

Form 3.2-1 Administrative Topics Outline

Facility: <u>Waterford 3</u>		Date of Examination: <u>8/21/2023</u>
Examination Level: RO <input checked="" type="checkbox"/>		SRO <input type="checkbox"/> Operating Test Number: <u>1</u>
Administrative Topic (Step 1)	Activity and Associated K/A (Step 2)	Type Code (Step 3)
A1 Conduct of Operations	Complete calculations to determine available Feedwater and maximum time remaining to Shutdown Cooling in accordance with OP-902-009, Attachment 2-G. 2.1.25 Ability to interpret reference materials, such as graphs, curves, and tables RO-3.9	R,M(2018)
A2 Conduct of Operations	Determine Acceptability of Containment Temperature in accordance with OP-903-001, Technical Specifications Surveillance Logs 2.1.19 Ability to use available indications to evaluate system or component status RO-3.9	R,D(2015)
A3 Equipment Control	Calculate Keff in accordance with OP-903-090, Shutdown Margin, Section 7.5, Keff Calculation. 2.2.12 Knowledge of surveillance procedures RO-3	R,M(2017)

<p>A4 Radiation Control</p>	<p>Evaluate Meteorological conditions for gaseous release from the Gaseous Waste Management System in accordance with OP-007-003, Gaseous Waste Management.</p> <p>2.3.11 Ability to control radiation releases</p> <p>RO-3.8</p>	<p>R,D(2017)</p>
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Instructions for completing Form 3.2-1, "Administrative Topics Outline"

1. For each license level, determine the number of administrative job performance measures (JPMs) and topic areas as follows:

Topic	Number of JPMs	
	RO*	SRO and RO Retakes
Conduct of Operations	1 (or 2)	2
Equipment Control	1 (or 0)	1
Radiation Control	1 (or 0)	1
Emergency Plan	1 (or 0)	1
Total	4	5

* Reactor operator (RO) applicants do not need to be evaluated on every topic (i.e., "Equipment Control," "Radiation Control," or "Emergency Plan" can be omitted by doubling up on "Conduct of Operations"), unless the applicant is taking only the administrative topics portion of the operating test (with a waiver or excusal of the other portions).

2. Enter the associated knowledge and abilities (K/A) statement and summarize the administrative activities for each JPM.

3. For each JPM, specify the type codes for location and source as follows:

Location:

(C)ontrol room, (S)imulator, or Class(R)oom

Source and Source Criteria:

(P)revious two NRC exams (no more than one JPM that is **randomly selected** from last two NRC exams)

(D)irect from bank (no more than three for ROs, no more than four for SROs and RO retakes)

(N)ew or Significantly (M)odified from bank (no fewer than one)

Form 3.2-1 Administrative Topics Outline

Facility: <u>Waterford 3</u>		Date of Examination: <u>8/21/2023</u>
Examination Level: RO <input type="checkbox"/>		SRO <input checked="" type="checkbox"/>
		Operating Test Number: <u>1</u>
Administrative Topic (Step 1)	Activity and Associated K/A (Step 2)	Type Code (Step 3)
<p>A5 Conduct of Operations</p>	<p>Review and approve a completed calculation for determining the amount of pure water that may be added to the Refuel Cavity without dilution to below shutdown margin requirements in accordance with OP-010-006, Outage Operations, section 9.24, Refueling Cavity Boron Concentration.</p> <p>2.1.23, Ability to perform specific system and integrated plant procedures during any plant condition SRO-4.4</p>	R,N
<p>A6 Conduct of Operations</p>	<p>Perform SM/CRS review of OP-901-501, PMC or Core Operating Limit Supervisory System Malfunction, Attachments 1, 2 and 3 following a PMC failure.</p> <p>2.1.20 Ability to interpret and execute procedure steps. SRO-4.6</p>	P,R,D(2020)

<p style="text-align: center;">A7 Equipment Control</p>	<p>Review Keff Calculation in accordance with OP-903-090, Shutdown Margin, Section 7.5, Keff Calculation. Applicant determines Keff does not meet Tech Spec 3.1.2.9 requirements and identifies required corrective actions.</p> <p>2.2.12, Knowledge of Surveillance Procedures SRO-4.1</p>	<p style="text-align: center;">R,M</p>
<p style="text-align: center;">A8 Radiation Control</p>	<p>Authorize Emergency Exposure as the Emergency Director in accordance with EP-002-030, Emergency Radiation Exposure Guidelines and Controls.</p> <p>2.3.14 Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities, such as analysis and interpretation of radiation and activity readings as they pertain to administrative, normal, abnormal, and emergency procedures or to analysis and interpretation of coolant activity, including comparison to emergency plan or regulatory limits(SRO Only) SRO-3.8</p>	<p style="text-align: center;">R,M</p>
<p style="text-align: center;">A9 Emergency Plan</p>	<p>Determine the appropriate emergency action level in accordance with EP-001-001, Recognition and Classification of Emergency Conditions(SRO Only) SRO-4.6</p> <p>2.4.41, Knowledge of the emergency action level thresholds and classifications</p>	<p style="text-align: center;">R,N</p>

Instructions for completing Form 3.2-1, "Administrative Topics Outline"

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Topic	Number of JPMs	
	RO*	SRO and RO Retakes
Conduct of Operations	1 (or 2)	2
Equipment Control	1 (or 0)	1
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Emergency Plan	1 (or 0)	1
Total	4	5

* Reactor operator (RO) applicants do not need to be evaluated on every topic (i.e., "Equipment Control," "Radiation Control," or "Emergency Plan" can be omitted by doubling up on "Conduct of Operations"), unless the applicant is taking only the administrative topics portion of the operating test (with a waiver or excusal of the other portions).

2. Enter the associated knowledge and abilities (K/A) statement and summarize the administrative activities for each JPM.

3. For each JPM, specify the type codes for location and source as follows:

Location:

(C)ontrol room, (S)imulator, or Class(R)oom

Source and Source Criteria:

(P)revious two NRC exams (no more than one JPM that is **randomly selected** from last two NRC exams)

(D)irect from bank (no more than three for ROs, no more than four for SROs and RO retakes)

(N)ew or Significantly (M)odified from bank (no fewer than one)

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 Admin JPM NRC Exam (A1)

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):		Actual Time (min):	
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading Instructions at end of JPM SAT UNSAT NEEDS IMPROVEMENT

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This JPM requires the applicant complete OP-902-009, Attachment 2-G, Condensate Inventory Calculation, and accurately determine the maximum time remaining to be on Shutdown Cooling.

TASK STANDARD: Applicant determined total feedwater to be 100738 gallons, available feedwater to be 69,738 to 70,238 gallons and maximum time remaining to be on SDC 2.3 to 2.7 hours.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

ENERGY NUCLEAR		Page 1
E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements: Revision 1

JPM Information:

Time Critical: **No**
Evaluation Method: **Admin**
Evaluation Location: **Classroom**
Task Title: **Verify time to place plant on Shutdown Cooling**
Task Number:
K/A Number and rating: **2.1.25** SRO: **4.2**
Safety Function: **4S**
PSA Applicability: **N/A**
Low Power: **Yes**
Emergency/Abnormal: **Yes**
Engineered Safety Function: **None**

REFERENCES:

1. OP-902-009, Standard Appendices, Rev. 323

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin.
2. State the following:
 - a) The task conditions are as follows:
 - Plant tripped 1 hours ago due to a loss of Main Feedwater
 - Plant conditions are as follows:
 - RCS Temperature = 520°F
 - DWST level = 50%
 - CSP level = 73%
 - 4 RCP's are running
 - Condensate Transfer Pump is unavailable
 - OP-901-001, Reactor Trip Recovery, has been completed up to step 21, Evaluate need for a plant cooldown.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

[Operator's name], the CRS directs you to calculate maximum time remaining to place Shutdown Cooling in service at 350°F in accordance with OP-902-009, Attachment 2-G, Condensate Inventory Calculation.

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PERFORMANCE:

START TIME: _____

Note

This calculation determines the limiting time to place shutdown cooling in service based on available feedwater.

Tech Spec 3.7.1.3 requirements also apply and must be met if CSP level below limit.

1.	Procedure Step:	1. Determine if Condensate Transfer Pump is available to transfer water from the DWST to the CSP.	
	Standard	Determined Condensate Transfer Pump is unavailable.	
	Cue	None	
	Notes	Pump is unavailable as stated in plant conditions on Student Handout	
	Results	SAT <input style="width: 50px; height: 20px;" type="checkbox"/>	UNSAT <input style="width: 50px; height: 20px;" type="checkbox"/>

2.	Procedure Step:	2. If the Condensate transfer Pump is NOT available to transfer water to the CSP, THEN do NOT include DWST volume in the Total Feedwater Volume calculation.	
	Standard	Determined Condensate Transfer Pump is unavailable.	
	Cue	None	
	Notes	None	
	Results	SAT <input style="width: 50px; height: 20px;" type="checkbox"/>	UNSAT <input style="width: 50px; height: 20px;" type="checkbox"/>

3.	Procedure Step:	3. Determine Total Feedwater: DWST Volume = 5,000 gal/% x _____ % - 58,000 gal = _____ gal CSP Volume = 2,106 gal/% x _____ % - 53,000 gal = _____ gal Total Feedwater = DWST Volume + CSP Volume = _____ gal	
	Standard	DWST Volume = 192000 gal (not critical since inventory not avail) CSP Volume = 100738 gal (Critical) Total Feedwater = 100738 gal (Critical)	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input style="width: 50px; height: 20px;" type="checkbox"/>	UNSAT <input style="width: 50px; height: 20px;" type="checkbox"/>

4.	Procedure Step:	4. Determine Available Feedwater: Total Feedwater – Required Feedwater from Attachment 2-H = Available Feedwater Total Feedwater _____ gal Required Feedwater – _____ gal Available Feedwater = _____ gal	
	Standard	100738 – (31,000 to 32,000) = 68,738 to 69,738 gal	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

5.	Procedure Step:	5. Plot Available Feedwater on the applicable Attachment 2-I thru 2-K, “Condensate Inventory Curves” to determine the maximum time remaining to place shutdown cooling system in service.	
	Standard	Figure 2-I (Four RCPs Operating) used.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

6.	Procedure Step:	6. Available Feedwater maximum time remaining: _____ (Hours) to SDC.	
	Standard	2.3 to 2.7 hours determined	
	Cue	None	
	Notes	Critical Step. If wrong curves used 2-J=3 hours and 2-K=4 hours	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- Plant tripped 1 hour ago due to a loss of Main Feedwater
- Plant conditions are as follows:
 - RCS Temperature = 520°F
 - DWST level = 50%
 - CSP level = 73%
 - 4 RCP's are running
 - Condensate Transfer Pump is unavailable
- OP-902-001, Reactor Trip Recovery, has been completed up to step 21, Evaluate need for a plant cooldown.

INITIATING CUES:

The CRS directs you to calculate maximum time remaining to place Shutdown Cooling in service at 350°F in accordance with OP-902-009, Attachment 2-G, Condensate Inventory Calculation.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 Admin JPM NRC Exam A2

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):		Actual Time (min):	
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This JPM requires the applicant to determine the acceptability of Containment Temperature in accordance with OP-903-001.

TASK STANDARD: Applicant calculated containment average temperature to be 98.3°F to 99.7°F. Applicant determined that the containment average temperature does **NOT** meet the acceptance criteria of OP-903-001 and Technical Specification 3.6.1.5 entry is required.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

Revision Statements: Revision 1

JPM Information:

Time Critical: **No**
Evaluation Method: **Admin**
Evaluation Location: **Classroom**
Task Title: **Determine Acceptability of Containment Temperature**
Task Number:
K/A Number and rating: **2.1.19** SRO: **3.9**
Safety Function: **5**
PSA Applicability: **N/A**
Low Power: **Yes**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

- 1. OP-903-001, Technical Specification Surveillance Logs, Rev. 102
- 2. Technical Specifications, Rev 368

SIMULATOR CONDITIONS:

- 1. NA

GENERAL TOOLS AND EQUIPMENT:

- 1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

- 1. State the following paragraph IF this is the first performance in this setting:
 - a) All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin.
- 2. State the following:
 - a) The task conditions are as follows:
 - Reactor power is at 100%
 - I & C has just completed calibration of CFC Air Intake temperature loops
 - Containment Fan Coolers A, C, and D are operating
 - Primary Containment Average Air temperatures are as follows:
 - PID A51115, CFC A Air Inlet Temp reads 97°F
 - PID A51119, CFC B Air Inlet Temp reads 100°F
 - PID A51123, CFC C Air Inlet Temp reads 101°F
 - PID A51127, CFC D Air Inlet Temp reads 98°F
- 3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

[Operator's name], the CRS directs you to determine compliance of Containment Average Temperature per OP-903-001. Document results and actions required, if any, on OP-903-001, Attachment 11.20.

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PERFORMANCE:

START TIME: _____

Evaluator Note	
The candidate will determine Containment Average Temperature using Containment Fan Cooler inlet temperatures from the PMC, Containment Fan Coolers running, and reactor power (all provided on the cue sheet)	

1.	Procedure Step:	Determine Containment Average Temperature
	Standard	Determined Containment Average Temperature to be 98.3°F to 99.7°F
	Cue	None
	Notes	Critical Step. The applicant should use the provided CFC temperatures and average the 3 running CFC temperatures (A, C and D). The average will be 98.7°F.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

2.	Procedure Step:	Determine if Containment Average Temperature meets acceptance criteria.
	Standard	Read Mode 1-4 Tech Spec Surveillance Notes. Determined Note 2.0 applies.
	Cue	None
	Notes	Note 2.0 provides instructions for which temperatures are preferred when calculating the average temperature and the guidance for Tech Spec 3.6.1.5.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

3.	Procedure Step:	Determine if Containment Average Temperature meets acceptance criteria.
	Standard	Determined Containment Average Temperature does NOT meet Acceptance Criteria of OP-903-001. Technical Specification 3.6.1.5 entry is required.
	Cue	None
	Notes	Critical Step.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

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STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- Reactor power is at 100%
- I & C has just completed calibration of CFC Air Intake temperature loops
- Containment Fan Coolers A, C, and D are operating
- Primary Containment Average Air temperatures are as follows:
 - PID A51115, CFC A Air Inlet Temp reads 97°F
 - PID A51119, CFC B Air Inlet Temp reads 100°F
 - PID A51123, CFC C Air Inlet Temp reads 101°F
 - PID A51127, CFC D Air Inlet Temp reads 98°F

INITIATING CUES:

The CRS directs you to determine compliance of Containment Average Temperature per OP-903-001. Document results and actions required, if any, on OP-903-001, Attachment 11.20.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 Admin JPM NRC Exam A3

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):		Actual Time (min):	
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading Instructions at end of JPM SAT UNSAT NEEDS IMPROVEMENT

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This JPM requires the applicant to determine Keff in accordance with OP-903-090.

TASK STANDARD: Applicant determined HZP Inverse Boron Worth to be **109 to 111 PPM** PPM/%Δk/k. Applicant determined Normalized Boron Worth to be **1.19 to 1.21**. Applicant determined required shutdown margin to be **1.5 %ΔK/K**. Applicant calculated actual boron concentration above shutdown margin to be **40 PPM**. Applicant calculated adjusted inverse boron worth to be **90.08 to 93.28 PPM/% ΔK/K**. Applicant calculated boron worth above shutdown margin to be **0.429 - 0.444 %ΔK/K**. Applicant calculated total excess reactivity worth to be **1.929-1.944 %ΔK/K**. Applicant converted % K/K and which resulted in **0.01929-0.01944 ΔK/K**. Applicant determined Keff to be **0.9809-0.9811**

Prepared:	Ramon Peter WTWF3-2022-00281-00022	Date:	2/15/23
Reviewed:	Jerome Robertson WTWF3-2022-00281-00046	Date:	6/1/23
Approved:	Hunter Wells WTWF3-2022-00281-00038	Date:	6/1/23

Superintendent, Operations Training (or Designee)

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
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CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

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ADMINISTRATIVE REQUIREMENTS

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Revision Statements: Revision 1

JPM Information:

Time Critical: **No**
Evaluation Method: **Admin**
Evaluation Location: **Classroom**
Task Title: **Calculate Keff in accordance with OP-903-090**
Task Number:
K/A Number and rating: **2.2.12** SRO: **3.7**
Safety Function: **1**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

1. OP-903-090, Shutdown Margin, Rev 306
2. Cycle 25 Plant Data Book, Rev 17

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin.
2. State the following:
 - a) The task conditions are as follows:
 - Plant is shutdown, all CEAs inserted
 - RCS boron concentration is 1000 PPM
 - RCS Thot and Tcold are 350°F
 - EFPD is 300 (MOC)
 - A Shutdown Margin calculation was completed satisfactorily using OP-903-090 Attachment 10.1 and calculated to be 960 PPM.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

[Operator's name], the CRS directs you to calculate K-Effective in accordance with OP-903-090, Shutdown Margin, Section 7.5, K-Effective Calculation. Stop after step 7.5.6.6 is completed.

Document the results on this cue sheet.

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2.	Procedure Step:	7.5.2 Determine current HZP Inverse Boron Worth, using current EFPD and PDB Figure 1.4.1, HZP Inverse Boron Worth vs. Burnup.	
	Standard	Applicant determined HZP Inverse Boron Worth to be 109 to 111 PPM PPM/%Δk/k	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

3.	Procedure Step:	7.5.3 Determine current Normalized Boron Worth, using temperature recorded in step 7.5.1.2 and PDB Figure 1.4.2, Normalized Boron Worth Versus Temperature Normalized to 541°F.	
	Standard	Applicant determined Normalized Boron Worth to be 1.19 to 1.21 .	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4.	Procedure Step:	7.5.4 Obtain Required Shutdown Margin Boron Concentration from Attachment 10.1, step 7.1.3.4 <u>or</u> Attachment 10.4, step 7.4.3.5.7.5.4.1. Circle step number used on Attachment 10.5.	
	Standard	Applicant obtained Attachment 10.1 Required Shutdown Margin Boron Concentration from Student Handout information. 960 PPM	
	Cue	None	
	Notes	Information provided on Student Handout	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

5.	Procedure Step:	7.5.5 Obtain Required Shutdown Margin from T.S. 3.1.1.1 <u>or</u> 3.1.1.2.	
	Standard	Applicant determined required shutdown margin to be 1.5 %ΔK/K	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

6.	Procedure Step:	7.5.6 Calculate K-Effective on Attachment 10.5 as follows: 7.5.6.1 Calculate Actual Boron Concentration above Shutdown Margin Requirement by subtracting value recorded in step 7.5.4 from value recorded in step 7.5.1.1.	
	Standard	Applicant calculated actual boron concentration above shutdown margin to be 40 PPM	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

7.	Procedure Step:	7.5.6.2 Calculate Adjusted Inverse Boron Worth by dividing value recorded in step 7.5.2 by value recorded in step 7.5.3.	
	Standard	Applicant calculated adjusted inverse boron worth to be 90.08 to 93.28 PPM/% ΔK/K	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

8.	Procedure Step:	7.5.6.3 Calculate Boron Worth above Shutdown Margin Requirement by dividing value recorded in step 7.5.6.1 by value recorded in step 7.5.6.2.	
	Standard	Applicant calculated 0.429 - 0.444 %ΔK/K	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

9.	Procedure Step:	7.5.6.4 Calculate Total Excess Reactivity Worth by adding value recorded in step 7.5.5 to value recorded in step 7.5.6.3.	
	Standard	Applicant calculated 1.929-1.944 %ΔK/K	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

10.	Procedure Step:	7.5.6.5 Convert %K/K to Δ K/K by dividing value recorded in step 7.5.6.4 by 100.	
	Standard	Applicant calculated 0.01929-0.01944 ΔK/K	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="text"/>	UNSAT <input type="text"/>

11.	Procedure Step:	7.5.6.6 Calculate K-Effective by dividing 1 by the sum of 1 + step 7.5.6.5.	
	Standard	Applicant calculated 0.9809-0.9811	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="text"/>	UNSAT <input type="text"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- Plant is shutdown, all CEAs inserted
- RCS boron concentration is 1000 PPM
- RCS Thot and Tcold are 350°F
- EFPD is 300 (MOC)
- A Shutdown Margin calculation was completed satisfactorily using OP-903-090 Attachment 10.1 and calculated to be 960 PPM.

INITIATING CUES:

The CRS directs you to calculate K-Effective in accordance with OP-903-090, Shutdown Margin, Section 7.5, K-Effective Calculation. Stop after step 7.5.6.6 is completed.

Document the results on this cue sheet.

K-Effective: _____

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Exam (A4)

OPERATOR: _____

DATE: _____

EVALUATOR: _____

EVALUATOR SIGNATURE: _____

CRITICAL TIME FRAME:	Required Time (min):	N/A	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT

Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This JPM requires the operator to evaluate wind speed, wind direction, and stability class in accordance with OP-007-003, Attachment 11.5, Meteorological Conditions Requirements, to determine if a batch gaseous release is allowed.

TASK STANDARD: Applicant used 10 meter wind speed of 2.68 or 2.75 m/s, 10 meter direction of 331.1 or 330.7 degrees, and a ΔT of 0.77 °C or 0.76 °C. Applicant concluded that a release is not allowed.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

ENERGY NUCLEAR			Page 1
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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements: Rev. 1

JPM Information:

Time Critical: **No**
Evaluation Method: **Admin**
Evaluation Location: **Classroom**
Task Title: **Determine Met Conditions for GWM Release**
Task Number: **W3-RO-GWM-NORM-2**
K/A Number and rating: **2.3.11** RO: **3.8**
Safety Function: **N/A**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

1. OP-007-003, Gaseous Waste Management, Attachment 11.5, Meteorological Conditions Requirements, Rev. 314

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin.
2. State the following:
 - a) The task conditions are as follows:
 - Plant is in Mode 1
 - Chemistry has requested a release of all 3 Gas Decay Tanks for planned maintenance
 - Environmental conditions are as displayed on the METDATA handout
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

[Operator's name], The CRS directs you to complete an evaluation of meteorological conditions for the release in accordance with OP-007-003, Gaseous Waste Management.

Document all work on OP-007-003, Attachment 11.5.

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PERFORMANCE:

START TIME: _____

Examiner Note	
Attachment 11.5, Meteorological Conditions Requirements, notes: Note 1 All parameters should be obtained from the 15 minute average values displayed on the PMC. Note 2 10 meter wind speed and wind direction may be obtained from the primary or back-up tower 33' reading. Note 3 $\Delta T/50m$ may be obtained from the primary or backup tower 199-33' Delta T reading.	

1.	Procedure Step:	Evaluate 10 meter (33 foot) wind speed.
	Standard	Determined wind speed is ≥ 0.67 m/s and ≤ 3.35 m/s using PRI or BKUP 33' wind speed 15M RAVG(2.68 or 2.75 m/s)
	Cue	None
	Notes	Critical Step
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

2.	Procedure Step:	Evaluate 10 meter (33 foot) wind direction
	Standard	Determined wind direction is ≥ 68 degrees and ≤ 339 degrees using PRI or BKUP 33' WIND DIR 15M AVG(331.1 or 330.7 DEG)
	Cue	None
	Notes	Critical Step
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

3.	Procedure Step:	Evaluate Pasquill Stability Class
	Standard	Determined stability class F, using ΔT of 0.77 °C or 0.76 °C and release is <u>NOT</u> permitted.
	Cue	None
	Notes	Critical Step.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

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STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- The plant is in Mode 1
- Chemistry has requested a release of all 3 Gas Decay Tanks for planned maintenance
- Environmental conditions are as displayed on the METDATA handout

INITIATING CUE(S):

The CRS directs you to complete an evaluation of meteorological conditions for the release in accordance with OP-007-003, Gaseous Waste Management.

