

# **NRC EXAM**

## **RO Admin JPM A1a**

## Job Performance Measure Worksheet

Facility: Ginna Task No.: 119-006-03-01

Task Title: Determine the Allowable Hours an Operator Can Work JPM No.: 2018 NRC RO Admin JPM A1a

K/A Reference: G 2.1.5 (2.9\*) Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.

Examinee: NRC Examiner:  
Facility Evaluator: Date:  
Method of testing:  
Simulated Performance: \_\_\_\_\_ Actual Performance: X  
Classroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last 2 Pages of this JPM) and Handout 1.**

Initial Conditions:

- Your previous work history is as provided.
- 08/29/18 1740 You report to work for Shift Turnover.
- 08/29/18 1800 You assume the HCO watch.

Initiating Cue: Based on your previous work history, the US has directed you to:

1. Determine the latest time that you can be relieved without violating Work Hour Rules or requiring a waiver or exception.
2. Assuming that you get relieved and leave the site at the time determined in #1 above, determine the earliest time that you can report to work on 08/30/18 without violating any Work Hour Rules or requiring a waiver or exception.

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Job Performance Measure Worksheet

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Task Standard: The operator will determine that the latest they can work is 1000 on 08/30/18 and the earliest they can report back to work on 08/30/18 is 2000.

Required Materials:

- Calculator
- General References must be available for the operator to reference

General References: LS-AA-119, Fatigue Management and Work Hour Limits (Rev 12)

Handouts: Handout 1: Blank copy of LS-AA-119, Fatigue Management and Work Hour Limits

Time Critical Task: NO

Validation Time: 22 minutes

Job Performance Measure Worksheet

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Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

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**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.</b>				
*1	(LS-AA-119, Section 5.1.5) Determine the latest time that you can be relieved without violating overtime limits or requiring a waiver or exception.	The Operator determines that they can work until <b>1000 on 08/30/18</b> without violating overtime limits or requiring a waiver or exception. (16 hours excluding turnover time)	_____	_____	_____
*2	(LS-AA-119, Section 5.1.5) Determine the earliest time that you can report to work on 08/30/18 without violating any overtime limits or requiring a waiver or exception.	The Operator determines that they <b>CANNOT</b> return to work until <b>2000 on 08/30/18</b> without violating overtime limits or requiring a waiver or exception. (10-hour break between successive work periods)	_____	_____	_____

JPM Stop Time: \_\_\_\_\_ Terminating Cue: **Candidate states task is complete.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2018 NRC RO Admin JPM A1a

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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## INITIAL CONDITIONS:

- Your previous work history is as provided.
- 08/29/18 1740 You report to work for Shift Turnover.
- 08/29/18 1800 You assume the HCO watch.

## INITIATING CUE:

Based on your previous work history, the US has directed you to:

1. Determine the latest time that you can be relieved without violating Work Hour Rules or requiring a waiver or exception.
2. Assuming that you get relieved and leave the site at the time determined in #1 above, determine the earliest time that you can report to work on 08/30/18 without violating any Work Hour Rules or requiring a waiver or exception.

**Candidate Name:** \_\_\_\_\_

**Latest date/time you CAN be relieved:** \_\_\_\_\_

**Earliest date/time you CAN report back to work:** \_\_\_\_\_

## JPM CUE SHEET

**2018 NRC RO Admin JPM A1a Data Sheet (page 1)**

	Mon 7/12	Tues 7/13	Wed 7/14	Thurs 7/15	Fri 7/16	Sat 7/17	Sun 7/18	Mon 7/19	Tues 7/20	Wed 7/21	Thurs 7/22	Fri 7/23	Sat 7/24	Sun 7/25	Mon 7/26	Tues 7/27
<b>SHIFT</b>	D	D	D										N	N	N	
<b>HOURS WORKED</b>	12	12	12										12	12	12	

	Wed 7/28	Thurs 7/29	Fri 7/30	Sat 7/31	Sun 8/01	Mon 8/02	Tues 8/0-3	Wed 8/04	Thurs 8/05	Fri 8/06	Sat 8/07	Sun 8/08	Mon 8/09	Tues 8/10	Wed 8/11	Thurs 8/12
						<b>OUTAGE</b>										
<b>SHIFT</b>		D	D	D	D			N	N	N	N		N	N	N	N
<b>HOURS WORKED</b>		12	12	12	12			12	12	12	12		12	12	12	12

	Fri 8/13	Sat 8/14	Sun 8/15	Mon 8/16	Tues 8/17	Wed 8/18	Thurs 8/19	Fri 8/20	Sat 8/21	Sun 8/22	Mon 8/23	Tues 8/24	Wed 8/25	Thurs 8/26	Fri 8/27	Sat 8/28
	<b>OUTAGE</b>															
<b>SHIFT</b>		N	N	N	N		N	N	N	N		D	D	D	WCC	
<b>HOURS WORKED</b>		12	12	12	12		12	12	12	12		12	12	12	9	

	Sun 8/29	Mon 8/30
<b>SHIFT</b>		N
<b>HOURS WORKED</b>		12



# **NRC EXAM**

## **RO Admin JPM A1b**

## Job Performance Measure Worksheet

Facility: Ginna Task No.: 351-009-01-05

Task Title: Manually Calculate Quadrant Power Tilt Ratio (QPTR) JPM No.: 2018 NRC RO Admin JPM A1b

K/A Reference: G 2.1.25 (3.9) Ability to interpret reference materials, such as graphs, curves, tables, etc.

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance:   X    
Classroom   X   Simulator \_\_\_\_\_ Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1, 2, and 3.**

Initial Conditions:

- Plant is operating at 95% power following a turbine load rejection.
- MCB Annunciator C-5, PPCS ROD SEQUENCE OR ROD DEVIATION/PPCS LTOP HI-LOW TEMPERATURE, is LIT.
- Control Room is performing AP-TURB.2, Turbine Load Rejection; and AP-RCC.2, RCC/RPI Malfunction.
- PPCS is Out-of-Service.

Initiating Cue: The US has directed you to calculate QPTR in accordance with O-6.4, Quadrant Power Tilt Ratio Calculation.

Task Standard: The operator will correctly calculate Quadrant Power Tilt Ratio (QPTR) in accordance with O-6.4, Quadrant Power Tilt Ratio Calculation.

## Job Performance Measure Worksheet

- Required Materials:
- Calculator
  - General References must be available for the operator to reference

General References: O-6.4, Quadrant Power Tilt Ratio Calculation (Rev 02600)

Handouts:

Handout 1: Blank copy of O-6.4, Quadrant Power Tilt Ratio Calculation

Handout 2: Photos of Power Range Drawers

Handout 3: Curve Book Data Sheet for VOLTS/MAMPS

Time Critical Task: NO

Validation Time: 15 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

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**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1, 2, and 3.</b>				
1	Reviews procedure, verify Precautions, and Initial Conditions.	<ul style="list-style-type: none"> <li>Operator reviews procedure.</li> <li>Operator reviews Precautions and Limitations, and verifies Initial Conditions.</li> <li>Operator recognizes that Steps 6.1, 6.2, and 6.3 are Not Applicable.</li> </ul>	_____	_____	_____
2	(O-6.4, Step 6.4) <b>CALCULATE</b> QPTR using Attachment 1, Quadrant Power Tilt Ratio Calculation <b>OR</b> a computer generated form.	Operator recognizes that PPCS is OOS and proceeds to Attachment 1 to calculate QPTR.	_____	_____	_____
<p style="text-align: center;"><b>NOTE</b></p> <p>Volts/Micro amp value for each upper and lower detector are obtained from the Curve Book. Curve Book values that are greater than 3 months old require the Reactor Engineer to be notified so curve book values can be updated.</p>					
3	(O-6.4, Attachment 1, NOTE)	Operator reads NOTE and proceeds	_____	_____	_____
*4	(O-6.4, Attachment 1, Step 1.0) <b>RECORD</b> the following data <b>AND CALCULATE</b> Total Volts for each power range channel:	Operator completes Attachment 1, Step 1.0 in accordance with provided KEY. <b>Candidate's answer MUST be within <math>\pm 0.01</math> of provided KEY.</b>	_____	_____	_____
<p style="text-align: center;"><b>NOTE</b></p> <p>If <u>one</u> power range channel INOPERABLE, then the Highest (Total) in numerator of the equation below must be multiplied by 3 instead of 4 <b>AND</b> only 3 operable channels are to be summed in the denominator.</p>					

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*5	(O-6.4, Attachment 1, Step 2.0)	<ul style="list-style-type: none"> <li>Operator reads the NOTE and recognizes that it is Not Applicable.</li> </ul>	___	___	___
		<ul style="list-style-type: none"> <li>* Operator completes Attachment 1, Step 2.0 in accordance with provided KEY. <b>Candidate's answer MUST be within <math>\pm 0.002</math> of provided KEY.</b></li> </ul>	___	___	___

JPM Stop Time: \_\_\_\_\_ Terminating Cue: **Candidate states task is complete.**

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## PERFORMANCE INFORMATION

**KEY****1.0**

N41 Upper	212.5 Microamp	X	0.0315 Volts/Microamp	=	6.694 Volts
N41 Lower	321.1 Microamp	X	0.0249 Volts/Microamp	=	7.995 Volts
				N41 Total	14.689 Volts
N42 Upper	208.2 Microamp	X	0.0357 Volts/Microamp	=	7.433 Volts
N42 Lower	348.2 Microamp	X	0.0240 Volts/Microamp	=	8.357 Volts
				N42 Total	15.790 Volts
N43 Upper	238.0 Microamp	X	0.0314 Volts/Microamp	=	7.473 Volts
N43 Lower	341.8 Microamp	X	0.0247 Volts/Microamp	=	8.442 Volts
				N43 Total	15.915 Volts
N44 Upper	217.9 Microamp	X	0.0353 Volts/Microamp	=	7.692 Volts
N44 Lower	323.3 Microamp	X	0.0259 Volts/Microamp	=	8.373 Volts
				N44 Total	16.065 Volts

**2.0**      Quadrant Power Tilt =  $\frac{4 \times 16.065}{14.689 + 15.790 + 15.915 + 16.065} = \frac{64.26}{62.459} = \underline{\underline{1.029}}$

VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2018 NRC RO Admin JPM A1b

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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## INITIAL CONDITIONS:

- Plant is operating at 95% power following a turbine load rejection.
- MCB Annunciator C-5, PPCS ROD SEQUENCE OR ROD DEVIATION/PPCS LTOP HI-LOW TEMPERATURE, is LIT.
- Control Room is performing AP-TURB.2, Turbine Load Rejection; and AP-RCC.2, RCC/RPI Malfunction.
- PPCS is Out-of-Service.

## INITIATING CUE:

The US has directed you to calculate QPTR in accordance with O-6.4, Quadrant Power Tilt Ratio Calculation.



# **NRC EXAM**

## **RO Admin JPM A2**

## Job Performance Measure Worksheet

Facility: Ginna Task No.: 119-014-03-01

Task Title: Determine proper tagging boundary for work JPM No.: 2018 NRC RO Admin JPM A2

K/A Reference: G 2.2.41 (3.5) Ability to obtain and interpret station electrical and mechanical drawings.

Examinee: NRC Examiner:  
Facility Evaluator: Date:  
Method of testing:  
Simulated Performance: \_\_\_\_\_ Actual Performance: X  
Classroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1, 2, and 3.**

- Initial Conditions:
- Plant is operating at 100% power.
  - You are an Extra RO in the Work Control Center.
  - A piping failure has occurred on the Condensate Transfer Pump side of V-4049C, Condensate Transfer Pump Discharge Crosstie Isolation Valve.
- Initiating Cue:
- The Shift Manager requests you to determine the tagout boundaries for V-4049C repair.
  - On the request below, record Equipment Names/EINs, the Required Positions, type of tag to be hung, and the order tags are to be hung in accordance with OP-CE-109-101, Clearance and Tagging.
  - When completed, provide list and any comments to the Shift Manager.
  - See Examiner with any questions or concerns regarding the Tagout.

## Job Performance Measure Worksheet

Task Standard: The operator will correctly determine the tagging boundaries for V-4049C.

Required Materials: None

General References: OP-CE-109-101, Clearance and Tagging (Rev 003)  
33013-1234, Condensate Storage (CDST) P&ID (Rev 046)  
10905-0233, MCCB – POS. 7D CNDST Transfer Pump (Rev 6)

Handouts: Handout 1: OP-CE-109-101, Clearance and Tagging  
Handout 2: 33013-1234, Condensate Storage (CDST) P&ID  
Handout 3: 10905-0233, MCCB – POS. 7D CNDST Transfer Pump

Time Critical Task: NO

Validation Time: 25 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

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**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1 and 2.</b>				
1	(OP-CE-109-101) Refers to procedure as needed.	Operator refers to procedure as needed.	___	___	___
2	(Drawings)	Operator refers to drawings as needed.	___	___	___
*3	Determines Electrical Tagout Boundary for Condensate Transfer Pump.	<b>In accordance with KEY on next page.</b>	___	___	___
*4	Determines Mechanical Tagout Boundary for V-4049C repair.	<b>In accordance with KEY on next page.</b>	___	___	___
5	Determines Drain Path for V-4049C repair.	<b>In accordance with KEY on next page. (*)</b>	___	___	___
*6	Determines Vent Path for V-4049C repair.	<b>In accordance with KEY on next page. (**)</b>	___	___	___

JPM Stop Time: \_\_\_\_\_ Terminating Cue: **Candidate states task is complete.**

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## PERFORMANCE INFORMATION

**KEY FOR PERFORMANCE STEP #3****REQUEST**

	<b>EQUIPMENT NAMES / EIN FOR ISOLATED WORK AREA</b>	<b>REQUIRED POSITION</b>	<b>TYPE OF TAG REQUIRED</b>	<b>ORDER TAGS TO BE HUNG</b>
1.	PB1/CTP, CNDST Transfer Pump Control Switch	DO NOT OPERATE	Information	1
2.	MCC B Position 7D, CNDST Transfer Pump	OPEN or OFF	Danger	2
✓ 3.	V-4046	LOCKED CLOSED <b>or</b> CLOSED	Danger	3
✓ 4.	V-4047	LOCKED CLOSED <b>or</b> CLOSED	Danger	3
✓ 5.	V-4048	LOCKED CLOSED <b>or</b> CLOSED	Danger	3
✓ 6.	V-4050	CLOSED	Danger	3
✓ 7.	V-9509C	CLOSED	Danger	3
✓ 8.	V-9509D	CLOSED	Danger	3
9.	See <b>NOTE</b> below *	OPEN	No Tag	4
10.	See <b>NOTE</b> below *	OPEN	No Tag	4
11.				
12.				
13.				
14.				
15.				

**NOTE:**

\* To satisfy the step for a vent and drain path, choose ANY **TWO** options below: (Order 4)

- 1. V-4046A
- 2. V-4049C
- 3. V-4049A, V-4049E **AND** V-4049F **OR** V-4049G;
- 4. V-4049A, V-4049D **AND** V-9517P **OR** V-9517X;
- 5. V-4049A, V-4049D, V-9517R, V-9517T, **AND** V-9517V **OR** V-9517W **OR** V-9517U

**COMMENTS:**

- Equipment may be listed in any order.
- For tag order (**Section 4.7.6**), 1 and 2 must be first and second, any tag 3s can be in any order after 1 and 2 and before any 4s. Tag 4s can be in any order after all the 3s are hung.

VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2018 NRC RO Admin JPM A2

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## JPM CUE SHEET

## INITIAL CONDITIONS:

- Plant is operating at 100% power.
- You are an Extra RO in the Work Control Center.
- A piping failure has occurred on the Condensate Transfer Pump side of V-4049C, Condensate Transfer Pump Discharge Crosstie Isolation Valve.

## INITIATING CUE:

- The Shift Manager requests you to determine the tagout boundaries for V-4049C repair.
- On the request below, record Equipment Names/EINs, the Required Positions, type of tag to be hung, and the order tags are to be hung in accordance with OP-CE-109-101, Clearance and Tagging.
- When completed, provide list and any comments to the Shift Manager.
- See Examiner with any questions or concerns regarding the Tagout.

## REQUEST

	EQUIPMENT NAMES / EIN FOR ISOLATED WORK AREA	REQUIRED POSITION	TYPE OF TAG REQUIRED	ORDER TAGS TO BE HUNG
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

Comments:

# **NRC EXAM**

# **RO Admin JPM A3**



## Job Performance Measure Worksheet

Facility: Ginna Task No.: 119-011-03-03

Task Title: Determine stay time and exit requirements for working in a High Radiation Area JPM No.: 2018 NRC RO Admin JPM A3

K/A Reference: G 2.3.7 (3.5) Ability to comply with radiation work permit requirements during normal or abnormal conditions.

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: Actual Performance: X

Classroom X Simulator Plant

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- The plant is in MODE 5.
  - A primary system leak has occurred.
  - Several valves must be operated to isolate the leak.
  - The valves to be operated are in the Aux. Bldg, within an uncontaminated High Radiation Area, where the general area radiation level is 160 mrem/hr.
  - Your accumulated TEDE dose for this year is 200 mrem.
  - RP has authorized performance of this activity under the requirements of RWP NRC Exam 18-00101.

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Job Performance Measure Worksheet

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Initiating Cue:	<ul style="list-style-type: none"><li>• You have been assigned to operate the valves to isolate the leak.</li><li>• This is NOT considered to be an emergency action.</li><li>• ASSUME no dose is received in transit to the HRA and no dose extension will be granted.</li><li>• Determine your most limiting dose limit.</li><li>• Determine the maximum time you can be in the area before you are required to exit.</li></ul>
Task Standard:	The operator will correctly determine the TEDE limit.
Required Materials:	Calculator
General References:	<ul style="list-style-type: none"><li>• RP-AA-460, Controls for High and Locked High Radiation Areas (Rev 32)</li><li>• An "EXAMINATION ONLY RWP" (<b>NRC Exam 18-00101</b>) written for this JPM with the ED DOSE Alarm setting listed as 150mrem.</li></ul>
Handouts:	Handout 1: RP-AA-460, Controls for High and Locked High Radiation Areas Handout 2: RWP NRC Exam 18-00101
Time Critical Task:	NO
Validation Time:	12 minutes

## Job Performance Measure Worksheet

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

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**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## VERIFICATION OF COMPLETION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1 and 2.</b>				
1	(RWP) Review RWP	Operator reviews RWP	___	___	___
*2	Determine first administrative limit.	<ul style="list-style-type: none"> <li>Operator determines the accumulated dose alarm for this RWP is 150 mrem.</li> <li>Operator determines the Back Out Criteria is 80% of the dose alarm setting (120 mrem).</li> <li>* Operator determines the most limiting dose limit is 120 mrem.</li> </ul>	___	___	___
*3	Calculate maximum stay time before exit is required.	* Operator determines the maximum stay time is 45 minutes (0.75 hr)	___	___	___
<b>Examiner Note: Stay Time Calculation:</b> $(120 \text{ mrem}/160 \text{ mrem/hr}) = 0.75 \text{ hr}$ $(0.75 \text{ hr} \times 60 \text{ min/hr}) = 45 \text{ minutes}$					

JPM Stop Time: \_\_\_\_\_ Terminating Cue: **Candidate states task is complete.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2018 NRC RO Admin JPM A3

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## JPM CUE SHEET

## INITIAL CONDITIONS:

- The plant is in MODE 5.
- A primary system leak has occurred.
- Several valves must be operated to isolate the leak.
- The valves to be operated are in the Aux. Bldg, within an uncontaminated High Radiation Area, where the general area radiation level is 160 mrem/hr.
- Your accumulated TEDE dose for this year is 200 mrem.
- RP has authorized performance of this activity under the requirements of RWP NRC Exam 18-00101.

## INITIATING CUE:

- You have been assigned to operate the valves to isolate the leak.
- This is NOT considered to be an emergency action.
- ASSUME no dose is received in transit to the HRA and no dose extension will be granted.
- Determine your most limiting dose limit.
- Determine the maximum time you can be in the area before you are required to exit.

**Most Limiting Dose Limit:** \_\_\_\_\_ mrem

**Maximum Stay Time:** \_\_\_\_\_ minutes

**NRC EXAM**  
**SRO Admin JPM**  
**A1a**

## Job Performance Measure Worksheet

Facility: Ginna Task No.: 119-006-03-01A

Task Title: Determine the Allowable Hours an Operator Can Work JPM No.: 2018 NRC SRO Admin JPM A1a

K/A Reference: G 2.1.5 (3.9) Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X

Classroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1 and 2.**

Initial Conditions:

- The plant is at 100% power MOL.
- You are the Shift Manager.
- It is Sunday of your Day Shift (0600 - 1800 Sunday).
- The oncoming HCO has called in sick for the next shift (1800 Sunday – 0600 Monday **M-23**).
- You must find a replacement HCO.

Initiating Cue:

- Determine if either, neither, or both of two possible replacements for HCO satisfy the work hour limits of LS-AA-119, Fatigue Management and Work Hour Limits.

For each possible replacement, explain on the JPM CUE SHEET:

1. If he/she can or cannot work as HCO.
2. Which work hour limit prevents him/her from working, if applicable.



Task Standard: The operator will determine that neither of two possible replacements for the HCO satisfy the work hour limits in accordance with LS-AA-119, Fatigue Management and Work Hour Limits.

Required Materials: Calculator

General References: LS-AA-119, Fatigue Management and Work Hour Limits (Rev 12)

Handouts: Handout 1: Blank copy of LS-AA-119, Fatigue Management and Work Hour Limits

Handout 2: 2018 NRC SRO Admin JPM A1a Data Sheet

Time Critical Task: NO

Validation Time: 22 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

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**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1 and 2.</b>				
1	(LS-AA-119, Section 5.1.1) The following limits apply to covered individuals regardless of unit status: * No more than 16 work hours in any 24-hour period	<ul style="list-style-type: none"> <li>* Operator reviews procedure and locates the 10 CFR 26 Work Hour Limits.</li> <li>* Operator determines that <b>neither</b> individual will exceed the limit.</li> </ul>	_____	_____	_____
2	(LS-AA-119, Section 5.1.1) The following limits apply to covered individuals regardless of unit status: * No more than 26 work hours in any 48-hour period	Operator determines that <b>neither</b> individual will exceed the limit.	_____	_____	_____
*3	(LS-AA-119, Section 5.1.1) The following limits apply to covered individuals regardless of unit status: * No more than 72 work hours in any 7-day (168-hour) period	* Operator determines that <b>Operator #1</b> will exceed the limit.	_____	_____	_____
		• Operator determines that Operator #2 will NOT exceed the limit.	_____	_____	_____
4	(LS-AA-119, Section 5.1.1) The following limits apply to covered individuals regardless of unit status: * At least a 10-hour break between successive work periods, or an 8-hour break when a break of less than 10 hours is necessary to accommodate a crew's scheduled transition between work schedules or shifts	Operator determines that <b>neither</b> individual will exceed the limit.	_____	_____	_____

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*5	(LS-AA-119, Section 5.1.1) The following limits apply to covered individuals regardless of unit status:	• Operator determines that Operator #1 will NOT exceed the limit.	_____	_____	_____
	* A 34-hour break in any 9-day period (this limit may be incorporated into minimum days off requirements)	* Operator determines that <b>Operator #2</b> will exceed the limit.	_____	_____	_____
6	(LS-AA-119, Step 5.1.2.1) General: A. Exelon adheres to the on-line operation averaging requirements of 10 CFR 26.205(d)(7). During on-line operations and without issuance of a waiver, a covered individual's required Maximum Average Work Hours is a weekly average of 54 hours worked, calculated based on a rolling average period of six (6) weeks. B. To derive the maximum benefits from the 54-Hour Rule, all functional work groups are to establish a rolling average period of six (6) weeks. There is no direct relationship between the physical rotation cycle and the length of the averaging period.	Operator determines that <b>neither</b> individual will exceed the limit.			
<b>Examiner Note: The point in time at which the week will roll to the next averaging period is Monday 0000 to Monday 0000. For shifts that bridge the point in time (Monday 0000) when the averaging period rolls forward by one week, the hours will be included in the weeks they are worked.</b>					

JPM Stop Time: \_\_\_\_\_ Terminating Cue: **Candidate states task is complete.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2018 NRC SRO Admin JPM A1a

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## JPM CUE SHEET

**ANSWER KEY**

	(Circle <b>ONE</b> for each Operator)	Justification for Decision
OPERATOR #1	CAN or <b>CANNOT</b> work as HCO	Exceed 72 hours of work in 168-hour period (or similar wording)
OPERATOR #2	CAN or <b>CANNOT</b> work as HCO	Exceed 9 days without a 34-hour break (or similar wording)

## JPM CUE SHEET

## INITIAL CONDITIONS:

- The plant is at 100% power MOL.
- You are the Shift Manager.
- It is Sunday of your Day Shift (0600 - 1800 Sunday).
- The oncoming HCO has called in sick for the next shift (1800 Sunday – 0600 Monday **M-23**).
- You must find a replacement HCO.

## INITIATING CUE:

- Determine if either, neither, or both of two possible replacements for HCO satisfy the work hour limits of LS-AA-119, Fatigue Management and Work Hour Limits.
- For each possible replacement, explain on the JPM CUE SHEET:
  1. If he/she can or cannot work as HCO
  2. Which work hour limit prevents him/her from working, if applicable.

**Candidate Name:** \_\_\_\_\_

	(Circle <b>ONE</b> for each Operator)	Justification for Decision
OPERATOR #1	CAN or CANNOT work as HCO	
OPERATOR #2	CAN or CANNOT work as HCO	

## JPM CUE SHEET

**2018 NRC SRO Admin JPM A1a Data Sheet (page 1)****OPERATOR #1**

	M-12	T-13	W-14	T-15	F-16	S-17	S-18	M-19	T-20	W-21	T-22	F-23	S-24	S-25	M-26	T-27
<b>SHIFT</b>	D	D	D					D	D				N	N	N	
<b>HOURS WORKED</b>	12	12	12					12	12				12	12	12	

	W-28	T-29	F-30	S-31	S-1	M-2	T-3	W-4	T-5	F-6	S-7	S-8	M-9	T-10	W-11	T-12
<b>SHIFT</b>		D	D	D	D		T9	T9	T9	T9				N	N	N
<b>HOURS WORKED</b>		12	12	12	12		9	9	9	9				12	12	12

	F-13	S-14	S-15	M-16	T-17	W-18	T-19	F-20	S-21	S-22	M-23	T-24	W-25	T-26	F-27	S-28
<b>SHIFT</b>	N			D	D	D	D	D	D		N					N
<b>HOURS WORKED</b>	12			12	12	12	12	12	12		?					12

	S-29	M-30
<b>SHIFT</b>	N	N
<b>HOURS WORKED</b>	12	12

## JPM CUE SHEET

**2018 NRC SRO Admin JPM A1a Data Sheet (page 2)****OPERATOR #2**

	M-12	T-13	W-14	T-15	F-16	S-17	S-18	M-19	T-20	W-21	T-22	F-23	S-24	S-25	M-26	T-27
<b>SHIFT</b>		T9	T9	T9	T9				N	N	N	N			D	D
<b>HOURS WORKED</b>		9	9	9	9				12	12	12	12			12	12

	W-28	T-29	F-30	S-31	S-1	M-2	T-3	W-4	T-5	F-6	S-7	S-8	M-9	T-10	W-11	T-12
<b>SHIFT</b>	D									N	N	N	N			
<b>HOURS WORKED</b>	12									12	12	12	12			

	F-13	S-14	S-15	M-16	T-17	W-18	T-19	F-20	S-21	S-22	M-23	T-24	W-25	T-26	F-27	S-28
<b>SHIFT</b>	D		N	N	T9	T9	T9	T9	D		N	N	N	N	N	
<b>HOURS WORKED</b>	12		12	12	9	9	9	9	12		?	12	12	12	12	

	S-29	M-30
<b>SHIFT</b>		D
<b>HOURS WORKED</b>		12



**NRC EXAM**  
**SRO Admin JPM**  
**A1b**

## Job Performance Measure Worksheet

Facility: Ginna

Task No.:

Task Title: Review a Manual Quadrant Power  
Tilt Ratio (QPTR) CalculationJPM No.: 2018 NRC SRO Admin  
JPM A1bK/A Reference: G 2.1.25 (4.2) Ability to interpret  
reference materials, such as graphs,  
curves, tables, etc.

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:

Actual Performance: XClassroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1, 2, and 3.**

Initial Conditions:

- Plant is stabilized at 95% power following a turbine load rejection.
- Control Bank 'D' rod K-7 is stuck at 215 steps.
- Control Room is performing AP-TURB.2, Turbine Load Rejection; and AP-RCC.2, RCC/RPI Malfunction.
- PPCS is Out-of-Service due to a planned maintenance outage.
- All Power Range NIS channels are OPERABLE.
- An extra RO has performed a QPTR calculation in accordance with O-6.4, Quadrant Power Tilt Ratio Calculation.
- You are the Unit Supervisor.

Initiating Cue:

Review the completed QPTR calculation in accordance with O-6.4, Quadrant Power Tilt Ratio Calculation, Section 7.2.

## Job Performance Measure Worksheet

Task Standard: The operator will review the completed O-6.4, Quadrant Power Tilt Ratio Calculation, and correctly identify the errors.

Required Materials: • Calculator

General References: O-6.4, Quadrant Power Tilt Ratio Calculation (Rev 02600)

Handouts: Handout 1: Completed copy of O-6.4, Quadrant Power Tilt Ratio Calculation

Handout 2: Photos of Power Range Drawers

Handout 3: Curve Book Data Sheet for VOLTS/MAMPS

Time Critical Task: NO

Validation Time: 15 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

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**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>	<u>Comment Number</u>
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1, 2, and 3.</b>				
1	(O-6.4, Step 7.2.1) <b>PERFORM</b> a page check of this procedure.	Operator determines that all pages are present and proceeds.	___	___	___
*2	(O-6.4, Step 7.2.2) <b>REVIEW</b> procedure to ensure the following: 1. Data is within ACCEPTANCE CRITERIA, as necessary.	Operator recognizes that QPTR is NOT within ACCEPTANCE CRITERIA and that Step 6.6 should NOT be marked N/A.	___	___	___
*3	(O-6.4, Step 7.2.2) <b>REVIEW</b> procedure to ensure the following: 2. Required information has been recorded.	Operator recognizes that Attachment 1 calculations are incorrect for: • N44 Total • Quadrant Power Tilt	___	___	___
*4	(O-6.4, Step 7.2.2) <b>REVIEW</b> procedure to ensure the following: 3. Any identified deficiencies are documented on Attachment 2, Comments, <b>AND</b> resolved, <b>OR</b> an Issue Report has been initiated.	Operator documents noted deficiencies on Attachment 2 with wording similar to <b>KEY</b> on next page.	___	___	___
*5	(O-6.4, Step 7.2.2) <b>REVIEW</b> procedure to ensure the following: 4. Procedure completeness is checked.	Operator recognizes that the following deficiencies exist: • Step 6.6 should NOT be marked N/A • Step 7.1.2 is missing "Completed by" Signature and Date	___	___	___

JPM Stop Time: \_\_\_\_\_ Terminating Cue: **Candidate states task is complete.**

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## KEY

### Attachment 2, Comments

1. Attachment 1 calculation for N44 Total voltage is incorrect (should be 16.065 volts)
2. Attachment 1 calculation for Quadrant Power tilt is incorrect (should be 1.029)
3. Step 6.6 should NOT be marked N/A and TS 3.2.4 should be referred to
4. Step 7.1.2 is missing "Completed by" Signature and Date

**\*\*Similar wording than above is acceptable**

VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2018 NRC SRO Admin JPM A1b

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

INITIAL CONDITIONS:

- Plant is stabilized at 95% power following a turbine load rejection.
- Control Bank 'D' rod K-7 is stuck at 215 steps.
- Control Room is performing AP-TURB.2, Turbine Load Rejection; and AP-RCC.2, RCC/RPI Malfunction.
- PPCS is Out-of-Service due to a planned maintenance outage.
- All Power Range NIS channels are OPERABLE.
- An extra RO has performed a QPTR calculation in accordance with O-6.4, Quadrant Power Tilt Ratio Calculation.
- You are the Unit Supervisor.

Review the completed QPTR calculation in accordance with O-6.4, Quadrant Power Tilt Ratio Calculation, Section 7.2.

**Candidate Name:** \_\_\_\_\_

## Comments

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# **NRC EXAM**

# **SRO Admin JPM A2**



## Job Performance Measure Worksheet

Facility: Ginna Task No.: 342-004-03-02A

Task Title: Review a clearance and tagging boundary for work JPM No.: 2018 NRC SRO Admin JPM A2

K/A Reference: G 2.2.41 (3.9) Ability to obtain and interpret station electrical and mechanical drawings.

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X

Classroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last 2 Pages of this JPM) and Handouts 1, 2, and 3.**

- Initial Conditions:
- Plant is operating at 100% power.
  - You are an Extra SRO in the Work Control Center.
  - A piping failure has occurred on the Condensate Transfer Pump side of V-4049C, Condensate Transfer Pump Discharge Crosstie Isolation Valve.
- Initiating Cue:
- The Shift Manager requests you to review the tagout boundaries for V-4049C repair.
  - On the request below, an extra RO has recorded the Equipment Names/EINs, the Required Positions, type of tag to be hung, and the order tags are to be hung in accordance with OP-CE-109-101, Clearance and Tagging.
  - When completed, provide list and any comments to the Shift Manager.

## Job Performance Measure Worksheet

- See Examiner with any questions or concerns regarding the Tagout.

**Task Standard:** The operator will correctly identify that the tagging boundaries for V-4049C are inadequate and correctly identify all deficiencies.

**Required Materials:** None

**General References:** OP-CE-109-101, Clearance and Tagging (Rev 003)  
33013-1234, Condensate Storage (CDST) P&ID (Rev 046)  
10905-0233, MCCB – POS. 7D CNDST Transfer Pump (Rev 6)

**Handouts:** Handout 1: OP-CE-109-101, Clearance and Tagging  
Handout 2: 33013-1234, Condensate Storage (CDST) P&ID  
Handout 3: 10905-0233, MCCB – POS. 7D CNDST Transfer Pump

**Time Critical Task:** NO

**Validation Time:** 22 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## VERIFICATION OF COMPLETION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handouts 1, 2, and 3.</b>				
1	(OP-CE-109-101) Refers to procedure as needed.	Operator refers to procedure as needed.	___	___	___
2	(Drawings) Refers to drawings as needed.	Operator refers to drawings as needed.	___	___	___
*3	Reviews the Electrical Tagout Boundary for Condensate Transfer Pump.	<b>In accordance with Answer Key on next page.</b>	___	___	___
*4	Reviews the Mechanical Tagout Boundary for V-4049C repair.	<b>In accordance with Answer Key on next page.</b>	___	___	___
5	Reviews the Drain Path for V-4049C repair.	Operator recognizes that the drain path is correct and proceeds.	___	___	___
*6	Reviews the Vent Path for V-4049C repair.	<b>In accordance with Answer Key on next page.</b>	___	___	___

JPM Stop Time: \_\_\_\_\_ Terminating Cue: **Candidate states task is complete.**

.....

## VERIFICATION OF COMPLETION

**ANSWER KEY**

1. MCC B Position 7D, CNDST Transfer Pump "Required Position" should be OPEN vice CLOSED
2. V-9509D must be added as CLOSED, Danger Tag, and order should be 3.
3. To establish an adequate vent and drain path: V-4049A must be added as OPEN, No Tag, and order should be 4.

**\*\*Similar wording than above is acceptable**

VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2018 NRC SRO Admin JPM A2

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## JPM CUE SHEET

## INITIAL CONDITIONS:

- Plant is operating at 100% power.
- You are an Extra SRO in the Work Control Center.
- A piping failure has occurred on the Condensate Transfer Pump side of V-4049C, Condensate Transfer Pump Discharge Crosstie Isolation Valve.

## INITIATING CUE:

- The Shift Manager requests you to review the tagout boundaries for V-4049C repair.
- On the request below, an extra RO has recorded the Equipment Names/EINs, the Required Positions, type of tag to be hung, and the order tags are to be hung in accordance with OP-CE-109-101, Clearance and Tagging.
- When completed, provide list and any comments to the Shift Manager.
- See Examiner with any questions or concerns regarding the Tagout.

## REQUEST

	EQUIPMENT NAMES / EIN FOR ISOLATED WORK AREA	REQUIRED POSITION	TYPE OF TAG REQUIRED	ORDER TAGS TO BE HUNG
1.	PB1/CTP, CNDST Transfer Pump Control Switch	DO NOT OPERATE	Information	1
2.	MCC B Position 7D, CNDST Transfer Pump	CLOSED	Danger	2
3.	V-4046	LOCKED CLOSED	Danger	3
4.	V-4047	LOCKED CLOSED	Danger	3
5.	V-4048	LOCKED CLOSED	Danger	3
6.	V-4050	CLOSED	Danger	3
7.	V-9509C	CLOSED	Danger	3
8.	V-4049C	OPEN/UNCAPPED	No Tag	4
9.	V-4049E	OPEN	No Tag	4
10.	V-4049G	OPEN	No Tag	4
11.				
12.				
13.				
14.				
15.				

**Candidate Name:** \_\_\_\_\_

## Comments

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# **NRC EXAM**

# **SRO Admin JPM A3**



## Job Performance Measure Worksheet

Facility: Ginna

Task No.:

Task Title: Determine stay time and exit requirements for working in a High Radiation AreaJPM No.: 2018 NRC SRO Admin JPM A3

K/A Reference: G 2.3.7 (3.6) Ability to comply with radiation work permit requirements during normal or abnormal conditions.

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:

Actual Performance: XClassroom X Simulator \_\_\_\_\_ Plant \_\_\_\_\_**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last 2 Pages of this JPM) and Handouts 1 - 8.**

Initial Conditions:

- The plant is in MODE 5.
- A primary system leak has occurred.
- Several valves must be operated to isolate the leak.
- The valves to be operated are in the Aux. Bldg, within an uncontaminated High Radiation Area, where the general area radiation level is 160 mrem/hr.
- The Primary EO's accumulated TEDE dose for this year is 200 mrem.
- RP has authorized performance of this activity under the requirements of RWP NRC Exam 18-00101.

## Job Performance Measure Worksheet

Initiating Cue:

**PART 1:**

- You have assigned the Primary EO to operate the valves to isolate the leak.
- This is NOT considered to be an emergency action.
- ASSUME no dose is received in transit to the HRA and no dose extension will be granted.
- Determine the maximum time the EO can be in the area before he/she is required to exit.

**PART 2:**

- While transiting to the work area, the Primary EO has tripped and broken his/her left ankle.
- The Primary EO has been determined to be radioactively contaminated and requires transport to Rochester General Hospital (and in-patient treatment) by ambulance. Mercy Flight services are not required.
- Determine and write down on the paper provided:
  1. **All offsite agencies/organizations** required to be contacted by ALL on-shift personnel (excluding RP actions) from the initial report to the Control Room until after the event.
  2. Any time limitations associated with the notification(s), if applicable.

Task Standard: The operator will correctly determine the TEDE limit and required notifications.

Required Materials: Calculator

- General References:
- RP-AA-460, Controls for High and Locked High Radiation Areas (Rev 32)
  - A-7, Procedure for Handling Injuries/Medical Emergencies at Ginna Station (Rev 107)
  - LS-AA-1020, Reportability and Decision Trees (Rev 27) (pages 99 – 126)
  - LS-AA-1110, Safety (SAF) (Rev 26)
  - LS-AA-1120, Radiation (RAD) (Rev 20)
  - OPG-NOTIFICATION, Required Notifications to the PSC, Senior Management Operations Management (Rev 030)
  - OP-AA-106-101, Significant Event Reporting (Rev 21)
  - An "EXAMINATION ONLY RWP" (**NRC Exam 18-00101**) written for this JPM with the ED DOSE Alarm setting listed as 150mrem.

## Job Performance Measure Worksheet

Handouts:

- Handout 1: RP-AA-460, Controls for High and Locked High Radiation Areas
- Handout 2: RWP NRC Exam 18-00101
- Handout 3: OPG-NOTIFICATION, Required Notifications to the PSC, Senior Management Operations Management
- Handout 4: OP-AA-106-101, Significant Event Reporting
- Handout 5: A-7, Procedure for Handling Injuries/Medical Emergencies at Ginna Station
- Handout 6: LS-AA-1020, Reportability and Decision Trees
- Handout 7: LS-AA-1110, Safety (SAF)
- Handout 8: LS-AA-1120, Radiation (RAD)

Time Critical Task: NO

Validation Time: 35 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

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**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## VERIFICATION OF COMPLETION

JPM Start Time: \_\_\_\_\_

**PART 1:**

<b><u>STEP</u></b>	<b><u>ELEMENT</u></b>	<b><u>STANDARD</u></b>	<b>SAT</b>	<b>UNSAT</b>	<b>Comment Number</b>
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last 2 Pages of this JPM) and Handouts 1 through 6.</b>				
1	(RWP) Review RWP	Operator reviews RWP	___	___	___
2	Determine first administrative limit.	<ul style="list-style-type: none"> <li>Operator determines the accumulated dose alarm for this RWP is 150 mrem.</li> <li>Operator determines the Back Out Criteria is 80% of the dose alarm setting (120 mrem).</li> <li>Operator determines the most limiting limit is 120 mrem.</li> </ul>	___	___	___
*3	Calculate maximum stay time before exit is required.	Operator determines the maximum stay time is 45 minutes (0.75 hr)	___	___	___
<b>Examiner Note: Stay Time Calculation:</b> $(120 \text{ mrem}/160 \text{ mrem/hr}) = 0.75 \text{ hr}$ $(0.75 \text{ hr} \times 60 \text{ min/hr}) = 45 \text{ minutes}$					

**PART 2:**

<b><u>STEP</u></b>	<b><u>ELEMENT</u></b>	<b><u>STANDARD</u></b>	<b>SAT</b>	<b>UNSAT</b>	<b>Comment Number</b>
4	(OPG-NOTIFICATION, Step 3.3) Review Attachment 1 and perform the required notifications.	Operator determines that Public Service Commission (PSC) must be notified within <b>one hour</b> . (Events that will likely result in local media attention)	___	___	___

## VERIFICATION OF COMPLETION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
5	(A-7, Step 5.2.A) <b>NOTIFY</b> Communicator to report to Control Room and <b>PERFORM</b> Attachment 1, Communicator.	Operator proceeds to Attachment 1.	___	___	___
*6	(A-7, Attachment 1, Step 2.1) The ambulance, and if requested, Advanced Life Support (ALS) should be called if an emergency exists and the patient is to be sent to a hospital. Local ambulance service, ALS, can be obtained by using the following source: <ul style="list-style-type: none"> <li>Wayne County Emergency Dispatcher: 769-911.</li> </ul>	Operator determines that Wayne County Emergency Dispatch must be contacted immediately.	___	___	___
*7	(A-7, Attachment 1, Step 2.5.2) For contaminated patients or if there are multiple patients, alert the hospital to begin arrangements to receive Ginna Station patient(s)	Operator determines that Rochester General Hospital must be contacted.	___	___	___
8	(A-7, Step 5.2.J) <b>IF</b> a person is transported off-site <b>AND</b> is also radioactively contaminated; <b>THEN NOTIFY</b> the NRC in accordance with LS-AA-1110, SAFETY (SAF).	Operator determines that this applies and proceeds to LS-AA-1110.	___	___	___
9	(LS-AA-1110, SAF 1.52) Reporting of Fatality or Hospitalization Incidents	Operator determines that a <b>24-HOUR</b> notification to OSHA is required.	___	___	___
*10	(LS-AA-1120, RAD 1.6) Transport of Contaminated Person to Medical Facility	Operator determines that an <b>8-HOUR</b> notification to NRC Operations Center is required.	___	___	___

JPM Stop Time: \_\_\_\_\_ Terminating Cue: **Candidate states task is complete.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2018 NRC SRO Admin JPM A3

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## JPM CUE SHEET

## INITIAL CONDITIONS:

- The plant is in MODE 5.
- A primary system leak has occurred.
- Several valves must be operated to isolate the leak.
- The valves to be operated are in the Aux. Bldg, within an uncontaminated High Radiation Area, where the general area radiation level is 160 mrem/hr.
- The Primary EO's accumulated TEDE dose for this year is 200 mrem.
- RP has authorized performance of this activity under the requirements of RWP NRC Exam 18-00101.

## Initiating Cue:

**PART 1:**

- You have assigned the Primary EO to operate the valves to isolate the leak.
- This is NOT considered to be an emergency action.
- ASSUME no dose is received in transit to the HRA and no dose extension will be granted.
- Determine the maximum time the EO can be in the area before he/she is required to exit.

**PART 2:**

- While transiting to the work area, the Primary EO has tripped and broken his/her left ankle.
- The Primary EO has been determined to be radioactively contaminated and requires transport to Rochester General Hospital (and in-patient treatment) by ambulance. Mercy Flight services are not required.
- Determine and write down on the paper provided:
  1. **All offsite agencies/organizations** required to be contacted by ALL on-shift personnel (excluding RP actions) from the initial report to the Control Room until after the event.
  2. Any time limitations associated with the notification(s), if applicable.

JPM CUE SHEET

CANDIDATE NAME: \_\_\_\_\_

**PART 1:**

**Maximum Stay Time:** \_\_\_\_\_ **minutes**

**PART 2:**

List all offsite notifications required by the Control Room during and after the event. Include any time limitations associated with the notification(s), if applicable.



# **NRC EXAM**

# **SRO Admin JPM A4**

## Job Performance Measure Worksheet

Facility: Ginna

Task No.:

Task Title: Determine the EAL for an Event

JPM No.: 2018 NRC SRO Admin  
JPM A4K/A Reference: G 2.4.41 (4.6) Knowledge of the  
emergency action level thresholds  
and classifications.

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:

Actual Performance:

X

Classroom

X

Simulator

Plant

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last 2 Pages of this JPM) and Handouts 1 - 5.**

## Job Performance Measure Worksheet

## Initial Conditions:

The following events have occurred:

- 0800 Off-Site Power Circuit 7T was lost, 'A' EDG is supplying Buses 14 and 18
- 0805 A fire is reported in the Engineering Building
- 0810 A 15 gpm S/G tube leak occurred on 'A' S/G
- 0812 Operating crew commences a 3%/minute downpower to take the Unit offline in accordance with AP-SG.1, Steam Generator Tube Leak
- 0815 Ontario Fire Department arrived on site
- 0825 Fire in the Engineering Building is reported extinguished
- 0830 HCO reports R-31 is in alarm and indicates 0.257 mR/hr and stable
- 0830 V-3509, S/G 'A' MS Safety Valve fails OPEN
- The 15-minute average Wind Speed and Direction is 7 mph at 230 degrees at 33-foot elevation
- Air Temperature:
  - 33 ft – 81.9°F
  - 150 ft – 82.5°F
  - 250 ft – 82.9°F

## Initiating Cue:

**PART 1:**

Classify the Event and return the sheet provided to the Examiner **PRIOR TO** starting Part 2.

**PART 2:**

Complete the GNP NY State Radiological Emergency Data Form (Part 1) (CNG) boxes 1 – 11 and return to the Examiner. **(Complete the Form as the SRO would prior to handing it to the Communicator)**

**ASSUME** the reactor is still on-line.

**THIS IS A TIME CRITICAL JPM**

## Task Standard:

The operator will declare an Unusual Event based on EAL FU1.1, and complete the GNP NY State Radiological Emergency Data Form (Part 1) (CNG) in accordance with the attached KEY.

## Required Materials:

General References must be available for the operator to reference

## Job Performance Measure Worksheet

General References: EP-AA-1012 Addendum 3, Emergency Action Levels (Rev 5)  
EP-CE-114-100-F-07, GNP NY State Radiological Emergency Data Form (Part 1) (CNG) (Rev D)  
EP-CE-111-F-03, Ginna PAR Flowchart (Rev B)  
EP-AA-114-F-04, GNP Release in Progress Determination Guidance (Rev D)

Handouts: Handout 1: Blank copy of EPJA-0 (Rev 2), E-Plan Wall Charts  
Handout 2, Blank copy of EP-AA-1012 Addendum 3, Emergency Action Levels  
Handout 3: Blank copy of EP-CE-114-100-F-07, GNP NY State Radiological Emergency Data Form (Part 1) (CNG)  
Handout 4: Blank copy of EP-CE-111-F-03, Ginna PAR Flowchart  
Handout 5, Blank copy of EP-AA-114-F-04, GNP Release in Progress Determination Guidance

Time Critical Task: **YES - 15 Minutes for each PART**

Validation Time: **Part 1: 10 minutes** **Part 2: 10 minutes**

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the Examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

.....

## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

**PART 1:**

<b><u>STEP</u></b>	<b><u>ELEMENT</u></b>	<b><u>STANDARD</u></b>	<b>SAT</b>	<b>UNSAT</b>	<b>Comment Number</b>
<b>CUE</b>	<b>Provide Candidate with the Initial Conditions/Cue (Last 2 Pages of this JPM) and Handouts 1 - 5.</b>				
*1	(Directed Action) Classify the Event	The operator proceeds to EAL Wall Charts and Handout 2 and determines that EAL FU1.1 – <b>ANY</b> loss or <b>ANY</b> potential loss of Containment (Table F-1) is applicable.	_____	_____	_____
	<b>Examiner Note: Log the following:</b> <b>Classification Start Time</b> _____ <b>Classification Stop Time</b> _____ <b>Classification Time</b> _____ minutes (15 minutes maximum)				
*2	(Directed Action) Complete EP-CE-114-100-F-F-07, GNP NY State Radiological Emergency Data Form (Part 1) (CNG)	The Operator completes EP-CE-114-100-F-07 in accordance with the attached KEY (Page 7 of 9).	_____	_____	_____
	<b>Examiner Note: Log the following:</b> <b>Notification Start Time</b> _____ <b>Notification Stop Time</b> _____ <b>Notification Time</b> _____ minutes (15 minutes maximum)				

JPM Stop Time: \_\_\_\_\_

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: 2018 NRC SRO Admin JPM A4

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

## VERIFICATION OF COMPLETION

**KEY:**

RECS Message Number	1
New York State	Unchecked
Monroe County Checkbox	Unchecked
Wayne County Checkbox	Unchecked
1. Message transmitted at:	Left Blank
2. This is:	A. An Actual Event <b>OR</b> B. An Exercise
3. Classification:	A. UNUSUAL EVENT
4. Classification Time:	Current Date and Time
5. Release of Radioactive Materials due to the Classified Event:	D. Unmonitored release requiring evaluation
6. Protective Actions Recommendations:	A. No need for Protective Actions outside the site boundary
7. EAL Number: Brief Event Description	FU1.1, <b>ANY</b> loss or <b>ANY</b> potential loss of Containment (Table F-1) is applicable.
8. Reactor Status:	A. Operational
9. Wind Speed:	7 Miles/hour at elevation 33 feet
10. Wind Direction:	230 degrees at elevation: 33 feet
11. Stability Class:	Echo (0.6)

**Critical in RED**

## JPM CUE SHEET

## INITIAL CONDITIONS:

The following events have occurred:

- 0800 Off-Site Power Circuit 7T was lost, 'A' EDG is supplying Buses 14 and 18
- 0805 A fire is reported in the Engineering Building
- 0810 A 15 gpm S/G tube leak occurred on 'A' S/G
- 0812 Operating crew commences a 3%/minute downpower to take the Unit offline in accordance with AP-SG.1, Steam Generator Tube Leak
- 0815 Ontario Fire Department arrived on site
- 0825 Fire in the Engineering Building is reported extinguished
- 0830 HCO reports R-31 is in alarm and indicates 0.257 mR/hr and stable
- 0830 V-3509, S/G 'A' MS Safety Valve fails OPEN
- The 15-minute average Wind Speed and Direction is 7 mph at 230 degrees at 33-foot elevation
- Air Temperature:
  - 33 ft – 81.9°F
  - 150 ft – 82.5°F
  - 250 ft – 82.9°F

## INITIATING CUE:

**PART 1:**

Classify the Event and return the sheet provided to the Examiner **PRIOR TO** starting Part 2.

**PART 2:**

Complete the GNP NY State Radiological Emergency Data Form (Part 1) (CNG) boxes 1 – 11 and return to the Examiner.

**(Complete the Form as the SRO would prior to handing it to the Communicator)**

**ASSUME** the reactor is still on-line.

**THIS IS A TIME CRITICAL JPM**



JPM CUE SHEET

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CANDIDATE NAME: \_\_\_\_\_

EAL Number: \_\_\_\_\_

# **NRC EXAM**

# **SIM JPM A**

## Job Performance Measure Worksheet

Facility: Ginna

Task No.:

Task Title: Borate for one rod not fully inserted per ES-0.1 and ER-CVCS.1

JPM No.: Ginna 2018 Control Room Systems JPM A (Alternate Path)

K/A Reference: 004 A4.07 (3.9/3.7) Ability to manually operate and/or monitor in the control room: Boration/dilution

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:

Actual Performance: XClassroom           Simulator   X  Plant           **READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

Initial Conditions:

- The plant has experienced a reactor trip.
- The crew has completed ES-0.1, REACTOR TRIP RESPONSE, through step 3.

Initiating Cue:

- \* The US has directed you to perform Step 4 of ES-0.1.
- \* Another operator will handle all other MCB operations and alarms not associated with the assigned task.

Task Standard:

The operator will take action to initiate RCS boration due to one control rod not fully inserted in accordance with Step 4 of ES-0.1. When the operator discovers that boration cannot be manually started in accordance with step 4 RNO of ES-0.1, the operator will need to take actions to manually initiate RCS boration in accordance with ER-CVCS.1, Section 6.2.

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Job Performance Measure Worksheet

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Required Materials:   None

General References:   ES-0.1, REACTOR TRIP RESPONSE, Rev 03000  
                              ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION, Rev  
                              00802

Handouts:             Handout 1: Marked up copy of ES-0.1 through step 3  
                              Handout 2: Blank copy of ER-CVCS.1

Time Critical Task:   NO

Validation Time:      5 minutes

## Job Performance Measure Worksheet

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

- \* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the Initiating Cue.

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## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Initiate to **any 100% MOL IC (IC-19)**.

<p><b>NOTE:</b> It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

2. Insert **Override OVR-CVC08A = FALSE** (Failure of BORATE Signal REACTOR MAKEUP MODE).
3. Insert **Override OVR-CVC08B = FALSE** (Failure of AUTO Signal REACTOR MAKEUP MODE).
4. Insert **Override OVR-CVC08C = FALSE** (Failure of DILUTE Signal REACTOR MAKEUP MODE).
5. Insert **Override OVR-CVC08D = FALSE** (Failure of ALT DIL Signal REACTOR MAKEUP MODE).
6. Insert **Malfunction ROD 03-D4 = UNTRIPPABLE** (Stuck Rod D4).
7. Insert **Override OVR-CVC34D = FALSE** (MOV-350 OPEN Signal IMMEDIATE BORATION VALVE).
8. Place Simulator in RUN.
9. Trip the reactor.
10. Perform actions of E-0 and transition to ES-0.1.
11. Perform ES-0.1 actions through Step 3.
12. Place Simulator in FREEZE.
13. Reset to IC-146 (May 2018)
14. Ensure PPCS Variable Boration Dilution screen is clear.
15. Placekeep the Control Room copy of ES-0.1 up to (but not including) Step 4 and place it on the HCO's desk.
16. When the above steps are completed for this and other JPMs to be run concurrently then validate, if not previously validated, the concurrently run JPMs using the JPM Validation Checklist.
17. This completes the setup for this JPM.
18. Place Simulator in RUN when directed by examiner.

## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.</b>				
*1	(ES-0.1 Step 4) Verify MRPI Indicates – ALL CONTROL AND SHUTDOWN RODS ON BOTTOM	<ul style="list-style-type: none"> <li>* The operator observes MRPI and recognizes that control rod D4 is not fully inserted.</li> <li>* The operator proceeds to the Step 4 RNO.</li> </ul>	___	___	___
2	(ES-0.1 Step 4 RNO) <u>IF</u> any control rods <u>NOT</u> fully inserted, <u>THEN</u> perform the following: <u>IF one</u> or <u>two</u> control rods <u>NOT</u> fully inserted, <u>THEN</u> perform the following: a. Place RMW mode selector switch to BORATE.	<p>The operator recognizes that only one control rod has NOT fully inserted.</p> <p>The operator places the RMW Mode Selector switch to BORATE.</p> <p>The operator observes the RMW Control Green status light is LIT, and the Red status light is OFF.</p>	___	___	___
3	(ES-0.1 Step 4 RNO) <u>IF</u> any control rods <u>NOT</u> fully inserted, <u>THEN</u> perform the following: <u>IF one</u> or <u>two</u> control rods <u>NOT</u> fully inserted, <u>THEN</u> perform the following: b. Adjust boric acid flow control valve, FCV-110A, for desired flowrate.	The operator adjusts FCV-110A to the desired flowrate.	___	___	___
<b>CUE</b>	<b>IF the operator questions “What is the desired flowrate?” respond with “US has directed you to borate at the maximum rate.” (a setting of “&gt; 9 gpm” on the FCV-110A controller).</b>				
*4	(ES-0.1 Step 4 RNO) <u>IF</u> any control rods <u>NOT</u> fully inserted, <u>THEN</u> perform the following: <u>IF one</u> or <u>two</u> control rods <u>NOT</u> fully inserted, <u>THEN</u> perform the following: c. Set boric acid integrator to the following: o 900 gallons for 1 stuck rod o 1800 gallons for 2 stuck rods	<p>The operator recognizes that only one control rod has NOT fully inserted.</p> <p>* The operator sets the boric acid integrator, YIC-110, to 900.0 gallons.</p>	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
	<b>Examiner Note: To set the BA COUNTER:</b> <ul style="list-style-type: none"><li>○ Push ‘SEL’ Button to move the number column to be adjusted.</li><li>○ Raise or Lower the column value by depressing the ‘+’ or ‘-’ Button. There is a decimal point between the last two (2) columns.</li><li>○ Depress the ‘ENT’ Button to enter (Lock-in) the selected amount to be added.</li><li>○ The ‘C’ Line is a running total for BA additions.</li></ul>				
<b>EXAMINER NOTE: ALTERNATE PATH DECISION POINT OCCURS IN THE NEXT STEP</b>					
*5	(ES-0.1 Step 4 RNO) <u>IF</u> any control rods <u>NOT</u> fully inserted, <u>THEN</u> perform the following: <u>IF one or two</u> control rods <u>NOT</u> fully inserted, <u>THEN</u> perform the following: <ul style="list-style-type: none"><li>d. Place RMW control to start and verify flow. <u>IF</u> flow can <u>NOT</u> be established, <u>THEN</u> refer to ER-CVCS.1, REACTOR MAKEUP CONTROL MALFUNCTION.</li></ul>	<ul style="list-style-type: none"><li>* The operator places the RMW Control switch to START.</li><li>* The operator observes the Red status light is LIT, Green status light is OFF; and then immediately becomes Green status light is LIT, Red status light is OFF.</li><li>* The operator recognizes that BA flow has NOT been established on RK-10 Yokogawa recorder; BA Counter, YIC-110, not counting; Boric Acid audible device not “clicking”.</li><li>* The operator refers to ER-CVCS.1.</li></ul>			
CUE	Provide Candidate with Handout 2.				



## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<p style="text-align: center;">PRECAUTIONS AND LIMITATIONS</p> <p>4.1 Charging pump suction automatically switches to RWST (LCV 112B Open, LCV 112C Closed) when VCT level lowers to 5% on <b>BOTH</b> LT-112 AND LT-139.</p> <p>4.2 The use of MOV-350 for normal dilution at power should be avoided as valve must stroke fully open before it may be reclosed, making it difficult to control amount of boric acid being added.</p> <p>4.3 <b>IF</b> boric acid filter D/P exceeds 20 psid, <b>THEN</b> filter should be bypassed and a CR should be submitted.</p> <p>4.4 <b>IF</b> seal injection is the only path of boron addition, CCW FROM RCP A (B) THERMAL BARRIER VALVES AOV-754A AND AOV-754B should be closed.</p>					
<b>CUE</b>	<b>IF the operator contacts the EO for boric acid filter D/P reading in response to the PRECAUTION above, THEN report as the EO that "Local boric acid filter D/P is ____ psid." (8 psid if 1 BA Pump is running or 12 psid if 2 BA Pumps are running)</b>				
6	(ER-CVCS.1 Step 6.1) NORMAL BORATION 6.1.1 <b>PLACE</b> RMW Mode selector switch to BORATE. 6.1.2 <b>ADJUST</b> boric acid flow control valve, HCV-110A to desired flowrate in AUTO. 6.1.3 <b>SET</b> Boric Acid Integrator to desired amount. 6.1.4 <b>PLACE</b> RMW Control switch to START. 6.1.5 <b>VERIFY</b> RMW control – ARMED. (Red light lit above RMW Control switch)	The operator reads the Precautions and Limitations and proceeds. The operator recognizes that Normal Boration was already attempted unsuccessfully in ES-0.1 and continues with Section 6.2. The operator proceeds to Step 6.2.1, Manual Method for Boration.	____	____	____
*7	(ER-CVCS.1 Step 6.2.1.1) Manual Method for Boration <b>IF</b> makeup system does <b>NOT</b> operate properly in BORATE, <b>THEN PERFORM</b> the following: a. <b>OPEN</b> Blender Outlet to Charging Pump Suction, AOV-110B.	The operator recognizes that the makeup system does NOT operate properly in BORATE. * The operator places the REACTOR MAKE UP TO CHG PUMP AOV-110B control switch to OPEN and observes the Red status light is LIT, and the Green status light is OFF.	____	____	____

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*8	(ER-CVCS.1 Step 6.2.1.1) Manual Method for Boration <b>IF</b> makeup system does <b>NOT</b> operate properly in BORATE, <b>THEN PERFORM</b> the following: b. <b>START</b> at least one boric acid pump.	* The operator places the BORIC ACID TRANSFER PUMP A/B control switch to START and observes the Red status light is LIT, and the Green status light is OFF.	_____	_____	_____
*9	(ER-CVCS.1 Step 6.2.1.1) Manual Method for Boration <b>IF</b> makeup system does <b>NOT</b> operate properly in BORATE, <b>THEN PERFORM</b> the following: c. <b>PLACE</b> Boric Acid Flow Control Valve, HCV-110A, to MANUAL and OPEN to establish desired flow.	* The operator places BA TO BA BLENDER FLOW CONTROL VLV HCV-110A controller to MAN. * The operator adjusts the manual knob to OPEN HCV-110A. The operator recognizes that BA flow has been established: <ul style="list-style-type: none"> <li>• RK-10 Yokogawa recorder indicates flow</li> <li>• BA Counter, YIC-110, counting ('C' row number increasing)</li> <li>• Boric Acid audible device "clicking"</li> </ul> The operator continues to monitor flowrate and amount added until the required amount is added.	_____	_____	_____
<b>Examiner Note: The operator should manually OPEN HCV-110A to obtain a boric acid flowrate &gt; 9 gpm as indicated on RK-10 Yokogawa recorder.</b>					

JPM Stop Time: \_\_\_\_\_

**CUE: This terminates the JPM.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: Ginna 2018 Control Room Systems JPM A (Alternate Path)

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result:

SAT

UNSAT

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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- INITIAL CONDITIONS:
- The plant has experienced a reactor trip.
  - The crew has completed ES-0.1, REACTOR TRIP RESPONSE, through step 3.

- INITIATING CUE:
- \* The US has directed you to perform Step 4 of ES-0.1.
  - \* Another operator will handle all other MCB operations and alarms not associated with the assigned task.

# **NRC EXAM**

# **SIM JPM B**

## Job Performance Measure Worksheet

Facility: Ginna Task No.: 015-007-01-01

Task Title: Remove a Power Range Channel from Service JPM No.: Ginna 2018 Control Room Systems JPM B

K/A Reference: 012 A4.05 (3.6/3.6) Ability to manually operate and/or monitor in the control room: Channel defeat controls

Examinee: Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X

Classroom \_\_\_\_\_ Simulator X Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

Initial Conditions:

- The plant is operating at 100% power.
- Power Range Channel N-41 has failed LOW and has been declared inoperable.
- No plant transient has occurred.
- Procedure ER-NIS.3, PR Malfunction, is being implemented.
- You are the CO.

Initiating Cue: The US has directed you to remove PR N-41 from service per ER-NIS.3., Step 6.4 using Attachment 1, N-41 Defeat.

Task Standard: The operator will remove PR N-41 from service per Attachment 1, N-41 Defeat, of ER-NIS.3.

Required Materials: None

General References: ER-NIS.3, PR Malfunction, Rev 02604

Handouts: Handout 1: Marked up copy of ER-NIS.3, PR Malfunction

Time Critical Task: NO

Validation Time: 15 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the Initiating Cue.

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## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Initiate to **any 100% IC (IC-19)**.

<p><b>NOTE:</b> It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.</p>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

2. Insert **Malfunction NIS07A = 0** (P.R. Channel Failure: CH-N41).
3. Place Simulator in RUN.
4. Carry out the actions of ER-NIS.3, PR Malfunction, through Step 6.3.
5. Ensure the following conditions exist:
  - N-41 is failed LOW.
  - The Control Rods are in MANUAL.
  - $T_{AVG}$  is matched to  $T_{REF}$ .
6. Place Simulator in FREEZE.
7. Reset to IC-147 (May 2018)
8. When the above steps are completed for this and other JPMs to be run concurrently then validate, if not previously validated, the concurrently run JPMs using the JPM Validation Checklist.
9. This completes the setup for this JPM.
10. Place Simulator in RUN when directed by examiner.



## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.</b>				
<b>NOTE</b> <b>WHEN</b> Step 1 is completed, <b>THEN</b> ΔI monitor is restored to operable.					
*1	(ER-NIS.3, Attachment 1, Step 1.0/1.1) <b>IF</b> the PPCS is operational, <b>THEN DELETE</b> NIS Channel 41 from processing by performing the following:  <b>SELECT</b> "Group Update" display	The operator reads the NOTE and proceeds.  * At the PPCS console, the operator selects "Group Update" display.	_____	_____	_____
*2	(ER-NIS.3, Attachment 1, Step 1.2)  <b>SELECT</b> "List Server Groups"	* At the PPCS console, the operator selects "List Server Groups."	_____	_____	_____
*3	(ER-NIS.3, Attachment 1, Step 1.3)  <b>SELECT</b> NIS1 from the pick list	* At the PPCS console, the operator selects "NIS1" from the pick list.	_____	_____	_____
*4	(ER-NIS.3, Attachment 1, Step 1.4) <b>TURN</b> "OFF" scan processing, <b>THEN CLICK</b> the "Set Scan Processing" button	* At the PPCS console, the operator turns "OFF" scan processing, then clicks the "Set Scan Processing" button.	_____	_____	_____
*5	(ER-NIS.3, Attachment 1, Step 1.5)  <b>ANSWER</b> prompts	* At the PPCS console, the operator answers the remaining prompts.	_____	_____	_____
6	(ER-NIS.3, Attachment 1, Step 2.0) <b>VERIFY</b> the ROD CONTROL BANK SELECTOR switch (MCB) is in the M (MANUAL) position.	The operator observes that the ROD CONTROL BANK SELECTOR switch is selected to MANUAL.	_____	_____	_____

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*7	(ER-NIS.3, Attachment 1, Step 3.0) <b>PLACE</b> the DROPPED ROD MODE switch (Power Range N41A drawer) to BYPASS <b>AND VERIFY</b> the following:	* The operator places the DROPPED ROD MODE switch to BYPASS	___	___	___
		* Operator observes the DROPPED ROD BYPASS (local light) is lit.	___	___	___
	DROPPED ROD BYPASS (local light) is ILLUMINATED.	The operator observes the DROPPED ROD BYPASS (local light) is LIT.	___	___	___
	POWER RANGE-1 ROD DROP BYPASS (MCB BYPASS STATUS LIGHT) is ILLUMINATED.	The operator observes the POWER RANGE-1 ROD DROP BYPASS (MCB BYPASS STATUS LIGHT) is LIT.	___	___	___
	Annunciator (MCB) E-7, NIS TRIP BYPASS, is ILLUMINATED.	The operator observes MCB Annunciator E-7 is LIT.	___	___	___
*8	(ER-NIS.3, Attachment 1, Step 4.0) <b>PLACE</b> T/405E DELTA T DEFEAT switch (RIL Insertion Limit Rack) to LOOP A UNIT 1 (Defeats the $\Delta T$ Runback and Rodstop for the failed channel <b>AND</b> removes the associated $\Delta T$ input from the RIL computer-Annunciators F-30 <b>AND</b> F-31 will clear if ILLUMINATED).	The operator obtains an RPS Racks Key.	___	___	___
		The operator unlocks and opens the RIL Insertion Limit cabinet.	___	___	___
		* The operator places the T/405E DELTA T DEFEAT switch (RIL Insertion Limit Rack) to LOOP A UNIT 1.	___	___	___
		The operator closes and locks the RIL Insertion Limit cabinet.	___	___	___
<b>NOTE</b>					
Bistable proving light status has no bearing on the tripped condition of the channel.					
9	(ER-NIS.3, Attachment 1, Step 5.0) <b>PLACE</b> the OVERTEMP TRIP bistable (RED R-1 Protection Channel 1 rack) proving switch to DEFEAT (UP) <b>AND VERIFY</b> the following:	The operator reads the NOTE and proceeds. The operator unlocks and opens the R-1 Protection Channel 1 cabinet.	___	___	___
*		The operator places the OVERTEMP TRIP bistable proving switch to DEFEAT (UP).	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
9 (Cont'd)	Annunciator F-23, RCS OTΔT CHANNEL ALERT, is ILLUMINATED.	The operator observes that MCB Annunciator F-23 is LIT.	___	___	___
	Proving light OFF if TI-405B ≥ TI-405A.	The operator observes that Proving light is ON.	___	___	___
	<b>IF</b> any proving light status is <b>NOT</b> correct, <b>THEN SUBMIT</b> an Issue Report on the discrepancy and continue with the channel defeat steps.	The operator recognizes that the proving light status is correct and proceeds.	___	___	___
<p style="text-align: center;"><b>NOTE</b></p> <p style="text-align: center;">Bistable proving light status has no bearing on the tripped condition of the channel.</p>					
*10	(ER-NIS.3, Attachment 1, Step 6.0) <b>PLACE</b> the OVERPOWER TRIP bistable (RED R-1 Protection Channel 1 rack) proving switch to DEFEAT (UP) <b>AND VERIFY</b> the following:	The operator reads the NOTE and proceeds.  * The operator places the OVERPOWER TRIP bistable (RED R-1 Protection Channel 1 rack) proving switch to DEFEAT (UP).	___	___	___
	Annunciator F-32, RCS OPΔT CHANNEL ALERT, is ILLUMINATED.	The operator observes that MCB Annunciator F-32 is LIT.	___	___	___
	Proving light OFF if TI-405B ≥ TI-405C	The operator observes that the Proving light is ON.	___	___	___
	<b>IF</b> any proving light status is <b>NOT</b> correct, <b>THEN SUBMIT</b> an Issue Report on the discrepancy and continue with the channel defeat steps.	The operator recognizes that the proving light status is correct and proceeds.  The operator closes and locks the R-1 Protection Channel 1 cabinet.	___	___	___
11	(ER-NIS.3, Attachment 1, Step 7.0/7.1) <b>VERIFY</b> the following bistables are ILLUMINATED: TC405A OPΔT Loop A	The operator observes that the TC405A OPΔT Loop A bistable is LIT.	___	___	___
12	(ER-NIS.3, Attachment 1, Step 7.2) TC405C OTΔT Loop A	The operator observes that the TC405C OTΔT Loop A bistable is LIT.	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
12 (Cont'd)	<b>IF</b> any bistable above is <b>NOT</b> lit, <b>THEN</b> the $\Delta T$ channel(s) may not be in the tripped condition. Further investigation is necessary to ensure ITS requirements are met.	The operator recognizes that both bistable lights are LIT and proceeds.	___	___	___
*13	(ER-NIS.3, Attachment 1, Step 8.0) <b>PLACE</b> the UPPER SECTION DEFEAT switch (Detector Current Comparator - Miscellaneous Control & Indications drawer) to the PRN41 position <b>AND VERIFY</b> the following:	* The operator places the UPPER SECTION DEFEAT switch to the PRN41 position.	___	___	___
	Local light for CHANNEL DEFEAT upper section is ILLUMINATED.	The operator observes that the CHANNEL DEFEAT upper section light is LIT.	___	___	___
*14	(ER-NIS.3, Attachment 1, Step 9.0) <b>PLACE</b> the LOWER SECTION DEFEAT switch (Detector Current Comparator - Miscellaneous Controls & Indications drawer) to the PRN41 position <b>AND VERIFY</b> the following:	* The operator places the LOWER SECTION DEFEAT switch to the PRN41 position.	___	___	___
	Local light for CHANNEL DEFEAT lower section is ILLUMINATED.	The operator observes that the CHANNEL DEFEAT lower section light is LIT.	___	___	___
*15	(ER-NIS.3, Attachment 1, Step 10.0) <b>PLACE</b> the POWER MISMATCH BYPASS switch (Detector Current Comparator - Miscellaneous Controls & Indications drawer) to BYPASS PR N41.	* The operator places the POWER MISMATCH BYPASS switch to BYPASS PR N41.	___	___	___
*16	(ER-NIS.3, Attachment 1, Step 11.0) <b>PLACE</b> the ROD STOP BYPASS switch (Detector Current Comparator - Miscellaneous Controls & Indications drawer) to BYPASS PR N41.	* The operator places the ROD STOP BYPASS switch to BYPASS PR N41.	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*17	(ER-NIS.3, Attachment 1, Step 12.0) <b>PLACE</b> the COMPARATOR CHANNEL DEFEAT switch (Comparator and Rate drawer) to N41 <b>AND VERIFY</b> the following:	* The operator places the COMPARATOR CHANNEL DEFEAT switch to N41.	___	___	___
	Local light for COMPARATOR DEFEAT is ILLUMINATED.	The operator observes that the COMPARATOR DEFEAT light is LIT.	___	___	___
<p style="text-align: center;"><b>CAUTION</b></p> <p><b>DO NOT</b> remove control power fuses. <b>IF</b> control power has been lost, <b>THEN</b> the Dropped Rod signal can <b>NOT</b> be bypassed.</p>					
<p style="text-align: center;"><b>NOTE</b></p> <p>Performing the next step will remove the <math>\Delta I</math> signal to the <math>\Delta T</math> channel and place the 108% bistable in the tripped condition.</p>					
*18	(ER-NIS.3, Attachment 1, Step 13.0) <b>REMOVE</b> the 118V 5A AC INSTR POWER fuses (Power Range N41B drawer) <b>AND VERIFY</b> the following alarms (MCB) are ILLUMINATED:	The operator reads the CAUTION and proceeds. The operator reads the NOTE and proceeds. * The operator removes the 118V 5A AC INSTR POWER fuses.	___	___	___
	E-18, POWER RANGE LOSS OF DETECTOR VOLTAGE	The operator observes that MCB Annunciator E-18 is LIT.	___	___	___
	E-19, POWER RANGE HI RANGE CHANNEL ALERT 108%	The operator observes that MCB Annunciator E-19 is LIT.	___	___	___
	E-21, POWER RANGE OVERPOWER ROD STOP 103%	The operator observes that MCB Annunciator E-21 is LIT.	___	___	___
	E-27, POWER RANGE LO RANGE CHANNEL ALERT 24%	The operator observes that MCB Annunciator E-27 is LIT.	___	___	___
	E-28, POWER RANGE ROD DROP -5%/5 SEC	The operator observes that MCB Annunciator E-28 is LIT.	___	___	___
19	(ER-NIS.3, Attachment 1, Step 13.1) <b>VERIFY</b> the following RED bistable lights (MCB) are ILLUMINATED:  HI POW RANGE P-10 NC41M	The operator observes that the HI POW RANGE P-10 NC41M bistable is LIT.	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
19 (Cont'd)	HI POW RANGE P-8 NC41N	The operator observes that the HI POW RANGE P-8 NC41N bistable is LIT.	___	___	___
	LO POW RANGE TRIP NC41P	The operator observes that the LO POW RANGE TRIP NC41P bistable is LIT.	___	___	___
	HI POW RANGE TRIP NC41R	The operator observes that the HI POW RANGE TRIP NC41R bistable is LIT.	___	___	___
	HI POW RANGE P-9 NC41S	The operator observes that the HI POW RANGE P-9 NC41S bistable is LIT.	___	___	___
	<b>IF</b> any bistable above is <b>NOT</b> ILLUMINATED, <b>THEN</b> the channel may not be in the tripped condition. Further investigation is necessary to ensure ITS requirements are met.	The operator recognizes that all bistable lights are LIT as required and proceeds.	___	___	___
20	(ER-NIS.3, Attachment 1, Step 13.2) <b>VERIFY</b> the following status lights (Power Range N41A drawer) are lit:  CONTROL POWER ON	The operator observes that the CONTROL POWER ON status light is LIT.	___	___	___
	LOSS OF DETECTOR VOLT	The operator observes that the LOSS OF DETECTOR VOLT status light is LIT.	___	___	___
	OVERPOWER TRIP HIGH RANGE	The operator observes that the OVERPOWER TRIP HIGH RANGE status light is LIT.	___	___	___
	OVERPOWER ROD STOP	The operator observes that the OVERPOWER ROD STOP status light is LIT.	___	___	___
	OVERPOWER TRIP LOW RANGE	The operator observes that the OVERPOWER TRIP LOW RANGE status light is LIT.	___	___	___
	POWER ABOVE PERMISSIVE P10	The operator observes that the POWER ABOVE PERMISSIVE P10 status light is LIT.	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
20 (Cont'd)	POWER ABOVE PERMISSIVE P8	The operator observes that the POWER ABOVE PERMISSIVE P8 status light is LIT.	___	___	___
	POWER ABOVE PERMISSIVE P9	The operator observes that the POWER ABOVE PERMISSIVE P9 status light is LIT.	___	___	___
	ROD DROP	The operator observes that the ROD DROP status light is LIT.	___	___	___
	DROPPED ROD BYPASS	The operator observes that the DROPPED ROD BYPASS status light is LIT.	___	___	___
21	(ER-NIS.3, Attachment 1, Step 13.3) <b>VERIFY</b> the following status lights (Power Range N41B drawer) are extinguished:  INSTRUMENT POWER ON	The operator observes that the INSTRUMENT POWER ON status light is OFF.	___	___	___
	CHANNEL ON TEST	The operator observes that the CHANNEL ON TEST status light is OFF.	___	___	___

JPM Stop Time: \_\_\_\_\_

**CUE: This terminates the JPM.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: Ginna 2018 Control Room Systems JPM B

Examinee's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Name \_\_\_\_\_ (print)

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_



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JPM CUE SHEET

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## INITIAL CONDITIONS:

- The plant is operating at 100% power.
- Power Range Channel N-41 has failed LOW and has been declared inoperable.
- No plant transient has occurred.
- Procedure ER-NIS.3, PR Malfunction, is being implemented.
- You are the CO.

## INITIATING CUE:

The US has directed you to remove PR N-41 from service per ER-NIS.3., Step 6.4 using Attachment 1, N-41 Defeat.

# **NRC EXAM**

# **SIM JPM C**

## Job Performance Measure Worksheet

Facility: Ginna Task No.: 005-001-04-01

Task Title: Restore RHR Cooling JPM No.: Ginna 2018 Control Room Systems JPM C

K/A Reference: 005 A2.03 (2.9/3.1) Ability to (a) predict the impacts of the following malfunctions or operations on the RHRS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: RHR pump/motor malfunction

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X  
Classroom \_\_\_\_\_ Simulator X Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

Initial Conditions:

- The plant is shutdown with the RCS drained to approximately 84 inches loop level in accordance with O-2.3, Draining the Reactor Coolant System to Lowered Inventory < 84" but > 64", which has subsequently been completed.
- The reactor head is unbolted and V-500 is open. S/G nozzle dams have not been installed.
- Containment Closure is set in accordance with O-15.2, Valve Alignment for Reactor Head Lift, Core Component Movement, and Periodic Status Checks.
- You are the HCO.

Initiating Cue: Monitor plant conditions and control as necessary.

Task Standard: The operator will re-establish RHR flow in accordance with AP-RHR.1.

Required Materials: None

General References: AP-RHR.1, Loss of RHR, Rev 02300  
AR-A-20, RESIDUAL HEAT REMOVAL LOOP LO FLOW (Rev 9)

Handouts: Handout 1: Marked-up Copy of O-2.3  
Handout 2: AP-RHR.1, Loss of RHR (Rev 02300) **on cue**

Time Critical Task: NO

Validation Time: 10 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the Initiating Cue.

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Job Performance Measure Worksheet

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**SIMULATOR OPERATIONAL GUIDELINES**

1. Reset to **IC-2** (BOL, loop level at approximately 84")
2. Ensure the 'A' RHR Pump is in service.
3. Insert **MALF RHR01A** (RHR Pump 1A Trip) on **Trigger #1**.
4. Place Simulator in FREEZE.
5. Reset to IC-148 (May 2018)
6. Place Control Band magnets on MCB for RCS Temperature band (95F – 105F) and Loop Level (64' – 84")
7. Place Simulator in RUN when directed by Examiner.
8. When the above steps are completed for this and other JPMs to be run concurrently then validate, if not previously validated, the concurrently run JPMs using the JPM Validation Checklist.
9. This completes the setup for this JPM.

## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number					
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.</b>									
	<b>Examiner NOTE: The operator may directly enter AP-RHR.1 upon diagnosing 'A' RHR Pump tripped.</b>									
1	(AR-A-20, Step 1) Adjust flow if operating near the alarm setpoint.	The operator observes zero flow indication on FI-626 and proceeds.	___	___	___					
*2	(AR-A-20, Step 2) GO TO the applicable AP-RHR procedure if unexpected or uncorrectable: <ul style="list-style-type: none"> <li>○ AP-RHR.1 (LOSS OF RHR)</li> <li>○ AP-RHR.2 (LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY)</li> </ul>	The operator observes 'A' RHR pump control switch white and green lights ON.  * The operator determines that AP-RHR.1 is the appropriate procedure.	___	___	___					
<b>CUE</b>	<b>Provide Candidate with a copy of AP-RHR.1 (after they have pulled the metal binder controlled copy from the rack and identified/vocalized "Entering AP-RHR.1")</b>									
<p style="text-align: center;"><b>CAUTION</b></p> <p><u>IF</u> decay heat removal capability has been lost while in lowered inventory <u>OR</u> in reduced inventory <u>THEN</u> actions to ensure Containment closure within the time to boil shall <u>NOT</u> be delayed.</p>										
<p style="text-align: center;"><b>NOTE</b></p> <p>Conditions should be evaluated for site contingency reporting (Refer to EP-AA-1012 Addendum 3, R.E. Ginna Nuclear Power Plant Emergency Action Levels.</p>										
3	(AP-RHR.1 NOTE and CAUTION)	The operator reads the CAUTION and proceeds.  The operator reads the NOTE and proceeds.	___	___	___					
<b>CUE</b>	<b>If directed by Candidate, report that "SM will refer to EP-AA-1012, Addendum 3"</b>									
4	(Step 1) Verify Emergency AC Power To Support At Least One Train Of RHR – AVAILABLE	The operator verifies Bus 14 and Bus 16 are energized.	___	___	___					

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
5	(Step 2) Check PRZR Wide Range Level - GREATER THAN 0 INCHES	<ul style="list-style-type: none"> <li>Verifies MCB PRZR wide range level (LI-433A) less than 0 inches.</li> <li>Goes to Step 2 RNO.</li> </ul>	___	___	___
6	(Step 2 RNO) IF RCS loop level indicator in service and loop level is less than 64 inches, <u>THEN</u> go to AP-RHR.2, LOSS OF RHR WHILE OPERATING AT RCS REDUCED INVENTORY CONDITIONS.	<ul style="list-style-type: none"> <li>Observes RCS loop level (LI-432A) indicator at ~84 inches.</li> <li>Proceeds to Step 3.</li> </ul>	___	___	___
7	(Step 3) Check RHR Pumps - AT LEAST ONE RUNNING	<ul style="list-style-type: none"> <li>Observes: <ul style="list-style-type: none"> <li>'A' RHR Pump breaker white and green lights ON</li> <li>Annunciators A-20 and J-9 LIT</li> <li>No previous signs of loss of NPSH</li> <li>'B' RHR Pump not running</li> </ul> </li> <li>Goes to Step 3 RNO.</li> </ul>	___	___	___
*8	(Step 3 RNO) IF running pump tripped due to loss of NPSH, <u>THEN</u> go to step 5. IF NOT, <u>THEN</u> go to step 11.	<p>The operator observes RHR flow / RCS temperature trends (MCB TR-630 / PPCS indication) STABLE prior to Pump trip</p> <p>* Proceeds to Step 11</p>	___	___	___
9	(Step 11.a) Establish Conditions To Start RHR Pump: a. RHR Pump - AVAILABLE	<ul style="list-style-type: none"> <li>The operator checks Bus 16 is energized.</li> <li>The operator checks 'B' RHR Pump valve alignment supports pump start.</li> </ul>	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
10	(Step 11.b) Establish Conditions To Start RHR Pump: b. Verify CCW cooling to RHR system in service <ul style="list-style-type: none"> <li>CCW pumps – ENSURE AT LEAST ONE RUNNING</li> <li>CCW to RHR HXs, MOV-738A <u>AND</u> MOV-738B – ADJUSTED TO OBTAIN DESIRED COOLING</li> <li>Check CCW flow <math>\leq</math> 4900 gpm (FI-619)</li> </ul>	<ul style="list-style-type: none"> <li>The operator observes both CCW Pumps running (red lights ON, green lights OFF).</li> <li>The operator observes MOV-738A and MOV-738B at mid-position</li> <li>The operator observes CCW flow less than 4900 gpm (FI-619 on PPCS)</li> </ul>	_____	_____	_____
11	(Step 11.c) Establish Conditions To Start RHR Pump: c. Close RHR pump flow control valves (controllers at 100% demand): <ul style="list-style-type: none"> <li>HCV-624</li> <li>HCV-625</li> </ul>	The operator observes both valves CLOSED with controllers at 100% demand	_____	_____	_____
12	(Step 11.d) Establish Conditions To Start RHR Pump: d. Place RHR Hx bypass valve, HCV-626, to MANUAL and close valve.	<ul style="list-style-type: none"> <li>The operator places HCV-626 MCB controller to MANUAL</li> <li>The operator lowers controller demand to CLOSE the valve</li> </ul>	_____	_____	_____
<p style="text-align: center;"><b>CAUTION</b></p> <p>Starting an RHR Pump may result in a lowering of RCS level <u>OR</u> pressure due to shrink <u>OR</u> void collapse.</p> <p><u>IF</u> adequate time to vent the RHR system was <u>NOT</u> available, <u>THEN</u> RHR flow should be slowly throttled (approximately 100 gpm) to the specified flow rate.</p>					
*13	(Step 12.a) Restore RHR flow: a. Start one RHR pump – RHR PUMP RUNNING	<p>* The operator rotates 'B' RHR Pump control switch to START.</p> <p>The operator verifies red light ON, green light OFF.</p>	_____	_____	_____
			_____	_____	_____



## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>	<u>Comment Number</u>
14	(Step 12.b) Restore RHR flow: b. Check RHR flow – LESS THAN 1500 GPM PER PUMP	The operator verifies RHR flow stable and less than 1500 gpm (MCB FI-626)	___	___	___
15	(Step 12.c) Restore RHR flow: c. Adjust RHR Hx bypass flow control valve, HCV-626, to desired flowrate	<ul style="list-style-type: none"> <li>The operator rotates controller rheostat to OPEN HCV-626, if desired to raise flow.</li> <li>The operator verifies RHR flow stable and less than 1500 gpm (MCB FI-626)</li> </ul>	___	___	___
*16	(Step 12.d) Restore RHR flow: d. Place RHR Hx bypass flow control valve, HCV-626, controller in AUTO	* The operator places HCV-626 controller in AUTOMATIC	___	___	___
		The operator verifies RHR flow stable and less than 1500 gpm (MCB FI-626)	___	___	___
17	(Step 12.e) Restore RHR flow: e. RHR flow - RESTORED	<ul style="list-style-type: none"> <li>The operator monitors RCS loop level (LI-432A) stable</li> <li>The operator monitors RCS pressure stable</li> </ul>	___	___	___

JPM Stop Time: \_\_\_\_\_

**CUE: No further actions are required.**

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Job Performance Measure No.: Ginna 2018 Control Room Systems JPM C

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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## INITIAL CONDITIONS:

- The plant is shutdown with the RCS drained to approximately 84 inches loop level in accordance with O-2.3, Draining the Reactor Coolant System to Lowered Inventory < 84" but > 64", which has subsequently been completed.
- The reactor head is unbolted and V-500 is open. S/G nozzle dams have not been installed.
- Containment Closure is set in accordance with O-15.2, Valve Alignment for Reactor Head Lift, Core Component Movement, and Periodic Status Checks.
- You are the HCO.

## INITIATING CUE:

Monitor plant conditions and control as necessary.

# **NRC EXAM**

# **SIM JPM D**

## Job Performance Measure Worksheet

Facility: Ginna Task No.:

Task Title: Respond to Total Loss of Service Water JPM No.: Ginna 2018 Control Room Systems JPM D (Alternate Path)

K/A Reference: 076 A2.01 (3.5\*/3.7\*) Ability to (a) predict the impacts of the following malfunctions or operations on the SWS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of SWS

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X

Classroom \_\_\_\_\_ Simulator X Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM), and Handout 1.**

Initial Conditions: Reactor power is stable at 100%.

Initiating Cue: Respond to all alarms and/or malfunctions.

Task Standard: The operator will respond to a complete loss of Service Water in accordance with AP-SW.2, Loss of Service Water; perform E-0, Reactor Trip or Safety Injection, Immediate Actions; trip both RCPs, and isolate Letdown.

Required Materials: None

General References: AP-SW.2, Loss of Service Water (Rev 00801)

Ginna 2018 Control Room Systems JPM D

NUREG 1021, Revision 11

## Job Performance Measure Worksheet

E-0, Reactor Trip or Safety Injection (Rev 048)

AR-J-9, SAFEGUARD BREAKER TRIP (Rev 12)

Handouts: Handout 1: AP-SW.2, Loss of Service Water, Rev 00801

Time Critical Task: NO

Validation Time: 5 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the Initiating Cue.

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Reset to **IC-19** (Or any appropriate 100% power IC)

**NOTE:** It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Ensure 'A' and 'C' Service Water Pumps are running.
3. Insert **MALF CLG01B** (Service Water Pump B Trip)
4. Insert **MALF CLG01D** (Service Water Pump D Trip)
5. Insert **MALF CLG01A** (Service Water Pump A Trip) on **Trigger #1**
6. Insert **MALF CLG01C** (Service Water Pump C Trip) on **Trigger #1**
7. Place Simulator in FREEZE.
8. Reset to IC-149 (May 2018)
9. Place Simulator in RUN when directed by Examiner.
10. When the above steps are completed for this and other JPMs to be run concurrently then validate, if not previously validated, the concurrently run JPMs using the JPM Validation Checklist.
11. This completes the setup for this JPM.

## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
CUE	Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).				
Simulator Driver: Operate Trigger #1 one minute after Candidate is in role.					
	Examiner NOTE: The Operator may directly enter AP-SW.2 upon diagnosing 'A' and 'C' SW Pumps tripped.				
	Examiner NOTE: The Operator may attempt to start 'B' and 'D' SW Pumps initially in accordance with A-503.1 guidance.				
1	(AR-J-9, Step 1) <u>IF</u> alarm is due to loss of SW pump(s), <u>THEN</u> refer to AP-SW.2.	The operator determines that AP-SW.2 must be entered.	___	___	___
CUE	Provide Candidate with a copy of AP-SW.2 (after they have pulled the metal binder controlled copy from the rack and identified/vocalized "Entering AP-SW.2")				
2	(Step 1) Verify 480V AC Emergency Busses 17 and 18 – ENERGIZED	Operator recognizes busses are energized. <ul style="list-style-type: none"><li>Busses 17 and 18 voltage meters read approximately 480 volts.</li><li>Normal feed breakers to Bus 17 and 18 are CLOSED (Red lights ON and Green lights OFF).</li></ul>	___	___	___
3	(Step 2.a) Verify SW Pump Alignment: a. Check at least one SW pump running in each loop <ul style="list-style-type: none"><li>A or B pump in loop A</li><li>C or D pump in loop B</li></ul>	Operator recognizes that no Service Water Pumps are running, proceeds to Step 2.a RNO.	___	___	___
EXAMINER NOTE: ALTERNATE PATH DECISION POINT OCCURS IN THE NEXT STEP					
4	(Step 2.a RNO) Perform the following: 1) Manually start SW pumps as necessary (257 kw each)	Operator attempts to start 'B' and 'D' SW Pumps by taking associated control switches to START. <ul style="list-style-type: none"><li>Recognizes 'B' and 'D' SW Pumps trip (Red lights OFF, White and Green lights ON).</li><li>Operator may attempt to restart 'A' and 'C' SW Pumps.</li></ul>	___	___	___



## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
5	(Step 2.a RNO) Perform the following: 2) <u>IF</u> adequate cooling can <u>NOT</u> be supplied to a running D/G, <u>THEN</u> perform the following: a) Pull stop affected D/G b) Immediately depress voltage shutdown pushbutton	The operator recognizes no Diesel Generators are running and performs no actions.  Operator may still perform the steps to protect the Diesel Generators from potential future start signal.	___	___	___
*6	(Step 2.a RNO) Perform the following: 3) <u>IF</u> no SW pumps can be operated, <u>THEN</u> perform the following: a) Trip the reactor	* The operator depresses Reactor Emergency Trip Pushbutton and performs E-0 Immediate Actions.	___	___	___
7	(Step 2.a RNO) Perform the following: 3) <u>IF</u> no SW pumps can be operated, <u>THEN</u> perform the following: b) <u>WHEN</u> all E-0 Immediate Actions done, <u>THEN</u> trip BOTH RCPs	The operator performs E-0 Immediate Actions: <b>1. Verifies Reactor Trip</b> – at least one train of Reactor Trip Breakers open, Neutron flux lowering, and MRPI indicates all rods on bottom. <b>2. Verifies Turbine is tripped</b> – Turbine Stop valves are closed as indicated on EHC valve status panel. SVL Closed and SVR Closed Green lights ON. <b>3. Verifies Both Trains of AC Emergency Busses energized to at least 440 Volts: Busses 14, 16, 17 and 18</b> – Volt meters for Busses 14, 16, 17, and 18 all read ≈ 480 VAC. <b>4. Checks if SI is Actuated: Any SI Annunciator – LIT</b> – Annunciators D-19, 21, 22, and 28 extinguished and no indications that an SI is required.	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*		The operator trips BOTH RCPs: * Rotates the 'A' RCP control switch to STOP and	___	___	___
		• verifies Green Light ON and Red light OFF	___	___	___
		* Rotates the 'B' RCP control switch to STOP	___	___	___
		• verifies Green Light ON and Red light OFF	___	___	___
*8	(Step 2.a RNO) Perform the following: 3) <u>IF</u> no SW pumps can be operated, <u>THEN</u> perform the following: c) Close letdown isol, AOV-427	The operator closes Letdown Isolation Valve, AOV-427: * Rotates the AOV-427 control switch to CLOSE	___	___	___
		• verifies Green Light ON and Red light OFF	___	___	___
9	(Step 2.a RNO) Perform the following: 3) <u>IF</u> no SW pumps can be operated, <u>THEN</u> perform the following: d) Close excess letdown, HCV-123	The operator verifies that HCV-123 is CLOSED.	___	___	___
10	(Step 2.a RNO) Perform the following: 3) <u>IF</u> no SW pumps can be operated, <u>THEN</u> perform the following: e) Go to E-0, REACTOR TRIP OR SAFETY INJECTION.	The operator transitions to E-0.	___	___	___

JPM Stop Time: \_\_\_\_\_

**CUE: No further actions are required.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: Ginna 2018 Control Room Systems JPM D

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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INITIAL CONDITIONS:            Reactor power is stable at 100%.

INITIATING CUE:                Respond to all alarms and/or malfunctions.

# **NRC EXAM**

# **SIM JPM E**

## Job Performance Measure Worksheet

Facility: Ginna Task No.: 006-018-05-01

Task Title: Transfer ECCS to Cold Leg Recirculation with only one CCW Pump available JPM No.: Ginna 2018 Control Room Systems JPM E (Alternate Path)

K/A Reference: 006 A4.05 (3.9/3.8) Ability to manually operate and/or monitor in the control room: Transfer of ECCS flowpaths prior to recirculation

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: \_\_\_\_\_ Actual Performance: X  
Classroom \_\_\_\_\_ Simulator X Plant \_\_\_\_\_

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

- Initial Conditions:
- The plant has experienced a large break LOCA.
  - RWST level is at 28% and trending down slowly.
  - The Control Room crew is currently at Step 23 of E-1, Loss of Reactor or Secondary Coolant.

Initiating Cue: The US has directed you to transfer to Cold Leg Recirculation in accordance with ES-1.3, Transfer to Cold Leg Recirculation.

Task Standard: The operator will establish ECCS Cold Leg Recirculation alignment with one RHR Pump operating in accordance with ES-1.3.

Required Materials: None

General References: E-0, Reactor Trip or Safety Injection (Rev 048)

## Job Performance Measure Worksheet

E-1, Loss of Reactor or Secondary Coolant (Rev 04100)

ES-1.3, Transfer to Cold Leg Recirculation (Rev 04600)

Handouts: Handout 1: Marked up copy of E-1 through Step 23  
Handout 2: Blank copy of ES-1.3, Transfer to Cold Leg Recirculation

Time Critical Task: NO

Validation Time: 20 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the Initiating Cue.

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## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Initiate to **any 100% MOL IC (IC-19)**.

<b>NOTE:</b> It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.
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2. Insert **MALF RCS03B** (RCS DBA Break in CNMT: Loop A Cold Leg).
3. Place Simulator in RUN.
4. Perform actions of E-0 and transition to E-1.
5. Perform E-1 actions through Step 23 with RWST Level > 28% (approximately 29%).
6. ENSURE 4 SW Pumps are running.
7. ENSURE both CS Pumps are running.
8. ENSURE 'A' CCW Pump is running.
9. ENSURE 'B' CCW Pump is secured.
10. Insert **MALF CLG02B** (CCW Pump B Trip).
11. ENSURE MOV-738A and MOV-738B are CLOSED.
12. Place Simulator in FREEZE.
13. Reset to IC-150 (May 2018)
14. Placekeep the Control Room copy of E-1 through Step 4 and place it on the HCO's desk.
15. When the above steps are completed for this and other JPMs to be run concurrently then validate, if not previously validated, the concurrently run JPMs using the JPM Validation Checklist.
16. This completes the setup for this JPM.
17. Place Simulator in RUN when directed by examiner.



## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number					
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.</b>									
<p style="text-align: center;"><b>CAUTION</b></p> <p>If Offsite Power is lost after SI reset, then manual action may be required to restart safeguards equipment. (Refer to ATT-8.5, Attachment Loss of Offsite Power)</p> <p>Consult with Radiation Protection before dispatching personnel to Auxiliary Building. Switchover to recirculation may cause high radiation levels.</p>										
<p style="text-align: center;"><b>NOTE</b></p> <p>FOLDOUT page should be open and monitored periodically.</p> <p>Adverse CNMT values should be used whenever CNMT pressure is greater than 4 psig or CNMT radiation is greater than 10+05 R/hr.</p>										
1	(*Step 1) Verify RWST level – GREATER THAN 15%	Operator reads the CAUTIONs and NOTES and proceeds.								
		The operator monitors RWST Level on MCB LI-920, LI-921.	___	___	___					
2	(Step 2) Verify CNMT Sump B Level – AT LEAST 113 INCHES	Operator locates and identifies and confirms 113 inches RED indicator lights are LIT.								
			___	___	___					
<b>Examiner Note: The CNMT Sump B Level lights are located to left of RWST level indicators.</b>										

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	<u>SAT</u>	<u>UNSAT</u>	<u>Comment Number</u>
<p align="center"><b>NOTE</b></p> <p>Steps 3 through 12 should be performed without delay. FR procedures should not be implemented prior to completion of these steps.</p>					
3	(Step 3) Reset SI	<p>Operator reads the NOTE and proceeds.</p> <ul style="list-style-type: none"> <li>Depresses SI RESET pushbutton</li> <li>Confirms Annunciator K-6, THERMAL OVERLOAD RELAY BYPASSED, is EXTINGUISHED</li> </ul>	___	___	___
4	(Step 4) Check If Unnecessary Pumps Can Be stopped: a. Three SI pumps - RUNNING	Operator recognizes that all SI Pumps are running (Red lights LIT and Green lights OFF)	___	___	___
*5	(Step 4) Check If Unnecessary Pumps Can Be stopped: b. Stop SI pump C and place both switches in PULL STOP	* Operator places Bus 14 SI Pump 'C' control switch in PULL STOP	___	___	___
		• checks Red and Green lights OFF	___	___	___
		* Operator places Bus 16 SI Pump 'C' control switch in PULL STOP	___	___	___
		• checks Red and Green lights OFF	___	___	___
*6	(Step 4) Check If Unnecessary Pumps Can Be stopped: c. Stop both RHR pumps and place in PULL STOP	* Operator places 'A' RHR Pump control switch in PULL STOP	___	___	___
		• checks Red and Green lights OFF	___	___	___
		* Operator places 'B' RHR Pump control switch in PULL STOP	___	___	___
		• checks Red and Green lights OFF	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
7	(Step 4) Check If Unnecessary Pumps Can Be stopped: d. Both CNMT spray pumps - RUNNING	Operator recognizes that both CS Pumps are running (Red lights LIT and Green lights OFF)	___	___	___
*8	(Step 4) Check If Unnecessary Pumps Can Be stopped: e. Pull stop one CNMT spray pump	* Operator places 'A' CS Pump control switch in PULL STOP	___	___	___
		• checks Red and Green lights OFF	___	___	___
		<u>OR</u>	___	___	___
		* Operator places 'B' CS Pump control switch in PULL STOP	___	___	___
		• checks Red and Green lights OFF	___	___	___
9	(Step 4) Check If Unnecessary Pumps Can Be stopped: f. Check CNMT pressure – LESS THAN 28 PSIG	Operator recognizes that MCB PI-944, PI-945, PI-947, or PI-949 indicates < 28 psig.	___	___	___
*10	(Step 4) Check If Unnecessary Pumps Can Be stopped: g. Place NaOH Tank outlet valve switches to OPEN • AOV-836A • AOV-836B	* Operator rotates AOV-836A control switch to OPEN * Operator rotates AOV-836B control switch to OPEN	___	___	___
*11	(Step 4) Check If Unnecessary Pumps Can Be stopped: h. Reset CNMT spray	* Operator depresses CNMT SPRAY RESET pushbutton.	___	___	___
		• Operator confirms Annunciator A-27, CONTAINMENT SPRAY 2/3 + 2/3 > 28 PSI, is EXTINGUISHED	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*12	(Step 4) Check If Unnecessary Pumps Can Be stopped: i. Close discharge valves for idle CNMT spray pump(s) o Pump A • MOV-860A • MOV-860B o Pump B • MOV-860C • MOV-860D	Operator rotates CNMT Spray Pump Discharge Valve control switches to CLOSE: * 'A' CS Pump: MOV-860A <b>AND</b> MOV-860B <b>OR</b> * 'B' CS Pump: MOV-860C <b>AND</b> MOV-860D	___	___	___
		Operator verifies Green lights LIT and Red lights OFF.	___	___	___
13	(Step 5) Establish Adequate SW Flow: a. Verify at least two SW pumps - RUNNING	Operator recognizes that ALL SW Pumps are running (Red lights LIT and Green lights OFF)	___	___	___
14	(Step 5) Establish Adequate SW Flow: b. Verify AUX BLDG SW isolation valves – OPEN * MOV-4615 and MOV-4734 * MOV-4616 and MOV-4735	Operator recognizes that ALL AUX BLDG SW Isolation Valves are OPEN (Red lights LIT and Green lights OFF)	___	___	___
15	(Step 5) Establish Adequate SW Flow: c. Determine required SW flow to CCW HXs per table:	Operator will determine that SW Discharge alignment is NORMAL and 5000 - 6000 gpm total SW flow equally divided is required	___	___	___
16	(Step 5) Establish Adequate SW Flow: d. Direct AO to adjust SW flow to required value o <u>IF</u> on normal SW discharge: • V-4619, CCW HX A • V-4620, CCW HX B -OR- o <u>IF</u> on alternate SW discharge: • V-4619C, CCW HX A • V-4620B, CCW HX B	Operator will contact EO to report SW flow to CCW HXs	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Acknowledge as EO and report that Total SW flow to CCW HXs is 5900 gpm and is equally divided between CCW HXs</b>				
17	(Step 6) Establish CCW flow to RHR Hxs: a. Check both CCW pumps - RUNNING	Operator recognizes that 'A' CCW Pump is running (Red light LIT and Green light OFF) and that 'B' CCW Pump is secured (Green light LIT and Red light OFF)	___	___	___
18	(Step 6.a RNO) Perform the following: 1) <u>IF</u> any RCP Seal Outlet Temperature is GREATER THAN 235°F, <u>THEN</u> perform the following:	Operator recognizes that RCP Seal Outlet Temperatures are normal (MCB indicators TI-181 and TI-182)	___	___	___
<b>EXAMINER NOTE: ALTERNATE PATH DECISION POINT OCCURS IN THE NEXT STEP</b>					
*19	(Step 6.a RNO) Perform the following: 2) Start CCW pumps as power supply permits (122 kw each)	* Operator attempts to start 'B' CCW Pump by rotating the control switch to START * Operator recognizes that 'B' CCW Pump has tripped (Green and White lights LIT, Red light OFF)	___	___	___
20	(Step 6.a RNO) Perform the following: 3) <u>IF</u> both CCW pumps are running, <u>THEN</u> got to Step 6b	Operator recognizes that only 'A' CCW Pump is operating and available	___	___	___
*21	(Step 6.a RNO) Perform the following: 4) <u>IF</u> only one CCW pump is running, <u>THEN</u> perform the following: a) Place NRHx temperature control valve TCV-130 to MANUAL and close valve	* Operator places TCV-130 controller to MANUAL and CLOSES valve.	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*22	(Step 6.a RNO) Perform the following: 4) <u>IF</u> only one CCW pump is running, <u>THEN</u> perform the following: b) Manually open CCW MOV to only one operable RHR loop. o Open MOV-738A -OR- o Open MOV-738B	* Operator rotates the control switch for <b>either</b> MOV-738A or MOV-738B to OPEN  • verifies the valve is OPEN (Red light LIT and Green light OFF)	___	___	___
23	(Step 6.a RNO) Perform the following: 4) <u>IF</u> only one CCW pump is running, <u>THEN</u> perform the following: c) Go to step 7	Operator proceeds to Step 7	___	___	___
24	(Step 7) Verify RHR System Alignment: a. Verify the following valves – CLOSED o RHR suction valves from loop A hot leg • MOV-700 • MOV-701 o RHR discharge valves to loop B cold leg • MOV-720 • MOV-721	Operator recognizes that ALL four valves are CLOSED (Green lights LIT and Red lights OFF)	___	___	___
25	(Step 7) Verify RHR System Alignment: b. Verify RHR pump suction crosstie valves – OPEN • MOV-704A • MOV-704B	Operator recognizes that both valves are OPEN (Red lights LIT and Green lights OFF)	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
26	(Step 7) Verify RHR System Alignment: c. Verify the following valves – OPEN <ul style="list-style-type: none"> <li>○ RHR pump discharge to Rx vessel deluge valves <ul style="list-style-type: none"> <li>• MOV-852A</li> <li>• MOV-852B</li> </ul> </li> <li>○ RHR suction from sump B (inside CNMT) <ul style="list-style-type: none"> <li>• MOV-851A</li> <li>• MOV-851B</li> </ul> </li> </ul>	Operator recognizes that ALL four valves are OPEN (Red lights LIT and Green lights OFF)			
27	(Step 7) Verify RHR System Alignment: d. Verify RCDT pump suction valves from sump B – CLOSED <ul style="list-style-type: none"> <li>• MOV-1813A</li> <li>• MOV-1813B</li> </ul>	Operator recognizes that both valves are CLOSED (Green lights LIT and Red lights OFF)			
CAUTION					
RHR flow indicated on FI-626 should be limited to 1500 gpm per operating pump to ensure optimum pump performance.					
<b>CUE</b>	<b>Provide Candidate with MCB Key Switch key when requested.</b>				
*28	(Step 8) Initiate RHR Sump Recirculation: a. Close RWST outlet valve to RHR pump suction, MOV-856 (turn on DC power key switch)	<ul style="list-style-type: none"> <li>* Operator receives key and rotates the DC power key switch to ON</li> <li>* Operator rotates MOV-856 control switch to CLOSE</li> </ul>			
		<ul style="list-style-type: none"> <li>• Operator verifies MOV-856 CLOSED (Green light LIT and Red light OFF)</li> </ul>			

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*29	(Step 8) Initiate RHR Sump Recirculation: b. Open both RHR suction valves from sump B (outside CNMT) o MOV-850A – OPEN o MOV-850B - OPEN	* Operator rotates MOV-850A and MOV-850B control switches to OPEN	___	___	___
		• Operator verifies MOV-850A and MOV-850B OPEN (Red lights LIT and Green lights OFF)	___	___	___
30	(Step 8) Initiate RHR Sump Recirculation: c. Check MOV-738A AND MOV-738B – BOTH OPEN	<ul style="list-style-type: none"> <li>• Operator recognizes that only ONE valve is OPEN due to having only one CCW Pump available</li> <li>• Operator verifies one valve OPEN (Red light LIT and Green light OFF)</li> <li>• Operator verifies one valve CLOSED (Green light LIT and Red light OFF)</li> </ul>	___	___	___
31	(Step 8.c RNO) Perform the following: 1) IF MOV-738A open, THEN start RHR Pump A and go to step 8d. 2) IF MOV-738B open, THEN start RHR Pump B and go to step 8d.	Operator determines RHR Pump to be started based on MOV-738 valve that is OPEN	___	___	___
*32	(Step 8) Initiate RHR Sump Recirculation: d. Start one RHR pump – ONE RHR PUMP RUNNING	* Operator rotates RHR Pump control switch to START (for pump associated with OPEN MOV-738)	___	___	___
		• Operator verifies RHR Pump is running (Red light LIT and Green light OFF)	___	___	___



## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
CAUTION					
Sump recirculation flow to RCS must be maintained at all times, except during alignment for high head recirculation.					
NOTE					
The TSC should be requested to establish periodic monitoring of the AUX BLDG sub-basement, as radiological conditions permit, to monitor RHR pump operation.					
33	Check RWST Level – LESS THAN 15%	<ul style="list-style-type: none"> <li>Operator reads the CAUTIONs and NOTES and proceeds.</li> <li>The operator monitors RWST Level on MCB LI-920, LI-921.</li> </ul>	___	___	___
34	(Step 9 RNO) DO <u>NOT</u> continue with this procedure until RWST level is less than 15%.	Operator recognizes that procedure cannot be continued until RWST level is < 15%.	___	___	___

JPM Stop Time: \_\_\_\_\_

**CUE: No further actions are required.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: Ginna 2018 Control Room Systems JPM E (Alternate Path)

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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- INITIAL CONDITIONS:
- The plant has experienced a large break LOCA.
  - RWST level is at 28% and trending down slowly.
  - The Control Room crew is currently at Step 23 of E-1, Loss of Reactor or Secondary Coolant.

INITIATING CUE: The US has directed you to transfer to Cold Leg Recirculation in accordance with ES-1.3, Transfer to Cold Leg Recirculation.

# **NRC EXAM**

# **SIM JPM F**

## Job Performance Measure Worksheet

Facility: Ginna

Task No.:

Task Title: Respond to Controlling Pressurizer Pressure Channel Failing High with Stuck Open Spray Valve

JPM No.: Ginna 2018 Control Room Systems JPM F (Alternate Path)

K/A Reference: 010 A2.02 (3.9/3.9) Ability to (a) predict the impacts of the following malfunctions or operations on the PZR PCS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Spray valve failures

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:

Actual Performance:

X

Classroom

Simulator

X

Plant

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).**

Initial Conditions: Reactor power is stable at 100%.

Initiating Cue: Respond to all alarms and/or malfunctions.

Task Standard: The operator will respond to the controlling Pressurizer pressure channel failing high and subsequent sticking open (30%) of PRZR Spray Valve AOV-431A in accordance with AP-PRZR.1, Abnormal Pressurizer Pressure; perform E-0, Reactor Trip or Safety Injection, Immediate Actions; and trip 'A' RCP.

