C57TV$P 0 delay=0 ramp=0 on=0 off=0
insert ABHV0017 Connected delay=0 ramp=0 on=0 off=0
insert AL01NB0105TA_BKPOS 3 delay=0 ramp=0 on=0 off=0
Scenario #3
Initial State: TRIGGER
Delay Time: 00:00:00
Event #1
Initial State: PENDING
Delay Time: 00:00:00
insert BBTE0411A1 650.000000 delay=0 ramp=10 on=0 off=0
Event #2
Initial State: PENDING
Delay Time: 00:00:00
insert PCE01A Trip delay=0 ramp=0 on=0 off=0
Event #3
Initial State: PENDING
Delay Time: 00:00:00
insert EAD05A 75.000000 delay=0 ramp=0 on=0 off=0
Event #4
Initial State: PENDING
Delay Time: 00:00:00
insert SFB08_DR stationary_gripper delay=0 ramp=0 on=0 off=0
Event #5
Initial State: PENDING
Delay Time: 00:00:00
insert AB003 10000.000000 delay=0 ramp=120 on=0 off=0
Event #6
Initial State: PENDING
Delay Time: 00:00:00

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 1	Page 7 of 32
Event Description:	RTD Fails High (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 1 (RTD Fails High) (At the discretion of the Lead Examiner) o Malfunction (BB) BBTE0411A1, Value = 650, Ramp = 10 sec • When contacted, respond as I&C. Acknowledge the request to trip bistables and to investigate the instrument/channel failure. • When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO.		
Indications Available		
		ANN 65C, AUCT T AVG HI ANN 65E, T REF / T AUCT LO ANN 82B, OTΔT ROD STOP ANN 82C, OPΔT ROD STOP ANN 83C, RX PARTIAL TRIP
OTO-SF-00001, Rod Control Malfunctions		
OTO-SF-00001	**CRS**	Implement OTO-SF-00001, Rod Control Malfunctions
	RO	(Step 1) CHECK Both Of The Following Are Met For Indication Of Multiple Dropped Rods: - **NO** Step 1 RNO Go To Step 3.
	RO	(Step 3) CHECK Main Turbine Runback Or. Load Reject - IN PROGRESS Step 3 RNO Go To Step 5
	RO	(Step 5) PLACE Rod Control in MANUAL: • SE HS-9
	RO	(Step 6) CHECK Control Rods Motion - STOPPED

Op Test No.: 2016-1 Scenario # 3 rev.1 Event # 1 Page 8 of 32

Event Description: RTD Fails High (Tech Spec)

Proc /Time	Position	Applicant's Actions or Behavior
OTO-SF-00001	**RO**	(Step 7) CHECK Instruments Indications - NORMAL b. RCS Tavg: • BB TI-412 Step 7.b RNO Go To OTO-BB-00004, RCS RTD Channel Failures.
OTO-BB-00004, RCS RTD Channel Failures		
	CRS	Implement OTO-BB-00004, RCS RTD Channel Failures
OTO-BB-00004	**RO**	(Step 1) Place rod control in manual • SE HS-9
	RO	(Step 2) CHECK RCS loop NR Tavg and Delta-T indicator - failed • Loop 1: BB TI-412 (Tavg) – failed high • Loop 1 BB TI-411A (ΔT) – failed high
	RO	(Step 3) Select ΔT and Tavg channel defeat switches to failed channel: • BB TS-411F, ΔT Defeat Switch – Select to T411 • BB TS-412T, Rod Control Tave Input Channel Defeat Switch – Select to T412
	RO	#(Step 4 and Step 4 RNO) Check RCS Tavg within 1.5°F of Tref RNO Restore RCS Tavg to within 1.5°F of Tref using any of the following: • Adjust control rods • Adjust turbine load • Adjust RCS boron concentration
NOTE		*RNO may or may not have to be performed dependent on how quickly rods are placed in manual IAW Step 1*
	RO	(Step 5) CHECK rod control – IN AUTO • SE HS-9

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 1	Page 9 of 32
Event Description:	RTD Fails High (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-BB-00004	**RO**	(Step 6) CHECK pressurizer level within one of the following: • Trending to program level OR • At Program Level
	BOP	(Step 7) Select an operable channel for the OPDT/OTDT temperature recorder: • SC TS-411E
	CRS	(Step 8) Review Attachment A, Effects Of RCS RTD Instrument Failure
	CRS	(Step 9) Review Applicable Technical Specifications: Att J • 3.3.1, Cond A • 3.3.1, Table 3.3.1-1, Item 6, Cond E • 3.3.1, Table 3.3.1-1, Item 7, Cond E ○ Place channel in trip in 72 hours OR Be in Mode 3 in 78 hours
	CRS	(Step 10) Direct I&C to trip bistables
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 2	Page 10 of 32
Event Description:	Stator Cooling Pump Trip with AUTO Start Failure		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 2 (Stator Cooling Pump Trip with AUTO Start Failure) o Malfunction (CE) PCE01A, value = Trip o (Preloaded) Insert ME Schematic (CE) m22ce01, CEPS0002TFASIS, value = 1 o (Preloaded) Insert ME Schematic (CE) e23ce05, CE05RL_63_C57TVSP, value = 0 • When contacted as an OT to 'A' SCW pump, wait 5 minutes and report back "**It is warm to the touch"** • When contacted as an OT to go to PG13 to check out the 'A' SCW pump breaker wait 5 minutes and report back "**The breaker for the 'A' SCW pump is the tripped free position and indicates overcurrent"** • When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO.		
Indications Available		
		132C Generator Protection Runback Circuit 83C RX PARTIAL TRIP
OTA-RK-00026, Add 132C, Generator Protection Runback Circuit		
	CRS	Implement OTA-RK-00026, Add 132C, Generator Protection Runback Circuit
OTA-RK-00026, Add 132C	**BOP**	(Step 3.1) IF a Turbine Runback occurs, Go To OTO-MA-00001, Turbine Runback.
	BOP	(Step 3.2) ENSURE Stator Cooling Pump RUNNING
	BOP	(Step 3.3) Using EA HIS-1, SERVICE WTR FROM STATOR WTR COOLERS, ENSURE EAHV0001 is OPEN.
	BOP	(Step 3.4) DETERMINE the cause of the alarm using the Computer Points listed in the table below.

Op Test No.: 2016-1 Scenario # 3 rev.1 Event # 2 Page 11 of 32

Event Description: Stator Cooling Pump Trip with AUTO Start Failure

Proc /Time	Position	Applicant's Actions or Behavior
OTA-RK-00026, Add 132C	**CRS**	(Step 3.5) DISPATCH an operator to the local panels to determine if the cause is an alarm on CE129A or a loss of DC power (DC SUPPLY light on CC128A).
	CRS	(Step 6) MAINTAIN Generator Load below the limits of Curve Book Figure 10.7, Main Generator Load vs SCW Flow.
OTO-MA-00001, Turbine Load Rejection		
OTO-MA-00001	**CRS**	Implement OTO- MA-00001, Turbine Load Rejection
	RO	(Step 1) Place Rod Control in AUTO
	RO	(Step 2) Check Rod control System Responding to RCS Tavg/Tref Deviation by ensuring on of the following: Control Rods are inserting and RCS Tavg trending to within 5°F of Tref OR RCS Tavg within 5°F of Tref
	BOP	(Step 3) Check Stator Cooling Status Inlet Pressure – Greater than 50 PSIG RNO – If Stator Cooling water pressure is low, Then START standby Stator Cooling Water Pump CE HIS-2
	RO	(Step 4) Check both 82B and 82 extinguished (they are extinguished from the previous event)
	BOP	(Step 5) Check all Circ Water Pumps running
	BOP	(Step 6) Check Turbine control responding correctly (runback should stop when standby stator cooling water pump started)

Op Test No.: 2016-1 Scenario # 3 rev.1 Event # 2 Page 12 of 32

Event Description: Stator Cooling Pump Trip with AUTO Start Failure

Proc /Time	Position	Applicant's Actions or Behavior
OTO-MA-00001	**BOP**	(Step 7) Check Stator Cooling Water inlet pressure less than 50 psig RNO – Go to step 19
	BOP	(Step 19) Maintain Main Generator MVARS
	BOP	(Step 20) Check HP Heater bypass valve closed
	BOP	(Step 21) If turbine steam admission valve failure occurred RNO – Go to step 22
	RO	(Step 22) Check if Rod Control should be placed in Manual
	BOP	(Step 23) Check Main Generator Load Stable
	BOP	(Step 24) Check C-7, Load Loss Stm Dump Armed – LIT RNO – Go to Step 26
	BOP	(Step 26) Determine if Turbine Setback has occurred RNO – go to step 28
	RO	(Step 28) Check Annunciator 81C extinguished and AFD within limits
	CRS	(Step 29) Review Tech Specs - NONE
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 3	Page 13 of 32
Event Description:	Partial Loss of Condenser Vacuum		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 3 (Partial Loss of Condenser Vacuum) o Malfunction(AD) EAD05, Value = 75 • When contacted, respond as Operations Tech to investigate the cause of the Loss of Vacuum. • **When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO.**		
Indications Available		
		Automatic Starting of Standby Condenser Vacuum Pump Rising Main Condenser Backpressure Unexplained lowering in Main Turbine Load ANN 106C COND HOTWELL LEV HI (potential)
OTO-AD-00001, Loss of Condenser Vacuum		
	CRS	Implement OTO-AD-00001, Loss of Condenser Vacuum
OTO-AD-00001	**BOP**	(Step 1) Check Main Condenser Backpressure – LESS THAN 7.5 inches HGA – YES
		Note: Attachment A, Diagnostic Actions, contains actions which may be performed for slow moving events.
	BOP	(Step 2) Refer to Attachment A, Diagnostic Actions, As Time permits to Perform Actions
	BOP	(Step 3) Check Main condenser Backpressure – greater than 4.0 inches HGA a. Obtain permission from the SM/CRS b. Place DA HS-113, Circ WTR Pump Turb Setback, to ENABLE
	BOP	(Step 4) Check Main Condenser Backpressure – Deteriorating or Stable