Document all work on OP-007-003, Attachment 11.5.

Release Permitted: Yes _____ No _____ (select one)

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements: New JPM

JPM Information:

Time Critical: **No**
Evaluation Method: **Admin**
Evaluation Location: **Classroom**
Task Title: **Review and approve a calc for amount of water that may be added to the Refuel Cavity**
Task Number: **W3-SRO-ADMIN-NORM-1**
K/A Number and rating: **2.21.23** SRO: **4.4**
Safety Function: **N/A**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

1. OP-010-006, Outage Operations Rev 341
2. COLR, Core Operating Limits Report, Cycle 25, Rev 0
3. Technical Specifications Rev 368

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. Calculator

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

State the following paragraph IF this is the first performance in this setting:

- a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - Waterford 3 is in Mode 6 during a refueling outage.
 - Reactor engineering has determined that a boron concentration of 1985 ppm is required to maintain the refuel cavity at a Keff of $\leq .95$.
 - Refueling Cavity Water Level is 24 ft. and will be drained to 22 ft.
 - Refueling Cavity boron concentration is 2090 ppm.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], RP requested that the refueling cavity walls be washed down as level in the refueling cavity is lowered to 22 ft. A Reactor Operator has completed OP-010-006, Outage Operations, Attachment 9.24 up to step 9.24.4. Perform review of completed steps and complete step 9.24.4 to designate the allowable pure water limit to add to cavity.

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PERFORMANCE:

START TIME: _____

NOTE

- (1) This attachment provides guidance for calculating the amount of pure water that may be added to the Refuel Cavity without dilution to below shutdown margin requirements. This is typically used while Radiation Protection is using CMU to wash down the Refuel Cavity walls to mitigate airborne radioactivity while performing Refuel Cavity drain down.
- (2) This calculation is only valid for water additions while the Refuel Cavity Water Level is $\geq 20'$ MSL.
- (3) This calculation includes a 50% margin.
- (4) Attachment 9.21 allows greater than 1500 gallons of pure water to wash down the cavity via an outage specific Engineering Calculation vice utilizing this attachment.

1.	Procedure Step:	9.24.1 Record the following: <ul style="list-style-type: none"> • Final Refuel Cavity Water Level (Lf): <u>22</u> feet MSL • Initial Refuel Cavity Boron Concentration (Ci) <u>2090</u> ppm • Refueling Minimum Boron Concentration (Cf) 1985 ppm <u>2050</u> ppm 	
	Standard	Determined from COLR that 2050 ppm is the minimum refueling boron concentration and corrected the entered concentration.	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

2.	Procedure Step:	9.24.2 Calculate the amount of pure water that may be added to the Refuel Cavity (Vw) using the following formula: $V_w = (6954 \text{ gal/ft} \times L_f - 79,161 \text{ gal}) \times (1 - C_f / C_i)$ $V_w = [(6954 \times \underline{22} \text{ ft}) - 79,161] \times [1 - (\underline{1985} \text{ } \underline{2050} \text{ ppm} / \underline{2090} \text{ ppm})]$ $V_w = \underline{3675-3725} \text{ } \underline{1402 - 1477} \text{ gallons}$	
	Standard	Entered the correct concentration from the COLR (2050) into calculation and determined the correct amount of water to be 1402 to 1477 gallons.	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

3.	Procedure Step:	9.24.3 Select the lower of Vw calculated in Step 9.24.2 or 1500 gallons:	
	Standard	Applicant determined 1402-1477 gallons to be lowest number and corrected entered amount.	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4.	Procedure Step:	9.24.4 SM/CRS designate the allowable amount of pure water to add to the Refuel Cavity by specifying an amount that is <input type="checkbox"/> amount specified in Step 9.24.3. SM/CRS designated allowable pure water limit to add to cavity: <u>1402-1477</u> gal	
	Standard	Applicant designated 1402 to 1477 gallons as the allowable amount.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

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STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- Waterford 3 is in Mode 6 during a refueling outage.
- Reactor engineering has determined that a boron concentration of 1985 ppm is required to maintain the refuel cavity at a Keff of $\leq .95$.
- Refueling Cavity Water Level is 24 ft. and will be drained to 22 ft.
- Refueling Cavity boron concentration is 2090 ppm.

INITIATING CUES:

RP requested that the refueling cavity walls be washed down as level in the refueling cavity is lowered to 22 ft. A Reactor Operator has completed OP-010-006, Outage Operations, Attachment 9.24 up to step 9.24.4. Perform review of completed steps and complete step 9.24.4 to designate the allowable pure water limit to add to cavity.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 Admin JPM NRC Exam A6

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):		Actual Time (min):	
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This JPM requires the applicant to review completed calculation for Containment Average Temperature and determine acceptability of Containment Temperature in accordance with OP-903-001.

TASK STANDARD: Applicant discovered error in the Containment Average Temperature calculation. Applicant corrected the average temperature to be 98.3°F to 99.7°F. Based on the corrected value, the applicant determined that the containment average temperature does **NOT** meet the acceptance criteria of OP-903-001 and Technical Specification 3.6.1.5 entry is required.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

ENERGY NUCLEAR		Page 3
E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

Revision Statements: Revision 1

JPM Information:

Time Critical: **No**
Evaluation Method: **Admin**
Evaluation Location: **Classroom**
Task Title: **Review Containment Average Temperature Calculation in accordance with OP-903-001**
Task Number:
K/A Number and rating: **2.1.20** SRO: **4.6**
Safety Function: **N/A**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

1. OP-903-001, Technical Specification Surveillance Logs, Rev. 102
2. Technical Specifications, Rev 368

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin.
2. State the following:
 - a) The task conditions are as follows:
 - Reactor power is at 100%
 - I & C has just completed calibration of CFC Air Intake temperature loops
 - Containment Fan Coolers A, C, and D are operating
 - Primary Containment Average Air temperatures are as follows:
 - PID A51115, CFC A Air Inlet Temp reads 97°F
 - PID A51119, CFC B Air Inlet Temp reads 100°F
 - PID A51123, CFC C Air Inlet Temp reads 101°F
 - PID A51127, CFC D Air Inlet Temp reads 98°F
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

[Operator's name], the Balance of Plant Operator has performed OP-903-001, Technical Specification Surveillance Logs, Attachment 11.20 for Containment Average Temperature. Review the calculation, correct errors, if any, and determine if any further actions are required. Document work on the provided Attachment 11.20.

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PERFORMANCE:

START TIME: _____

Evaluator Note	
The candidate will determine Containment Average Temperature using Containment Fan Cooler inlet temperatures from the PMC, Containment Fan Coolers running, and reactor power (all provided on the cue sheet)	

1.	Procedure Step:	Review Containment Average Temperature calculation
	Standard	Discovered error in calculation. Determined Containment Average Temperature to be 98.3°F to 99.7°F
	Cue	None
	Notes	Critical Step. The applicant should use the provided CFC temperatures and average the 3 running CFC temperatures (A, C and D). The average will be 98.7°F.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

2.	Procedure Step:	Determine if Containment Average Temperature meets acceptance criteria.
	Standard	Determined Containment Average Temperature does NOT meet Acceptance Criteria of OP-903-001. Technical Specification 3.6.1.5 entry is required.
	Cue	None
	Notes	Critical Step.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

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STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- Reactor power is at 100%
- I & C has just completed calibration of CFC Air Intake temperature loops
- Containment Fan Coolers A, C, and D are operating
- Primary Containment Average Air temperatures are as follows:
 - PID A51115, CFC A Air Inlet Temp reads 97°F
 - PID A51119, CFC B Air Inlet Temp reads 100°F
 - PID A51123, CFC C Air Inlet Temp reads 101°F
 - PID A51127, CFC D Air Inlet Temp reads 98°F

INITIATING CUES:

The Balance of Plant Operator has performed OP-903-001, Technical Specification Surveillance Logs, Attachment 11.20 for Containment Average Temperature. Review the calculation, correct errors, if any, and determine if any further actions are required. Document work on the provided Attachment 11.20.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Exam A7

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):		Actual Time (min):	
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This JPM requires the applicant to review Keff calculation in accordance with OP-903-090, Shutdown Margin, and identify required actions.

TASK STANDARD: Applicant determined 1.5% to be the correct value from the COLR. Applicant corrected Attachment 10.5, step 7.5.5 from 2.5 to 1.5. Applicant corrected value used for required shutdown margin to 1.5% and calculated Total Excess Reactivity Worth to be 1.734 to 1.744. Applicant converted units to 0.01734 to 0.01744. Applicant calculated K_{EFF} to be 0.982 to 0.983. and determined that K_{EFF} is not less than that required by the COLR. Applicant determined that Emergency Boration is required.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements:

JPM Information:

Time Critical: **No**

Evaluation Method: **Admin**

Evaluation Location: **Classroom**

Task Title: **Review Keff Calculation in accordance with OP-903-090, Shutdown Margin**

Task Number:

K/A Number and rating: **2.1.12** SRO: **4.1**

Safety Function: **N/A**

PSA Applicability: **N/A**

Low Power: **No**

Emergency/Abnormal: **No**

Engineered Safety Function: **None**

REFERENCES:

1. OP-903-090, Shutdown Margin, Rev 306
2. COLR, Core Operating Limits Report, Cycle 25 Rev 0
3. Technical Specifications, Rev 368

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. Handouts 1 and 2
2. eCart

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - Plant is in MODE 3, all CEAs inserted
 - RCS boron concentration is 900 PPM
 - RCS Thot and Tcold are 400°F
 - EFPD is 200 (MOC)
 - Charging pumps A and B are running
 - Charging pump AB circuit breaker is racked out
 - A Shutdown Margin calculation was completed satisfactorily using OP-903-090 Attachment 10.1 and calculated to be 876 PPM.
 - S/U Channel 1 failed, and the NPO performed a Keff calculation
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], review the completed K-Effective calculation in accordance with OP-903-090, Shutdown Margin, Section 7.5, K-Effective Calculation, to verify that current plant conditions are in compliance with Tech Spec 3.1.2.9. Document results and required actions, if any, on this cue sheet or on the handout(s) provided.

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PERFORMANCE:

START TIME: _____

Examiner Note	
The applicant will review a K-Effective calculation that has been performed in accordance with OP-903-090, Shutdown Margin, Section 7.5, K-Effective Calculation. All required data to perform the review is supplied on the cue sheet. Provide Applicant Handouts 1 and 2 to applicant at the start of the JPM.	

1.	Procedure Step:	7.5.5 Obtain Required Shutdown Margin from T.S 3.1.1.1 <u>or</u> 3.1.1.2.
	Standard	Applicant determined 1.5% to be the correct value from the COLR. Applicant corrected Attachment 10.5, step 7.5.5 from 2.5 to 1.5 .
	Cue	None
	Notes	Critical Step
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

2.	Procedure Step:	7.5.6 Calculate K-Effective on Attachment 10.5 as follows: 7.5.6.4 Total Excess Reactivity Worth
	Standard	Applicant corrected value used for required shutdown margin to 1.5% and calculated Total Excess Reactivity Worth to be 1.734 to 1.744 .
	Cue	None
	Notes	Critical Step
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

3.	Procedure Step:	7.5.6.5 Convert %K/K to Δ K/K by dividing value recorded in step 7.5.6.4 by 100.
	Standard	Applicant calculated 0.01734 to 0.01744
	Cue	None
	Notes	Critical Step.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Procedure Step:	7.5.6.6 Calculate K-Effective by dividing 1 by the sum of 1 + step 7.5.6.5.
Standard	Applicant calculated 0.982 to 0.983
Cue	None
Notes	Critical Step.
Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Procedure Step:	7.5.6.7 Verify K-Effective <u>less than or equal to</u> that required by the COLR.
Standard	Applicant determined that K_{EFF} is not less than that required by the COLR and circled NO
Cue	None
Notes	Critical Step. The NO determination can be annotated on handout vice circled.
Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Procedure Step:	7.5.7 If the requirements of Technical Specifications 3.1.2.9 or 3.9.1 are not met, then Commence Emergency Boration and go to OP-901-103, Emergency Boration.
Standard	Applicant determined Emergency Boration is required.
Cue	None
Notes	Critical Step. Other actions from TS 3.1.2.9 are not required to be documented but may be included in answer provided by applicant.
Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

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STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- Plant is in MODE 3, all CEAs inserted
- RCS boron concentration is 900 PPM
- RCS Thot and Tcold are 400°F
- EFPD is 200 (MOC)
- Charging pumps A and B are running
- Charging pump AB circuit breaker is racked out
- A Shutdown Margin calculation was completed satisfactorily using OP-903-090 Attachment 10.1 and calculated to be 876 PPM.
- S/U Channel 1 failed, and the NPO performed a Keff calculation

INITIATING CUES:

Review the completed K-Effective calculation in accordance with OP-903-090, Shutdown Margin, Section 7.5, K-Effective Calculation, to verify that current plant conditions are in compliance with Tech Spec 3.1.2.9.

Document results and required actions, if any, on this cue sheet or on the handout(s) provided.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Exam A8

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):		Actual Time (min):	
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading Instructions at end of JPM SAT UNSAT NEEDS IMPROVEMENT

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This JPM requires the applicant to Authorize Emergency Exposure for accident mitigation.

TASK STANDARD: Applicant determined 10 rem to be the exposure limit. Applicant calculated the expected dose to be 9.33 rem. Applicant authorized the emergency exposure.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements:

JPM Information:

Time Critical: **No**
Evaluation Method: **Admin**
Evaluation Location: **Classroom**
Task Title: **Authorize Emergency Exposure as the Emergency Director**
Task Number:
K/A Number and rating: **2.3.14** SRO: **3.8**
Safety Function: **N/A**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

1. EP-002-030, Emergency Radiation Exposure Guidelines and Controls, Rev 11

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - A manual drain valve must be for accident mitigating purposes
 - Dose rates in the area are 8 REM/Hour.
 - The job will take 70 minutes.
 - The only available person to do this task is an Operations Nuclear Auxiliary Operator.
 - Radiation Protection has reported that they can take no action to reduce the dose rate.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], Evaluate authorizing Emergency Exposure as Emergency Director.

Document all work and results on this sheet.

Emergency Exposure Authorized: Yes or No

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PERFORMANCE:

START TIME: _____

5.2 GUIDELINES FOR EMERGENCY EXPOSURE

1.	Procedure Step:	5.2.1. Emergency Team members chosen to perform Corrective Actions for accident-mitigating activities shall not exceed the following guidelines: A. TEDE: 10 rem B. Extremities: 100 rem C. Thyroid: 100 rem D. Lens of Eye: 30 rem
	Standard	Applicant determines 10 rem to be the exposure limit.
	Cue	None
	Notes	Critical Step
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

2.	Procedure Step:	5.2.1. Emergency Team members chosen to perform Life Saving activities shall not exceed the following exposure guidelines <u>except</u> as noted in 5.2.3 below: A. TEDE: 25 rem B. Extremities: 250 rem C. Thyroid: 250 rem D. Lens of Eye: 75 rem
	Standard	Applicant determined this step to be NA
	Cue	None
	Notes	None
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

3.	Procedure Step:	$8 \text{ rem/hr} \times 70 \text{ min} \times 1 \text{ hour}/60 \text{ min} = 9.33 \text{ rem}$
	Standard	Applicant completed calculation and determined the dose to be 9.33 rem
	Cue	None
	Notes	Critical Step. 9.30 to 9.33 is acceptable
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

4.	Procedure Step:	Emergency Exposure Authorized	
	Standard	Applicant determined emergency exposure is authorized and/or Yes circled.	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- A manual drain valve must be for accident mitigating purposes
- Dose rates in the area are 8 REM/Hour.
- The job will take 70 minutes.
- The only available person to do this task is an Operations Nuclear Auxiliary Operator.
- Radiation Protection has reported that they can take no action to reduce the dose rate.

INITIATING CUES:

Evaluate authorizing Emergency Exposure as Emergency Director.

Document all work and results on this sheet and Circle your response to Emergency Exposure Authorized.

Emergency Exposure Authorized: Yes or No

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Exam A9

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):		Actual Time (min):	
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading Instructions at end of JPM SAT UNSAT NEEDS IMPROVEMENT

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This JPM requires the operator to determine the emergency action level from the stated plant conditions within 15 minutes IAW EP-001-001. The JPM will be performed in the classroom using data obtained from the Initial Conditions.

TASK STANDARD: Applicant determined Tab F of EP-001-001-WC, EAL Wallcharts, is applicable. Applicant determined "Reactor Coolant System Barrier (RCB)" is applicable. Applicant declared FA1.1 based on RCB1 and/or RCB2 within 15 minutes of JPM start.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements: New JPM

JPM Information:

Time Critical: **YES**
Evaluation Method: **Admin**
Evaluation Location: **Classroom**
Task Title: **Classify an E-Plan Event**
Task Number: **W3-SRO-EP-EMERG-1**
K/A Number and rating: **2.4.41** SRO: **4.6**
Safety Function: **N/A**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **Yes**
Engineered Safety Function: **None**

REFERENCES:

1. EP-001-001, Recognition and Classification of Emergency Conditions, Rev. 036
2. EP-001-001-01, Recognition and Classification of Emergency Conditions Wall Chart, Rev. 000

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - Plant was operating at 100% power when a Steam Generator Tube Rupture occurred.
 - The reactor was manually tripped
 - RCS Pressure is 1500 PSIA and lowering
 - The only manual actions taken by the crew was tripping the reactor.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], you are directed to classify and declare this event in accordance with EP-001-001, Recognition and Classification of Emergency Conditions. This is a time critical task.

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PERFORMANCE:

START TIME: _____

1.	Procedure Step:	5.2 Classification	
		5.2.1 Verify the off-normal event to ensure that the event is real.	
	Standard	Determined from initial conditions that event is real.	
	Cue	None	
	Notes	None	
Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>	

2.	Procedure Step:	5.2.2 Match the off-normal event with one of the following six emergency categories:	
		5.2.2.1 Abnormal Radiation Levels/Radiological Effluents	TAB A
		5.2.2.2 Cold Shutdown/Refueling System Malfunction	TAB C
		5.2.2.3 ISFSI Malfunction	TAB E
		5.2.2.4 Fission Product Barrier Degradation	TAB F
	5.2.2.5 Hazards and Other Conditions Affecting Plant Safety	TAB H	
	5.2.2.6 System Malfunction	TAB S	
Standard	Determined Tab F is applicable		
Cue	None		
Notes	Critical Step		
Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>	

3.	Procedure Step:	5.2.3 Refer to EP-001-001-WC, EAL Wallcharts, under the category TAB selected in step 5.2.2 above, match the off-normal condition with the appropriate IC to determine the emergency classification.	
	Standard	Determined "Reactor Coolant System Barrier (RCB)" is applicable	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4.	Procedure Step:	5.2.4 If an event or condition existed which met or exceeded an IC but no emergency was declared and the basis for the emergency classification no longer exists at the time of the discovery (rapidly concluded event, missed classification or misclassified event), <u>then</u> do <u>not</u> classify the emergency or make offsite notifications.	
		5.2.4.1 Notify the NRC within one hour of the discovery of the undeclared or misclassified event in accordance with UNT-006-010.	
	Standard	Determined step is Not Applicable	
	Cue	None	
	Notes	None	
Results	SAT	<input type="checkbox"/>	UNSAT <input type="checkbox"/>

5.	Procedure Step:	5.2.5 Declare the highest emergency classification for which an IC has been met or exceeded	
	Standard	Declared FA1.1 based on RCB1 and/or RCB2 within 15 minutes of JPM start.	
	Cue	None	
	Notes	Critical Step. RCB1 or RCB2 criteria met.	
	Results	SAT	<input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- Plant was operating at 100% power when a Steam Generator Tube Rupture occurred.
- The reactor was manually tripped
- RCS Pressure is 1500 PSIA and lowering
- The only manual actions taken by the crew was tripping the reactor.

INITIATING CUES:

- You are directed to classify and declare this event in accordance with EP-001-001, Recognition and Classification of Emergency Conditions.
- This is a time critical task.
- Write your declaration (EAL), if one exists, on this sheet.

EAL	
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ENERGY NUCLEAR		Page 7
E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

Form 3.2-2 Control Room/In-Plant Systems Outline

Facility: <u>Waterford 3</u>		Date of Examination: <u>8/21/2023</u>
		Operating Test Number: <u>1</u>
Exam Level: <input checked="" type="checkbox"/> RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U		
System/JPM Title	Type Code	Safety Function
Control Room Systems		
<p>S1 APE 001 Continuous Rod Withdrawal</p> <p>Operator will withdraw CEA's to support plant startup per OP-010-003, Plant Startup.</p> <p>Alt. Path: During CEA withdrawal, the selected CEA group will continue to withdraw after the CEA Shim switch is released. The operator is required to manually trip the reactor per OP-901-102, CEA or CEDMCS Malfunction.</p> <p>AA2.05 Uncontrolled rod withdrawal</p> <p style="text-align: right;">RO-4.2 SRO-4.1</p>	N,A,E,S	1
<p>S2 006 ECCS Emergency Core Cooling System</p> <p>Adjust HPSI Flow to Maintain Pressurizer Level after HPSI Throttle Criteria Met per OP-902-004, Excess Steam Demand Recovery</p> <p>A1.18 PZR level and pressure RO/SRO-3.8</p>	N,EN,L,S	2
<p>S3 010 PZR RCS Pressurizer Pressure Control System</p> <p>Operate Pressurizer Vents to lower RCS Pressure to maintain P-T Limits per Appendix 38, Pressurizer Vent Operations</p> <p>A2.04 Loss of charging flow to auxiliary spray valves</p> <p style="text-align: right;">RO-3.4 SRO-3.1</p>	E,L,N,S	3

<p>S4 003 Reactor Coolant Pump System (2017 Exam)</p> <p>Perform a Reactor Coolant Pump Shutdown in accordance with OP-001-002, Reactor Coolant Pump Operation. (2014 NRC Exam)</p> <p>Alt. Path: Reactor Coolant pump reverse rotates requiring stopping of remaining Reactor Coolant Pumps. (W3 OE)</p> <p>A2.02 Conditions which exist for an abnormal shutdown of an RCP in comparison to a normal shutdown of an RCP RO – 3.5 SRO – 3.8</p>	A,D,L,S	4P
<p>S5 059 MFW Main Feedwater System</p> <p>Emergency Feedwater Actuation Signal reset in accordance with OP-902-006, Loss of Feedwater, step 29.b.2) and OP-902-009, Appendix 5C.</p> <p>A2.01 Actuation of AFW system RO-4.0 SRO-4.1</p>	N,EN,S	4S
<p>S6 022 CCS Containment Cooling System</p> <p>Change running Containment Cooling Fan configuration per OP-008-003, Containment Cooling System, sections 6.1 and 7.1.</p> <p>A4.01 Ability to manually operate and/or monitor in the control room: CCS fans RO/SRO-3.7</p>	N,S	5
<p>S7 062 ED AC AC Electrical Distribution System</p> <p>Transfer 3A from EDG A to 2A in accordance with OP-902-009, Standard Appendices, Attachment 12C</p> <p>A4.07 Synchronizing and paralleling of different AC supplies RO/SRO-3.7</p>	N,E,L,S	6
<p>S8 068 Liquid Radwaste System</p> <p>Discharging a Boric Acid Condensate Tank to Circulating Water in accordance with OP-007-001, Boron Management</p> <p>Alt. Path: After flow is established, the flow controller will fail and flow will exceed the release permit allowed value.</p> <p>A4.03 Stoppage of release if limits exceeded RO/SRO-3.5</p>	M,A,S	9

In-Plant Systems		
<p>P1 013 Engineered Safety Features Actuation System (ESFAS) (2020 Exam)</p> <p>Actuate a Recirculation Actuation Signal (RAS) manually in accordance with OP-902-009 Appendix 34, RAS Manual Actuation.</p> <p>Fault: The RAS will not actuate using the manual pushbuttons and will actuate by opening the breakers.</p> <p>A4.03 ESFAS Initiation RO/SRO-4.4</p>	A,D,EN,P	2
<p>P2 045 MT/G Main Turbine Generator System</p> <p>Transfer Operating Stator Cooling Water Pump in accordance with OP-003-022, Stator Cooling Water, section 6.2.</p> <p>Fault: The stopped stator cooling water pump will experience reverse rotation requiring the pump to be restarted to prevent loss of stator cooling water flow to the main generator.</p> <p>A2.02 Loss of Stator Cooling Water</p> <p style="text-align: right;">RO – 3.4 SRO – 3.6</p>	A,N	4S
<p>P3 064 Electrical Diesel Generators (2017 Exam)</p> <p>Reset EDG A following an overspeed trip with a LOOP in accordance with OP-009-002, Emergency Diesel Generator, section 8.8.</p> <p>EPE 055 EA1.06 Restoration of power with one EDG</p> <p style="text-align: center;">RO/SRO-4.3</p>	D,E,L,R	6

1. Determine the number of control room system and in-plant system job performance measures (JPMs) to develop using the following table:

License Level	Control Room	In-Plant	Total
Reactor Operator (RO)	8	3	11
Senior Reactor Operator-Instant (SRO-I)	7	3	10
Senior Reactor Operator-Upgrade (SRO-U)	2 or 3	3 or 2	5

2. Select safety functions and systems for each JPM as follows:

Refer to Section 1.9 of the applicable knowledge and abilities (K/A) catalog for the plant systems organized by safety function. For pressurized-water reactor operating tests, the primary and secondary systems listed under Safety Function 4, "Heat Removal from Reactor Core," in Section 1.9 of the applicable K/A catalog, may be treated as separate safety functions (i.e., two systems, one primary and one secondary, may be selected from Safety Function 4). From the safety function groupings identified in the K/A catalog, select the appropriate number of plant systems by safety functions to be evaluated based on the applicant's license level (see the table in step 1).