Required Materials: None

## Job Performance Measure Worksheet

General References: AP-PRZR.1, Abnormal Pressurizer Pressure (Rev 01700)  
E-0, Reactor Trip or Safety Injection (Rev 048)  
AR-J-9, SAFEGUARD BREAKER TRIP (Rev 12)

Handouts: Handout 1: AP-PRZR.1, Abnormal Pressurizer Pressure (Rev 01700)

Time Critical Task: NO

Validation Time: 5 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the Initiating Cue.  
.....

## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Reset to **IC-19** (Or any appropriate 100% power IC)

**NOTE:** It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Insert **MALF PZR02D = 2500 psig** (PZR Pressure Channel Failure: CH-449 (IV)) on **Trigger #1**
3. Insert **MALF PZR01B = 30.0%** (Pressurizer Spray Vlv Failure: PCV-431A (NO MANUAL)) on **Trigger #1**
4. Place Simulator in FREEZE.
5. Reset to IC-151 (May 2018)
6. Place Simulator in RUN when directed by Examiner.
7. When the above steps are completed for this and other JPMs to be run concurrently then validate, if not previously validated, the concurrently run JPMs using the JPM Validation Checklist.
8. This completes the setup for this JPM.

## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
CUE	Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).				
Simulator Driver: Operate Trigger #1 one minute after Candidate is in role.					
	Examiner NOTE: The operator may directly enter AP-PRZR.1 upon diagnosing PT-449 failing high and actual RCS pressure lowering.				
1	Operator responds to Pressurizer Pressure alarms and recognizes that PT-449 (controlling PRZR Pressure channel) has failed high, causing both PRZR Spray Valves to OPEN fully.	Operator acknowledges various Pressurizer pressure alarms and recognizes that a Pressurizer pressure control failure has occurred.			
	Examiner NOTE: Operator may take actions to stabilize the plant following the failure by taking immediate MANUAL control of the Pressurizer Pressure Controller (PC-431K) without the procedure (in accordance with A-503.1).				
CUE	Provide Candidate with a copy of AP-PRZR.1 (after they have pulled the metal binder controlled copy from the rack and identified/vocalized “Entering AP-PRZR.1”).				
2	(Step 1) Check PRZR Pressure: <ul style="list-style-type: none"><li>○ All 4 narrow range channels – APPROXIMATELY EQUAL</li><li>○ All 4 narrow range channels – TRENDING TOGETHER</li></ul>	<ul style="list-style-type: none"><li>• Operator recognizes that MCB PI-449 has failed high, resulting in BOTH PRZR Spray Valves opening.</li><li>• Operator recognizes that actual RCS pressure is lowering (PI-429, PI-430, PI-431)</li></ul>			
*3	(Step 1 RNO) IF one pressure channel deviates significantly from the other 3, THEN perform the following:  a. IF the controlling PRZR pressure channel has failed, THEN place controller, 431K, in MANUAL and adjust output to restore PRZR pressure.	* Operator places controller 431K in MANUAL and raises output to energize PRZR Heaters and CLOSE Spray Valves.			
		<ul style="list-style-type: none"><li>• Operator may recognize that PRZR Spray Valve AOV-431A sticks partially OPEN (30%)</li></ul>			



## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
4	(Step 1 RNO) <u>IF</u> one pressure channel deviates significantly from the other 3, <u>THEN</u> perform the following: b. Refer to ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE.	Operator will inform the US/SM.			
<b>CUE</b>	<b>Acknowledge as US/SM.</b>				
5	(Step 2) Check Reactor Power - STABLE	Operator recognizes that reactor power is stable and that the pressure transient was caused by an instrument failure (PT-449 high).			
6	(Step 3) Check PRZR Pressure: a. Pressure – LESS THAN 2235 PSIG b. Pressure – GREATER THAN 2000 PSIG	Operator recognizes that pressure is lowering, but not as rapidly as before. Pressure is less than 2235 psig, but still greater than 2000 psig.			
	<b>Examiner NOTE: Decision point, operator may trip the reactor per step 3.b. RNO b. If Candidate does, proceed to performance step 10 and ensure actions are completed.</b>				
7	(Step 4) Check PRZR Heater Status: a. PRZR proportional heater breaker - CLOSED	Operator recognizes that the Proportional Heaters breaker is CLOSED (Red light LIT and Green light OFF)			
8	(Step 4) Check PRZR Heater Status: b. PRZR heater backup group - ON	Operator recognizes that the Backup Heaters are ON (Red light LIT and Green light OFF)			
	<b>Examiner NOTE: Operator may have to perform the Step 4 RNO actions to energize PRZR Heaters dependent upon 431K MANUAL output.</b>				
<b>EXAMINER NOTE: ALTERNATE PATH DECISION POINT OCCURS IN THE NEXT STEP</b>					
9	(Step 5) Verify Normal PRZR Spray Valves – CLOSED • AOV-431A • AOV-431B	Operator recognizes that AOV-431A is NOT CLOSED (controller indicates 30% OPEN and RCS pressure continues to lower).			

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*10	(Step 5 RNO) Place controllers in MANUAL at 0% demand. <u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> perform the following: a. Trip the reactor.	<ul style="list-style-type: none"> <li>Operator places AOV-431A controller in MANUAL and lowers controller demand to 0% in an attempt to CLOSE valve.</li> <li>Operator recognizes that the controller for AOV-431A will not lower below 30% demand.</li> </ul>	___	___	___
		* The operator depresses Reactor Emergency Trip Pushbutton and performs E-0 Immediate Actions.	___	___	___
*	(Step 5 RNO) Place controllers in MANUAL at 0% demand. <u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> perform the following: b. <u>WHEN</u> all E-0 Immediate Actions done, <u>THEN</u> trip the RCP associated with failed spray valve. <ul style="list-style-type: none"> <li>RCP A(AOV-431A)</li> <li>RCP B (AOV-431B)</li> </ul> <u>IF</u> pressure lowering in an uncontrolled manner, <u>THEN</u> stop remaining RCP.	<p>The operator performs E-0 Immediate Actions:</p> <ol style="list-style-type: none"> <li><b>Verifies Reactor Trip</b> – at least one train of Reactor Trip Breakers open, Neutron flux lowering, and MRPI indicates all rods on bottom.</li> <li><b>Verifies Turbine is tripped</b> – Turbine Stop valves are closed as indicated on EHC valve status panel. SVL Closed and SVR Closed Green lights ON.</li> <li><b>Verifies Both Trains of AC Emergency Busses energized to at least 440 Volts: Busses 14, 16, 17 and 18</b> – Volt meters for Busses 14, 16, 17, and 18 all read ≈ 480 VAC.</li> <li><b>Checks if SI is Actuated: Any SI Annunciator – LIT</b> – Annunciators D-19, 21, 22, and 28 extinguished and no indications that an SI is required.</li> </ol>	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*		The operator trips 'A' RCP: * Rotates the 'A' RCP control switch to STOP	___	___	___
		verifies Green Light ON and Red light OFF	___	___	___
11	(Step 5 RNO) Place controllers in MANUAL at 0% demand. <u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> perform the following: c. Go to E-0, REACTOR TRIP OR SAFETY INJECTION.	Operator transitions to E-0.	___	___	___

JPM Stop Time: \_\_\_\_\_

**CUE: No further actions are required.**

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## VERIFICATION OF COMPLETION

Job Performance Measure No.: Ginna 2018 Control Room Systems JPM F

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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INITIAL CONDITIONS:            Reactor power is stable at 100%.

INITIATING CUE:                Respond to all alarms and/or malfunctions.

# **NRC EXAM**

# **SIM JPM G**

## Job Performance Measure Worksheet

Facility: Ginna

Task No.:

Task Title: Verify/Initiate Containment Spray Actuation IAW E-0 (Verify NaOH Flow)

JPM No.: Ginna 2018 Control Room Systems JPM G

K/A Reference: 026 A4.01 (4.5/4.3) Ability to manually operate and/or monitor in the control room: CSS controls

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:

Actual Performance: XClassroom          Simulator X Plant         **READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).**

Initial Conditions:

- The plant has experienced a reactor trip and Safety Injection.
- The crew has implemented E-0, REACTOR TRIP OR SAFETY INJECTION, through Step 4.

Initiating Cue:

- The US directs you to continue performance of E-0 from Step 5.

Task Standard: The operator will manually initiate Containment Spray and verify NaOH flow in accordance with E-0, Reactor Trip or Safety Injection, Step 5 RNO Actions.

Required Materials: None

General References: E-0, Reactor Trip or Safety Injection (Rev 048)

## Job Performance Measure Worksheet

Handouts: Handout 1: E-0, Reactor Trip or Safety Injection (Rev 048), marked up through Step 4

Time Critical Task: NO

Validation Time: 5 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the Initiating Cue.  
.....



## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Reset to **IC-19** (Or any appropriate 100% power IC)

**NOTE:** It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Insert **MALF RCS03B** (RCS DBA Break in CNMT: Loop A Cold Leg)
3. Insert **MALF RPS08A = Manual Available** (Cont Spray Train A Failure to Activate)
4. Insert **MALF RPS08B = Manual Available** (Cont Spray Train B Failure to Activate)
5. Insert **OVR IND-SIS36 = 0 GPM** (FI-930 Spray Additive Flow)
6. Insert **OVR IND-SIS36 = 22.7 GPM (5 sec ramp)** (FI-930 Spray Additive Flow) on **Trigger #29**
7. Insert **OVR IND-SIS36 = 41.5 GPM (5 sec ramp)** (FI-930 Spray Additive Flow) on **Trigger #30**
8. Set **Trigger #29 = X07I359B==1 | X07I368B==1** (Either AOV-836A OR AOV-836B to OPEN)
9. Set **Trigger #30 = X07I359B==1 & X07I368B==1** (Both AOV-836A AND AOV-836B to OPEN)
10. Perform E-0 Immediate Actions
11. Ensure CNMT pressure > 28 psig
12. Place Simulator in FREEZE
13. Reset to IC-152 (May 2018)
14. Place Simulator in RUN when directed by Examiner.
15. When the above steps are completed for this and other JPMs to be run concurrently then validate, if not previously validated, the concurrently run JPMs using the JPM Validation Checklist.
16. This completes the setup for this JPM.

## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.</b>				
1	(*Step 5) Verify CNMT Spray Not Required: <ul style="list-style-type: none"> <li>○ Annunciator A-27, CNMT SPRAY – EXTINGUISHED</li> <li>○ CNMT pressure – LESS THAN 28 PSIG</li> </ul>	Operator recognizes that CNMT pressure is greater than 28 psig and proceeds to Step 5 RNO actions.	___	___	___
*2	(Step 5 RNO) Verify CNMT spray initiated. <b>IF</b> CNMT spray <b>NOT</b> initiated, <b>THEN</b> perform the following: a. Depress manual CNMT spray pushbuttons (2 of 2).	• Operator recognizes that CNMT Spray has NOT initiated.	___	___	___
		* Operator depresses BOTH manual CNMT Spray pushbuttons (simultaneously).	___	___	___
3	(Step 5 RNO) Verify CNMT spray initiated. <b>IF</b> CNMT spray <b>NOT</b> initiated, <b>THEN</b> perform the following: b. Ensure CNMT spray pumps running. <b>IF</b> no CNMT spray pump available, <b>THEN</b> go to Step 6.	• Operator recognizes that both CNMT Spray Pumps are running (Red lights LIT and Green lights OFF)	___	___	___
4	(Step 5 RNO) Verify CNMT spray initiated. <b>IF</b> CNMT spray <b>NOT</b> initiated, <b>THEN</b> perform the following: c. Ensure CNMT spray pump discharge valves open for operating pump(s): <ul style="list-style-type: none"> <li>○ CNMT spray pump A:               <ul style="list-style-type: none"> <li>• MOV-860A</li> <li>• MOV-860B</li> </ul> </li> <li>○ CNMT spray pump B:               <ul style="list-style-type: none"> <li>• MOV-860C</li> <li>• MOV-860D</li> </ul> </li> </ul>	Operator recognizes that all four CNMT Spray Pump Discharge Valves are OPEN (Red lights LIT and Green lights OFF)	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*5	(Step 5 RNO) Verify CNMT spray initiated. <u>IF</u> CNMT spray <u>NOT</u> initiated, <u>THEN</u> perform the following: d. Verify NaOH flow (FI-930) <u>IF</u> NaOH flow <u>NOT</u> indicated, <u>THEN</u> place switches for NaOH tank outlet valves to OPEN. • AOV-836A • AOV-836B	• Operator recognizes that NaOH flow is NOT indicated on FI-930.	___	___	___
		* Operator places AOV-836A and AOV-836B control switches to OPEN.	___	___	___
		• Operator verifies NaOH flow indicated on FI-930.	___	___	___
Simulator Driver: Verify that Trigger #29 activates after first AOV-836 control switch is taken to OPEN.					
Simulator Driver: Verify that Trigger #30 activates after BOTH AOV-836 control switches are taken to OPEN.					
	Examiner NOTE: AOV-836 control switches are located on the apron section on either side of the CVCS and RHR controllers.				

JPM Stop Time: \_\_\_\_\_

**CUE: No further actions are required.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: Ginna 2018 Control Room Systems JPM G

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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## INITIAL CONDITIONS:

- The plant has experienced a reactor trip and Safety Injection.
- The crew has implemented E-0, REACTOR TRIP OR SAFETY INJECTION, through Step 4.

## INITIATING CUE:

- The US directs you to continue performance of E-0 from Step 5.

# **NRC EXAM**

# **SIM JPM H**

## Job Performance Measure Worksheet

Facility: Ginna

Task No.:

Task Title: Component Cooling Water Leak Isolation

JPM No.: Ginna 2018 Control Room Systems JPM H

K/A Reference: 008 A4.01 (3.3/3.1) Ability to manually operate and/or monitor in the control room: CCW indications and controls

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:

Actual Performance:

Classroom

Simulator

X

Plant

X

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).**Initial Conditions: 

- The plant is at 100% power.

Initiating Cue: 

- Respond to all alarms and indications.

Task Standard: The operator will ensure CLOSED/CLOSE RCV-017 following R-17 exceeding the alarm setpoint and CLOSE the CCW return from the affected RCP thermal barrier (RCP 'B', AOV-754B) in accordance with AP-CCW.1.

Required Materials: None

General References: AP-CCW.1, Leakage Into the Component Cooling Loop (Rev 01901)  
AR-B-10, RCP 1B LABYR SEAL LO DIFF PRESS 15" H<sub>2</sub>O (Rev 10)  
AP-RCP.1, RCS Seal Malfuction (Rev 01800)

## Job Performance Measure Worksheet

Handouts: Handout 1: AR-B-10, RCP 1B LABYR SEAL LO DIFF PRESS 15" H<sub>2</sub>O (Rev 10)  
Handout 2: AP-RCP.1, RCS Seal Malfunction (Rev 01800)  
Handout 3: AP-CCW.1, Leakage Into the Component Cooling Loop (Rev 01901)

Time Critical Task: NO

Validation Time: 8 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the candidate acknowledges the Initiating Cue.  
.....



## Job Performance Measure Worksheet

**SIMULATOR OPERATIONAL GUIDELINES**

1. Reset to **IC-19** (Or any appropriate 100% power IC)

**NOTE:** It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPMs that are scheduled to be run concurrently.

2. Insert **MALF RCS01B = 12 GPM** (RCP 1B Thermal Barrier Leak) on **Trigger #1**
3. Insert **OVR-CLG13A = OFF** (CCW Surge Tk Vent RCV-017 – GREEN Lamp)
4. Insert **OVR-CLG13B = ON** (CCW Surge Tk Vent RCV-017 – RED Lamp)
5. Insert **OVR-CLG13A = ON** (CCW Surge Tk Vent RCV-017 – GREEN Lamp) on **Trigger #30**
6. Insert **OVR-CLG13B = OFF** (CCW Surge Tk Vent RCV-017 – RED Lamp) on **Trigger #30**
7. Set **Trigger #30 = X07I254A==0** (RCV-017 to CLOSE)
8. Place Simulator in FREEZE
9. Reset to IC-153 (May 2018)
10. Place Simulator in RUN when directed by Examiner.
11. When the above steps are completed for this and other JPMs to be run concurrently then validate, if not previously validated, the concurrently run JPMs using the JPM Validation Checklist.
12. This completes the setup for this JPM.

## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM).</b>				
<b>Simulator Driver: Operate Trigger #1 after Candidate is in role.</b>					
<b>CUE</b>	<b>Provide Candidate with a copy of AR-B-10 (after they have identified/vocalized "Entering AR-B-10").</b>				
<b>Examiner NOTE: The operator may CLOSE RCV-017 upon Radiation Monitor R-17 ALARM and recognizing that RCV-017 is OPEN in accordance with A-503.1, Emergency and Abnormal Operating Procedures Users Guide, Section 5.3.A.5. Additionally, Operator may transition to AP-CCW.1.</b>					
1	Operator responds to alarms and indications. <ul style="list-style-type: none"> <li>Annunciator B-10, RCP 1B LABYR SEAL LO DIFF PRESS 15" H<sub>2</sub>O</li> <li>'B' RCP Labyrinth Seal D/P indicating 0 psid (PI-124)</li> </ul>	Operator recognizes indications of a thermal barrier leak and enters AR-B-10.	___	___	___
<b>Examiner NOTE: The operator may directly enter AP-RCP.1 upon diagnosing 'B' RCP Labyrinth Seal D/P indicating 0 psid. In this case, JPM Performance Steps 2 – 3 do NOT need to be observed, proceed to Performance Step 4.</b>					
2	(AR-B-10 Step 1) Check AOV-142 position correct for plant conditions.	<ul style="list-style-type: none"> <li>Operator recognizes that AOV-142 is OPEN and is correct for plant conditions.</li> </ul>	___	___	___
3.	(AR-B-10 Step 2) GO TO applicable procedure: <ul style="list-style-type: none"> <li>AP-RCP.1, RCP SEAL MALFUNCTION</li> <li>AP-CVCS.1, CVCS LEAK</li> <li>AP-CVCS.3, LOSS OF ALL CHARGING FLOW</li> </ul>	<ul style="list-style-type: none"> <li>Operator recognizes that AP-RCP.1 is applicable and enters AP-RCP.1</li> </ul>	___	___	___
<b>CUE</b>	<b>Provide Candidate with a copy of AP-RCP.1 (after they have pulled the metal binder controlled copy from the rack and identified/vocalized "Entering AP-RCP.1").</b>				
4	(AP-RCP.1 Step 1) Check <u>Total</u> #1 Seal Flow – LESS THAN 8.0 GPM FOR EACH RCP	Operator recognizes that #1 Seal flow for each RCP is less than 8.0 gpm	___	___	___
<b>CUE</b>	<b>Provide Candidate with a copy of AP-CCW.1 (after they have pulled the metal binder controlled copy from the rack and identified/vocalized "Entering AP-CCW.1").</b>				

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
5	(AP-RCP.1 Step 2) Check RCP Seal Return Valve Alignment: a. RCP seal return isolation valve, MOV-313 - OPEN	Operator recognizes that MOV-313 is OPEN (Red light ON and Green light OFF)	___	___	___
6	(AP-RCP.1 Step 2) Check RCP Seal Return Valve Alignment: b. Verify RCP seal disch valves – OPEN • RCP A, AOV-270A • RCP B, AOV-270B	Operator recognizes that AOV-270A and AOV-270B are OPEN (Red lights ON and Green lights OFF)	___	___	___
<p style="text-align: center;"><b>NOTE</b></p> <ul style="list-style-type: none"> <li>○ If a reactor trip is initiated while performing Step 3, transition to E-0 should occur while completing subsequent actions of the step.</li> <li>○ The lower limit of 0.8 GPM limit for <u>total</u> #1 seal flow applies when the RCS is at normal operating pressure. Refer to FIG-4.0, FIGURE RCP SEAL LEAKOFF and consult staff for guidance if the RCS is at reduced pressure.</li> </ul>					
7	(AP-RCP.1 Step 3) Check RCP Seal Return Flow: a. Total #1 Seal Flow – BETWEEN 0.8 AND 6.0 GPM FOR EACH RCP	<ul style="list-style-type: none"> <li>• Operator reads the NOTES and proceeds.</li> <li>• Operator recognizes that total #1 Seal flow for both RCPs is between 0.8 and 6.0 gpm.</li> </ul>	___	___	___
8	(AP-RCP.1 Step 3) Check RCP Seal Return Flow: b. Go to Step 5.	Operator proceeds to Step 5.	___	___	___
<p style="text-align: center;"><b>NOTE</b></p> <p>ATT-15.1, ATTACHMENT RCP DIAGNOSTICS may be used to aid in diagnostics.</p>					
9	(AP-RCP.1 Step 5) Check RCP Cooling: ○ Annunciator A-7, RCP A CCW RETURN HIGH TEMP OR LOW FLOW – EXTINGUISHED ○ Annunciator A-15, RCP B CCW RETURN HIGH TEMP OR LOW FLOW – EXTINGUISHED	<ul style="list-style-type: none"> <li>• Operator reads the NOTE and proceeds.</li> <li>• Operator recognizes that Annunciators A-7 and A-15 are extinguished.</li> </ul>	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
10	(AP-RCP Step 6) Check RCP #2 Seal Indications: <ul style="list-style-type: none"> <li>○ Annunciator B-3, RCP A STANDPIPE HI LEVEL +1 FT – EXTINGUISHED</li> <li>○ Annunciator B-4, RCP B STANDPIPE HI LEVEL +1 FT – EXTINGUISHED</li> </ul>	Operator recognizes that Annunciators B-3 and B-4 are extinguished.	___	___	___
<p style="text-align: center;"><b>CAUTION</b></p> <p>Reducing Charging flow will result in rising REGEN HX Outlet Temperature.</p>					
11	(AP-RCP.1 Step 7) Check RCP Labyrinth Seal D/Ps – GREATER THAN 15 INCHES OF WATER	Operator recognizes that 'B' RCP Labyrinth Seal D/P is indicating 0" of water and proceeds to RNO.	___	___	___
12	(AP-RCP.1 Step 7 RNO) Perform the following: <ul style="list-style-type: none"> <li>a. Ensure open CCW outlet valves from RCP thermal barriers. <ul style="list-style-type: none"> <li>• RCP A, AOV-754A</li> <li>• RCP B, AOV-754B</li> </ul> </li> </ul>	Operator recognizes that AOV-754A and AOV-754B are OPEN (Red lights ON and Green lights OFF).	___	___	___
13	(AP-RCP.1 Step 7 RNO) Perform the following: <ul style="list-style-type: none"> <li>b. Verify seal injection flow greater than 5 GPM for affected RCP.</li> </ul>	Operator recognizes that seal injection flow to each RCP is greater than 5 GPM.	___	___	___
14	(AP-RCP.1 Step 7 RNO) Perform the following: <ul style="list-style-type: none"> <li>c. Adjust HCV-142 to obtain at least 15 inches labyrinth seal <math>\Delta P</math>.</li> </ul>	Operator uses HCV-142 controller and CLOSES HCV-142 while monitoring 'B' RCP labyrinth seal D/P.	___	___	___
15	(AP-RCP.1 Step 7 RNO) Perform the following: <ul style="list-style-type: none"> <li>d. Dispatch AO to check seal injection filter D/P.</li> </ul>	Operator dispatches EO to check seal injection filter D/P.	___	___	___
<b>CUE</b>	<b>As EO, acknowledge communication to check seal injection filter D/P.</b>				

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*16	(AP-RCP.1 Step 7 RNO) Perform the following: e. Check CCW surge tank level stable. <u>IF</u> level rising, <u>THEN</u> go to AP-CCW.1, LEAKAGE INTO THE COMPONENT COOLING LOOP.	<ul style="list-style-type: none"> <li>* Operator checks CCW Surge Tank level and recognizes that it is rising (may use MCB indication and/or PPCS L0618).</li> <li>• Operator transitions to AP-CCW.1.</li> </ul>	___	___	___
<b>CUE</b>	<b>Provide Candidate with a copy of AP-CCW.1 (after they have pulled the metal binder controlled copy from the rack and identified/vocalized "Entering AP-CCW.1").</b>				
*17	(AP-CCW.1 CAUTION) During the performance of this procedure, RCV-017 should be monitored to ensure closure on CCW System Radiation Monitor alarm.	<ul style="list-style-type: none"> <li>• Operator recognizes that R-17 is in alarm.</li> <li>• Operator recognizes that RCV-017 is OPEN (Red light LIT and Green light OFF)</li> <li>* Operator rotates RCV-017 control switch to CLOSE</li> <li>• Operator verifies RCV-017 is CLOSED (Green light LIT and Red light OFF)</li> </ul>	___	___	___
<b>Simulator Driver: Verify that Trigger #30 activates after RCV-017 control switch is taken to CLOSE.</b>					
18	(AP-CCW.1 Step 1) Check CCW Indications a. Check CCW surge tank level – RISING (PPCS Point L0618)	Operator recognizes that CCW Surge Tank level is rising	___	___	___
19	(AP-CCW.1 Step 1) Check CCW Indications b. Direct RP tech to perform CH-PRI-CCW-LEAK, DETERMINATION OF CCW SYSTEM LEAKAGE	Operator contacts RP/Chemistry Technician to perform CH-PRI-CCW-LEAK.	___	___	___
<b>CUE</b>	<b>As RP/Chemistry Technician, acknowledge communication to perform CH-PRI-CCW-LEAK.</b>				
20	(AP-CCW.1 Step 1) Check CCW Indications c. CCW radiation monitor, R-17 - RISING	Operator recognizes that R-17 indication is rising and that R-17 is in ALARM.	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CAUTION</b> If either RCP #1 Seal Outlet Temperature exceeds 215°F, then the affected RCP(s) should be stopped.					
<b>NOTE</b> RCPs may be safely operated without CCW to the thermal barrier if seal injection flow is maintained.					
21	(AP-CCW.1 Step 2) Check RCP Thermal Barrier Indications: <ul style="list-style-type: none"> <li>○ Labyrinth seal D/Ps – GREATER THAN 15 INCHES OF WATER AND APPROXIMATELY EQUAL</li> <li>○ RCP #1 Seal leak off flows – WITHIN THE NORMAL OPERATING RANGE OF FIG-4.0, FIGURE RCP SEAL LEAKOFF</li> <li>○ Annunciator A-7 (15), RCP A (B) CCW RETURN HI TEMP OR LO FLOW 165 GPM 125°F - EXTINGUISHED</li> </ul>	<ul style="list-style-type: none"> <li>• Operator reads the CAUTION and NOTE and proceeds.</li> <li>• Operator recognizes that RCP Labyrinth Seal D/Ps are not equal (PI-131 and PI-124) and that 'B' RCP Labyrinth Seal D/P indicates 0 psid (PI-124).</li> <li>• Operator proceeds to Step 2 RNO actions.</li> </ul>	___	___	___
22	(AP-CCW.1 Step 2 RNO) Check RCP Thermal Barrier Indications: <u>IF</u> either pump has indication of a thermal barrier leak, <u>THEN</u> perform the following: <ul style="list-style-type: none"> <li>a. Verify seal injection flow to affected RCP.</li> </ul>	Operator recognizes that adequate seal injection flow to 'B' RCP exists (FI-116A).	___	___	___
*23	(AP-CCW.1 Step 2 RNO) Check RCP Thermal Barrier Indications: <u>IF</u> either pump has indication of a thermal barrier leak, <u>THEN</u> perform the following: <ul style="list-style-type: none"> <li>b. Close CCW return from affected RCP thermal barrier (labyrinth seal D/P should rise). <ul style="list-style-type: none"> <li>• RCP A, AOV-754A</li> <li>• RCP B, AOV-754B</li> </ul> </li> </ul>	• Operator recognizes that 'B' RCP is the affected RCP.	___	___	___
		* Operator rotates AOV-754B control switch to CLOSE	___	___	___
		• Operator verifies AOV-754B is CLOSED (Green light LIT and Red light OFF)	___	___	___
		• Operator verifies that 'B' RCP Labyrinth Seal D/P rises (PI-124).	___	___	___

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
24	(AP-CCW.1 Step 2 RNO) Check RCP Thermal Barrier Indications: <u>IF</u> either pump has indication of a thermal barrier leak, <u>THEN</u> perform the following: c. Evaluate CCW surge tank level trend. <u>IF</u> leakage into the CCW system has stopped, <u>THEN</u> go to Step 17. (PPCS Point L0618)	Operator recognizes that leakage into the CCW system has stopped and proceeds to Step 17.	_____	_____	_____

JPM Stop Time: \_\_\_\_\_

**CUE: No further actions are required.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: Ginna 2018 Control Room Systems JPM H

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result:                      SAT        \_\_\_\_\_        UNSAT        \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_



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JPM CUE SHEET

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INITIAL CONDITIONS:

- The plant is at 100% power.

INITIATING CUE:

- Respond to all alarms and indications.

# **NRC EXAM**

# **In-Plant JPM I**

## Job Performance Measure Worksheet

Facility: Ginna Task No.: 061-006-04-01

Task Title: Align Service Water to the TDAFW Pump JPM No.: Ginna 2018 In-Plant Systems JPM I

K/A Reference: APE 067 AA2.17 (3.5/4.3) Ability to determine and interpret the following as they apply to Plant Fire on Site: Systems that may be affected by the fire

Examinee: NRC Examiner:

Facility Evaluator: Date:

Method of testing:

Simulated Performance: X Actual Performance: \_\_\_\_\_  
Classroom \_\_\_\_\_ Simulator \_\_\_\_\_ Plant X

**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.**

- Initial Conditions:
- The plant was operating at 100% power.
  - A fire in the Cable Tunnel forced evacuation of the Control Room approximately 2 hours ago.
  - All operators are at locations specified in ER-FIRE.2, Alternate Shutdown for Cable Tunnel Fire.
  - CST levels are less than 5 feet.
  - The Primary EO is standing by in the Auxiliary Building to assist, as necessary.

- Initiating Cue:
- The US has directed you to lineup Service Water to the TDAFW Pump in accordance with ER-FIRE.2, Step 6.5.8.1.

**NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.**

## Job Performance Measure Worksheet

Task Standard: The operator will align Service Water to the TDAFW Pump suction in accordance with ER-FIRE.2.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)

General References: ER-FIRE.2, Alternate Shutdown for Cable Tunnel Fire (Rev 036)

Handouts: ER-FIRE.2, Alternate Shutdown for Cable Tunnel Fire (Rev 036), pages 17-18

Time Critical Task: NO

Validation Time: 8 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

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**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.</b>				
1	(ER-FIRE.2, Step 6.5.8) <b>DIRECT</b> HCO to <b>MONITOR</b> level of the CSTs locally. Pressure on PI-2802 (located behind CST B) may be converted to level by using the conversion plaque behind the gauge.	Operator recognizes from Initial Conditions that CST levels are less than 5 feet and proceeds.	_____	_____	_____
2	(ER-FIRE.2, Step 6.5.8.1) <b>WHEN</b> CST level less than 5 feet, <b>THEN PERFORM</b> the following to align Service Water to the TDAFW Pump suction: a. <b>UNLOCK AND OPEN</b> the breaker for TURBINE DRIVEN, AUXILIARY FEEDWATER PUMP SERVICE WATER SUCTION, MOV-4013 (MCC D POS. 12M)	Operator contacts the Primary EO to unlock and OPEN the breaker.	_____	_____	_____
<b>CUE</b>	<b>Examiner: As the Primary EO acknowledge the report and report back that "MOV-4013 breaker has been unlocked and is OPEN".</b>				
3	(ER-FIRE.2, Step 6.5.8.1) <b>WHEN</b> CST level less than 5 feet, <b>THEN PERFORM</b> the following to align Service Water to the TDAFW Pump suction: b. <b>CLOSE</b> TDAFW PUMP SERVICE WATER SUCTION LINE TELLTALE ISOL VALVE, V-4358D	Operator SIMULATES closing V-4358D by turning the handle 90 degrees so that handle is perpendicular to pipe.	_____	_____	_____
<b>CUE</b>	<b>Examiner: Valve no longer turns in that direction.</b>				

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*4	(ER-FIRE.2, Step 6.5.8.1) <b>WHEN</b> CST level less than 5 feet, <b>THEN PERFORM</b> the following to align Service Water to the TDAFW Pump suction: c. <b>UNLOCK AND OPEN SW TO TDAFW PUMP MANUAL ISOLATION, V-4098.</b>	* Operator SIMULATES unlocking and opening V-4098 by turning the handwheel in the <b>counter-clockwise</b> direction.	___	___	___
<b>CUE</b>	<b>Examiner: Valve is unlocked. Valve no longer turns in that direction.</b>				
*5	(ER-FIRE.2, Step 6.5.8.1) <b>WHEN</b> CST level less than 5 feet, <b>THEN PERFORM</b> the following to align Service Water to the TDAFW Pump suction: d. <b>LOCALLY OPEN TURBINE DRIVEN AUXILIARY FEEDWATER PUMP SERVICE WATER SUCTION, MOV-4013.</b>	* Operator SIMULATES depressing the declutch level on MOV-4013. * Operator SIMULATES opening V-4013 by turning the handwheel in the <b>counter-clockwise</b> direction.	___	___	___
<b>CUE</b>	<b>Examiner: Valve is declutched. Valve no longer turns in that direction.</b>				
6	(ER-FIRE.2, Step 6.5.8.2) <b>IF</b> TDAFW flow cannot be established on SW, <b>THEN ESTABLISH</b> SAFW flow per Attachment 15, SBAFW Pump C Restoration.	Operator may listen to check for TDAFW flow indications.	___	___	___
<b>CUE</b>	<b>Examiner: Flow noises can be heard.</b>				
7	Notify Unit Supervisor that Service Water is aligned to the TDAFW Pump suction.	Operator SIMULATES contacting US via radio.	___	___	___
<b>CUE</b>	<b>Examiner: As US acknowledge radio communication.</b>				

JPM Stop Time: \_\_\_\_\_

**CUE: No further action is required.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: Ginna 2018 In-Plant Systems JPM I

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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## INITIAL CONDITIONS:

- The plant was operating at 100% power.
- A fire in the Cable Tunnel forced evacuation of the Control Room approximately 2 hours ago.
- All operators are at locations specified in ER-FIRE.2, Alternate Shutdown for Cable Tunnel Fire.
- CST levels are less than 5 feet.
- The Primary EO is standing by in the Auxiliary Building to assist, as necessary.

## INITIATING CUE:

- The US has directed you to lineup Service Water to the TDAFW Pump in accordance with ER-FIRE.2, Step 6.5.8.1.

**NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.**



# **NRC EXAM**

# **In-Plant JPM J**

## Job Performance Measure Worksheet

Facility: Ginna

Task No.:

Task Title: Release the 'D' Gas Decay Tank

JPM No.: Ginna 2018 In-Plant  
Systems JPM J  
(Alternate Path)

K/A Reference: 071 A3.03 (3.6/3.8) Ability to  
monitor automatic operation of the  
Waste Gas Disposal System  
including: Radiation monitoring  
system alarm and actuating signals

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:

X

Actual Performance:

Classroom

Simulator

Plant

X**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.**

Initial Conditions:

- The 'D' Gas Decay Tank (GDT) is full and approved for release.
- The 'D' GDT does NOT have elevated activity.
- Procedure S-4.2.5, Release of Gas Decay Tank, is in progress with the procedure signed off through Section 5.0.

Initiating Cue:

- The US has directed you to release the 'D' GDT in accordance with S-4.2.5, Release of Gas Decay Tank.
- The Extra EO has removed the required tagout and completed the necessary paperwork.

**NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.**

## Job Performance Measure Worksheet

Task Standard: The operator will lineup and release the 'D' GDT in accordance with S-4.2.5, Section 6.4. The operator will properly ensure the release is secured in accordance with S-4.2.5, Step 4.2 based on an alarm condition on R-14.

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)  
Dosimetry

General References: S-4.2.5, Release of Gas Decay Tank (Rev 01902)

Handouts: S-4.2.5, Release of Gas Decay Tank (Rev 01902), completed through Section 5.0.

Time Critical Task: NO

Validation Time: 20 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.</b>				
1	(S-4.2.5, Sections 1.0 through 5.0) Operator reviews Sections 1.0 through 5.0 of S-4.2.5	Operator reviews S-4.2.5, Sections 1.0 through 5.0 and proceeds.	___	___	___
<b>CAUTION</b>					
Only one gas decay tank may be released at one time.					
2	(S-4.2.5, Section 6.0) CAUTION	Operator reads the Caution and proceeds.	___	___	___
3	(S-4.2.5, Step 6.4.1) <b>IF</b> GDT D contains VCT gas, <b>THEN REQUEST</b> Shift Manager authorize removal of Operator Aid Tag. <b>OTHERWISE, MARK</b> this Step N/A.	Operator recognizes that this is not applicable and marks the Step N/A.	___	___	___
<b>CUE</b>	<b>Examiner: Inform operator: "For the purposes of this JPM, there are no caution tags or operator aids. Mark the Step N/A."</b>				
4	(S-4.2.5, Step 6.4.2) <b>CLOSE</b> INLET AOV TO GAS DECAY TANK D, PCV-1039A.	<ul style="list-style-type: none"> <li>Operator verifies PCV-1039A is CLOSED (Green light LIT and Red light OFF).</li> <li>Operator initials Step.</li> </ul>	___	___	___
<b>CUE</b>	<b>Examiner: After the switch is located (on Waste Panel): "Green light for PCV-1039A is LIT".</b>				
5	(S-4.2.5, Step 6.4.3) <b>CLOSE</b> GAS DECAY TANK D REUSE CONTROL AOV, AOV-1632.	<ul style="list-style-type: none"> <li>Operator verifies AOV-1632 control switch is in CLOSE (Green light LIT).</li> <li>Operator initials Step.</li> </ul>	___	___	___
<b>CUE</b>	<b>Examiner: After the switch is located (on Waste Panel): "Green light for AOV-1632 is LIT".</b>				
6	(S-4.2.5, Step 6.4.4) <b>CLOSE</b> GAS DECAY TANK D OUTLET AOV TO GAS ANALYZER, PCV-1039B.	<ul style="list-style-type: none"> <li>Operator verifies PCV-1039B is CLOSED (Green light LIT and Red light OFF).</li> <li>Operator initials Step.</li> </ul>	___	___	___
<b>CUE</b>	<b>Examiner: After the switch is located (on Waste Panel): "Green light for PCV-1039B is LIT".</b>				

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
7	<p>(S-4.2.5, Step 6.4.5) <b>LOCK CLOSED</b> GDT manual outlet valves on all tanks:</p> <ul style="list-style-type: none"> <li>GAS DECAY TANK A MANUAL OUTLET VLV, V-1617</li> <li>GAS DECAY TANK B MANUAL OUTLET VLV, V-1618</li> <li>GAS DECAY TANK C MANUAL OUTLET VLV, V-1619</li> <li>GAS DECAY TANK D MANUAL OUTLET VLV, V-1620</li> </ul>	<ul style="list-style-type: none"> <li>Operator verifies all four valves are LOCKED CLOSED.</li> <li>Operator initials Steps.</li> </ul>	_____	_____	_____
	<b>Examiner NOTE: To check the valve locked closed, the candidate will attempt to rotate the valve in the clockwise direction and check to see if locking device is locked.</b>				
<b>CUE</b>	<b>Examiner: For each valve feedback: "Lock is locked and the handwheel does not rotate in the clockwise direction."</b>				
<b>CUE</b>	<b>Examiner: If asked, the eSoms location for these valves are AUX BLDG Intermediate Level GDT Alley 5' (V-1617 and 1618) and 1' (V-1619 and 1620) elevation.</b>				
8	<p>(S-4.2.5, Step 6.4.6) <b>CLOSE</b> GAS DECAY TANK RELEASE AOV TO PLANT VENT VIA CHARCOAL FILTER, RCV-014</p>	<ul style="list-style-type: none"> <li>Operator SIMULATES rotating knob for RCV-14 in the <b>counter-clockwise</b> direction.</li> <li>Operator verifies RCV-014 is CLOSED (Green light LIT).</li> <li>Operator observes air pressure reads 0 psig on the air pressure gauge.</li> <li>Operator initials Step.</li> </ul>	_____	_____	_____
<b>CUE</b>	<b>Examiner: After the knob is located (on Waste Panel): "The knob does NOT rotate in the counter-clockwise direction".</b>				
9	<p>(S-4.2.5, Step 6.4.7) <b>REMOVE</b> eSOMS Tag from V-1620.</p>	<ul style="list-style-type: none"> <li>Operator verifies the hold on V-1620 is removed (Initiating Cues).</li> <li>Operator initials Step.</li> </ul>	_____	_____	_____
<b>CUE</b>	<b>Examiner: "Extra EO has removed the Tag and completed the necessary paperwork".</b>				

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*10	(S-4.2.5, Step 6.4.8) <b>UNLOCK AND OPEN</b> GAS DECAY TANK D MANUAL OUTLET VLV, V-1620.	<ul style="list-style-type: none"> <li>* Operator SIMULATES unlocking V-1620.</li> <li>* Operator SIMULATES rotating V-1620 handwheel in the <b>counter-clockwise</b> direction.</li> </ul>	___	___	___
		<ul style="list-style-type: none"> <li>• Operator initials Step.</li> </ul>	___	___	___
<b>CUE</b>	<b>Examiner: After the candidate describes lock removal: "The lock is removed." "The valve no longer rotates in that direction."</b>				
<p style="text-align: center;"><b>CAUTION</b></p> <ul style="list-style-type: none"> <li>• <b>WHEN</b> moving water or gas in the Waste Handling Systems with elevated activity present, <b>THEN COORDINATE</b> with RP to monitor local radiation levels.</li> <li>• <b>WHEN</b> releasing gas from tanks with elevated activity, <b>THEN INITIATE</b> the release slowly and allow time for the Rad Monitor to stabilize. Raise the release rate, if necessary, in small increments, realizing that it may take several minutes for the Rad Monitor to react to the elevated activity level being released.</li> <li>• <b>SECURE</b> gas decay tank from release when approximately 5 psig, to prevent vacuum on the NSA Gas Analyzed (when the GDT is placed in service).</li> </ul>					
11	(S-4.2.5, Step 6.4.9) CAUTIONs prior to Step 6.4.9	Operator reads and place keeps CAUTIONs and proceeds.	___	___	___
12	(S-4.2.5, Step 6.4.9) <b>PERFORM</b> the following to begin release: 1. <b>RECORD</b> the following: <ul style="list-style-type: none"> <li>• GDT D Initial Pressure:</li> <li>• Time GDT D release initiated:</li> </ul>	Operator records initial tank pressure and time.	___	___	___
<b>CUE</b>	<b>Examiner: After the PI-1039 is located (on Waste Panel): "Initial tank pressure is 90 psig."</b>				

## PERFORMANCE INFORMATION

STEP	ELEMENT	STANDARD	SAT	UNSAT	Comment Number
*13	(S-4.2.5, Step 6.4.9) <b>PERFORM</b> the following to begin release: 2. <b>THROTTLE OPEN</b> (may be full open) GAS DECAY TANK RELEASE AOV TO PLANT VENT VIA CHARCOAL FILTER, RCV-014, to desired release rate.	<ul style="list-style-type: none"><li>* Operator SIMULATES rotating RCV-014 control knob <b>clockwise</b> to OPEN valve and begin release.</li><li>• Operator observes RCV-014 control air pressure rising.</li><li>• Operator observes RCV-014 opening (Both Red and Green lights LIT).</li></ul>	<div></div>	<div></div>	<div></div>
CUE	Examiner: Once operator begins rotating RCV-014 control knob: <ul style="list-style-type: none"><li>• “Air pressure is rising.”</li><li>• As RCV-014 is being opened: “Both Red and Green lights are LIT”</li><li>• Once RCV-014 is fully OPEN: “Red light is LIT, Green light is OFF”.</li><li>• After R-14 indication is located (on Waste Panel): “R-14 indicates rising counts.”</li></ul>				
EXAMINER NOTE: ALTERNATE PATH DECISION POINT OCCURS IN THE NEXT STEP					
14	(S-4.2.5, Step 6.4.9) <b>PERFORM</b> the following to begin release: 3. <b>NOTIFY</b> Control Room of time GDT D release was initiated and the initial pressure.	Operator records initial tank pressure and time.	<div></div>	<div></div>	<div></div>
CUE	Examiner: As Control Room acknowledge radio communications.				
CUE	Examiner: After RCV-014 is OPEN for approximately 10 to 15 seconds: <ul style="list-style-type: none"><li>• As Control Room inform the operator “R-14 reads 2 X 10<sup>5</sup> CPM and rising slowly.</li><li>• After R-14 indication is located (on Waste Panel): “R-14 indicates 2 X 10<sup>5</sup> CPM and rising.”</li><li>• IF necessary, as Control Room inform operator “R-14 is in HIGH ALARM”.</li></ul>				

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*15	(S-4.2.5, Step 4.2) <b>ENSURE</b> RCV-014 closes if a high alarm occurs on R-14.	<ul style="list-style-type: none"> <li>Operator recognizes that RCV-014 is OPEN (Red light LIT and Green light OFF).</li> </ul>	_____	_____	_____
		<ul style="list-style-type: none"> <li>* Operator SIMULATES rotating RCV-014 control knob <b>counter-clockwise</b> to CLOSE valve.</li> </ul>	_____	_____	_____
		<ul style="list-style-type: none"> <li>Operator observes RCV-014 control air pressure lowering.</li> <li>Operator observes RCV-014 CLOSED (Green light LIT and Red light OFF).</li> </ul>	_____	_____	_____
<b>CUE</b>	<b>Examiner: Once operator begins rotating RCV-014 control knob:</b> <ul style="list-style-type: none"> <li>“Air pressure is lowering.”</li> <li>As RCV-014 is being closed: “Both Red and Green lights are LIT”.</li> <li>Once RCV-014 is fully CLOSED: “Green light is LIT, Red light is OFF”.</li> <li>After R-14 indication is located (on Waste Panel): “R-14 indicates lowering counts.”</li> </ul>				
<b>CUE</b>	<b>Examiner: Once RCV-014 is CLOSED, state: “This JPM is now complete”.</b>				

JPM Stop Time: \_\_\_\_\_

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: Ginna 2018 In-Plant Systems JPM J

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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## INITIAL CONDITIONS:

- The 'D' Gas Decay Tank (GDT) is full and approved for release.
- The 'D' GDT does NOT have elevated activity.
- Procedure S-4.2.5, Release of Gas Decay Tank, is in progress with the procedure signed off through Section 5.0.

## INITIATING CUE:

- The US has directed you to release the 'D' GDT in accordance with S-4.2.5, Release of Gas Decay Tank.
- The Extra EO has removed the required tagout and completed the necessary paperwork.

**NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.**

# **NRC EXAM**

# **In-Plant JPM K**

## Job Performance Measure Worksheet

Facility: Ginna

Task No.:

Task Title: Start 'A' EDG Locally in accordance with ER-FIRE.1

JPM No.: Ginna 2018 In-Plant Systems JPM K

K/A Reference: 064 A4.01 (4.0/4.3) Ability to manually operate and/or monitor in the control room: Local and remote operation of the ED/G

Examinee:

NRC Examiner:

Facility Evaluator:

Date:

Method of testing:

Simulated Performance:

X

Actual Performance:

Classroom

Simulator

Plant

X**READ TO THE EXAMINEE**

I will explain the initial conditions, which steps to simulate or discuss, and provide initiating cues. When you complete the task successfully, the objective for this Job Performance Measure will be satisfied.

**Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.**

Initial Conditions:

- There has been a fire in the Control Room.
- The Shift Manager has directed the Control Room be evacuated in accordance with AP-CR.1, Control Room Inaccessibility, Step 3.
- In addition, ER-FIRE.1, Alternate Shutdown for Control Complex Fire, has been implemented.

Initiating Cue:

- The Shift Manager has directed you to proceed to 'A' D/G and perform ER-FIRE.1, Attachment 2, Shift Technical Advisor (STA).

**NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.**

Task Standard:

The operator will operate 'A' EDG locally in accordance with ER-FIRE.1, Attachment 2, Shift Technical Advisor (STA).

Required Materials: PPE (Hardhat, Safety Glasses, Hearing Protection, Safety Shoes etc.)

Ginna 2018 In-Plant Systems JPM K

NUREG 1021, Revision 11

Job Performance Measure Worksheet

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General References: ER-FIRE.1, Alternate Shutdown for Control Complex Fire (Rev 040)

Handouts: Handout 1: ER-FIRE.1, Alternate Shutdown for Control Complex Fire (Rev 040), Attachment 2, Shift Technical Advisor (STA).

Time Critical Task: NO

Validation Time: 8 minutes

Fill in the JPM Start Time when the student acknowledges the Initiating Cue.

.....  
**Information For Evaluator's Use:**

UNSAT requires written comments on respective step.

\* Denotes critical steps.

Number any comments in the "Comment Number" column on the following pages. Then annotate that comment in the "Comments" section. The comment section should be used to document: the reason that a step is marked as unsatisfactory, marginal performance relating to management expectations, or problems the examinee had while performing the JPM. Comments relating to procedural or equipment issues should be entered and tracked using the site's appropriate tracking system.

Some operations that are performed from outside of the Control Room may require multiple steps. These items may be listed as individual steps in this JPM. It is acceptable for the Candidate to direct the local operator to perform groups of procedure steps instead of calling for each individual item to be performed.

The timeclock starts when the Candidate acknowledges the Initiating Cue.

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## PERFORMANCE INFORMATION

JPM Start Time: \_\_\_\_\_

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
CUE	Provide Candidate with Initial Conditions/Cue (Last Page of this JPM) and Handout 1.				
1	(ER-FIRE.1, Attachment 2, Step 1.0) <b>PROCEED</b> to D/G ROOM A ER-FIRE EQUIPMENT locker and retrieve equipment.	<ul style="list-style-type: none"><li>Operator proceeds to 'A' D/G Room.</li><li>Operator SIMULATES breaking the lock, or unlocking the lock, on ER-FIRE locker.</li><li>Operator SIMULATES obtaining STA tool bag.</li></ul>	_____	_____	_____
CUE	Examiner: "Lock is broken and you have retrieved appropriate equipment."				
NOTE					
It may be necessary to unlock the Plexiglass cover using the key in the STA tool bag.					
2	(ER-FIRE.1, Attachment 2, Step 2.0) NOTE	Operator reads the NOTE and proceeds.	_____	_____	_____
*3	(ER-FIRE.1, Attachment 2, Step 2.0) At ELCP <b>PERFORM</b> the following: 2.1 <b>PLACE</b> D/G A MODE SELECT SWITCH to EMERG.	<ul style="list-style-type: none"><li>Operator locates ELCP and opens Plexiglass cover.</li></ul>	_____	_____	_____
		* Operator SIMULATES rotating switch to EMERG position.	_____	_____	_____
CUE	Examiner: "Switch is in position indicated."				
4	(ER-FIRE.1, Attachment 2, Step 2.0) At ELCP <b>PERFORM</b> the following: 2.2 <b>IF</b> D/G a is running, <b>THEN PERFORM</b> the following: 2.2.1 <b>PLACE</b> START/STOP switch to STOP. 2.2.2 <b>IMMEDIATELY PUSH</b> the VOLT. SHUTDOWN CONTROL button (Red button).	Operator recognizes that 'A' EDG is NOT running and marks Step N/A.	_____	_____	_____
CUE	Examiner: If operator asks, feedback "A D/G is NOT running."				

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
5	(ER-FIRE.1, Attachment 2, Step 2.0) At ELCP <b>PERFORM</b> the following:  2.3 <b>NOTIFY</b> SM that D/G A is isolated.	Operator contacts SM and makes notification.			
<b>CUE</b>	<b>Examiner: As SM acknowledge that ‘A’ D/G is isolated. Direct the start of ‘A’ D/G and inform operator that Buses 14 and 18 have been isolated.</b>				
<b>NOTE</b>					
<ul style="list-style-type: none"><li>• <b>IF</b> manual trip of D/G was necessary, <b>THEN</b> the D/G may trip on Overspeed <b>WHEN</b> it is restarted. This condition is addressed in step 2.3.2. Re-perform step 2.3.1 as necessary to restart D/G.</li><li>• <b>IF</b> D/G trips on Overspeed it may be necessary to repeat step 2.3.1 and 2.3.2 until the Electrical Governor setting is lowered enough to prevent the trip.</li></ul>					
6	(ER-FIRE.1, Attachment 2, Step 2.3.1) <b>NOTES</b>	Operator reads the <b>NOTES</b> and proceeds.			
7	(ER-FIRE.1, Attachment 2, Step 2.3.1) <b>WHEN</b> Buses 14 and 18 have been isolated, <b>THEN START</b> D/G A as follows:  A. <b>ENSURE</b> the UNIT / PARALLEL switch in UNIT.	Operator verifies the switch is in UNIT position.			
<b>CUE</b>	<b>Examiner: “Switch is in position indicated.”</b>				
8	(ER-FIRE.1, Attachment 2, Step 2.3.1) <b>WHEN</b> Buses 14 and 18 have been isolated, <b>THEN START</b> D/G A as follows:  B. <b>ENSURE</b> the VOLTAGE MAN/AUTO switch in AUTO.	Operator verifies the switch is in AUTO position.			
<b>CUE</b>	<b>Examiner: “Switch is in position indicated.”</b>				
*9	(ER-FIRE.1, Attachment 2, Step 2.3.1) <b>WHEN</b> Buses 14 and 18 have been isolated, <b>THEN START</b> D/G A as follows:  C. <b>DEPRESS</b> FIELD RESET (K4) (Black button).	* Operator <b>SIMULATES</b> resetting the Field Relay by depressing the pushbutton.			
<b>CUE</b>	<b>Examiner: Feedback “FIELD relay is RESET.”</b>				

## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
*10	(ER-FIRE.1, Attachment 2, Step 2.3.1) <b>WHEN</b> Buses 14 and 18 have been isolated, <b>THEN START</b> D/G A as follows: D. <b>DEPRESS</b> EG1A SHUTDOWN RESET (R3) (Yellow button).	* Operator <b>SIMULATES</b> resetting the Shutdown Relay by depressing the pushbutton.	___	___	___
<b>CUE</b>	<b>Examiner: Feedback "SHUTDOWN relay is RESET."</b>				
11	(ER-FIRE.1, Attachment 2, Step 2.3.1) <b>WHEN</b> Buses 14 and 18 have been isolated, <b>THEN START</b> D/G A as follows: E. <b>IF</b> the D/G previously tripped on Overspeed, <b>THEN PLACE AND HOLD</b> the GOVERNOR SPEED CONTROL switch in the LOWER position.	Operator recognizes that this Step is not applicable and proceeds.	___	___	___
<b>CUE</b>	<b>Examiner: If operator asks, feedback "A D/G is NOT running."</b>				
*12	(ER-FIRE.1, Attachment 2, Step 2.3.1) <b>WHEN</b> Buses 14 and 18 have been isolated, <b>THEN START</b> D/G A as follows: F. <b>START</b> D/G A by placing START STOP switch to START A.	* Operator <b>SIMULATES</b> rotating switch to START A position.	___	___	___
		• Operator verifies 'A' D/G started.	___	___	___
<b>CUE</b>	<b>Examiner: Initial Feedback "Switch is in position indicated." After switch rotated, Report "A D/G is running".</b>				
*13	(ER-FIRE.1, Attachment 2, Step 2.3.1) <b>WHEN</b> Buses 14 and 18 have been isolated, <b>THEN START</b> D/G A as follows: G. <b>ADJUST</b> the GOVERNOR SPEED CONTROL to obtain a frequency of approximately 60 Hertz.	• Operator observes frequency meter.	___	___	___
		* Operator <b>SIMULATES</b> rotating GOVERNOR SPEED CONTROL to RAISE and monitors frequency.	___	___	___
		• Operator <b>SIMULATES</b> releasing GOVERNOR SPEED CONTROL at 60 Hertz.	___	___	___



## PERFORMANCE INFORMATION

<u>STEP</u>	<u>ELEMENT</u>	<u>STANDARD</u>	SAT	UNSAT	Comment Number
<b>CUE</b>	<b>Examiner: Initial Feedback “Frequency is at 58 Hertz”. After operator rotates switch in RAISE direction, Report “frequency is at 60 Hertz”.</b>				
*14	(ER-FIRE.1, Attachment 2, Step 2.3.1) <b>WHEN</b> Buses 14 and 18 have been isolated, <b>THEN START</b> D/G A as follows: H. <b>ADJUST</b> the AUTO VOLT. CONTROL to obtain a voltage of 480 Volts.	Operator observes voltage meter indicates 480 volts	_____	_____	_____
<b>CUE</b>	<b>Examiner: After operator observes voltage meter, feedback “Voltage indicates 480 volts”.</b>				
15	(ER-FIRE.1, Attachment 2, Step 2.3.2) <b>IF</b> the D/G trips on Overspeed, <b>THEN PERFORM</b> the following:	Operator recognizes that this Step is not applicable and proceeds.	_____	_____	_____
<b>CUE</b>	<b>Examiner: If asked, Report “A D/G is running”.</b>				
16	(ER-FIRE.1, Attachment 2, Step 2.4) <b>DIRECT</b> US to <b>PERFORM</b> step 5.0 of Attachment 1, Unit Supervisor (US) to energize Bus 18 and start SW pumps.	Operator contacts US and makes report.	_____	_____	_____
<b>CUE</b>	<b>Examiner: As US acknowledge radio communications.</b>				
17	(ER-FIRE.1, Attachment 2, Step 2.5) <b>NOTIFY</b> SM that D/G A is running.	Operator contacts SM and makes report.	_____	_____	_____
<b>CUE</b>	<b>Examiner: As SM acknowledge radio communications.</b>				

JPM Stop Time: \_\_\_\_\_

**CUE: No further actions required.**

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VERIFICATION OF COMPLETION

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Job Performance Measure No.: Ginna 2018 In-Plant Systems JPM K

Examinee's Name:

Examiner's Name:

Date Performed:

Facility Evaluator:

Number of Attempts:

Time to Complete:

Question Documentation:

Question:

Response:

Result: SAT \_\_\_\_\_ UNSAT \_\_\_\_\_

Examiner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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JPM CUE SHEET

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## INITIAL CONDITIONS:

- There has been a fire in the Control Room.
- The Shift Manager has directed the Control Room be evacuated in accordance with AP-CR.1, Control Room Inaccessibility, Step 3.
- In addition, ER-FIRE.1, Alternate Shutdown for Control Complex Fire, has been implemented.