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 3	Page 14 of 32
Event Description:	Partial Loss of Condenser Vacuum		

Proc /Time	Position	Applicant's Actions or Behavior
	RO	(Step 5) Place Rod Control in AUTO
OTO-AD-00001	**CREW**	(Step 6) Manage Reactivity Perform a Reactivity Management Brief
	BOP	(Step 7) REDUCE Turbine Load At Less Than Or Equal To 5% Per Minute Using Any Of The Following: • REDUCE Turbine load using the %/Min Loading Rate: a. SLOWLY LOWER Load using the DECREASE LOAD pushbutton until all of the following are met: ▪ Load Limit Limiting Light – EXTINGUISHED ▪ Decrease Loading Rate "OFF" Light – LIT ▪ Loading Rate Limit %/MIN "1/2" Light – LIT b. ROTATE Load Limit Set potentiometer fully clockwise c. SELECT Decrease Loading Rate – ON d. SET Loading Rate Limit %/Min to desired value e. LOWER load set MW toward desired load using the DECREASE LOAD pushbutton OR • REDUCE Turbine load using the Load Limit Potentiometer

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 3	Page 15 of 32
Event Description:	Partial Loss of Condenser Vacuum		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-AD-00001	**RO**	(Step 8) BORATE From The BAST By Performing Any Of The Following: • BORATE using OTN-BG-00002 Attachment 8 OR • BORATE to the VCT: a. PLACE RCS Makeup Control in STOP: ▪ BG HS-26 b. PLACE RCS Makeup Control Selector in BORATE: ▪ BG HS-25 c. SET Boric Acid Flow Controller to the desired flow rate ▪ BG FK-110 d. PLACE BG FK-110 in AUTO e. RESET Boric Acid Counter to 000: ▪ BG FY-110B f. SET BG FY-110B for the desired gallons of boric acid to be added g. PLACE BG HS-26 in RUN h. WHEN desired boration is complete, THEN PLACE BG HS-26 in STOP i. REPEAT Boration as necessary OR

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 3	Page 16 of 32
Event Description:	Partial Loss of Condenser Vacuum		

Proc /Time	Position	Applicant's Actions or Behavior
		(Step 8 continued) BORATE From The BAST By Performing Any Of The Following: OR • BORATE using Emergency Boration: a. START at least one Boric Acid Transfer Pump: ▪ BG HIS-5A ▪ BG HIS-6A b. OPEN Emergency Borate To Charging Pump Suction: ▪ BG HIS-8104 c. CHECK Emergency Borate Flowrate - GREATER THAN 30 GPM ▪ BG FI-183A d. WHEN desired boration is complete, THEN: 1) CLOSE Emergency Borate to Charging Pump Suction: o BG HIS-8104 2) STOP Boric Acid Transfer Pumps: o BG HIS-5A o BG HIS-6A e. REPEAT Boration as necessary
OTN-BG-00002, Att. 8	**RO**	(Attachment 8) Borate Mode of RMCS Operation 1. Place BG HS-26 , RCS M/U CTRL, in STOP 2. Place BG HS-25, RCS M/U CTRL SEL, in BOR 3. RESET BG FY-110B, BA Counter, to 000 4. ENSURE BG-FY-110B is set to deliver the desired amount of boron 5. Place BG HS-26, RCS M/U CTRL, in RUN 6. When the desired amount of borated water has been added, PLACE BG HS-26, RCS M/U CTRL, in STOP. 7. If required, PERFORM the following: a. Place BG HS-25, RCS M/U CTRL SEL, in AUTO b. Place BG HS-26, RCS M/U CTRL, in RUN

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 3	Page 17 of 32
Event Description:	Partial Loss of Condenser Vacuum		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-AD-00001	**RO**	(Step 9) INITIATE Boron Equalization By Performing the Following: a. ENERGIZE at least one group of Pressurizer Backup Heaters: • B/U Group A BB HIS-51A • B/U Group B BB HIS-52A b. PLACE the Pressurizer Pressure Master Controller in MAN: • BB PK-455A c. LOWER Pressurizer Pressure Master Controller output to 38% to 42% d. PLACE the Pressurizer Pressure Master Controller in AUTO
	BOP	(Step 10) Check MFP Turbine Speed Control – In AUTO
	CRS	(Step 11) NOTIFY The Power Dispatcher Of The Following: • Load reduction is in progress • Rate of load reduction • Amount of load reduction
	CRS	(Step 12) NOTIFY The Following Departments That Load Reduction Is In Progress And The Rate Of Load Reduction: • Chemistry • Count Room Technician • Radiation Protection • Radwaste
	RO	(Step 13) CHECK Rod Control System Responding To RCS Tavg/Tref Deviation By Ensuring One Of The Following: • Control Rods are inserting AND RCS Tavg trending to within 3°F of Tref OR • RCS Tavg within 3°F of Tref
	BOP	(Step 14) If possible Perform a Rapid Downpower NIS PR adjustment while reducing power using OSP-SE-00004, NIS Power Range Heat Balance
	RO	(Step 15) Check if Rod Control should be in MANUAL

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 3	Page 18 of 32
Event Description:	Partial Loss of Condenser Vacuum		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-AD-00001	**CRS**	(Step 16) Perfom additional Actions As Necessary for Power Reduction
NOTE		**After load has been reduced approximately 50 MWe or at Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 4	Page 19 of 32
Event Description:	Dropped Rod Cntrl Bank C1 Rod B8		

Proc /Time	Position	Applicant's Actions or Behavior

Booth Operator:

- Insert Event 4 (Dropped Rod Cntrl Bank C1 Rod B8)
  - Malfunctions/SF/SFB08_DR/Stationary Gripper/Insert
- When directed to delete dropped rod malfunction delete SFB08_DR from Instructor Action Summary
- When requested to investigate as I&C, wait 5 minutes and report that there is a blown fuse and it has been replaced
- When contacted as Reactor Engineering wait 5 minutes and report that there is no reason the rod cannot be recovered
- When requested to investigate as the OPS TECH, report that 'B' light on 1AC and 2AC cabinets are lit.
- When contacted, hold AUTO/MAN switch for the P-A Converter in MAN:
  - P/A Converter
  - ENG MODE ME Schematics/SF/x6064d95s001(P/A converter)/ Click on P/A converter/Manual Signal=1/Insert
  - Report to the Control Room that the AUTO/MAN switch is in Manual.
- When contacted, return the AUTO/MAN switch to AUTO:
  - P/A Converter
  - ENG MODE ME Schematics/SF/x6064d95s001(P/A converter)/ Click on P/A converter/Auto Signal=1/Insert
  - Report to the Control Room that the AUTO/MAN switch is in AUTO.
- When contacted, respond as Duty Manager, acknowledge entry into the OTO

Indications Available:

		ANN 79 C CONTROL ROD DEV ANN 80 C RPI ROD DEV ANN 81 B ROD AT BOTTOM
OTO-SF 00001, Rod Control Malfunctions		
	CRS	Implement OTO-SF 00001, Rod Control Malfunctions
NOTE		Steps 1 through 6 are immediate action steps

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 4	Page 20 of 32
Event Description:	Dropped Rod Cntrl Bank C1 Rod B8		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-SF 00001	**RO**	(Step 1) Check Both of the Following are Met for Indication of Multiple Dropped Rods ANN 81A, TWO/More Rods at Bottom Lit Rod Bottom lights lit for greater than one rod • RNO G0 to Step 3
	RO	(Step 3) Check Main Turbine Runback Or Load Reject – IN PROGRESS • RNO Go to Step 5
	RO	(Step 5) Place Rod Control in Manual • SE HS-9
	RO	(Step 6) Check Control Rods Motion STOPPED
	RO	(Step 7) Check Instrument Indication Normal
	RO/BOP	(Step 8) Check Annunciator 79A LIT – NO: RNO: Maintain RCS Tavg/Tref and go to Step 10 • ADJUST Turbine load. • ADJUST RCS boron concentration. • ADJUST Control Rods.
	RO	(Step 10) Check Annunciator 81B and all Rod Bottom Lights Extinguished – NO: RNO: Go to Attachment 'A'
	RO	(Step A1) Check Reactor Power less than 5% - NO: RNO: Go to Step A3
	CRS	(Step A3) Contact I&C to determine reason for Dropped Rod
	CRS	(Step A4) CHECK Shutdown Margin Is Within The Limits Provided In The COLR Within 1 Hour

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 4	Page 21 of 32
Event Description:	Dropped Rod Cntrl Bank C1 Rod B8		