For RO/SRO-I applicants: Each of the control room system JPMs and, separately, each of the in-plant system JPMs must evaluate a different safety function, and the same system or evolution cannot be used to evaluate more than one safety function in each location. One of the control room system JPMs must be an engineered safety feature.

For SRO-U applicants: Evaluate SRO-U applicants on five different safety functions. One of the control room system JPMs must be an engineered safety feature, and the same system or evolution cannot be used to evaluate more than one safety function.

3. Select a task for each JPM that supports, either directly or indirectly and in a meaningful way, the successful fulfillment of the associated safety function. Select the task from the applicable K/A catalog (K/As for plant systems or emergency and abnormal plant evolutions) or the facility licensee's site-specific task list. If this task has an associated K/A, the K/A should have an importance rating of at least 2.5 in the RO column. K/As that have importance ratings of less than 2.5 may be used if justified based on plant priorities; inform the NRC chief examiner if selecting K/As with an importance rating less than 2.5. The selected tasks must be different from the events and evolutions conducted during the simulator operating test and tasks tested on the written examination. A task that is similar to a simulator scenario event may be acceptable if the actions required to complete the task are significantly different from those required in response to the scenario event.

Apply the following specific task selection criteria:

- At least one of the tasks shall be related to a shutdown or low-power condition.
- Four to six of the tasks for RO and SRO-I applicants shall require execution of alternative paths within the facility licensee's operating procedures. Two to three of the tasks for SRO-U applicants shall require execution of alternative paths within the facility licensee's operating procedures.
- At least one alternate path JPM must be new or modified from the bank.
- At least one of the tasks conducted in the plant shall evaluate the applicant's ability to implement actions required during an emergency or abnormal condition.
- At least one of the tasks conducted in the plant shall require the applicant to enter the radiologically controlled area. This provides an excellent opportunity for the applicant to discuss or demonstrate radiation control administrative subjects.

If it is not possible to develop or locate a suitable task for a selected system, return to step 2 and select a different system.

4. For each JPM, specify the codes for type, source, and location:

Code	License Level Criteria		
	RO	SRO-I	SRO-U
(A)lternate path	4-6	4-6	2-3
(C)ontrol room			
(D)irect from bank	≤ 9	≤ 8	≤ 4
(E)mergency or abnormal in-plant	≥ 1	≥ 1	≥ 1
(EN)gineered safety feature (for control room system)	≥ 1	≥ 1	≥ 1
(L)ow power/shutdown	≥ 1	≥ 1	≥ 1
(N)ew or (M)odified from bank (must apply to at least one alternate path JPM)	≥ 2	≥ 2	≥ 1
(P)revious two exams (randomly selected)	≤ 3	≤ 3	≤ 2
(R)adiologically controlled area	≥ 1	≥ 1	≥ 1
(S)imulator			

Form 3.2-2 Control Room/In-Plant Systems Outline

Facility: <u>Waterford 3</u>		Date of Examination: <u>8/21/2023</u>
		Operating Test Number: <u>1</u>
Exam Level: <input type="checkbox"/> RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U		
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<p>S8 068 Liquid Radwaste System</p> <p>Discharging a Boric Acid Condensate Tank to Circulating Water in accordance with OP-007-001, Boron Management</p> <p>Alt. Path: After flow is established, the flow controller will fail and flow will exceed the release permit allowed value.</p> <p>A4.03 Stoppage of release if limits exceeded RO/SRO-3.5</p>	M,A,S	9

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<p>P2 045 MT/G Main Turbine Generator System</p> <p>Transfer Operating Stator Cooling Water Pump in accordance with OP-003-022, Stator Cooling Water, section 6.2.</p> <p>Fault: The stopped stator cooling water pump will experience reverse rotation requiring the pump to be restarted to prevent loss of stator cooling water flow to the main generator.</p> <p>A2.02 Loss of Stator Cooling Water</p> <p style="text-align: right;">RO – 3.4 SRO – 3.6</p>	A,N	4S
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- At least one alternate path JPM must be new or modified from the bank.
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4. For each JPM, specify the codes for type, source, and location:

Code	License Level Criteria		
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(C)ontrol room			
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(P)revious two exams (randomly selected)	≤ 3	≤ 3	≤ 2
(R)adiologically controlled area	≥ 1	≥ 1	≥ 1
(S)imulator			

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Initial Exam S1

OPERATOR: _____

DATE: _____

EVALUATOR: _____

EVALUATOR SIGNATURE: _____

CRITICAL TIME FRAME:	Required Time (min):	N/A	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The applicant will perform the required actions to withdraw CEAs to raise power per OP-004-004, Plant Startup. During CEA withdrawal, the selected group will experience continuous rod motion after the CEA shim switch is released. The applicant is required to recognize the continuous motion, verify the CEDMCS Mode Select switch is in the OFF position and manually trip the reactor per OP-901-102, CEA or CEDMCS Malfunction.

TASK STANDARD:

CEA mode switch placed in the Manual Sequential (MS) position. The Shim Switch is pushed up to the WIHDRAW position. After continuous CEA motion is observed, the reactor is manually tripped.

Prepared: Ramon Peter WTWF3-2022-00281-00022 _____

Date: 2/15/23 _____

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 _____

Date: 6/1/23 _____

Approved: Hunter Wells WTWF3-2022-00281-00038 _____

Date: 6/1/23 _____

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

Revision Statements: TQF-100-JPM requirement

JPM Information:

Time Critical: **No**
Evaluation Method: **Perform**
Evaluation Location: **Simulator**
Task Title: **Perform Operator Actions for a Continuous Rod Withdrawal**
Task Number: **W3-RO-PPO-OFFNORM-2**
K/A Number and rating: **001 A3.11 RO/SRO: 3.7**
Safety Function: **1**
PSA Applicability: **NA**
Low Power: **No**
Emergency/Abnormal: **Yes**
Engineered Safety Function: **None**

REFERENCES:

1. OP-004-004, Control Element Drive, Rev 029
2. OP-901-102, CEA or CEDMCS Malfunction, Rev 308

SIMULATOR CONDITIONS:

1. IC-180

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - i) The plant is at 1% power.
 - ii) OP-010-003, Plant Startup, is in progress.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following: "[Operator's name], You have been directed to continue the plant start by withdrawing CEA Group 6, in Manual Sequential (MS). Starting at step 6.9.3 of OP-004-004, Control Element Drive, withdraw Group 6, 10 inches per minute, to raise power to 5%. All prerequisites are met.

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PERFORMANCE:

START TIME: _____

6.9 Operation of CEA in Manual Sequential (MS) Mode

NOTE

The Operator should remain in the area in front of the CEA Drive Mechanism Control Panel when the Mode Select switch is not in OFF.

1.	Procedure Step:	6.9.3 Place the Mode Select switch to MS <u>and</u> verify the MS light illuminates.	
	Standard	Mode select switch turned to the MS position.	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input style="width: 40px; height: 20px;" type="checkbox"/>	UNSAT <input style="width: 40px; height: 20px;" type="checkbox"/>

ALTERNATE PATH STARTS HERE

Alternate Path begins when Shim Switch is taken to the Withdraw position. Group 6 CEAs will continue outward motion until the reactor is manually tripped.

2.	Procedure Step:	6.9.4 Operate CEA Manual Shim switch to Withdraw <u>or</u> Insert CEA groups to desired height while monitoring the following: <ul style="list-style-type: none"> • CEA Regulating groups are moving with proper overlap of 100 inches • <u>If</u> Reactor is critical, <u>then</u> monitor the following: <ul style="list-style-type: none"> • Reactor Power • Reactor Coolant System (RCS) temperature • Axial Shape Index (ASI) 	
	Standard	Shim switch pushed upward to withdraw Group 6 CEAs.	
	Cue	None	
	Notes	Critical Step. Alternate path begins when Shim Switch is pushed up to the WITHDRAW position.	
	Results	SAT <input style="width: 40px; height: 20px;" type="checkbox"/>	UNSAT <input style="width: 40px; height: 20px;" type="checkbox"/>

OP-901-102, CEA or CEDMCS Malfunction

3.	Procedure Step:	E ₀ General 1. Place CEDMCS Mode Select switch to OFF	
	Standard	Mode select switch turned to the OFF position.	
	Cue	None	
	Notes	CEA motion continues with switch in OFF position.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4.	Procedure Step:	E ₃ CONTINUOUS MOVEMENT OF CEA GROUP 1. Verfiy CEDMCS Mode Select switch to OFF. 2. <u>If</u> CEA movement continues, <u>then</u> trip Reactor <u>and</u> <u>go to</u> OP,902-000, Standard Post Trip Actions.	
	Standard	Mode select switch verified in the OFF position. Reactor tripped.	
	Cue	None	
	Notes	Critical Step. Tripping the reactor is the critical component.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- The plant is at 1% power.
- OP-010-003, Plant Startup, is in progress.

INITIATING CUES:

You have been directed to continue the plant start by withdrawing CEA Group 6, in Manual Sequential (MS). Starting at step 6.9.3 of OP-004-004, Control Element Drive, withdraw Group 6, 10 inches per minute, to raise power to 5%. All prerequisites are met.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Initial Exam S2

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	NA	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):	12	Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading Instructions at end of JPM SAT UNSAT NEEDS IMPROVEMENT

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator will perform HPSI Throttle per step 20 of OP-902-004, Excess Steam Demand Recovery. Alternate Path begins when Pressurizer level begins to lower due to a Steam Generator tube rupture, requiring raising HPSI flow. The task is complete after the examinee establishes HPSI flow.

TASK STANDARD: Operator completed the following without any unrecovered errors: Operator verified HPSI Throttle Criteria is met per OP-902-004, step 20, and performs step to throttle HPSI flow (Throttle Injection Valves and/or stop one HPSI pump at a time). When conditions changed, the operator performed step 21, HPSI Pump Restart Criteria, and raised HPSI flow (Opened Injection Valves and/or started HPSI pumps as necessary).

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

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JPM GRADING INSTRUCTIONS

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4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

Revision Statements: New JPM

JPM Information:

Time Critical: **No**
Evaluation Method: **Perform**
Evaluation Location: **Simulator**
Task Title: **Adjust HPSI FLOW TO MAINTAIN PRESSURIZER LEVEL AFTER HPSI THROTTLE**
CRITERIA MET
Task Number: **W3-RO-SI-EMERG-36**
K/A Number and rating: **E05 EA2.11 RO/SRO: 4.0/3.9**
Safety Function: **2**
PSA Applicability: **NA**
Low Power: **No**
Emergency/Abnormal: **Yes**
Engineered Safety Function: **SIAS**

REFERENCES:

1. OP-902-004, Excess Steam Demand Recovery, Rev. 17

SIMULATOR CONDITIONS:

1. IC-181

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed/simulated. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - i) An Excess Steam Demand Event is in progress.
 - ii) The crew has entered OP-902-004, Excess Steam Demand Recovery"
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], The CRS has directed you to verify HPSI Throttle Criteria per step 20 of OP-902-004 and perform step(s) to throttle flow if conditions allow."

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PERFORMANCE:

START TIME: _____

HPSI THROTTLE CRITERIA

1.	Procedure Step:	20. IF HPSI pumps are operating, AND ALL of the following conditions are satisfied: <ul style="list-style-type: none">• RCS subcooling is greater than or equal to 28°F• PZR level is greater than 7% [23%] and controlled• Verify at least ONE SG is available for RCS heat removal and level is being maintained or restored to within 55 to 70% NR [60 to 80% NR] using EFW in auto or manual.• RVLMS indicates level higher than Hot Leg by at least ONE of the following:<ul style="list-style-type: none">• QSPDS REACTOR VESSEL LEVEL 5 NOT voided• VESSEL LEVEL PLENUM greater than or equal to 80% <p>THEN perform ANY of the following:</p> <ul style="list-style-type: none">• Throttle HPSI flow.• Stop ONE HPSI pump at a time.
	Standard	Both HPSI pumps stopped and/or HPSI Loop Injection Valves throttled closed to stabilize RCS level.
	Cue	None
	Notes	Critical Step. All flow from HPSI must be stopped. Alternate path begins after flow is secure. Pressurizer level will begin to lower.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

ALTERNATE PATH

HPSI Pump Restart Criteria

2.	Procedure Step:	21. IF ANY of the HPSI throttle criteria can NOT be maintained, THEN <u>perform</u> the following: <ul style="list-style-type: none">a. <u>Raise</u> HPSI flow.b. <u>Start</u> HPSI pumps as necessary.
	Standard	HPSI pump(s) restarted and/or Injection Valves opened.
	Cue	None
	Notes	Critical Step. Pressurizer level rising and HPSI flow can used to verify critical step is met.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

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STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

1. An Excess Steam Demand Event is in progress.
2. The crew has entered OP-902-004, Excess Steam Demand Recovery.

INITIATING CUES:

The CRS has directed you to verify HPSI Throttle Criteria per step 20 of OP-902-004 and perform step(s) to throttle flow if conditions allow.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Initial Exam S3

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	NA	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):	12	Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The applicant is directed to perform OP-902-009, Standard Appendices, Appendix 38, Pressurizer Vent Operations, following a small break LOCA with concurrent LOOP and loss of Charging flow to the Auxiliary Spray valves.

TASK STANDARD: Applicant placed the Train A RCS Vent Valves Power To Solenoids keyswitch to ON. Applicant Opened RC 3186 and RC 3184. After RCS pressure lowered the applicant Closed RC 3184 and RC 3186. The Applicant placed the Train A RCS Vent Valves Power To Solenoids keyswitch to OFF.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

 Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001	

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements: New JPM

JPM Information:

Time Critical: **No**
Evaluation Method: **Perform**
Evaluation Location: **Simulator**
Task Title: **Operate Pressurizer Vents to Lower RCS Pressure**
Task Number:
K/A Number and rating: **010 A2.04** RO/SRO: **3.4/3.1**
Safety Function: **3**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **Yes**
Engineered Safety Function: **SIAS**

REFERENCES:

1. OP-902-002, Loss of Coolant Accident Recovery, Rev 021
2. OP-902-009, Standard Appendices, Rev 323

SIMULATOR CONDITIONS:

1. IC-184

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed/simulated. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - A Small Break LOCA is in progress with a LOOP
 - Both Auxiliary Spray Valves could not be opened to lower RCS Pressure
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], The CRS has directed you to perform OP-902-009, Appendix 38, Pressurizer Vent Operations, and use Train A Pressurizer Vent valves to lower RCS pressure to less than 1300 PSIA"

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PERFORMANCE:

START TIME: _____

NOTE

Quench Tank pressure will rise while venting RCS. The rupture disc has a nominal setpoint of 124 psig.

1.	Procedure Step:	1. <u>Monitor</u> Pressurizer pressure and level trends.	
	Standard	Applicant monitored Pressurizer pressure using Control Board indications, PMC indication, and/or QSPDS indications	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

2.	Procedure Step:	2. <u>Monitor</u> Quench Tank pressure and level trends.	
	Standard	Applicant monitored Quench Tank pressure and level using Control Board indications and/or PMC indications	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

3.	Procedure Step:	3. IF desired to operate Train A Pressurizer Vent valves, THEN <u>perform</u> the following: a. Place the Train A RCS Vent Valves Power To Solenoids keyswitch to "ON."	
	Standard	Keyswitch turned clockwise to ON position	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4.	Procedure Step:	b. <u>Open</u> RC 3186, RCS Vent Valves To Quench Tank valve.	
	Standard	RC 3186 opened by turning control switch clockwise	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

5.	Procedure Step:	c. <u>Open</u> RC 3184, Pressurizer Vent To Quench Tank.	
	Standard	RC 3184 opened by turning control switch clockwise	
	Cue	None	
	Notes	Critical Step. Pressurizer pressure will begin to slowly lower and Quench Tank pressure and level will begin to rise.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

6.	Procedure Step:	d. WHEN desired to secure venting pressurizer, THEN <u>perform</u> the following: 1) Close RC 3184, Pressurizer Vent To Quench Tank valve.	
	Standard	RC 3184 closed by turning control switch counter-clockwise	
	Cue	None	
	Notes	Critical Step. Quench pressure and level will begin to stabilize	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

7.	Procedure Step:	2) Close RC 3186, RCS Vent Valves To Quench Tank valve.	
	Standard	RC 3186 closed by turning control switch counter-clockwise	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

8.	Procedure Step:	3) Place the Train A RCS Vent Valves Power To Solenoids keyswitch to "OFF."	
	Standard	Keyswitch turned counter-clockwise to OFF position	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- A Small Break LOCA is in progress with a LOOP
- Both Auxiliary Spray Valves could not be opened to lower RCS Pressure

INITIATING CUES:

The CRS has directed you to perform OP-902-009, Appendix 38, Pressurizer Vent Operations, and use Train A Pressurizer Vent valves to lower RCS pressure to less than 1300 PSIA”

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Initial Exam S4

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	NA	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):	12	Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The applicant is directed to secure Reactor Coolant Pump 2A in accordance with OP-001-002, Reactor Coolant Pump Operation. Alternate Path begins after RCP 2A is secured. RCP 2A begins to rotate in the reverse direction requiring all Reactor Coolant Pumps to be secured per OP-901-130, Reactor Coolant Pump Malfunction.

TASK STANDARD: Applicant stopped Reactor Coolant Pump 2A by taking its control switch to STOP. Applicant recognized RCP 2A rotor does not come to a rest. Applicant stopped all running Reactor Coolant Pumps.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements: New JPM

JPM Information:

Time Critical: **No**
Evaluation Method: **Perform**
Evaluation Location: **Simulator**
Task Title: **Perform RCP Shutdown**
Task Number:
K/A Number and rating: **003 A2.02** RO/SRO: **3.5/3.8**
Safety Function: **4P**
PSA Applicability: **N/A**
Low Power: **Yes**
Emergency/Abnormal: **Yes**
Engineered Safety Function: **N/A**

REFERENCES:

1. OP-001-002, Reactor Coolant Pump Operation, Rev 028
2. OP-901-130, Reactor Coolant Pump Malfunction, Rev 012

SIMULATOR CONDITIONS:

1. IC-183

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed/simulated. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - A plant shutdown is in progress
 - OP-001-002, Reactor Coolant Pump Operation, prerequisites have been met
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], The CRS has directed you to secure Reactor Coolant Pump 2A in accordance with OP-001-002, section 6.2, Stopping A Reactor Coolant Pump.

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PERFORMANCE:

START TIME: _____

6.2 STOPPING A REACTOR COOLANT PUMP

CAUTION

THE FOLLOWING SECTION HAS THE POTENTIAL TO AFFECT CORE REACTIVITY.

[INPO 06-006]

CAUTION

ALL CLOSED REACTOR TRIP BREAKERS WILL OPEN ON FIRST RCP TRIP UNLESS REACTOR COOLANT LOW FLOW BYPASSES ARE ENABLED.

1.	Procedure Step:	6.2.1 For RCP to be secured (1A, 1B, 2A, or 2B), Place associated RCP (1A, 1B, 2A, 2B) Oil Lift Pump A or B control switch to ON and verify lift pump Starts. [P-15101]	
	Standard	Applicant started either one of RCP 2A Oil Lift Pumps A or B by taking the control switch to start.	
	Cue	None	
	Notes	Either Oil Lift Pump may be started.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

2.	Procedure Step:	6.2.1.1 Verify remaining RCP 1A (1B, 2A, 2B) Oil Lift Pump B or A control switch in AUTO.	
	Standard	Applicant verified the remaining Oil Lift Pump control switch is in the AUTO position.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

CAUTION

CBO AND CCW FLOW TO SEAL COOLERS SHOULD BE MAINTAINED AFTER RCP HAS BEEN SECURED UNTIL RCS TEMPERATURE HAS BEEN REDUCED TO $\leq 140^{\circ}\text{F}$.

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3.	Procedure Step:	6.2.2 Stop desired RCP 1A (1B, 2A, 2B) by placing its associated control switch at CP-2 to Stop.	
	Standard	RCP 2A control switch turned counter-clockwise to the STOP position.	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

ALTERNATE PATH BEGINS

RCP 2A will coast down but begin to reverse rotate upon shutdown requiring entry into OP-901-130.

4.	Procedure Step:	6.2.3 When RCP 1A (1B, 2A, 2B) speed indicates rotor is at rest, as indicated by PMC PID (PIDs are listed on Attachment 11.2), or with SM/CRS authorization, then secure operating RCP 1A (1B, 2A, 2B) Oil Lift Pumps by placing their control switches to OFF. [P-15101]	
	Standard	Applicant recognizes RCP 2A does not come to rest	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

5.	Procedure Step:	6.2.3.1 After RCP 1A (1B, 2A, 2B) has been secured for approximately 5 minutes, then verify all secured RCPs are not rotating in the reverse direction by observing zero speed indicated on the computer points listed in Attachment 11.2.	
	Standard	Applicant recognized RCP 2A has not stopped	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

6.	Procedure Step:	6.2.3.2 If PMC points indicate any RCP is rotating in the reverse direction, then refer to OP-901-130, Reactor Coolant Pump Malfunction and notify SM/CRS.	
	Standard	Applicant notified the SM/CRS of reverse rotation and recommended/entered OP-901-130.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

OP-901-130, RCP Malfunction E₀

NOTE

Waterford 3 has operating Experience of ARRD failures, resulting in reverse rotation of a tripped Reactor Coolant Pump. In this case, indicated speed will not go negative when a RCP rotates in the reverse direction, it will be an absolute number. Speed will indicate approximately 600 RPM for the affected RCP with the other three RCPs running.