## INITIATING CUE:

- The Shift Manager has directed you to proceed to 'A' D/G and perform ER-FIRE.1, Attachment 2, Shift Technical Advisor (STA).

**NOTE: No plant equipment should be operated during the performance of this JPM. All actions must be SIMULATED.**

PROGRAM: Ginna Operations Training

MODULE: Initial License Operator Training Class 17-1

TOPIC: NRC Simulator Exam

**Scenario #1**

**REFERENCES:**

1. Technical Specification LCO 3.5.2, ECCS - MODES 1, 2, and 3 (Amendment 118)
2. O-1.2, Plant Startup From Hot Shutdown To Full Load (Rev 212)
3. S-3.1, Boron Concentration Control (Rev 03200)
4. AR-J-9, SAFEGUARD BREAKER TRIP (Rev 12)
5. AR-C-1, CONTAINMENT RECIRC SYSTEM LO AIR FLOW (Rev 00800)
6. P-17, Operations Control Room Operating Instructions (Rev 019)
7. A-503.1, Emergency and Abnormal Operating Procedures Users Guide (Rev 048)
8. Technical Specification LCO 3.6.6, Containment Spray (CS), Containment Recirculation Fan Cooler (CRFC), and NaOH Systems (Amendment 118)
9. AR-L-5, SAFEGUARD BUS MAIN BREAKER OVERCURRENT TRIP (Rev 10)
10. AP-ELEC.14/16, Loss of Safeguards Bus 14/16 (Rev 01203)
11. S-3.2P, Swapping CVCS Letdown Orifice Valves (Rev 008)
12. ATT-9.0, ATTACHMENT LETDOWN (Rev 10)
13. ATT-9.1, ATTACHMENT EXCESS L/D (Rev 00800)
14. Technical Specification LCO 3.8.1, AC Sources – MODES 1, 2, 3, and 4 (Amendment 109)
15. Technical Specification LCO 3.8.4, DC Sources – MODES 1, 2, 3, and 4 (Amendment 80)
16. Technical Specification LCO 3.8.9, Distribution Systems – MODES 1, 2, 3, and 4 (Amendment 80)
17. AP-RCS.1, Reactor Coolant Leak (Rev 022)
18. E-0, Reactor Trip or Safety Injection (Rev 048)
19. ATT-27.0, Attachment Automatic Action Verification (Rev 00400)
20. ATT-3.0, ATTACHMENT CI/CVI (Rev 01200)
21. E-1, Loss of Reactor or Secondary Coolant (Rev 04100)
22. ATT-14.5, ATTACHMENT RHR SYSTEM (Rev 3)
23. FR-C.2, Response to Degraded Core Cooling (Rev 02600)
24. ATT-15.0, Attachment RCP start (Rev 012)

Validation Time: 76 minutes

Author: David Eckert

Facility Review: Dale Bisailon /s/  
Rev. 061118

Scenario Event Description  
NRC Scenario 1

Facility: <b>Ginna</b>		Scenario No.: <b>1</b>		Op Test No.: <b>2018</b>	
Examiners: _____		Operators: _____		(SRO)	
_____		_____		(RO)	
_____		_____		(BOP)	
Initial Conditions:		<p>The plant is at <math>1 \times 10^{-8}</math> amps (BOL). The area has experienced overcast conditions for the past 4 hours, with light wind from the West at 10-15 mph, and this is expected to continue throughout the shift. The crew will raise reactor power to the POAH and stabilize plant power between 0.5 - 1%; and then raise and stabilize reactor power to 2-3 % and start 'A' MFW Pump for a confidence run. Do NOT exceed 5% reactor power until maintenance on the 'C' SI Pump is complete.</p>			
Turnover:		<p>The following equipment is Out-Of-Service: The 'C' SI Pump is OOS for lube oil cooler replacement and is expected to be back in 2 hours.</p>			
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	R(ATC) N(US) N(BOP)	Raise power to the POAH and start the 'A' MFW Pump		
2	OVR-MIS06A OVR-MIS06B OVR-MIS06C OVR-MIS06D OVR-MIS06E	C(BOP) TS(US)	Containment Recirculation Fan Cooler 'A' Trips		
3	EDS04B	C(ALL) TS(US)	Fault / Loss of Emergency Bus: 480V Bus 16		
4	RCS02D	M(ALL)	Small Break Loss of Coolant Accident (SBLOCA) (Ramp In)		
5	SIS02A SIS02B	C(US) C(ATC)	Failure of AUTO Safety Injection		
6	SIS03A	C(US) C(ATC)	1A SI Pump Trip		
7	RPS07E	C(BOP)	1A RHR Pump Fails to AUTO Start		
8	P-MIS07 RCS05A RCS15A	(ALL)	FR-C.2 - Degraded Core Cooling		
<p>* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor</p>					

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Scenario Event Description  
NRC Scenario 1

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**Ginna 2018 NRC Scenario #1**

The plant is at  $1 \times 10^{-8}$  amps power (BOL). The area has experienced overcast conditions for the past 4 hours, with light wind from the West at 10-15 mph, and this is expected to continue throughout the shift. The crew will raise reactor power to the POAH and stabilize plant power between 0.5 - 1%; and then raise and stabilize reactor power to 2-3 % and start 'A' MFW Pump for a confidence run. Do NOT exceed 5% reactor power until maintenance on the 'C' SI Pump is complete.

The following equipment is Out-Of-Service: The 'C' SI Pump is OOS for lube oil cooler replacement and is expected to be back in 2 hours.

Shortly after taking the watch, the crew will withdraw control rods to raise and stabilize power at 0.5-1% in accordance with O-1.2, PLANT STARTUP FROM HOT SHUTDOWN TO FULL LOAD.

Subsequently, the 'A' Containment Recirc Fan will trip. The operator will respond in accordance with AR-C-1, CONTAINMENT RECIRC SYSTEM LO AIR FLOW; AR-J-9, SAFEGUARD BREAKER TRIP; and manually start a second Containment Recirc Fan in accordance with A-503.1, Emergency and Abnormal Operating Procedures Users Guide; and P-17, Operations Control Room Operating Instructions. The operator will address Technical Specification LCO 3.6.6, Containment Spray (CS), Containment Recirculation Fan Cooler (CRFC), and NaOH Systems.

Next, a fault on 480V Bus 16 will occur, resulting in Bus 16 de-energizing. The operator will enter AP-ELEC.14/16, Loss of Safeguards Bus 14/16. The operator may leave 'B' EDG running or secure it within AP-ELEC.14/16. The operator will address Technical Specification LCO 3.8.1, AC Sources – MODES 1, 2, 3, and 4; and LCO 3.8.9, Distribution Systems – MODES 1, 2, 3, and 4.

Afterwards, a Small Break LOCA occurs over five minutes. The operator will enter AP-RCS.1, Reactor Coolant Leak; however, ultimately the reactor will be tripped, Safety Injection will be manually actuated, and the operator will enter E-0, Reactor Trip or Safety Injection. When the SI occurs, the 'A' SI Pump will trip and the 'A' RHR Pump will fail to start automatically and will be manually started in accordance with ATT-27.0, Attachment Automatic Action Verification.

The operator will transition from E-0 to E-1, Loss of Reactor or Secondary Coolant. Ultimately, an ORANGE path on the Core Cooling Safety Function will occur and the operator will transition to FR-C.2, Response to Degraded Core Cooling.

Shortly after entry into FR-C.2, 'A' RCP will trip on high vibrations. The scenario will terminate at Step 13 (or beyond) of FR-C.2 after S/G depressurization has begun and ECCS Accumulators begin to inject.

**Critical Tasks:**

**Manually actuate at least one train of Safety Injection before exiting E-0 (EOP-Based)**

Safety Significance: Failure to actuate Safety Injection when it is required to be actuated, and can be actuated, violates the assumptions of the Safety Analysis and constitutes incorrect performance that could lead to misdiagnosis of the event, implementation of an incorrect mitigation strategy and ultimately degradation of the RCS and/or fuel cladding fission product barriers.

**Manually start at least one RHR Pump to provide a low-head injection source prior to initiating S/G depressurization in FR-C.2 (EOP-Based)**

Safety Significance: Failure to depressurize the S/Gs results in the needless deterioration of core cooling to an inadequate status. Inventory losses continue while no makeup can be injected into the RCS because of the system pressure. Depressurizing the S/Gs would provide some immediate benefit by condensing steam on the primary side of the S/G U-tubes. Eventually, continued depressurization of the S/Gs will lead to ECCS accumulator injection and to low-head ECCS injection. Accumulator injection and low-head injection would restore the core cooling CSF to an adequate status. Thus, failure to depressurize the S/Gs when it is possible to do so (as it is in the postulated plant conditions) causes an extreme (red-path) challenge to the core cooling CSF that could be avoided by secondary depressurization. Failure to perform the critical task causes a "significant reduction of safety margin beyond that irreparably introduced by the scenario." Additionally, it represents a "demonstrated inability by the crew to take an action or combination of actions that would prevent a challenge to plane safety."

**Depressurize S/Gs to atmospheric pressure (at  $< 100^{\circ}\text{F/hr}$ ) to inject ECCS accumulators and establish low-head injection flow before a Core Cooling Red Path develops (EOP-Based)**

Safety Significance: Failure to depressurize the S/Gs results in the needless deterioration of core cooling to an inadequate status. Inventory losses continue while no makeup can be injected into the RCS because of the system pressure. Depressurizing the S/Gs would provide some immediate benefit by condensing steam on the primary side of the S/G U-tubes. Eventually, continued depressurization of the S/Gs will lead to ECCS accumulator injection and to low-head ECCS injection. Accumulator injection and low-head injection would restore the core cooling CSF to an adequate status. Thus, failure to depressurize the S/Gs when it is possible to do so (as it is in the postulated plant conditions) causes an extreme (red-path) challenge to the core cooling CSF that could be avoided by secondary depressurization. Failure to perform the critical task causes a "significant reduction of safety margin beyond that irreparably introduced by the scenario." Additionally, it represents a "demonstrated inability by the crew to take an action or combination of actions that would prevent a challenge to plane safety."

Scenario Event Description  
NRC Scenario 1

**SIMULATOR OPERATOR INSTRUCTIONS**

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>		Reset to NRC Exam IC 141 (June 2018) (Originally IC-17)	<p>T = 0 (from IC-17):</p> <p>MALF SIS03C to prevent start of 'C' SI pump (OOS contingency)</p> <p>Take 'C' SI Pump Control Switch to PULL STOP</p> <p>Hang LOTO Tags, as necessary</p> <p>STOP 'B' CRFC (Ensure 'A' and 'D' are running ONLY)</p> <p>Insert REM SGN10=CLOSED (SG Blowdown Isolation AOV-5738)</p> <p>Insert REM SGN11=CLOSED (SG Blowdown Isolation AOV-5737)</p> <p>Insert MALF SIS02A=Manual Available (SI Train 'A' fails to auto actuate)</p> <p>Insert MALF SIS02B=Manual Available (SI Train 'B' fails to auto actuate)</p> <p>Insert MALF RPS07E ('A' RHR Pump fails to auto start)</p> <p>Insert MALF SIS03A (SI Pump 1A Trip)</p> <p>Insert OVR MIS06A=ON (CP-HS-CR1A Green Lamp Containment Recirculation Fan No 1A) on T-1</p> <p>Insert OVR MIS06B=ON (CP-HS-CR1A White Lamp Containment Recirculation Fan No 1A) on T-1</p> <p>Insert OVR MIS06C=OFF (CP-HS-CR1A Red Lamp Containment Recirculation Fan No 1A) on T-1</p> <p>Insert OVR MIS06D=TRUE (CP-HS-CR1A STOP Signal Containment Recirculation Fan No 1A) on T-1</p> <p>Insert OVR MIS06E=FALSE (CP-HS-CR1A START Signal Containment Recirculation Fan No 1A) on T-1</p> <p>Insert MALF EDS04B (Loss of Emergency Bus – 480V Bus 16) on T-2</p> <p>Insert MALF RCS02D=3000 gpm (300 Second Ramp) (RCS Leak into CNMT – Loop B Cold Leg) on T-3</p>



Scenario Event Description  
NRC Scenario 1

	Bench Mark	ACTIVITY	DESCRIPTION
			<p>Insert REM P-MIS07 = 1 (Decay Heat Level) on T-4</p> <p>Set T-4 to "Rx Trip Signal from Either Logic Train (1/2)"</p> <p>Insert MALF RCS15A = 20 (10 Second Ramp) (RCP A – Vibration Pump Shaft) on T-5</p> <p>Insert MALF RCS05A (20 Second Delay) (RCP 1A Trip) on T-5</p>
<input type="checkbox"/>	Prior to Crew Briefing		<ul style="list-style-type: none"> <li>• Hang Protective Tags per OPG-PROTECTED-EQUIPMENT ('C' SI Pump)</li> <li>• Place Black Dot on all required MCB Annunciators (J-25)</li> <li>• Place CP placard on MCB for SGWL 52%±7%.</li> </ul>
<input type="checkbox"/>	<p style="text-align: center;"><b>Crew Briefing</b></p> <ul style="list-style-type: none"> <li>• Assign Crew Positions based on evaluation requirements.</li> <li>• Review the Shift Turnover Information with the crew.</li> <li>• Provide the crew with a copy of S-3.1 and O-1.2 complete through Step 6.3.3.</li> <li>• Handout current Reactivity Plan.</li> </ul>		

Scenario Event Description  
NRC Scenario 1

<input type="checkbox"/>	T-0	Begin Familiarization Period	
<input type="checkbox"/>	At direction of examiner	<b>Event 1</b>	Raise power to the POAH and start the 'A' MFW Pump
<input type="checkbox"/>	Stabilized at 0.5-1% power	<b>Event 2</b> <b>Trigger #1</b> <b>OVR-MIS06A</b> <b>OVR-MIS06B</b> <b>OVR-MIS06C</b> <b>OVR-MIS06D</b> <b>OVR-MIS06E</b>	Containment Recirculation Fan Cooler 'A' Trips
<input type="checkbox"/>	At direction of examiner	<b>Event 3</b> <b>Trigger #2</b> <b>EDS04B</b>	Fault / Loss of Emergency Bus: 480V Bus 16
<input type="checkbox"/>	At direction of examiner	<b>Event 4</b> <b>Trigger #3</b> <b>RCS02D (3000 gpm, 300 second Ramp)</b>	Small Break Loss of Coolant Accident (SBLOCA)
<input type="checkbox"/>	Post-Rx Trip	<b>Event 5</b> <b>SIS02A (T=0)</b> <b>SIS02B (T=0)</b>	Failure of AUTO Safety Injection  <b>NOTE: This Malfunction is inserted at T = 0</b>
<input type="checkbox"/>	Post-Rx Trip	<b>Event 6</b> <b>SIS03A (T=0)</b>	1A SI Pump Trip <b>NOTE: This Malfunction is inserted at T = 0</b>
<input type="checkbox"/>	Post-Rx Trip	<b>Event 7</b> <b>RPS07E (T=0)</b>	1A RHR Pump Fails to AUTO Start <b>Note: This malfunction is inserted at T=0</b>
<input type="checkbox"/>	Post-Rx Trip	<b>Event 8</b> <b>P-MIS07</b> <b>RCS05A</b> <b>RCS15A</b>	FR-C.2 - Degraded Core Cooling <b>Note: This malfunction is a result of plant conditions</b>
<input type="checkbox"/>	<b>Terminate the scenario upon direction of Lead Examiner</b>		

Op Test No.:	2018	Scenario #	1	Event #	1	Page	8	of	60
Event Description:		<b>Raise power to POAH</b>							

Shortly after taking the watch, the crew will withdraw control rods to raise and stabilize power at 0.5-1% per Section 6.3 of O-1.2, PLANT STARTUP FROM HOT SHUTDOWN TO FULL LOAD.

**SIM DRIVER Instructions:** N/A

**Indications Available:** N/A

Time	Pos.	Expected Actions/Behavior	Comments
<b>O-1.2, PLANT STARTUP FROM HOT SHUTDOWN TO FULL LOAD</b>			
	US	(Step 6.3) Raising Power To The Point Of Adding Heat	
	HCO	(Step 6.3.4) <b>WITHDRAW</b> controlling bank of Rods <b>AND RAISE</b> Reactor Power to the point of adding heat without exceeding capacity of <u>one</u> AFW Pump.	<b>NOTE:</b> The HCO will withdraw Bank 'D' rods and stabilize reactor power between 0.5-1%
	CO	(Step 6.3.5) <b>VERIFY</b> <u>one</u> of the following is operating to control RCS Tavg <b>AND MARK</b> component <b>NOT</b> controlling Tavg N/A	
			The crew may continue with O-1.2, Section 6.4. No additional actions are performed. Section 6.4 actions are not scripted.
<b>When power is stabilized at 0.5-1% Lead Examiner move to Event #2</b>			

Event Description: **Containment Recirc Fan Cooler 'A' Trips**

- MCB Annunciator J-9, SAFEGUARD BREAKER TRIP
- MCB Annunciator C-1, CONTAINMENT RECIRC SYSTEM LO AIR FLOW
- 'A' CNMT Recirc Fan Green and White lights LIT

Time	Pos.	Expected Actions/Behavior	Comments
			<b>NOTE:</b> The US may direct the HCO to start the 'C' CNMT Recirc Fan in accordance with CROI, proceed to page 10.
<b>AR- J-9, SAFEGUARD BREAKER TRIP</b>			
	CO	(Step 1) <u>IF</u> alarm is due to loss of SW pump(s), <u>THEN</u> refer to AP-SW.2.	<b>NOTE:</b> SW Pump has NOT tripped.
	CO	(Step 2) <u>IF</u> alarm is due to loss of RHR pump(s), <u>THEN</u> refer to:	<b>NOTE:</b> RHR Pump has NOT tripped
	CO	(Step 3) Notify AO to perform the following:	<b>SIM DRIVER:</b> as <b>EO</b> , acknowledge
		○ Investigate	
		○ Report findings back to Control Room	<b>SIM DRIVER:</b> as <b>EO</b> , report that 'A' CNMT Recirc Fan breaker is tripped.

Op Test No.: 2018 Scenario # 1 Event # 2 Page 10 of 60Event Description: **Containment Recirc Fan Cooler 'A' Trips**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 4) <u>IF</u> SI is <b>NOT</b> required, <u>THEN</u> reset or reclosure of a breaker should not be attempted.	<b>NOTE:</b> SI is not required
	US	(Step 5) <u>IF</u> SI is required, <u>THEN</u> one breaker reset and reclosure may be attempted.	<b>NOTE:</b> SI is not required
	US CO	(Step 6) Notify Electricians.	<b>SIM DRIVER:</b> as <b>WCC</b> , acknowledge
	US	(Step 7) Refer to ITS LCO for affected equipment.	<b>NOTE:</b> US will reference ITS 3.6.6
	US	(Step 8) Notify higher supervision	<b>SIM DRIVER:</b> as <b>WCC</b> , acknowledge
<b>AR-C-1, CONTAINMENT RECIRC SYSTEM LO AIR FLOW</b>			
	HCO	(Step 4.1) <b>DETERMINE</b> which fan has low flow <b>AND REMOVE</b> from service.	<b>NOTE:</b> 'A' CNMT Recirc Fan has tripped
	US	(Step 4.2) <b>REFER</b> to TS LCO 3.6.6, Containment Spray (CS), Containment Recirculation Fan Cooler (CRFC), and NaOH Systems.	<b>NOTE:</b> The US will evaluate Technical Specifications.
	US	(Step 4.3) <b>NOTIFY</b> Maintenance.	<b>SIM DRIVER:</b> as <b>WCC</b> , acknowledge
<b>P-17, OPERATIONS CONTROL ROOM OPERATING INSTRUCTIONS Attachment 9, CROI-9 Swapping Containment Recirc Fans</b>			
	HCO	(Step 1.3) Starting or Stopping C Containment Recirc Fan	<b>NOTE:</b> US may direct HCO to start 'C' CNMT Recirc Fan utilizing A-503.1 direction.

Op Test No.: 2018 Scenario # 1 Event # 2 Page 11 of 60Event Description: **Containment Recirc Fan Cooler 'A' Trips**

Time	Pos.	Expected Actions/Behavior			Comments
	HCO	(Step 1.3.1) <b>PLACE ON</b> sound monitor for C Containment Recirc Fan <b>AND MONITOR</b>			
	HCO	(Step 1.3.2) <b>START OR STOP</b> C Containment Recirc Fan			<b>NOTE:</b> The HCO will start 'C' CNMT Recirc Fan
	HCO	(Step 1.3.3) <b>PLACE OFF</b> sound monitor for C Containment Recirc Fan			
<b>TECHNICAL SPECIFICATION 3.6.6, CONTAINMENT SPRAY (CS), CONTAINMENT RECIRCULATION FAN COOLER (CRFC), AND NaOH SYSTEMS</b>					
	US	LCO 3.6.6 Two CS Trains, four CRFC units, and the NaOH system shall be OPERABLE.			
	US	APPLICABILITY: MODES 1, 2, 3, and 4.			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	<b>NOTE:</b> The US will identify that Condition D is applicable.
		D. One or two CRFC units inoperable.	D.1 Restore CRFC unit(s) to OPERABLE status.	7 days	<b>NOTE:</b> The US may call WCC/Maintenance to address the status of the 'A' CNMT Recirc Fan. If so, <b>SIM DRIVER</b> acknowledge as WCC.
<b>At the discretion of the Lead Examiner move to Event #3</b>					

Op Test No.:	2018	Scenario #	1	Event #	3	Page	12	of	60
Event Description:		<b>Fault / Loss of Emergency Bus: 480V Bus 16</b>							

Next, a fault on 480V Bus 16 will occur, resulting in Bus 16 de-energizing. The operator will enter AP-ELEC.14/16, Loss of Safeguards Bus 14/16. The operator may leave 'B' EDG running or secure it within AP-ELEC.14/16. The operator will address Technical Specification LCO 3.8.1, AC Sources – MODES 1, 2, 3, and 4; and LCO 3.8.9, Distribution Systems – MODES 1, 2, 3, and 4.

**SIM DRIVER Instructions:** Operate Trigger #2 (EDS04B)

**Indications Available:**

- MCB Annunciator L-7, BUS 16 UNDER VOLTAGE SAFEGUARDS
- MCB Annunciator L-5, SAFEGUARD BUS MAIN BREAKER OVERCURRENT TRIP
- Multiple MCB Annunciators
- Bus 16 Volts indicating 0
- Bus 16 amperage indicating 0
- 'B' EDG starts, voltage at 480 VAC, but will not load onto Bus 16

Time	Pos.	Expected Actions/Behavior	Comments
			<b>NOTE:</b> The crew will enter AP-ELEC.14/16 directly.
<b>AR-L-5, SAFEGUARD BUS MAIN BREAKER OVERCURRENT TRIP</b>			
			<b>NOTE:</b> CO may perform these actions while crew is performing AP-ELEC.14/16.
	CO	(Step 1) To prevent the D/G from loading on the affected Safeguards bus while troubleshooting is in progress, <b>PULL STOP</b> the affected D/G supply breaker.	<b>NOTE:</b> The CO will PULL STOP the "D/G B BUS 16 SUPPLY BREAKER" (located on the back of the MCB).
	US	(Step 2) Notify the following:	
		o Electricians	<b>NOTE:</b> The US may call WCC to address the loss of Bus 16. If so, <b>SIM DRIVER</b> acknowledge as WCC.
		o Scheduling	
		o Operations Supervision	
	US	(Step 3) Refer to ITS LCO 3.8.1 <u>OR</u> 3.8.2	<b>NOTE:</b> The US will evaluate Technical Specifications.

Op Test No.: 2018 Scenario # 1 Event # 3 Page 13 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 4) Direct Electricians to investigate cause of overcurrent condition.	<b>NOTE:</b> The US may call WCC to contact Electricians. If so, <b>SIM DRIVER</b> acknowledge as WCC.
<b>AP-ELEC.14/16, LOSS OF SAFEGUARDS BUS 14/16</b>			
	HCO	(*Step 1) Monitor Tavg	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Place Rods in MANUAL	<b>NOTE:</b> The rods are already in MANUAL
		b. Manually move control rods to control Tavg	
	US	(Step 2) Verify Emergency D/G Associated With Affected Bus - RUNNING	<b>NOTE:</b> The 'B' D/G is RUNNING, but its breaker is NOT Closed.
		o Bus 16 – D/G B	
	CO	(Step 3) Verify Both Trains Of AC Emergency Busses Energized To At Least 440 VOLTS:	
		o Bus 14 and Bus 18	
		o Bus 16 and Bus 17	<b>NOTE:</b> Bus 16 is de-energized.
	CO	(Step 3 RNO) <u>IF</u> Bus 14 <u>AND</u> Bus 16 are deenergized, <u>THEN</u> ....	<b>NOTE:</b> Bus 14 is energized.
		<u>IF</u> one train deenergized, <u>THEN</u> perform the following:	<b>NOTE:</b> ONLY Bus 16 is de-energized.
		a. Ensure D/G aligned for unit operation	
		o Mode switch in UNIT	
		o Voltage control selector in AUTO	
		b. Check D/G running.	



Op Test No.:	2018	Scenario #	1	Event #	3	Page	14	of	60
Event Description:		<b>Fault / Loss of Emergency Bus: 480V Bus 16</b>							

Time	Pos.	Expected Actions/Behavior	Comments
	CO	<u>IF NOT, THEN</u> perform the following:	<b>NOTE:</b> The 'B' D/G is RUNNING, but its breaker is NOT Closed.
		c. Adjust D/G voltage to approximately 480 volts.	
		d. Adjust D/G frequency to approximately 60 Hz.	
	HCO	(Step 4) Verify CCW Pump Status	
		a. At least one CCW Pump - RUNNING	<b>NOTE:</b> The 'A' CCW Pump is running.
		b. Annunciator A-22, CCW PUMP DISCHARGE LO PRESS 60 PSIG - EXTINGUISHED	
	HCO	(Step 5) Verify Charging Pump Status – AT LEAST ONE RUNNING	<b>NOTE:</b> The 'A' Charging Pump is running.
			<b>NOTE:</b> The US may elect to isolate Normal Letdown at this point due to only one Charging Pump available and 60 gpm Letdown orifice in service; or hand off S-3.2P to HCO to swap to 40 gpm orifice while continuing in AP-ELEC.14/16 with CO.  Examiner following HCO continue here, other Examiners continue on <b>Page 16</b> .
<b>S-3.2P, SWAPPING CVCS LETDOWN ORIFICE VALVES</b>			
	HCO	(Step 6.2.1) <b>PLACE</b> PCV-135 to <b>MANUAL</b> .	
	HCO	(Step 6.2.2) <b>ADJUST</b> as necessary to control Low Pressure Letdown pressure at approximately 300 psig.	<b>NOTE:</b> HCO will adjust PCV-135 controller to raise LP Letdown pressure.

Op Test No.: 2018 Scenario # 1 Event # 3 Page 15 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 6.2.3) <b>IF</b> letdown temperature adjustment is required, <b>THEN PERFORM</b> the following: <b>OTHERWISE, MARK</b> this Step N/A.	<b>NOTE:</b> This step should not be performed.
	HCO	(Step 6.2.4) <b>CLOSE</b> LTDN ORIFICE VALVE, AOV-202, <b>THEN IMMEDIATELY OPEN</b> LTDN ORIFICE AOV-200A <b>OR</b> LTDN ORIFICE AOV-200B. <b>MARK</b> orifice valve not operated N/A. <ul style="list-style-type: none"> <li>• AOV-202 <b>CLOSED</b></li> <li>• AOV-200A <b>OPEN</b></li> <li>• AOV-200B <b>OPEN</b></li> </ul>	<b>NOTE:</b> The HCO will <b>CLOSE</b> AOV-202 and immediately <b>OPEN</b> either AOV-200A or AOV-200B while maintaining LP letdown pressure manually.
	HCO	(Step 6.2.5) <b>ADJUST</b> PCV-135 <b>UNTIL</b> PI-135 indicates approximately 250 psig.	
	HCO	(Step 6.2.6) <b>ENSURE</b> PCV-135 controller signal is nulled/balanced, <b>THEN PLACE</b> PCV-135 to <b>AUTO</b> .	
	HCO	(Step 6.2.7) <b>ADJUST</b> the Charging Pump that is in manual <b>UNTIL</b> the speed of the operating pumps is approximately equal.	<b>NOTE:</b> Only 'A' Charging Pump is running. HCO will adjust 'A' Charging Pump speed to regain control of PRZR level.
	HCO	(Step 6.2.8) <b>VERIFY</b> Letdown temperature is at desired value, <b>THEN ENSURE</b> TCV-130 is in <b>AUTO</b> .	<b>NOTE:</b> TCV-130 remained in <b>AUTO</b> during orifice valve swap.
	HCO	(Step 6.2.9) <b>IF</b> Charging/Letdown mismatch exist, <b>THEN PLACE</b> Charging Pumps in manual <b>AND ADJUST</b> as necessary to maintain Charging/Letdown mismatch at approximately 0. <b>OTHERWISE, MARK</b> this Step N/A.	<b>NOTE:</b> US may decide to maintain a Charging/Letdown mismatch until PRZR level is restored to program.

Op Test No.: 2018 Scenario # 1 Event # 3 Page 16 of 60

Event Description: Fault / Loss of Emergency Bus: 480V Bus 16

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 6.2.10) <b>LOCALLY ADJUST</b> SEAL INJECTION INLET NEEDLE VLV TO RCP A, V-300A <b>AND</b> SEAL INJECTION INLET NEEDLE VLV TO RCP B, V-300B, as necessary to maintain labyrinth seal D/P between 30 and 40 inches.	<b>NOTE:</b> HCO may contact EO to adjust needle valves. <b>SIM DRIVER:</b> utilize <b>REM CVC19</b> and <b>CVC20</b> to adjust valves, acknowledge communications.
	HCO	(Step 6.2.11) <b>MONITOR</b> Letdown temperature is controlling at desired value.	
	HCO	(Step 6.2.12) <b>VERIFY</b> local demin D/P less than 25 psid. (DPI-100 or DPI-101)	<b>NOTE:</b> HCO will contact EO. <b>SIM DRIVER:</b> acknowledge communications.
	HCO	(Step 6.2.13) <b>NOTIFY</b> Shift Chemistry Technician.	<b>NOTE:</b> HCO will contact Chemistry. <b>SIM DRIVER:</b> as Chemistry, acknowledge communications.
<b>AP-ELEC.14/16, LOSS OF SAFEGUARDS BUS 14/16</b>			
			Examiner following US and CO continue here.
	CO	(Step 6) Check MFW Regulating Valves – RESTORING S/G LEVEL TO 52% IN AUTO	<b>NOTE:</b> The AFW System is in service.
	CO	(Step 7) Verify Bus 14 – ENERGIZED TO AT LEAST 440 VOLTS	
	CO	(Step 8) Verify Bus 16 – ENERGIZED TO AT LEAST 440 VOLTS	
	HCO	(Step 8 RNO) Perform the following:	
		a. Ensure the following equipment operating as necessary:	
		o CCW Pump A	
		o Charging Pump A	

Op Test No.: 2018 Scenario # 1 Event # 3 Page 17 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	<ul style="list-style-type: none"> <li>PRZR Proportional Heaters</li> </ul>	
		<ul style="list-style-type: none"> <li>CNMT Recirc Fans A and D</li> </ul>	<b>NOTE:</b> Only 'D' CNMT Recirc Fan is available.
		<ul style="list-style-type: none"> <li>Boric Acid Pump A</li> </ul>	
		<ul style="list-style-type: none"> <li>RMW Pump A</li> </ul>	
		<ul style="list-style-type: none"> <li>Reactor Compartment Cooling Fan A</li> </ul>	
		<ul style="list-style-type: none"> <li>Penetration Cooling Fan A</li> </ul>	<b>NOTE:</b> CO will START 'A' Penetration Cooling Fan
		<ul style="list-style-type: none"> <li>SFP Cooling</li> </ul>	<b>NOTE:</b> The US will contact the EO. <b>SIM DRIVER:</b> acknowledge as EO and report that 'A' SFP cooling system is in service.
	US	b. Direct AO to swap Aux Bldg lighting to MCC C (switch at MCC C, locked valve key required)	<b>NOTE:</b> The US will contact the EO. <b>SIM DRIVER:</b> acknowledge as EO
		c. <u>IF</u> Bus 16 can <u>NOT</u> be energized, <u>THEN:</u>	
		<ul style="list-style-type: none"> <li>Provide alternate room cooling for D/G B.</li> </ul>	<b>NOTE:</b> The US will contact the EO/WCC.
		<ul style="list-style-type: none"> <li>Cross-connect D/G A fuel oil transfer pump to D/G B (Refer to ER-D/G.1, RESTORING D/Gs).</li> </ul>	<b>SIM DRIVER:</b> acknowledge as EO/WCC, and use REM GEN18 = OPEN. Report complete in 3 minutes.
	HCO	(Step 9) Check VCT Makeup System:	
		a. Ensure the following:	
		1) RMW mode selector switch in AUTO	
		2) RMW control armed – RED LIGHT LIT	
		b. Check VCT level:	<b>NOTE:</b> RNO will be performed if Letdown was isolated.
		<ul style="list-style-type: none"> <li>Level – GREATER THAN 20%</li> </ul>	
		-OR-	

Op Test No.: 2018 Scenario # 1 Event # 3 Page 18 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	o Level – STABLE OR RISING	
	HCO	(Step 9.b RNO) Check letdown divert valve, LCV-112A, aligned to VCT.	<b>NOTE:</b> If S-3.2P performed, then RNO will not be performed.
		Manually raise VCT makeup flow as follows:	<b>NOTE:</b> US may elect to allow AUTO Makeup to maintain VCT level.
	HCO	(Step 10) Check Charging Pump Suction Aligned To VCT:	
		a. VCT level – GREATER THAN 20%	
		b. Align charging pumps to VCT	
		o LCV-112C open	
		o LCV-112B closed	
	HCO	(Step 11) Check CVCS Operation:	
		a. Charging pumps – AT LEAST ONE RUNNING	
		b. Charging line flow – GREATER THAN 22 GPM	
	US	(Step 11.b RNO) Establish charging line flow to REGEN Hx – GREATER THAN 22 GPM	<b>NOTE:</b> IF Letdown is isolated, the US may decide to maintain minimum Charging flow until letdown is established
	HCO	(Step 11 cont'd)	
		c. Check letdown indications:	
		o Check PRZR level – GREATER THAN 13%	
		o Letdown flow – APPROXIMATELY 40 GPM (60 GPM IF AOV-202 OPEN)	
		o Letdown flow - STABLE	

Op Test No.: 2018 Scenario # 1 Event # 3 Page 19 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 11.c RNO) Perform the following:	<b>NOTE:</b> IF Letdown is isolated, the US will perform RNO
		1) Close letdown isolation, AOV-427	
	HCO	2) Close letdown orifice valves (AOV-200A, AOV-200B, AOV-202)	
		3) Close letdown isolation, AOV-371	
		4) <u>IF</u> seal injection in service, <u>THEN</u> close charging flow control valve HCV-142 <u>WHILE</u> adjusting charging pump speed to maintain:	
		o RCP labyrinth seal D/P between 15 inches and 80 inches	
		o PRZR level at program	<b>NOTE:</b> With letdown isolated, PRZR level will be rising
		5) <u>IF</u> PRZR level greater than 13%, <u>THEN</u> go to step 12.	
	US	(Step 12) Establish Normal Letdown (Refer to ATT-9.0, ATTACHMENT LETDOWN)	<b>NOTE:</b> IF Letdown was isolated, the US may decide to place Normal Letdown in service using a 40 gpm orifice. If so continue <b>HERE</b> .
			<b>NOTE:</b> If the US determines that Excess Letdown will be placed in service, then continue on <b>PAGE 20</b> .
			<b>NOTE:</b> IF S-3.2P was performed to swap orifice valves, then continue on <b>PAGE 22</b> .
<b>ATT-9.0, ATTACHMENT LETDOWN</b>			
	HCO/CO	(Step A) The following conditions must be met to place normal letdown in service:	
		o IA to CNMT – ESTABLISHED	
		o CCW – IN SERVICE	
		o PRZR level – GREATER THAN 13%	

Op Test No.:	2018	Scenario #	1	Event #	3	Page	20	of	60
Event Description:		<b>Fault / Loss of Emergency Bus: 480V Bus 16</b>							

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step B) Establish Normal Letdown:	
		1. Establish charging line flow to REGEN Hx – GREATER THAN 22 gpm	
		2. Place the following switches to CLOSE:	
	HCO/ CO	<ul style="list-style-type: none"> <li>Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)</li> </ul>	
		<ul style="list-style-type: none"> <li>Letdown isolation, AOV-427</li> </ul>	
		3. Place letdown controllers in MANUAL at 40% open (60% open if 60 gpm orifice to be selected):	<b>NOTE:</b> 40 gpm orifice will be placed in service.
		<ul style="list-style-type: none"> <li>Temperature control valve, TCV-130</li> </ul>	
		<ul style="list-style-type: none"> <li>Pressure control valve, PCV-135</li> </ul>	
		4. Ensure AOV-371, letdown isolation valve – OPEN.	
		5. Place letdown isolation, AOV-427 to OPEN, <u>THEN</u> place to AUTO.	
		6. Open letdown orifice valve(s) to obtain desired flow	
		<ul style="list-style-type: none"> <li>40 gpm letdown orifice valve, AOV-200A or AOV-200B</li> </ul>	<b>NOTE:</b> A 40 gpm orifice will be placed in service
		<ul style="list-style-type: none"> <li>60 gpm letdown orifice valve, AOV-202</li> </ul>	
		7. Place PCV-135 in AUTO at 250 psig.	
		8. Place TCV-130 in AUTO at the normal setpoint.	
		9. Adjust charging pump speed and HCV-142 to control PRZR level and RCP labyrinth seal D/P.	
<b>ATT-9.1, ATTACHMENT EXCESS L/D</b>			
	HCO/ CO	(Step A) The following conditions must be met to place excess letdown in service:	
		<ul style="list-style-type: none"> <li>IA to CNMT - ESTABLISHED</li> </ul>	
		<ul style="list-style-type: none"> <li>CCW - IN SERVICE</li> </ul>	

Op Test No.:	2018	Scenario #	1	Event #	3	Page	21	of	60
Event Description:		<b>Fault / Loss of Emergency Bus: 480V Bus 16</b>							

Time	Pos.	Expected Actions/Behavior	Comments
		o PRZR level - GREATER THAN 13%	
	HCO/ CO	(Step B) Establish excess letdown:	
	HCO/ CO	1. Ensure EXCESS LTDN LOOP A COLD TO Hx, AOV-310 is closed.	
		2. Ensure EXCESS LTDN flow control valve, HCV-123 is closed, demand at 0.	
		3. Ensure SEAL OR EXCESS LTDN RETURN ISOL VALVE, MOV-313, is open.	
		4. Place excess letdown divert valve, AOV-312, to DIVERT.	
		5. Ensure CCW FROM EX LTDN Hx, AOV-745 – OPEN.	
		6. Open EXCESS LTDN LOOP A COLD TO HX, AOV-310.	
		7. Flush approximately 10 gallons to RCDT as follows (3.2 gal/%, PPCS Point ID LI003).	
		a. Slowly open EXCESS LTDN flow control valve, HCV-123, to maintain excess letdown temperature less than 195°F and pressure less than 100 psig.	
		b. Ensure approximately 10 gallons is flushed to the RCDT.	
		c. <u>IF</u> RCP seal return has been established, <u>THEN</u> place EXCESS LTDN HX DIVERT TO VCT OR RCDT VALVE, AOV-312, to NORMAL.	
		8. Adjust charging pump speed to control PRZR level and labyrinth seal D/P.	
<b>AP-ELEC.14/16, LOSS OF SAFEGUARDS BUS 14/16</b>			



Op Test No.: 2018 Scenario # 1 Event # 3 Page 22 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 11 cont'd) d. Adjust charging pump speed and HCV-142 to restore PRZR level and labyrinth seal D/P	<b>NOTE:</b> This Step will be performed IF S-3.2P was performed to swap orifice valves and Normal letdown is in service.
	US	e. Go to Step 13.	
	HCO	(Step 13) Verify PRZR Heaters Restored:	
		o PRZR proportional heater breaker - CLOSED	
		o PRZR backup heater breaker – RESET, IN AUTO	<b>NOTE:</b> The US will recognize that the PRZR Backup Heaters are de-energized
	HCO	(Step 14) Verify Normal Rod Control Restored:	
		a. Annunciator C-5, PPCS ROD SEQUENCE OR ROD DEVIATION - EXTINGUISHED	
		b. Annunciator E-28, POWER RANGE ROD DROP ROD STOP - EXTINGUISHED	
		c. Annunciator F-15, RCS TAVG DEV 4°F - EXTINGUISHED	
		d. Place rods in AUTO, if desired	<b>NOTE:</b> The US will maintain rods in MANUAL
	US	(Step 15) Establish Stable Plant Conditions:	
	HCO	a. Check Tavg – TRENDING TO TREF	<b>NOTE:</b> The US will recognize that Tavg is normal for plant conditions
	HCO	b. Check PRZR pressure – TRENDING TO 2235 PSIG IN AUTO	
	HCO	c. Check PRZR level – TRENDING TO PROGRAM IN AUTO CONTROL	<b>NOTE:</b> 'A' Charging Pump may still be in MANUAL control
	US	(Step 16) Restore Normal Electric System Alignment:	

Op Test No.: 2018 Scenario # 1 Event # 3 Page 23 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	a. Verify all AC bus normal feed breakers - CLOSED	
		• Bus 13	
		• Bus 14	
		• Bus 15	
		• Bus 16	<b>NOTE:</b> Bus 16 normal feed breaker is tripped
		• Bus 17	
		• Bus 18	
	US	(Step 16.a RNO) Perform the following:	
	CO	1) Refer to AR-L-5 to reset a safeguards bus over current condition.	<b>NOTE:</b> The US will recognize that Bus 16 overcurrent condition has NOT been repaired
		2) Restore non-faulted AC busses...	
		3) <u>IF</u> normal power is restored to all AC emergency buses, <u>THEN</u> return to step 9. <u>IF NOT</u> , <u>THEN</u> go to step 17.	<b>NOTE:</b> The US will go to step 17
	US	(Step 17) Establish Normal Plant Conditions:	
	HCO	a. Verify 2 charging pumps - RUNNING	<b>NOTE:</b> Only 'A' Charging Pump is available
	HCO	b. Verify at least 2 CNMT Recirc fans - RUNNING	<b>NOTE:</b> Only 'D' CNMT Recirc Fan is available
	HCO	c. Check CCW pumps – ONLY ONE RUNNING	
	CO	d. Check radiation monitoring systems:	
		○ CNMT vent sample pump - RUNNING	
		○ Plant vent sample pump - RUNNING	
		○ All area and process monitors operating as required	

Op Test No.: 2018 Scenario # 1 Event # 3 Page 24 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step18) Check Status of DC System Loads:	
	CO	a. Verify TDAFW pump DC oil pump - OFF IN AUTO	
	US	(Step 19) Check Status of Battery Chargers:	
	CO	a. Battery Chargers A <u>OR</u> A1 - ENERGIZED (Annunciator J-15, BATTERY CHRGR FAILURE OR PA INVERTER TROUBLE, EXTINGUISHED	
	CO	b. Battery Chargers B <u>OR</u> B1 - ENERGIZED (Annunciator J-15, BATTERY CHRGR FAILURE OR PA INVERTER TROUBLE, EXTINGUISHED	<b>NOTE:</b> US should recognize that Battery Chargers B AND B1 are de-energized.
			<b>Examiner NOTE:</b> At discretion, move to next Events and address the Technical Specification evaluation after the scenario.
	US	(Step 20) Restore Equipment Alignment:	
	CO	a. Verify annunciator L-1, AUX BLDG VENT SYSTEM CONTROL PANEL - EXTINGUISHED	
	US	(Step 20.a RNO) Dispatch AO to restore AUX BLDG ventilation (Refer to T-35A, AUX AND INTERMEDIATE BUILDING VENTILATION STARTUP AND SHUTDOWN)	<b>NOTE:</b> The US will contact the EO. <b>SIM DRIVER:</b> acknowledge as EO
	US	(Step 20 cont'd) b. Restore affected bus equipment as power supply permits.	
		o SFP Cooling	<b>NOTE:</b> The US will contact the EO. <b>SIM DRIVER:</b> acknowledge as EO
	HCO	o Penetration cooling fans	

Op Test No.: 2018 Scenario # 1 Event # 3 Page 25 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	<ul style="list-style-type: none"> <li>Reactor compartment cooling fans</li> </ul>	
		<ul style="list-style-type: none"> <li>Hydrogen panel</li> </ul>	<b>NOTE:</b> The US will contact the EO. <b>SIM DRIVER:</b> acknowledge as EO
		<ul style="list-style-type: none"> <li>PA system inverter (Battery Room A)</li> </ul>	
		<ul style="list-style-type: none"> <li>Auxiliary Bldg lighting (normal supply MCC D, manual throwover to MCC C) (switch at MCC C, locked valve key required)</li> </ul>	
		<ul style="list-style-type: none"> <li>Fire system (Refer to SC-3.16.2.3)</li> </ul>	<b>NOTE:</b> The US will inform the STA/SM
	HCO/CO	c. Evaluate MCB annunciator status (Refer to AR Procedures)	
	HCO	d. Verify control board valve alignment - NORMAL (Refer to O-6.13, DAILY SURVEILLANCE LOG)	
	US	(Step 21) Establish Control System In Auto:	
	HCO	a. Verify 431K in AUTO	
	HCO	b. Verify PRZR spray valves in AUTO	
	HCO	c. Verify PRZR heaters restored:	
	HCO	<ul style="list-style-type: none"> <li>PRZR proportional heaters breaker - CLOSED</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR backup heaters breaker – RESET, IN AUTO</li> </ul>	<b>NOTE:</b> The US will recognize that the PRZR Backup Heaters are de-energized
	HCO	d. Verify one charging pump in AUTO	
	CO	e. Verify MFW regulating valves in AUTO	<b>NOTE:</b> The AFW System is in service
	CO	f. Restore EH controls	<b>NOTE:</b> The Main Turbine is secured
	CO	g. Verify annunciator G-15, STEAM DUMP ARMED - EXTINGUISHED	<b>NOTE:</b> The MSIVs are CLOSED
	HCO	h. Verify rods in AUTO	<b>NOTE:</b> The US will maintain rods in MANUAL

Op Test No.:	2018	Scenario #	1	Event #	3	Page	26	of	60
Event Description:		<b>Fault / Loss of Emergency Bus: 480V Bus 16</b>							

Time	Pos.	Expected Actions/Behavior			Comments
	HCO/ CO	(Step 22) Evaluate MCB annunciator status (Refer to AR Procedures)			
	US	(Step 23) Verify emergency AC bus normal feed breakers closed			
		o Bus 14			
		o Bus 16			<b>NOTE:</b> Bus 16 normal feed breaker is tripped
	US	(Step 23 RNO) Return to Step 9			
					<b>NOTE:</b> US may conduct a Plant Status Brief.
<b>TECHNICAL SPECIFICATION 3.8.1, AC SOURCES – MODES 1, 2, 3, AND 4</b>					
	US	LCO 3.8.1 The following AC electrical sources shall be OPERABLE:			
		<ul style="list-style-type: none"><li>One qualified independent offsite power circuit connected between the offsite transmission network and each of the onsite 480 V safeguards buses required by LCO 3.8.9, "Distribution Subsystems – MODES 1, 2, 3, and 4"; and</li></ul>			
		<ul style="list-style-type: none"><li>Two emergency diesel generators (DGs) capable of supplying their respective onsite 480 V safeguards buses required by LCO 3.8.9.</li></ul>			
	US	APPLICABILITY: MODES 1, 2, 3, and 4.			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	

Op Test No.: 2018 Scenario # 1 Event # 3 Page 27 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior			Comments
		A. Offsite power to one or more 480 V safeguards bus(es) inoperable.	A.1 Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.  <u>AND</u> A.2 Restore offsite circuit to OPERABLE status.	12 hours from discovery of Condition A concurrent with inoperability of redundant required feature(s)   72 hours	The US will recognize that LCO 3.8.1 Conditions A, B and C are applicable.
		B. One DG inoperable.	B.1 Perform SR 3.8.1.1 for the offsite circuit.  <u>AND</u>	1 hour <u>AND</u> Once per 8 hours thereafter	
			B.2 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.  <u>AND</u>	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s).	
			B.3.1 Determine OPERABLE DG is not inoperable due to common cause failure.  <u>OR</u>	24 hours	
			B.3.2 Perform SR 3.8.1.2 for OPERABLE DG.  <u>AND</u>	24 hours	
			B.4 Restore DG to OPERABLE status.	7 days	

Op Test No.: 2018 Scenario # 1 Event # 3 Page 28 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior			Comments
		C. Offsite power to one or more 480 V safeguards bus(es) inoperable.  <u>AND</u> One DG inoperable.	C.1 Restore required offsite circuit to OPERABLE status. <u>OR</u> C.2 Restore DG to OPERABLE status.	12 hours  12 hours	
TECHNICAL SPECIFICATION 3.8.4, DC SOURCES – MODES 1, 2, 3, AND 4					
	US	LCO 3.8.4 The Train A and Train B DC electrical power sources shall be OPERABLE:			
	US	APPLICABILITY: MODES 1, 2, 3, and 4.			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will recognize that LCO 3.8.4 Condition A is applicable.
		A. One DC electrical power source inoperable.	A.1 Restore DC electrical power source to OPERABLE status.	2 hours	
TECHNICAL SPECIFICATION 3.8.9, DISTRIBUTION SYSTEMS – MODES 1, 2, 3, AND 4					
	US	LCO 3.8.9 Train A and Train B of the following electrical power distribution subsystems shall be OPERABLE:			
		• AC power;			
		• AC instrument bus power; and			
		• DC power			
	US	APPLICABILITY: MODES 1, 2, 3, and 4.			

Op Test No.: 2018 Scenario # 1 Event # 3 Page 29 of 60Event Description: **Fault / Loss of Emergency Bus: 480V Bus 16**

Time	Pos.	Expected Actions/Behavior			Comments
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will recognize that LCO 3.8.9 Condition A is applicable.
		A. One AC electrical power distribution train inoperable	A.1 Restore AC electrical power distribution train to OPERABLE status.	8 hours	
At the discretion of the Lead Examiner move to Events #4-8					



Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 30 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Afterwards, a Small Break LOCA occurs over five minutes. The operator will enter AP-RCS.1, Reactor Coolant Leak; however, ultimately the reactor will be tripped, Safety Injection will be manually actuated, and the operator will enter E-0, Reactor Trip or Safety Injection. When the SI occurs, the 'A' SI Pump will trip and the 'A' RHR Pump will fail to start automatically and will be manually started in accordance with ATT-27.0, Attachment Automatic Action Verification.

The operator will transition from E-0 to E-1, Loss of Reactor or Secondary Coolant. Ultimately, an ORANGE path on the Core Cooling Safety Function will occur and the operator will transition to FR-C.2, Response to Degraded Core Cooling.

Shortly after entry into FR-C.2, 'A' RCP will trip on high vibrations. The scenario will terminate at Step 13 (or beyond) of FR-C.2 after S/G depressurization has begun and ECCS Accumulators begin to inject.

**SIM DRIVER Instructions:** **Operate Trigger #3 (RCS02D, 3000, 300 second Ramp)**

**Indications Available:**

- Pressurizer Pressure lowers
- MCB Annunciator F-10, PRESSURIZER LO PRESS 2205 PSI
- PZR level lowers
- Containment Pressure starts to rise
- MCB Annunciator E-16, RMS PROCESS MONITOR HIGH ACTIVITY
- Containment Radiation Monitors (R-2, R-7, others) start to rise

Time	Pos.	Expected Actions/Behavior	Comments
<b>AP-RCS.1, REACTOR COOLANT LEAK</b>			
	HCO	(*Step 1) Monitor PRZR Level – STABLE AT PROGRAM LEVEL	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
	HCO	(Step 1 RNO) <u>IF</u> PRZR level lowering, <u>THEN</u> start additional charging pumps and raise speed as necessary to stabilize PRZR level.	<b>NOTE:</b> Only 'A' Charging Pump is available
		<u>IF</u> PRZR level continues to lower, <u>THEN</u> close letdown isolation AOV-427 <u>AND</u> excess letdown AOV-310.	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 31 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	IF available charging pumps are running at maximum speed with letdown isolated, <u>AND</u> PRZR level is lowering, <u>THEN</u> trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION.	<b>Examiner NOTE:</b> The RCS leak/LOCA is slow developing and the crew may perform additional steps in AP-RCS.1 while determining that the Rx must be tripped and SI actuated.  Regardless of further actions in AP-RCS.1, ultimately the crew will need to trip the reactor and actuate SI.
<b>SIM DRIVER Instructions: Ensure Trigger #4 (P-MIS07, 1) activates on Reactor Trip</b>			
<b>E-0, REACTOR TRIP OR SAFETY INJECTION</b>			
	HCO	(Step 1) Verify Reactor Trip:	<b>Immediate Action</b>
		o At least one train of reactor trip breakers – OPEN	
		o Neutron flux – LOWERING	
		o MRPI indicates – ALL CONTROL <u>AND</u> SHUTDOWN RODS ON BOTTOM with no instrument fluctuations concurrent with fire.	
	CO	(Step 2) Verify Turbine Stop Valves - CLOSED	<b>Immediate Action</b> <b>NOTE:</b> The Turbine is NOT latched.
	CO	(Step 3) Verify sufficient AC Emergency buses Energized To At Least 440 VOLTS:	<b>Immediate Action</b>
		o Bus 14 <u>OR</u> Bus 16	<b>NOTE:</b> Bus 16 is de-energized.
		-AND-	
		o Bus 17 <u>OR</u> Bus 18	<b>NOTE:</b> Both buses are energized. The 'B' D/G is powering Bus 17.

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 32 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 4) Check if SI is Actuated:	<b>Immediate Action</b>
		a. Any SI Annunciator – LIT	
		b. SI sequencing – BOTH TRAINS STARTED	<b>NOTE:</b> Automatic SI will fail to actuate. It is expected that the HCO will manually actuate SI and CI when the reactor is manually tripped. If not, then MANUAL SI and CI will be performed here.
	HCO	(Step 4.b RNO) Manually actuate SI and CI.	<b>NOTE:</b> Only 'A' Train equipment will start.

**CRITICAL TASK:****Manually actuate at least one train of Safety Injection before exiting E-0 (EOP-Based)**

Safety Significance: Failure to actuate Safety Injection when it is required to be actuated, and can be actuated, violates the assumptions of the Safety Analysis and constitutes incorrect performance that could lead to misdiagnosis of the event, implementation of an incorrect mitigation strategy and ultimately degradation of the RCS and/or fuel cladding fission product barriers.