Proc /Time	Position	Applicant's Actions or Behavior
	CRS	(Step A5) CHECK Axial Flux Difference (AFD) - WITHIN THE LIMITS OF CURVE BOOK, FIGURE 1-1, AXIAL FLUX DIFFERENCE LIMITS
NOTE		Depending on the amount of the downpower from the previous event QPTR could be either above or below 1.02
	CRS	(Step A6) CHECK QPTR - LESS THAN OR EQUAL TO 1.02 If YES the crew continues with step A7 If NO TS 3.2.4 Cond A applies and the crew will reduce power
NOTE		If QPTR is greater than 1.02 continue with scenario (go to next event and follow up on TS 3.1.4.B after the scenario)
	CRS	(Step A7) Check Dropped Rod can be recovered in less than one hour.
	CRS	(Step A8) CONSIDER The Following Prior To Recovering The Rod: • Length of time the rod has been misaligned • Power Level at which the realignment will be performed • Rate of control rod movement during realignment • Movement of other control rods to support realignment
	CRS	(Step A9) PERFORM Notifications Per ODP-ZZ-00001 Addendum 13, Shift Manager Communications
	CRS	(Step A10) NOTIFY Reactor Engineering Prior To Attempting Recovery Of The Control Rod
	CRS	(Step A11) CHECK Both Of The Following Are Met: • Reason for dropped/misaligned rod has been identified • Problem has been corrected
	CRS	(Step A12) PERFORM Attachment B, Dropped/Misaligned Rod Recovery
NOTE		**While some recovery actions of Attachment B may be performed, the intent is proceed to the next event after the Technical Specification declaration. Therefore Attachment B actions are not listed here.**

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 4	Page 22 of 32
Event Description:	Dropped Rod Cntrl Bank C1 Rod B8		

Proc /Time	Position	Applicant's Actions or Behavior
	CRS	(Step A13) REVIEW Applicable Technical Specifications: • 3.1.4.B for Rod Group Alignment Limits
NOTE		**Any time after the Technical Specifications have been identified and at Lead Examiner's discretion, move to the next Event**

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 5 and 6	Page 23 of 32
Event Description:	Large Steam Line Rupture in Turbine Building with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start		

Proc /Time	Position	Applicant's Actions or Behavior

Booth Operator

- Insert Event 5 and 6 (Large Steam Line Rupture outside Containment with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start)
  - Malfunction (AB) AB003, value = 10000, ramp = 2 minutes

- **The following PRELOADS are activated**
  - MSIVs dot not auto close and B MSIV fails open (Event 5)
    - Malfunction (SA) SAS9XX_1, value = Enable,
    - Malfunction (SA) SAS9XX_2, value = Enable,
    - Malfunction (SA) SAS9XX_3, value = Enable,
    - Malfunction (SA) SAS9XX_4, value = Enable
    - Malfunction (SA) SAS9XX_6, value = Enable
    - Remote Function (AB) ABHV0017_AuxM, value = Connected
  - MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start (Event 6)
    - Remote Function (AL) PAL02_3, value = TRUE
    - Malfunction (AL) PAL01B_1, value = Trip, Condition = rec0009 eq 1, Delay = 2 min

- When contacted, respond as DUTY MANAGER to acknowledge plant trip.

- If contacted as an OT to locally close TDAFP steam supply (ABV0085) wait 5 minutes a respond **"I can't enter Area 5 due to steam in the area"**

- If contacted as an OT to locally check the 'B' MDAFP wait 5 minutes a respond "**The pump is warm to the touch and has an overcurrent trip on the breaker"**

Indications Available:		
		STEAM FLOW FEED FLOW MISMATCH **RISING REACTOR POWER AND LOWERING TAVG**
	CREW	Observes Indications of Steam Line Break and Trips Reactor RCS Temperature Lowering RCS Pressure Lowering
E-0, Reactor Trip or Safety Injection		
	CRS	Implement E-0, Reactor Trip or Safety Injection

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 5 and 6	Page 24 of 32
Event Description:	Large Steam Line Rupture in Turbine Building with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start		

Proc /Time	Position	Applicant's Actions or Behavior
		NOTE Steps 1 through 4 are immediate actions
E-0	**RO**	(Step 1) Check Reactor Trip Rod Bottom Lights – All Lit Reactor Trip and Bypass Breakers – Open Neutron Flux - Lowering
	BOP	(Step 2) Check Turbine Trip Turbine Stop Valves - Closed
	BOP	(Step 3) Check Power to AC Emergency Buses At Least One Emergency Bus – Energized Both Emergency Buses – Energized
	RO	(Step 4) Check SI Status Actuated or Required Manually Actuate SI (If not actuated) Check both Trains of SI Actuated LOCA Sequencer ANN 30A – Lit LOCA Sequencer ANN 31A – Lit SB069 SI Actuate Red Light – Lit Solid
	RO/BOP	(Step 5) Perform Attachment A, Automatic Action Verification, while continuing with this procedure
E-0 Att A	**RO/BOP**	(Step A1) Check Charging Pumps – Both CCPs running
	RO/BOP	(Step A2) Check SI and RHR Pumps – All running

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 5 and 6	Page 25 of 32
Event Description:	Large Steam Line Rupture in Turbine Building with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A3) Check ECCS Flow a. CCPs To Boron Inj Header - FLOW INDICATED • EM FI-917A • EM FI-917B b. RCS pressure - LESS THAN 1700 PSIG (at this time pressure might be below 1700 psig. If it the applicant will contine with the step, if not the applicant will go to step A4) c. SI Pump Discharge - FLOW INDICATED d. RCS pressure - LESS THAN 325 PSIG – **NO** Go To Step A4.
	RO/BOP	(Step A4) CHECK ESW Pumps – BOTH RUNNING
	RO/BOP	(Step A5) CHECK CCW Alignment: a. CCW Pumps – ONE RUNNING IN EACH TRAIN • Red Train: ▪ EG HIS-21 or EG HIS-23 • Yellow Train: ▪ EG HIS-22 or EG HIS-24 b. CCW Service Loop Supply and Return valves for one operating CCW pump – OPEN • EG ZL-15 AND EG ZL-53 OR • EG ZL-16 AND EG ZL-54 c. OPEN CCSW To RHR HX valves: • EG HIS-101 • EG HIS-102 d. CLOSE Spent Fuel Pool HX CCW Outlet Valves: • EC HIS-11 • EC HIS-12 e. STOP Spent Fuel Pool Cooling Pump(s): • EC HIS-27 • EC HIS-28 f. RECORD The Time Spent Fuel Pool Cooling Pump Secured g. MONITOR Time Since CCW Flow Isolated to SFP HX LESS THAN 4 HOURS

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 5 and 6	Page 26 of 32
Event Description:	Large Steam Line Rupture in Turbine Building with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A6) CHECK Containment Cooler Fans – RUNNING IN SLOW SPEED • GN HIS-9 • GN HIS-17 • GN HIS-5 • GN HIS-13
	RO/BOP	(Step A7) CHECK Containment Hydrogen Mixing Fans – RUNNING IN SLOW SPEED • GN HIS-2 • GN HIS-4 • GN HIS-1 • GN HIS-3
	RO/BOP	(Step A8) CHECK If Containment Spray should Be Actuated: a. CHECK the following: • Containment pressure – GREATER THAN 27 PSIG OR • GN PR-934 indicates containment pressure – HAS BEEN GREATER THAN 27 PSIG OR • Annunciator 59A CSAS LIT OR • Annunciator 59B CISB – LIT (Step A8.a RNO) Go To Step A9

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 5 and 6	Page 27 of 32
Event Description:	Large Steam Line Rupture in Turbine Building with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A9) CHECK If Main Steamlines Should Be Isolated: a. CHECK for any of the following: • Containment pressure – GREATER THAN 17 PSIG OR • GN PR-934 indicates containment pressure – HAS BEEN GREATER THAN 17 PSIG OR • Steamline pressure – LESS THAN 615 PSIG OR • AB PR-514 or AB PR-535 indicates steamline pressure – HAS BEEN LESS THAN 615 PSIG b. CHECK MSIVs and Bypass valves – CLOSED – **NO** RNO - FAST CLOSE all MSIVs and Bypass valves: • AB HS-79 • AB HS-80 IF valve(s) will NOT fast close, THEN CLOSE MSIV(s) and bypass valves as necessary.
		The 'B' MSIV does not go closed
Critical Task	**CREW**	**Manually actuate main steamline isolation before a severe (ORANGE path) challenge develops to either the subcriticality or the integrity CSF or before transition to ECA-2.1 (whichever happens first)**
	RO/BOP	(Step A10) CHECK ECCS Valves – PROPER EMERGENCY ALIGNMENT a. ESFAS status panels SIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A11) CHECK Containment Isolation Phase A: a. ESFAS status panels CISA sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 5 and 6	Page 28 of 32
Event Description:	Large Steam Line Rupture in Turbine Building with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start		