7.	Procedure Step:	1. If Reactor Coolant Pump trips, then verify Reactor tripped and go to OP-902-000, Standard Post Trip Actions.	
	Standard	Step would be read by CRS	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

8.	Procedure Step:	2. If loss of Component Cooling Water to Reactor Coolant Pumps occurs, then go to OP-901-510, COMPONENT COOLING WATER SYSTEM MALFUNCTION. 3. If Reactor Coolant Pump Seal has failed, then go to section E1, Seal Failure. 4. If Reactor Coolant Pump low oil pressure alarm occurs, then go to section E2, Lube Oil Emergency. 5. If a Reactor Coolant Pump Bearing temperature alarm occurs, then go to section E3, Bearing Temperature High. 6. If Reactor Coolant Pump high vibration alarm occurs, then go to section E4, High Vibration.	
	Standard	Steps above would be read by CRS and marked N/A	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

9.	Procedure Step:	7. If reverse rotation is indicated on an idle Reactor Coolant Pump, then go to section E5, Reverse Rotation.	
	Standard	Step would be read by CRS	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

E5 REVERSE ROTATION

NOTE

Waterford 3 has operating Experience of ARRD failures, resulting in reverse rotation of a tripped Reactor Coolant Pump. In this case, indicated speed will not go negative when a RCP rotates in the reverse direction, it will be an absolute number. Speed will indicate approximately 600 RPM for the affected RCP with the other three RCPs running.

10.	Procedure Step:	1. Monitor Reactor Coolant Pump after shutdown for reverse rotation with the following methods: <ul style="list-style-type: none"> • If conditions permit, then verify reverse rotation by local observation. • PMC PID's D13214 (RCP 1A), D13614 (RCP 1B), D13414 (RCP 2A) and D13814 (RCP 2B). • Associated RCP PMC mimic 	
	Standard	Applicant confirmed reversed rotation is occurring on RCP 2A	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

11.	Procedure Step:	2. Start an oil lift pump on affected RCP.	
	Standard	Applicant verified an Oil Lift is running for RCP 2A	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

12.	Procedure Step:	3. Remove ALL Reactor Coolant Pumps from service.	
	Standard	Applicant stopped all running RCPs by placing their control switches in the STOP position	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- A plant shutdown is in progress
- OP-001-002, Reactor Coolant Pump Operation, prerequisites have been met

INITIATING CUES:

The CRS has directed you to secure Reactor Coolant Pump 2A in accordance with OP-001-002, section 6.2, Stopping A Reactor Coolant Pump.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Initial Exam S5

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	NA	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):	12	Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The applicant is directed to reset an Emergency Feedwater Actuation Signal in accordance with OP-901-504, Inadvertent ESFAS Actuation.

TASK STANDARD: Applicant reset EFAS-2 and secured all running EFW Pumps. Both EFAS-2, ESFAS Reset Pushbuttons depressed. EFW Pumps A and B stopped by turning their control switches counterclockwise to the STOP position and both control switches returned to the Mid Position. MS-401A and MS-401B closed by turning their control switch counter-clockwise to the CLOSE position.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements: New JPM

JPM Information:

Time Critical: **No**
Evaluation Method: **Perform**
Evaluation Location: **Simulator**
Task Title: **Reset Inadvertent EFAS signal**
Task Number:
K/A Number and rating: **061 A2.01** RO/SRO: **3.9/3.3**
Safety Function: **4S**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **Yes**
Engineered Safety Function: **EFAS**

REFERENCES:

1. OP-901-504, Inadvertent ESFAS Actuation, Rev 308

SIMULATOR CONDITIONS:

1. IC-185

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed/simulated. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - The plant is in Mode 1, 99.8% Power
 - An inadvertent EFAS 2 signal was generated during I&C calibrations
 - The CRS has entered OP-901-504, Inadvertent ESFAS Actuation
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], The CRS has directed you to reset Emergency Feedwater Actuation 2 per OP-901-504, E₅ Inadvertent EFAS, starting at step 4.

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PERFORMANCE:

START TIME: _____

NOTE

EFAS 2 signal resets at ~68.4% rising Narrow Range level in Steam Generator 2.

4. Reset Emergency Feedwater Actuation 2 as follows:

1.	Procedure Step:	4.1 Restore <u>and</u> maintain Steam Generator 2 level between 65% and 70% Narrow Range.	
	Standard	Applicant verified SG 2 level is being maintained 65% to 70%.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

2.	Procedure Step:	4.2 Verify SG 2 EMERG FW (EFAS-2) Manual Actuation Switches in NORM position.	
	Standard	Applicant verified EFAS-2 Manual Actuation Switches in NORM position.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

3.	Procedure Step:	4.3 Reset EFAS-2 actuation logic by depressing <u>both</u> EFAS-2 ESFAS RESET pushbuttons on CP-33.	
	Standard	Both EFAS-2 ESFAS Reset Pushbuttons depressed.	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4.	Procedure Step:	4.4 Verify both Emergency Feedwater Flow Control Valves Closed and associated controllers in AUTO:	
		<ul style="list-style-type: none"> • EFW-223B SG 2 Backup • EFW-224B SG 2 Primary 	
	Standard	Applicant verified EFW-223B and EFW-224B are closed with the controller in AUTO	
	Cue	None	
	Notes	None	
Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>	

5.	Procedure Step:	4.5 Close the following valves:	
		<ul style="list-style-type: none"> • EFW-229B EFW Isolation SG 2 Backup • EFW-228B EFW Isolation SG 2 Primary 	
	Standard	Applicant closed EFW-229B and EFW-228B by turning their control switch counter-clockwise to the CLOSE position.	
	Cue	None	
	Notes	None	
Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>	

6.	Procedure Step:	5. Stop EFW Pump A <u>and</u> B and place EFW Pump A <u>and</u> B control switches to Mid Position.	
	Standard	Both EFW Pumps A and B stopped by turning their control switches counter-clockwise to the STOP position and both control swiches returned to the Mid Position.	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

7.	Procedure Step:	6. Secure EFW Pump AB by Closing the following valves: <ul style="list-style-type: none"> MS-401A Emergency Feedwater Pump AB Turb Stm Supply SG 1 MS-401B Emergency Feedwater Pump AB Turb Stm Supply SG 2 	
	Standard	MS-401A and MS-401B closed by turning their respective control switch counter-clockwise to the CLOSE position.	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- The plant is in Mode 1, 99.8% Power
- An inadvertent EFAS 2 signal was generated during I&C calibrations
- The CRS has entered OP-901-504, Inadvertent ESFAS Actuation

INITIATING CUES:

The CRS has directed you to reset Emergency Feedwater Actuation 2 per OP-901-504, E₅ Inadvertent EFAS, starting at step 4.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Initial Exam S6

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	NA	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):	12	Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The applicant is directed to change the running Containment Cooling Fan configuration per OP-008-003, Containment Cooling System.

TASK STANDARD: Applicant stopped Containment Cooling Fan B by turning its control switch counterclockwise to the STOP position. This was done prior to starting Containment Cooling Fan D by turning its control switch clockwise to the Start/FAST position.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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Revision Statements: New JPM

JPM Information:

Time Critical: **No**
Evaluation Method: **Perform**
Evaluation Location: **Simulator**
Task Title: **Swap Running Containment Cooling Fans**
Task Number:
K/A Number and rating: **022 A4.01** RO/SRO: **3.7**
Safety Function: **5**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

1. OP-008-003, Containment Cooling System, Rev 303

SIMULATOR CONDITIONS:

1. IC-187

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed/simulated. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - The plant is at 100%
 - Engineering has requested Containment Cooling Fan B be removed from service
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], The CRS has directed you align Containment Fan Coolers so that CFC A, C and D are running. All Prerequisites are met. All Precautions and Limitations are met.

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PERFORMANCE:

START TIME: _____

EVALUATOR NOTE

Applicant should recognize that CFC B needs to be stopped prior to starting CFC ?. If applicant starts in section 6.1, the NOTE and CAUTION prior to step 6.1.1 should direct them to section 7.0 to perform the shutdown of CFC B first.

7.1 SECURING CONTAINMENT FAN COOLERS

1.	Procedure Step:	7.1.1. Stop desired Containment Fan Coolers (CFC), from CP-18, by placing Fan Cooler A(B)(C)(D) control switch CCS-0003 A(B)(C)(D) to Stop.	
	Standard	CFC B control switch turned counterclockwise to the STOP position	
	Cue	None	
	Notes	Critical Step. Stopping CFC B prior to starting CDC ? is critical	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

2.	Procedure Step:	7.1.2. Verify at CP-18, that Component Cooling Water Inlet and Outlet Valves for all secured Containment Fan Coolers are Closed.	
	Standard	Applicant verified CFC B and CFC ? Inlet and Outlet valves indicate closed	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

6.1 STARTING CONTAINMENT FAN COOLERS

NOTE

Normal Containment Cooling System Configuration in modes 1-4 is three (3) Containment Fan Coolers operating and one (1) in standby.

CAUTION

TO PREVENT VIBRATION ALARMS AND DAMAGE TO CONTAINMENT COOLING UNIT DUCT WORK, LIMIT CONFIGURATION TO ONLY THREE (3) OF FOUR (4) CONTAINMENT FAN COOLERS OPERATING AT ONE TIME WHEN IN FAST SPEED.

3.	Procedure Step:	6.1.1. Start desired Containment Fan Coolers (CFC), from CP-18, by placing Fan Cooler A(B)(C)(D) control switch CCS-0003 A(B)(C)(D) to Start/ Fast.	
	Standard	CFC B control switch turned clockwise to the Start/Fast position.	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4.	Procedure Step:	6.1.2. Verify at CP-18 that the Component Cooling Water Inlet and Outlet Valves Open for the in-service coolers:	
	Standard	Applicant verified the Inlet and Outlet CCW valves for running Containment Cooling Fans indicated open.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- The plant is at 100%
- Engineering has requested Containment Cooling Fan B be removed from service

INITIATING CUES:

"[Operator's name], The CRS has directed you align Containment Fan Coolers so that CFC A, C and D are running. All Prerequisites are met. All Precautions and Limitations are met.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Initial Exam S7

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	NA	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):	12	Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The applicant is directed to transfer 3A Bus from EDG A to the 2A Bus in accordance with OP-902-009, Attachment 12C, TRANSFER 3A(B) FROM EDG A(B) TO 2A(B).

TASK STANDARD: Bus 3A transferred to the 2A Bus by performing the following: A2 to A3S TIE BKR closed by turning its control switch clockwise to the CLOSE position, key inserted into the SYNCHRONIZER keyswitch for EDG A and turned to the BUS TIE position, EDG A Governor adjusted until the synchroscope was rotating slowly clockwise, BUS A3S TO A2 TIE BKR control switch turned clockwise to the CLOSE position while the synchroscope was within the required band, allowing the breaker to close.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

Revision Statements: New JPM

JPM Information:

Time Critical: **No**
Evaluation Method: **Perform**
Evaluation Location: **Simulator**
Task Title: **Transfer 3A Bus from EDG A to the 2A Bus**
Task Number:
K/A Number and rating: **0062 A4.07** RO/SRO: **3.7**
Safety Function: **5**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **Yes**
Engineered Safety Function: **None**

REFERENCES:

1. OP-902-009, Standard Appendices, Rev 323

SIMULATOR CONDITIONS:

1. IC-186

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed/simulated. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - The plant tripped due to a grid disturbance 2 hours ago
 - EDG A is currently running loaded onto the 3A Bus.
 - Offsite power has been restored to the 1A Bus and 2A Bus per Attachment 12A
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], The CRS has directed you transfer the 3A Bus from EDG A to the 2A Bus per OP-902-009, Attachment 12C, Transfer 3A(B) from EDG A(B) to 2A(B).

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PERFORMANCE:

START TIME: _____

NOTE

Perform this attachment when the 3A(B) bus is energized from EDG A(B). Perform when the 2A(B) Bus is energized and the associated 86A(B)2/HR Lockout Relay reset.
(REFER TO Attachment 12-A.)

1.	Procedure Step:	1. Verify EDG Annunciators acknowledged and reviewed.	
	Standard	NAO dispatched to address local EDG A alarms	
	Cue	Notify applicant that all alarms are acknowledged and reset with no abnormal alarms present.	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

2.	Procedure Step:	2. IF 4.16 KV Non-Safety Bus A2 is energized, AND the 4.16 KV Safety Bus A3 is energized from the associated EDG, THEN <u>perform</u> the following: a. <u>Verify</u> BUS A3S TO A2 TIE BKR open.	
	Standard	Verified breaker indicates open on CP-	
	Cue	None	
	Notes	None. Breaker is found Open	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

3.	Procedure Step:	b. <u>Close</u> BUS A2 TO A3S TIE BKR.	
	Standard	A2 to A3S TIE BKR control switch turned clockwise to the CLOSE position	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4.	Procedure Step:	c. Place the SYNCHRONIZER keyswitch in "BUS TIE."	
	Standard	Key inserted into the SYNCHRONIZER keyswitch for EDG A and turned to the BUS TIE position.	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

5.	Procedure Step:	d. Parallel EDG A as follows: 1) Adjust EDG voltage to equal system voltage.	
	Standard	EDG A voltage adjusted, using EDG A Voltage Regulator, to match system voltage.	
	Cue	None	
	Notes	Applicants may make several adjustments. It is desired that EDG A voltage remain slightly higher than system voltage to maintain VARS out.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

6.	Procedure Step:	2) Adjust engine speed until synchroscope rotates slowly clockwise.	
	Standard	Applicant adjusted EDG A Governor to raise or lower load until the synchroscope is rotating slowly clockwise.	
	Cue	None	
	Notes	Critical Step. Applicants may make several adjustments in both the raise and lower direction to obtain the proper synchroscope speed and direction.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

7.	Procedure Step:	3) Close BUS A3S TO A2 TIE BKR at 5 minutes to twelve position on the synchroscope.	
	Standard	BUS A3S TO A2 TIE BKR control switch turned clockwise to the CLOSE position while the synchroscope was within the required band.	
	Cue	None	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

8.	Procedure Step:	4) Place SYNCHRONIZER keyswitch in "OFF."	
	Standard	Synchroscope keyswitch turned counterclockwise to the OFF position.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- The plant tripped due to a grid disturbance 2 hours ago
- EDG A is currently running loaded onto the 3A Bus.
- Offsite power has been restored to the 1A Bus and 2A Bus per Attachment 12A

INITIATING CUES:

The CRS has directed you transfer the 3A Bus from EDG A to the 2A Bus per OP-902-009, Attachment 12C, Transfer 3A(B) from EDG A(B) to 2A(B).

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Initial Exam S8

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	N/A	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):	10	Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator is directed to discharge Boric Acid Condensate Tank A per OP-007-001, Boron Management. The operator will align the system and commence discharging BACT A to the Circulating Water System while maintaining release limits.

TASK STANDARD: Operator initiated Boric Acid Condensate Tank A release by opening BM-547 and throttling BM-549 to achieve desired flow rate. Upon flow rate exceeding the release limit of 50 gpm, the operator closed BM-547.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

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JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

ENERGY NUCLEAR		Page 3
E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

Revision Statements:

JPM Information:

Time Critical: **No**
Evaluation Method: **Perform**
Evaluation Location: **Simulator**
Task Title: **Discharge A Boric Acid Condensate Tank to the CW System**
Task Number:
K/A Number and rating: **068 A4.03** RO/SRO: **3.5**
Safety Function: **9**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

1. OP-007-001, Boron Management, Rev 040

SIMULATOR CONDITIONS:

1. IC-187

GENERAL TOOLS AND EQUIPMENT:

- OP-007-001, Boron Management (Handout 1)
- OP-007-001, Attachment 11.17 (Handout 2)
- Discharge Permit for BACT A (Handout 2)
- Release request form (Handout 3)

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - i)Boric Acid Condensate Tank A has been prepared for discharge.
 - ii)The RCA Watch reports that he has completed step 6.17.7 in OP-007-001, Boron Management, and that Attachment 11.17, Boric Acid Condensate Tank Discharge Checklist, is complete through step 11.17.19."
 - iii)
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:"[Operator's name], The Control Room Supervisor directs you to commence discharging Boric Acid Condensate Tank A, starting at step 6.17.8 of OP-007-001, Boron Management."

ENERGY NUCLEAR		Page 4
E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

PERFORMANCE:

START TIME: _____

1.	Procedure Step:	6.17.8 On CP-4, Reset Liquid Waste Discharge Flow Integrator to zero.	
	Standard	Reset pushbutton depressed on the Discharge flow integrator	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

2.	Procedure Step:	6.17.9 Record BACT level and flow Integrator reading on Liquid Release Permit.	
	Standard	BACT A level and flow Integrator reading recorded on permit	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

3.	Procedure Step:	6.17.10 <u>If</u> Circ Water flow is reduced to < that required by discharge permit, <u>then discharging</u> must be stopped immediately.	
	Standard	Step read by applicant.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4.	Procedure Step:	6.17.11 Record Circulating Water Flowrate on Liquid Release Permit.	
	Standard	Recorded 1,000,000 GPM (4 CW pumps) on the Release Permit	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

5.	Procedure Step:	6.17.12 If BAC Condensate Discharge Activity Hi Alarm (C-10 on Cabinet G) or Boron Management Discharge Monitor Alarm (RM-11 on CP-6) is received while discharging, then go to OP-901-412, Liquid Waste Discharge High Radiation.	
	Standard	Step read.	
	Cue	None	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

6.	Procedure Step:	6.17.13 Verify BMS Liq Waste Disch, BM-IFIC-0627, in manual with 0 % output.	
	Standard	Controller manual light verified lit when output at 0%.	
	Cue	None	
	Notes	Controller will be found in Manual with 0% output.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

7.	Procedure Step:	6.17.14 To start discharging BACT, momentarily position the following select switches to Open: <ul style="list-style-type: none"> • BM-547 BM Discharge To CW Auto Isolation • BM-549 BM Discharge Header To CW Flow Control 	
	Standard	BM 547/549 switch turned clockwise to OPEN	
	Cue	None	
	Notes	Critical Step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

8.	Procedure Step:	6.17.14.1 Adjust flow using BMS Liq Waste Disch, BM-IFIC-0627, <u>not</u> to exceed value specified on Liquid Release Permit.	
	Standard	BM-IFIC-0627 output raise button depressed to raise discharge flow to 30 to 40 gpm.	
	Cue	None	
	Notes	Critical Step. Initiating flow is the critical step. Reaching the desired flow is not critical since the flow controller failure will occur prior to reaching the desired band. Alternate path begins during this step.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Alternate Path

As BM-IFIC-0627 output is raised, the controller will fail to maximum output and discharge flow will rise to above the allowed rate.

9.	Procedure Step:	6.17.20.2 Close the following valves: <ul style="list-style-type: none"> • BM-547 BM Discharge To CW Auto Isolation • BM-549 BM Discharge Header To CW Flow Control 	
	Standard	BM 547/549 switch turned counter-clockwise to CLOSE	
	Cue	None	
	Notes	Critical Step. Applicant may attempt to use the flow controller but it will not respond.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

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STUDENT HANDOUT

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- Boric Acid Condensate Tank A has been prepared for discharge.
- The RCA Watch reports that he has completed step 6.17.7 in OP-007-001, Boron Management, and that Attachment 11.17, Boric Acid Condensate Tank Discharge Checklist, is complete through step 11.17.19.

INITIATING CUES:

The Control Room Supervisor directs you to commence discharging Boric Acid Condensate Tank A, starting at step 6.17.8 of OP-007-001, Boron Management.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Exam (P1)

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	N/A	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT

Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: Task is performed at the local ESFAS cabinet in Switchgear Room A. The operator is directed to manually actuate Recirculation Actuation Signal (RAS) Train A per OP-902-009, Appendix 34.0, RAS Manual Actuation. The applicant will simultaneously depress both RAS Train A Trip pushbuttons which fails to actuate RAS. The applicant will open both Nuclear Instrument Cabinet A relay breakers to successfully initiate RAS.

TASK STANDARD: The applicant used key to access ESFAS Cabinet A by unlocking and opening both cabinet doors. The applicant simultaneously depressed both RAS Train A Manual Trip pushbuttons and verified RAS actuation by contacting Control Room. Upon notification that RAS had not actuated, the applicant placed both Nuclear Instruments CAB A RAS Relay breakers to OFF.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

Revision Statements: New JPM

JPM Information:

Time Critical: **No**

Evaluation Method: **Simulate**

Evaluation Location: **Plant**

Task Title: **Manually actuate Recirculation Actuation Signal (RAS)**

Task Number: **N/A**

K/A Number and rating: **013 A2.12** RO/SRO: **3.3/3.7**

Safety Function: **2**

PSA Applicability: **NA**

Low Power: **No**

Emergency/Abnormal: **Yes**

Engineered Safety Function: **Yes**

REFERENCES:

1. OP-902-009, Standard Appendices Rev. 323, Appendix 34, RAS Manual Actuation

SIMULATOR CONDITIONS:

N/A

GENERAL TOOLS AND EQUIPMENT:

1. OP-902-009, Standard Appendices, Attachment 34

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) The task conditions are as follows:
 - A loss of coolant accident has occurred.
 - The crew has entered OP-902-002, LOCA Recovery Procedure.
 - Key 55 has been obtained from the Control Room
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], CRS directs you to manually actuate Recirculation Actuation Signal (RAS) Train A using OP-902-009, Appendix 34.0, RAS Manual Actuation."

PERFORMANCE:

START TIME: _____

1.	Procedure Step:	1: <u>Obtain</u> SM/CRS permission to manually actuate RAS.
	Standard	Reviewed step
	Cue	Initiating cue states permission is granted. If operator asks for permission from the SM/CRS to manually actuate an RAS, inform the operator that permission has been granted.
	Notes	None
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

2.	Procedure Step:	2: <u>Obtain</u> Controlled key 55.
	Standard	Reviewed step.
	Cue	Initiating cue indicates that key 55 has been obtained.
	Notes	None
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

3: **IF** manual RAS Train A actuation is desired, **THEN** perform the following:

3.	Procedure Step:	a: Locally at ESFAS Cabinet A <u>unlock</u> and <u>open</u> BOTH front doors (Switchgear Rm A) <ul style="list-style-type: none">• Bay 6 Door• Bay 7 Door
	Standard	Bay 6 and 7 doors are unlocked and opened.
	Cue	When the operator simulates unlocking and opening doors, state “ESFAS cabinet doors are open”.
	Notes	Critical Step. Examiner Note: “SIMULATE OPEING DOORS ONLY”. Doors open like French doors, such that both pushbuttons can be operated simultaneously.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

STUDENT HANDOUT

Do Not Manipulate Any Plant Components

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- A loss of coolant accident has occurred.
- The crew has entered OP-902-002, LOCA Recovery Procedure.
- Key 55 has been obtained from the Control Room

INITIATING CUES:

"[Operator's name], CRS directs you to manually actuate Recirculation Actuation Signal (RAS) Train A using OP-902-009, Appendix 34.0, RAS Manual Actuation."

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Exam (P1)

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	N/A	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT

Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: Task is performed at the local ESFAS cabinet in Switchgear Room B. The operator is directed to manually actuate Recirculation Actuation Signal (RAS) Train B per OP-902-009, Appendix 34.0, RAS Manual Actuation. The applicant will simultaneously depress both RAS Train B Trip pushbuttons which fails to actuate RAS. The applicant will open both Nuclear Instrument Cabinet B relay breakers to successfully initiate RAS.