	HCO/CO	Foldout Page	<b>NOTE:</b> The crew will monitor these conditions throughout the performance of E-0.
	HCO/CO	RCP TRIP CRITERIA	
		a. <u>IF</u> BOTH conditions listed below occur, <u>THEN</u> trip both RCPs:	
		a. SI pumps - AT LEAST TWO RUNNING	<b>NOTE:</b> This condition is NOT met.

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 33 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	b. RCS pressure minus maximum S/G pressure - LESS THAN 210 psi [240 psi adverse CNMT]	
		LOSS OF SW CRITERIA	
		AFW SUPPLY SWITCHOVER CRITERION	
		SFP COOLING CRITERIA	
	HCO	(*Step 5) Verify CNMT Spray Not Required:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.  <b>NOTE:</b> Containment Pressure is expected to be ≈ 3 psig and rising slowly.
		○ Annunciator A-27, CNMT SPRAY EXTINGUISHED	
		○ CNMT pressure – LESS THAN 28 PSIG	
	CO	(Step 6) Direct Operator to Perform ATT-27.0, ATTACHMENT AUTOMATIC ACTION VERIFICATION	
			<b>NOTE:</b> The US will hand off ATT-27.0 to either the HCO or the CO, and continue with the other operator in E-0. <b>Examiner</b> following operator performing ATT-27.0 continue below. <b>Examiner</b> following operator NOT performing ATT-27.0 continue at <b>Page 39</b> .
<b>E-0, REACTOR TRIP OR SAFETY INJECTION, ATTACHMENT 27.0, ATTACHMENT AUTOMATIC ACTION VERIFICATION</b>			
	HCO/ CO	(Step 1) Verify SI and RHR Pumps Running:	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 34 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
		a. All SI pumps – RUNNING	<b>NOTE:</b> There are no SI Pumps running
	HCO/ CO	(Step 1.a RNO) Manually start SI pumps	<b>NOTE:</b> SI Pumps CANNOT be started.
	HCO/ CO	b. Both RHR pumps – RUNNING	<b>NOTE:</b> No RHR Pumps are running
	HCO/ CO	(Step 1.b RNO) Manually start RHR pumps.	<b>NOTE:</b> 'A' RHR Pump will be started.

**CRITICAL TASK:**

**Manually start at least one RHR Pump to provide a low-head injection source prior to initiating S/G depressurization in FR-C.2 (EOP-Based)**

Safety Significance: Failure to depressurize the S/Gs results in the needless deterioration of core cooling to an inadequate status. Inventory losses continue while no makeup can be injected into the RCS because of the system pressure. Depressurizing the S/Gs would provide some immediate benefit by condensing steam on the primary side of the S/G U-tubes. Eventually, continued depressurization of the S/Gs will lead to ECCS accumulator injection and to low-head ECCS injection. Accumulator injection and low-head injection would restore the core cooling CSF to an adequate status. Thus, failure to depressurize the S/Gs when it is possible to do so (as it is in the postulated plant conditions) causes an extreme (red-path) challenge to the core cooling CSF that could be avoided by secondary depressurization. Failure to perform the critical task causes a "significant reduction of safety margin beyond that irreparably introduced by the scenario." Additionally, it represents a "demonstrated inability by the crew to take an action or combination of actions that would prevent a challenge to plane safety."

	HCO/ CO	(Step 2) Verify CNMT RECIRC Fans RUNNING:	
		a. All fans - RUNNING	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 35 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 2.a RNO) Manually start fans.	<b>NOTE:</b> Only 'D' CNMT Recirc Fan is available.
	HCO/ CO	b. Charcoal filter dampers green status lights – EXTINGUISHED	
	HCO/ CO	(Step 3) Check If Main Steamlines Should Be Isolated:	
		• Any MSIV – OPEN	<b>NOTE:</b> MSIVs are CLOSED
	HCO/ CO	(Step 3.a RNO) Go to Step 4.	
	HCO/ CO	(Step 4) Verify MFW Isolation:	
		a. MFW pumps – TRIPPED	<b>NOTE:</b> Both MFW Pumps are in PULL STOP.
		b. MFW Isolation valves - CLOSED	
		• S/G A, AOV-3995	
		• S/G B, AOV-3994	
		c. S/G blowdown and sample valves - CLOSED	
	HCO/ CO	(Step 5) Verify At Least Two SW Pumps - RUNNING	
	HCO/ CO	(Step 6) Verify CI and CVI:	
		a. CI and CVI annunciators - LIT	
		• Annunciator A-26, CNMT ISOLATION	
		• Annunciator A-25, CNMT VENTILATION ISOLATION	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 36 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	b. Verify CI and CVI valve status lights - BRIGHT	
	HCO/ CO	(Step 6b RNO) Manually close affected CI and CVI valve(s).	<b>NOTE:</b> MOV-814 is de-energized
		<u>IF</u> valve(s) can <u>NOT</u> be closed from the MCB, <u>THEN</u> close alternate isolation valve(s). (Refer to ATT-3.0, ATTACHMENT CI/CVI)	<b>NOTE:</b> MOV-814 will have a DIM status light and will be isolated using ATT-3.0.
<b>ATTACHMENT 3.0, ATTACHMENT CI/CVI</b>			
	HCO/ CO	(Step 1) For each of the following AUTO ISOL VALVES that will not close, take the action directed in the ALTERNATE ISOLATION column.	
	HCO/ CO	MOV-814 (ALTERNATE ISOL) Close V-815A (AB INT LEVEL)	<b>NOTE:</b> The HCO/CO will dispatch an EO. <b>SIM DRIVER:</b> as EO acknowledge (V-815A is NOT modeled)
<b>E-0, REACTOR TRIP OR SAFETY INJECTION, ATTACHMENT 27.0, ATTACHMENT AUTOMATIC ACTION VERIFICATION</b>			
	HCO/ CO	(Step 6 Continued) c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT	
		• FCV-4561	
		• FCV-4562	
	HCO/ CO	d. Letdown orifice valves - CLOSED	
		• AOV-200A	
		• AOV-200B	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 37 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	<ul style="list-style-type: none"> <li>AOV-202</li> </ul>	
	HCO/ CO	(Step 7) Check CCW System Status:	
		a. Verify CCW pump – AT LEAST ONE RUNNING	<b>NOTE:</b> 'A' CCW Pump is running.
	HCO/ CO	(Step 8) Verify SI And RHR Pump Flow:	
		a. SI flow indicators – CHECK FOR FLOW	
	HCO/ CO	(Step 8a RNO) <u>IF</u> RCS pressure less than 1300 psig manually start pumps and align valves. <u>IF NOT, THEN</u> go to Step 9.	<b>NOTE:</b> No SI Pumps can be started.
	HCO	b. RHR flow indicator – CHECK FOR FLOW	
	HCO/ CO	(Step 8b RNO) <u>IF</u> RCS pressure less than 150 psig manually start pumps and align valves. <u>IF NOT, THEN</u> go to Step 9.	<b>NOTE:</b> 'A' RHR Pump should have been started earlier. If not, it will be started now.
	HCO/ CO	(Step 9) Verify SI Pump And RHR Pump Emergency Alignment:	
		a. RHR pump discharge to Rx vessel deluge - OPEN	
		<ul style="list-style-type: none"> <li>MOV-852A</li> </ul>	
		<ul style="list-style-type: none"> <li>MOV-852B</li> </ul>	<b>NOTE:</b> MOV-852B is de-energized.
	HCO/ CO	(Step 9.a RNO) Ensure at least one valve open.	<b>NOTE:</b> MOV-852A is open.



Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 38 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	b. Verify SI pump C – RUNNING	
	HCO/ CO	(Step 9.b RNO) Manually start pump on available bus.	<b>NOTE:</b> 'C' SI Pump is tagged for maintenance.
		c. Verify SI pump A - RUNNING	
	HCO/ CO	(Step 9.c RNO) Perform the following:	
	HCO/ CO	1) Ensure SI pumps B and C running. <u>IF</u> either pump <u>NOT</u> , running, <u>THEN</u> go to Step 9e.	<b>NOTE:</b> No SI Pumps are running nor available.
	HCO/ CO	(Step 9.e) Verify SI pump C discharge valves - OPEN	
		• MOV-871A	
		• MOV-871B	
	HCO/ CO	(Step 10) Verify CREATS Actuation:	
		a. At least one damper in each flowpath - CLOSED	
		• Normal Supply Air	
		• Normal Return Air	
		• Lavatory Exhaust Air	
		b. CREATS fans – BOTH RUNNING	
	HCO/ CO	(Step 10.b RNO) Start both CREATS fans	<b>NOTE:</b> 'B' CREATS Fan is de-energized.
	HCO/ CO	(Step 11) Verify CI and CVI During a Fire Event	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 39 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	a. A confirmed fire has occurred in the control complex or cable tunnel (fire systems S05, S06, S08, Z05, Z18, or Z19).	
	HCO/ CO	(Step 11 RNO) Go to END	
<b>E-0, REACTOR TRIP OR SAFETY INJECTION</b>			
			<b>Examiner</b> following operator NOT performing ATT-27.0 continue <b>HERE</b> .
	CO/ HCO	(Step 7) Verify Both MDAFW Pumps - RUNNING	<b>NOTE:</b> 'B' MDAFW Pump is de-energized.
	CO/ HCO	(Step 7 RNO) Manually start both MDAFW pumps.	
		IF less than 2 MDAFW pumps are running, THEN manually open TDAFW pump steam supply valves.	<b>NOTE:</b> TDAFW Pump valves will be opened. Operator will need to CLOSE TDAFW Pump discharge valves based on S/G level.
		• MOV-3505A	
		• MOV-3504A	
	CO/ HCO	(Step 8) Verify AFW Valve Alignment:	
		a. AFW flow – INDICATED TO BOTH S/G(s)	
		b. AFW flow from each MDAFW pump - LESS THAN 230 GPM	<b>NOTE:</b> Only 'A' MDAFW Pump is running.
	CO/ HCO	(Step 8.b RNO) Manually align valves as necessary.	<b>NOTE:</b> Available AFW Pumps are aligned.

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 40 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	(*Step 9) Monitor Heat Sink:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Check S/G narrow range level GREATER THAN 7% [25% adverse CNMT] in any S/G	<b>NOTE:</b> Adverse Containment may exist at this time.
		b. Check S/G narrow range level - BOTH S/G LESS THAN 50%	<b>NOTE:</b> S/G water level may be > 50% due to initial plant conditions.
	CO/ HCO	(Step 9.b RNO) Secure AFW flow to any S/G with level above 50%.	<b>NOTE:</b> AFW flow will be secured, if not already completed.
	CO/ HCO	c. Control feed flow to maintain S/G narrow range level between 7% [25% adverse CNMT] and 50%.	<b>NOTE:</b> Adverse Containment may exist at this time.
	CO/ HCO	(Step 10) Check If TDAFW Pump Can Be Stopped:	
		a. Both MDAFW pumps – RUNNING	
	CO/ HCO	(Step 10.a RNO) Go to step 11.	
	CO/ HCO	(Step 11) Check CCW Flow to RCP thermal Barriers:	
		o Annunciator A-7. RCP 1A CCW RETURN HI TEMP <u>OR</u> LO FLOW - EXTINGUISHED	
		o Annunciator A-15, RCP 1B CCW RETURN HI TEMP <u>OR</u> LO FLOW - EXTINGUISHED	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 41 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	(*Step 12) Monitor RCS Tavg – STABLE AT <u>OR</u> TRENDING TO 547°F	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.  <b>NOTE:</b> Tavg is expected to be less than 547°F and lowering.
	CO/ HCO	(Step 12 RNO) <u>IF</u> temperature less than 547°F and lowering, <u>THEN</u> perform the following:	
	CO	<ul style="list-style-type: none"> <li>Stop dumping steam.</li> </ul>	
		<ul style="list-style-type: none"> <li>Ensure reheater steam supply valves are closed.</li> </ul>	
		<ul style="list-style-type: none"> <li><u>IF</u> cooldown continues, <u>THEN</u> control total feed flow between 200 gpm to 230 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G.</li> </ul>	<b>NOTE:</b> Adverse Containment may exist at this time.
		<ul style="list-style-type: none"> <li><u>WHEN</u> S/G level greater than 7% [25% adverse CNMT] in one S/G, <u>THEN</u> limit feed flow to that required to maintain level in at least one S/G.</li> </ul>	
		<ul style="list-style-type: none"> <li><u>IF</u> cooldown continues, <u>THEN</u> close both MSIVs.</li> </ul>	<b>NOTE:</b> Both MSIVs are closed. US may contact EO to CLOSE MSIV Bypass Valves. <b>SIM DRIVER:</b> as EO acknowledge, Insert REM STM03 and STM04 = 0
	CO/ HCO	(Step 13) Check PRZR PORVS And Spray Valves:	
		a. PORVs – CLOSED	
		b. Auxiliary spray valve (AOV-296) - CLOSED	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 42 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	c. Check PRZR pressure - LESS THAN 2260 PSIG	
		d. Normal PRZR spray valves - CLOSED	
		• PCV-431A	
		• PCV-431B	
	CO/ HCO	(Step 14) Monitor RCP Trip Criteria:	
		a. RCP status – ANY RCP RUNNING	<b>NOTE:</b> Both RCPs are running.
		b. SI pumps - AT LEAST TWO RUNNING	<b>NOTE:</b> No SI Pumps are running.
	CO/ HCO	(Step 14.b RNO) Go to step 15.	
	CO/ HCO	(Step 15) Check If S/G Secondary Side Is Intact:	
		• Pressure in both S/Gs - STABLE <u>OR</u> RISING	
		• Pressure in both S/Gs – GREATER THAN 110 PSIG	
	CO/ HCO	(Step 16) Check if S/G Tubes are intact:	
		• Air Ejector radiation monitors (R-15, R-47, R-48) - NORMAL	
		• S/G blowdown radiation monitor (R-19) - NORMAL	
		• Steamline radiation monitors (R-31 and R-32) - NORMAL	
	CO/ HCO	(Step 17) Check if RCS is intact:	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 43 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	a. CNMT area radiation monitors - NORMAL	<b>NOTE:</b> Containment Radiation Monitors are rising.
		• R-2	
		• R-7	
		• R-29	
		• R-30	
		b. CNMT pressure – LESS THAN 0.5 PSIG	
	US	(Step 17 RNO) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.	
			<b>NOTE:</b> The US will go to E- 1. The US will conduct an alignment brief.
<b>E-1, LOSS OF REACTOR OR SECONDARY COOLANT</b>			
			<b>Examiner NOTE:</b> Core Cooling ORANGE path conditions are expected to occur during the performance of E-1 actions. US will transition to FR-C.2 and conduct a transition brief. At that time, the remaining steps in E-1 will NOT be taken, continue on <b>Page 51.</b>
	HCO/ CO	Foldout Page	<b>NOTE:</b> The crew will monitor these conditions throughout the performance of E-1.
		RCP TRIP CRITERIA	
		• <u>IF BOTH</u> conditions listed below occur, <u>THEN</u> trip both RCPs:	
		a. SI pumps - AT LEAST TWO RUNNING	<b>NOTE:</b> This condition IS NOT met.

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 44 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	b. RCS pressure minus maximum S/G pressure - LESS THAN 210 psi [240 psi adverse CNMT]	<b>NOTE:</b> Adverse Containment is likely to exist.
		LOSS OF SW CRITERIA	
		SI REINITIATION CRITERIA	
		SI TERMINATION CRITERIA	
		SECONDARY INTEGRITY CRITERIA	
		E-3 TRANSITION CRITERIA	
		COLD LEG RECIRCULATION SWITCHOVER CRITERION	
		AFW SUPPLY SWITCHOVER CRITERION	
	HCO	(Step 1) Monitor RCP Trip Criteria:	
		a. RCP status – ANY RCP RUNNING	
		b. SI pumps – AT LEAST TWO RUNNING	
	US	(Step 1.b RNO) Go to Step 2.	
	CO	(Step 2) Check If S/G Secondary Side Is Intact:	
		o Pressure in both S/Gs – STABLE OR RISING	
		o Pressure in both S/Gs – GREATER THAN 110 PSIG	
	CO	(*Step 3) Monitor Intact S/G Levels:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Narrow range level – GREATER THAN 7% [25% adverse CNMT]	
		b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	<b>NOTE:</b> Adverse Containment is likely to exist.

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 45 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 4) Monitor If Secondary Radiation Levels Are Normal	
		<ul style="list-style-type: none"> <li>Steamline radiation monitor (R-31 and R-32)</li> </ul>	
		<ul style="list-style-type: none"> <li>Request Chem Tech sample S/Gs for activity</li> </ul>	<b>NOTE:</b> The US may contact Chemistry. <b>SIM DRIVER:</b> as Chemistry, acknowledge.
	HCO	(*Step 5) Monitor PRZR PORV Status:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Power to PORV block valves – AVAILABLE	
		b. PORVs – CLOSED	
	HCO	c. Block valves – AT LEAST ONE OPEN.	
	HCO	(Step 6) Reset SI.	
	HCO	(Step 7) Reset CI:	
		a. Depress CI reset pushbutton	
		b. Verify annunciator A-26, CNMT ISOLATION – EXTINGUISHED	
	CO	(Step 8) Verify Adequate SW Flow:	
		a. Check at least two SW pumps - RUNNING	



Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 46 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	<b>NOTE:</b> The US will dispatch an EO. <b>SIM DRIVER:</b> as EO, acknowledge and RUN schedule file SD-1.sch.
	HCO/ CO	(Step 9) Establish IA to CNMT:	
	CO	a. Verify non-safeguards busses energized from offsite power	
		o Bus 13 normal feed breaker – CLOSED	
		OR	
		o Bus 15 normal feed breaker – CLOSED	
		b. Verify SW isolation valves to turbine building - OPEN	
		• MOV-4613 and MOV-4670	
		• MOV-4614 and MOV-4664	
	CO	c. Verify adequate air compressors – RUNNING	
		d. Check IA supply:	
		o Pressure – GREATER THAN 60 PSIG	
		o Pressure – STABLE OR RISING	
		e. Reset both trains of XY relays for IA to CNMT AOV-5392	
		f. Verify IA to CNMT AOV-5392 – OPEN	
	CO	(Step 10) Check Power Availability to Charging Pumps:	
		a. Check Normal Power Available To Charging Pumps:	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 47 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	<ul style="list-style-type: none"> <li>Bus 14 normal feed breaker - CLOSED</li> </ul>	
		<ul style="list-style-type: none"> <li>Bus 16 normal feed breaker - CLOSED</li> </ul>	<b>NOTE:</b> Bus 16 is de-energized
	CO	b. Verify adequate Safeguard Bus capacity to run charging pumps (6 amps each)	
		<ul style="list-style-type: none"> <li>Station Service transformer 14 ammeter</li> </ul>	
		<ul style="list-style-type: none"> <li>Station Service transformer 16 ammeter</li> </ul>	<b>NOTE:</b> Bus 16 is de-energized
	HCO	(Step 11) Check If Charging Flow Has Been Established:	
		a. Charging pumps – ANY RUNNING	
	HCO	(Step 11.a RNO) Perform the following:	
	HCO	1) IF CCW flow is lost to any RCP thermal barrier OR any RCP #1 seal outlet temperature greater than 235°F, THEN dispatch AO to close seal injection needle valve(s) to affected RCP:	<b>NOTE:</b> CCW flow has NOT been lost and seal outlet temperatures are satisfactory.
		2) Ensure HCV-142 open, demand at 0%.	
	HCO	(Step 11.b) Charging pump suction aligned to RWST:	
		o LCV-112B – OPEN	
		o LCV-112C - CLOSED	
	HCO	(Step 11.b RNO) Manually align valves as necessary.	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 48 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 11.c) Start charging pumps and adjust charging flow as necessary to restore PRZR level	<b>NOTE:</b> HCO will start 'A' Charging Pump and maximize flow.
	HCO	(Step 12) Check If SI Should Be Terminated:	
		a. RCS pressure:	
		o Pressure – GREATER THAN 1650 psig [1650 psig adverse CNMT]	
	US	(Step 12.a RNO) Do <u>NOT</u> stop SI pumps. Go to Step 13.	
	HCO	(*Step 13) Monitor If CNMT Spray Should Be Stopped:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. CNMT spray pumps – ANY RUNNING	
	US	(Step 13.a RNO) Go to Step 14.	
	HCO	(*Step 14) Monitor If RHR Pumps Should Be Stopped:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Check RCS pressure:	
		1) Pressure – GREATER THAN 300 psig [350 psig adverse CNMT]	
		2) RCS pressure – STABLE OR RISING	<b>NOTE:</b> RCS pressure will be lowering slowly. Crew may consider RCS pressure STABLE and secure 'A' RHR Pump.

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 49 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 14.a RNO) Go to Step 15.	
		(Step 15) Check RCS and S/G Pressures:	
	CO	a. Check pressures in both S/Gs – STABLE OR RISING	
	CO	b. Check pressures in both S/Gs – GREATER THAN 110 PSIG	
	HCO	c. Check RCS pressure – STABLE OR LOWERING	
	CO	(Step 16) Check If D/Gs Should Be Stopped:	
		a. Verify Safeguards busses 14, 16, 17, and 18 voltage – GREATER THAN 440 VOLTS	<b>NOTE:</b> Bus 16 is de-energized
	US	(Step 16.a RNO) Perform the following:	
		1) Restore bus voltage (Refer to AP-ELEC.2, SAFEGUARD BUSES LOW VOLTAGE OR SYSTEM LOW FREQUENCY)	<b>NOTE:</b> US will recognize that Bus 16 CANNOT be restored. US may contact WCC. <b>SIM DRIVER:</b> as WCC, acknowledge.
	US	2) Continue with Step 17. <u>WHEN</u> bus voltage restored, <u>THEN</u> do Step 16b and c.	
		(Step 17) Evaluate Plant Status:	
	HCO	a. Check auxiliary building radiation – NORMAL	
		• Plant vent iodine (R-10B)	
		• Plant vent particulate (R-13)	
		• Plant vent gas (R-14)	
		• CCW liquid monitor (R-17)	
		• LTDN line monitor (R-9)	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 50 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	<ul style="list-style-type: none"> <li>CHG pump room (R-4)</li> </ul>	
	US	b. WHEN TSC is manned, THEN request evaluation of sampling requirements.	<b>NOTE:</b> US may contact WCC/TSC. <b>SIM DRIVER:</b> as WCC/TSC, acknowledge.
		<ul style="list-style-type: none"> <li>RCS boron</li> </ul>	
		<ul style="list-style-type: none"> <li>RCS activity</li> </ul>	
		<ul style="list-style-type: none"> <li>CNMT hydrogen</li> </ul>	
		<ul style="list-style-type: none"> <li>CNMT sump boron</li> </ul>	
		<ul style="list-style-type: none"> <li>CNMT Sump pH</li> </ul>	
	HCO	c. Verify adequate Rx head cooling:	
		1) Verify at least one control rod shroud fan – RUNNING	
		2) Verify one Rx compartment cooling fan - RUNNING	
		(Step 18) Verify CNMT Sump Recirculation Capability:	
	HCO	a. Check RHR and Support systems:	
	HCO	1) At least one recirculation flowpath, including required power supplies, from Sump B and back to RCS available per ATT-14.5, ATTACHMENT RHR SYSTEM	
	CO	2) At least one SW pump available.	
	HCO	3) At least one CCW pump available.	
	HCO	4) At least one CCW Hx available.	
	CO	b. Check SW pumps – AT LEAST 2 PUMPS AVAILABLE	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 51 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	US	c. Dispatch AO to check AUX BLDG sub-basement for RHR system leakage (AUX BLDG sub-basement key may be required)	<b>NOTE:</b> US will contact EO. <b>SIM DRIVER:</b> as EO, acknowledge and report in 5 minutes that no leakage is observed from the RHR system.
		(Step 19) Check If RCS Cooldown And Depressurization Is Required:	
	HCO	a. RCS pressure – GREATER THAN 300 psig [350 psig adverse CNMT]	
	US	b. Go to ES-1.2, POST LOCA COOLDOWN AND DEPRESSURIZATION, Step 1	
			<b>Examiner NOTE:</b> Core Cooling ORANGE path conditions are expected to have occurred or will occur shortly. US will transition to FR-C.2 and conduct a transition brief. <b>ES-1.2 actions are NOT scripted.</b>
<b>FR-C.2, RESPONSE TO DEGRADED CORE COOLING</b>			
	HCO/CO	Foldout Page	<b>NOTE:</b> The crew will monitor these conditions throughout the performance of FR-C.2.
		LOSS OF SW CRITERIA	
	HCO	(*Step 1) Monitor RWST Level – GREATER THAN 28%	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
<b>SIM DRIVER Instructions: Operate Trigger #5 (RCS15A, 20, 10 second Ramp) (RCS05A, 20 second Delay)</b>			

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 52 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 2) Verify SI Pump Suction Aligned To RWST:	
		a. SI pump suction valves from RWST – OPEN	
		• MOV-825A	
		• MOV-825B	<b>NOTE:</b> MOV-852B is de-energized.
		(Step 3) Verify SI Pump And RHR Pump Emergency Alignment:	
	HCO	a. RHR pump discharge to Rx vessel deluge – OPEN	
		• MOV-852A	
		• MOV-852B	<b>NOTE:</b> MOV-852B is de-energized.
	HCO	(Step 3.b RNO) Ensure at least one valve open.	
	US/ HCO	Step (3.b) Verify SI pump C - RUNNING	
	US	(Step 3.b RNO) Manually start pump on available bus.	<b>NOTE:</b> US will recognize that 'C' SI Pump is tagged for maintenance.
	US/ HCO	(Step 3.c) Verify SI pump A - RUNNING	
		(Step 3.c RNO) Perform the following:	
	US/ HCO	1) Ensure SI pumps B and C running.	<b>NOTE:</b> No SI Pumps are available.
	US/ HCO	2) Ensure SI pump C aligned to discharge line A:	
		o MOV-871B closed	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 53 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	US/ HCO	<ul style="list-style-type: none"> <li>MOV-871A open</li> </ul>	<b>NOTE:</b> US may elect to NOT change valve positions.
	US	3) Go to Step 4.	
		(Step 4) Verify SI Flow In Both Trains:	
	HCO	a. SI line loop A and B flow indicators – CHECK FOR FLOW	
		(Step 4.a RNO) Perform the following:	
	HCO	1) Manually start SI pumps and align valves as necessary.	<b>NOTE:</b> No SI Pumps are available.
	HCO	2) Establish maximum Charging flow as follows:	
	HCO	a) Reset SI if necessary.	
	CO	b) Verify sufficient electrical power is available to start Charging pumps.	
		<ul style="list-style-type: none"> <li><u>IF</u> Bus 14/16 Normal Feed Breakers are Closed 6 amps per pump</li> </ul>	
		<ul style="list-style-type: none"> <li><u>IF</u> Bus 14/16 D/G Breakers are Closed 75 kw per pump</li> </ul>	
	HCO	c) <u>IF</u> sufficient electrical power is available <u>THEN</u> Start Charging Pumps and establish maximum available charging flow.	<b>NOTE:</b> 'A' Charging Pump will be started here if not already running. Suction should be swapped to the RWST.
	HCO	d) <u>IF</u> sufficient power is not available	
		e) <u>WHEN</u> sufficient electrical power is available <u>THEN</u> Start a Charging Pumps and establish maximum available charging flow.	



Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 54 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 4.b) RCS pressure – LESS THAN 300 psig [350 psig adverse CNMT]	
	US	(Step 4.b RNO) Go to Step 5.	
	HCO	(Step 5) Check RCS Vent Paths:	
		a. Power to PRZR PORV block valves – AVAILABLE	<b>NOTE:</b> Only MOV-516 is energized.
		b. PORVs – CLOSED	
		c. Block valves – AT LEAST ONE OPEN	
		d. Rx vessel head vent valves – CLOSED	
		• SOV-590	
		• SOV-591	
		• SOV-592	
		• SOV-593	
		(Step 6) Check RCP Status:	
	HCO	a. At least one RCP – RUNNING	<b>NOTE:</b> 'B' RCP is running.
	HCO/CO	b. Support conditions for the operating RCP(s) available (Refer to ATT-15.0, ATTACHMENT RCP START)	<b>NOTE:</b> The US will hand off ATT-15.0 to either the HCO or the CO, and continue with the other operator in FR-C.2. <b>Examiner</b> following operator performing ATT-15.0 continue below. <b>Examiner</b> following operator NOT performing ATT-15.0 continue at <b>Page 56</b> .
<b>ATT-15.0, ATTACHMENT RCP START</b>			

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 55 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step A) The following are prerequisites for starting an RCP:	<b>NOTE:</b> The operator will recognize these do NOT apply.
	HCO/ CO	(Step B) In addition, the following conditions should be met prior to starting an RCP:	
		<ul style="list-style-type: none"> <li>Both PRZR spray valves closed – DEMAND AT 0%</li> </ul>	
		<ul style="list-style-type: none"> <li>CCW in service to selected RCP(s) with flow and temperature alarms (A-7, A-15) extinguished. (IF NOT, THEN refer to ATT-15.2, ATTACHMENT SEAL COOLING)</li> </ul>	<b>NOTE:</b> There are no RCP cooling issues.
		<ul style="list-style-type: none"> <li>Selected RCP(s) seal inlet temperature – LESS THAN 135°F</li> </ul>	
		<ul style="list-style-type: none"> <li>Selected RCP(s) motor bearing temperatures – LESS THAN 200°F (PPCS Group Display RCPS or use recorder, if selected)</li> </ul>	
		<ul style="list-style-type: none"> <li>Selected RCP(s) seal injection in service (IF NOT, THEN refer to ATT-15.2, ATTACHMENT SEAL COOLING)</li> </ul>	
		<ul style="list-style-type: none"> <li>Seal injection flow – GREATER THAN 6 gpm</li> </ul>	
	HCO/ CO	<ul style="list-style-type: none"> <li>Labyrinth seal D/P – GREATER THAN 15 inches OF WATER</li> </ul>	
		<ul style="list-style-type: none"> <li>Selected RCP(s) #1 seal D/P – GREATER THAN 220 psid</li> </ul>	
		<ul style="list-style-type: none"> <li>Selected RCP(s) oil levels:</li> </ul>	
		<ul style="list-style-type: none"> <li>Level alarms (A-24, A-32 – EXTINGUISHED)</li> </ul>	
		<ul style="list-style-type: none"> <li>Level indicators – ON SCALE</li> </ul>	
		<ul style="list-style-type: none"> <li>Selected RCP(s) seal return alignment:</li> </ul>	
		<ul style="list-style-type: none"> <li>a) RCP #1 seal outlet valve(s) open:</li> </ul>	
		<ul style="list-style-type: none"> <li>o AOV-270A for RCP A</li> </ul>	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 56 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
		o AOV-270B for RCP B	
		b) <u>IF</u> MOV-313, seal return isolation, open, <u>THEN</u> verify the following:	<b>NOTE:</b> MOV-313 is CLOSED.
		c) <u>IF</u> MOV-313 closed, <u>THEN</u> verify other RCP #1 seal parameters normal for selected RCP(s):	
		o RCP #1 seal inlet temperature – LESS THAN 135°F	
		o RCP #1 seal D/P – GREATER THAN 220 psid	
	HCO/ CO	(Step C) <u>IF</u> ES-0.2, ES-0.3 or ES-1.1 is in effect, <u>THEN</u> requirements of S-2.1, REACTOR COOLANT PUMP OPERATION, also apply.	<b>NOTE:</b> The operator will recognize these do NOT apply.
			<b>Examiner</b> following operator NOT performing ATT-15.0 continue <b>HERE</b> .
<b>FR-C.2, RESPONSE TO DEGRADED CORE COOLING</b>			
		(Step 7) Check RVLIS Fluid Fraction	
	CO/ HCO	a. Fluid fraction (any RCP on) – GREATER THAN 66%	
	US	(Step 7.a RNO) <u>IF</u> rising, <u>THEN</u> return to Step 1. <u>IF NOT</u> , <u>THEN</u> go to Step 8.	
		(Step 8) Check If One RCP Should Be Stopped:	
	CO/ HCO	a. Both RCPs – RUNNING	<b>NOTE:</b> Only 'B' RCP is running.
	US	(Step 8.a RNO) Go to Step 10.	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 57 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	(Step 10) Check SI ACCUM Discharge Valves - OPEN	
		<ul style="list-style-type: none"> <li>• MOV-841</li> </ul>	
	CO/ HCO	<ul style="list-style-type: none"> <li>• MOV-865</li> </ul>	
	CO/ HCO	(*Step 11) Monitor Intact S/G Levels:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Narrow range level – GREATER THAN 7% [25% adverse CNMT]	
		b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	
	CO	(Step 12) Establish Condenser Steam Dump Manual Control	
		a. Verify condenser available:	
		<ul style="list-style-type: none"> <li>o Intact S/G MSIV - OPEN</li> </ul>	<b>NOTE:</b> Both MSIVs are CLOSED
	CO/ US	(Step 12.a RNO) Place intact S/G ARV controller in MANUAL and go to Step 13.	<b>NOTE:</b> CO will place BOTH S/G ARV controllers in MANUAL.
		(Step 13) Depressurize All Intact S/Gs To 160 PSIG:	
	CO	a. Maintain cooldown rate in RCS cold legs – LESS THAN 100°F/HR	
		b. Dump steam to condenser	
	CO	(Step 13.b RNO) Manually or locally dump steam from intact S/Gs:	
		<ul style="list-style-type: none"> <li>o Use S/G ARVs</li> </ul>	

Op Test No.: 2018 Scenario # 1 Event # 4, 5, 6, 7 & 8 Page 58 of 60Event Description: **SBLOCA / SI fails to automatically initiate / Manually actuate / 'A' SI Pump trip / 'A' RHR Pump fails to automatically start / Degraded Core Cooling**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 13.c) Check S/G pressures – LESS THAN 160 PSIG	
	US	(Step 13.c RNO) Return to Step 11.	

**CRITICAL TASK:**

**Depressurize S/Gs to atmospheric pressure (at < 100°F/hr) to inject ECCS accumulators and establish low-head injection flow before a Core Cooling Red Path develops (EOP-Based)**

Safety Significance: Failure to depressurize the S/Gs results in the needless deterioration of core cooling to an inadequate status. Inventory losses continue while no makeup can be injected into the RCS because of the system pressure. Depressurizing the S/Gs would provide some immediate benefit by condensing steam on the primary side of the S/G U-tubes. Eventually, continued depressurization of the S/Gs will lead to ECCS accumulator injection and to low-head ECCS injection. Accumulator injection and low-head injection would restore the core cooling CSF to an adequate status. Thus, failure to depressurize the S/Gs when it is possible to do so (as it is in the postulated plant conditions) causes an extreme (red-path) challenge to the core cooling CSF that could be avoided by secondary depressurization. Failure to perform the critical task causes a "significant reduction of safety margin beyond that irreparably introduced by the scenario." Additionally, it represents a "demonstrated inability by the crew to take an action or combination of actions that would prevent a challenge to plane safety."

**Upon ECCS Accumulator injection and at the discretion of the Lead Examiner terminate the exam**

TURNOVER SHEET for NRC Exam Scenario #1

<p><u>Core Age: BOL</u>  <math>1 \times 10^{-8}</math> amps Power, Equilibrium Xe          Outside Air Temp = 52°F          Water Temp = 50°F</p>	<p><u>Procedure in Use:</u>          O-1.2</p>	<p><u>ACTIONS/NOTES:</u></p> <ul style="list-style-type: none"> <li>• A plant startup is in progress with reactor power at <math>1 \times 10^{-8}</math> amps (Critical rod height data is complete).</li> <li>• The area has experienced overcast conditions for the past 4 hours, with light wind from the West at 10-15 mph, and this is expected to continue throughout the shift.</li> <li>• The MSIVs have been bypassed. Two hours of Steam Header Warm-up has been completed, and there are two hours remaining.</li> <li>• The crew will raise reactor power to the POAH and stabilize plant power between 0.5 - 1%; and then raise and stabilize reactor power to 2 - 3 % and start 'A' MFW Pump for a confidence run. Do NOT exceed 5% reactor power until maintenance on the 'C' SI Pump is complete.</li> <li>• The SM has directed the following portions of O-1.2 be performed:             <ul style="list-style-type: none"> <li>○ Steps 6.3.4 and 6.3.5</li> <li>○ Section 6.4</li> <li>○ Steps 6.5.1 through 6.5.4</li> <li>○ Steps 6.6.1 through 6.6.9</li> <li>○ Steps 6.6.13 through 6.6.16, 6.6.19, 6.6.21 through 6.6.23</li> <li>○ Steps 6.7.1 through 6.7.5</li> </ul> </li> <li>• The 'C' SI Pump is OOS for lube oil cooler replacement and is expected to be back in 2 hours.</li> <li>• The 60 gpm Letdown Orifice is in service.</li> <li>• The following Alarms are in:             <ul style="list-style-type: none"> <li>• J-25, SAFEGUARDS EQUIPMENT LOCKED OFF ('C' SI Pump is OOS)</li> </ul> </li> <li>• Protected equipment IAW OPG-PROTECTED-EQUIPMENT for 'C' SI Pump.</li> </ul>
<p>Boron: 2090 ppm          BAST: 17,400 ppm          RCS Activity: Normal</p>	<p><u>RCS LEAKAGE:</u> (gpm)          Total: 0.021          Identified: 0.003          Unidentified: 0.018</p>	

TURNOVER SHEET for NRC Exam Scenario #1

<u>Equipment Problems/OOS:</u> See NOTES	<u>Planned Activities for Shift:</u> <ul style="list-style-type: none"> <li>• Stabilize power at 0.5-1%</li> <li>• Start a second AFW Pump</li> <li>• Start 'A' MFW Pump</li> <li>• Transition from AFW to MFW</li> </ul>	<u>Electrical System Operator Declarations</u> None in effect
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A-52.4					
EQUIPMENT	DATE/TIME OOS	LCO	TITLE	EXP DATE	ECD
'C' SI Pump	Yesterday, 24hrs ago	3.5.2	ECCS - MODES 1, 2, and 3	72 hours	2 hours
A-52.12					
EQUIPMENT	DATE/TIME OOS	TRM /ODCM	TITLE	EXP DATE	ECD

PROGRAM: Ginna Operations Training

MODULE: Initial License Operator Training Class 17-1

TOPIC: NRC Simulator Exam

### **Scenario #3**

#### **REFERENCES:**

1. A-503.1, Emergency and Abnormal Operating Procedures Users Guide (Rev 048)
2. AR-G-11, LO STEAM PRESSURE LOOP A 600 PSI (Rev 7)
3. AR-G-27, STM LINE A LO-LO PRESS CHANNEL ALERT 514 PSI (Rev 8)
4. AR-G-22, ADFCS SYSTEM TROUBLE (Rev 01100)
5. ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure (Rev 037)
6. Technical Specification LCO 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation (Amendment 109)
7. Technical Specification LCO 3.3.3, Post Accident Monitoring (PAM) Instrumentation (Amendment 90)
8. AR-PPCS-R47AR, SGTL INDICATED (Rev 00000)
9. AP-SG.1, Steam Generator Tube Leak (Rev 017)
10. AR-L-20, 12A XFMR OR 12A BUS TROUBLE (Rev 01400)
11. AP-ELEC.1, Loss of 12A and/or 12B Busses (Rev 03203)
12. ATT-9.0, Attachment Letdown (Rev 10)
13. ER-ELEC.1, Restoration of Offsite Power (Rev 01801)
14. ATT-23.0, Attachment Transfer 4160V Loads (Rev 0)
15. Technical Specification LCO 3.4.13, RCS Operational Leakage (Amendment 100)
16. Technical Specification LCO 3.7.14, Secondary Specific Activity (Amendment 122)
17. Technical Specification LCO 3.3.4, Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation (Amendment 109)
18. Technical Specification LCO 3.8.1, Ac Sources – MODES 1, 2, 3, and 4 (Amendment 109)
19. Technical Specification LCO 3.8.9, Distribution Systems – MODES 1, 2, 3, and 4 (Amendment 80)
20. Technical Requirements TR 3.8.1, Offsite Power Sources (Rev 50)
21. E-0, Reactor Trip or Safety Injection (Rev 048)
22. ATT-27.0, Attachment Automatic Action Verification (Rev 00400)
23. E-3, Steam Generator Tube Rupture (Rev 04900)
24. FIG-1.0, Figure Min Subcooling (Rev 00200)
25. ECA-3.1, SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired (Rev 03401)
26. ATT-8.4, Attachment SI/UV (Rev 6)

Validation Time: 88 minutes

Author: David Eckert

Facility Review: Dale Bisailon /s/

Rev. 060618



Scenario Event Description  
NRC Scenario 3

Facility:	<b>Ginna</b>	Scenario No.:	<b>3</b>	Op Test No.:	<b>2018</b>
Examiners:	_____	Operators:	_____	(SRO)	
	_____		_____	(RO)	
	_____		_____	(BOP)	

  

Initial Conditions:	The plant is at 90% power (MOL). Corrective Maintenance was performed on 'A' HDT Pump four days ago and Engineering is monitoring Pump seal performance. It is intended to observe the 'A' HDT Pump operation for one more day at this power level and then raise power to 100%. The area has experienced overcast conditions for the past 4 hours, with wind from the West at 20 - 30 mph, and this is expected to continue throughout the shift.
Turnover:	There is no equipment is Out-Of-Service.

  

Event No.	Malf. No.	Event Type*	Event Description
1	CVC09	C(ATC)	VCT Divert Control Valve Failure (LCV-112A) – Fails to full divert position, requires taking valve to manual VCT.
2	SGN03B	I(BOP) TS(US)	S/G PRESSURE CHANNEL FAILURE: PT-469 (II) – fails low to zero.
3	SGN05B	R(ATC) N(BOP) TS(US)	Steam Generator B Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.
4	EDS01A GEN08	C(ALL) TS(US)	Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1
5	SGN05B	M(ALL)	B SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)
6	EDS01B	C(ALL)	Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)
7	PZR05A	C(ATC)	During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.  (Or force the use of PORV 430, by causing PORV 431-C to not open)

  

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
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Scenario Event Description  
NRC Scenario 3

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**Ginna 2018 NRC Scenario #3**

The plant is at 90% power (MOL). Corrective Maintenance was performed on 'A' HDT Pump four days ago and Engineering is monitoring Pump seal performance. It is intended to observe the 'A' HDT Pump operation for one more day at this power level and then raise power to 100%. The area has experienced overcast conditions for the past 4 hours, with wind from the West at 20 - 30 mph, and this is expected to continue throughout the shift.

There is no equipment is Out-Of-Service.

Shortly after taking the watch, VCT or Holdup Tank Divert Valve, LCV-112A, will fail to the FULL DIVERT position. The operator will respond in accordance with A-503.1, Emergency and Abnormal Operating Procedures Users Guide, and place the control switch for LCV-112A to the VCT position.

Following this, S/G Pressure Transmitter PT-469 will fail Low. The operator will respond in accordance with AR-G-27, STM LINE A LO-LO PRESS CHANNEL ALERT 514 PSI; AR-G-22, ADFCS SYSTEM TROUBLE, and enter ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure. The operator will address Technical Specification LCO 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation, and LCO 3.3.3, Post Accident Monitoring (PAM) Instrumentation.

Subsequently, a 10 gpm Steam Generator Tube Leak (SGTL) will develop on the 'B' Steam Generator. The operator will respond in accordance with AR-PPCS-R47AR, SGTL INDICATED, and enter AP-SG.1, Steam Generator Tube Leak, and commence a load reduction. The operator will address Technical Specification LCO 3.4.13, RCS Operational Leakage, and LCO 3.7.14, Secondary Specific Activity.

During the load reduction, the 7T Line will de-energize, and the 'A' EDG will fail to start automatically. The operator will respond in accordance with AP-ELEC.1, Loss of 12A and/or 12B Busses, and manually start the 'A' EDG. When the 'A' EDG is manually started, power will be restored to all Safeguards Buses, and the operator will restore plant equipment as required. The operator will address Technical Specification LCO 3.3.4, Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation, LCO 3.8.1, AC Sources – MODES 1, 2, 3, and 4, and LCO 3.8.9, Distribution Systems – Modes 1, 2, 3, and 4; as well as Technical Requirements Manual, TR-3.8.1, Offsite Power Sources.

After this, the S/G Tube Leak in the 'B' S/G will degrade to a S/G Tube Rupture (640 gpm) over five minutes. This will result in an automatic reactor trip and Safety Injection actuation. The crew will enter E-0, Reactor Trip or Safety Injection, and transition to E-3, Steam Generator Tube Rupture. Following the verification of AFW step in E-0, the remaining Offsite Power Circuit 767 will be lost resulting in loss of all Offsite Power. ECCS loads that were lost will automatically sequence onto 'B' EDG.

While depressurizing the RCS using a PORV at Step 19 of E-3, the PORV and its associated block valve will fail to CLOSE. The crew will transition to ECA-3.1, SGTR With Loss of Reactor Coolant – Subcooled Recovery Desired.

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Scenario Event Description  
NRC Scenario 3

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The scenario will terminate at Step 15 of ECA-3.1, after the crew has established a 100°F/hr RCS cooldown rate; or any time after entry into ECA-3.1 and an entry into FR-P.1 is required because of an Orange Path on the RCS Integrity Critical Safety Function Status Tree.

**Critical Tasks:**

**Isolate feedwater flow into and steam flow from the ruptured SG (B) so that minimum  $\Delta P$  between the B SG and A SG is not less than 250 psid once target temperature is reached (Entry into ECA-3.1 at Step 16 RNO). (EOP-Based)**

Safety Significance: Failure to isolate the ruptured SG causes a loss of  $\Delta P$  between the ruptured SG and the intact SG. Upon a loss of  $\Delta P$ , the crew must transition to a contingency procedure that constitutes an incorrect performance that "necessitates the crew taking compensating action which complicates the event mitigation strategy." If the crew fails to isolate steam from the SG, or feed flow into the SG, the ruptured SG pressure will tend to decrease to the same pressures as the intact SG, requiring a transition to a contingency procedure, and delaying the stopping of RCS leakage into the SG.

**While in EOP-E-3, establish/maintain an RCS temperature so that transition from E-3 does not occur because the RCS temperature is in either (1) Too high to maintain 20°F of RCS Subcooling OR (2) below 284°F (RCS Integrity Red Path Limit) (EOP-Based)**

Safety Significance: Failure to establish and maintain the correct RCS temperature during a SGTR leads to a transition from E-3 to a contingency procedure. This failure constitutes an incorrect performance that necessitates the operator taking compensating action that would unnecessarily complicate the event mitigation strategy.

Scenario Event Description  
NRC Scenario 3

**SIMULATOR OPERATOR INSTRUCTIONS**

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>		Reset to Temp IC 143 (May 2018) (Originally IC-19).	<p>T = 0 (From IC-19):</p> <p>Reduce reactor power to 90%</p> <p>Borate as necessary to clear Rod Insertion Limit alarms</p> <p>Insert MALF GEN08 = A D/G (Diesel Generator AutoStart Failure)</p> <p>Insert REM OVR-PZR02D = TRUE (OPEN Signal Pressurizer Relief Stop Valve No 516)</p> <p>Insert REM OVR-PZR02C = FALSE (CLOSE Signal Pressurizer Relief Stop Valve No 516)</p> <p>Insert MALF PZR05B = 0 (PZR Relief Vlv Failure: PCV-431C)</p> <p>Insert MALF CVC09 = 0 (VCT Divert Control Valve Failure (LCV-112A)) on T-30</p> <p>Set T-30 to X07I210A==1 (LCV-112A to VCT)</p> <p>Insert MALF CVC09 = 100 (VCT Divert Control Valve Failure (LCV-112A)) on T-1</p> <p>Insert MALF SGN03B = 0 (S/G Pressure Channel Failure: PT-469 (II)) on T-2</p> <p>Insert MALF SGN05B = 10, 60sec Ramp (S/G B Tube Leak Halfway Up Tube) on T-3</p> <p>Insert MALF EDS01A (Loss of Off-Site Power: Ckt 7T) on T-4</p> <p>Insert MALF SGN05B = 640 (300sec Ramp) (S/G B Tube Leak Halfway Up Tube) on T-5</p> <p>Insert MALF EDS01B (Loss of Off-Site Power: Ckt 767) on T-6</p> <p>Insert MALF PZR05A = 100 (PZR Relief Vlv Failure: PCV-430) on T-7</p>
<input type="checkbox"/>	Prior to Crew Briefing		

Scenario Event Description  
NRC Scenario 3

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	<b>Crew Briefing</b> <ul style="list-style-type: none"> <li>Assign Crew Positions based on evaluation requirements</li> <li>Review the Shift Turnover Information with the crew.</li> </ul>		
<input type="checkbox"/>	T-0	Begin Familiarization Period	
<input type="checkbox"/>	At direction of examiner	<b>Event 1</b> <b>Trigger #1</b> <b>CVC09</b>	VCT Divert Control Valve Failure (LCV-112A) – Fails to full divert position, requires taking valve to manual VCT
<input type="checkbox"/>	At direction of examiner	<b>Event 2</b> <b>Trigger#2</b> <b>SGN03B (0)</b>	S/G PRESSURE CHANNEL FAILURE: PT-469 (II) – fails low to zero.
<input type="checkbox"/>	At direction of examiner	<b>Event 3</b> <b>Trigger#3</b> <b>SGN05B (10, 60 second Ramp)</b>	Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.
<input type="checkbox"/>	At direction of examiner	<b>Event 4</b> <b>Trigger #4</b> <b>EDS01A</b> <b>GEN08 (A D/G)</b>	Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1  <b>Note: This malfunction is inserted at T=0</b>
<input type="checkbox"/>	At direction of examiner	<b>Event 5</b> <b>Trigger #5</b> <b>SGN05B (640, 300 second Ramp)</b>	'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)
<input type="checkbox"/>	Post-Rx Trip E-0, Step 9	<b>Event 6</b> <b>Trigger #6</b> <b>EDS01B</b>	Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)
<input type="checkbox"/>	Post-Rx Trip E-3, Step 19	<b>Event 7</b> <b>Trigger #7</b> <b>PZR05A (100)</b>	During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED. (Or force the use of PORV 430, by causing PORV 431-C to not open)
<input type="checkbox"/>	<b>Terminate the scenario upon direction of Lead Examiner</b>		

Op Test No.: 2018 Scenario # 3 Event # 1 Page 7 of 72Event Description: **VCT Divert Control Valve Failure (LCV-112A) – Fails to full divert position, requires taking valve to manual VCT**

Shortly after taking the watch, VCT or Holdup Tank Divert Valve, LCV-112A, will fail to the FULL DIVERT position. The operator will respond in accordance with A-503.1, Emergency and Abnormal Operating Procedures Users Guide, and place the control switch for LCV-112A to the VCT position.

**SIM DRIVER Instructions:** Operate Trigger #1 CVC09 = 100 (VCT Divert Control Valve Failure (LCV-112A))

**Indications Available:**

- LCV-112A Red Light LIT, Green Light Extinguished
- VCT level lowers on MCB LI-112
- PPCS LWRN P0139, LOW WRN VCT PRESSURE, at 20 psig
- MCS Annunciator G-1, BORIC ACID FLOW DEVIATION, at 20%
- MCB Annunciator G-17, RMW FLOW DEVIATION, at 20%

Time	Pos.	Expected Actions/Behavior	Comments
<b>A-503.1, EMERGENCY AND ABNORMAL OPERATING PROCEDURES USERS GUIDE</b>			
	HCO	(Step 5.3.A.5) Actions are permitted to mitigate or compensate for equipment or controller failures or to isolate leaks. Permitted actions include those actions necessary to take manual control and stabilize the affected parameters, or to isolate a leak. Examples include closing or isolating a failed open PORV, taking manual control of a failed FRV controller, etc. These deviations fall under the Maintenance Rule. Therefore, 50.59 is not required.	<b>NOTE:</b> It is expected that the HCO will place control switch for LCV-112A, VCT or Holdup Tank Divert Valve, to the VCT position.
			<b>NOTE:</b> The US may notify the WCC/I&C. <b>SIM DRIVER:</b> as WCCS/I&C, acknowledge
<b>SIM DRIVER Instructions:</b> When HCO has placed control switch for LCV-112A to VCT, ENSURE T-30 initiates			
<b>At the discretion of the Lead Examiner move to Event #2.</b>			

Op Test No.: 2018 Scenario # 3 Event # 2 Page 8 of 72Event Description: **S/G PRESSURE CHANNEL FAILURE: PT-469 (II) – fails low to zero.**

Following this, S/G Pressure Transmitter PT-469 will fail Low. The operator will respond in accordance with AR-G-27, STM LINE A LO-LO PRESS CHANNEL ALERT 514 PSI; AR-G-22, ADFCS SYSTEM TROUBLE, and enter ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure. The operator will address Technical Specification LCO 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation, and LCO 3.3.3, Post Accident Monitoring (PAM) Instrumentation.

**SIM DRIVER Instructions:** Operate Trigger #2 SGN03B = 0 (S/G Pressure Channel Failure: PT-469 (II))

**Indications Available:**

- MCB Annunciator G-11, LO STEAM PRESSURE LOOP A 600 PSI
- MCB Annunciator G-27, STM LINE A LO-LO PRESS CHANNEL ALERT 514 PSI
- MCB Annunciator G-22, ADFCS SYSTEM TROUBLE
- PI-469 indicates 0 psig

Time	Pos.	Expected Actions/Behavior	Comments
<b>AR-G-11, LO STEAM PRESSURE LOOP A 600 PSI</b>			
	CO	(Step 1) Perform channel check.	<b>NOTE:</b> PI-469 will indicate failed low.
	CO	(Step 2) Monitor SG pressures and steam flows.	
	US	(Step 3) <u>IF</u> Channel has failed, <u>THEN</u> GO TO ER-INST.1.	<b>NOTE:</b> The US will go to ER-INST.1.
<b>AR-G-27, STM LINE A LO-LO PRESS CHANNEL ALERT 514 PSI</b>			
	CO	(Step 1) Perform a channel check of the following:	<b>NOTE:</b> PI-469 will indicate failed low.
		<ul style="list-style-type: none"> <li>• PI-468</li> </ul>	
		<ul style="list-style-type: none"> <li>• PI-469</li> </ul>	
		<ul style="list-style-type: none"> <li>• PI-482</li> </ul>	

Op Test No.: 2018 Scenario # 3 Event # 2 Page 9 of 72Event Description: **S/G PRESSURE CHANNEL FAILURE: PT-469 (II) – fails low to zero.**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 2) Monitor SGs levels	
	US	(Step 3) Go to ER-INST.1 for failed channel	<b>NOTE:</b> The US will go to ER-INST.1.
<b>AR-G-22, ADFCS SYSTEM TROUBLE</b>			
	CO	(Step 4.1) <b>CHECK</b> ADFACS EMMI monitor (Relay Room) for the cause of the failure by performing the following:	<b>NOTE:</b> The CO will call the EO to go to the Relay Room and support. If so, <b>SIM DRIVER</b> acknowledge as EO and report the following: • Bad Stm Pressure Loop A
			<b>NOTE:</b> The US may call WCC/I&C to address the instrument failure. If so, <b>SIM DRIVER</b> acknowledge as WCC/I&C.
	CO	(Step 4.2) <b>REFER</b> TO ER-INST.1 REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE for action to defeat failed instrument(s)	
			<b>NOTE:</b> The US will go to ER-INST.1.
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE</b>			
	HCO/ CO	(Step 6.1.1) <b>IDENTIFY</b> the failed instrument channel by observation of the bistable status light board, MCB annunciators, and the MCB metering indication.	
	US	(Step 6.1.2) <b>WHEN</b> a failed instrument loop and/or channel has been identified, <b>THEN</b> refer to the appropriate section of this procedure list below:	<b>NOTE:</b> The US will determine that S/G Pressure Channel Failures – Section 6.8, should be addressed.



Op Test No.: 2018 Scenario # 3 Event # 2 Page 10 of 72Event Description: **S/G PRESSURE CHANNEL FAILURE: PT-469 (II) – fails low to zero.**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 6.8.1) <b>REFER TO</b> the appropriate attachment for defeat of failed S/G pressure channel.	<b>NOTE:</b> The US will determine that Attachment 31, White Channel – S/G Pressure Channel PI-469, should be addressed.
			<b>NOTE:</b> The US will hand this off to the CO, who will coordinate with the HCO. <b>NOTE:</b> CO will conduct an Instrument Defeat Brief.
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE, ATTACHMENT 31 WHITE CHANNEL – S/G PRESSURE CHANNEL PI-469</b>			
	CO	(Step 1.0) <b>DETERMINE</b> the expected Bistable proving light status for the post defeat condition as follows:	
	CO	(Step 1.1) <b>RECORD</b> the following Data:	
		• S/G A Pressure PI-469 ____ PSIG	<b>NOTE:</b> 0 psig
		• S/G A Steam Flow F0465(PPCS) ____ lb/hr	<b>NOTE:</b> 3190 klb/hr
	CO	(Step 1.2) <b>DETERMINE</b> the expected post defeat Bistable proving light status and circle the expected status in table below:	
		<u>469 LOOP A-2</u>	
		• LO LO PRESS SI	<b>NOTE:</b> The CO will circle OFF.
		• LOW PRESS	<b>NOTE:</b> The CO will circle OFF.
		<u>465 LOOP A-2</u>	
		• HIGH TRIP	<b>NOTE:</b> The CO will circle OFF.
		• HI-HI TRIP	<b>NOTE:</b> The CO will circle ON.