Proc /Time	Position	Applicant's Actions or Behavior
E-0 Att A	**RO/BOP**	(Step A12) CHECK SG Blowdown Isolation: a. ESFAS status panels SGBSIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A13) CHECK Both Trains of Control Room Ventilation Isolation: a. ESFAS status panels CRVIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A14) CHECK Containment Purge Isolation: a. ESFAS status panels CPIS sections: • SA066X WHITE lights – ALL LIT • SA066Y WHITE light – ALL LIT
	RO/BOP	(Step A15) NOTIFY CRS of the following: • Unanticipated Manual actions taken. • Failed Equipment status • Attachment A, Automatic Action Verification, completed.
E-0, REACTOR TRIP OR SAFETY INJECTION		
E-0		
	BOP	(Step 6) Check Generator Output Breakers – Open
	BOP	(Step 7) Check Feedwater Isolation a. Main Feedwater Pumps – Tripped b. Main Feedwater Reg Valves – Closed c. Main Feedwater Reg Bypass Valves – Closed d. Feedwater Isolation Valves – Closed

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 5 and 6	Page 29 of 32
Event Description:	Large Steam Line Rupture in Turbine Building with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start		

Proc /Time	Position	Applicant's Actions or Behavior
E-0	**BOP**	(Step 8) Check AFW Pumps a. MD AFW Pumps – Both Running - ***NO** b. TD AFW Pump – Running if Necessary – **NO** RNO b. START TD AFW Pump: 1) OPEN AFP Turbine Loop Steam Supply valve(s): • AB HIS-5A (SG B) • AB HIS-6A (SG C) 2) OPEN AFP Turbine Mechanical Trip/Throttle valve: • FC HIS-312A 3) ENSURE AFP Turbine Speed Control is set at 3850 rpm minimum: • FC HIK-313A
		*The "B" MDAFP starts normally and then trips after running for 2 minutes.
Critical Task	**CREW**	**Establish 285,000 lbm/hr to the intact SGs before intact SG level indicates less than 10% WR**
	BOP	(Step 9) Check AFW Valves – Proper Alignment • MD AFP Flow Control Valves – Throttled • TD AFP Flow Control Valves – Full Open • AFW may be isolated to SG B per foldout page
	BOP	(Step 10) Check Total AFW Flow > 285,000 lbm/hr
	RO	(Step 11) Check PZR PORVs and Spray Valves a. PZR PORVs – Closed b. PZR PORVs – Both in AUTO c. PORV Block Valves – Both Open d. Normal PZR Spray Valves – Closed
	RO	(Step 12) Check if RCPs should be Stopped a. RCPs – Any Running b. ECCS Pumps – At least One Running c. RCS Pressure – Less than 1425 psig RNO – Go to Step 13

Op Test No.: 2016-1 Scenario # 3 rev.1 Event # 5 and 6 Page 30 of 32

Event Description: Large Steam Line Rupture in Turbine Building with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start

Proc /Time	Position	Applicant's Actions or Behavior
E-0	**RO**	(Step 13) Check RCS Temperatures • RCPs Running – Tavg 557 Deg F • No RCPs Running – Tcold 557 Deg F
	RO/BOP	(Step 14) Check if any SG is Faulted: a. CHECK pressures in all SGs: • Any SG pressure lowering uncontrollably • Any SG completely depressurized Go to E-2, Faulted Steam Generator Isolation, Step 1.
E-2, Faulted Steam Generator Isolation		
	CRS	Implement E-2, Faulted Steam Generator Isolation, Initiate CSF Monitoring
E-2	**RO/BOP**	(Step 1) Check MSIV's and Bypass Valves – **NO** RNO - FAST CLOSE all MSIVs and Bypass valves: • AB HS-79 • AB HS-80 IF valve(s) will NOT fast close, THEN CLOSE MSIV(s) and bypass valves as necessary.
		The 'B' MSIV does not go closed This step may have been completed during the performance of E-0, Attachment A
Critical Task	**CREW**	**Manually actuate main steamline isolation before a severe (ORANGE path) challenge develops to either the subcriticality or the integrity CSF or before transition to ECA-2.1 (whichever happens first)**
	BOP	(Step 2) Check if any SG Secondary Pressure Boundary is Intact

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 5 and 6	Page 31 of 32
Event Description:	Large Steam Line Rupture in Turbine Building with "B" MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start		

Proc /Time	Position	Applicant's Actions or Behavior
E-2	**BOP**	(Step 3) Identify Faulted SG(s) Any SG pressure lowering uncontrollably Any SG completely depressurized Identifies 'B' as faulted SG
	BOP	(Step 4) Isolate Faulted SG(s) • Isolate AFW flow (AL HK-9A and AL HK-10A) • Check ASD closed (AB PIC-2A) RNO: Close valve as necessary. If valves cannot be closed, then locally close or isolate valves. • Locally close TDAFP steam supply (ABV0085) (Due to location of steam leak this will not be completed) • Check MFRV closed (AE ZL-520) • Check MFRBV closed (AE ZL-560) • Check MFIV closed (AE HIS-40) • Check SGBD CTMT iso valve closed (BM HIS-2A) • Close Steamline Low Point Drain valve (AB HIS-8)
	BOP/RO	(Step 5) Check CST to AFP Suction Header Pressure – Greater than 2.75 psig
	BOP/RO	(Step 6) Check Secondary Radiation • Perform EOP Addendum 11, Restore SG sampling • Direct Chem. to sample All SG's • Direct RP to survey steamlines Check unisolated secondary rad monitors Secondary Radiation – Normal Level in all SGs

Op Test No.: 2016-1	Scenario # 3 rev.1	Event # 5 and 6	Page 32 of 32
Event Description:	Large Steam Line Rupture in Turbine Building with “B” MSIV failing open / MD AFP B trips 2 minutes after starting and TDAFP fails to automatically start		

Proc /Time	Position	Applicant’s Actions or Behavior
E-2	**BOP/RO**	(Step 7) Check If ECCS Flow Should be Reduced a. RCS Subcooling > 30 Deg F [50 Deg F] b. Secondary heat sink: • NR level in one SG > 5% [25%] OR • Total AFW low > 285,000 lbm/hr c. RCS Pressure stable or rising d. PZR level > 9% [29%]
	BOP/RO	(Step 8) Reset SI
	BOP/RO	(Step 9)Stop All But One CCP
	BOP/RO	(Step 10) Go To ES-1.1, SI Termination, Step 3
The scenario can be terminated at the discretion of the Lead Examiner		

Facility: Callaway Scenario No.: 4, Rev 1 Op-Test No.: 2016-1

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: Reactor Start up preparations in progress, Mode 3 with S/D Banks Withdrawn

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.

Event No.	Malf. No.	Event Type*	Event Description
1	HWXST1E21A	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	Lossofswitchyard.lsn	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

Scenario Event Description
Callaway 2016-1 NRC Scenario #4, rev. 1

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.

Once the crew takes the watch, the Secondary OT reports a worker accidently bumped open two valves and lowered the air pressure on both of the 'A' EDG air receivers and both of the 'A' EDG starting air receivers are at 300 psig. The SRO reviews the applicable TS for the EDG air receivers, Tech Spec 3.8.3 applies.

After Tech Specs have been addressed, the Source Range channel N31 will fail to 1E4 CPS (more than double the original value). The operator will respond in accordance with OTO SE-00001, "Nuclear Instrument Malfunction," and, Tech Spec 3.3.1 applies.

After Tech Specs have been addressed, Steam Dump Valves fail open. The operator will respond in accordance with OTO-AB-00001, "Steam Dump Malfunction." The operator will be required to close the valves manually to control the cooldown.

After the Steam Dumps have been closed, a fault at the Montgomery substation results in a loss of all offsite power. The reactor does not automatically trip (RCP loss) since power is below the P-7 setpoint. However, it should be manually tripped when it is realized that no RCPs are running.

The crew should implement E-0, Reactor Trip or Safety Injection. Emergency Diesel Generator (EDG) NE01 fails to start due to a faulty 'Start Failure Relay'. EDG NE02 starts and energizes Essential Bus NB02, but ESW Pump B trips upon manual start attempt. NE02 trips 10 minutes after starting due to lack of cooling water if it is not manually secured by the crew. The crew should enter ECA-0.0, Loss of All AC Power.

When NB02 is deenergized, PZR PORV BB PCV 455A fails partially open. The crew should close the failed PORV in step 3 of ECA-0.0. The crew should begin making attempts to reenergize one of the busses by dispatching operators to locally check the EDG.

5 minutes after the loss of NB02, the crew can start the A EDG locally. After the A EDG is started and energizes NB01, the A ESW pump will fail to AUTO start and must be manually started.

The scenario is complete when the crew has transitioned out of ECA-0.0.