TASK STANDARD: The applicant used key to access ESFAS Cabinet B by unlocking and opening both cabinet doors. The applicant simultaneously depressed both RAS Train B Manual Trip pushbuttons and verified RAS actuation by contacting Control Room. Upon notification that RAS had not actuated, the applicant placed both Nuclear Instruments CAB B RAS Relay breakers to OFF.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

Revision Statements: New JPM

JPM Information:

Time Critical: **No**

Evaluation Method: **Simulate**

Evaluation Location: **Plant**

Task Title: **Manually actuate Recirculation Actuation Signal (RAS)**

Task Number: **N/A**

K/A Number and rating: **013 A2.12** RO/SRO: **3.3/3.7**

Safety Function: **2**

PSA Applicability: **NA**

Low Power: **No**

Emergency/Abnormal: **Yes**

Engineered Safety Function: **Yes**

REFERENCES:

1. OP-902-009, Standard Appendices Rev. 323, Appendix 34, RAS Manual Actuation

SIMULATOR CONDITIONS:

N/A

GENERAL TOOLS AND EQUIPMENT:

1. OP-902-009, Standard Appendices, Attachment 34

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) The task conditions are as follows:
 - A loss of coolant accident has occurred.
 - The crew has entered OP-902-002, LOCA Recovery Procedure.
 - Key 55 has been obtained from the Control Room
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], CRS directs you to manually actuate Recirculation Actuation Signal (RAS) Train B using OP-902-009, Appendix 34.0, RAS Manual Actuation."

PERFORMANCE:

START TIME: _____

1.	Procedure Step:	1. <u>Obtain</u> SM/CRS permission to manually actuate RAS.	
	Standard	Reviewed step	
	Cue	Initiating cue states permission is granted. If operator asks for permission from the SM/CRS to manually actuate an RAS, inform the operator that permission has been granted.	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

2.	Procedure Step:	2. <u>Obtain</u> Controlled key 55.	
	Standard	Reviewed step.	
	Cue	Initiating cue indicates that key 55 has been obtained.	
	Notes	None	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

3	Procedure Step:	3. IF manual RAS Train B actuation is desired, THEN <u>perform</u> the following:	
	Standard	Read step.	
	Cue	None	
	Notes	Step is NA	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

4: **IF** manual RAS Train B actuation is desired, **THEN** perform the following:

4.	Procedure Step:	a. Locally at ESFAS Cabinet B <u>unlock</u> and <u>open</u> BOTH front doors (Switchgear Rm B) <ul style="list-style-type: none">• Bay 6 Door• Bay 7 Door	
	Standard	Bay 6 and 7 doors are unlocked and opened.	
	Cue	When the operator simulates unlocking and opening doors, state "ESFAS cabinet doors are open".	
	Notes	Critical Step. Examiner Note: "SIMULATE OPEING DOORS ONLY". Doors open like French doors, such that both pushbuttons can be operated simultaneously.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

5.	Procedure Step:	b. Simultaneously <u>depress</u> BOTH RAS Train B manual Trip pushbuttons: <ul style="list-style-type: none"> • S63B • S73B
	Standard	Both pushbuttons were simultaneously depressed.
	Cue	None
	Notes	Critical Step. Examiner Note: Must ensure both pushbuttons were simultaneously depressed. RAS will not actuate if they are depressed one at a time.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

ALTERNATE PATH STARTS HERE

RAS Train B pushbuttons did not actuate RAS, requiring operator to place Nuclear Instrument CAB B RAS relay breakers to OFF.

6.	Procedure Step:	c. <u>Check</u> with Control Room that RAS Train B actuated.
	Standard	Checked with Control Room that RAS actuated.
	Cue	When asked to verify RAS Train B actuated, state “RAS Train B did NOT actuate”.
	Notes	Critical Step.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

7.	Procedure Step:	d. IF RAS Train B did NOT actuate, THEN <u>place</u> BOTH of the following breakers to “OFF”. <ul style="list-style-type: none"> • ESFEBKR6410 63B, Nuclear Instruments CAB B RAS Relays • ESFEBKR6410 73B, Nuclear Instruments CAB B RAS Relays
	Standard	Both breakers placed in OFF
	Cue	If asked, state that “RAS has been actuated”.
	Notes	Critical Step.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

Do Not Manipulate Any Plant Components

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- A loss of coolant accident has occurred.
- The crew has entered OP-902-002, LOCA Recovery Procedure.
- Key 55 has been obtained from the Control Room

INITIATING CUES:

"[Operator's name], CRS directs you to manually actuate Recirculation Actuation Signal (RAS) Train A using OP-902-009, Appendix 34.0, RAS Manual Actuation."

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC RO/SRO Exam (P2)

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	N/A	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator is directed to transfer the operating Stator Cooling Water pumps by starting Stator Cooling Water Pump B and stopping Stator Cooling Water Pump A. During the task, the pump that is stopped by the operator will have its discharge check valve stuck open which causes a loss of stator cooling water flow to the stator. The operator is required to start the pump with the stuck open discharge check valve.

TASK STANDARD: Stator cooling water pump B is started and Stator cooling water pump A is stopped. After visually verifying that the discharge check valve remained open on Stator Cooling Water Pump A, it is restarted. All critical steps completed satisfactory.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

ENERGY NUCLEAR		Page 1
E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

ENERGY NUCLEAR		Page 3
E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

Revision Statements: New JPM

JPM Information:

Time Critical: **No**
Evaluation Method: **Simulate**
Evaluation Location: **Plant**
Task Title: **Transfer Operating Stator Cooling Water Pump**
Task Number: **W3-NAO-SCW-NORM-6**
K/A Number and rating: **045 K6.01** RO/SRO: **3.2**
Safety Function: **4S**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

1. OP-003-022, Stator Cooling Water, Revision 022

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be simulated. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - i) The plant is at 100% power
 - ii) Stator Cooling Water Pump A is operating, and Stator Cooling Water Pump B is in standby
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], Using procedure OP-003-022, Stator Cooling Water, Step 6.2, transfer operating Stator Cooling Water pumps by starting Stator Cooling Water Pump B and stopping Stator Cooling Water Pump A. All Prerequisites, Precautions and Limitations are met. Inform me when you have completed this task."

PERFORMANCE:

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START TIME: _____

6.2 Transferring Operating Stator Coil Water Pumps

1.	Procedure Step:	6.2.1 <u>Prior</u> to starting idle Stator Coil Water Pump A(B) <u>verify</u> the following: <ul style="list-style-type: none"> • Stator Coil Water Pump A(B) Suction Isolation, SCW-101A(B), Open • Stator Coil Water Pump A(B) oil level is satisfactory • Stator Coil Water Pump A(B) local control switch is in AUTO 	
	Standard	Operator verifies SCW-101B is open, oil level is sat and control switch is in AUTO position.	
	Cue	None	
	Notes	Standby pump alignment will be as seen in the plant.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

CAUTION

START STANDBY STATOR COIL WATER PUMP BEFORE STOPPING OPERATING PUMP.
A GENERATOR TRIP COULD RESULT IF OPERATING PUMP IS STOPPED FIRST.

2.	Procedure Step:	6.2.2 Start idle Stator Coil Water Pump A(B).	
	Standard	Stator Cooling Water Pump B control switch turned clockwise to the start position.	
	Cue	After switch is turned to the start position, cue the operator that the pump has started.	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

3.	Procedure Step:	6.2.2.1 Verify pump is operating satisfactorily.	
	Standard	Operator verifies oil level, vibrations and pumps parameters are satisfactory before stopping the previously running pump.	
	Cue	As the operator verifies oil level, vibrations, pressure and flow, state the parameter(s) is/are satisfactory.	
	Notes		
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

NOTE

Discharge Stop Check Valve, SCW-107-A(B), arm should change positions and point downward when pump is secured.

4.	Procedure Step:	6.2.3 Place control switch for pump to be stopped, Stator Coil Water Pump A(B), to STOP	
	Standard	Stator Cooling Water Pump A control switch is turned counter-clockwise to the Stop position.	
	Cue	After the control switch is turned to the stop position, inform the operator that Stator Cooling Water Pump A is slowing down. If asked about SCW-107A position, state the arm has not moved.	
	Notes	Critical Step. The pump taken to stop will not stop since its discharge check valve is not closed. Reverse rotation would occur.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

5.	Procedure Step:	6.2.3.1 Verify control switch returns to AUTO.	
	Standard	Operator releases control switch allowing it to return to AUTO position.	
	Cue	After the operator releases the control switch, state the switch is in the AUTO position.	
	Notes		
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

ALTERNATE PATH

6.	Procedure Step: Alternate Path:	6.2.3.2 Verify SCW-107A(B) discharge stop check valve arm changes position immediately following securing of pump.	
	Standard	Operator verifies SCW-107A arm has not moved and is not pointing downward.	
	Cue	If the operator states that he/she is checking the position of SCW-107A, then provide the cue that the arm has not moved and is not pointing downward.	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

7.	Procedure Step:	6.2.3.3 If SCW-107A(B) discharge stop check valve arm fails to change position, <u>then</u> immediately start secured Stator Coil Water Pump A(B).	
	Standard	Operator starts Stator Cooling Water Pump A	
	Cue	Once the control switch is turned clockwise to the start position, state Stator Cooling Water Pump A has started.	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

Do Not Manipulate Any Plant Components

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

1. The plant is at 100% power
2. Stator Cooling Water Pump A is operating and Stator Cooling Water Pump B is in standby

INITIATING CUES:

Per OP-003-022, Stator Cooling Water, Step 6.2, transfer operating Stator Cooling Water pumps by starting Stator Cooling Water Pump B and stopping Stator Cooling Water Pump A. All Prerequisites, Precautions and Limitations are met.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC RO/SRO Exam (P2)

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	N/A	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
 Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: The operator is directed to transfer the operating Stator Cooling Water pumps by starting Stator Cooling Water Pump A and stopping Stator Cooling Water Pump B. During the task, the pump that is stopped by the operator will have its discharge check valve stuck open which causes a loss of stator cooling water flow to the stator. The operator is required to start the pump with the stuck open discharge check valve.

TASK STANDARD: Stator Cooling Water Pump A is started and Stator Cooling Water Pump B is stopped. After visually verifying that the discharge check valve remained open on Stator Cooling Water Pump B, it is restarted. All critical steps completed satisfactory.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

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E-DOC TITLE: JOB PERFORMANCE MEASURE TEMPLATE	E-DOC NO. TQF-100-JPM	REVISION NO. 001

Revision Statements: New JPM

JPM Information:

Time Critical: **No**
Evaluation Method: **Simulate**
Evaluation Location: **Plant**
Task Title: **Transfer Operating Stator Cooling Water Pump**
Task Number: **W3-NAO-SCW-NORM-6**
K/A Number and rating: **045 A2.02** RO/SRO: **3.4/3.6**
Safety Function: **4S**
PSA Applicability: **N/A**
Low Power: **No**
Emergency/Abnormal: **No**
Engineered Safety Function: **None**

REFERENCES:

1. OP-003-022, Stator Cooling Water, Revision 022

SIMULATOR CONDITIONS:

1. NA

GENERAL TOOLS AND EQUIPMENT:

1. None

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be simulated. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) "The task conditions are as follows:
 - i) The plant is at 100% power
 - ii) Stator Cooling Water Pump B is operating, and Stator Cooling Water Pump A is in standby
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], Using procedure OP-003-022, Stator Cooling Water, Step 6.2, transfer operating Stator Cooling Water pumps by starting Stator Cooling Water Pump A and stopping Stator Cooling Water Pump B. All Prerequisites, Precautions and Limitations are met. Inform me when you have completed this task."

PERFORMANCE:

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START TIME: _____

6.2 Transferring Operating Stator Coil Water Pumps

1.	Procedure Step:	6.2.1 <u>Prior</u> to starting idle Stator Coil Water Pump A(B) <u>verify</u> the following: <ul style="list-style-type: none"> • Stator Coil Water Pump A(B) Suction Isolation, SCW-101A(B), Open • Stator Coil Water Pump A(B) oil level is satisfactory • Stator Coil Water Pump A(B) local control switch is in AUTO 	
	Standard	Operator verifies SCW-101A is open, oil level is sat and control switch is in AUTO position.	
	Cue	None	
	Notes	Standby pump alignment will be as seen in the plant.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

CAUTION

START STANDBY STATOR COIL WATER PUMP BEFORE STOPPING OPERATING PUMP.
A GENERATOR TRIP COULD RESULT IF OPERATING PUMP IS STOPPED FIRST.

2.	Procedure Step:	6.2.2 Start idle Stator Coil Water Pump A(B).	
	Standard	Stator Cooling Water Pump A control switch turned clockwise to the start position.	
	Cue	After switch is turned to the start position, cue the operator that the pump has started.	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

3.	Procedure Step:	6.2.2.1 Verify pump is operating satisfactorily.	
	Standard	Operator verifies oil level, vibrations and pumps parameters are satisfactory before stopping the previously running pump.	
	Cue	As the operator verifies oil level, vibrations, pressure and flow, state the parameter(s) is/are satisfactory.	
	Notes		
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

NOTE

Discharge Stop Check Valve, SCW-107-A(B), arm should change positions and point downward when pump is secured.

4.	Procedure Step:	6.2.3 Place control switch for pump to be stopped, Stator Coil Water Pump A(B), to STOP
	Standard	Stator Cooling Water Pump B control switch is turned counter-clockwise to the Stop position.
	Cue	After the control switch is turned to the stop position, inform the operator that Stator Cooling Water Pump B is slowing down. If asked about SCW-107B position, state the arm has not moved.
	Notes	Critical Step. The pump taken to stop will not stop since its discharge check valve is not closed. Reverse rotation would occur.
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

5.	Procedure Step:	6.2.3.1 Verify control switch returns to AUTO.
	Standard	Operator releases control switch allowing it to return to AUTO position.
	Cue	After the operator releases the control switch, state the switch is in the AUTO position.
	Notes	
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

ALTERNATE PATH

6.	Procedure Step: Alternate Path:	6.2.3.2 Verify SCW-107A(B) discharge stop check valve arm changes position immediately following securing of pump.
	Standard	Operator verifies SCW-107B arm has not moved and is not pointing downward.
	Cue	If the operator states that he/she is checking the position of SCW-107B, then provide the cue that the arm has not moved and is not pointing downward.
	Notes	Critical Step
	Results	SAT <input type="checkbox"/> UNSAT <input type="checkbox"/>

7.	Procedure Step:	6.2.3.3 If SCW-107A(B) discharge stop check valve arm fails to change position, <u>then</u> immediately start secured Stator Coil Water Pump A(B).	
	Standard	Operator starts Stator Cooling Water Pump B	
	Cue	Once the control switch is turned clockwise to the start position, state Stator Cooling Water Pump B has started.	
	Notes	Critical Step	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

Do Not Manipulate Any Plant Components

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

1. The plant is at 100% power
2. Stator Cooling Water Pump B is operating and Stator Cooling Water Pump A is in standby

INITIATING CUES:

Per OP-003-022, Stator Cooling Water, Step 6.2, transfer operating Stator Cooling Water pumps by starting Stator Cooling Water Pump A and stopping Stator Cooling Water Pump B. All Prerequisites, Precautions and Limitations are met.

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NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Exam (P3 Train A)

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	N/A	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT

Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This task is performed in the RCA on the +21 level in Emergency Diesel Generator Room A. Applicant uses OP-009-002, Emergency Diesel Generator, step 8.8, to reset EDG A following an overspeed trip. Manipulations 1 and 2 take place on the upper level of EDG A. The last manipulation takes place at the EDG A control panel.

TASK STANDARD: The applicant reset the Turbocharger Butterfly Valve by depressing and holding the EDG A Combustion Air Overspeed Trip Reset pushbutton or by manually resetting the Combustion Air Intake Butterfly Valve. The applicant reset the Fuel Oil Overspeed Trip by pushing the plunger on the Governor Overspeed Trip Block resulting in EDG A starting.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

Revision Statements:

JPM Information:

Time Critical: **No**

Evaluation Method: **Simulate**

Evaluation Location: **Plant (RCA)**

Task Title: **Reset Emergency Diesel Generator A following an Overspeed Trip with a LOOP**

Task Number: **W3-NAO-EDG-OFFNORM-3**

K/A Number and rating: **EPE E13 EA1.10** RO/SRO: **4.0**

Safety Function: **6**

PSA Applicability: **NA**

Low Power: **No**

Emergency/Abnormal: **Yes**

Engineered Safety Function: **Yes**

REFERENCES:

1. OP-009-002, Emergency Diesel Generator, Rev 360

SIMULATOR CONDITIONS:

N/A

GENERAL TOOLS AND EQUIPMENT:

1. OP-009-002, Emergency Diesel Generator, Rev 360

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) The task conditions are as follows:
 - The plant has experienced a Loss of Offsite Power.
 - Emergency Diesel Generator A tripped on overspeed.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], The CRS has directed you to reset Emergency Diesel Generator A per OP-009-002, Emergency Diesel Generator, section 8.8.

2.	Procedure Step:	8.8.2 Reset the Fuel Oil Overspeed Trip by pushing in the plunger on the Governor Overspeed Trip Block.	
	Standard	Plunger pushed in	
	Cue	If steps 8.8.2 ad 8.8.3 are performed correctly, then cue that the EDG starts up.	
	Notes	Critical Step. The reset plunger is on the upper level of the EDG. After this is reset, the EDG will crank and start. If the applicant failed to accomplish the preceding steps, then the EDG will not start. Refer to picture 2.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

NOTE

(1) Depressing the System Reset Pushbutton following restart of the EDG in Emergency Mode will prevent an EDG trip when the engine goes from Emergency Mode to Test Mode during paralleling operations.

(2) If the EDG is not running but is still coasting down, depressing the System Reset pushbutton before the EDG has come to a complete stop may cause the unit to attempt to crank. [CR-WF3-2005-00807].

3	Procedure Step:	8.8.3 <u>When</u> Emergency Diesel Generator A has come to a complete stop <u>or if</u> EDG A restarted in Emergency Mode following reset of Overspeed Trip, <u>then</u> depress the System Reset pushbutton on the Emergency Diesel Generator A Control Panel.	
	Standard	Reset button is pressed.	
	Cue	If applicant asks if any alarms are locked in, say that all alarms are clear except "Starting Air System Press Lo" (F-4).	
	Notes	The system reset button is located on the EDG Control Panel in the Diesel Room. Refer to picture 4. "Starting Air System Press Lo" is an expected alarm right after an EDG start. Alarm clears several minutes later.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

Do Not Manipulate Any Plant Components

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- The plant has experienced a Loss of Offsite Power.
- Emergency Diesel Generator A tripped on overspeed.

INITIATING CUES:

"[Operator's name], The CRS has directed you to reset Emergency Diesel Generator A per OP-009-002, Emergency Diesel Generator, section 8.8.

NUCLEAR PLANT OPERATOR JOB PERFORMANCE MEASURE

SRO RO NLO

ALTERNATE SUCCESS PATH

LESSON #

TITLE: 2023 NRC Exam (P3 Train B)

OPERATOR: _____ **DATE:** _____

EVALUATOR: _____ **EVALUATOR SIGNATURE:** _____

CRITICAL TIME FRAME:	Required Time (min):	N/A	Actual Time (min):	N/A
PERFORMANCE TIME:	Validation Time (min):		Actual Time (min):	

JPM RESULTS*:

(Circle one) *Refer to Grading SAT UNSAT NEEDS IMPROVEMENT
Instructions at end of JPM

COMMENT SHEET ATTACHED: Yes / No (circle one) (Required for Unsat, Needs Improvement or Follow-Up Questions)

SYNOPSIS: This task is performed in the RCA on the +21 level in Emergency Diesel Generator Room B. Applicant uses OP-009-002, Emergency Diesel Generator, step 8.8, to reset EDG B following an overspeed trip. Manipulations 1 and 2 take place on the upper level of EDG B. The last manipulation takes place at the EDG B control panel.

TASK STANDARD: The applicant reset the Turbocharger Butterfly Valve by depressing and holding the EDG B Combustion Air Overspeed Trip Reset pushbutton or by manually resetting the Combustion Air Intake Butterfly Valve. The applicant reset the Fuel Oil Overspeed Trip by pushing the plunger on the Governor Overspeed Trip Block resulting in EDG B starting.

Prepared: Ramon Peter WTWF3-2022-00281-00022 **Date:** 2/15/23

Reviewed: Jerome Robertson WTWF3-2022-00281-00046 **Date:** 6/1/23

Approved: Hunter Wells WTWF3-2022-00281-00038 **Date:** 6/1/23

Superintendent, Operations Training (or Designee)

Submit this document to records in accordance with the requirements of EN-AD-103, Document Control Records Management Programs.

JPM GRADING INSTRUCTIONS

CRITERIA FOR SATISFACTORY EVALUATION

1. 100% of critical elements/steps identified in the JPM successfully completed.
2. Critical Time Frame is met if applicable.
3. No actual safety violation (radiological or industrial) requiring evaluator intervention.

CRITERIA FOR UNSAT EVALUATION

1. Any critical element/step is graded as "UNSAT"
2. Critical Time Frame is not met if applicable. *
3. Actual safety violation (radiological or industrial) requiring evaluator intervention.
4. Operator's actions would have damaged plant equipment, created a personnel safety hazard, or otherwise reduced the level of safety of the plant

CRITERIA FOR NEEDS IMPROVEMENT EVALUATION

1. One or more non-critical elements/ steps evaluated as UNSAT which indicate the need for remediation.
2. Any relevant Management Expectation/Standard, including operator fundamentals, missed a majority of the opportunities.

ADMINISTRATIVE REQUIREMENTS

Any performance deficiencies resulting in an UNSAT or NEEDS IMPROVEMENT evaluation shall be documented on the JPM comment sheet.

Documentation for Satisfactory evaluations need only consist of the cover sheet and any applicable comment sheet(s) provided that a Master Copy of the JPM is on file or captured.

Documentation for UNSAT evaluations shall consist of the entire, as administered JPM, with associated comment sheets.

Documentation for NEEDS IMPROVEMENT evaluations need only consist of the cover sheet and the associated comment sheet(s) describing the operator deficiencies noted, provided that a Master Copy of the JPM is on file or captured and the deficiencies are involving only management expectations. Otherwise, the entire JPM shall be retained.

Revision Statements:

JPM Information:

Time Critical: **No**

Evaluation Method: **Simulate**

Evaluation Location: **Plant (RCA)**

Task Title: **Reset Emergency Diesel Generator A following an Overspeed Trip with a LOOP**

Task Number: **W3-NAO-EDG-OFFNORM-3**

K/A Number and rating: **EPE E13 EA1.10** RO/SRO: **4.0**

Safety Function: **6**

PSA Applicability: **NA**

Low Power: **No**

Emergency/Abnormal: **Yes**

Engineered Safety Function: **Yes**

REFERENCES:

1. OP-009-002, Emergency Diesel Generator, Rev 360

SIMULATOR CONDITIONS:

N/A

GENERAL TOOLS AND EQUIPMENT:

1. OP-009-002, Emergency Diesel Generator, Rev 360

CRITICAL ELEMENTS:

Critical steps will be shaded in and the words critical step stated in the notes section.

OPERATOR BRIEF: (For LOR Annual Exams see EN-TQ-218 for Operator Briefs)

1. State the following paragraph IF this is the first performance in this setting:
 - a) "All actions associated with this job performance measure are to be performed. You will be provided access to any tools or equipment you determine necessary to perform the task. When a second checker is called for, the evaluator will perform the role of second checker and will always be in agreement with your actions. Before you start, the evaluator will state the task conditions and answer any questions, then provide a cue to begin".
2. State the following:
 - a) The task conditions are as follows:
 - The plant has experienced a Loss of Offsite Power.
 - Emergency Diesel Generator B tripped on overspeed.
3. Solicit and answer any questions the operator may have.

INITIATING CUE:

State the following:

"[Operator's name], The CRS has directed you to reset Emergency Diesel Generator B per OP-009-002, Emergency Diesel Generator, section 8.8.

2.	Procedure Step:	8.8.2 Reset the Fuel Oil Overspeed Trip by pushing in the plunger on the Governor Overspeed Trip Block.	
	Standard	Plunger pushed in	
	Cue	If steps 8.8.2 ad 8.8.3 are performed correctly, then cue that the EDG starts up.	
	Notes	Critical Step. The reset plunger is on the upper level of the EDG. After this is reset, the EDG will crank and start. If the applicant failed to accomplish the preceding steps, then the EDG will not start. Refer to picture 2.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

NOTE

(1) Depressing the System Reset Pushbutton following restart of the EDG in Emergency Mode will prevent an EDG trip when the engine goes from Emergency Mode to Test Mode during paralleling operations.