Op Test No.: 2018 Scenario # 3 Event # 2 Page 11 of 72Event Description: **S/G PRESSURE CHANNEL FAILURE: PT-469 (II) – fails low to zero.**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 2.0) In the (WHITE) W-2 PROTECTION CHANNEL 2 rack, <b>PLACE</b> the following bistable proving switches to DEFEAT (UP) <b>AND VERIFY</b> proving light status is correct per the table above:	
		<u>469 LOOP A-2</u>	
		• LO LO PRESS SI	<b>NOTE:</b> Proving Light is OFF.
		• LOW PRESS	<b>NOTE:</b> Proving Light is OFF.
		<u>465 LOOP A-2</u>	
		• HIGH TRIP	<b>NOTE:</b> Proving Light is OFF.
		• HI-HI TRIP	<b>NOTE:</b> Proving Light is ON.
	CO	(Step 3.0) <b>VERIFY</b> the bistable status lights <b>AND</b> Annunciators listed above are lit.	<b>NOTE:</b> Bistable status lights and MCB Annunciators are LIT
	CO	(Step 4.0) <b>DELETE</b> the point from the PPCS by <b>PERFORMING</b> the following:	
		(Step 4.1) <b>SELECT</b> the "Sub/Delete/Restore" display.	
		(Step 4.2) <b>SELECT</b> Point ID P0469.	
		(Step 4.3) <b>TURN</b> "OFF" scan processing.	
		(Step 4.4) <b>SELECT</b> "Change".	
		(Step 4.5) <b>ANSWER</b> Prompts.	
		(Step 4.6) <b>SELECT</b> Point ID F0465.	
		(Step 4.7) <b>TURN</b> "OFF" scan processing.	
		(Step 4.8) <b>SELECT</b> "Change".	
		(Step 4.9) <b>ANSWER</b> Prompts.	
	US	(Step 5.0) <b>GO TO</b> Step 6.8.2.	
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE</b>			

Op Test No.: 2018 Scenario # 3 Event # 2 Page 12 of 72Event Description: **S/G PRESSURE CHANNEL FAILURE: PT-469 (II) – fails low to zero.**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 6.8.2) <b>REFER TO</b> the following ITS Sections for LCO's:	
		<ul style="list-style-type: none"> <li>Section 3.3.2, Table 3.3.2-1, Function 1e</li> </ul>	
	US	<ul style="list-style-type: none"> <li>Section 3.3.2, Table 3.3.2-1, Functions 4d and 4e (due to inability to satisfy requirements of SR 3.3.2.1)</li> </ul>	
		<ul style="list-style-type: none"> <li>Section 3.3.3, Table 3.3.3-1, Functions 24 and 25</li> </ul>	
	US	(Step 6.8.3) <b>GO TO</b> Step 6.15.	
	US	<b>(Step 6.15) Follow Up Actions:</b>	
	HCO	(Step 6.15.1) <b>IF</b> necessary, <b>VERIFY</b> an operable channel is selected for the affected recorder.	
	US	(Step 6.15.2) <b>VERIFY</b> the following systems in <b>AUTO</b> if desired:	
	HCO	<ul style="list-style-type: none"> <li>Rod Control</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>Turbine EH control</li> </ul>	
	HCO	<ul style="list-style-type: none"> <li>PRZR Pressure control</li> </ul>	
		<ul style="list-style-type: none"> <li>HC 431K</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR spray valves</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR heaters</li> </ul>	
	HCO	<ul style="list-style-type: none"> <li>PRZR level control</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>Steam Dump (unless 1<sup>st</sup> stage pressure failed)</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>MFW control</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>S/G Atmos Relief Valve Control</li> </ul>	

Op Test No.: 2018 Scenario # 3 Event # 2 Page 13 of 72Event Description: **S/G PRESSURE CHANNEL FAILURE: PT-469 (II) – fails low to zero.**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 6.15.3) <b>NOTIFY</b> the following people:	<b>NOTE:</b> The US may notify the SM/STA. <b>SIM DRIVER:</b> as <b>SM/STA</b> , acknowledge.
		<ul style="list-style-type: none"> <li>Operations Supervision</li> </ul>	
		<ul style="list-style-type: none"> <li>STA</li> </ul>	
	US	<ul style="list-style-type: none"> <li>Work Week Manager</li> </ul>	
	US	(Step 6.15.4) <b>UPDATE</b> the Temporary Configuration Change Tracking Log for the following as necessary:	<b>NOTE:</b> This Step is N/A
		<ul style="list-style-type: none"> <li>Jumper Removal</li> </ul>	
		<ul style="list-style-type: none"> <li>Lifted Wires</li> </ul>	
		<ul style="list-style-type: none"> <li>Slide Links</li> </ul>	
	US	(Step 6.15.5) <b>REFER</b> to the following for Notification Requirements:	
		<ul style="list-style-type: none"> <li>LS-AA-1020, REPORTABILITY TABLES AND DECISION TREES</li> </ul>	
		<ul style="list-style-type: none"> <li>OPG-NOTIFICATION, REQUIRED NOTIFICATIONS TO THE PSC/PIO/CEG SENIOR MANAGEMENT/OPERATIONS MANAGEMENT</li> </ul>	
<b>TECHNICAL SPECIFICATION 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION</b>			
	US	LCO 3.3.2 The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE. (Functions 1e, 4d, and 4e)	
	US	APPLICABILITY: According to Table 3.3.2-1	
		ACTIONS	

Op Test No.: 2018 Scenario # 3 Event # 2 Page 14 of 72Event Description: **S/G PRESSURE CHANNEL FAILURE: PT-469 (II) – fails low to zero.**

Time	Pos.	Expected Actions/Behavior			Comments
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will identify that Functions 1e, 4d, and 4e are affected, and that Conditions A, F and L are applicable.
		A. One or more Functions with one channel or train inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel or train.	Immediately	
		F. As required by Required Action A.1 and referenced by Table 3.3.2-1	F.1 Place channel in trip.	6 hours	
		L. As required by Required Action A.1 and referenced by Table 3.3.2-1	L.1 Place channel in trip.	6 hours	
TECHNICAL SPECIFICATION 3.3.3, POST ACCIDENT MONITORING (PAM) INSTRUMENTATION					
	US	LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.			
	US	APPLICABILITY: MODES 1, 2, and 3.			
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will identify that Functions 24 and 25 requirements are met and that Condition A is NOT applicable.
		A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days	
At the discretion of the Lead Examiner move to Event #3.					

Op Test No.: 2018 Scenario # 3 Event # 3 & 4 Page 15 of 72

Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Subsequently, a 10 gpm Steam Generator Tube Leak (SGTL) will develop on the 'B' Steam Generator. The operator will respond in accordance with AR-PPCS-R47AR, SGTL INDICATED, and enter AP-SG.1, Steam Generator Tube Leak, and commence a load reduction. The operator will address Technical Specification LCO 3.4.13, RCS Operational Leakage, and LCO 3.7.14, Secondary Specific Activity.

During the load reduction, the 7T Line will de-energize, and the 'A' EDG will fail to start automatically. The operator will respond in accordance with AP-ELEC.1, Loss of 12A and/or 12B Busses, and manually start the 'A' EDG. When the 'A' EDG is manually started, power will be restored to all Safeguards Buses, and the operator will restore plant equipment as required. The operator will respond in accordance with AP-ELEC.1, Loss of 12A and/or 12B Busses. The operator will address Technical Specification LCO 3.3.4, Loss of Power (LOP) Diesel Generator (DG) Start Instrumentation, LCO 3.8.1, AC Sources – MODES 1, 2, 3, and 4, and LCO 3.8.9, Distribution Systems – Modes 1, 2, 3, and 4; as well as Technical Requirements Manual, TR-3.8.1, Offsite Power Sources.

**SIM DRIVER Instructions:** Operate Trigger #3 SGN05B = 10, 60sec Ramp (S/G B Tube Leak Halfway Up Tube)

**Indications Available:**

- R47AR SGTL Indicated
- R-32 indication starts to rise and alarms
- Charging Flow (FI-128C) starts to increase
- MCB Annunciator E-16; RMS PROCESS MONITOR HIGH ACTIVITY

Time	Pos.	Expected Actions/Behavior	Comments
			<b>NOTE:</b> The crew may enter AP-SG.1 directly.
<b>AR-PPCS-R47AR, SGTL INDICATED</b>			
	US	(Step 1) <u>IF</u> SG Tube Rupture is evident,....	<b>NOTE:</b> a SGTR is NOT evident.
	HCO/ CO	(Step 2) Trend PPCS point R-47G.	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 3) Notify RP/Chemistry to <u>IMMEDIATELY</u> obtain and analyze an air ejector grab sample per CH-360, Primary to Secondary Leakage Sampling and Measurement.	<b>NOTE:</b> The HCO/CO will notify the WCC/Chemistry. <b>SIM DRIVER:</b> as <b>WCC/Chemistry</b> , acknowledge.
	HCO/ CO	(Step 4) Determine the estimated leak rate using PPCS point R47G or the R-47 Local Reading and the Conversion Table (Curve Book #06-004).	
	US	(Step 5) <u>IF</u> any condition below is met, <u>THEN</u> go to AP-SG.1, STEAM GENERATOR TUBE LEAK:	
		a. R47G (PPCS) greater than 5 gpd,	
		<u>OR</u>	
		b. R-47 greater than or equal to 5 gpd (per conversion table),	
		<u>OR</u>	
		c. Air ejector grab sample indicates SG tube leakage $\geq$ 5 gpd,	
		<u>OR</u>	
		d. SM discretion.	
	US	(Step 6) <u>IF</u> air ejector grab samples do <u>NOT</u> indicate the presence of RCS radiogases....	<b>NOTE:</b> This condition will NOT be known for some time.
<b>AP-SG.1, STEAM GENERATOR TUBE LEAK</b>			
	HCO	(*Step 1) Monitor PRZR Level – STABLE AT PROGRAM LEVEL	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(*Step 1 RNO) <u>IF</u> PRZR level lowering, <u>THEN</u> start additional charging pumps and raise speed as necessary to stabilize PRZR level.	<b>NOTE:</b> The Step 1 RNO may need to be performed.
		<u>IF</u> PRZR level continues to lower, <u>THEN</u> close letdown isolation, AOV-427 and excess letdown AOV-310.	<b>NOTE:</b> The leak will NOT be large enough to require letdown isolation
		<u>IF</u> available charging pumps are running at maximum speed with letdown isolated, <u>AND</u> PRZR level is lowering, <u>THEN</u> ....	<b>NOTE:</b> The leak will NOT be large enough to require a Rx Trip.
	CO	(*Step 2) Monitor S/G Tube Leak Rate:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Estimate S/G tube leak rate:	
		o Charging/Letdown mismatch	
		o $\Delta$ VCT	
		o PPCS Point R47G	
		o R-47 drawer indication (using conversion table, Curve Book #06-004)	
		b. Check total RCS to secondary leak rate – LESS THAN 1 GALLON PER MINUTE (1440 GPD)	<b>NOTE:</b> leak rate is $\approx$ 10 gpm.
	US	(Step 2b RNO) Go to Step 8.	
	US	(Step 8) Initiate Load Reduction	<b>NOTE:</b> US will conduct a Load Reduction Brief
		a. Notify higher supervision.	
	HCO	b. Verify rods in AUTOMATIC.	
		c. Initiate boration at the rate determined in OPG-REACTIVITY-CALC.	



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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	d. Reduce turbine load in Auto as follows:	
		1) Place Turbine EH Control in OPER PAN., IMP PRESS IN, if desired.	
		2) Select rate of 3%/min on thumbwheel.	
		3) Reduce the setter to zero.	
		4) Depress the GO button.	<b>NOTE:</b> The CO will start the load reduction.
	HCO	e. Place PRZR backup heaters switch to ON.	
	CO	f. Transfer 4160V Auxiliary load from #11 Transformer. (Refer to ATT-23.0, ATTACHMENT TRANSFER 4160V LOADS)	<b>NOTE:</b> This will occur after the crew restores Off-Site Power.
<b>SIM DRIVER Instructions: When the US hands ATT-23.0 to the CO:</b> <b>Operate Trigger #4 EDS01A (Loss of Off-Site Power: Ckt 7T)</b> <b>MALF GEN08 inserted at T = 0</b>			
<b>Indications Available:</b> <ul style="list-style-type: none"> <li>• MCB Annunciator L-20, 12A XFMR OR 12A BUS TROUBLE</li> <li>• Bus 12A Voltmeter indicates 0 volts</li> <li>• Multiple MCB Annunciators</li> </ul>			
			<b>Examiner NOTE:</b> The crew may place the Turbine in HOLD, and stop the boration.
			<b>NOTE:</b> The HCO may diagnose the failure of the 'A' D/G to start as required, and take manual action to start it.
			<b>NOTE:</b> The crew may enter AP-ELEC.1 directly.

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
<b>AR-L-20, 12A XFMR OR 12A BUS TROUBLE</b>			
	US	(Step 4.1) <b>CHECK</b> Bus 12A voltage on all three (3) phases	
		(Step 4.1.1) <b>IF</b> Voltage is <b>LESS THAN</b> 3700 volts on all Phases <b>THEN GO TO:</b>	
		<ul style="list-style-type: none"> <li>AP-ELEC.1, LOSS OF 12A AND/OR 12B BUSSES <b>IF</b> RCS temperature is <b>GREATER THAN</b> 350°F</li> </ul>	
	HCO/ CO	(Step 4.2) <b>DISPATCH</b> an AO to investigate the alarm at the 12A Relay panel (Relay Room Annex)	<b>NOTE:</b> The US will dispatch an EO. <b>SIM DRIVER:</b> as <b>EO</b> , acknowledge.
		(Step 4.2.1) <b>IF</b> the cause of the Alarm was a 12A Transformer Alarm <b>THEN DISPATCH</b> an AO to investigate the cause at the 12A Transformer Annunciator Panel (Transformer Yard)	
	US	(Step 4.3) <b>PERFORM</b> actions of the applicable local panel AR procedure.	
	US	(Step 4.4) <b>PERFORM</b> the following notifications:	<b>NOTE:</b> The US will notify indicated personnel. <b>SIM DRIVER:</b> Acknowledge, appropriately.
		(Step 4.4.1) <b>NOTIFY</b> Plant management staff per OPG-NOTIFICATION	
		(Step 4.4.2) <b>IF</b> the plant is on line <b>NOTIFY</b> the Work Week Manager	
		(Step 4.4.3) <b>IF</b> the plant is shutdown <b>NOTIFY</b> the Outage Control Center	
			<b>NOTE:</b> The US will go to AP-ELEC.1.

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
<b>AP-ELEC.1, LOSS OF 12A AND/OR 12B BUSES</b>			
	HCO	(Step 1) Check RCS Temperature – GREATER THAN 350°F	
	HCO	(*Step 2) Monitor Tav <sub>g</sub>	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Place Rods in MANUAL	<b>NOTE:</b> The HCO will place the Rods in MANUAL.
	HCO	b. Manually move control rods to control Tav <sub>g</sub>	
	HCO	(Step 3) Verify RCPs – BOTH RUNNING	
	HCO/ CO	(Step 4) Verify Emergency D/G Associated With Deenergized Bus(es) – RUNNING	<b>NOTE:</b> The 'A' D/G has failed to automatically start.
		o Bus 12A – D/G A	
	HCO/ CO	(Step 4 RNO) Manually start D/G(s) associated with affected bus.	<b>NOTE:</b> If not previously performed, the HCO will start the 'A' D/G.
	CO	(Step 5) Verify Both Trains of AC Emergency Busses Energized To At Least 440 VOLTS on all phases:	
		o Bus 14 and bus 18	
		o Bus 16 and bus 17	
	CO	(Step 6) Verify Service Water System Operation:	
		a. Check at least one SW pump running in each loop	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	<ul style="list-style-type: none"> <li>A or B Pump in Loop A</li> </ul>	
		<ul style="list-style-type: none"> <li>C or D Pump in Loop B</li> </ul>	
	CO	(Step 6.a RNO) Perform the following:	
		1) Manually start pumps as necessary (257 kw each)	
		2) <u>IF</u> adequate cooling can <u>NOT</u> be supplied to a running D/G, ...	<b>NOTE:</b> Adequate cooling can be supplied.
		b. SW header pressure – GREATER THAN 40 PSIG IN EACH LOOP	
	HCO	(Step 7) Check CCW Pump Status:	
		a. At least one CCW pump – RUNNING	
		b. Annunciator A-22, CCW PUMP DISCHARGE LO PRESS 60 PSIG - EXTINGUISHED	
	HCO	(Step 8) Verify charging pump status – AT LEAST ONE RUNNING	<b>NOTE:</b> The 'C' Charging Pump is running.
	CO	(Step 9) Verify Annunciator H-16, INSTRUMENT AIR COMP – EXTINGUISHED	
	CO	(Step 10) Verify Bus 11A And 11B Normal Feed Breakers – CLOSED	<b>NOTE:</b> If crew continued load reduction, Step 10 RNO may be performed.
	CO	(Step 11) Check MFW Regulating Valves – RESTORING S/G LEVEL TO 52% IN AUTO	
	HCO	(Step 12) Check VCT Makeup System:	
		a. Ensure the following:	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	1) RMW mode selector switch in AUTO	<b>NOTE:</b> The HCO may still be borating depending on the status of the load reduction.
		2) RMW control armed – RED LIGHT LIT	
		b. Check VCT level:	
		o Level GREATER THAN 20%	
		-OR-	
		o Level – STABLE OR RISING	
	HCO	(Step 13) Check Charging Pump Suction Aligned to VCT:	
		a. VCT level – GREATER THAN 20%	
		b. Align charging pumps to VCT	
		o LCV-112C open	
		o LCV-112B closed	
	HCO	(Step 14) Check CVCS Operation:	
		1) Charging pumps – AT LEAST ONE RUNNING	<b>NOTE:</b> The 'C' Charging Pump is running.
		2) Check letdown indications:	
		o Check PRZR level – GREATER THAN 13%	
		o Letdown flow – APPROXIMATELY 40 gpm (60 gpm if AOV-202 OPEN)	<b>NOTE:</b> Letdown is Isolated, and PRZR level will be rising
		o Letdown flow - STABLE	
	HCO	(Step 14.b RNO) Perform the following:	
		1) Close letdown isolation, AOV-427	
		2) Close letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)	
		3) Close letdown isolation, AOV-371	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	4) <u>IF</u> seal injection in service, <u>THEN</u> close charging flow control valve, HCV-142 <u>WHILE</u> adjusting charging pump speed to maintain:	
		<ul style="list-style-type: none"> <li>RCP labyrinth seal D/P between 15 inches and 80 inches</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR level at program</li> </ul>	
		5) <u>IF</u> PRZR level greater than 13%, <u>THEN</u> go to Step 15.	
	HCO/ CO	(Step 15) Establish Normal Letdown: (Refer to ATT-9.0, ATTACHMENT LETDOWN)	
			<p><b>NOTE:</b> The US will hand off ATT-9.0 to either the HCO or the CO, and continue with the other operator in the AP.</p> <p><b>Examiner</b> following operator performing ATT-9.0 continue below.</p> <p><b>Examiner</b> following operator NOT performing ATT-9.0 continue at <b>Page 24</b>.</p>
<b>ATT-9.0, ATTACHMENT LETDOWN</b>			
	HCO/ CO	(Step A) The following conditions must be met to place normal letdown in service:	
		<ul style="list-style-type: none"> <li>IA to CNMT – ESTABLISHED</li> </ul>	
		<ul style="list-style-type: none"> <li>CCW – IN SERVICE</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR level – GREATER THAN 13%</li> </ul>	
	HCO/ CO	(Step B) Establish Normal Letdown:	
		1. Establish charging line flow to REGEN Hx – GREATER THAN 22 gpm.	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	2. Place the following switches to CLOSE:	
		<ul style="list-style-type: none"> <li>Letdown orifice valves (AOV-200A, AOV-200B, and AOV-202)</li> </ul>	
		<ul style="list-style-type: none"> <li>Letdown isolation, AOV-427</li> </ul>	
		3. Place letdown controllers in MANUAL at 40% open (60% open if 60 gpm orifice to be selected):	
		<ul style="list-style-type: none"> <li>Temperature control valve, TCV-130</li> </ul>	
		<ul style="list-style-type: none"> <li>Pressure control valve, PCV-135</li> </ul>	
		4. Ensure AOV-371, letdown isolation valve – OPEN.	
		5. Place letdown isolation, AOV-427 to OPEN, <u>THEN</u> place to AUTO.	
		6. Open letdown orifice valve(s) to obtain desired flow	
		<ul style="list-style-type: none"> <li>40 gpm letdown orifice valve, AOV-200A or AOV-200B</li> </ul>	<b>NOTE:</b> A 40 gpm letdown orifice was in service prior to the loss of the 7T line.
		<ul style="list-style-type: none"> <li>60 gpm letdown orifice valve, AOV-202</li> </ul>	
		7. Place PCV-135 in AUTO at 250 psig.	
		8. Place TCV-130 in AUTO at the normal setpoint.	
		9. Adjust charging pump speed and HCV-142 to control PRZR level and RCP labyrinth seal D/P.	
<b>AP-ELEC.1, LOSS OF 12A AND/OR 12B BUSES</b>			
			<b>Examiner</b> following operator NOT performing ATT-9.0 continue <b>HERE</b> .
	CO/ HCO	(Step 16) Verify PRZR Heaters Restored:	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	o PRZR proportional heater breaker – CLOSED	
		o PRZR backup heater breaker – RESET/IN AUTO	
		(Step 16 RNO) <u>IF</u> adequate D/G capacity available for PRZR heaters (400 kw each bank), <u>THEN</u> perform the following:	
	CO/ HCO	a. Reset and close PRZR proportional heaters breaker if necessary.	<b>NOTE:</b> It is only necessary to restart the proportional heaters.
		b. Reset PRZR backup heater breaker and return to AUTO if necessary.	
	CO/ HCO	(Step 17) Verify Normal Rod Control Restored:	
		a. Annunciator C-5, PPCS ROD SEQUENCE OR ROD DEVIATION – EXTINGUISHED	
		b. Annunciator E-28, POWER RANGE ROD DROP ROD STOP -5% / 5 sec – EXTINGUISHED	
		c. Annunciator F-15, RCS TAVG DEV 4°F - EXTINGUISHED	
		d. Place rods in AUTO if desired	<b>NOTE:</b> The HCO may place the Rods in AUTO.
	HCO	(Step 18) Establish Stable Plant Conditions:	
		a. Check Tavg – TRENDING TO TREF	<b>NOTE:</b> The crew may perform the RNO (Adjust rod position, boron concentration and Turbine load).
		b. Check PRZR pressure – TRENDING TO 2235 PSIG IN AUTO	
		c. Check PRZR level – TRENDING TO PROGRAM IN AUTO CONTROL	<b>NOTE:</b> The crew may perform the RNO (Control Charging flow).



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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 19) Restore Normal Electric System Alignment:	
		a. Verify circuit 767 and/or 7T - AVAILABLE	<b>NOTE:</b> Circuit 767 is available.
		b. Restore power to non-faulted Buses 12A and/or 12B (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)	
		<b>NOTE:</b> The US will likely contact RG&E to determine status of Off-Site Circuits 7T and 767. <b>SIM DRIVER:</b> as <b>RG&amp;E ECC</b> , acknowledge and report that a crew is out looking at Circuit 7T and Circuit 767 is capable of supplying power to Ginna loads.	<b>NOTE:</b> The US will likely hand this off to the CO and continue with the HCO in AP-SG.1. <b>Examiner</b> following operator performing ER-ELEC.1 continue below. <b>Examiner</b> following operator NOT performing ER-ELEC.1 continue at <b>Page 27</b> .
<b>ER-ELEC.1, RESTORATION OF OFFSITE POWER</b> <b>SECTION 6.1.2, OFFSITE POWER RECOVERY USING ONLY CKT 767</b>			
	CO	(Step 6.1.2) <b>OFFSITE POWER RECOVERY USING ONLY CKT 767:</b>	
		1. <b>NOTIFY</b> RG&E Energy Control Center that all offsite power to Ginna is being placed on CKT 767.	<b>NOTE:</b> The CO will notify the RG&E ECC. <b>SIM DRIVER:</b> as <b>RG&amp;E ECC</b> , acknowledge.
		2. <b>ENSURE OPEN AND RESET</b> BUS 12A NORMAL FEED FROM 7T 52/12AY	
		3. <b>ENSURE OPEN AND RESET</b> BUS 12B ALT FEED FROM 7T 52/12AX	
		4. <b>ENSURE</b> CLOSED CIRCUIT BKR 76702 34KV BUS	
		5. <b>VERIFY</b> CIRCUIT 767 VOLTMETER 34.5kv is approximately 34kv.	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	6. <b>IF BUS 12A ALT FEED FROM 767 52/12BY is OPEN THEN PERFORM</b> the following:	
		a. <b>PLACE IN</b> ON BUS 12A ALT FEED FROM 767 52/12BY SYNCHROSCOPE	
		b. <b>CLOSE</b> BUS 12A ALT FEED FROM 767 52/12BY.	
		c. <b>VERIFY</b> BUS 12A VOLTMETER 4160V is approximately 4kv.	
		d. <b>PLACE IN</b> OFF BUS 12A ALT FEED FROM 767 52/12BY SYNCHROSCOPE	
		7. <b>IF BUS 12B NORMAL FEED FROM 767 52/12BX is OPEN THEN...</b>	<b>NOTE:</b> This condition is NOT met.
			<b>NOTE:</b> The US will go back to AP-SG.1.
			<b>Examiner</b> following operator NOT performing ER-ELEC.1 continue <b>HERE</b> .
<b>AP-SG.1, STEAM GENERATOR TUBE LEAK</b>			
	CO	(Step 8.f) Transfer 4160V Auxiliary load from #11 Transformer. (Refer to ATT-23.0, ATTACHMENT TRANSFER 4160V LOADS)	<b>NOTE:</b> The US will likely hand this off to the CO following Off-Site Power restoration and continue with the HCO in AP-SG.1
			<b>Examiner</b> following operator performing ATT-23.0 continue below. <b>Examiner</b> following operator NOT performing ATT-23.0 continue at <b>Page 28</b> .
<b>ATT-23.0, ATTACHMENT TRANSFER 4160V LOADS</b>			
	CO	(Step 1) Place Bus 12A – BUS 11A TIE SYNCHROSCOPE to ON.	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 2) Close BUS 12A – BUS 11A TIE 4160V.	
	CO	(Step 3) Place BUS 12A – BUS 11A TIE SYNCHROSCOPE to OFF.	
	CO	(Step 4) Open BUS 11A NORMAL FEED 4160V.	
	CO	(Step 5) Place BUS 11B – BUS 12B TIE SYNCHROSCOPE to ON.	
	CO	(Step 6) Close BUS 11B – BUS 12B TIE 4160V.	
	CO	(Step 7) Place BUS 11B - 12B TIE SYNCHROSCOPE to OFF.	
	CO	(Step 8) Open BUS 11B NORMAL FEED 4160V.	
	CO	(Step 9) Reset alarms L-20 <u>AND</u> L-28, locally in the Relay Room Addition.	<b>NOTE:</b> The CO will dispatch an EO. <b>SIM DRIVER:</b> as EO, acknowledge, and use REM EDS049 and EDS050 = RESET, to reset alarms.
<b>AP-SG.1, STEAM GENERATOR TUBE LEAK</b>			
			<b>US/HCO Examiner</b> continue with procedure <b>HERE</b> .

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(*Step 9) Monitor RCS Tavg	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		o Tavg – GREATER THAN 545°F	
		o Tavg – LESS THAN 579°F	
	HCO	(Step 10) Adjust Boric Acid Addition Rate as Necessary to: (Refer to OPG-REACTIVITY-CALC)	
		o Maintain control rods above insertion limits	
		o Match Tavg and Tref	
		o Compensate for Xenon	
	US	(Step 11) <u>While Continuing With This Procedure</u> , Perform the Following:	
		a. Perform parts A <b>AND</b> B of ATT-16.1, ATTACHMENT SGTL	<b>NOTE:</b> The US will dispatch an EO. <b>SIM DRIVER:</b> as <b>EO</b> , acknowledge, and Run Schedule for ATT 16.1 Parts A and B, on the B S/G.
	US	b. Dispatch an EO to perform T-35H, NUCLEAR HOUSE HEATING STEAM TO BOILER STEAM SUPPLY CHANGE OVER	<b>NOTE:</b> The US will hand off to the CO, and dispatch an EO. <b>SIM DRIVER:</b> as <b>EO</b> , acknowledge, and report that house steam loads are being supplied by the Boiler.
	US	(Step 12) Request Chemistry to obtain the following samples:	<b>NOTE:</b> The US will contact Chemistry. <b>SIM DRIVER:</b> as <b>CHEMISTRY</b> acknowledge
		• RCS boron	
		• RCS activity (ITS 3.4.16)	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(*Step 13) Monitor PRZR Pressure – TRENDING TO 2235 PSIG IN AUTO	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
	CO	(*Step 14) Monitor MFW Regulating Valves – RESTORING S/G LEVEL TO 52% IN AUTO	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
	HCO	(*Step 15) Monitor PRZR Level – TRENDING TO PROGRAM IN AUTO CONTROL	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
	CO	(Step 16) Check IA Available To CNMT	
		o IA pressure - GREATER THAN 60 PSIG	
		o Instr Air to CNMT Isol Valve, AOV-5392 - OPEN	
	CO	(*Step 17) Check Steam Dump Status:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		o Annunciator G-15, STEAM DUMP ARMED - LIT	
		o Steam dump operating properly in AUTO	
	CO	(Step 18) Check If Condensate Booster Pumps Should Be Secured	
		a. Condensate booster pumps – 2 PUMPS RUNNING	
		b. Verify the following:	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	<ul style="list-style-type: none"> <li>Verify reactor power is 70%-75%</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>Trim valve controller set at 400 psig</li> </ul>	
		<ul style="list-style-type: none"> <li>Trim valve, AOV-9508G - GREATER THAN 80% OPEN</li> </ul>	
		<ul style="list-style-type: none"> <li>PI-4017, CNDST BSTR DISCH PRESS greater than 395 psig</li> </ul>	
	US	(Step 18.b RNO) Return to step 9.	
			<b>Examiner NOTE:</b> Due to the length and transient nature of this evaluation, the Examiner may elect to evaluate Technical Specifications after the scenario. The remaining Steps of AP-SG.1 are not scripted.
<b>TECHNICAL SPECIFICATION 3.4.13, RCS OPERATIONAL LEAKAGE</b>			
	US	LCO 3.4.13 RCS operational LEAKAGE shall be limited to:	
		a. No pressure boundary LEAKAGE;	
		b. 1 gpm unidentified LEAKAGE;	
		c. 10 gpm identified LEAKAGE; and	
		d. 150 gallons per day primary to secondary LEAKAGE through any one steam generator (SG).	
		APPLICABILITY MODES 1, 2, 3, and 4.	
		ACTIONS	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior			Comments
		CONDITION	REQUIRED ACTION	COMPLETION TIME	<b>NOTE:</b> The US will identify that Condition B is applicable based on Primary-To-Secondary Leakage.
		B. Required Action and associated Completion Time not met. <u>OR</u> RCS pressure boundary LEAKAGE exists. <u>OR</u> Primary to secondary LEAKAGE not within limit.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	6 hours  36 hours	
<b>TECHNICAL SPECIFICATION 3.7.14, SECONDARY SPECIFIC ACTIVITY</b>					
	US	LCO 3.7.14 The specific activity of the secondary coolant shall be ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131.			
		APPLICABILITY MODES 1, 2, 3, and 4.			
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	<b>NOTE:</b> The US will identify that Condition A is applicable if Chemistry indicates the specific activity of the secondary coolant is > 0.10 μCi/gm DOSE EQUIVALENT I-131.
		A. Specific activity not within limit.	A.1 Be in MODE 3. <u>AND</u> A.2 Be in MODE 5.	6 hours  36 hours	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior			Comments
TECHNICAL SPECIFICATION 3.3.4, LOSS OF POWER (LOP) DIESEL GENERATOR (DG) START INSTRUMENTATION					
	US	LCO 3.3.4 Each 480V safeguards bus shall have two OPERABLE channels of LOP DG Start Instrumentation.			
		APPLICABILITY: MODES 1, 2, 3, and 4.			
		ACTIONS			
	US	CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will recognize that the DG did not start automatically when Buses 14 and 18 were de-energized, and enter Condition B.
		A. One or more 480V bus(es) with one channel inoperable	A.1 Place channel(s) in trip.	6 hours	
		B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> One or more 480 V bus(es) with two channels inoperable.	Enter applicable Condition(s) and Required Action(s) for the associated DG made inoperable by LOP DG start instrumentation.	Immediately	
TECHNICAL SPECIFICATION 3.8.1, AC SOURCES MODES 1, 2, 3, and 4					
	US	LCO 3.8.1 The following AC electrical sources shall be OPERABLE:			



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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior			Comments
		a. One qualified independent offsite power circuit connected between the offsite transmission network and each of the onsite 480V safeguards buses required by LCO 3.8.9, "Distribution Subsystems – MODES 1, 2, 3, and 4"; and			
		b. Two emergency diesel generators (DGs) capable of supplying their respective onsite 480V safeguards buses required by LCO 3.8.9.			
	US	APPLICABILITY MODES 1, 2, 3, and 4.			
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will determine with the 'A' DG failure to Auto Start, Condition B of LCO 3.8.1 is required.
		B. One DG inoperable.	B.1 Perform SR 3.8.1.1 for the offsite circuit.	1 hour <u>AND</u> Once per 8 hours thereafter	
			<u>AND</u>		
			B.2 Declare required feature(s) supported by the inoperable DG inoperable when its required redundant feature(s) is inoperable.	4 hours from discovery of Condition B concurrent with inoperability of redundant required feature(s)	
			<u>AND</u>		
			B.3.1 Determine OPERABLE DG is not inoperable due to common cause failure.	24 hours	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior			Comments
			<u>OR</u>		
			B.3.2 Perform SR 3.8.1.2 for OPERABLE DG.	24 hours	
			<u>AND</u>		
			B.4 Restore DG to OPERABLE status.	7 days	
<b>TECHNICAL SPECIFICATION 3.8.9, DISTRIBUTION SYSTEMS - MODES 1, 2, 3, and 4</b>					
	US	LCO 3.8.9 Train A and Train B of the following electrical power distribution subsystems shall be OPERABLE:			
		a. AC power;			
		b. AC instrument bus power; and			
		c. DC power.			
	US	APPLICABILITY MODES 1, 2, 3, and 4.			
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will identify that LCO 3.8.9 was entered and exited during the time period when the 'A' DG failed to start and it was manually started.
		A. One AC electrical power distribution train inoperable.	A.1 Restore AC electrical power distribution train to OPERABLE status.	8 hours	
		B. One AC instrument bus electrical power distribution train inoperable.	B.1 Restore AC instrument bus electrical power distribution train to OPERABLE status.	2 hours	

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Event Description: **Steam Generator 'B' Tube Leak (SGTL) – 10 gpm, downpower required IAW AP-SG.1.**  
**Loss of 7T Line/'A' EDG fails to start in AUTO – AP-ELEC.1**

Time	Pos.	Expected Actions/Behavior			Comments
		C. One DC electrical power distribution train inoperable.	C.1 Restore DC electrical power distribution train to OPERABLE status.	2 hours	
TECHNICAL REQUIREMENT 3.8.1, OFFSITE POWER SOURCES					
	US	TR 3.8.1 Two qualified independent offsite power circuits shall be OPERABLE.			
	US	APPLICABILITY: MODES 1, 2, 3, 4			
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will recognize that Condition A was entered when the 7T line was de-energized.
		A. One offsite power circuit inoperable.	A.1 Initiate action to verify reliability of OPERABLE offsite power circuit.  <u>AND</u>	Immediately	
			A.2.1 Establish pre-conditions necessary to complete backfeed procedure in 8 hours or less  <u>OR</u> A.2.2 Restore Offsite Power Circuit to OPERABLE status	72 Hours  72 Hours	
At the discretion of the Lead Examiner move to Events #5 - 7.					

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

After this, the S/G Tube Leak in the 'B' S/G will degrade to a S/G Tube Rupture (640 gpm) over five minutes. This will result in an automatic reactor trip and Safety Injection actuation. The crew will enter E-0, Reactor Trip or Safety Injection, and transition to E-3, Steam Generator Tube Rupture. Following the verification of AFW step in E-0, the remaining Offsite Power Circuit 767 will be lost resulting in loss of all Offsite Power. ECCS loads that were lost will automatically sequence onto 'B' EDG.

While depressurizing the RCS using a PORV at Step 19 of E-3, the PORV and its associated block valve will fail to CLOSE. The crew will transition to ECA-3.1, SGTR With Loss of Reactor Coolant – Subcooled Recovery Desired.

The scenario will terminate at Step 15 of ECA-3.1, after the crew has established a 100°F/hr RCS cooldown rate.

**SIM DRIVER Instructions:**

**Operate Trigger #5 SGN05B = 640,  
300sec Ramp (S/G B Tube Leak  
Halfway Up Tube)**

**Indications Available:**

- MCB Annunciator F-10, PRESSURIZER LO PRESS 2205 PSI
- Pressurizer level starts to lower
- Charging flow starts to rise
- R-32, Steam Line Monitor, in alarm
- Automatic Reactor Trip and Safety Injection may occur

Time	Pos.	Expected Actions/Behavior	Comments
<b>AP-SG.1, STEAM GENERATOR TUBE LEAK</b>			
	HCO	(*Step 1) Monitor PRZR Level – STABLE AT PROGRAM LEVEL	<b>NOTE:</b> PRZR level will continually be lowering in this progressively degrading SGTR.

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## Event Description:

**'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)****Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)****During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.****(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 1 RNO) <u>IF</u> PRZR level lowering, <u>THEN</u> start additional charging pumps and raise speed as necessary to stabilize PRZR level.	
		<u>IF</u> PRZR level continues to lower, <u>THEN</u> close letdown isolation, AOV-427 and excess letdown AOV-310.	
		<u>IF</u> available charging pumps are running at maximum speed with letdown isolated, <u>AND</u> PRZR level is lowering, <u>THEN</u> trip the reactor and go to E-0, REACTOR TRIP OR SAFETY INJECTION.	<b>NOTE:</b> The leak will be large enough to require a Rx Trip.
			<b>NOTE:</b> The US will go to E-0.
<b>E-0, REACTOR TRIP OR SAFETY INJECTION</b>			
	HCO	(Step 1) Verify Reactor Trip:	<b>Immediate Action</b>
		o At least one train of reactor trip breakers – OPEN	
		o Neutron flux - LOWERING	
		o MRPI indicates - ALL CONTROL <u>AND</u> SHUTDOWN RODS ON BOTTOM with no instrument fluctuations concurrent with fire.	
	CO	(Step 2) Verify Turbine Stop Valves – CLOSED	<b>Immediate Action</b>
	HCO/ CO	(Step 3) Verify sufficient AC Emergency buses Energized To At Least 440 VOLTS:	<b>Immediate Action</b>
	HCO/ CO	o Bus 14 <u>OR</u> Bus 16	

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## Event Description:

**'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)****Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)****During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.****(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	-AND-	
		o Bus 17 <u>OR</u> Bus 18	
	HCO	(Step 4) Check if SI is Actuated:	<b>Immediate Action</b>
		a. Any SI Annunciator – LIT	
		b. SI sequencing – BOTH TRAINS STARTED.	
			<b>NOTE:</b> CO may secure AFW flow to 'B' S/G due to SGTR.
	HCO/ CO	Foldout Page	<b>NOTE:</b> The crew will monitor these conditions throughout the performance of E-0.
		RCP TRIP CRITERIA	
		LOSS OF SW CRITERIA	
		AFW SUPPLY SWITCHOVER CRITERION	
		SFP COOLING CRITERIA	<b>NOTE:</b> The US may dispatch an EO to address the status of the SFPCS. If so, <b>SIM DRIVER</b> acknowledge as EO, and report in 5 Minutes that the SFPCS is operating normally.
	HCO	(*Step 5) Verify CNMT Spray Not Required:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		o Annunciator A-27, CNMT SPRAY – EXTINGUISHED	
		o CNMT pressure- LESS THAN 28 PSIG	<b>NOTE:</b> Containment Pressure will be normal

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 6) Direct Operator to Perform ATT-27.0, ATTACHMENT AUTOMATIC ACTION VERIFICATION	
			<b>NOTE:</b> The US will hand off ATT-27.0 to either the HCO or the CO, and continue with the other operator in E-0. <b>Examiner</b> following operator performing ATT-27.0 continue below. <b>Examiner</b> following operator NOT performing ATT-27.0 continue at <b>Page 44</b> .
<b>E-0, REACTOR TRIP OR SAFETY INJECTION, ATTACHMENT 27.0, ATTACHMENT AUTOMATIC ACTION VERIFICATION</b>			
	HCO/CO	(Step 1) Verify SI and RHR Pumps Running:	<b>NOTE:</b> It is expected that Off-Site Power circuits will be de-energized during performance of ATT-27.0 requiring the operator to re-perform completed steps.
		a. All SI pumps – RUNNING	
		b. Both RHR pumps – RUNNING	
	HCO/CO	(Step 2) Verify CNMT RECIRC Fans Running:	
		a. All fans – RUNNING	
		b. Charcoal filter dampers green status lights – EXTINGUISHED	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 3) Check If Main Steamlines Should Be Isolated:	
		a. Any MSIV – OPEN	
		b. Check CNMT pressure - LESS THAN 18 PSIG	
		c. Check if ANY main steamlines should be isolated:	
		a. Low Tavg (545°F) AND high steam flow (0.5x10 <sup>6</sup> lb/hr) from either S/G	<b>NOTE:</b> Tavg will be LOW with Hi Steam Flow from both S/Gs.
		-OR-	
		b. High-High steam flow (4.4x10 <sup>6</sup> lb/hr) from either S/G	
	HCO/ CO	(Step 3.c RNO) Go to Step 4.	
	HCO/ CO	(Step 4) Verify MFW Isolation:	
		a. MFW pumps – TRIPPED	
		b. MFW Isolation valves – CLOSED	
		• S/G A, AOV-3995	
		• S/G B, AOV-3994	
	HCO/ CO	c. S/G Blowdown and sample valves - CLOSED	
	HCO/ CO	(Step 5) Verify At Least Two SW Pumps - RUNNING	



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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 6) Verify CI and CVI:	
		a. CI and CVI annunciators - LIT	
		• Annunciator A-26, CNMT ISOLATION	
		• Annunciator A-25, CNMT VENTILATION ISOLATION	
		b. Verify CI and CVI valve status lights – BRIGHT	
		c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT	
		• FCV-4561	
		• FCV-4562	
		d. Letdown orifice valves - CLOSED	
		• AOV-200A	
		• AOV-200B	
		• AOV-202	
	HCO/ CO	(Step 7) Check CCW System Status:	
		a. Verify CCW pump – AT LEAST ONE RUNNING	
	HCO/ CO	(Step 8) Verify SI and RHR Pump Flow:	
		a. SI flow indicators – CHECK FOR FLOW	
	HCO/ CO	b. RHR flow indicator – CHECK FOR FLOW	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
		(Step 7b RNO) IF RCS pressure less than 150 psig.....	<b>NOTE:</b> RCS Pressure is > 150 psig.
	HCO/ CO	(Step 9) Verify SI Pump and RHR Pump Emergency Alignment:	
		a. RHR pump discharge to Rx vessel deluge - OPEN	
		• MOV-852A	
		• MOV-852B	
		b. Verify SI pump C – RUNNING	
		c. Verify SI pump A - RUNNING	
		d. Verify SI pump B - RUNNING	
		e. Verify SI pump C discharge valves - OPEN	
		• MOV-871A	
		• MOV-871B	
	HCO/ CO	(Step 10) Verify CREATS Actuation:	
		a. At least one damper in each flowpath - CLOSED	
	HCO/ CO	• Normal Supply Air	
		• Normal Return Air	
		• Lavatory Exhaust Air	
		b. CREATS fans – BOTH RUNNING	

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Event Description:

**'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)****Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)****During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.****(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 11) Verify CI and CVI During a Fire Event	
		a. A confirmed fire has occurred in the control complex or cable tunnel (fire systems S05, S06, S08, Z05, Z18, or Z19).	
		(Step 11.a RNO) Go to END	
<b>E-0, REACTOR TRIP OR SAFETY INJECTION</b>			
			<b>Examiner</b> following operator NOT performing ATT-27.0 continue <b>HERE</b> .
	CO/ HCO	(Step 7) Verify Both MDAFW Pumps Running	
	CO/ HCO	(Step 8) Verify AFW Valve Alignment:	
		a. AFW flow – INDICATED TO BOTH S/G(s)	
		b. AFW flow from each MDAFW pump – LESS THAN 230 GPM	<b>NOTE:</b> The CO may have isolated AFW flow to the 'B' S/G due to the SGTR.
<b>SIM DRIVER Instructions: Operate Trigger #6 EDS01B (Loss of Off-Site Power: Ckt 767)</b>			

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
<b>Indications Available:</b> <ul style="list-style-type: none"> <li>Multiple MCB Annunciators</li> <li>Loss of 4160V Busses 11A, 11B, 12A, and 12B</li> <li>Loss of RCPs</li> <li>480V Safeguards Busses energized by 'A' and 'B' EDGs</li> <li>ECCS equipment re-sequences onto EDGs</li> </ul>			
	CO/ HCO	(*Step 9) Monitor Heat Sink:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Check S/G narrow range level – GREATER THAN 7% [25% ADVERSE CNMT] in any S/G	
	CO/ HCO	(Step 9.a RNO) Perform the following:	<b>NOTE:</b> Step 9.a RNO actions may not be performed.
		1) Verify total AFW flow - GREATER THAN 200 GPM	<b>NOTE:</b> AFW flow is expected to be 200 gpm.
		<u>IF</u> total AFW is less than 200 gpm, <u>THEN....</u>	
	US	2) Go to Step 10.	
	CO/ HCO	(Step 10) Check If TDAFW Pump Can Be Stopped:	
		a. Both MDAFW pumps – RUNNING	<b>NOTE:</b> Both of the MDAFW Pumps are running.
		b. PULL STOP TDAFW pump steam supply valves	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	<ul style="list-style-type: none"> <li>MOV-3504A</li> </ul>	
		<ul style="list-style-type: none"> <li>MOV-3505A</li> </ul>	
	CO/ HCO	(Step 11) Check CCW Flow to RCP Thermal Barriers:	<b>NOTE:</b> Annunciators will be LIT
		<ul style="list-style-type: none"> <li>Annunciator A-7, RCP 1A CCW RETURN HI TEMP <u>OR</u> LO FLOW - EXTINGUISHED</li> </ul>	
		<ul style="list-style-type: none"> <li>Annunciator A-15, RCP 1B CCW RETURN HI TEMP <u>OR</u> LOW FLOW - EXTINGUISHED</li> </ul>	
	HCO	(Step 11 RNO)	<b>NOTE:</b> RCPs are secured.
		a. Stop affected RCPs.	
		b. Reset SI.	
	CO	c. Check adequate power available to run one charging pump.	
		1) <u>IF</u> the Bus 14/16 Normal Feed Breakers are closed <u>THEN</u> verify adequate Safeguard Bus capacity to run one charging pump (6 amps) <ul style="list-style-type: none"> <li>Station Service transformer 14 ammeter</li> <li>Station Service transformer 16 ammeter</li> </ul>	
		2) <u>IF</u> the Bus 14/16 D/G Breakers are closed <u>THEN</u> verify adequate emergency D/G capacity to run one charging pump (75 kw)	<b>NOTE:</b> Adequate power is available.

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## Event Description:

**'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)****Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)****During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.****(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	3) <u>IF</u> sufficient power is <u>NOT</u> available to operate a charging pump <u>THEN</u> go to step 12.	<b>NOTE:</b> Adequate power is available.
	HCO	d. Check seal outlet temperatures	
		1) <u>IF</u> seal outlet temperatures are greater than 235°F, <u>THEN</u> Go to Step 12	<b>NOTE:</b> Seal outlet temperatures are less than 235°F.
		2) <u>IF</u> seal outlet temperatures are less than 235°F, <u>THEN</u> start one charging pump at minimum speed for seal injection	
	HCO	e. Adjust HCV-142 to establish either of the following:	
		o Labyrinth seal D/P to each RCP greater than 15 inches of water.	
		-OR-	
		o RCP seal injection flow to each RCP greater than 6 gpm.	
		f. <u>IF</u> large imbalance in seal injection flow exists, <u>THEN</u> consider local adjustment of V-300A and V-300B.	<b>NOTE:</b> Seal injection flows are balanced.
	CO/ HCO	(*Step 12) Monitor RCS Tavg – STABLE AT <u>OR</u> TRENDING TO 547°F	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
			<b>NOTE:</b> Based on plant temperature, the crew may perform the RNO. If not, continue with Step 13.
	CO/ HCO	(Step 12 RNO) <u>IF</u> temperature less than 547°F and lowering, <u>THEN</u> perform the following:	

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## Event Description:

**'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)****Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)****During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.****(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	a. Stop dumping steam.	
		b. Ensure reheater steam supply valves are closed.	
		c. <u>IF</u> cooldown continues, <u>THEN</u> control total feed flow between 200 gpm to 230 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G.	
		d. <u>WHEN</u> S/G level greater than 7% [25% adverse CNMT] in one S/G, <u>THEN</u> limit feed flow to that required to maintain level in at least one S/G.	
		e. <u>IF</u> cooldown continues, <u>THEN</u> close both MSIVs.	<b>NOTE:</b> The crew may close the 'B' MSIV due to the SGTR.
	CO	<u>IF</u> temperature greater than 547°F and rising, <u>THEN</u> dump steam to stabilize and slowly lower temperature to 547°F.	
	CO/ HCO	(Step 13) Check PRZR PORVs and Spray Valves:	
		a. PORVs – CLOSED	
		b. Auxiliary spray valve (AOV-296) – CLOSED	
	CO/ HCO	c. Check PRZR pressure – LESS THAN 2260 PSIG	
		d. Normal PRZR spray valves - CLOSED	
		• PCV-431A	
		• PCV-431B	

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## Event Description:

**'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**

**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**

**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**

**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	(Step 14) Monitor RCP Trip Criteria:	
		a. RCP status – ANY RCP RUNNING	<b>NOTE:</b> The RCPs are de-energized
	US	(Step 14.a RNO) Go to Step 15.	
	CO/ HCO	(Step 15) Check If S/G Secondary Side Is Intact:	
		o Pressure in both S/Gs – STABLE <u>OR</u> RISING	
	CO/ HCO	o Pressure in both S/Gs – GREATER THAN 110 PSIG	
	CO/ HCO	(Step 16) Check if S/G Tubes Are Intact:	
		o Air ejector radiation monitors (R-15, R-47, R-48) - NORMAL	
		o S/G blowdown radiation monitor (R- 19) - NORMAL	
		o Steamline radiation monitors (R-31 and R-32) - NORMAL	
	US	(Step 16 RNO) Go to E-3, STEAM GENERATOR TUBE RUPTURE, Step 1.	
			<b>NOTE:</b> The US will go to E-3.
			<b>NOTE:</b> The US will likely conduct an Alignment Brief.



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## Event Description:

**'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)****Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)****During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.****(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
<b>E-3, STEAM GENERATOR TUBE RUPTURE</b>			
			<b>Examiner NOTE:</b> It is expected that the crew will enter ECA-3.1 from E-3.
	HCO/ CO	Foldout Page	<b>NOTE:</b> The crew will monitor these conditions throughout the performance of E-3.
		LOSS OF SW CRITERIA	
		SI REINITIATION CRITERIA	
		SECONDARY INTEGRITY CRITERIA	
		COLD LEG RECIRCULATION SWITCHOVER CRITERION	
		AFW SUPPLY SWITCHOVER CRITERION	
		MULTIPLE S/G TUBE RUPTURE CRITERIA	
	US	(Step 1) Dispatch an AO to standby at door 44 in the Turbine Building.	<b>NOTE:</b> The US may direct the EO to standby at door 44 in the Turbine Building. If so, <b>SIM DRIVER</b> acknowledge as EO.
	HCO	(*Step 2) Monitor RCP Trip Criteria:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. RCP status –ANY RCP RUNNING	<b>NOTE:</b> Both RCPs are de-energized
	US	(Step 2.a RNO) Go to Step 3	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 3) Identify Ruptured S/G(s):	
		<ul style="list-style-type: none"> <li>Unexpected rise in either S/G narrow range level</li> </ul>	<b>NOTE:</b> The CO may report that there is an unexpected rise in 'B' S/G Level.
		-OR-	
		<ul style="list-style-type: none"> <li>High radiation indication on main steamline radiation monitor</li> </ul>	
		<ul style="list-style-type: none"> <li>R-31 for S/G A</li> </ul>	
		<ul style="list-style-type: none"> <li>R-32 for S/G B</li> </ul>	
		-OR-	
	US	<ul style="list-style-type: none"> <li>AO reports local indication of high steamline radiation</li> </ul>	
		-OR-	
	US	<ul style="list-style-type: none"> <li>RP reports high radiation from S/G activity sample.</li> </ul>	<b>NOTE:</b> The US will request that RP assist the Chemistry sample. <b>SIM DRIVER:</b> as RP, acknowledge, and report that 'B' SG has high radioactivity.
	CO	(Step 4) Isolate Flow From Ruptured S/G(s):	<b>NOTE:</b> 'B' S/G is ruptured
	CO	a. Adjust ruptured S/G ARV controller to 1050 psig in AUTO	
		b. Check ruptured S/G ARV - CLOSED	
		c. Close ruptured S/G TDAFW pump steam supply valve and place in PULL STOP	
		<ul style="list-style-type: none"> <li>S/G B, MOV-3504A</li> </ul>	
		d. Verify ruptured S/G blowdown valve - CLOSED	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	<ul style="list-style-type: none"> <li>S/G B, AOV-5737</li> </ul>	
	CO	(Step 5) Complete Ruptured S/G Isolation:	
		a. Close ruptured S/G MSIV – RUPTURED S/G MSIV CLOSED	
		b. Dispatch AO to complete ruptured S/G isolation (Refer to ATT-16.0, ATTACHMENT RUPTURED S/G part A)	<b>NOTE:</b> The US will dispatch an EO. <b>SIM DRIVER:</b> as EO, acknowledge, and RUN Schedule file ATT16.0 SGBpartA.sch
	CO	(Step 6) Check Ruptured S/G Level:	
		a. Narrow range level – GREATER THAN 7% [25% adverse CNMT]	
		b. Close MDAFW pump discharge valve to ruptured S/G	
		<ul style="list-style-type: none"> <li>S/G B, MOV-4008</li> </ul>	
		c. Pull stop MDAFW pump for ruptured S/G	
		d. Close TDAFW pump flow control valve to ruptured S/G	
		<ul style="list-style-type: none"> <li>S/G B, AOV-4298</li> </ul>	
		e. Verify MDAFW pump crosstie valves - CLOSED	
		<ul style="list-style-type: none"> <li>MOV-4000A</li> <li>MOV-4000B</li> </ul>	
	CO	(Step 7) Verify Ruptured S/G Isolated:	
		a. Check ruptured MSIV - CLOSED	

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## Event Description:

**'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)****Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)****During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.****(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	b. Check TDAFW pump steam supply from ruptured S/G - ISOLATED	
		c. Ruptured S/G pressure – GREATER THAN 500 PSIG	

**CRITICAL TASK:**

**Isolate feedwater flow into and steam flow from the ruptured SG (B) so that minimum  $\Delta P$  between the B SG and A SG is not less than 250 psid once target temperature is reached (Entry into ECA-3.1 at Step 16 RNO). (EOP-Based)**

Safety Significance: Failure to isolate the ruptured SG causes a loss of  $\Delta P$  between the ruptured SG and the intact SG. Upon a loss of  $\Delta P$ , the crew must transition to a contingency procedure that constitutes an incorrect performance that "necessitates the crew taking compensating action which complicates the event mitigation strategy." If the crew fails to isolate steam from the SG, or feed flow into the SG, the ruptured SG pressure will tend to decrease to the same pressures as the intact SG, requiring a transition to a contingency procedure, and delaying the stopping of RCS leakage into the SG.