Scenario Critical Tasks
Callaway 2016-1 NRC Scenario #4, rev. 1

Critical Tasks:

Critical Tasks	Manually close the Open PORV before completing Step 3 of ECA-0.0	Manually start A ESW pump prior to A EDG tripping on high temperature.
EVENT	7	6
Safety significance	The open PORV greatly increases the rate at which RCS inventory is depleted, at a time when the lost inventory cannot be replaced by active injection. Thus, failure to close the PORV defeats the basic purpose of ECA-0.0. Additionally, it is critical that the PORV be closed as soon as possible. Hence, manual closure of the PORV (when the PORV is open and RCS pressure is less than [the setpoint for automatic closure]4) is imperative and urgent in order to ensure the effectiveness of subsequent actions in extending the time to core uncovery.	Failure to manually start the SW pump under the postulated plant conditions means that the EDG is running without SW cooling. Running the EDG without SW cooling leads to a high-temperature condition that can result in EDG failure due to damage caused by engine overheating. Under the postulated plant conditions, the running EDG is the only operable EDG. Thus, failure to perform the critical task constitutes misoperation or incorrect crew performance in which the crew does not prevent “degraded emergency power capacity.”
Cueing	Indication and/or annunciation of station blackout Valve position indication and/or annunciation that the PRZR PORV is open Indication that RCS pressure is below the setpoint at which the PRZR PORV should reclose automatically Indication and/or annunciation of decreasing RCS pressure Indication and/or annunciation consistent with the discharge of PRZR fluid to the PRT • PRT temperature, level, pressure • Tailpipe RTDs and/or acoustic monitors	Indication and/or annunciation that one ac emergency bus is energized by an EDG • Bus-energized lamp illuminated • Circuit breaker position lamps indicate breaker closed • Bus voltage indication shows nominal voltage present • EDG status AND Indication and/or annunciation that no SW pump is running • Control switch indication that the circuit breakers or contactors for all SW pumps are open • SW pump discharge pressure indicator reads zero • SW flow indicator reads zero
Performance indicator	Manipulation of controls as required to close the PRZR PORV • PRZR PORV indicates closed	Manipulation of controls as required to start the SW pump powered from the ac emergency bus energized by the EDG • Control switch indication that the circuit breaker or contactor for a SW pump aligned to supply cooling water to the running EDG is closed
Performance feedback	PRZR pressure stabilizes	Indication and/or annunciation that a SW pump is running, aligned to supply cooling water to the running EDG • SW low flow condition clear; indication of flow • SW low pressure condition clear; indication of pressure
Justification for the chosen performance limit	This performance standard is imposed because it is imperative and urgent that the PRZR PORV be closed in order for the strategy of ECA-0.0 to succeed. The PORV constitutes a very large leakage path. Leaving it open causes rapid depletion of RCS inventory at a time when that inventory cannot be replaced. In step 3 of ECA-0.0, the crew is directed to check the major RCS outflow paths that could contribute to rapid depletion of RCS inventory. The PRZR PORVs offer the largest potential for RCS inventory loss. Therefore, they are an outflow path that must be checked and, if necessary, closed.	If the EDG trips automatically because of an engine over-temperature condition, it means that the station is again blacked out. It also means that the crew failed to start the SW pump manually as directed by ECA-0.0, Step 27
PWR Owners Group Appendix	CT-22, Manually close an open PORV during SBO.	CT - 25, Manually start SW pump for EDG cooling

Scenario Procedure References
Callaway 2016-1 NRC Scenario #4, rev. 1

References
OTG-ZZ-00002, Reactor Startup - IPTE
OTA-RK-00016, Add 20D, Diesel Generator NE01 Trouble
OTO-AB-00001, Steam Dump Malfunction
OTO SE-00001, Nuclear Instrument Malfunction
E-0, Reactor Trip or Safety Injection
ES-0.1, Reactor Trip Response
ECA-0.0, Loss of All AC Power
Tech spec 3.3.1 for RTS Instrumentation
Tech spec 3.8.3 for Diesel Starting Air
ODP-ZZ-00025, EOP/OTO User's Guide

PRA Systems, Events or Operator Actions

1. Loss of Offsite Power (T(1))
    a. Any Open Pressurizer PORVs Reclose

Scenario Setup Guide
Callaway 2016-1 NRC Scenario #4, rev. 1

Scenario #4 Setup Guide:

Establish the initial conditions of 0% power: (IC 8 on 15-3)

- RCS boron concentration 1437 ppm
- CCP A 1441 ppm minus 1 day
- CCP B 1439 ppm minus 1 day
- Shutdown Banks at 228 steps all other control rods at 0
- AEPS is OOS for breaker repair on PB0501 (Open PA50103 and place WPA on PBXY0001 interface)

==========SCENARIO PRELOADS / SETUP ITEMS==========

AEPS is OOS for breaker repair on PB0501

"B" ESW Pump Trip: (Event 5)

- Insert Malfunction (EF) PEF01B, Value = Trip, Condition = HWX19O241R eq 1

"A" EDG Fails to Start / "A" ESW pump fails to AUTO start (Event 6)

- Insert Malfunction (NE) NE01, Value = Fail
- Insert Malfunction (EF) PEF01A_1 B lock

========== EVENT 1 ==========

NE02 Starting Air Receiver air pressure low

- Panel SA 066X Insert 21E as RED HWXST1E21A, Value=1

========== EVENT 2 ==========

Source Range Channel Failure

- Insert Malfunction (SE) SEN0031_1, Value = 10000

==========EVENT 3 ==========

Controlling Steam Dump Valves fail open

- Insert Malfunctions (AB) ABPT507A, Value = 1500, Ramp = 5 min

==========EVENT 4 ==========

Loss of Offsite Power

- Insert steps from Loss of Switchyard lesson.

==========EVENT 5 PRELOADED ==========

"B" ESW Pump Trip / Loss of All AC Power

- SEE PRELOADS ABOVE

==========EVENT 6 PRELOADED==========

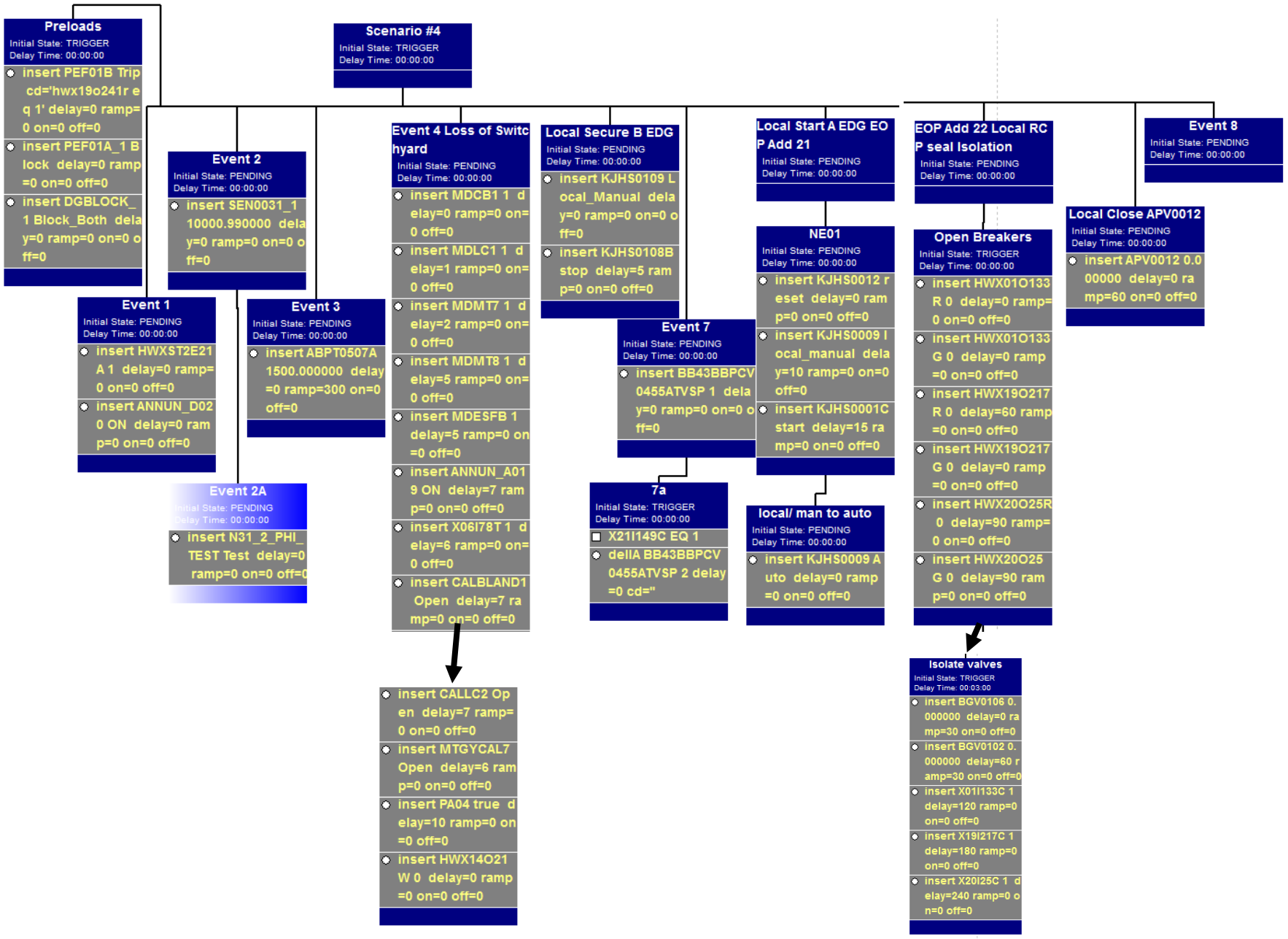
"A" EDG Fails to Start / "A" ESW pump fails to AUTO start

- SEE PRELOADS ABOVE

==========EVENT 7 PRELOADED==========

Pressurizer PORV Fails Open:

- Insert ME Schematic (BB) m22bb02_a, RT04RC_PCV455A_ATVFAILSP, Value = .30
- Delete ME Schematic (BB) m22bb02_a, RT04RC_PCV455A_ATVFAILSP, Value = .30, Condition = X21I149C eq 1