(2) If the EDG is not running but is still coasting down, depressing the System Reset pushbutton before the EDG has come to a complete stop may cause the unit to attempt to crank. [CR-WF3-2005-00807].

3	Procedure Step:	8.8.3 <u>When</u> Emergency Diesel Generator B has come to a complete stop <u>or if</u> EDG B restarted in Emergency Mode following reset of Overspeed Trip, <u>then</u> depress the System Reset pushbutton on the Emergency Diesel Generator B Control Panel.	
	Standard	Reset button is pressed.	
	Cue	If applicant asks if any alarms are locked in, say that all alarms are clear except "Starting Air System Press Lo" (F-4).	
	Notes	The system reset button is located on the EDG Control Panel in the Diesel Room. Refer to picture 4. "Starting Air System Press Lo" is an expected alarm right after an EDG start. Alarm clears several minutes later.	
	Results	SAT <input type="checkbox"/>	UNSAT <input type="checkbox"/>

Cue: This completes this JPM.

STOP TIME: _____

STUDENT HANDOUT

Do Not Manipulate Any Plant Components

DIRECTIONS TO EXAMINEE:

Read the following and tell me when you are ready to begin:

INITIAL CONDITIONS:

- The plant has experienced a Loss of Offsite Power.
- Emergency Diesel Generator B tripped on overspeed.

INITIATING CUES:

"[Operator's name], The CRS has directed you to reset Emergency Diesel Generator B per OP-009-002, Emergency Diesel Generator, section 8.8.

Form 3.3-1 Scenario Outline

Facility:	Waterford 3	Scenario #:	1
Scenario Source:		Op. Test #:	1
Examiners:		Applicants/	
		Operators:	
Initial Conditions: 1% Power, Plant Startup in progress, PTED not available			
Turnover: Continue startup to 5% power by adding Primary Water to the VCT			
Critical Tasks: CT-1: Trip RCP's upon a loss of CCW; CT-2: Establish RCS Pressure Control			

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R-ATC N-SRO	Dilute to continue startup
2	CH08E1	I – BOP I – SRO TS – SRO	Plant Protection System Channel D Containment Pressure (CIAS), CB-IPI-6701SMD, fails high requiring Technical Specification entry and bypass of channel trip bistables. (TS 3.3.1 action 2 & 3.3.2 action 13)
3	RC15A2	MC-ATC TS-SRO	Pressurizer Level Control Channel Level Transmitter, RC-ILT-0110X (selected channel), fails low requiring the "Y" channel to be selected per OP-901-110, Pressurizer Level Control Malfunction. (TS 3.3.3.5 action a)
4	TP01A TP08B	MC – BOP C – SRO	Running Turbine Cooling Water Pump A trips and the standby pump does not auto start resulting in manual action to start TCCW Pump B in accordance with OP-901-512, Loss of Turbine Cooling Water
5	MS11A	M-All	Excess Steam Demand Event will occur on #1 Steam Generator inside Containment. resulting in a manual or automatic reactor trip and automatic CSAS actuation (Critical Task 1, Trip RCPs) (Critical Task 2, Establish RCS Pressure Control)
6	RP08C	C – ATC C – BOP I – SRO	Relay K202A fails, CVC-401, CVC-109, IA-909, and FP-601A fail to close automatically
7	CS01A	C – BOP C – SRO	Containment Spray Pump A trips requiring action to override close CS-125A, Containment Spray Header A Isolation

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control

Scenario Quantitative Attributes

1. Malfunctions after EOP entry (1–2)	2
2. Abnormal events (2–4) [<i>Events 3 and 4 credited</i>]	2
3. Major transients (1–2)	1
4. EOPs entered/requiring substantive actions (1–2)	1
5. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0
6. Preidentified critical tasks (≥ 2)	2

The crew assumes the shift with the reactor at POAH following a forced outage. The turnover will include instructions to continue the startup by diluting to the charging pump suction in accordance with the reactivity plan.

Event 1: The reactivity plan will include instructions to add primary water RCS. Once enough of a reactivity change is seen by the examiners the next event can be triggered.

Event 2: After the first event is complete, CB-IPI-6701SMD, Containment Pressure (CIAS) fails high. The SRO should review Technical Specifications 3.3.1 and 3.3.2. Per Table 3.3-1 under Containment Pressure – High (Functional Unit 6) the SRO should enter Technical Specification 3.3.1 action 2. Per Table 3.3-3 under Functional Units 1b (Safety Injection, Containment Pressure-High), 3b (Containment Isolation, Containment Pressure-High), and 4c (Main Steam Line Isolation, Containment Pressure High) the SRO should enter Tech 3.3.2 action 13. The SRO should direct the BOP to bypass the Containment Pressure High (RPS) and Containment Pressure High (ESF) trip bistables (13&16) in PPS Channel D within 1 hour. The BOP should bypass the trip bistables in accordance with OP-009-007, Plant Protection System.

Event 3: Once TS have been entered and bypasses are complete, pressurizer Level Control Channel Level Transmitter, RC-ILT-0110X, fails low. The SRO should enter OP-901-110, Pressurizer Level Control Malfunction and implement Section E1. The crew should take manual control of the Pressurizer Level Controller and/or operate Charging Pumps to restore Pressurizer level, swap control to the Channel Y level channel, and return the Pressurizer Level Controller back to AUTO. The SRO should review Technical Specifications 3.3.3.5 and 3.3.3.6 and OP-903-013, Monthly Channel Checks. Tech Spec 3.3.3.5 action “a” should be entered with the action to restore the inoperable channel within 7 days. The SRO should determine that TS 3.3.3.6 requirements are met after verifying QSPDS value for PZR level is within the channel check limit of 5%.

Event 4: After event 3 is complete, the running Turbine Cooling Water Pump A will trip and the standby pump will fail to start automatically. The CRS should direct the BOP to start the standby pump in accordance with OP-901-512, Loss of Turbine Cooling Water and OP-500-005, Control Room Cabinet E.

Event 5: After TCCW Pump B is manually started, an Excess Steam Demand Event will occur on Steam generator #1 inside containment. This will result in an automatic reactor trip and containment pressure exceeding 17.7 psia (the setpoint for automatic Containment Spray Actuation). The ATC should manually stop all RCPs within 3 minutes of the loss of CCW to the RCPs (CRITICAL TASK 1). Once SG #1 has blown dry, the BOP should be directed to Establish RCS Pressure Control to prevent lifting the RCS Safety Valves (Critical Task 2).

Event 6: On actuation of the Safety Injection signal, Relay K202A will not actuate and CVC-401, CVC-109, IA-909, and FP-601A fail to close automatically. The ATC and BOP should position these valves to ensure Containment Isolation.

Event 7: After to crew diagnose to and enter OP-902-004, Excess Steam Demand Recovery, Containment Spray Pump A trips requiring the BOP to manually close CS-125A meet Containment Isolation.

The scenario can be terminated once all CT's are complete AND event 7 is completed or at the lead examiner's discretion.

Critical Task	Safety Significance	Cueing	Measurable Performance Indicator	Performance Feedback
<p>CT-1: Trip any RCP exceeding operating limits or after 3 min without CCW flow</p> <p>This task is satisfied by manually tripping all 4 Reactor Coolant Pumps within 3 minutes of a loss of CCW flow to the RCPs. This task becomes applicable following the actuation of CSAS.</p>	<p>This step is performed for protection of the RCPs, since CCW, which provides cooling to the RCPs, is isolated upon CSAS actuation.</p>	<p>CCW flow low/lost to RCPs alarms on CP-2 and CP-18</p> <p>CCW valve status CP-2</p> <p>CSAS initiated CP-8</p> <p>Procedurally driven from OP-902-000 step 3.b.1 and 9.3</p>	<p>Stops RCPs using control switch</p>	<p>RCP off light illuminated</p> <p>RCP indicated flow lowering</p>
<p>CT-2: Establish RCS Pressure Control.</p> <p>This task is satisfied by performing any of the following: securing pressurizer heaters, reducing charging flow, raising letdown flow, manually initiating pressurizer spray flow, or raising steam generator feedwater flow or steaming rate. This task becomes applicable following the affected steam generator reaching dry out condition.</p> <p>RCS pressure will rise to the Pressurizer Safety Valve lift setpoint approximately 30 minutes after the affected SG is dry if no actions.</p>	<p>Prevents RCS pressure from exceeding brittle fracture specifications or reaching safety valve lift setpoint. Safety valves lifting or exceeding brittle fracture limitations could result in a LOCA and degradation of the RCS fission product barrier.</p>	<p>Affected SG Level approx. 0% WR</p> <p>Affected SG pressure is approx. atmospheric /containment pressure</p> <p>CET Temperature rising</p> <p>Pressurizer Pressure rising</p> <p>Procedurally driven from OP-902-000 step 7.d.2 and Appendix 13</p>	<p>ADV opened on least affected SG</p> <p>EFW flow established to least affected SG</p>	<p>SG ADV Open annunciator</p> <p>EFW flow indicated</p> <p>RCS Pressure stable or lowering</p> <p>CET Temperature stable or lowering</p>

REFERENCES

Event	Procedures
1	OP-010-003, Plant Startup, Rev. 363
2	OP-009-007, Plant Protection System, Rev. 22 OP-903-013, Monthly Channel Checks, Rev. 23 OP-500-009, Ann. Response Procedure Cabinet K, Rev. 023 Technical Specifications 3.3.1, 3.3.2
3	OP-901-110, Pressurizer Level Control Malfunction, Rev 011 OP-500-008, Ann. Response Procedure Cabinet H, Rev. 048 Technical Specifications 3.3.3.5
4	OP-901-512, Loss of Turbine Cooling Water, Rev. 003 OP-500-005, Ann. Response Procedure Cabinet E, Rev. 034
5/6/7	OP-902-000, Standard Post Trip Actions, Rev. 17 OP-902-004, Excess Steam Demand Recovery, Rev. 17 OP-902-009, Standard Appendices, Rev. 323
GEN	EN-OP-115, Conduct of Operations, Rev. 31 EN-OP-115-08, Annunciator Response, Rev. 7 OI-038-000, EOP Operations Expectations / Guidance, Rev. 21 OP-100-017, EOP Implementation Guide, Rev 6

Event Description: Dilute to raise power to 5-10% power.

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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Examiner Note		
Event 1 is a normal plant evolution. The crew will be pre-briefed and ready to start raising power once they take the shift. Per the reactivity plan the crew will add 100 gallons of Primary Makeup Water (PMU) on the first batch followed by 60 gallon batches.		

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OP-010-003, Section 9.4, Plant Startup to 10% Power		
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	SRO	9.4.54 Begin raising Reactor power by CEA withdrawal <u>or</u> boron dilution to ≤5% full power.
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	NOTE	The SRO directs the ATC to coordinate with the BOP and raise power to 5-6%. The SRO will direct the ATC to initiate RCS dilution in accordance with OP-002-005 and the approved reactivity plan.
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OP-002-005, Section 6.9, VCT Makeup using the Dilute Makeup Mode (C)		
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<u>NOTE</u>		
VCT makeup and RWSP makeup utilize the same supply header. VCT makeup <u>cannot</u> be performed while performing the following procedure sections:		
<ul style="list-style-type: none"> • Section 6.12 RWSP Blended Makeup • Section 6.13 RWSP Boration 		

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<u>CAUTION</u>		
(1) THIS SECTION HAS THE POTENTIAL TO AFFECT CORE REACTIVITY.[INPO 06-006]		
(2) THIS EVOLUTION SHOULD BE CROSS-CHECKED <u>AND COMPLETED PRIOR TO LEAVING</u> CP-4.		

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	ATC	6.9.1 Inform SM/CRS that this Section is being performed.
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Event Description: Dilute to raise power to 5-10% power.

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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NOTE

When performing a Plant down power where final RCS Boron Concentration needs to be determined, the following Plant Data Book figure(s) will assist the Operator in determining the required RCS Boron PPM change.

- 1.2 Power Defect Vs Power Level
- 1.4.3 Inverse Boron Worth Vs. T_{mod} at BOC
- 1.4.4 Inverse Boron Worth Vs. T_{mod} at Peak Boron
- 1.4.5 Inverse Boron Worth Vs. T_{mod} at MOC
- 1.4.6 Inverse Boron Worth Vs. T_{mod} at EOC

	NOTE	Not applicable, reactivity plan gives required volume.
	ATC	6.9.3 Set Primary Makeup Water Batch Counter to volume of Primary Makeup water desired.
	NOTE	<p>Procedure does not give specific steps to set the counter. 50 gal of water on the counter is set by pressing:</p> <ul style="list-style-type: none"> • UP arrow button • ENTER button • the side arrow button to move the cursor • the raise button to enter 5 (counter reading is multiplied by 10) • ENTER • RESET
	ATC	6.9.4 Place Makeup Mode selector switch to DILUTE.
	ATC	6.9.5 Open VCT Makeup Valve, CVC-510.

NOTE

The Dilution Flow Totalizer will not register below 5 GPM. The Dilution Flow Totalizer is most accurate at >10 GPM.

CAUTION

DILUTION SHALL IMMEDIATELY BE STOPPED IF PRE-POWER DEPENDENT INSERTION LIMIT (H-9, CABINET H) ALARM IS INITIATED OR ANY UNEXPECTED REACTIVITY CHANGE OCCURS.

Event Description: Dilute to raise power to 5-10% power.

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	NOTE	ATC will likely use manual Primary Makeup Water flow control. "CVCS Rx Makeup Wtr Flow Hi/Lo" on CP-4 is an expected annunciator. Red pen on flow recorder PMU-IFR-0210-X will indicate GPM.
	ATC	6.9.6 <u>If</u> manual control of Primary Makeup Water flow is desired, <u>then</u> perform the following: 6.9.6.1 Verify Primary Makeup Water Flow controller, PMU-IFIC-0210X, in Manual. 6.9.6.2 Adjust Primary Makeup Water Flow controller, PMU-IFIC-0210X, output to >5 GPM flow rate.
	ATC	6.9.7 <u>If</u> automatic control of Primary Makeup Water flow is desired, <u>then</u> perform the following: 6.9.7.1 Verify Primary Makeup Water Flow controller, PMU-IFIC-0210X, in Auto. 6.9.7.2 Adjust Primary Makeup Water Flow controller, PMU-IFIC-0210X, setpoint potentiometer to >5 GPM flow rate.
	ATC	6.9.8 Verify Primary Makeup Water Control Valve, PMU-144, intermediate <u>or</u> Open
	ATC	6.9.9 Observe Primary Makeup water flow rate for proper indication
	ATC	6.9.10 Operate VCT Inlet/Bypass to Holdup Tanks, CVC-169 Control Switch to BMS/Auto positions as necessary to maintain VCT pressure and level within normal operating bands.
	ATC	6.9.11 <u>When</u> Primary Makeup Water Batch Counter has counted down to desired value, <u>then</u> verify Primary Makeup Water Control Valve, PMU-144, Closed.
NOTE		
Step 6.9.12 may be repeated as necessary to achieve desired total Primary Makeup Water addition for plant conditions.		

Event Description: Dilute to raise power to 5-10% power.

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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		6.9.12 If additional Primary Makeup Water addition is required <u>and</u> with SM/CRS permission, <u>then</u> perform the following: 6.9.12.1 Reset Primary Makeup Water Batch Counter. 6.9.12.2 Verify Primary Makeup Water Control Valve, PMU-144, Intermediate <u>or</u> Open. 6.9.12.3 Observe Primary Makeup Water flow rate for proper indication. 6.9.12.4 <u>When</u> Primary Makeup Water Batch Counter has counted down to desired value, <u>then</u> verify Primary Makeup Water Control Valve, PMU-144, Closed.
	NOTE	The reactivity plan describes that additional PMU additions will be required. The SRO may or may not use this option. It is acceptable if the crew chooses to leave this aligned.
	ATC	6.9.13 Verify Primary Makeup Water Flow controller, PMU-IFIC-0210X, in Manual.
	ATC	6.9.14 Verify <u>both</u> Primary Makeup Water Flow controller, PMU-IFIC-0210X, output <u>and</u> setpoint potentiometer set to zero.
	ATC	6.9.15 Close VCT Makeup Valve, CVC-510.
	ATC	6.9.16 Place Makeup Mode selector switch to MANUAL.
	ATC	6.9.17 Verify VCT Inlet/Bypass To Holdup Tanks, CVC-169, aligned to the VCT <u>and</u> control switch in AUTO.

<p>Examiner Note</p> <p>This event is complete after the crew has added 50 gallons of Primary Makeup</p> <p style="text-align: center;">Or</p> <p>As directed by the Lead Evaluator</p> <p style="text-align: center;">Examiner Note</p> <p style="text-align: center;">Cue the Simulator Operator when ready for Event 2</p>

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 1 Event No.: 2 Page **5** of **29**

Event Description: PPS Channel D Containment Pressure Transmitter, CB-IPI-6701SMD, fails high

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC/BOP	Recognizes and reports indications of failed instrument.
		Alarms:
		<ul style="list-style-type: none"> • RPS CHANNEL TRIP CNTMT PRESSURE HI (Cabinet K, A-17) • CNTMT PRESSURE HI PRETRIP B/D (Cabinet K, C-17) • RPS CHANNEL D TROUBLE (Cabinet K, H-18) • ESFAS CHANNEL TRIP CNTMT PRESSURE HI (Cabinet K, L-17) • CNTMT PRESSURE HI ESFAS PRETRIP B/D (Cabinet K, N-17)
		Indications:
		<ul style="list-style-type: none"> • PPS Channel D Containment Pressure (CIAS), CB-IPI-6701SMD failed high on CP-7 • All other Containment Pressure instruments reading normal on CP-7 • Pretrip and Trip Bistable Lights illuminated for Containment Pressure HI CNT PRESS (RPS and ESF) on Channel D CP-7 ROM.
OP-009-007, Plant Protection System ,Section 6.2, Trip Channel Bypass Operation		
	(note)	All BOP manipulations for OP-009-007 are located at CP-10 (back panel) except as noted.
	SRO	6.2.1 Refer to Attachment 11.11, PPS Bistable Bypass Chart to assist in determination of Trip Channels requiring placement in bypass.
	(note)	SRO determines the following bistables are affected and need to be bypassed: <ul style="list-style-type: none"> • 13 - HI CNT PRESS (RPS) • 16 - HI CNT PRESS (SIAS/CIAS/MSIS)

Event Description: PPS Channel D Containment Pressure Transmitter, RC-IPI-6701SMD, fails high

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	SRO	Directs BOP to bypass the HI CNT PRESS (RPS) and HI CNT PRESS (SIAS/CIAS/MSIS) bistables in PPS Channel D within 1 hour in accordance with OP-009-007, Plant Protection System.
	BOP	6.2.2 To place a bistable in <u>or</u> remove a bistable from bypass, go to Attachment 11.10, Trip Channel Bypass Operation.
	BOP	CAUTION (1) ATTEMPTING TO PLACE MORE THAN ONE TRIP CHANNEL IN BYPASS REMOVES BOTH TRIP CHANNELS FROM BYPASS. (2) PRIOR TO PLACING ANY TRIP CHANNEL IN BYPASS, VERIFY BYPASS PUSH BUTTONS ON DE-ENERGIZED PPS BAY NOT DEPRESSED.
	BOP	11.10.1 To <u>Bypass</u> a Trip Channel, perform the following: 11.10.1.1 Circle the bistable numbers selected for bypass under Step 11.10.1.4.
	(note)	BOP circles bistable numbers 13 and 16 in Step 11.10.1.4 table
	BOP	11.10.1.2 Check desired Trip Channel is <u>not</u> Bypassed on another PPS Channel.
	BOP	11.10.1.3 Open key-locked portion of BCP in desired PPS Channel.
	BOP	11.10.1.4 Depress Bypass push buttons for the desired Trip Channels
	BOP	11.10.1.5 Check all selected bistable Bypass push buttons remain in a Depressed state.
	BOP	11.10.1.6 Check all selected bistable Bypass lights illuminate on BCP for the desired Trip Channels.
	CREW	11.10.1.7 Check all selected bistable Bypass lights illuminate on ROM for the desired Trip Channels.
	(note)	Crew verifies correct bistables lit on CP-7 PPS Channel D Remote Operator Module.

Event Description: PPS Channel D Containment Pressure Transmitter, RC-IPI-6701SMD, fails high

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	SRO	Reviews the following Technical Specifications and determines applicable actions: <ul style="list-style-type: none"> • 3.3.1 action 2 (Bypass w/in 1 hr) • 3.3.2 action 13 (Bypass w/in 1 hr)
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Examiner Note

This event is complete when bistables are bypassed and Technical Specifications have been addressed

OR

As directed by the Lead Evaluator

Examiner Note

Cue the Simulator Operator when ready for Event 3

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 1 Event No.: 3 Page **8** of **29**

Event Description: Pressurizer Level Control Channel RC-ILI-0110X fails low

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC / BOP	Recognize and report indications of Channel Failure
		Alarms
		<ul style="list-style-type: none"> • PRESSURIZER LEVEL HI/LO (Cabinet H, B-1) • PRESSURIZER LEVEL LO-LO (Cabinet H, C-1) • LETDOWN FLOW HI/LO (Cabinet G, C-1)
		Indications
		<ul style="list-style-type: none"> • PZR Level RC-ILR-0110-X fails downscale • All PZR Heaters OFF • All Charging Pumps running • Letdown Flow lowering • Actual PZR level RC-ILR-0110-Y rising
	Booth Cue	If directed as NAO to report power on LCP-43, wait 3 minutes and report channel RC-ILI-0110-X1 appears to be failed low.
	SRO	Enter and direct the implementation of OP-901-110, Pressurizer Level Control Malfunction.

OP-901-110, Pressurizer Level Control Malfunction, E₀, General Actions

	N/A	1. Stop Turbine load changes.
	N/A	2. <u>IF</u> malfunction is due to failure of Letdown Flow Control valve, <u>then go to</u> OP-901-112, CHARGING/LETDOWN MALFUNCTION.
	SRO	3. <u>IF</u> malfunction is due to failure of Pressurizer Level Control Channel (incorrect readings on <u>either</u> RC-ILI-0110X <u>or</u> RC-ILI-0110Y), <u>then go to</u> Subsection E ₁ , Pressurizer Level Control Channel Malfunction.

OP-901-110, Pressurizer Level Control Malfunction, E₁, Pressurizer Level Control Channel Malfunction

<u>O</u>T<u>E</u>		
Selecting the non-faulted channel may cause automatic actions to occur if actual level is not at program level.		
	ATC	1. Place Pressurizer Level Controller (RC-ILIC-0110) in MAN <u>and</u> adjust OUTPUT to slowly adjust letdown flow to restore Pressurizer level.