	CO	(Step 8) Establish Condenser Steam Dump Pressure Control:	
	CO	a. Verify condenser available:	
		o Intact S/G MSIV - OPEN	
	CO	(Step 8.a RNO) Adjust S/G ARV controller to maintain intact S/G pressure in AUTO and go to Step 9.	
	HCO	(Step 9) Reset SI	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
		(Step 10) Initiate RCS Cooldown:	
	US	a. Determine required core exit temperature from below table: <ul style="list-style-type: none"> <li>• 1000-1049 psig (512°F)</li> <li>• 1050-1099 psig (519°F)</li> </ul>	
	CO	b. <u>IF</u> ruptured S/G MSIV closed, <u>THEN</u> initiate dumping steam to condenser from intact S/G at maximum rate	<b>NOTE:</b> Condenser is not available.
	CO	(Step 10.b RNO) Manually or locally initiate steam dump from intact S/G at maximum rate using S/G ARV.	
	CO	c. Core exit T/Cs – LESS THAN REQUIRED TEMPERATURE	
	CO	(Step 10c RNO) Continue with Step 11. <u>WHEN</u> core exit T/Cs less than required, <u>THEN</u> do Step 10d.	<b>NOTE:</b> The CO will initiate a cooldown, and proceed on in the procedure. When the target temperature is reached perform Step 10.d.
	CO	(Step 10d) Stop RCS cooldown and stabilize core exit T/Cs less than required temperature	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
<b><u>CRITICAL TASK:</u></b>			
<p><b>While in EOP E-3, establish/maintain an RCS temperature so that transition from E-3 does not occur because the RCS temperature is in either (1) Too high to maintain 20°F of RCS Subcooling OR (2) below 284°F (RCS Integrity Red Path Limit) (EOP-Based)</b></p> <p>Safety Significance: Failure to establish and maintain the correct RCS temperature during a SGTR leads to a transition from E-3 to a contingency procedure. This failure constitutes an incorrect performance that necessitates the operator taking compensating action that would unnecessarily complicate the event mitigation strategy.</p>			
	CO	(*Step 11) Monitor Intact S/G Level:	<p><b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.</p> <p><b>NOTE:</b> The Step 11 RNO (Maintain AFW &gt;200 gpm until at least one S/G &gt; 7%) may be performed.</p>
	CO	a. Narrow range level – GREATER THAN 7% [25% adverse CNMT]	
		b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	
	HCO	(*Step 12) Monitor PRZR PORVs and Block Valves:	<p><b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.</p>
		a. Power to PORV block valves - AVAILABLE	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	b. PORVs - CLOSED	
		c. Block valves – AT LEAST ONE OPEN	
	HCO	(Step 13) Reset CI:	
		a. Depress CI reset push button	
		b. Verify annunciator A-26, CNMT ISOLATION - EXTINGUISHED	
	HCO/ CO	(Step 14) Establish IA to CNMT:	
		a. Verify IA Available	
		o Adequate air compressors Running	<b>NOTE:</b> No IACs are available. US may have already contacted the EO to start Diesel Air Compressor <b>SIM DRIVER:</b> as EO, acknowledge, and <b>INSERT REM MIS042 = OPEN</b>
		o IA Pressure GREATER THAN 60 PSIG	
	CO	o IA Pressure Stable or Rising	
	US	(Step 14.a RNO) Go to Step 15	<b>NOTE:</b> If crew has the Diesel Air Compressor operating, then Step 14.a RNO will not be performed.
	HCO/ CO	b. Reset both trains of XY relays for IA to CNMT AOV-5392	
		c. Verify IA to CNMT AOV-5392 OPEN	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 15) Check if RCS Cooldown Should be Stopped:	
		a. Core exit T/Cs - LESS THAN REQUIRED TEMPERATURE	
		b. Stop RCS cooldown	<b>NOTE:</b> If NOT previously done, when the target temperature has been reached, the cooldown will be stopped.
		c. Stabilize core exit T/Cs – LESS THAN REQUIRED TEMPERATURE	
	CO	(Step 16) Check Ruptured S/G Pressure – STABLE OR RISING	
	CO	(Step 17) Check RCS Subcooling Based On Core Exit T/Cs – GREATER THAN 20°F USING FIG-1.0, FIGURE MIN SUBCOOLING	
	HCO	(Step 18) Depressurize RCS To Minimize Break Flow and Refill PRZR:	
	CO	a. Check the following:	
		o Ruptured S/G level - LESS THAN 90% [80% adverse CNMT]	
		o Any RCP - RUNNING	
	CO	o IA to CNMT - AVAILABLE	
	US	(Step 18.a RNO) Go to Step 19.	



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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 19) Depressurize RCS Using PRZR PORV To Minimize Break Flow And Refill PRZR:	
		a. Verify IA to CNMT - AVAILABLE	
		b. PRZR PORVs – AT LEAST ONE AVAILABLE	
	HCO	c. Open one PRZR PORV until ANY of the following conditions satisfied:	
		o PRZR level – GREATER THAN 75% [65% adverse CNMT]	
		-OR-	
		o RCS pressure – LESS THAN SATURATION USING FIG-1.0, FIGURE MIN SUBCOOLING	
		-OR-	
		o BOTH of the following:	
		1) RCS pressure – LESS THAN RUPTURED S/G PRESSURE	
		2) PRZR level – GREATER THAN 10% [30% adverse CNMT]	

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## Event Description:

**'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**

**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**

**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**

**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
<b>SIM DRIVER Instructions: Operate Trigger #7 PZR05A = 100 (PZR Relief Vlv Failure: PCV-430) once HCO OPENS PORV PCV-430</b>			
<u>Inserted at T = 0</u> <b>REM OVR-PZR02D = TRUE (OPEN Signal Pressurizer Relief Stop Valve No 516)</b> <b>REM OVR-PZR02C = FALSE (CLOSE Signal Pressurizer Relief Stop Valve No 516)</b> <b>MALF PZR05B = 0 (PZR Relief Vlv Failure: PCV-431C)</b>			
<b>Indications Available:</b> <ul style="list-style-type: none"> <li>• PORV PCV-431C fails to OPEN</li> <li>• PORV PCV-430 fails to CLOSE</li> <li>• PORV PCV-430 Block Valve fails to CLOSE</li> <li>• RCS pressure continues to lower</li> </ul>			
	HCO	(Step 19 cont'd) d. Close PRZR PORVs	
	HCO	(Step 19.d RNO) <u>IF</u> either PRZR PORV can <u>NOT</u> be closed, <u>THEN</u> close associated block valve.	
	HCO	(Step 20) Check RCS Pressure - RISING	
	HCO	(Step 20 RNO) Close block valve for the PRZR PORV that was opened.	
		<u>IF</u> pressure continues to lower, <u>THEN</u> perform the following:	
		a. Monitor the following conditions for indication of leakage from PRZR PORV:	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
		o PORV outlet temp (TI-438) <u>NOT</u> lowering.	
		o PRT pressure, level or temperature continue to rise.	
	US	b. Go to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED, Step 1.	
			<b>NOTE:</b> The US will go to ECA-3.1.
<b>ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT SUBCOOLED RECOVERY DESIRED</b>			
			<b>Examiner NOTE:</b> It is expected that at some time during the performance of ECA-3.1, an Orange/Red Path may exist on RCS Integrity. If so, Terminate Exam at the discretion of the Lead Examiner.
	HCO/ CO	Foldout Page	<b>NOTE:</b> The crew will monitor these conditions throughout the performance of ECA-3.1.
		LOSS OF SW CRITERIA	
		SI REINITIATION CRITERIA	
		SATURATED RECOVERY CRITERIA	
		SECONDARY INTEGRITY CRITERIA	
		COLD LEG RECIRCULATION SWITCHOVER CRITERION	
		AFW SUPPLY SWITCHOVER CRITERION	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 1) Reset SI	
	HCO	(Step 2) Reset CI:	
	HCO	a. Depress CI reset pushbutton	
		b. Verify annunciator A-26, CNMT ISOLATION – EXTINGUISHED	
	CO	(Step 3) Verify Adequate SW Flow:	
		a. Check at least two SW pumps – RUNNING	
		b. Dispatch AO to establish normal shutdown alignment (Refer to ATT-17.0, ATTACHMENT SD-1)	<b>NOTE:</b> The US will dispatch an EO. <b>SIM DRIVER:</b> as <b>EO</b> , acknowledge, and perform all remotes associated with ATT-17.0 (Schedule File <b>SD-1.sch</b> ).
	HCO/ CO	(Step 4) Establish IA to CNMT:	
		a. Verify non-safeguards buses energized from offsite power	
		o Bus 13 normal feed – CLOSED	
		-OR-	
		o Bus 15 normal feed - CLOSED	
	CO	(Step 4.a RNO) Perform the following:	
		1) Close non-safeguards bus tie breakers:	<b>NOTE:</b> US may decide NOT to close bus tie breakers due to risk

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	<ul style="list-style-type: none"> <li>Bus 13 to Bus 14 tie</li> </ul>	
		<ul style="list-style-type: none"> <li>Bus 15 to Bus 16 tie</li> </ul>	
		2) Reset Control Room lighting	
	CO	(Step 4 cont'd) b. Verify SW isolation valves to turbine building - OPEN	<b>NOTE:</b> These valves are CLOSED.
		<ul style="list-style-type: none"> <li>MOV-4613 and MOV-4670</li> </ul>	
		<ul style="list-style-type: none"> <li>MOV-4614 and MOV-4664</li> </ul>	
	CO	(Step 4.b RNO) Perform the following:	
		1) Restore IA using Service Air Compressor per step 4c.	<b>NOTE:</b> The US will start the Diesel Air Compressor.
	HCO/ CO	(Step 4 cont'd) c. Verify adequate air compressor(s) – RUNNING	<b>NOTE:</b> RNO will NOT be performed if Diesel Air Compressor is running.
	US	(Step 4.c RNO) Manually start electric air compressor(s) as power supply permits:	
		<ul style="list-style-type: none"> <li><u>IF</u> Buses 13/15 normal feed breakers are CLOSED – no restrictions</li> </ul>	
		<ul style="list-style-type: none"> <li><u>IF</u> Buses 14/16 normal feed breakers are CLOSED 6 amps per air compressor</li> </ul>	
		<ul style="list-style-type: none"> <li><u>IF</u> Buses 14/16 D/G breakers are CLOSED 75 kw per air compressor</li> </ul>	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	IF electric air compressors CAN <u>NOT</u> be started <u>THEN</u> start the diesel air compressor and tie in to Instrument Air (refer to ATT-11.3, ATTACHMENT DIESEL AIR COMPRESSOR)	<b>NOTE:</b> US may have already contacted the EO to start diesel air compressor <b>SIM DRIVER:</b> as <b>EO</b> , acknowledge, and <b>INSERT REM MIS042 = OPEN</b>
	CO	(Step 4 cont'd) d. Check IA supply:	
		o Pressure – GREATER THAN 60 PSIG	
		o Pressure – STABLE OR RISING	
	HCO	e. Reset both trains of XY relays for IA to CNMT AOV-5392	
		f. Verify IA to CNMT AOV-5392 - OPEN	
	CO	(*Step 5) Monitor AC Bus Power:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Verify Safeguards Busses 14, 16, 17, and 18 – GREATER THAN 440 VOLTS	
		b. Verify All AC Busses – BUSSES ENERGIZED BY OFFSITE POWER	
		o Normal feed breakers to all 480 volt busses - CLOSED	
		o Emergency D/G output breakers - OPEN	

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Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 5.b RNO) Perform the following as necessary:	
		1) <u>IF</u> any AC emergency bus normal feed breaker open, <u>THEN</u> ensure associated D/G breaker closed.	
		2) Close non-safeguards bus tie breakers:	<b>NOTE:</b> US may decide NOT to close bus tie breakers due to risk
	CO	• Bus 13 to Bus 14 tie	
		• Bus 15 to Bus 16 tie	
		3) Place the following pumps in PULL STOP:	
		• EH pumps	
		• Turning gear oil pump	
		• HP seal oil backup pump	
		4) Restore power to MCCs.	
		• A from Bus 13	
		• B from Bus 15	
		• E from Bus 15	
		• F from Bus 15	
		5) Start HP seal oil backup pump.	
		6) Ensure D/G load within limits.	
		7) <u>WHEN</u> bus 15 restored, <u>THEN</u> reset control room lighting.	
		8) Refer to ATT-8.4, ATTACHMENT SI/UV for other equipment lost with loss of offsite power.	<b>NOTE:</b> ATT-8.4 actions not scripted.

Op Test No.: 2018 Scenario # 3 Event # 5, 6, & 7 Page 65 of 72

Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	9) Try to restore offsite power to all AC busses (Refer to ER-ELEC.1, RESTORATION OF OFFSITE POWER)	<b>NOTE:</b> ER-ELEC.1 actions will not be performed.
	HCO	(Step 6) Deenergize PRZR Heaters	
		a. Place PRZR proportional heaters in PULL STOP	
		b. Place PRZR backup heaters to OFF	
	US	c. Consult TSC for a recommended minimum indicated PRZR level that will ensure heaters are covered.	<b>NOTE:</b> The US will contact the TSC. <b>SIM DRIVER:</b> as TSC, acknowledge, indicate that TSC is NOT manned, and will call when active.
	HCO	(*Step 7) Monitor If CNMT Spray Should Be Stopped:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. CNMT spray pumps – ANY RUNNING	<b>NOTE:</b> The CS Pumps are NOT running.
	US	(Step 7a RNO) Go to Step 8.	
	CO	(Step 8) Check Ruptured S/G Level:	
		a. Narrow range level – GREATER THAN 7% [25% adverse CNMT]	
		b. Close MDAFW pump discharge valve to ruptured S/G	
		• S/G B, MOV-4008	



Op Test No.: 2018 Scenario # 3 Event # 5, 6, & 7 Page 66 of 72

Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	c. Pull stop MDAFW pump for ruptured S/G	
		d. Close TDAFW pump flow control valve to ruptured S/G	
		• S/G B, AOV-4298	
		e. Verify MDAFW pump crosstie valves - CLOSED	
		• MOV-4000A	
		• MOV-4000B	
	HCO	(*Step 9) Monitor If RHR Pumps Should Be Stopped:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. RHR pumps – ANY RUNNING IN INJECTION MODE	<b>NOTE:</b> The RHR Pumps are BOTH running.
		b. Check RCS pressure:	
		○ Pressure - GREATER THAN 300 psig [350 psig adverse CNMT]	
		○ Pressure - STABLE OR RISING	
		c. Stop RHR pumps and place in AUTO	
	US	(Step 10) Evaluate Plant Status:	
	HCO/ CO	a. Check auxiliary building radiation - NORMAL	
		• Plant vent iodine (R-10B)	
		• Plant vent particulate (R-13)	
		• Plant vent gas (R-14)	

Op Test No.: 2018 Scenario # 3 Event # 5, 6, & 7 Page 67 of 72

Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	<ul style="list-style-type: none"> <li>CCW liquid monitor (R-17)</li> </ul>	
		<ul style="list-style-type: none"> <li>Letdown line monitor (R-9)</li> </ul>	
		<ul style="list-style-type: none"> <li>CHG pump room (R-4)</li> </ul>	
	US	b. Direct Chem Tech to obtain following samples:	<b>NOTE:</b> The US may contact Chemistry. <b>SIM DRIVER:</b> as Chemistry, acknowledge.
		<ul style="list-style-type: none"> <li>RCS boron</li> </ul>	
		<ul style="list-style-type: none"> <li>RCS activity</li> </ul>	
		<ul style="list-style-type: none"> <li>CNMT hydrogen</li> </ul>	
		<ul style="list-style-type: none"> <li>CNMT sump boron</li> </ul>	
		<ul style="list-style-type: none"> <li>CNMT sump pH</li> </ul>	
	HCO	c. Verify adequate Rx head cooling:	
		1) Verify at least one control rod shroud fan – RUNNING	
		2) Verify one Rx compartment cooling fan - RUNNING	
	HCO	(Step 10.c RNO)	
		1) Manually start one fan as power supply permits (45 kw)	
		2) Perform the following: <ul style="list-style-type: none"> <li>Dispatch AO to locally reset UV relays at MCC C and MCC D               <ul style="list-style-type: none"> <li>MCC C POS 15C</li> <li>MCC D POS 4B</li> </ul> </li> <li>Manually start one fan as power supply permits (23 kw)</li> </ul>	<b>SIM DRIVER:</b> as EO, acknowledge. Reset MCC C/D UV Relays by inserting <b>REM EDS033 and EDS034 = RESET.</b>

Op Test No.: 2018 Scenario # 3 Event # 5, 6, & 7 Page 68 of 72

Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 11) Check Power Availability to Charging Pumps:	
		a. Check Normal Power Available To Charging Pumps:	
		• Bus 14 normal feed breaker - CLOSED	
		• Bus 16 normal feed breaker - CLOSED	
	HCO	(Step 11.a RNO) Verify adequate emergency D/G capacity to run Charging Pumps (75 kw each).	
		<u>IF</u> sufficient power is available <u>THEN</u> GO TO step 12.	<b>NOTE:</b> Sufficient power is available.
	HCO	(Step 12) Establish 75 GPM Charging Flow:	
		a. Charging pumps – ANY RUNNING	
	HCO	b. Align charging pump suction to RWST:	
		○ LCV-112B – OPEN	
		○ LCV-112C - CLOSED	
		c. Start charging pumps as necessary and establish 75 gpm total charging flow	<b>NOTE:</b> A second Charging Pump will be started.
		• Charging line flow	
		• Seal injection	
	CO	(Step 13) Check If S/G Secondary Side Is Intact:	

Op Test No.: 2018 Scenario # 3 Event # 5, 6, & 7 Page 69 of 72

Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	<ul style="list-style-type: none"> <li>Pressure in both S/Gs – STABLE OR RISING</li> </ul>	
		<ul style="list-style-type: none"> <li>Pressure in both S/Gs – GREATER THAN 110 PSIG</li> </ul>	
	CO	(*Step 14) Monitor Intact S/G levels:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Narrow range level – GREATER THAN 7% [25% adverse CNMT]	
		b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	
	CO	(Step 15) Initiate RCS Cooldown To Cold Shutdown:	
		a. Establish and maintain cooldown rate in RCS cold legs – LESS THAN 100°F/HR	<b>NOTE:</b> It is likely that the RCS Cooldown Rate is > 100°F/hour.
		b. Use RHR system if in service	
		c. Dump steam to condenser from intact S/G	<b>NOTE:</b> Condenser is not available.
		(Step 15.c RNO) Manually or locally dump steam using intact S/G ARV.	
	CO	(*Step 16) Monitor Conditions For Subcooled Recovery:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.

Op Test No.: 2018 Scenario # 3 Event # 5, 6, & 7 Page 70 of 72

Event Description: **'B' SG SGTR / Rx Trip / SI (Ramp to 640 gpm tube rupture over 300 seconds)**  
**Loss of Off-Site Power (Prior to transition to E-3) (At step 9, following AFW verification)**  
**During RCS Depressurization with a PORV, the selected PORV and its associated Block Valve will not close. Causes transition to ECA-3.1, SGTR WITH LOSS OF REACTOR COOLANT – SUBCOOLED RECOVERY DESIRED.**  
**(Or force the use of PORV 430, by causing PORV 431-C to not open)**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	a. Check RWST level – GREATER THAN 56%	
	CO	b. Check ruptured S/G narrow level – LESS THAN 90% [80% adverse CNMT]	<b>NOTE:</b> If SG Level < 90%, continue in ECA-3.1.
<b>At the discretion of the Lead Examiner terminate the exam.</b>			

TURNOVER SHEET for NRC Exam Scenario #3

<u>Core Age: MOL</u> 90% Power Outside Air Temp = 45°F Water Temp = 45°F	<u>Procedure in Use:</u>	<u>ACTIONS/NOTES:</u> <ul style="list-style-type: none"> <li>• The plant is at 90% power (MOL).</li> <li>• Corrective Maintenance was performed on 'A' HDT Pump four days ago and Engineering is monitoring Pump seal performance.</li> <li>• It is intended to observe the 'A' HDT Pump operation for one more day at this power level and then raise power to 100%.</li> <li>• The area has experienced overcast conditions for the past 4 hours, with wind from the West at 20-30 mph, and this is expected to continue throughout the shift.</li> <li>• There is no equipment Out-of-Service.</li> </ul>
Boron: 950 ppm BAST: 19,000 ppm RCS Activity: Normal	<u>RCS LEAKAGE: (gpm)</u> Total: .021 Identified: .003 Unidentified: .018	

TURNOVER SHEET for NRC Exam Scenario #3

<u>Equipment Problems/OOS:</u> None	<u>Planned Activities for Shift:</u>	<u>Electrical System Operator Declarations</u> None in effect
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A-52.4					
EQUIPMENT	DATE/TIME OOS	LCO	TITLE	EXP DATE	ECD
A-52.12					
EQUIPMENT	DATE/TIME OOS	TRM /ODCM	TITLE	EXP DATE	ECD

PROGRAM: Ginna Operations Training

MODULE: Initial License Operator Training Class 17-1

TOPIC: NRC Simulator Exam

**Scenario #4**

**REFERENCES:**

1. AR-F-11, PRESSURIZER LO LEVEL 13% (Rev 4)
2. ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure (Rev 037)
3. S-3.2E, Placing In or Removing From Service Normal Letdown/Excess Letdown (Rev 028)
4. Technical Specification LCO 3.3.1, Reactor Trip System (RTS) Instrumentation (Amendment 112)
5. Technical Specification LCO 3.3.3, Post Accident Monitoring (PAM) Instrumentation (Amendment 90)
6. Technical Specification LCO 3.4.9, Pressurizer (Amendment 122)
7. AR-F-16, AVERAGE TAVG – TREF DEVIATION  $\pm 5^{\circ}\text{F}$  (Rev 6)
8. AP-RCC.1, Continuous Control Rod Withdrawal/Insertion (Rev 012)
9. AR-G-25, MOTOR OFF CTR SECT PMPS EXCEPT MAIN & AUX FEED PMPS (Rev 01000)
10. AP-FW.1, Abnormal MFW Pump Flow or NPSH (Rev 02000)
11. AP-TURB.5, Rapid Load Reduction (Rev 018)
12. AR-G-22, ADFCS SYSTEM TROUBLE (Rev 01100)
13. Technical Specification LCO 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation (Amendment 109)
14. E-0, Reactor Trip or Safety Injection (Rev 048)
15. ATT-27.0, Attachment Automatic Actuation Verification (Rev 00400)
16. FR-H.1, Response to Loss of Secondary Heat Sink (Rev 04100)
17. ATT-5.1, Attachment SAFW From SW (Rev 01200)
18. ATT-22.0, Attachment Restoring Feed Flow (Rev 00700)
19. E-2, Faulted Steam Generator Isolation (Rev 01302)
20. FIG-7.0, Figure Intact S/G Pressure (Rev 1)

Validation Time: 80 minutes

Author: David Eckert

Facility Review: Dale Bisailon /s/

Rev. 060618



Scenario Event Description  
NRC Scenario 4

Facility:	<b>Ginna</b>	Scenario No.:	<b>4</b>	Op Test No.:	<b>2018</b>
Examiners:	_____	Operators:	_____ (SRO)		
	_____		_____ (RO)		
	_____		_____ (BOP)		
Initial Conditions:		The plant is at 100% power (MOL). The area has experienced overcast conditions for the past 4 hours, with wind from the West at 20-30 mph, and this is expected to continue throughout the shift.			
Turnover:		The following equipment is Out-Of-Service: The 'A' MDAFW Pump is OOS for bearing replacement.			
Event No.	Malf. No.	Event Type*	Event Description		
1	PZR03B	I(ATC) TS(US)	Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown.		
2	TUR16A	I(ATC/ BOP)	Turbine 1 <sup>st</sup> Stage Pressure (PI-485) fails low AP-RCC.1, Continuous Control Rod Withdrawal / Insertion. ER-INST.1		
3	HTR02A	R(ATC) N(BOP) N(US)	HEATER DRAIN TANK PUMP 1A TRIP – AP-FW.1, Abnormal MFW Pump Flow or NPSH. Load reduction to less than 70% IAW AP-TURB.5, Rapid Load Reduction.		
4	CND03A	C(BOP)	Hotwell Level Transmitter fails high.		
5	STM01A	I(BOP) TS(US)	STEAM FLOW CHANNEL FAILURE: FT-464 (1A-1) fails high - ER-INST.1		
6	STM02A TUR02	M(ALL)	STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip		
7	RPS07L FDW11B FDW12?	C(ALL)	The 'B' AFW Pump will fail to Auto start, then trip after it is manually started. The TDAFW Pump will trip on Overspeed.		
8	STM09A	(ALL)	FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.		
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor					

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Scenario Event Description  
NRC Scenario 4

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**Ginna 2018 NRC Scenario #4**

The plant is at 100% power (MOL). The area has experienced overcast conditions for the past 4 hours, with wind from the West at 20-30 mph, and this is expected to continue throughout the shift.

The following equipment is Out-Of-Service: The 'A' MDAFW Pump is OOS for bearing replacement.

Shortly after taking the watch, Pressurizer Level Channel 427 will fail LOW, resulting in letdown isolation and de-energizing the Pressurizer heaters. The crew will respond per AR-F-11, PRESSURIZER LO LEVEL 13%, and enter ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure. They will defeat the failed channel, reset PZR heaters, reduce charging to a single charging pump, and re-establish letdown in accordance with S-3.2E, Placing In or Removing From Service Normal Letdown/Excess Letdown. The crew will start a second charging pump and slowly restore PRZR level to program (56%). The operator will address Technical Specification LCO 3.3.1, Reactor Trip System (RTS) Instrumentation; LCO 3.3.3, Post Accident Monitoring (PAM) Instrumentation; and LCO 3.4.9, Pressurizer.

Following this, Main Turbine 1<sup>st</sup> Stage Pressure Instrument PT-485 will fail LOW. This will result in an automatic control rod insertion requiring the operator to place control rods in MANUAL. The operator will respond in accordance with AR-F-16, AVERAGE TAVG – TREF DEVIATION  $\pm$  5°F; AP-RCC.1, Continuous Control Rod Withdrawal/Insertion; and enter ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure.

Subsequently, 'A' Heater Drain Tank (HDT) Pump will trip resulting in the Standby Condensate Pump starting and the Condensate Bypass Valve to OPEN. The operator will respond in accordance with AR-G-25, MOTOR OFF CTR SECT PMPS EXCEPT MAIN & AUX FEED PMPS, and enter AP-FW.1, Abnormal MFW Pump Flow or NPSH, and commence a load reduction to 70% reactor power in accordance with AP-TURB.5, Rapid Load Reduction.

During the load reduction Hotwell Level transmitter LT-2006 will fail HIGH resulting in the Condenser Reject Valve opening. The operator will respond in accordance with AP-FW.1, Abnormal MFW Pump Flow or NPSH, and take manual control of the Hotwell Level Controller.

Following this, Steam Flow Transmitter FT-464 will fail HIGH. The operator will respond in accordance with AR-G-22, ADFCS SYSTEM TROUBLE, and enter ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure. The operator will address Technical Specification LCO 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation.

After this, a steam line break will occur upstream of the MSIVs outside Containment. The Reactor will automatically trip, and Safety Injection is expected to actuate; however, the Main Turbine will fail to automatically trip, and the operator will need to manually trip the Turbine. When the operator manually actuates the SLI signal, only the B MSIV will close. The 'B' MDAFW Pump will fail to automatically start and the TDAFW Pump will trip on overspeed. Additionally, 'B' MDAFW Pump will trip when manually started by the operator.

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Scenario Event Description  
NRC Scenario 4

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The crew will enter E-0, Reactor Trip or Safety Injection, and transition to FR-H.1, Response to Loss of Secondary Heat Sink. The operators will restore 'B' S/G water level utilizing 'D' Standby Auxiliary Feedwater (SAFW) Pump and transition back to E-0. Upon re-entry into E-0, the crew will transition to E-2, Faulted Steam Generator Isolation.

The scenario will terminate at Step 9 of E-2, after the crew has transitioned to E-1, Loss of Reactor or Secondary Coolant.

**Critical Tasks:**

**Manually trip the main turbine or shut both MSIVs 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 (EOP Based)**

Safety Significance: Failure to trip the main turbine under the postulated plant conditions causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Additionally, such an omission constitutes a demonstrated inability by the crew to "take an action that would prevent a challenge to plant safety."

**Establish feedwater flow into at least one SG before RCS bleed and feed is required (EOP Based)**

Safety Significance: Failure to establish feedwater flow to any SG results in the crew's having to rely upon the lower priority action of establishing RCS bleed and feed to minimize core uncover. This constitutes incorrect performance that "leads to degradation of any barrier to fission product release."

**Isolate the Faulted Steam Generator Before Transition out of E-2 (EOP Based)**

Safety Significance: Failure to isolate a faulted SG that can be isolated causes challenges to the Integrity and/or Subcriticality CSFs beyond those irreparably introduced by the postulated conditions. Also, depending upon plant conditions, it could constitute a demonstrated inability by the crew to recognize a failure of the automatic actuation of an ESF system or component.

Scenario Event Description  
NRC Scenario 4

**SIMULATOR OPERATOR INSTRUCTIONS**

	<b>Bench Mark</b>	<b>ACTIVITY</b>	<b>DESCRIPTION</b>
<input type="checkbox"/>		<b>Reset to Temp IC 144 (April 2018) (Originally IC-19).</b>	<p><b>T = 0 (From IC-19):</b></p> <p><b>Take 'A' MDAFW Pump Control Switch to PULL STOP</b></p> <p><b>Insert MALF A-FDW28 = ON (H-28: Motor Driven Aux Feed Pump Oil Pump OFF)</b></p> <p><b>Insert REM IND-FDW19A = OFF (Green Lamp Aux Steam Generator FW Pump No 1A AC Oil Pump)</b></p> <p><b>Insert REM IND-FDW19B = OFF (Red Lamp Aux Steam Generator FW Pump No 1A AC Oil Pump)</b></p> <p><b>Insert MALF FDW11A (Aux Feedwater Pump Failure: Motor Driven Pump 1A)</b></p> <p><b>Hang LOTO Tags as necessary</b></p> <p><b>Insert MALF TUR02 (Turbine Failure to Auto Trip)</b></p> <p><b>Insert MALF RPS07L (Auto Fail: B MDAFW Pump)</b></p> <p><b>Insert MALF FDW11B (Aux Feedwater Pump Failure: Motor Driven Pump 1B)</b></p> <p><b>Insert MALF FDW12 = 0 (AFW Turbine Driven Pump Speed Control Failure)</b></p> <p><b>Insert MALF PZR03B = 0 (PZR Level Channel Failure: CH-427 (II)) on T-1</b></p> <p><b>Insert MALF TUR16A = 0 (First Stage Pressure Transmitter Failure: PT-485) on T-2</b></p> <p><b>Insert MALF HTR02A (Heater Drain Tank Pump 1A Trip) on T-3</b></p> <p><b>Insert MALF CND03A = 48 (Hotwell Level Transmitter Failure: LT-2006) on T-4</b></p> <p><b>Insert MALF STM01A = 4.7e+006 (Steam Flow Channel Failure: FT-464 (1A-1)) on T-5</b></p> <p><b>Insert MALF STM02A = 1.7e+007 (Stmln Brk Outside CNM Upstrm MSIVs: S/G 1A) on T-6</b></p> <p><b>Insert MALF STM09A = 10 (Main Steam Safety Failure: VLV 3508) on T-6</b></p>

Scenario Event Description  
NRC Scenario 4

	<b>Bench Mark</b>	<b>ACTIVITY</b>	<b>DESCRIPTION</b>
<input type="checkbox"/>	Prior to Crew Briefing		<ul style="list-style-type: none"> <li>• Hang Protective Tags per OPG-PROTECTED-EQUIPMENT ('A' MDAFW)</li> <li>• Place Black Dot on J-25, SAFEGUARDS EQUIPMENT LOCKED OFF, and H-28, MOTOR DRIVEN AUX FEED PUMP OIL PUMP OFF.</li> </ul>
<input type="checkbox"/>	<p style="text-align: center;"><b>Crew Briefing</b></p> <ul style="list-style-type: none"> <li>• Assign Crew Positions based on evaluation requirements</li> <li>• Review the Shift Turnover Information with the crew</li> </ul>		

Scenario Event Description  
NRC Scenario 4

	Bench Mark	ACTIVITY	DESCRIPTION
<input type="checkbox"/>	T-0	Begin Familiarization Period	
<input type="checkbox"/>	At direction of examiner	<b>Event 1</b> <b>Trigger #1</b> <b>PZR03B = 0</b>	Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown.
<input type="checkbox"/>	At direction of examiner	<b>Event 2</b> <b>Trigger #2</b> <b>TUR16A = 0</b>	Turbine 1 <sup>st</sup> Stage Pressure (PI-485) fails low AP-RCC.1, Continuous Control Rod Withdrawal / Insertion. ER-INST.1
<input type="checkbox"/>	At direction of examiner	<b>Event 3</b> <b>Trigger #3</b> <b>HTR02A</b>	HEATER DRAIN TANK PUMP 1A TRIP – AP-FW.1, Abnormal MFW Pump Flow or NPSH. Load reduction to less than 70% IAW AP-TURB.5, Rapid Load Reduction
<input type="checkbox"/>	During downpower	<b>Event 4</b> <b>Trigger #4</b> <b>CND03A = 48</b>	Hotwell Level Transmitter fails high
<input type="checkbox"/>	At direction of examiner	<b>Event 5</b> <b>Trigger #5</b> <b>STM01A = 4.7e+006</b>	STEAM FLOW CHANNEL FAILURE: FT-464 (1A-1) fails high - ER-INST.1
<input type="checkbox"/>	At direction of examiner  Post-Rx Trip	<b>Event 6</b> <b>Trigger #6</b> <b>STM02A = 1.7e+007</b> <b>TUR02</b>	STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip  <b>Note: This malfunction is inserted at T=0.</b>
<input type="checkbox"/>	Post-Rx Trip	<b>Event 7</b> <b>RPS07L</b> <b>FDW11B</b> <b>FDW12 = 0</b>	The 'B' AFW Pump will fail to Auto start, then trip after it is manually started. The TDAFW Pump will trip on Overspeed. <b>Note: These malfunctions are inserted at T=0.</b>
<input type="checkbox"/>	Post-Rx Trip	<b>Event 8</b> <b>STM09A = 10</b>	FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0, transition to E-2 and isolate faulted SG 'A'. <b>Note: This malfunction is inserted at Trigger #6.</b>
<input type="checkbox"/>	<b>Terminate the scenario upon direction of Lead Examiner</b>		

Op Test No.: 2018 Scenario # 4 Event # 1 Page 8 of 60

Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Shortly after taking the watch, Pressurizer Level Channel 427 will fail LOW, resulting in letdown isolation and de-energizing the Pressurizer heaters. The crew will respond per AR-F-11, PRESSURIZER LO LEVEL 13%, and enter ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure. They will defeat the failed channel, reset PZR heaters, reduce charging to a single charging pump, and re-establish letdown in accordance with S-3.2E, Placing In or Removing From Service Normal Letdown/Excess Letdown. The crew will start a second charging pump and slowly restore PRZR level to program (56%). The operator will address Technical Specification LCO 3.3.1, Reactor Trip System (RTS) Instrumentation; LCO 3.3.3, Post Accident Monitoring (PAM) Instrumentation; and LCO 3.4.9, Pressurizer.

**SIM DRIVER Instructions:**

**Operate Trigger #1 PZR03B = 0 (PZR Level Channel Failure: CH-427 (II))**

**Indications Available:**

- MCB Annunciator F-11, PRESSURIZER LO LEVEL 13%
- LI-427 goes indicates 0%
- PRZR Heaters trip
- Letdown isolates
- PRZR level begins to rise

Time	Pos.	Expected Actions/Behavior	Comments
<b>AR-F-11, PRESSURIZER LO LEVEL 13%</b>			
	HCO	(Step 1) Perform a channel check.	<b>NOTE:</b> LT-427 will indicate 0%.
	US	(Step 2) Go to the appropriate procedure:	
		o AP-RCS.1 for RCS leak	
		o ER-INST.1 for failed channel	
			<b>NOTE:</b> THE HCO may reduce Charging to a single Charging Pump at minimum speed.
			<b>NOTE:</b> The US will go to ER-INST.1.

Op Test No.: 2018 Scenario # 4 Event # 1 Page 9 of 60Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Time	Pos.	Expected Actions/Behavior	Comments
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE</b>			
	HCO/ CO	(Step 6.1.1) <b>IDENTIFY</b> the failed instrument channel by observation of the bistable status light board, MCB annunciators, and the MCB metering indication.	
	HCO/ CO	(Step 6.1.2) <b>WHEN</b> a failed instrument loop and/or channel has been identified, <b>THEN</b> refer to the appropriate section of this procedure list below:	<b>NOTE:</b> The US will determine that PRZR Level Channel Failures – Section 6.4, should be addressed.
	HCO	(Step 6.4.1) <b>IF</b> PRZR low level heater cut out has occurred, <b>THEN</b> monitor PRZR pressure <b>AND DEFEAT</b> failed channel in a timely manner to allow restoration of PRZR heaters.	
	HCO	(Step 6.4.2) <b>IF</b> letdown isolation valve, AOV-427 has closed, <b>THEN</b> perform the following:	
		1. <b>PLACE</b> charging pump speed controllers in MANUAL AND minimize charging flow.	
		2. <b>STOP</b> all but one charging pump(s).	
		3. <b>ADJUST</b> HCV-142 as necessary to maintain RCP labyrinth seal $\Delta P$ between 20 and 80 inches.	
		4. <b>PLACE</b> loop B cold leg to REGEN HX, AOV-427 switch (MCB) to the CLOSE position.	
		5. <b>CONSIDER</b> placing excess letdown in service, <b>REFER TO</b> S-3.2E, <b>PLACING IN OR REMOVING FROM SERVICE NORMAL LETDOWN/EXCESS LETDOWN.</b>	<b>NOTE:</b> The US will hand off S-3.2E to the HCO to complete removing normal letdown from service and prepare to restore normal letdown.



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Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 6.4.3) <b>REFER TO</b> the appropriate attachment for defeat of the associated Protection and Control functions.	<b>NOTE:</b> The US will determine that Attachment 10, WHITE CHANNEL PRZR Level LI-427, should be addressed.
		<ul style="list-style-type: none"> <li>Attachment 10, White Channel - PRZR Level LI-427</li> </ul>	<b>NOTE:</b> The US will hand this off to the CO, who will coordinate with the HCO.
			<b>NOTE:</b> CO will conduct an Instrument Defeat Brief.
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE, ATTACHMENT 10 WHITE CHANNEL - PRZR LEVEL LI-427</b>			
			<b>Examiner</b> following operator performing channel defeat continue below. <b>Examiner</b> following operator NOT performing channel defeat continue at <b>Page 12</b>
	HCO	(Step 1.0) <b>ENSURE</b> Charging Pump Controllers are in MANUAL.	<b>NOTE:</b> The HCO will take MANUAL control of Charging Pump Speed.
	CO	(Step 2.0) In the PLP PRESS AND LEVEL rack, <b>VERIFY</b> the PRZR level defeat switch L/428A position.	
		<ul style="list-style-type: none"> <li><b>IF</b> L/428A is in NORMAL, <b>THEN</b> place L-428A to DEFEAT-2.</li> </ul>	
	CO	(Step 3.0) <b>NOTIFY</b> CRS that PRZR Heaters and Letdown can now be restored per steps 6.4.4 <b>AND</b> 6.4.5.	<b>NOTE:</b> US will have HCO restore PRZR Heaters and Normal Letdown.
	CO	(Step 4.0) <b>DETERMINE</b> the expected Bistable proving light status for the post defeat condition as follows:	
		4.1 <b>RECORD</b> the following data:	
		<ul style="list-style-type: none"> <li>PRZR Level LI-427 _____ %</li> </ul>	<b>NOTE:</b> 0 %

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Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 5) <b>DETERMINE</b> the expected post defeat Bistable proving light status and circle the expected status in table below:	<b>NOTE:</b> The post-defeat proving light status is ON.
		<ul style="list-style-type: none"> <li>427, CHANNEL 2 HIGH LEVEL TRIP, Light OFF if LI-427 ≥87%</li> </ul>	
	CO	(Step 6.0) In the (WHITE) W-1 PROTECTION CHANNEL 2 rack, <b>PLACE</b> the bistable proving switches to DEFEAT (UP) <b>AND VERIFY</b> the proving light status is correct per the table above.	
		<u>427, CHANNEL 2</u> <ul style="list-style-type: none"> <li>HIGH LEVEL TRIP</li> </ul>	<b>NOTE:</b> The post-defeat proving light status is ON.
	CO	(Step 7.0) <b>PLACE</b> PRZR LEVEL RECORDER TRANSFER switch (MCB) to position 428.	
	CO	(Step 8.0) <b>VERIFY</b> the bistable status lights <b>AND</b> Annunciators listed above are lit.	<b>NOTE:</b> Bistable status light LC427A is LIT, and MCB Annunciator F-28 is LIT
	CO	(Step 9.0) <b>REMOVE</b> the PRZR level channel from the PPCS, by performing the following:	
		9.1 <b>SELECT</b> the "Sub/Delete/Restore" display	
		9.2 <b>SELECT</b> Point ID L0427	
		9.3 <b>TURN</b> "OFF" scan processing	
		9.4 <b>SELECT</b> "Change"	
		9.5 <b>ANSWER</b> Prompts	
	US	(Step 10.0) <b>GO TO</b> step 6.4.4	

Op Test No.: 2018 Scenario # 4 Event # 1 Page 12 of 60Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Time	Pos.	Expected Actions/Behavior	Comments
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE</b>			
	HCO	(Step 6.4.4) <b>RESET</b> PRZR heaters breakers as necessary.	
	HCO	(Step 6.4.5) <b>RESTORE</b> normal letdown as follows, if desired.	
		1. <b>COMPLETE</b> removal of normal letdown from service per S-3.2E, PLACING IN OR REMOVING FROM SERVICE NORMAL LETDOWN/ EXCESS LETDOWN.	
		2. <b>RESTORE</b> normal letdown per S-3.2E, PLACING IN OR REMOVING FROM SERVICE NORMAL LETDOWN/ EXCESS LETDOWN.	
			<b>Examiner</b> following operator performing S-3.2E continue below. <b>Examiner</b> following operator NOT performing S-3.2E continue at <b>Page 15</b> .
<b>S-3.2E, PLACING IN OR REMOVING FROM SERVICE NORMAL LETDOWN/EXCESS LETDOWN</b>			
			<b>NOTE:</b> This action will complete the removal of Normal Letdown from Service.
	HCO/CO	(Step 6.2.1) <b>PLACE</b> Charging Pumps in <b>MANUAL</b>	
	HCO/CO	(Step 6.2.2) <b>ENSURE CLOSED</b> Letdown Orifice isolation valves. <ul style="list-style-type: none"> <li>• AOV-200A</li> <li>• AOV-200B</li> <li>• AOV-202</li> </ul>	

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Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 6.2.3) <b>CLOSE</b> LTDN ISOLATION VLV RHR to NRHX, AOV-427.	
	HCO/ CO	(Step 6.2.4) <b>REDUCE</b> charging flow while throttling closed charging flow to Regenerative Heat Exchanger HCV-142 to maintain greater than 20" RCP labyrinth seal $\Delta P$ .	
	HCO/ CO	(Step 6.2.5) <b>CLOSE</b> LETDOWN ISOL VLV RHR TO NRHX AOV-371.	
	HCO/ CO	(Step 6.2.6) <b>PLACE</b> NRHX LTDN OUTLET TEMP (TI-130) TCV-130 in <b>MANUAL/ CLOSED</b> .	
	HCO/ CO	(Step 6.3.1) Determine if a flush is required.	
		<ul style="list-style-type: none"> <li>If the letdown line has been isolated for less than one hour perform section 6.4 and N/A section 6.5, with the permission of the Shift Manager or Unit Supervisor.</li> </ul>	<b>NOTE:</b> Since letdown has been isolated <b>ONLY</b> a few minutes, a flush will <b>NOT</b> be required.
	HCO/ CO	(Step 6.4.1) <b>IF</b> the letdown line has been isolated for less than one hour or as desired by the US, <b>THEN PERFORM</b> the following:	
	HCO/ CO	1. <b>ENSURE</b> letdown is secured <b>PER</b> Section 6.2 prior to restoring.	
	HCO/ CO	2. <b>IF</b> charging flowpath to Loop B COLD Leg is desired (preferred method), <b>THEN PERFORM</b> the following:	
		a. <b>ENSURE CLOSED CHARGING</b> VLV RHX TO LOOP B HOT, AOV-392A.	
		b. <b>OPEN CHARGING VLV RHX TO</b> LOOP B COLD LEG AOV-294.	

Op Test No.: 2018 Scenario # 4 Event # 1 Page 14 of 60Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	3. <b>IF</b> Charging flowpath to Loop B <b>HOT</b> leg is desired.....	<b>NOTE:</b> Charging alignment to the Hot Leg will NOT be desired.
	HCO/ CO	(Step 6.4.2) <b>START</b> a second Charging Pump at <b>MINIMUM</b> speed.	
	HCO/ CO	(Step 6.4.3) <b>SLOWLY OPEN</b> charging flow to Regenerative Heat Exchanger HCV-142 to reduce labyrinth seal $\Delta P$ to - 40".	<b>NOTE:</b> The HCO may coordinate with the CO to complete this step.
	HCO/ CO	(Step 6.4.4) <b>ADJUST</b> Charging Pump speed while maintaining - 40" labyrinth seal $\Delta P$ UNTIL HCV-142 is fully <b>OPEN</b> .	
	HCO/ CO	(Step 6.4.5) <b>ESTABLISH</b> greater than or equal to 22 gpm charging line flow.	
	HCO/ CO	(Step 6.4.6) <b>IF</b> placing 40 GPM orifice in service <b>THEN PERFORM</b> the following:	<b>NOTE:</b> A 40 gpm Orifice was previously in service.
		1. <b>PLACE</b> LOW PRESS LTDN PRESS PCV-135 in <b>MANUAL</b> at - 40% <b>OPEN</b> .	
		2. <b>PLACE</b> NRHX LTDN OUTLET TEMP (TI-130) TCV-130 in <b>MANUAL</b> at - 40% <b>OPEN</b> .	
	HCO/ CO	(Step 6.4.7) <b>IF</b> placing 60 GPM orifice in service <b>THEN PERFORM</b> the following:	<b>NOTE:</b> A 40 gpm Orifice was previously in service.
	HCO/ CO	(Step 6.4.8) <b>OPEN</b> LETDOWN ISOL VLV RHR TO NRHX AOV-371.	

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Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 6.4.9) <b>PLACE</b> LTDN LOOP B COLD LEG TO RHX AOV-427 to <b>OPEN AND THEN</b> to <b>AUTO</b> .	
	HCO/ CO	(Step 6.4.10) <b>OPEN</b> desired Letdown orifice valve AOV-200A, AOV-200B, or AOV-202 <b>AND MARK</b> AOV's not opened N/A.	
		• AOV-200A	
		• AOV-200B	
		• AOV-202	
	HCO/ CO	(Step 6.4.11) <b>ADJUST</b> LOW PRESS LTDN PRESS PCV-135 to achieve Letdown pressure of - 250 psig on PI-135.	
	HCO/ CO	(Step 6.4.12) <b>PLACE</b> LOW PRESS LTDN PRESS, PCV-135 IN <b>AUTO</b> .	
	HCO/ CO	(Step 6.4.13) <b>PLACE</b> NRHX LTDN OUTLET TEMP (TI-130) TCV-130 in <b>AUTO</b> at the setpoint recorded in Step 5.5.	
	HCO/ CO	(Step 6.4.14) <b>PLACE</b> Pressurizer level control (Charging Pump) to <b>AUTO</b> .	
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE</b>			
	HCO	(Step 6.4.6) <b>WHEN</b> PRZR level is restored to normal, <b>THEN</b> place an operating charging pump controller in AUTO.	<b>NOTE:</b> The HCO will place Charging Pump Speed back in AUTO.
	US	(Step 6.4.7) <b>REFER TO</b> the following ITS Sections for LCOs:	

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Time	Pos.	Expected Actions/Behavior	Comments
	US	<ul style="list-style-type: none"> <li>Section 3.3.1, Table 3.3.1-1, Function 8</li> </ul>	
		<ul style="list-style-type: none"> <li>Section 3.3.3, Table 3.3.3-1, Function 2</li> </ul>	
		<ul style="list-style-type: none"> <li>Section 3.4.9</li> </ul>	
	US	(Step 6.4.8) <b>GO TO</b> Step 6.15.	
	HCO	(Step 6.15.1) <b>IF</b> necessary, <b>VERIFY</b> an operable channel is selected for the affected recorder.	
		(Step 6.15.2) <b>VERIFY</b> the following systems in <b>AUTO</b> if desired:	
	HCO	<ul style="list-style-type: none"> <li>Rod Control</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>Turbine EH control</li> </ul>	
	HCO	<ul style="list-style-type: none"> <li>PRZR Pressure control</li> </ul>	
		<ul style="list-style-type: none"> <li>HC 431K</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR spray valves</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR heaters</li> </ul>	
	HCO	<ul style="list-style-type: none"> <li>PRZR level control</li> </ul>	<b>NOTE:</b> IF NOT already done, the HCO may place Charging Pump Speed back in AUTO.
	CO	<ul style="list-style-type: none"> <li>Steam Dump (unless 1<sup>st</sup> stage pressure failed)</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>MFW control</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>S/G Atmos Relief Valve Control</li> </ul>	
	US	(Step 6.15.3) <b>NOTIFY</b> the following people:	<b>NOTE:</b> The US may notify the WCC/SM/STA. <b>SIM DRIVER:</b> as WCC/SM/STA, acknowledge.
		<ul style="list-style-type: none"> <li>Operations Supervision</li> </ul>	

Op Test No.: 2018 Scenario # 4 Event # 1 Page 17 of 60Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Time	Pos.	Expected Actions/Behavior			Comments
	US	<ul style="list-style-type: none"><li>STA</li></ul>			
		<ul style="list-style-type: none"><li>Work Week Manager</li></ul>			
	US	(Step 6.15.4) <b>UPDATE</b> the Temporary Configuration Change Tracking Log for the following as necessary:			<b>NOTE:</b> This step is Not Applicable.
		<ul style="list-style-type: none"><li>Jumper Removal</li></ul>			
		<ul style="list-style-type: none"><li>Lifted Wires</li></ul>			
		<ul style="list-style-type: none"><li>Slide Links</li></ul>			
	US	(Step 6.15.5) <b>REFER</b> to the following Notification Requirements:			
		<ul style="list-style-type: none"><li>LS-AA-1020, REPORTABILITY TABLES AND DECISION TREES</li></ul>			
		<ul style="list-style-type: none"><li>OPG-NOTIFICATION, REQUIRED NOTIFICATIONS TO THE PSC/PIO/CEG SENIOR MANAGEMENT/OPERATIONS MANAGEMENT</li></ul>			
TECHNICAL SPECIFICATION 3.3.1, REACTOR TRIP SYSTEM (RTS) INSTRUMENTATION					
	US	LCO 3.3.1 The RTS instrumentation for each Function in Table 3.3.1-1 shall be OPERABLE. (Function 8)			
	US	APPLICABILITY: According to Table 3.3.1-1			
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will identify that



Op Test No.: 2018 Scenario # 4 Event # 1 Page 18 of 60Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Time	Pos.	Expected Actions/Behavior			Comments
		A. One or more Functions with one channel inoperable.	A.1 Enter the Condition referenced in Table 3.3.1-1 for the channel(s)	Immediately	Function 8 is affected, and that Conditions A and D are applicable.
		D. As required by Required Actions A.1 and referenced by Table 3.3.1-1	D.1 Place channel in trip.	6 hours	
TECHNICAL SPECIFICATION 3.3.3, POST-ACCIDENT MONITORING (PAM) INSTRUMENTATION					
	US	LCO 3.3.3 The PAM instrumentation for each Function in Table 3.3.3-1 shall be OPERABLE.			
	US	APPLICABILITY: MODES 1, 2, and 3.			
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will identify that Function 2 is not affected by LI-427 since LI-426 and LI-428 are operable, and that Condition A is NOT applicable.
		A. One or more Functions with one required channel inoperable.	A.1 Restore required channel to OPERABLE status.	30 days	
TECHNICAL SPECIFICATION 3.4.9, PRESSURIZER					
	US	LCO 3.4.9 The pressurizer shall be OPERABLE.			

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Event Description: **Pressurizer Level Channel 427 (Channel II) fails low, resulting in letdown isolation. (AR-F-11 & ER-INST.1 & S-3.2E) Defeats failed channel and restores letdown**

Time	Pos.	Expected Actions/Behavior			Comments
	US	APPLICABILITY: MODES 1, 2, and 3.			
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will identify that Condition B was applicable until PRZR heaters were restored.
		B. Pressurizer heaters capacity not within limits.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 4.	6 hours  12 hours	
At the discretion of the Lead Examiner move to Event #2					

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Event Description: **Turbine 1<sup>st</sup> Stage Pressure (PI-485) fails low**  
**AP-RCC.1, Continuous Control Rod Withdrawal / Insertion.**  
**ER-INST.1**

Following this, Main Turbine 1<sup>st</sup> Stage Pressure Instrument PT-485 will fail LOW. This will result in an automatic control rod insertion requiring the operator to place control rods in MANUAL. The operator will respond in accordance with AR-F-16, AVERAGE TAVG – TREF DEVIATION  $\pm 5^{\circ}\text{F}$ ; AP-RCC.1, Continuous Control Rod Withdrawal/Insertion; and enter ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure.