Preloads
Initial State: TRIGGER
Delay Time: 00:00:00
insert PEF01B Trip cd='hwx19o241r eq 1' delay=0 ramp=0 on=0 off=0
insert PEF01A_1 Block delay=0 ramp=0 on=0 off=0
insert DGBLOCK_1 Block_Both dely=0 ramp=0 on=0 off=0
Scenario #4
Initial State: TRIGGER
Delay Time: 00:00:00
Event 1
Initial State: PENDING
Delay Time: 00:00:00
insert HWXST2E21A 1 delay=0 ramp=0 on=0 off=0
insert ANNUN_D020 ON delay=0 ramp=0 on=0 off=0
Event 2
Initial State: PENDING
Delay Time: 00:00:00
insert SEN0031_1 10000.990000 dely=0 ramp=0 on=0 off=0
Event 2A
Initial State: PENDING
Delay Time: 00:00:00
insert N31_2_PHI_TEST Test delay=0 ramp=0 on=0 off=0
Event 3
Initial State: PENDING
Delay Time: 00:00:00
insert ABPT0507A 1500.000000 delay=0 ramp=300 on=0 off=0
Event 4 Loss of Switchyard
Initial State: PENDING
Delay Time: 00:00:00
insert MDCB1 1 delay=0 ramp=0 on=0 off=0
insert MDLC1 1 delay=1 ramp=0 on=0 off=0
insert MDMT7 1 delay=2 ramp=0 on=0 off=0
insert MDMT8 1 delay=5 ramp=0 on=0 off=0
insert MDESFB 1 delay=5 ramp=0 on=0 off=0
insert ANNUN_A019 ON delay=7 ramp=0 on=0 off=0
insert X06I78T 1 delay=6 ramp=0 on=0 off=0
insert CALBLAND1 Open delay=7 ramp=0 on=0 off=0
insert CALLC2 Open delay=7 ramp=0 on=0 off=0
insert MTGYCAL7 Open delay=6 ramp=0 on=0 off=0
insert PA04 true delay=10 ramp=0 on=0 off=0
insert HWX14O21W 0 delay=0 ramp=0 on=0 off=0
Local Secure B EDG
Initial State: PENDING
Delay Time: 00:00:00
insert KJHS0109 Local_Manual dely=0 ramp=0 on=0 off=0
insert KJHS0108B stop delay=5 ramp=0 on=0 off=0
Event 7
Initial State: PENDING
Delay Time: 00:00:00
insert BB43BBPCV0455ATVSP 1 dely=0 ramp=0 on=0 off=0
7a
Initial State: TRIGGER
Delay Time: 00:00:00
X21I149C EQ 1
delIA BB43BBPCV0455ATVSP 2 delay=0 cd=''
Local Start A EDG EOP Add 21
Initial State: PENDING
Delay Time: 00:00:00
NE01
Initial State: PENDING
Delay Time: 00:00:00
insert KJHS0012 reset delay=0 ramp=0 on=0 off=0
insert KJHS0009 local_manual dely=10 ramp=0 on=0 off=0
insert KJHS0001C start delay=15 ramp=0 on=0 off=0
local/ man to auto
Initial State: PENDING
Delay Time: 00:00:00
insert KJHS0009 Auto delay=0 ramp=0 on=0 off=0
EOP Add 22 Local RCP seal Isolation
Initial State: PENDING
Delay Time: 00:00:00
Open Breakers
Initial State: TRIGGER
Delay Time: 00:00:00
insert HWX01O133R 0 delay=0 ramp=0 on=0 off=0
insert HWX01O133G 0 delay=0 ramp=0 on=0 off=0
insert HWX19O217R 0 delay=60 ramp=0 on=0 off=0
insert HWX19O217G 0 delay=0 ramp=0 on=0 off=0
insert HWX20O25R 0 delay=90 ramp=0 on=0 off=0
insert HWX20O25G 0 delay=90 ramp=0 on=0 off=0
Isolate valves
Initial State: TRIGGER
Delay Time: 00:03:00
insert BGV0106 0.000000 delay=0 ramp=30 on=0 off=0
insert BGV0102 0.000000 delay=60 ramp=30 on=0 off=0
insert X01I133C 1 delay=120 ramp=0 on=0 off=0
insert X19I217C 1 delay=180 ramp=0 on=0 off=0
insert X20I25C 1 delay=240 ramp=0 on=0 off=0
Event 8
Initial State: PENDING
Delay Time: 00:00:00
Local Close APV0012
Initial State: PENDING
Delay Time: 00:00:00
insert APV0012 0.000000 delay=0 ramp=60 on=0 off=0

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 1	Page 7 of 19
Event Description:	NE01 Starting Air Receiver air pressure low (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 1 (NE01 Starting Air Receiver air pressure low) o RED HWXST1E21A, Value=1 o ANNUN_D020, value = ON • When contacted, wait 3 minutes and respond as the Secondary OT reports a scaffold builder accidently bumped open two valves and lowered the air pressure on both of the 'A' EDG air receivers and both of the 'A' EDG starting air receivers are at 300 psig. • If directed or asked, report the valves can be shut and restore 'A' EDG starting air o Wait 3 minutes and delete the items in event 1 ▪ RED HWXST1E21A, Value=1 ▪ ANNUN_D020, value = ON o Report that the valve is closed and air has been restored		
Indications Available		
		ANN 20D, Diesel Generator NE01 Trouble
OTA-RK-00016, Add 20D Diesel Generator NE01 Trouble		
	CRS	Implement OTA-RK-00016, Add 20D Diesel Generator NE01 Trouble
OTA-RK-00016	**RO**	(Step 3.1) DISPATCH an Operator to Panel KJ-121, PNL CONT D/G NE01, to determine local alarm.
	CRS	Reviews Technical specifications • 3.8.3 Cond E o Restore two starting air receivers with pressure ≥ 435 psig within 48 hours
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 2	Page 8 of 19
Event Description:	Source Range Channel Failure (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 2 (Source Range Channel Failure) o Malfunction (SE) SEN0031_1, Value = 10000 • When contacted as I&C to place the Normal/Test switch on module NM107 of SR Channel 31 Drawer in TEST, wait 3 minutes and: o Insert Event 2A o Call the CR and report **"The Normal/Test switch on module NM107 of SR Channel 31 Drawer is in TEST"** • When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO. • If contacted and asked if anyone is in containment answer "**No one is in containment"**		
Indications Available		
		N31 fails to 10K CPS 57A SR Flux Doubled 65A SR HI Flux at S/D
OTO-SE-00001, Nuclear Instrumentation Failure		
	CRS	Implement OTO-SE-00001, Nuclear Instrumentation Failure
OTO-SE-00001	**RO**	(Step 1) Check Power Range Nuclear Instruments - Normal
	RO	(Step 2) Check Intermediate Range Nuclear Instruments – Normal
	RO	(Step 3) Check Source Range Nuclear Instruments – Normal – NO RNO – Go To Attachment C, Source Range Instrument Malfunction
ATTACHMENT C, SOURCE RANGE INSTRUMENT MALFUNCTION		
	RO	(Step C1) CHECK Reactor Power – Greater than P-6 – **NO** RNO – Go To Step C5
	RO	(Step C5) CHECK High Flux at Shutdown Alarm – IN ALARM

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 2	Page 9 of 19
Event Description:	Source Range Channel Failure (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
	RO	(Step C6) CHECK Plant Personnel – INSIDE CONTAINMENT – **NO** RNO – Go to Step C9
	CRS	(Step C9) Check Plant Status Meets One of the Following: • MODE 3
OTO-SE-00001	**RO**	(Step C10) CHECK One Source Range Indication - OPERABLE
	RO	(Step C11) Suspend Operations Involving Positive Reactivity Additions
	CRS	(Step C12) Check Rod Control System CAPABLE OF ROD WITHDRAWAL
	CRS	(Step C13) Restore Inoperable SR Channel within 48 Hours
	CRS	(Step C14) Check Plant in MODE 6 – **NO** RNO – Go to Step C17
	RO	(Step C17) Check ANN 57A, SR Flux Doubled - LIT

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 2	Page 10 of 19
Event Description:	Source Range Channel Failure (Tech Spec)		

Proc /Time	Position	Applicant's Actions or Behavior
	RO	(Step C18) Check ANN 57A, SR Flux Doubled – EXTINGUISHED – **NO** RNO RESTORE charging lineup: a. On module NM107 of the affected SR Drawer, DIRECT I&C to place the Normal/Test switch, in TEST. b. PRESS BLOCK on the SR Doubled Block/Reset pushbuttons: • SE HS-11 • SE HS-12 c. PRESS RESET on both SR Flux Doubling Block/Reset pushbuttons: • SE HS-11 • SE HS-12 d. ENSURE SR FLUX DBL BLOC on SB069 is EXTINGUISHED. e. OPEN VCT Outlet Valves: • BG HIS-112B and BG HIS-112C f. CLOSE CCP Suction From RWST Valves: • BN HIS-112D and BN HIS-112E g. UPDATE Status Board for current Boron concentration in charging pumps.
	RO	(Step C19) SELECT An Operable Channel On NIS Recorder - SE NR-45
	CRS	(Step C20) PLACE Inoperable Source Range Channel in the EOSL
	CRS	(Step C21) REVIEW Applicable Technical Specifications: Attachment I • 3.3.1 Cond A: • 3.3.1 Cond K: Restore channel to Operable status within 48 hours OR Initiate actions to fully insert all rods within 48 hours AND Place the Rod Control System in a condition incapable of rod withdrawal within 49 hours • 3.3.9 Cond A
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 3	Page 11 of 19
Event Description:	Steam Dump Valves fail open		