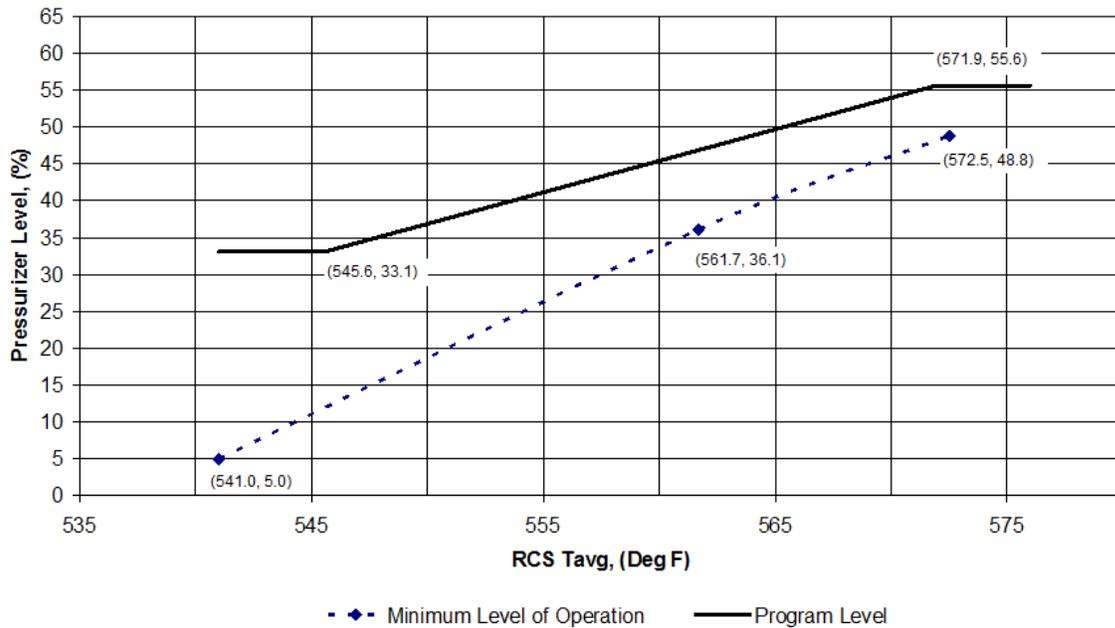
Event Description: Pressurizer Level Control Channel, RC-ILT-0110X, fails low

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC	2. Transfer Pressurizer Level Control CHANNEL SELECT switch to non-faulted channel.
	ATC	3. Transfer Pressurizer CHANNEL SELECT LO LEVEL HEATER CUTOFF switch to non-faulted channel.
	ATC	4. Verify desired backup Charging pumps in AUTO.
	ATC	5. Verify <u>all</u> PROPORTIONAL <u>and</u> BACKUP HEATER BANKS reset.
	ATC	6. Place Pressurizer Level Controller (RC-ILIC-0110) in AUTO <u>and</u> verify Pressurizer Level is being restored to setpoint.
	ATC	7. Verify Pressurizer level controlling at program setpoint in accordance with Attachment 1, Pressurizer Level Versus Tavg Curve.

Pressurizer Level vs. Tavg Curve



Event Description: Pressurizer Level Control Channel, RC-ILT-0110X,fails low

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	SRO	8. Refer to the following Technical Specifications for Operability determination. <ul style="list-style-type: none"> • 3.2.8, Power Distribution Systems, Pressurizer Pressure • 3.3.3.5, Instrumentation, Remote Shutdown Instrumentation • 3.3.3.6, Instrumentation, Accident Monitoring Instrumentation • 3.4.3.1, Reactor Coolant System, Pressurizer
	SRO	Reviews the following Technical Specifications and determines applicable actions: <ul style="list-style-type: none"> • 3.3.3.5 – action a

Examiner Note
This event is complete after the ATC has restored automatic Pressurizer level control and the SRO has evaluated Technical Specifications
OR
At Lead Examiner's Discretion

Examiner Note
Cue the Simulator Operator when ready for Event 4

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 1 Event No.: 4 Page **11** of **29**

Event Description: Turbine Cooling Water Pump A trips with no standby pump auto start

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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OP-901-512, Loss of Turbine Cooling Water		
	ATC / BOP	Recognize and report indications of Turbine Cooling water Pump A Trip
		Alarms
		<ul style="list-style-type: none"> • TURBINE CLNG WATER DISCH HDR PRESS LO (Cabinet E, E-9)
		<ul style="list-style-type: none"> • TURBINE CLNG WTR PUMP A TRIP/TROUBLE (Cabinet E, F-9)
		<ul style="list-style-type: none"> • HYDROGEN TEMPERATURE HI (Cabinet D, H-8)
		Indications
		<ul style="list-style-type: none"> • TCCW Pump A indication STOP and White Lights
		<ul style="list-style-type: none"> • TCCW Pump B indication STOP light
	SRO	Enter and direct the implementation of OP-901-512, Loss of Turbine Cooling Water.
<p>Examiner Note</p> <p>Annunciator response procedure OP-500-005 Panel E window F-9, includes instructions for manual start of a standby TCW Pump if it is available. The SRO could direct the BOP to start TCW Pump B from the ARP prior to entering OP-901-512.</p>		
OP-901-512, Loss of Turbine Cooling Water, E₀, General Actions		
	SRO	1. <u>If</u> loss of Turbine Cooling Water is due to loss of Turbine Cooling Water Pumps, <u>then</u> go to Subsection E1, Loss of Turbine Cooling Water Pumps.
OP-901-512, Loss of Turbine Cooling Water, E₁, Loss of Turbine Cooling Water Pumps		
	BOP	1. <u>If either</u> Turbine Cooling Water Pump is available, <u>then</u> attempt to start Turbine Cooling Water Pump to restore system flow.
	BOOTH	If dispatched to TCW Pump A or its breaker, report no abnormalities can be found. If directed to close the breaker, report breaker can not be closed.

Event Description: Turbine Cooling Water Pump A trips with no standby pump auto start

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	<p>2. If <u>any</u> of the following equipment is in operation, <u>then</u> monitor the associated Turbine Cooling Water temperatures <u>and</u> secure <u>any</u> unnecessary loads:</p> <ul style="list-style-type: none"> ▪ Condenser Vacuum Pumps ▪ Steam Generator Feed Pump Turbines ▪ Heater Drain Pumps ▪ Turbine EH System ▪ Condensate Pumps ▪ Main Turbine Lube Oil Coolers ▪ Generator Exciter Coolers ▪ Generator Hydrogen Coolers ▪ Instrument Air Compressors ▪ Station Air Compressors ▪ Stator Coil Water System ▪ Hydrogen Seal Oil Coolers ▪ Isophase Bus Coolers ▪ Hydrogen Dryers
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CAUTION

AT 100% POWER A TOTAL LOSS OF TURBINE COOLING WATER WILL RESULT IN SIGNIFICANT MAIN TURBINE DAMAGE IN 2-3 MINUTES WITH THE GENERATOR AS THE MOST LIMITING COMPONENT.

Examiner Note

Step 3 should not be applicable unless the crew fails to start TCCW Pump B.

	N/A	3. If <u>both</u> Turbine Cooling Water pumps are unavailable <u>and</u> flow can <u>not</u> be restored, <u>then</u> perform the following:
		<p>3.1 Manually trip the Reactor. 3.2 Verify Main Turbine tripped. 3.3 Go to OP-902-000, Standard Post Trip Actions, <u>and</u> perform concurrently with this procedure.</p>

Examiner Note

This event is complete after the BOP has started TCCW Pump B.

OR

At Lead Examiner's Discretion

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 1 Event No.: 5 Page **13** of **29**

Event Description: Excess Steam Demand Event SG#1 inside containment, Rx Trip

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC/BOP	Indications
		<ul style="list-style-type: none"> Reactor Power Rising CP-2, CP-7
		<ul style="list-style-type: none"> Lowering Steam Generator Pressure CP-1, CP-8
		<ul style="list-style-type: none"> Lowering Steam Generator Level CP-1, CP-8
		<ul style="list-style-type: none"> Lowering RCS temperatures Tavg, Th, Tc CP-2, CP-7
	SRO	Directs a manual reactor trip.
	(note)	<p>The SRO may also direct a manual actuation of SIAS and CIAS. If not the SRO should direct Emergency Boration per OP-901-103, Emergency Boration due to the uncontrolled cooldown. The following steps are applicable after the reactor is tripped and the crew is performing Standard Post Trip Actions.</p>

Emergency Boration steps:

	ATC	1. If Charging is available, <u>then</u> perform the following:
	ATC	1.1 Place Makeup Mode selector switch to MANUAL.
	ATC	1.2 Align borated water source by performing <u>one</u> of the following (a <u>or</u> b):
		<p>a. Initiate Emergency Boration using Boric Acid Pump as follows:</p> <ul style="list-style-type: none"> Open Emergency Boration Valve, BAM-133. Start <u>one</u> Boric Acid Pump. Close recirc valve for Boric Acid Pump started: <ul style="list-style-type: none"> BAM-126A Boric Acid Makeup Pump Recirc Valve A <u>or</u> <ul style="list-style-type: none"> BAM-126B Boric Acid Makeup Pump Recirc Valve B
		<u>OR</u>

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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		b. Initiate Emergency Boration using Gravity Feed as follows: <ul style="list-style-type: none"> • Open the following Boric Acid Makeup Gravity Feed valves: <ul style="list-style-type: none"> • BAM-113A Boric Acid Makeup Gravity Feed Valve A • BAM-113B Boric Acid Makeup Gravity Feed Valve B
	ATC	1.3 Close VCT Disch Valve, CVC-183.
	ATC	1.4 Verify at least one Charging Pump operating and Charging Header flow greater than or equal to 40 GPM.
OP-902-000, Standard Post Trip Actions (SPTAs)		
	ATC	1. <u>Determine</u> Reactivity Control acceptance criteria are met: <ol style="list-style-type: none"> a. <u>Check</u> reactor power is dropping. b. <u>Check</u> startup rate is negative. c. <u>Check</u> less than TWO CEAs are NOT fully inserted.
	BOP	2. <u>Verify</u> Main Turbine and Generator tripped: <ol style="list-style-type: none"> a. <u>Check</u> the Main Turbine is tripped: <ul style="list-style-type: none"> • Governor valves closed • Throttle valves closed • Turbine Speed lowering
	BOP	b. <u>Check</u> the Main Generator is tripped: <ul style="list-style-type: none"> • GENERATOR BREAKER A tripped • GENERATOR BREAKER B tripped • EXCITER FIELD BREAKER tripped

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	<p>3. <u>Verify</u> maintenance of Vital Auxiliaries</p> <p>a. <u>Check</u> station loads are energized from Off-site power as follows:</p> <p><u>Train A</u></p> <ul style="list-style-type: none"> • A1, Non-Safety bus • A2, Non-Safety bus • A3, Safety bus • A-DC Electrical bus • A and C Vital AC Instrument Channels <p><u>Train B</u></p> <ul style="list-style-type: none"> • B1, Non-Safety bus • B2, Non-Safety bus • B3, Safety bus • B-DC Electrical bus • B and D Vital AC Instrument Channels <p>b. <u>Verify</u> CCW flow to RCPs</p>
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<u>CRITICAL TASK 1</u>		
Trip RCPs Upon Loss of CCW		
This task is satisfied by stopping RCPs within 3 minutes of a loss of CCW to the RCP Seal Coolers.		
This task becomes applicable after Containment pressure rises to 17.7 psia and a CSAS is generated.		

	ATC	b.1 IF CCW flow is lost to RCPs, AND is NOT restored within 3 minutes, THEN <u>stop</u> the affected RCPs.
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	ATC	<p>4. <u>Verify</u> RCS Inventory Control:</p> <p>a. <u>Check</u> that BOTH of the following conditions exist:</p> <ul style="list-style-type: none"> • Pressurizer level is 7% to 60% • Pressurizer level is trending to 33% to 60% <p>b. <u>Check</u> RCS subcooling is greater than or equal to 28°F.</p>
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Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC	5. <u>Check</u> RCS Pressure control: <ul style="list-style-type: none"> • PZR pressure is 1750 psia to 2300 psia • PZR pressure is trending to 2125 psia to 2275 psia
	ATC	5.2 IF PZR pressure is less than 1684 psia, THEN <u>verify</u> BOTH of the following have initiated. <ul style="list-style-type: none"> • SIAS • CIAS
	ATC/BOP	CVC-401, CVC-109, IA-909, and FP-601A fail to close automatically on CIAS. (ATC: CVC-109,CVC-401) (BOP: IA-909, FP-601)
	ATC	5.3 IF PZR pressure is less than 1621 psia, THEN <u>verify</u> ONE RCP in each loop is stopped.
	ATC	5.4 IF PZR pressure is less than the minimum RCP NPSH of Attachments 2A-B, "RCS Pressure and Temperature Limits," THEN <u>stop</u> ALL RCPs.
	ATC	6. <u>Check</u> Core Heat Removal: <ol style="list-style-type: none"> a. At least ONE RCP is operating. b. Operating loop ΔT less than 13°F. c. RCS subcooling greater than or equal to 28°F.
	BOP	7. <u>Verify</u> RCS Heat Removal: <ol style="list-style-type: none"> a. <u>Check</u> that at least ONE SG has BOTH of the following: <ul style="list-style-type: none"> • SG level is 10% to 76% NR • Feedwater is available to restore level within 55%-70% NR.
	BOP	b. <u>Check</u> Feedwater Control in Reactor Trip Override: <ul style="list-style-type: none"> • MAIN FW REG valves are closed • STARTUP FW REG valves are 13% to 21% open Operating Main Feedwater pumps are 3800 rpm to 4000 rpm
	ATC	c. <u>Check</u> RCS Tc is 530 to 550°F.

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	<p>c.2 IF RCS TC is less than 530°F, THEN <u>perform</u> the following:</p> <ul style="list-style-type: none"> • <u>Control</u> SG steam and feed rates to minimize cooldown rate. • <u>Verify</u> Steam Bypass or ADVs are restoring RCS TC 530 to 550°F. • IF RCS TC is less than 380°F, THEN <u>verify</u> ONE RCP in each loop is stopped. • IF MSIS has actuated AND cooldown terminates, THEN <u>stabilize</u> RCS temperature using ADVs. • IF RCS TC is being controlled by an ESD, THEN <u>stabilize</u> RCS temperature with the least affected SG using Appendix 13, "Stabilize RCS Temperature."
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OP-902-009, Standard Appendices, Appendix 13 Stabilize RCS Temperature

Note

Actions to stabilize RCS temperature following an excess steam demand event should be initiated when **BOTH** of the following parameters are met:

- CET temperatures rise
- Pressurizer pressure rise

	BOP	<p>1. For the LEAST AFFECTED SG:</p> <ol style="list-style-type: none"> a. <u>Place</u> the ADV to manual and fully open ADV. b. Manually <u>initiate</u> EFAS. c. <u>Place</u> the EFW Flow Control valve to manual and <u>commence</u> feeding. d. <u>Perform</u> ANY of the following as necessary to establish RCS pressure and temperature control: <ul style="list-style-type: none"> • <u>Throttle</u> associated SG ADV. • <u>Adjust</u> associated SG EFW flow.
	ATC/BOP	<p>2. IF RCS pressure is greater than or equal to 1500 psia, THEN <u>stabilize</u> RCS pressure at a value not to exceed 1600 psid between the RCS and the lowest SG pressure.</p>
	ATC/BOP	<p>3. IF RCS pressure is less than 1500 psia, THEN <u>stabilize</u> RCS pressure at greater than HPSI shutoff head (1500 - 1600 psia).</p>
	BOP	<p>2. Manually initiate EFAS for the least affected Steam Generator.</p>

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	3. Place the EFW Flow Control Valve to manual and commence feeding the least affected Steam Generator.
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CRITICAL TASK 2		
Establish RCS Pressure Control		
<p>This task is satisfied by manual actions to prevent lifting of the Pressurizer Safety Valves by performing any of the following: securing pressurizer heaters, reducing charging flow, raising letdown flow, manually initiating spray flow, or raising secondary steaming rate.</p>		
<p>This task becomes applicable once the affected Steam Generator is empty and RCS pressure and CET begin to rise.</p>		

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	BOP	4. IF RCS pressure is greater than or equal to 1500 psia, THEN stabilize RCS pressure at a value not to exceed 1600 psid between the RCS and the lowest SG pressure.
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	BOP	5. IF RCS pressure is less than 1500 psia, THEN stabilize RCS pressure at greater than HPSI shutoff head (1500-1600 psia).
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	ATC/BOP	<p>*4. IF HPSI pumps are operating, AND ALL of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • RCS subcooling is greater than or equal to 28°F • PZR level is greater than 7% [23%] and controlled • At least ONE Steam Generator level is being maintained or restored to within ANY of the following: <ul style="list-style-type: none"> ○ 55 to 70% NR [60-80% NR] using MFW ○ 55 to 70% NR [60-80% NR] using EFW in auto or manual • RVLMS indicates level higher than Hot Leg by at least ONE of the following: <ul style="list-style-type: none"> ○ QSPDS REACTOR VESSEL LEVEL 5 NOT voided ○ VESSEL LEVEL PLENUM greater than or equal to 80% <p>THEN perform ANY of the following:</p> <ul style="list-style-type: none"> • Throttle HPSI flow. • <u>Stop</u> ONE HPSI pump at a time.
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Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	d. <u>Check</u> Steam Generator pressure is 885 to 1040 psia.
	BOP	d.1 IF SG pressure less than or equal to 666 psia, THEN <u>verify</u> MSIS is initiated. d.2 IF SG pressure less than 885 psia, THEN <u>perform</u> ALL of the following: 1) <u>Verify</u> Steam Bypass valves are closed. 2) <u>Verify</u> ADVs are closed. d.3 IF SG pressure greater than to 1040 psia, THEN <u>verify</u> that Steam Bypass or ADVs are restoring SG pressure to less than 1040 psia.
	BOP	e. <u>Reset</u> Moisture Separator reheaters, and <u>check</u> the Temperature Control valves closed.
	ATC	8. <u>Verify</u> Containment Isolation: a. <u>Check</u> containment pressure is less than 16.4 psia. b. <u>Check</u> NO containment area radiation monitor alarms OR unexplained rise in activity. c. <u>Check</u> NO steam plant activity monitor alarms OR unexplained rise in activity.
	ATC	a.1 IF CNTMT pressure is greater than or equal to 17.1 psia, THEN <u>verify</u> ALL of the following: • CIAS is initiated • SIAS is initiated • MSIS is initiated
	BOP	9 <u>Verify</u> Containment Temperature and Pressure Control: a. <u>Check</u> Containment temperature is less than or equal to 120°F. b. <u>Check</u> Containment pressure is less than 16.4 psia.
	BOP	9.1 <u>Verify</u> at least three Containment Fan Coolers are operating.

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	9.2 IF Containment pressure is greater than or equal to 17.1 psia, THEN <u>verify</u> ALL available Containment Fan Coolers are operating in emergency mode.
	BOP	9.3 IF Containment pressure is greater than or equal to 17.7 psia, THEN <u>verify</u> ALL of the following: <ul style="list-style-type: none"> • CSAS is initiated • ALL available Containment Spray pumps are delivering flow greater than 1750 gpm • ALL RCPs are stopped
	CRS	10. <u>GO TO</u> Appendix 1, "Diagnostic Flowchart" and diagnose to appropriate EOP.

OP-902-009, Standard Appendices, Appendix 1 Diagnostic Flow Chart

Examiner Note

Appendix 1 is a flow chart used to diagnose to the correct recovery procedure for the event in progress. The steps below will be followed by a YES or NO to indicate proper flow path.

	ATC	Is Reactivity Control met? (Note 1) (YES)
	BOP	Is at least ONE 125 VDC SAFETY bus energized? (YES)
	BOP	Is at least ONE 4.16 KV NON-SAFETY bus energized? (YES)
	BOP	Is at least ONE 4.16 KV SAFETY bus energized? (YES)
	ATC	Is at least ONE RCP running? (NO)
	SRO	Consider LOOP/LOFC OP-902-003
	BOP	Does at least ONE SG have adequate FW? (Note 2) (YES)
	ATC	Is PZR pressure >1750 psia AND stable or rising? (NO)
	ATC	Is RCS Subcooling < 28°F AND stable or lowering? (NO)
	BOP	Are BOTH SG pressures > 885 psia AND stable or rising? (NO)

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	SRO	Consider ESD OP-902-004
	BOP	Is CNTMT pressure < 16.4 psia AND stable or lowering? (NO)
	ATC	Are CNTMT Rad monitor(s) in alarm or unexplained rise? (NO)
	SRO	Consider ESD OP-902-004
	ATC	Is SGTR Indicated (Note 3) (NO)
	BOP	Are BOTH SG pressures > 885 psia AND stable or rising? (Note 5) (NO)
	SRO	Consider ESD OP-902-004
	SRO	Are ALL acceptance criteria satisfied? (NO)
	SRO	Has ANY event been diagnosed? (YES)
	SRO	Can a single event be diagnosed? (Note 4) (YES)
	SRO	GO TO Appropriate EOP
	Note	SRO goes to OP-902-004, Excess Steam Demand Recovery

OP-902-004, Excess Steam Demand Recovery

Examiner Note

CS Pump A trip is the next event. The SRO may pull up step 27 to override and close CS-125A using Attachment 21-A.

The SRO may pull up step 18 to stabilize RCS temperature depending on plant conditions. Step 16 contains actions to isolate Steam Generator #1; step 20 contains HPSI throttle criteria.

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Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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NOTE

The Shift Chemist should be notified if a SIAS or CIAS has occurred. The secondary sampling containment isolation valves should not be opened following a SIAS or CIAS until directed by the Shift Chemist.

	SRO/STA	*1. <u>Confirm</u> diagnosis of an ESD: a. <u>Monitor</u> the SFSCs and <u>check</u> Safety Function Status Check Acceptance criteria are satisfied. b. IF Steam Generator sample path is available, THEN <u>direct</u> Chemistry to sample BOTH Steam Generators for activity.
	Booth Cue	If Chemistry is called to perform samples acknowledge the request.
	Crew	*2. <u>Announce</u> an Excess Steam Demand is in progress using the plant page.
	SRO	*3. <u>Advise</u> the Shift Manager to implement the Emergency Plan using EP-001-001, "Recognition & Classification of Emergency Condition".
	SRO	*4. <u>REFER TO</u> Section 6.0, "Placekeeper" and <u>record</u> the time of the reactor trip.
	N/A	*5. IF power has been interrupted to either 3A or 3B Safety bus, THEN <u>perform</u> Appendix 20, "Operation of DCT Sump Pumps."
	ATC/BOP	* 6. <u>Check</u> SIAS has actuated.
	ATC/BOP	6.1 IF PZR pressure is less than 1684 psia, OR CNTMT pressure greater than or equal to 17.1 psia, THEN <u>verify</u> SIAS has initiated.

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC/BOP	<p>* 7. IF SIAS has actuated, THEN <u>perform</u> the following:</p> <ol style="list-style-type: none"> a. <u>Verify</u> Safety Injection pumps have started. b. <u>Check</u> Safety Injection flow is within BOTH of the following: <ul style="list-style-type: none"> o Attachment 2-E, "HPSI Flow Curve" o Attachment 2-F, "LPSI Flow Curve" c. <u>Verify</u> ALL available Charging pumps are operating. d. IF RWSP on Purification, THEN <u>isolate</u> RWSP using Appendix 40 "Isolate RWSP from Purification."
	BOP	8. <u>Verify</u> MSIS Actuation.
	N/A	<p>* 9. IF PZR pressure is less than 1621 psia, AND SIAS is actuated, THEN <u>perform</u> the following:</p> <ol style="list-style-type: none"> a. <u>Verify</u> ONE RCP in each loop is stopped. b. <u>Check</u> Pressurizer pressure is greater than the minimum RCP NPSH of Attachment 2A-D, "RCS Pressure and Temperature Limits."
	N/A	<p>* 10. IF RCPs are operating, THEN <u>perform</u> the following:</p> <ol style="list-style-type: none"> a. <u>Verify</u> CCW available to RCPs. b. IF a CSAS is initiated, THEN <u>stop</u> ALL RCPs. c. IF RCS TC is less than 380°F [384°F], THEN <u>verify</u> ONE RCP in each loop is stopped. d. <u>Check</u> RCP operating parameters: <ul style="list-style-type: none"> • NPSH, <u>REFER TO</u> Attachment 2A-D, "RCS P-T Limits" • Bearing temperatures less than or equal to 225°F • Bleed Off temperature less than 200°F • Cooling Coils Return CCW temp less than 155°F • At Least Two Seals per RCP operable
	BOP	<p>*11. <u>Perform</u> BOTH of the following to protect the Main condenser:</p> <ul style="list-style-type: none"> • <u>Verify</u> CW System in operation. <u>REFER TO</u> OP-003-006, "Circulating Water." • <u>Check</u> Condenser vacuum greater than 14 inches Hg.