**SIM DRIVER Instructions:** Operate Trigger #2 TUR16A = 0 (First Stage Pressure Transmitter Failure: PT-485)

**Indications Available:**

- Control rods begin inserting
- MCB Annunciator G-22, ADFCS SYSTEM TROUBLE
- MCB Annunciator F-16, AVERAGE TAVG – TREF DEVIATION  $\pm 5^{\circ}\text{F}$
- $T_{\text{REF}}$  indicates  $547^{\circ}\text{F}$
- PI-485 indicates 0 psig

Time	Pos.	Expected Actions/Behavior	Comments
			<p><b>NOTE:</b> The crew may enter AP-RCC.1 directly.</p> <p><b>NOTE:</b> HCO will verify that Turbine load is stable and place control rods in MANUAL.</p>
<b>AR-G-22, ADFCS SYSTEM TROUBLE</b>			
	CO	(Step 4.1) <b>CHECK</b> ADFACS EMMI monitor (Relay Room) for the cause of the failure by performing the following:	<p><b>NOTE:</b> The CO will call the EO to go to the Relay Room and support.</p> <p>If so, <b>SIM DRIVER</b> acknowledge as EO and report the following:</p> <ul style="list-style-type: none"> <li>• First Stage Deviation</li> </ul>
			<p><b>NOTE:</b> The US may call WCC/I&amp;C to address the instrument failure.</p> <p>If so, <b>SIM DRIVER</b> acknowledge as WCC/I&amp;C.</p>

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Event Description: **Turbine 1<sup>st</sup> Stage Pressure (PI-485) fails low**  
**AP-RCC.1, Continuous Control Rod Withdrawal / Insertion.**  
**ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 4.2) <b>REFER</b> TO ER-INST.1 REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE for action to defeat failed instrument(s)	
			<b>NOTE:</b> The US will go to ER-INST.1.
<b>AR- F-16, AVERAGE TAVG – TREF DEVIATION <math>\pm 5^{\circ}\text{F}</math></b>			
	HCO	(Step 1) Check Avg Tavg and Tref indication.	
	HCO/ CO	(Step 2) Check for instrument failures on Tavg channels and Turbine first stage pressure (PI-485).	
	US	(Step 3) Go to the appropriate procedure:	
		o AP-RCC.1 (if rod control failures)	
		o ER-INST.1 (for instrument failures)	
			<b>NOTE:</b> The US will go to AP-RCC.1.
<b>AP-RCC.1, CONTINUOUS CONTROL ROD WITHDRAWAL/INSERTION</b>			
	HCO	(Step 1) Evaluate Rod Control System Operability:	
	CO	a. Check turbine load - STABLE	
	HCO	b. Place Rods to MANUAL	
		c. Verify control rod motion stops	
	HCO	(*Step 2) Monitor Tavg:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		• Tavg – GREATER THAN $545^{\circ}\text{F}$	
		• Tavg – LESS THAN $579^{\circ}\text{F}$	

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Event Description: **Turbine 1<sup>st</sup> Stage Pressure (PI-485) fails low**  
**AP-RCC.1, Continuous Control Rod Withdrawal / Insertion.**  
**ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 3) Check Tav <sub>g</sub> – TRENDING TO Tref	<b>NOTE:</b> IF Tav <sub>g</sub> is matched to what Tref should be at, Step 3 RNO actions will NOT be performed.
	HCO	(Step 3 RNO) <u>IF</u> Tav <sub>g</sub> less than Tref, <u>THEN</u> restore Tav <sub>g</sub> to Tref by one or more of the following:	<b>NOTE:</b> Tav <sub>g</sub> may be less than Tref.
		<ul style="list-style-type: none"> <li>Withdraw control rods</li> </ul>	
		<ul style="list-style-type: none"> <li>Reduce turbine load</li> </ul>	
		<ul style="list-style-type: none"> <li>Dilution of RCS</li> </ul>	
	HCO	(Step 4) Check RCS Tav <sub>g</sub> Channel Indications:	
		<ul style="list-style-type: none"> <li>All 4 channels indicate approximately the same value</li> </ul>	
		<ul style="list-style-type: none"> <li>All 4 channels responding to the power change</li> </ul>	
	CO	(Step 5) Check Turbine 1 <sup>st</sup> Stage Pressure Channel, PI-485 – APPROXIMATELY EQUAL TO PI-486	
	US	(Step 5 RNO) <u>IF</u> PI-485 malfunction is indicated, <u>THEN</u> refer to ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE.	<b>NOTE:</b> The US will go to ER-INST.1
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE</b>			

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Event Description: **Turbine 1<sup>st</sup> Stage Pressure (PI-485) fails low**  
**AP-RCC.1, Continuous Control Rod Withdrawal / Insertion.**  
**ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 6.1.1) <b>IDENTIFY</b> the failed instrument channel by observation of the bistable status light board, MCB annunciators, and the MCB metering indication.	
	HCO/ CO	(Step 6.1.2) <b>WHEN</b> a failed instrument loop and/or channel has been identified, <b>THEN</b> refer to the appropriate section of this procedure list below:	<b>NOTE:</b> The US will determine that Turbine First Stage Pressure Channel Failures – Section 6.11, should be addressed.
		(Step 6.11.1) <b>IF</b> turbine first stage pressure channel PT-485 fails, <b>THEN PERFORM</b> the following:	
	HCO	1. <b>PLACE</b> the Rod Control Selector switch in MANUAL (485 inputs the POWER MISMATCH circuit and TREF).	
	CO	2. <b>PLACE</b> the Steam Dump Mode Selector switch in MANUAL.	
	CO	3. <b>MONITOR</b> S/G level <b>AND</b> control MANUALLY IF Automatic control is not functioning correctly.	
	US	4. <b>REFER TO</b> Attachment 44, White Channel – First Stage Pressure PI-485, to defeat channel <b>AND</b> to restore AUTOMATIC control.	<b>NOTE:</b> The US will hand this off to the CO, who will coordinate with the HCO.
			<b>Examiner NOTE:</b> If it is desired to NOT defeat the channel, proceed to Event #3; otherwise, proceed with channel defeat below.
			<b>NOTE:</b> Co will conduct an Instrument Defeat Brief.

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Event Description: **Turbine 1<sup>st</sup> Stage Pressure (PI-485) fails low**  
**AP-RCC.1, Continuous Control Rod Withdrawal / Insertion.**  
**ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE, ATTACHMENT 44</b> <b>WHITE CHANNEL – FIRST STAGE PRESSURE PI-485</b>			
			<b>Examiner</b> following operator performing channel defeat continue below.  <b>Examiner</b> following operator NOT performing channel defeat continue at <b>Page 26</b> .
	CO	(Step 1.0) <b>DETERMINE</b> the expected Bistable proving light status for the post defeat condition as follows:	
		1.1 <b>RECORD</b> the following data:	
	CO	<ul style="list-style-type: none"> <li>Turbine First Stage Press PI-485 _____ PSIG</li> </ul>	<b>NOTE:</b> 0 psig
	CO	1.2 <b>DETERMINE</b> the expected post defeat Bistable proving light status and circle the expected status in table below:	<b>NOTE:</b> The post-defeat proving light status is ON.
		<u>485 CHANNEL 2</u> <ul style="list-style-type: none"> <li>TURBINE PWR TRIP Light OFF IF PI-485 <math>\geq</math> 51.6 PSIG</li> </ul>	
	CO	(Step 2.0) In the (WHITE) W1 PROTECTION CHANNEL 2 rack, <b>PLACE</b> the following bistable proving switch to DEFEAT (UP) <b>AND</b> verify the proving light status is correct per the table above.	
		<u>485 CHANNEL 2</u> <ul style="list-style-type: none"> <li>TURBINE PWR TRIP</li> </ul>	<b>NOTE:</b> The post-defeat proving light status is ON
	HCO	(Step 3.0) <b>VERIFY</b> the AMSAC TRIPPED status light (MCB) is EXTINGUISHED.	

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Event Description: **Turbine 1<sup>st</sup> Stage Pressure (PI-485) fails low**  
**AP-RCC.1, Continuous Control Rod Withdrawal / Insertion.**  
**ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 4.0) <b>VERIFY</b> the TL 400 bistable indicating light (FOX 3-RELAY ROOM) is extinguished.	<b>NOTE:</b> The US/CO will contact the EO. <b>SIM DRIVER:</b> as <b>EO</b> , acknowledge and report TL 400 bistable light is extinguished.
	CO	(Step 5.0) <b>IF</b> $\geq 35\%$ power, <b>THEN VERIFY</b> AMSAC Feedwater Flow Bistables are RESET by observing the following: (FOX 3-RELAY ROOM)	<b>NOTE:</b> The US/CO will contact the EO. <b>SIM DRIVER:</b> as <b>EO</b> , acknowledge and report the trip status lights are extinguished.
		<ul style="list-style-type: none"> <li>TL/466 TRIP STATUS LIGHT EXTINGUISHED</li> </ul>	
		<ul style="list-style-type: none"> <li>TL/467 TRIP STATUS LIGHT EXTINGUISHED</li> </ul>	
		<ul style="list-style-type: none"> <li>TL/476 TRIP STATUS LIGHT EXTINGUISHED</li> </ul>	
		<ul style="list-style-type: none"> <li>TL/477 TRIP STATUS LIGHT EXTINGUISHED</li> </ul>	
	CO	(Step 6.0) <b>PLACE</b> switch TPS/485 (FOX 3-RELAY ROOM) to the TRIP position <b>AND VERIFY</b> TL/485 TRIP STATUS light is LIT.	<b>NOTE:</b> The US/CO will contact the EO. <b>SIM DRIVER:</b> as <b>EO</b> , acknowledge and operate <b>REM TUR22 = TRIP</b> ; then report the switch is repositioned and the trip status light is LIT.
	HCO	(Step 7.0) <b>IF</b> $\geq 40\%$ power, <b>THEN VERIFY</b> the AMSAC AUTO BLOCK status light (MCB) is EXTINGUISHED.	
	CO	(Step 8.0) <b>DELETE</b> the computer point from the PPCS by performing the following:	



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Event Description: **Turbine 1<sup>st</sup> Stage Pressure (PI-485) fails low**  
**AP-RCC.1, Continuous Control Rod Withdrawal / Insertion.**  
**ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	8.1 <b>SELECT</b> the "Sub/Delete/Restore" display.	
		8.2 <b>SELECT</b> Point ID P0485.	
		8.3 <b>TURN</b> "OFF" scan processing.	
		8.4 <b>SELECT</b> "Change"	
		8.5 <b>ANSWER</b> Prompts	
	US	(Step 9.0) <b>GO TO</b> step 6.11.3	
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE</b>			
	US	(Step 6.11.3) <b>GO TO</b> Step 6.15.	
	HCO	(Step 6.15.1) <b>IF</b> necessary, <b>VERIFY</b> an operable channel is selected for the affected recorder.	
		(Step 6.15.2) <b>VERIFY</b> the following systems in <b>AUTO</b> if desired:	
	HCO	<ul style="list-style-type: none"> <li>Rod Control</li> </ul>	<b>NOTE:</b> Control Rods will remain in MANUAL.
	CO	<ul style="list-style-type: none"> <li>Turbine EH control</li> </ul>	
	HCO	<ul style="list-style-type: none"> <li>PRZR Pressure control</li> </ul>	
		<ul style="list-style-type: none"> <li>HC 431K</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR spray valves</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR heaters</li> </ul>	
	HCO	<ul style="list-style-type: none"> <li>PRZR level control</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>Steam Dump (unless 1<sup>st</sup> stage pressure failed)</li> </ul>	<b>NOTE:</b> Steam Dump will remain in MANUAL
	CO	<ul style="list-style-type: none"> <li>MFW control</li> </ul>	

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Event Description: **Turbine 1<sup>st</sup> Stage Pressure (PI-485) fails low**  
**AP-RCC.1, Continuous Control Rod Withdrawal / Insertion.**  
**ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	<ul style="list-style-type: none"> <li>S/G Atmos Relief Valve Control</li> </ul>	
	US	(Step 6.15.3) <b>NOTIFY</b> the following people:	<b>NOTE:</b> The US may notify the WCC/SM/STA. <b>SIM DRIVER:</b> as WCC/SM/STA, acknowledge.
	US	<ul style="list-style-type: none"> <li>Operations Supervision</li> </ul>	
		<ul style="list-style-type: none"> <li>STA</li> </ul>	
		<ul style="list-style-type: none"> <li>Work Week Manager</li> </ul>	
	US	(Step 6.15.4) <b>UPDATE</b> the Temporary Configuration Change Tracking Log for the following as necessary:	<b>NOTE:</b> This step is Not Applicable.
		<ul style="list-style-type: none"> <li>Jumper Removal</li> </ul>	
		<ul style="list-style-type: none"> <li>Lifted Wires</li> </ul>	
		<ul style="list-style-type: none"> <li>Slide Links</li> </ul>	
	US	(Step 6.15.5) <b>REFER</b> to the following Notification Requirements:	
		<ul style="list-style-type: none"> <li>LS-AA-1020, REPORTABILITY TABLES AND DECISION TREES</li> </ul>	
		<ul style="list-style-type: none"> <li>OPG-NOTIFICATION, REQUIRED NOTIFICATIONS TO THE PSC/PIO/CEG SENIOR MANAGEMENT/OPERATIONS MANAGEMENT</li> </ul>	
			<b>NOTE:</b> The US will likely conduct a Plant Status Brief.
<b>At the discretion of the Lead Examiner move to Event #3</b>			

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Event Description: **HEATER DRAIN TANK PUMP 1A TRIP – AP-FW.1, Abnormal MFW Pump Flow or NPSH.**  
**Load reduction to less than 70% IAW AP-TURB.5, Rapid Load Reduction.**  
**Hotwell Level Transmitter fails high.**

Subsequently, 'A' Heater Drain Tank (HDT) Pump will trip resulting in the Standby Condensate Pump starting and the Condensate Bypass Valve to OPEN. The operator will respond in accordance with AR-G-25, MOTOR OFF CTR SECT PMPS EXCEPT MAIN & AUX FEED PMPS, and enter AP-FW.1, Abnormal MFW Pump Flow or NPSH, and commence a load reduction to 70% reactor power in accordance with AP-TURB.5, Rapid Load Reduction.

During the load reduction Hotwell Level transmitter LT-2006 will fail HIGH resulting in the Condenser Reject Valve opening. The operator will respond in accordance with AP-FW.1, Abnormal MFW Pump Flow or NPSH, and take manual control of the Hotwell Level Controller.

**SIM DRIVER Instructions:** **Operate Trigger #3 HTR02A (Heater Drain Tank Pump 1A Trip)**

**Indications Available:**

- 'A' Heater Drain Tank Pump Green and White status lights LIT, Red status light OFF
- MCB Annunciator G-25, MOTOR OFF CTR SECT PMPS EXCEPT MAIN & AUX FEED PMPS
- MFW Pump suction pressure lowers
- Condensate Bypass Valve AOV-3959 OPEN (Green status light OFF, Red status light LIT)
- Standby Condensate Pump starts

Time	Pos.	Expected Actions/Behavior	Comments
			<b>NOTE:</b> The US may enter AP-FW.1 directly.
<b>AR- G-25, MOTOR OFF CTR SECT PMPS EXCEPT MAIN &amp; AUX FEED PMPS</b>			
	CO	(Step 4.1) <b>DETERMINE</b> affected pump (white light at control switch ILLUMINATED).	
		(Step 4.2) <b>ENSURE</b> standby pump AUTO STARTS, if required.	<b>NOTE:</b> The STANDBY Condensate Pump will have started

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## Event Description:

**HEATER DRAIN TANK PUMP 1A TRIP – AP-FW.1, Abnormal MFW Pump Flow or NPSH.****Load reduction to less than 70% IAW AP-TURB.5, Rapid Load Reduction.****Hotwell Level Transmitter fails high.**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 4.3) <b>IF</b> HDT Pump(s) <u>or</u> Condensate Pump(s) TRIPPED, <b>THEN GO TO</b> AP-FW.1, Abnormal MFW Pump Flow Or NPSH.	<b>NOTE:</b> The US will go to AP-FW.1.
<b>AP-FW.1, ABNORMAL MFW PUMP FLOW OR NPSH</b>			
	HCO/ CO	(Step 1) Check MFW Requirements:	
		a. Power – GREATER THAN 50%	
		b. Both MFW pumps - RUNNING	
		c. GO to Step 3.	
	CO	(Step 3) Check S/G Status	
		o MFW flows – GREATER THAN STEAM FLOWS	
		o S/G levels stabilizing or returning to program	
	CO	(Step 4) Verify At Least 2 Condensate Pumps - RUNNING	
	CO	(Step 5) Verify Both HDT Pumps - RUNNING	<b>NOTE:</b> The 'B' HDT Pump is the only pump running.
	US	(Step 5 RNO) <u>IF</u> greater than 70% power, and one HDT Pump has tripped, <u>THEN</u> reduce power to less than 70%	
		<u>IF</u> both HDT pumps have tripped, <u>THEN</u> reduce power to less than 50%. (Refer to AP-TURB.5, RAPID LOAD REDUCTION)	
			<b>NOTE:</b> The US will conduct a Power Reduction Brief.

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Event Description:

**HEATER DRAIN TANK PUMP 1A TRIP – AP-FW.1, Abnormal MFW Pump Flow or NPSH.****Load reduction to less than 70% IAW AP-TURB.5, Rapid Load Reduction.****Hotwell Level Transmitter fails high.**

Time	Pos.	Expected Actions/Behavior	Comments
<b>AP-TURB.5, RAPID LOAD REDUCTION</b>			
	HCO	(Step 1) Initiate Load Reduction	
		a. Verify rods in AUTO	<b>NOTE:</b> Rods are in MANUAL from previous instrument failure.
	HCO	(Step 1.a RNO) Perform the following:	
		1) Place rods to MANUAL.	
		2) Adjust rods to match Tavg and Tref.	
	HCO	(Step 1 cont'd)	<b>NOTE:</b> The HCO will initiate a boration.
		b. Initiate boration at the rate determined in OPG-REACTIVITY-CALC.	
	CO	c. Reduce turbine load in Auto as follows:	
		1) Place Turbine EH Control in OPER PAN., IMP PRESS IN, if desired.	
		2) Select desired rate on thumbwheel	<b>NOTE:</b> The CO will select 1%/Minute.
		3) Reduce the setter to the desired load	
		4) Depress the GO button	<b>NOTE:</b> The CO will start the load reduction.
	HCO	d. Place PRZR backup heaters switch to ON	

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## Event Description:

**HEATER DRAIN TANK PUMP 1A TRIP – AP-FW.1, Abnormal MFW Pump Flow or NPSH.**

**Load reduction to less than 70% IAW AP-TURB.5, Rapid Load Reduction.**

**Hotwell Level Transmitter fails high.**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(*Step 2) Monitor RCS Tavg	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		o Tavg – GREATER THAN 545°F	
		o Tavg – LESS THAN 579°F	
	HCO	(Step 3) Adjust Boric Acid Addition Rate As Necessary To (refer to OPG-REACTIVITY-CALC):	
		o Maintain rods above the insertion limit	
	HCO	o Match Tavg and Tref	
		o Compensate for Xenon	
	HCO	(*Step 4) Monitor PRZR Pressure – TRENDING TO 2235 PSIG IN AUTO	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
	CO	(*Step 5) Monitor MFW Regulating Valves – RESTORING S/G LEVEL TO 52% IN AUTO	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
	HCO	(*Step 6) Monitor PRZR Level – TRENDING TO PROGRAM IN AUTO CONTROL	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
<b>SIM DRIVER: Operate Trigger #4 CND03A = 48 (Hotwell Level Transmitter Failure: LT-2006).</b>			

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Event Description: **HEATER DRAIN TANK PUMP 1A TRIP – AP-FW.1, Abnormal MFW Pump Flow or NPSH.**  
**Load reduction to less than 70% IAW AP-TURB.5, Rapid Load Reduction.**  
**Hotwell Level Transmitter fails high.**

Time	Pos.	Expected Actions/Behavior	Comments
<b>Indications Available:</b>			
<ul style="list-style-type: none"> <li>Hotwell level controller output rising to 100%</li> <li>'B' Condenser Hotwell Level LI-2006 indication at 48"</li> <li>'A' Condenser Hotwell Level LI-2006A lowering</li> </ul>			
	CO	(Step 7) Check IA Available to CNMT	
		<ul style="list-style-type: none"> <li>IA pressure – GREATER THAN 60 PSIG</li> </ul>	
		<ul style="list-style-type: none"> <li>Instr Air to CNMT Isol Valve, AOV-5392 - OPEN</li> </ul>	
	CO	(*Step 8) Check Steam Dump Status:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		<ul style="list-style-type: none"> <li>Annunciator G-15, STEAM DUMP ARMED - LIT</li> </ul>	
		<ul style="list-style-type: none"> <li>Steam dump operating properly in AUTO</li> </ul>	<b>NOTE:</b> Steam Dumps are in MANUAL from previous event, US will recognize that RNO does NOT apply.
	CO	(Step 9) Check Hotwell Level:	
		<ul style="list-style-type: none"> <li>Hotwell level controller in AUTO</li> </ul>	
		<ul style="list-style-type: none"> <li>Controller demand LESS THAN 60%</li> </ul>	
		<ul style="list-style-type: none"> <li>Hotwell level at setpoint</li> </ul>	
	CO	(Step 9 RNO) <u>IF</u> controller demand approaching 70% (Large Reject Valve Opens), <u>THEN</u> place controller in Manual and control level.	<b>NOTE:</b> The US may contact the EO to report local hotwell levels. <b>SIM DRIVER:</b> as EO acknowledge and report hotwell levels from Extreme View indications.

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Event Description:

**HEATER DRAIN TANK PUMP 1A TRIP – AP-FW.1, Abnormal MFW Pump Flow or NPSH.****Load reduction to less than 70% IAW AP-TURB.5, Rapid Load Reduction.****Hotwell Level Transmitter fails high.**

Time	Pos.	Expected Actions/Behavior	Comments
		(*Step 10) Check If Condensate Booster Pumps Should Be Secured	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
	CO	a. Condensate booster pumps – 2 PUMPS RUNNING	
		b. Verify the following:	
	HCO	<ul style="list-style-type: none"> <li>Verify reactor power is 70% - 75%</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>Trim valve controller set at 400 psig</li> </ul>	
		<ul style="list-style-type: none"> <li>Trim valve, AOV-9508G – GREATER THAN 80% open</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>PI-4017, CNDST BSTR DISCH PRESS greater than 395 psig</li> </ul>	
	US	(Step 10.b RNO) Go to Step 18.	
	US	(Step 18) Evaluate Plant Status	
		a. <u>IF</u> load was reduced more than 15% RTP in one hour, <u>THEN</u> notify RP to obtain primary samples required by ITS LCO 3.4.16	<b>NOTE:</b> The US will contact RP/Chemistry. <b>SIM DRIVER:</b> as RP/Chemistry, acknowledge
		b. Power stable at desired level	
	US	(Step 18b RNO) <u>IF</u> power greater than 20% and further reduction is required, <u>THEN</u> continue load reduction and return to Step 2.	<b>NOTE:</b> US will determine that further power reduction is required and return to Step 2.
<b>At the discretion of the Lead Examiner continue with Event 3, or move to Event #5.</b>			



Op Test No.: 2018 Scenario # 4 Event # 5 Page 34 of 60Event Description: **STEAM FLOW CHANNEL FAILURE: FT-464 (1A-1) fails high - ER-INST.1**

Following this, Steam Flow Transmitter FT-464 will fail HIGH. The operator will respond in accordance with AR-G-22, ADFCS SYSTEM TROUBLE, and enter ER-INST.1, Reactor Protection Bistable Defeat After Instrumentation Loop Failure. The operator will address Technical Specification LCO 3.3.2, Engineered Safety Feature Actuation System (ESFAS) Instrumentation.

**SIM DRIVER Instructions:** Operate Trigger #5 STM01A = 4.7e+006 (Steam Flow Channel Failure: FT-464 (1A-1))

**Indications Available:**

- MCB Annunciator G-22, ADFCS SYSTEM TROUBLE
- 'A' Stem Flow indication FI-464 will read high

Time	Pos.	Expected Actions/Behavior	Comments
<b>AR-G-22, ADFCS SYSTEM TROUBLE</b>			
	CO	(Step 4.1) <b>CHECK</b> ADFACS EMMI monitor (Relay Room) for the cause of the failure by performing the following:	<b>NOTE:</b> The CO will call the EO to go to the Relay Room and support. If so, <b>SIM DRIVER</b> acknowledge as EO and report the following: <ul style="list-style-type: none"> <li>• Deviation Stm Flow Loop A</li> </ul>
			<b>NOTE:</b> The US may call WCC/I&C to address the instrument failure. If so, <b>SIM DRIVER</b> acknowledge as WCC/I&C.
	CO	(Step 4.2) <b>REFER TO</b> ER-INST.1 REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE for action to defeat failed instrument(s)	
			<b>NOTE:</b> The US will go to ER-INST.1.
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE</b>			

Op Test No.: 2018 Scenario # 4 Event # 5 Page 35 of 60Event Description: **STEAM FLOW CHANNEL FAILURE: FT-464 (1A-1) fails high - ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 6.1.1) <b>IDENTIFY</b> the failed instrument channel by observation of the bistable status light board, MCB annunciators, and the MCB metering indication.	
	HCO/ CO	(Step 6.1.2) <b>WHEN</b> a failed instrument loop and/or channel has been identified, <b>THEN</b> refer to the appropriate section of this procedure list below:	<b>NOTE:</b> The US will determine that Steam Flow Channel Failure – Section 6.9, should be addressed.
	US	(Step 6.9.1) <b>REFER TO</b> the appropriate attachment for defeat of a failed channel:	
		<ul style="list-style-type: none"> <li>Attachment 36, Red Channel – Steam Flow FI-464</li> </ul>	<b>NOTE:</b> The US will hand this off to the CO, who will coordinate with the HCO.
			<b>Examiner NOTE:</b> If it is desired to NOT defeat the channel, proceed to Event #6; otherwise, proceed with channel defeat below.
			<b>NOTE:</b> Co will conduct an Instrument Defeat Brief.
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE, ATTACHMENT 36 RED CHANNEL – STEAM FLOW FI-464</b>			
			<b>Examiner</b> following operator performing channel defeat continue below. <b>Examiner</b> following operator NOT performing channel defeat continue at <b>Page 37</b> .
	CO	(Step 1.0) <b>VERIFY</b> that the associated S/G pressure channel PI-468 is operating properly. <b>IF NOT, THEN GO</b> to Attachment 30, Red Channel – S/G Pressure Channel PI-468.	<b>NOTE:</b> Pressure channel 468 is operating properly.

Op Test No.: 2018 Scenario # 4 Event # 5 Page 36 of 60Event Description: **STEAM FLOW CHANNEL FAILURE: FT-464 (1A-1) fails high - ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 2.0) <b>DETERMINE</b> the expected Bistable proving light status for the post defeat condition as follows:	
		2.1 <b>RECORD</b> the following data:	
	CO	<ul style="list-style-type: none"> <li>S/G A Steam Flow F0464 (PPCS) _____ lb/hr</li> </ul>	<b>NOTE:</b> 4.7 klb/hr
	CO	2.2 <b>DETERMINE</b> the expected post defeat Bistable proving light status and circle the expected status in table below:	<b>NOTE:</b> The post-defeat proving light statuses are OFF.
		<u>464 LOOP A-1</u> <ul style="list-style-type: none"> <li>HIGH TRIP Light OFF <b>IF</b> F0464 (PPCS) <math>\geq 0.50 \times 10^6</math> lb/hr</li> <li>HI-HI TRIP Light OFF <b>IF</b> F0464 (PPCS) <math>\geq 4.40 \times 10^6</math> lb/hr</li> </ul>	
	CO	(Step 3.0) In the (RED) R-2 PROTECTION CHANNEL 1 rack, <b>PLACE</b> the following bistable proving switches to DEFEAT (UP) <b>AND</b> verify the proving light status is correct per the table above.	
		<u>464 LOOP A-1</u> <ul style="list-style-type: none"> <li>HIGH TRIP</li> <li>HI-HI TRIP</li> </ul>	<b>NOTE:</b> The post-defeat proving light statuses are OFF
	CO	(Step 4.0) <b>VERIFY</b> the bistable status lights <b>AND</b> Annunciators listed above are lit.	<b>NOTE:</b> Bistable status lights FC464A and FC464B are LIT, and MCB Annunciator G-26 is LIT.
	CO	(Step 5.0) <b>DELETE</b> the point from the PPCS by <b>PERFORMING</b> the following:	
		5.1 <b>SELECT</b> the "Sub/Delete/Restore" display.	
		5.2 <b>SELECT</b> Point ID F0464.	
		5.3 <b>TURN</b> "OFF" scan processing.	
		5.4 <b>SELECT</b> "Change"	

Op Test No.: 2018 Scenario # 4 Event # 5 Page 37 of 60Event Description: **STEAM FLOW CHANNEL FAILURE: FT-464 (1A-1) fails high - ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	5.5 <b>ANSWER</b> Prompts	
	US	(Step 6.0) <b>GO TO</b> step 6.9.2.	
<b>ER-INST.1, REACTOR PROTECTION BISTABLE DEFEAT AFTER INSTRUMENTATION LOOP FAILURE</b>			
	US	(Step 6.9.2) <b>REFER TO</b> the following ITS Sections for LCO's:	
		<ul style="list-style-type: none"> <li>Section 3.3.2, Table 3.3.2-1, Functions 4d and 4e</li> </ul>	
	US	(Step 6.9.3) <b>GO TO</b> Step 6.15.	
	HCO	(Step 6.15.1) <b>IF</b> necessary, <b>VERIFY</b> an operable channel is selected for the affected recorder.	
		(Step 6.15.2) <b>VERIFY</b> the following systems in <b>AUTO</b> if desired:	
	HCO	<ul style="list-style-type: none"> <li>Rod Control</li> </ul>	<b>NOTE:</b> Control Rods will remain in MANUAL
	CO	<ul style="list-style-type: none"> <li>Turbine EH control</li> </ul>	
	HCO	<ul style="list-style-type: none"> <li>PRZR Pressure control</li> </ul>	
		<ul style="list-style-type: none"> <li>HC 431K</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR spray valves</li> </ul>	
		<ul style="list-style-type: none"> <li>PRZR heaters</li> </ul>	
	HCO	<ul style="list-style-type: none"> <li>PRZR level control</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>Steam Dump (unless 1<sup>st</sup> stage pressure failed)</li> </ul>	<b>NOTE:</b> Steam Dump will remain in MANUAL
	CO	<ul style="list-style-type: none"> <li>MFW control</li> </ul>	
	CO	<ul style="list-style-type: none"> <li>S/G Atmos Relief Valve Control</li> </ul>	

Op Test No.: 2018 Scenario # 4 Event # 5 Page 38 of 60Event Description: **STEAM FLOW CHANNEL FAILURE: FT-464 (1A-1) fails high - ER-INST.1**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 6.15.3) <b>NOTIFY</b> the following people:	<b>NOTE:</b> The US may notify the WCC/SM/STA. <b>SIM DRIVER:</b> as WCC/SM/STA, acknowledge.
	US	<ul style="list-style-type: none"> <li>Operations Supervision</li> </ul>	
		<ul style="list-style-type: none"> <li>STA</li> </ul>	
		<ul style="list-style-type: none"> <li>Work Week Manager</li> </ul>	
	US	(Step 6.15.4) <b>UPDATE</b> the Temporary Configuration Change Tracking Log for the following as necessary:	<b>NOTE:</b> This step is Not Applicable.
		<ul style="list-style-type: none"> <li>Jumper Removal</li> </ul>	
		<ul style="list-style-type: none"> <li>Lifted Wires</li> </ul>	
		<ul style="list-style-type: none"> <li>Slide Links</li> </ul>	
	US	(Step 6.15.5) <b>REFER</b> to the following Notification Requirements:	
		<ul style="list-style-type: none"> <li>LS-AA-1020, REPORTABILITY TABLES AND DECISION TREES</li> </ul>	
		<ul style="list-style-type: none"> <li>OPG-NOTIFICATION, REQUIRED NOTIFICATIONS TO THE PSC/PIO/CEG SENIOR MANAGEMENT/OPERATIONS MANAGEMENT</li> </ul>	
			<b>NOTE:</b> The US will likely conduct a Plant Status Brief.
<b>TECHNICAL SPECIFICATION 3.3.2, ENGINEERED SAFETY FEATURE ACTUATION SYSTEM (ESFAS) INSTRUMENTATION</b>			
	US	LCO 3.3.2 The ESFAS instrumentation for each Function in Table 3.3.2-1 shall be OPERABLE.	
	US	APPLICABILITY: According to Table 3.3.2-1	

Op Test No.: 2018 Scenario # 4 Event # 5 Page 39 of 60Event Description: **STEAM FLOW CHANNEL FAILURE: FT-464 (1A-1) fails high - ER-INST.1**

Time	Pos.	Expected Actions/Behavior			Comments
		ACTIONS			
		CONDITION	REQUIRED ACTION	COMPLETION TIME	The US will identify that Functions 4d and 4e are affected, and that Conditions A and F are applicable.
		A. One or more Functions with one channel or train inoperable.	A.1 Enter the Condition referenced in Table 3.3.2-1 for the channel or train.	Immediately	
		F. As required by Required Action A.1 and referenced by Table 3.3.2-1.	F.1 Place channel in trip.	6 hours	
At the discretion of the Lead Examiner move to Events #6 - 8					

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## Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

After this, a steam line break will occur upstream of the MSIVs outside Containment. The Reactor will automatically trip, and Safety Injection is expected to actuate; however, the Main Turbine will fail to automatically trip, and the operator will need to manually trip the Turbine. When the operator manually actuates the SLI signal, only the B MSIV will close. The 'B' MDAFW Pump will fail to automatically start and the TDAFW Pump will trip on overspeed. Additionally, 'B' MDAFW Pump will trip when manually started by the operator.

The crew will enter E-0, Reactor Trip or Safety Injection, and transition to FR-H.1, Response to Loss of Secondary Heat Sink. The operators will restore 'B' S/G water level utilizing 'D' Standby Auxiliary Feedwater (SAFW) Pump and transition back to E-0. Upon re-entry into E-0, the crew will transition to E-2, Faulted Steam Generator Isolation.

The scenario will terminate at Step 9 of E-2, after the crew has transitioned to E-1, Loss of Reactor or Secondary Coolant.

**SIM DRIVER Instructions:**

**Operate Trigger #6 MALF STM02A = 1.7e+007  
(Stmln Brk Outside CNM Upstrm MSIVs: S/G 1A)  
MALF STM09A = 10 (Main Steam Safety Failure: Vlv 3508)**

**Entered at T = 0:**

**MALF TUR02 (Turbine Failure to Auto Trip)  
MALF RPS07L (Auto Fail: B MDAFW Pump)  
MALF FDW11B (Aux Feedwater Pump Failure: Motor Driven Pump 1B)  
MALF FDW12 = 5100 (AFW Turbine Driven Pump Speed Control Failure)**

**Indications Available:**

- Various MCB alarms
- Steam noise is heard in the Control Room
- Fire Alarms Z-37 and Z-38
- Lowering S/G water levels
- No AFW flow
- Automatic Reactor trip and Safety Injection actuate

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## Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
<b>E-0, REACTOR TRIP OR SAFETY INJECTION</b>			
	HCO	(Step 1) Verify Reactor Trip:	<b>Immediate Action</b>
		o At least one train of reactor trip breakers – OPEN	
		o Neutron flux - LOWERING	
		o MRPI indicates – ALL CONTROL <u>AND</u> SHUTDOWN RODS ON BOTTOM with no instrument fluctuations concurrent with fire.	
	CO	(Step 2) Verify Turbine Stop Valves – CLOSED	<b>Immediate Action</b>
	HCO	(Step 2 RNO) Manually trip turbine.	<b>Immediate Action</b>
		<u>IF</u> turbine trip can <u>NOT</u> be verified, <u>THEN</u> close both MSIVs.	<b>NOTE:</b> Manual Turbine trip will be successful.
		<u>IF</u> the turbine CANNOT be tripped <u>AND</u> either MSIV CANNOT be closed from the Control Room <u>THEN</u> ...	<b>NOTE:</b> This action will not be necessary.
<b><u>CRITICAL TASK:</u></b>			
<p><b>Manually trip the main turbine or shut both MSIVs 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 (EOP Based)</b></p>			
<p>Safety Significance: Failure to trip the main turbine under the postulated plant conditions causes challenges to CSFs beyond those irreparably introduced by the postulated conditions. Additionally, such an omission constitutes a demonstrated inability by the crew to "take an action that would prevent a challenge to plant safety."</p>			



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## Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	(Step 3) Verify sufficient AC Emergency buses Energized To At Least 440 VOLTS:	<b>Immediate Action</b>
		o Bus 14 <u>OR</u> Bus 16	
	CO	-AND-	
		o Bus 17 <u>OR</u> Bus 18	
	HCO	(Step 4) Check if SI is Actuated:	<b>Immediate Action</b>
		a. Any SI Annunciator – LIT	
		b. SI sequencing – BOTH TRAINS STARTED	
<b>SIM DRIVER Instructions: Delete MALF STM09A when a Red Path exists on the Heat Sink CSFST as indicated on SPDS Display.</b>			
	HCO/ CO	Foldout Page	<b>NOTE:</b> The crew will monitor these conditions throughout the performance of E-0.
		RCP TRIP CRITERIA	<b>NOTE:</b> RCP trip criteria MAY be met dependent upon RCS – S/G D/P.
		LOSS OF SW CRITERIA	
		AFW SUPPLY SWITCHOVER CRITERION	
		SFP COOLING CRITERIA	
	HCO	(*Step 5) Verify CNMT Spray Not Required:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		o Annunciator A-27, CNMT SPRAY - EXTINGUISHED	
	HCO	o CNMT pressure – LESS THAN 28 PSIG	

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## Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 6) Direct Operator to Perform ATT-27.0, ATTACHMENT AUTOMATIC ACTION VERIFICATION	
			<p><b>NOTE:</b> The US will hand off ATT-27.0 to either the HCO or the CO, and continue with the other operator in E-0.</p> <p>Examiner following operator performing ATT-27.0 continue below.</p> <p>Examiner following operator NOT performing ATT-27.0 continue at <b>Page 46</b>.</p>
<b>E-0, REACTOR TRIP OR SAFETY INJECTION, ATTACHMENT 27.0, ATTACHMENT AUTOMATIC ACTION VERIFICATION</b>			
	HCO/ CO	(Step 1) Verify SI and RHR Pumps Running:	
		a. All SI pumps – RUNNING	
		b. Both RHR pumps – RUNNING	
	HCO/ CO	(Step 2) Verify CNMT RECIRC Fans RUNNING:	
		a. All fans - RUNNING	
		b. Charcoal filter dampers green status lights – EXTINGUISHED	
	HCO/ CO	(Step 3) Check If Main Steamlines Should Be Isolated:	<b>NOTE:</b> MSIVs are expected to be CLOSED.
		a. Any MSIV - OPEN	

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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	(Step 3.a RNO) Go to Step 4.	
	HCO/ CO	(Step 4) Verify MFW Isolation:	
		a. MFW pumps – TRIPPED	
		b. MFW Isolation valves - CLOSED	
		• S/G A, AOV-3995	
		• S/G B, AOV-3994	
		c. S/G blowdown and sample valves - CLOSED	
	HCO/ CO	(Step 5) Verify At Least Two SW Pumps - RUNNING	
	HCO/ CO	(Step 6) Verify CI and CVI:	
		a. CI and CVI annunciators - LIT	
		• Annunciator A-26, CNMT ISOLATION	
		• Annunciator A-25, CNMT VENTILATION ISOLATION	
		b. Verify CI and CVI valve status lights - BRIGHT	
		c. CNMT RECIRC fan coolers SW outlet valve status lights - BRIGHT	
		• FCV-4561	
		• FCV-4562	
		d. Letdown orifice valves - CLOSED	
	HCO/ CO	• AOV-200A	

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## Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	<ul style="list-style-type: none"> <li>• AOV-200B</li> </ul>	
		<ul style="list-style-type: none"> <li>• AOV-202</li> </ul>	
	HCO/ CO	(Step 7) Check CCW System Status:	
		a. Verify CCW pump – AT LEAST ONE RUNNING	
	HCO/ CO	(Step 8) Verify SI And RHR Pump Flow:	
		a. SI flow indicators – CHECK FOR FLOW	
		b. RHR flow indicator – CHECK FOR FLOW	<b>NOTE:</b> RCS pressure is above the shutoff head of the RHR Pumps.
	HCO/ CO	(Step 8b RNO) <u>IF</u> RCS pressure less than 150 psig ... <u>IF NOT, THEN</u> go to Step 9.	
	HCO/ CO	(Step 9) Verify SI Pump And RHR Pump Emergency Alignment:	
		a. RHR pump discharge to Rx vessel deluge - OPEN	
		<ul style="list-style-type: none"> <li>• MOV-852A</li> </ul>	
		<ul style="list-style-type: none"> <li>• MOV-852B</li> </ul>	
		b. Verify SI pump C – RUNNING	
		c. Verify SI pump A - RUNNING	
		d. Verify SI pump B – RUNNING	
	HCO/ CO	e. Verify SI pump C discharge valves - OPEN	
		<ul style="list-style-type: none"> <li>• MOV-871A</li> </ul>	

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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO/ CO	<ul style="list-style-type: none"> <li>MOV-871B</li> </ul>	
	HCO/ CO	(Step 10) Verify CREATS Actuation:	
		a. At least one damper in each flowpath - CLOSED	
		<ul style="list-style-type: none"> <li>Normal Supply Air</li> </ul>	
		<ul style="list-style-type: none"> <li>Normal Return Air</li> </ul>	
		<ul style="list-style-type: none"> <li>Lavatory Exhaust Air</li> </ul>	
		b. CREATS fans – BOTH RUNNING	
	HCO/ CO	(Step 11) Verify CI and CVI During a Fire Event	
		a. A confirmed fire has occurred in the control complex or cable tunnel (fire systems S05, S06, S08, Z05, Z18, or Z19).	
	HCO/ CO	(Step 11.a RNO) Go to END	
<b>E-0, REACTOR TRIP OR SAFETY INJECTION</b>			
			<b>Examiner</b> following operator NOT performing ATT-27.0 continue <b>HERE</b> .
	CO/ HCO	(Step 7) Verify Both MDAFW Pumps Running	
	CO/ HCO	(Step 7 RNO) Manually start both MDAFW pumps.	<b>NOTE:</b> Neither MDAFW Pump will start.

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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	<u>IF</u> less than 2 MDAFW pumps are running, <u>THEN</u> manually open TDAFW pump steam supply valves.	<b>NOTE:</b> The TDAFW Pump is tripped on overspeed.
		• MOV-3505A	
		• MOV-3504A	
	CO/ HCO	(Step 8) Verify AFW Valve Alignment:	
		a. AFW flow – INDICATED TO BOTH S/G(s)	<b>NOTE:</b> There is no AFW flow indicated to either S/G.
	CO/ HCO	(Step 8 RNO) Manually align valves as necessary.	<b>NOTE:</b> AFW flow cannot be established to either S/G.
	CO/ HCO	(*Step 9) Monitor Heat Sink:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Check S/G narrow range level GREATER THAN 7% [25% adverse CNMT] in any S/G	
	CO/ HCO	(Step 9.a RNO) Perform the following:	
		1) Verify total AFW flow - GREATER THAN 200 GPM	<b>NOTE:</b> There is no AFW flow indicated to either S/G.
	CO/ HCO	2) <u>IF</u> total AFW is less than 200 gpm, <u>THEN</u> manually start pumps and align valves to establish greater than 200 gpm AFW flow. <u>IF</u> AFW flow greater than 200 gpm can <u>NOT</u> be established, <u>THEN</u> go to FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1.	<b>NOTE:</b> AFW flow cannot be established to either S/G.

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## Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
			<b>NOTE:</b> The US will transition to FR-H.1.
<b>FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK</b>			
	HCO/ CO	Foldout Page	<b>NOTE:</b> The crew will monitor these conditions throughout the performance of FR-H.1.
		LOSS OF SW CRITERIA	
	HCO	(Step 1) Check If Secondary Heat Sink Is Required:	
		a. RCS pressure - GREATER THAN ANY NON-FAULTED S/G PRESSURE	
		b. Check RCS cold leg temperature - GREATER THAN 350°F	
	CO	(*Step 2) Check if Bleed and Feed is Required	
		a. Both S/G level wide range levels LESS THAN 120 inches [160 inches adverse CNMT]	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
	US	(Step 2.a RNO) Go to Step 3.	
	CO	(Step 3) Try To Establish AFW Flow To At Least One Intact S/G:	
		a. Check Blowdown and Sample Valves - CLOSED	
		b. Check any preferred AFW pump - AVAILABLE	<b>NOTE:</b> There are no AFW Pumps available

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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 3.b RNO) Go to Step 4.	
	HCO	(Step 4) Stop Both RCPs	
	HCO	(Step 5) Reset SI If Actuated	
		(Step 6) Try To Establish SAFW Flow To At Least One Intact S/G:	
		a. Perform the following:	
	HCO/ CO	1) Align SAFW System for operation (Refer to ATT-5.1, ATTACHMENT SAFW FROM SW)	<b>NOTE:</b> The US will hand off ATT-5.1 to either the HCO or the CO, and continue with the other operator in FR-H.1. <b>Examiner</b> following operator performing ATT-5.1 continue below. <b>Examiner</b> following operator NOT performing ATT-5.1 continue at <b>Page 51</b> .
	US	2) Determine SAFW flow requirements per ATT-22.0, ATTACHMENT RESTORING FEED FLOW	
	CO/ HCO	3) Start selected SAFW pump(s)	
<b>ATT-5.1, ATTACHMENT SAFW FROM SW</b>			
	CO/ HCO	(Step A) <u>IF</u> SW is not available <b>OR</b> cannot support required SAFW flow, <u>THEN</u> ...	<b>NOTE:</b> SW is adequate to support SAFW flow
	CO/ HCO	(Step B) <u>IF</u> feeding both S/Gs using only one SAFW pump, <u>THEN</u> ...	<b>NOTE:</b> Only 'B' S/G will be fed



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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	(Step C) Align SAFW Pump C to feed S/G A as follows:	<b>NOTE:</b> 'A' S/G will NOT be fed
	CO/ HCO	(Step D) Align SAFW Pump D to feed S/G B as follows:	
		1. Ensure SI Reset.	
		2. Ensure MDAFW pump B control switch in PULL STOP.	
		3. Ensure the following SAFW pump D valves are open:	
		• SAFW PUMP D DISCHARGE VLV, MOV-9701B	
		• SAFW PUMP D ISOL VLV, MOV-9704B	
		• SAFW PMP D EMERG DISCH VLV, MOV-9746	
		• AUX BLDG SW ISOL VLV, MOV-4615	
		4. Open MOV-9629B, SAFW PUMP D SUCTION VLV.	
		5. Verify at least 1 SW pump running.	
		6. Notify US that SAFW pump D is aligned and ready for start.	
	CO/ HCO	7. Start SAFW pump D and establish flow as directed.	
<b>ATT-22.0, ATTACHMENT RESTORING FEED FLOW</b>			
		(Step 1) Check Affected Loop RCS Temperature:	<b>Examiner</b> following operator NOT performing ATT-5.1 continue <b>HERE</b> .
	HCO/ CO	a. Affected loop hot leg temperature Less Than 550°F	

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## Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	CO/ HCO	b. S/G(s) should be filled as necessary to restore narrow range level greater than 7% [25% adverse CNMT]	
	US	c. Return To Procedure And Step In Effect.	
<b><u>CRITICAL TASK:</u></b>			
<b>Establish feedwater flow into at least one SG before RCS bleed and feed is required (EOP Based)</b>			
Safety Significance: Failure to establish feedwater flow to any SG results in the crew's having to rely upon the lower priority action of establishing RCS bleed and feed to minimize core uncover. This constitutes incorrect performance that "leads to degradation of any barrier to fission product release."			
<b>FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK</b>			
	CO/ HCO	(Step 6.a.4)) Control SAFW flow per requirements of ATT-22.0, ATTACHMENT RESTORING FEED FLOW	
	US	b. Go to Step 11.	
		(Step 11) Check S/G Levels:	
	CO	a. Narrow range level in at least one S/G – GREATER THAN 7% [25% adverse CNMT]	<b>NOTE:</b> It is likely that 'B' S/G level is still < 7%.

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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 11.a RNO) <u>IF</u> feed flow verified and level rising in at least one S/G, <u>THEN</u> maintain flow to restore narrow range level greater than 7% [25% adverse CNMT]. <u>IF NOT</u> verified, <u>THEN</u> go to Step 12.	<b>NOTE:</b> SAFW flow is verified to 'B' S/G and water level is rising
	US	(Step 11.b) Return to procedure and step in effect	<b>NOTE:</b> US will transition back to E-0, Step 9
<b>E-0, REACTOR TRIP OR SAFETY INJECTION</b>			
	CO	(*Step 9) Monitor Heat Sink:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Check S/G narrow range level GREATER THAN 7% [25% adverse CNMT] in any S/G	
	CO	(Step 9.a RNO) Perform the following:	
		1) Verify total AFW flow - GREATER THAN 200 GPM	<b>NOTE:</b> There is no AFW flow indicated to either S/G.
		<u>IF</u> total AFW is less than 200 gpm, <u>THEN</u> manually start pumps and align valves to establish greater than 200 gpm AFW flow. <u>IF</u> AFW flow greater than 200 gpm can <u>NOT</u> be established, <u>THEN</u> go to FR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, Step 1.	<b>NOTE:</b> SAFW flow is established to 'B' S/G.
	US	2) Go to Step 10	
	CO	(Step 10) Check If TDAFW Pump Can Be Stopped:	

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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	a. Both MDAFW pumps – RUNNING	<b>NOTE:</b> No AFW Pumps are running.
	US	(Step 10.a RNO) Go to Step 11.	
	HCO	(Step 11) Check CCW Flow to RCP Thermal Barriers:	
		o Annunciator A-7, RCP 1A CCW RETURN HI TEMP <u>OR</u> LO FLOW - EXTINGUISHED	
		o Annunciator A-15, RCP 1B CCW RETURN HI TEMP <u>OR</u> LOW FLOW - EXTINGUISHED	
	HCO	(*Step 12) Monitor RCS Tav <sub>g</sub> – STABLE AT <u>OR</u> TRENDING TO 547°F	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
	CO	(Step 12 RNO) <u>IF</u> temperature less than 547°F and lowering, <u>THEN</u> perform the following:	
	CO	a. Stop dumping steam.	
		b. Ensure reheater steam supply valves are closed.	
		c. <u>IF</u> cooldown continues, <u>THEN</u> control total feed flow between 200 gpm to 230 gpm until narrow range level greater than 7% [25% adverse CNMT] in at least one S/G.	
		d. <u>WHEN</u> S/G level greater than 7% [25% adverse CNMT] in one S/G, <u>THEN</u> limit feed flow to that required to maintain level in at least one S/G.	

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## Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	e. IF cooldown continues, <u>THEN</u> close both MSIVs.	<b>NOTE:</b> Both MSIVs are CLOSED.
	HCO	(Step 13) Check PRZR PORVs and Spray Valves:	
		a. PORVs – CLOSED	
		b. Auxiliary spray valve (AOV-296) – CLOSED	
		c. Check PRZR pressure – LESS THAN 2260 PSIG	
		d. Normal PRZR spray valves - CLOSED	
		• PCV-431A	
		• PCV-431B	
	CO/ HCO	(Step 14) Monitor RCP Trip Criteria:	
		a. RCP status – ANY RCP RUNNING	<b>NOTE:</b> Both RCPs are secured
	US	(Step 14.a RNO) Go to Step 15.	
	CO	(Step 15) Check If S/G Secondary Side Is Intact:	
		o Pressure in both S/Gs – STABLE <u>OR</u> RISING	
		o Pressure in both S/Gs – GREATER THAN 110 PSIG	

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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	US	(Step 15 RNO) <u>IF</u> any S/G pressure lowering in an uncontrolled manner <u>OR</u> completely depressurized, <u>THEN</u> go to E-2, FAULTED STEAM GENERATOR ISOLATION, Step 1.	
			<b>NOTE:</b> The US will go to E-2.
<b>E-2, FAULTED STEAM GENERATOR ISOLATION</b>			
	HCO/ CO	Foldout Page	<b>NOTE:</b> The crew will monitor these conditions throughout the performance of E-2.
		LOSS OF SW CRITERIA	
	CO	(Step 1) Check MSIV of Faulted S/G(s) - CLOSED	<b>NOTE:</b> The 'A' MSIV is CLOSED.
	CO	(Step 2) Check If Any S/G Secondary Side Is Intact:	
		o Check pressure in S/G A - STABLE OR RISING	
		-OR-	
		o Check pressure in S/G B – STABLE OR RISING	<b>NOTE:</b> The 'B' S/G is intact.
	CO	(Step 3) Check Faulted S/G Status:	<b>NOTE:</b> The 'A' S/G may be depressurized.
	CO	o Faulted S/G pressure – LOWERING IN AN UNCONTROLLED MANNER	
		-OR-	
		o Faulted S/G – COMPLETELY DEPRESSURIZED	

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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
		(Step 4) Isolate Feed Flow to Faulted S/G:	<b>NOTE:</b> If Feed flow has NOT been isolated previously, it will be isolated here.
	CO	a. Close or verify closed the following valves:	
		o Faulted S/G MDAFW pump discharge valve	
		• S/G A, MOV-4007	
		o Faulted S/G MFW regulating valve and bypass valve - CLOSED	
		• S/G A, HCV-466 and HCV-480	
		o MFW isolation valves - CLOSED	
		• S/G A, AOV-3995	
		o MDAFW pump crosstie valves – BOTH CLOSED	
		• MOV-4000A	
		• MOV-4000B	
	HCO	o Faulted S/G SAFW pump discharge valve	
		• S/G A, MOV-9704A	
	CO	b. Pull stop faulted S/G MDAFW pump	<b>NOTE:</b> The CO will PULL-STOP the 'A' MDAFW Pump.
	CO	c. Close faulted S/G TDAFW flow control valve	
		o S/G A, AOV-4297	
	CO	(Step 5) Isolate Steam Flow From Faulted S/G:	
		o Verify faulted S/G ARV – CLOSED	
		• S/G A, AOV-3411	

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## Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	CO	<ul style="list-style-type: none"> <li>○ Close faulted S/G TDAFW pump steam supply valve and place in PULL STOP</li> </ul>	
		<ul style="list-style-type: none"> <li>• S/G A, MOV-3505A</li> </ul>	
		<ul style="list-style-type: none"> <li>○ Verify faulted S/G blowdown and sample valves – CLOSED</li> </ul>	
		<ul style="list-style-type: none"> <li>• S/G A, AOV-5738 and AOV-5735</li> </ul>	
		<ul style="list-style-type: none"> <li>○ Dispatch EO to complete faulted S/G isolation (Refer to ATT-10.0, ATTACHMENT FAULTED S/G)</li> </ul>	<p><b>NOTE:</b> The US will dispatch an EO.</p> <p><b>SIM DRIVER:</b> as EO, acknowledge, and After 3 Minutes report that the area cannot be accessed.</p>

**CRITICAL TASK:****Isolate the Faulted Steam Generator Before Transition out of E-2 (EOP Based)**

Safety Significance: Failure to isolate a faulted SG that can be isolated causes challenges to the Integrity and/or Subcriticality CSFs beyond those irreparably introduced by the postulated conditions. Also, depending upon plant conditions, it could constitute a demonstrated inability by the crew to recognize a failure of the automatic actuation of an ESF system or component.

	CO	(*Step 6) Monitor Intact S/G Levels:	<b>NOTE:</b> This is a Continuous Action. The US will make one or more board operators aware.
		a. Narrow range level – GREATER THAN 7% [25% adverse CNMT]	
		b. Control feed flow to maintain narrow range level between 17% [25% adverse CNMT] and 50%	



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Event Description:

**STMLN BRK OUTSIDE CNMT UPSTRM MSIV'S: S/G 1A / Turbine fails to Auto Trip / The 'B' AFW Pump will fail to Auto start, then trip after it is manually started.**

**The TDAFW Pump will trip on Overspeed / FR-H.1 Transition, recovery available with either SAFW pump. Return to procedure in effect E-0 and then transition to E-2 and isolate faulted SG 'A'.**

Time	Pos.	Expected Actions/Behavior	Comments
	HCO	(Step 7) Check Secondary Radiation Levels - NORMAL	
		o Steamline radiation monitor (R-31 and R-32)	
		o Air ejector radiation monitor (R-15)	
		o S/G blowdown radiation monitor (R-19)	
	US	o Request Chem Tech sample S/Gs for activity	<b>NOTE:</b> The US will request that Chemistry sample. <b>SIM DRIVER:</b> as <b>Chemistry</b> , acknowledge.
		(Step 8) Adjust Steam Dump To Minimize RCS Heatup:	
	US / HCO	a. Determine allowable intact S/G pressure using maximum hot leg temperature (Refer to FIG-7.0, FIGURE INTACT S/G PRESSURE)	
	CO	b. Check condenser steam dump available:	
		o Verify intact S/G MSIV - OPEN	
		o Annunciator G-15, STEAM DUMP ARMED - LIT	
		(Step 8.b RNO) Perform the following:	
	CO	1) Adjust intact S/G ARV to pressure determined from FIG-7.0, FIGURE INTACT S/G PRESSURE).	
	US	2) Go to E-1, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1.	
			<b>NOTE:</b> The US will go to E-1.
<b>At the discretion of the Lead Examiner terminate the exam</b>			

TURNOVER SHEET for NRC Exam Scenario #4

<u>Core Age: MOL</u> 100% Power, Equilibrium Xe Outside Air Temp = 45°F Water Temp = 45°F	<u>Procedure in Use:</u>	<u>ACTIONS/NOTES:</u> <ul style="list-style-type: none"> <li>• The plant is at 100% power (MOL).</li> <li>• The area has experienced overcast conditions for the past 4 hours, with light wind from the West at 20-30 mph, and this is expected to continue throughout the shift.</li> <li>• The 'A' MDAFW Pump is OOS for bearing replacement.</li> <li>• Protected equipment IAW OPG-PROTECTED-EQUIPMENT. ('A' MDAFW Pump)</li> </ul>
Boron: 936 ppm BAST: 19,000 ppm RCS Activity: Normal	<u>RCS LEAKAGE:</u> (gpm) Total: .021 Identified: .003 Unidentified: .018	

TURNOVER SHEET for NRC Exam Scenario #4

<u>Equipment Problems/OOS:</u> See NOTES	<u>Planned Activities for Shift:</u>	<u>Electrical System Operator Declarations</u> None in effect
---------------------------------------------	--------------------------------------	------------------------------------------------------------------

A-52.4					
EQUIPMENT	DATE/TIME OOS	LCO	TITLE	EXP DATE	ECD
'A' MDAFW Pump	Yesterday, 24hrs ago	3.7.5	Auxiliary Feedwater (AFW) System	7 Days	12 hours
A-52.12					
EQUIPMENT	DATE/TIME OOS	TRM /ODCM	TITLE	EXP DATE	ECD