Proc /Time	Position	Applicant's Actions or Behavior
Booth Operator: • Insert Event 3 (Controlling Steam Dump Valves fail open) o Malfunctions (AB) ABPT507A, Value = 1500, Ramp = 5 min • When contacted, respond as DUTY MANAGER. Acknowledge entry into the OTO.		
Indications Available		
		ANN 65D, "Tref/Tauct HI" Steam Dump Valve Position – Open (AB-ZI-34, 35, and 36) ANN 108-111C "SG A-D Level Deviation" Pressurizer level decreases due to RCS cooldown Letdown may isolate on low Pressurizer level.
OTO-AB-00001, STEAM DUMP MALFUNCTION		
OTO-AB-00001	**RO**	(Step 1) CHECK Reactor Power – LESS THAN 100%
	BOP	(Step 2) CHECK At Least One SG ASD – FAILED OPEN- **NO** RNO – Go to Step 6
	BOP	(Step 6) CHECK Steam Header Pressure Channel Failed
	BOP	(Step 7) CHECK Steam Dump Control ‑ IN STEAM PRESSURE MODE • AB US‑500Z
	BOP	(Step 8) PLACE Steam Header Pressure Controller ‑ IN MANUAL • AB PK‑507
	BOP	(Step 9) CHECK Steam Dump ‑ Responding in MANUAL
	BOP	(Step 10) MANUALLY Control Steam Generator Pressure ‑ At Desired Value

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 3	Page 12 of 19
Event Description:	Steam Dump Valves fail open		

Proc /Time	Position	Applicant's Actions or Behavior
OTO-AB-00001	**BOP**	(Step 11) Go To Step 17
	CRS	(Step 17) INITIATE Actions to Repair the Failed Component.
	CRS	(Step 18) REVIEW Technical Specification 3.7.4. NOT applicable for the failure
	CRS	(Step 19) PLACE Inoperable Component In the EOSL.
	CRS	(Step 20) RECORD Any Locked Valve Manipulations in the Locked Valve Deviation Log Per ODP-ZZ-00004, Locked Component Control.
	CRS	(Step 21) PERFORM Notifications Per ODP-ZZ-00001 Addendum 13, Shift Manager Communications to Emergency Duty Officer.
NOTE		**At Lead Examiner's discretion move to the next Event**

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 4, 5, 6, 7	Page 13 of 19
Event Description:	Loss of Offsite Power / "B" ESW Pump Trip / Loss of All AC Power / "B" ESW Pump Trip / Loss of All AC Power / PZR PORV PCV-455 Fails Open with Manual Control Available		

Proc /Time	Position	Applicant's Actions or Behavior

Booth Operator

- Insert Event 4 (Loss of Off Site Power)
  - Loss of Switchyard steps.

- **The following PRELOADS are activated:**
  - Event 5 (B ESW Pump Trip / Loss of All AC Power)
    - (EF) PEF01B, Value = Trip, Condition = HWX19O241R eq 1
  - Event 6 (A EDG Fails to Start)
    - (NE) NE01, Value = Fail

- 10 minutes after the loss of off site power OR when directed to secure B EDG (whichever occurs first)
  - Acknowledge request
  - Wait 3 minutes and Insert "Local Secure B EDG" step of simulator lesson
    - (KJ) KJHS0109, value = Local_Manual
    - (KJ) KJHS0108B, value = Stop, delay = 5 secs
  - Report to control room that the B EDG is stopped

- Insert Event 7 upon securing Power to NB02 initiating loss of All AC Power. (Pressurizer PORV Fails Open)
  - ME Schematic (BB) m22bb02_a, RT04RC_PCV455A_ATVFAILSP, Value = .30
  - ME Schematic (BB) m22bb02_a, RT04RC_PCV455A_ATVFAILSP, Value = .30, Condition = X21I149C eq 1

- If crew dispatches and OT to manually start A EDG early (i.e. as soon as it is determined not to have started) do not start A EDG until step 6 of ECA-0.0; if OT is sent after step 6 of ECA-0.0 wait 3 minutes to start A EDG
  - Trigger simulator lesson step "Local Start A EDG EOP ADD 21" (AFTER step 7 of ECA-0.0)

- Acknowledge as Power Supervisor. A fault has occurred at the Montgomery substation causing a widespread power outage. Repair crews have been dispatched

- Respond as the Secondary OT and go to panel KJ-121. Report that Annunciator 6A, Diesel Start Failure, is in alarm. Request assistance from maintenance troubleshoot in an attempt to clear the alarm.

- Respond as an OT if directed to investigate the B ESW pump that the motor is hot to the touch

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 4, 5, 6, 7	Page 14 of 19
Event Description:	Loss of Offsite Power / "B" ESW Pump Trip / Loss of All AC Power / "B" ESW Pump Trip / Loss of All AC Power / PZR PORV PCV-455 Fails Open with Manual Control Available		

Proc /Time	Position	Applicant's Actions or Behavior
Indications Available		
		15BD PA01/02 BUS UV Multiple FIRST OUT Annunciators
E-0, Reactor Trip or Safety Injection		
	CRS	Implement E-0, Reactor Trip or Safety Injection
E-0	**RO**	(Step 1) Check Reactor Trip • Rod Bottom Lights – All Lit • Reactor Trip and Bypass Breakers – Open - NO • Neutron Flux – Lowering RNO: Manually Trip Reactor.
	BOP	(Step 2) Check Turbine Trip a. All Turbine Stop Valves – Closed
	BOP	(Step 3) Check Power to AC Emergency Buses a. AC emergency buses – At Least One Energized • NB02 Energized from EDG NE02 b. AC emergency buses – BOTH Energized - **NO** RNO – TRY to restore power – Try to start NE01 using KJ HS-8A
	RO	(Step 4) Check SI Status a. Check if SI is actuated RNO – Check if SI is Required If SI is NOT required, GO TO ES-0.1, Reactor Trip Response, Step 1.
ES-0.1, Reactor Trip Response		
	CRS	Implement ES-0.1, Reactor Trip Response
	CRS	Implement CSF Status Tree Monitoring per CSF-1

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 4, 5, 6, 7	Page 15 of 19
Event Description:	Loss of Offsite Power / "B" ESW Pump Trip / Loss of All AC Power / "B" ESW Pump Trip / Loss of All AC Power / PZR PORV PCV-455 Fails Open with Manual Control Available		

Proc /Time	Position	Applicant's Actions or Behavior
ES-0.1	**BOP**	(Step 1) Check RCS Temperature a. Any RCP running –NO RNO: Transfer Condenser Steam Dump to Steam Pressure Mode. b. Check RCS temperature response - Normal
ES-0.1	**RO**	(Step 8) Check Status of AC Buses a. Check Generator Output Breakers – Open b. Check All AC Buses – Energized by Offsite Power RNO: • Ensure PZR PORVs in AUTO • Ensure PORV Block Valves Open (no power to A PORV block valve) • Ensure DGs have assumed loads: o CCP, ESW, CCW, Ctmt Cooler Fans, MDAFP, CR AC Units, Class 1E AC Units • If any DG running with NO cooling, **STOP affected DG**
ECA-0.0, Loss of All AC Power		
	CRS	Transition to ECA-0.0, Loss of All AC Power
ECA-0.0	**RO**	(Step 1) Check Reactor Trip a. Reactor Trip and Bypass Breakers – OPEN\ b. Neutron Flux - Lowering
	RO	(Step 2) Check Turbine Trip a. Turbine Stop Valves - Closed
	BOP	(Step 3) Check if RCS is Isolated a. Letdown Isolation Valves – CLOSED b. PZR PORVs - CLOSED RNO: If PZR pressure is < 2335 psig **THEN CLOSE PORVs** c. RCS to Excess Letdown HX Valves – CLOSED d. Reactor Head Vents – CLOSED

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 4, 5, 6, 7	Page 16 of 19
Event Description:	Loss of Offsite Power / "B" ESW Pump Trip / Loss of All AC Power / "B" ESW Pump Trip / Loss of All AC Power / PZR PORV PCV-455 Fails Open with Manual Control Available		

Proc /Time	Position	Applicant's Actions or Behavior
Critical Task	**BOP**	**Manually close the Open PORV before completing Step 3 of ECA-0.0**
	CRS	(Step 4) Check AFW Flow > 285,000 lbm/hr
ECA-0.0	**CRS**	(Step 5) Try to Restore Power to any Emergency Bus • Energize with DG ○ Check both DG's running ○ RNO – Manually Start ○ Check at least one bus energized ○ RNO Stop affected DG ○ Try any available supply – EOP Add 7 • Check AC emergency buses – One energized ○ RNO – OPEN CR cabinet doors – EOP Add 20 ○ GO TO Step 6
	RO	(Step 6) Place the Following Equipment Switches in PTL • CCP's • SI Pumps • RHR Pumps • Containment Spray Pumps • CCW Pumps • Containment Cooler Fans • Motor Driven AFW Pumps • Control Room AC Units • Class 1E Electrical Eq Room AC Units
	BOP	(Step 7) Restore AC Power a. Check if Offsite is available - NO RNO – Perform the following while continuing with step 8 1. EOP Add 21 Local EDG start 2. Consult Power Supervisor and TD. If offsite power source not available, restore power using EOP Addendum 39, Alternate Emergency Power Supply. (**AEPS NOT available**)
	CRS	(Step 8) Locally Isolate RCP Seals – EOP Add 22

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 4, 5, 6, 7	Page 17 of 19
Event Description:	Loss of Offsite Power / "B" ESW Pump Trip / Loss of All AC Power / "B" ESW Pump Trip / Loss of All AC Power / PZR PORV PCV-455 Fails Open with Manual Control Available		

Proc /Time	Position	Applicant's Actions or Behavior
	BOP	(Step 9) Check if CST is Isolated from Hotwell Place AD LIC-79A in manual with zero output Place AD LIC-79B in manual with zero output Locally close APV0012
ECA-0.0	**BOP**	(Step 10) Check SG Status a. MSIVs and Bypass valves closed b. MFRVs Closed c. MFRV bypass valves closed d. FWIVs closed e. SG Blowdown isolation valves closed
	BOP	(Step 11) Check if Any SG is Faulted • Any pressure lowering uncontrollably – or – • Any SG completely depressurized RNO Go To Step 12
	BOP	(Step 12) Check if SG Tubes are intact a. Steamline Radiation Normal b. Cond Air Removal radiation normal before isolation c. SG Blowdown and Sample rad normal before isolation d. No SG Levels rising uncontrollably
	BOP	(Step 13) Check Intact SG Levels a. Narrow Range > 7% (25%) b. Control AFW flow between 7% (25%) and 52%
	BOP	(Step 14) Check DC Bus Loads a. Monitor 125 vdc Class 1E Buses b. Consult Plant Engineering to evaluate shedding loads c. Locally Check Security DG - RUNNING
	BOP	(Step 15) Check CST to AFP Suction Header Pressure Greater than 2.75 psig

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 4, 5, 6, 7	Page 18 of 19
Event Description:	Loss of Offsite Power / "B" ESW Pump Trip / Loss of All AC Power / "B" ESW Pump Trip / Loss of All AC Power / PZR PORV PCV-455 Fails Open with Manual Control Available		

Proc /Time	Position	Applicant's Actions or Behavior
ECA-0.0	**RO**	(Step 16) Monitor RCS Integrity a. Monitor RCS Inventory: • Check RCS subcooling – Greater than 30˚F[50˚F] • PZR level – Greater than 9% [29%] b. Check time elapsed since loss of RCP seal cooling – Less than 4 hours. c. Go to Step 19
	RO	(Step 19) Check SI Signal Status: a. SI Has Been Actuated – NO RNO: When SI is actuated Then Perform Steps 19.b, 20, 21, 22. Continue With Step 23.
	RO	(Step 23) Check Core Exit TCs – Less than 1200˚F
	BOP	(Step 24) Check if AC Emergency Power Is Restored: a. Check AC Emergency Buses – At least ONE Energized.
	BOP	(Step 25) Stabilize SG Pressures a. Manually Control SG ASDs to maintain existing Pressure
	BOP	(Step 26) Check Following Equipment Loaded on Energized Bus • 480 Busses NG01 and NG03 • Battery Chargers NK21 and NK23 • Instrument Busses NN01 and NN03 • CR Emergency Lighting NK51-20
	BOP	(Step 27) Check ESW System Operation • EF HIS-37, 51, 31, 33, 45 and 49 Open • EF HIS-41, 23 and 59 Closed • ESW Pump A Running

Op Test No.: 2016-1	Scenario # 4 rev.1	Event # 4, 5, 6, 7	Page 19 of 19
Event Description:	Loss of Offsite Power / "B" ESW Pump Trip / Loss of All AC Power / "B" ESW Pump Trip / Loss of All AC Power / PZR PORV PCV-455 Fails Open with Manual Control Available		

Proc /Time	Position	Applicant's Actions or Behavior
Critical Task	**BOP**	**Manually start A ESW pump prior to A EDG tripping on high temperature.**
ECA-0.0	**CRS**	(Step 28) Select Recovery Procedure a. Check RCS Subcooling > 30 °F (50°F) b. Check PZR level > 9% (29%) c. Check if ECCS equipment actuated YES – ECA-0.1 RNO - ECA-0.2
NOTE		**The scenario can be terminated at the discretion of the Lead Examiner**

Facility:	***Callaway***	Date of Exam:	***05/23/2016***	Operating Test No.:	***2016-1***
Team 1	SRO-I: S1, S2, S3,				

APPLICANT	EVENT TYPE	Scenarios												
		4			3			2			TOTAL	MINIMUM(*)		
		CREW POSITION			CREW POSITION			CREW POSITION						
		S1	S2	S3	S2	S3	S1	S3	S1	S2				
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
SRO-I S1	RX								2		1		**1**	
	NOR						1				1		**1**	
	I/C	2,3,4					2,4		3,5		7		**4**	
	MAJ	5					6		6		3		**2**	
	TS	1,2									2		**2**	
SRO-I S2	RX				3						1		**1**	
	NOR									1	1		**1**	
	I/C		2,3		1,2,4					2,4	7		**4**	
	MAJ		4		5					6	3		**2**	
	TS				1,4						2		**2**	
SRO-I S3	RX					3					1		**1**	
	NOR										1		**1**	
	I/C			3,4		1,4		2,3,4, 5			8		**4**	
	MAJ			5		5		6			3		**2**	
	TS							2,3			2		**2**	

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs 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.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility:	***Callaway***	Date of Exam:	***05/23/2016***	Operating Test No.:	***2016-1***
Team 2	SRO-I: S6, S7 / RO: R1				

APPLICANT	EVENT TYPE	Scenarios									TOTAL	MINIMUM(*)		
		4			3			2						
		CREW POSITION			CREW POSITION			CREW POSITION						
		S6	S7	R1	S7	R1	S6	S7	S6	R1				
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
SRO-I S6	RX								2		1		**1**	
	NOR						1				1		**1**	
	I/C	2,3,4					2,4		3,5		7		**4**	
	MAJ	5					6		6		3		**2**	
	TS	1,2									2		**2**	
SRO-I S7	RX				3						1		**1**	
	NOR										0*		**1**	
	I/C		2,3		1,2,4			2,3,4, 5			9		**4**	
	MAJ		4		5			6			3		**2**	
	TS				1,4			2,3			4		**2**	
RO R1	RX					3					1	**1**		
	NOR									1	1	**1**		
	I/C			3,4		1,4				2,4	6	**4**		
	MAJ			5		5				6	3	**2**		
	TS													

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs 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.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility:	***Callaway***	Date of Exam:	***05/23/2016***	Operating Test No.:	***2016-1***

Team 2 SRO-I: S4, S5

APPLICANT	EVENT TYPE	Scenarios									TOTAL	MINIMUM(*)		
		4			3									
		CREW POSITION			CREW POSITION			CREW POSITION						
		S4	S5	Surrogate	S5	S4	Surrogate							
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
SRO-I S4	RX					3					1		**1**	
	NOR				1						0*		**1**	
	I/C	2,3,4				1,4					5		**4**	
	MAJ	5				5					2		**2**	
	TS	1,2									2		**2**	
SRO-I S5	RX				3						1		**1**	
	NOR										0*		**1**	
	I/C		2,3		1,2,4						5		**4**	
	MAJ		4		5						2		**2**	
	TS				1,4						2		**2**	
	RX													
	NOR													
	I/C													
	MAJ													
	TS													

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs 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.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility:	***Callaway***				Date of Exam:	***05/23/2014***				Operating Test No.:	***2016-1***							
APPLICANT	EVENT TYPE	Scenarios												TOTAL	MINIMUM(*)		
		1															
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP	SRO	ATC	BOP		R	I	U
SPARE	RX	5		5													
	NOR			1													
	I/C	2,3,4	2,5	3,4													
	MAJ	6	6	6													
	TS	2,3															

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs 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.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility: Callaway Date of Examination: 5/23/16 Operating Test No.: 2016-1

Competencies	APPLICANTS							
	RO ☒ SRO-I ☐ SRO-U ☐				RO ☐ SRO-I ☒ SRO-U ☐			
	SCENARIO				SCENARIO			
	1	2	3	4	1	2	3	4
Interpret/Diagnose Events and Conditions	2,3,4,5,6,7	2,3,4,5,6,7	1,2,3,4,5,6	2,3,4,5,6,7	2,3,4,5,6,7	2,3,4,5,6,7	1,2,3,4,5,6	2,3,4,5,6,7
Comply With and Use Procedures (1)	1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6,	2,3,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6	2,3,5,6,7
Operate Control Boards (2)	1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6,	2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6	2,3,4,5,6,7
Communicate and Interact	1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6	1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6	1,2,3,4,5,6,7
Demonstrate Supervisory Ability (3)					1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6	1,2,3,4,5,6,7
Comply With and Use Tech. Specs. (3)					2,3	2,3	1,4	1,2

Notes:
(1) Includes Technical Specification compliance for an RO.
(2) Optional for an SRO-U.
(3) Only applicable to SROs.

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Competency Rating factors as described on forms ES-303-1 and ES-303-3.)