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	* 12. <u>Check</u> CCW operation: a. <u>Check</u> a CCW pump is operating for EACH energized 4.16 KV Safety bus: <ul style="list-style-type: none"> • 3A Safety bus • 3B Safety bus
	N/A	b. IF only ONE CCW pump operating, THEN <u>split</u> CCW headers using Appendix 35, "Single CCW Pump Operation."
	BOP	c. <u>Check</u> an Essential chiller is operating for EACH energized 4.16 KV Safety bus: <ul style="list-style-type: none"> • 3A Safety bus • 3B Safety bus
	Crew	*13. <u>Check</u> ESD break flow is still in progress.
	ATC/BOP	* 14. <u>Determine</u> the MOST AFFECTED SG by considering ALL of the following: <ul style="list-style-type: none"> • High steam flow from SG • Dropping SG pressure • Dropping SG level • Dropping RCS Cold Leg temperature
	N/A	*15. IF BOTH SGs are equally affected, AND suspect that the break is in the EFW Pump AB Steam Supply line, THEN <u>perform</u> the following:
		* 16. Isolate the MOST AFFECTED SG as follows:
	BOP	a. <u>Verify</u> MS 124A, MSIV 1 is closed.
	BOP	b. <u>Verify</u> FW 184A, MFIV 1 is closed.
	BOP	c. <u>Verify</u> MS 116A, ADV 1 is closed and the controller in manual.

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	d. <u>Verify</u> EFW Isolation valves are closed: <ul style="list-style-type: none"> • EFW 228A, SG 1 PRIMARY • EFW 229A, SG 1 BACKUP
	BOP	e. <u>Place</u> EFW FLOW CONTROL valves in MAN and THEN close: <ul style="list-style-type: none"> • EFW 224A, SG 1 PRIMARY • EFW 223A, SG 1 BACKUP
	BOP	f. <u>Close</u> MS 401A, PUMP AB TURB STM SUPPLY SG 1.
	BOP	g. <u>Close</u> Main Steam Line Drains: <ul style="list-style-type: none"> • MS 120A, NORMAL • MS 119A, BYPASS
	BOP	h. <u>Verify</u> SG Blowdown Isolation valves are closed: <ul style="list-style-type: none"> • BD 103A, STM GEN 1 (OUT) • BD 102A, STM GEN 1 (IN)
	NAO	i. <u>Check</u> SG1 West Side Main Steam Safety valves are closed.
	Note	The crew should direct an NAO to locally verify the MS safety valves closed.
	ATC/BOP	* 17. <u>Verify</u> the most affected SG is isolated by evaluating ALL of the following: <ul style="list-style-type: none"> • SG pressures • SG levels • RCS Cold Leg temperatures

NOTE

Actions to stabilize RCS temperature following an excess steam demand event should be initiated when **BOTH** of the following parameters are met:

- CET temperatures rise
- Pressurizer pressure rise

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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Examiner Note Least affected SG is #2		
	BOP	* 18. <u>Stabilize</u> RCS temperature within PT Curves by performing the following:
	BOP	a. For the LEAST AFFECTED SG: 1) <u>Place</u> the ADV to manual and fully open ADV.
	BOP	2) Manually <u>initiate</u> EFAS.
	BOP	3) <u>Place</u> the EFW Flow Control valve to manual and <u>commence</u> feeding.
	BOP	4) <u>Perform</u> ANY of the following as necessary to establish RCS pressure and temperature control: <ul style="list-style-type: none"> • <u>Throttle</u> associated SG ADV. • <u>Adjust</u> associated SG EFW flow.
	ATC/BOP	b. IF RCS pressure is greater than or equal to 1500 psia, THEN <u>stabilize</u> RCS pressure at a value not to exceed 1600 psid between the RCS and the lowest SG pressure.
	ATC/BOP	b.1 IF RCS pressure is less than 1500 psia, THEN <u>stabilize</u> RCS pressure at greater than HPSI shutoff head (1500 - 1600 psia).
	ATC/BOP	c. <u>REFER TO</u> Step 20, HPSI Throttle Criteria.
	N/A	*19. IF ESD isolated by MSIS, THEN <u>stabilize</u> RCS temperature within PT Curves by performing the following:

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC/BOP	<p>*20. IF HPSI pumps are operating, AND ALL of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • RCS subcooling is greater than or equal to 28°F • PZR level is greater than 7% [23%] and controlled • <u>Verify</u> at least ONE SG is available for RCS heat removal and level is being maintained or restored to within 55 to 70% NR [60 to 80% NR] using EFW in auto or manual. • RVLMS indicates level higher than Hot Leg by at least ONE of the following: <ul style="list-style-type: none"> ○ QSPDS REACTOR VESSEL LEVEL 5 NOT voided ○ VESSEL LEVEL PLENUM greater than or equal to 80% <p>THEN <u>perform</u> ANY of the following:</p> <ul style="list-style-type: none"> • <u>Throttle</u> HPSI flow. • <u>Stop</u> ONE HPSI pump at a time.
	BOP	<p>21. IF ANY of the HPSI throttle criteria can NOT be maintained, THEN <u>perform</u> the following:</p> <ol style="list-style-type: none"> a. <u>Raise</u> HPSI flow. b. <u>Start</u> HPSI pumps as necessary.
	BOP	<p>22. IF PZR pressure is greater than 200 psia, AND controlled, THEN <u>perform</u> the following:</p> <ol style="list-style-type: none"> a. <u>Stop</u> LPSI pumps. b. <u>Close</u> the LPSI Flow Control valves.
	BOP	<p>23. IF PZR pressure lowers to less than 200 psia, AND is NOT controlled, THEN <u>perform</u> the following:</p> <ol style="list-style-type: none"> a. <u>Start</u> LPSI pumps as necessary. b. <u>Open</u> the LPSI Flow Control valves.
	BOP	<p>24. <u>Verify</u> at least ONE SG is available AND ALL SGs used for steaming are being maintained or restored to within 55 to 70% NR [60 to 80%NR] using MFW or EFW in auto or manual.</p>

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	<p>*27. IF CNTMT pressure is greater than 17.7 psia, THEN <u>perform</u> the following:</p> <ul style="list-style-type: none"> a. <u>Check</u> CSAS is initiated. b. <u>Verify</u> ALL operating Containment Spray Pumps are delivering flow greater than 1750 gpm. <ul style="list-style-type: none"> b.1 IF ANY CS-125, Containment Spray Header Isolation is open, AND the associated CS Pump is NOT operating, THEN <u>close</u> the valve using Attachment 21-A, "CS-125 Override".
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OP-902-009, Attachment 21-A, CS-125 Override

	BOP	1. Override CS 125A, CNTMT Spray HDR A Isolation as follows"
	BOP	a. <u>Place</u> CNTMT Spray Pump A Control Switch to "OFF".
	BOP	b. <u>Obtain</u> key 76 from SM office.
	BOP	c. <u>Place</u> keyswitch, Containment Spray !@%A Override, to "OVERRIDE". (located on the side of Auxiliary Panel 1 +35 Relay Rm).
	BOP	d. <u>Place</u> CS 125A, CNTMT SPRAY HEADER A ISOL valve to "OPEN" and THEN to "CLOSE".

Examiner Note

This scenario is complete after Reactor Coolant System temperature and pressure have been stabilized and steps to isolate Steam Generator 1 have been taken.

OR

As directed by the Lead Evaluator.

Event Description: Excess Steam Demand Event SG#1 inside containment

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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Form 3.3-1 Scenario Outline

Facility:	Waterford 3	Scenario #:	2
Scenario Source:		Op. Test #:	1
Examiners:		Applicants/	
		Operators:	
Initial Conditions: 100% Power, EDG A OOS, PTED not available			
Turnover:			
Critical Tasks: CT-1: Manually trip the reactor; CT-2: Establish SI Flow			

Event No.	Malf. No.	Event Type*	Event Description
1	RC19C	I-BOP I-SRO TS-SRO	Safety Channel C RCS Cold Leg instrument RC-ITI-0112CC fails high requiring TS 3.3.1 entry and bypassing affected bistables.
2	CV30A2	C – ATC C – SRO	Letdown Flow Control Valve, CVC-113A, fails closed requiring entry into OP-901-112, Charging or Letdown Malfunction.
3	FW51A	TS – SRO	Condensate Storage Pool level instrument EFW-ILI-9013A fails low. (TS 3.3.3.5 action a, TS 3.3.3.6 action a and)
4	FW21A FW21AA	R- ATC R/N-BOP N-SRO	Lowering Main Condenser vacuum requiring implementation of OP-901-220, Loss of Condenser Vacuum and a plant power reduction in accordance with OP-901-212, Rapid Plant Power Reduction.
5	RP02A-D RC03C	C – ATC M – All	RCP 2A sustains a locked rotor and an automatic reactor trip does not occur. Manual action is needed to trip the reactor (Critical Task 1, manually trip the reactor)
6	SG01B	M – ALL	SGTR SG #2.
7	SI02A SI02B	C/MC – BOP	Both HPSI pumps fail to start requiring manual action (Critical Task 2, establish SI flow)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control

Scenario Quantitative Attributes

1. Malfunctions after EOP entry (1–2)	1
2. Abnormal events (2–4) [<i>Events 2 and 4 credited</i>]	2
3. Major transients (1–2)	2
4. EOPs entered/requiring substantive actions (1–2)	1
5. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0
6. Preidentified critical tasks (≥ 2)	2

The crew assumes the shift with the reactor at 100% power. Emergency Diesel Generator A is danger tagged out of service and the PTED is not available.

Event 1: Safety Channel C RCS Cold Leg instrument RC-ITI-0102CC (Loop T112C) fails high requiring TS 3.3.1 entry and bypassing affected bistables. The SRO should review and enter Technical Specification 3.3.1 Action 2 and bypass 3-HI LOCAL POWER and 4-LOW DNBR bistables within 1 hour in accordance with OP-009-007, Plant Protection System.

Event 2: The in-service Letdown flow control valve, CVC-113A, fails closed. The SRO should enter OP-901-112, Charging or Letdown Malfunction and implement Section E2, Letdown Malfunction, and place the backup flow control valve, CVC-113B, in-service. Manual control of letdown flow is required to restore letdown to service.

Event 3: Condensate Storage Pool level indicator EFW-ILI-9013 A will fail low. The SRO should use OP-903-013, Monthly channel Checks, and enter Tech Spec 3.3.3.5 action a and 3.3.3.6 action a..

Event 4: A leak in the Main Condenser develops and Main Condenser vacuum begins to drop. The SRO will enter OP-901-220, Loss of Condenser Vacuum. Main Condenser vacuum will drop below 25 inches, requiring a rapid plant power reduction. The SRO will enter OP-901-212, Rapid Plant Power Reduction. For the power reduction, the ATC will perform direct boration to the RCS as well as ASI control with CEAs and Pressurizer boron equalization. The BOP will manipulate the controls to reduce Main Turbine load. Vacuum will stabilize during the power reduction.

Event 5: Reactor Coolant Pump 2A rotor seizes and the RCP breaker trips. The Reactor Protection System fails to open the required Reactor Trip Breakers and an ATWS condition exists. The ATC should recognize that an automatic protection system has failed to occur and attempt to manually trip the reactor. Manual trip buttons on CP-2 (including Diverse Rx Trip) will trip the reactor. **(Critical Task 1)**

Event 6: After the reactor is tripped and during Standard Post Trip Actions, a Steam Generator tube rupture will occur on SG #2. The CRS should direct a manual Safety Injection (SIAS) and Containment Isolation (CIAS). The SRO should enter OP-902-007, Steam Generator Tube Rupture Recovery Procedure following diagnoses. The crew should perform a rapid RCS cooldown to < 520 °F and isolate Steam Generator #2.

Event 7: After the crew initiates SIAS, both HPSI Pumps will fail to autostart. The BOP should manually start the at least one HPSI Pump to meet SI flow requirements (**CRITICAL TASK 2**). Both pumps should be started once identified.

The scenario can be terminated once all CT's are complete () AND event 7 is completed or at the lead examiner's discretion.

Critical Task	Safety Significance	Cueing	Measurable Performance Indicator	Performance Feedback
<p>CT-1: Establish Reactivity Control</p> <p>This task is satisfied by manually tripping the Reactor by using the manual trip pushbuttons, Diverse Reactor trip pushbuttons, or by de-energizing busses 32A and 32B within 1 minute of exceeding a Plant Protection System (PPS) limit. This task becomes applicable following the trip of RCP 2A.</p>	<p>Failure to trip the Reactor when an automatic PPS signal has failed to actuate can lead to a degradation of fission product barriers. 1 minute is determined to be a reasonable time limit to identify and take action for satisfactory performance. OPS management standard documented in WTRN-OPS-CRITTASK.</p> <p>(WTRN-OPS-CRITTASK, CT-1)</p>	<p>RCP off light illuminated</p> <p>Trips and pre-trips on SG lo flow on CP-7</p> <p>All CEA rod bottom lights extinguished</p> <p>Procedurally driven from OP-902-000 step 1.a.1.1)</p>	<p>Depresses two Reactor Trip pushbuttons on CP-2 or CP-8 within 1 minute.</p>	<p>Reactor Trip breakers open</p> <p>All CEA rod bottom lights illuminated</p> <p>Reactor power lowering</p>
<p>CT-2: Establish Required Safety Injection Flow</p> <p>This task is satisfied by manually starting either High Pressure Safety Injection Pump such that HPSI flow curve is met within 15 minutes from the time that RCS Inventory Control Safety Function is not met.</p> <p>RCS Inventory Control Safety Function is not met at the time RCS pressure drops below 1450 psia (HPSI shutoff head).</p>	<p>Based on Emergency Operating Procedure Required flow. Failure to take action to maintain the core covered demonstrates a significant performance deficiency regarding the maintenance of the RCS inventory Control Safety Function and jeopardizes the Fuel clad fission product barrier. OPS management Standard documented in WTRN-OPS-CRITTASK.</p> <p>(WTRN-OPS-CRITTASK, CT-16)</p>	<p>HPSI Flow on CP-8 less than required</p> <p>HPSI Pump running light extinguished</p> <p>Procedurally driven from OP-902-007 step 7</p>	<p>Starts either HPSI Pump using control switch</p>	<p>Adequate HPSI Flow on CP-8 indicated</p> <p>HPSI Pump running light illuminated</p>

REFERENCES

Event	Procedures
1	OP-009-007, Plant Protection System, Rev. 20 OP-903-013, Monthly Channel Checks, Rev. 23 Technical Specifications 3.3.1, Rev. 366 OP-500-009, Ann. Response Procedure Cabinet K, Rev. 023
2	OP-901-112, Charging or Letdown Malfunction, Rev. 011 OP-500-007, Annun. Response Procedure Cabinet G, Rev 025
3	OP-903-013, Monthly Channel Checks, Rev. 18 Technical Specifications 3.3.3.5, 3.3.3.6, Rev. 366
4	OP-901-220, Loss of Condenser Vacuum, Rev. 306 OP-901-212, Rapid Plant Power Reduction, Rev. 20
5/6/7	OP-902-000, Standard Post Trip Actions, Rev. 17 OP-902-007, Steam Generator Tube Rupture, Rev. 18 OP-902-009, Standard Appendices, Rev. 323
GEN	EN-OP-115, Conduct of Operations, Rev. 31 EN-OP-115-08, Annunciator Response, Rev. 7 OI-038-000, EOP Operations Expectations / Guidance, Rev. 21 OP-100-017, EOP Implementation Guide, Rev 6

Event Description: Safety Ch. C RCS Cold Leg Temp fails high (RC-ITI-0102CC) (T112CC)
 Symptoms/Cues: Cabinet K RPS Channel C Annunciators, PPS Channel C Trip bistables lit

Time	Position	Applicant's Actions or Behavior
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	ATC	Alarms:
		RPS CHANNEL TRIP LOCAL PWR DENSITY HI (Cabinet K, A-11)
		RPS CHANNEL TRIP DNBR LO (Cabinet K, A-12)
		RPS CHANNEL C TROUBLE (Cabinet K, G-18)
		Indications:
		RC-ITI-0112CC, CP-7 Channel C Cold Leg Loop 1A indicator fails Hi
		Red "CPC SENS FAIL" light on CPC Ch C
		Trip indication Channel C HI LOCAL POWER bistable
		Trip indication Channel C HI LOW DNBR bistable
	Booth Cue	If sent to LCP-43, report all Cold Leg temperatures on LCP-43 read approximately 545F.

Examiner Note		
All BOP manipulations for OP-009-007 are located at CP-10 except as noted.		

OP-009-007, Plant Protection System ,Section 6.2, Trip Channel Bypass Operation		
	SRO	6.2.1 Refer to Attachment 11.11, PPS Bistable Bypass Chart to assist in determination of Trip Channels requiring placement in bypass.
	Note	SRO determines the following bistables are affected and need to be bypassed: <ul style="list-style-type: none"> • 3 - HI LOCAL POWER • 4 - LO DNBR
	BOP	6.2.2 To place a bistable in or remove a bistable from bypass, go to Attachment 11.10, Trip Channel Bypass Operation.

Event Description: Safety Ch. C RCS Cold Leg Temp fails high (RC-ITI-0102CC) (T112CC)
 Symptoms/Cues: Cabinet K RPS Channel C Annunciators, PPS Channel C Trip bistables lit

Time	Position	Applicant's Actions or Behavior
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OP-009-007, Plant Protection System ,Attachment 11.10, Trip Channel Bypass Operation		
<u>CAUTION</u>		
(1) ATTEMPTING TO PLACE MORE THAN ONE TRIP CHANNEL IN BYPASS REMOVES BOTH TRIP CHANNELS FROM BYPASS. (2) PRIOR TO PLACING ANY TRIP CHANNEL IN BYPASS, VERIFY BYPASS PUSH BUTTONS ON DE-ENERGIZED PPS BAY NOT DEPRESSED.		
	Note	BOP circles Channel C.
	BOP	11.10.1 To Bypass a Trip Channel, perform the following: 11.10.1.1 Circle the bistable numbers selected for bypass under Step 11.10.1.4.
	Note	BOP circles bistable numbers 3 and 4 in Step 11.10.1.4 table
	BOP	11.10.1.2 Check desired Trip Channel is <u>not</u> Bypassed on another PPS Channel.
	BOP	11.10.1.3 Open key-locked portion of BCP in desired PPS Channel.
	Note	The crew should expect annunciator RPS CABINET CONDITION ABNORMAL (Cabinet L, B-1) to actuate when the PPS Channel door is opened.
	BOP	11.10.1.4 Depress Bypass push buttons for the desired Trip Channels (placekeep below).
	Note	BOP depresses pushbuttons for bistables 3 and 4 using placekeeping table.
	Note	The crew should expect annunciator RPS BISTABLE BY-PASS (Cabinet K, B-18) to actuate when the first bistable is bypassed in the PPS Channel.
	BOP	11.10.1.5 Check all selected bistable Bypass push buttons remain in a Depressed state.
	BOP	11.10.1.6 Check all selected bistable Bypass lights Illuminate on BCP for the desired Trip Channels.

Event Description: Safety Ch. C RCS Cold Leg Temp fails high (RC-ITI-0102CC) (T112CC)
 Symptoms/Cues: Cabinet K RPS Channel C Annunciators, PPS Channel C Trip bistables lit

Time	Position	Applicant's Actions or Behavior
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	CREW	11.10.1.7 Check all selected bistable Bypass lights Illuminate on ROM for the desired Trip Channels.
	Note	Crew verifies correct bistables lit on CP-7 PPS Channel C Remote Operator Module.

TECH SPEC CALL

	SRO	Reviews the following Technical Specifications and determines applicable actions: <ul style="list-style-type: none"> • 3.3.1 action 2 (Bypass w/in 1 hr) and action 6 • 3.3.3.5 – Not applicable • 3.3.3.6 – Not applicable

Examiner Note

This event is complete when bistables are bypassed and Technical Specifications have been addressed or at Lead Examiner's Discretion.

Cue the Simulator Operator when ready for Event 2

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 2 Event No.: 2 Page **4** of **29**

Event Description: Letdown Flow Control Valve, CVC-113A, fails closed
 Symptoms/Cues: Letdown Flow Lo, Pressurizer level rise, VCT level lowering

Time	Position	Applicant's Actions or Behavior
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	ATC	Recognize and report indications of CVC-113 A failing closed.
		Alarms:
		LETDOWN FLOW HI/LO (Cabinet G, C-1)
		LETDOWN HX OUTLET PRESS LO (Cabinet G, B-2)
		Indications:
		Letdown flow goes to zero GPM with RC-IHIC-0110 output rising
		Backpressure drops with controller output lowering
		CVC-113 A goes from intermediate position indication to closed
		PZR level rising
	Booth Cue	If called, Work Week Manager or PMI reports a work package will be assembled and a team will be sent to the Control Room.
	SRO	Enter and direct the implementation of OP-901-112, Charging or Letdown Malfunction.
OP-901-112, Charging or Letdown Malfunction, E₀ – General		
	SRO	4. <u>IF</u> a Letdown Malfunction is indicated, <u>THEN</u> go to Subsection E2, Letdown Malfunction
OP-901-112, Charging or Letdown Malfunction, E₂ – LETDOWN MALFUNCTION		
ATC actions will be performed at CP-4		
	ATC	1. <u>IF</u> necessary, <u>THEN</u> maintain Pressurizer level by placing LETDOWN FLOW CONTROL VALVES controller (RC-IHIC-0110) in MAN, and control manually.
	Note	The SRO may choose to direct this or not. Manipulation of this controller at this time will not impact Pressurizer level, but will aid in the restoration of Letdown flow.

Event Description: Letdown Flow Control Valve, CVC-113A, fails closed
 Symptoms/Cues: Letdown Flow Lo, Pressurizer level rise, VCT level lowering

Time	Position	Applicant's Actions or Behavior
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	ATC	<p style="text-align: center;">NOTE</p> <p>If all Charging Pumps are secured, <u>then</u> LETDOWN STOP VALVE (CVC 101) will close on high REGEN HX TUBE OUTLET temperature if RCS is $\geq 470^{\circ}\text{F}$.</p>
	ATC	2. Operate Charging Pumps as necessary to maintain or restore Pressurizer level above the minimum level for operation in accordance with Attachment 1, Pressurizer Level Versus Tave Curve.
	ATC	3. <u>IF</u> normal Charging flow can <u>NOT</u> be established <u>AND</u> Pressurizer level falls below the minimum level for operation of Attachment 1, <u>THEN</u> perform the following...
	Note	Charging flow will not be affected by this valve failure.
	N/A	4. <u>IF</u> a leak exists in Letdown System, <u>THEN</u> attempt to locate <u>AND</u> isolate leak.
	N/A	5. <u>IF</u> leak has been isolated, <u>THEN</u> re-establish Letdown in accordance with Attachment 2.
	ATC	6. <u>IF</u> the in service Letdown Flow Control valve (CVC 113A) <u>OR</u> (CVC 113B) is <u>NOT</u> controlling, <u>THEN</u> place standby Letdown Flow Control valve in service as follows:
	ATC	<p style="text-align: center;">NOTE</p> <p>(1) To minimize thermal transients in the system, Letdown and Charging flows should be started as close together as possible.</p> <p>(2) When restoring Letdown, if Letdown Flow is too high Pressurizer Level will lower below program level, and the backup Charging Pump may automatically start.</p>
	ATC	6.1 <u>IF</u> restoring Letdown, <u>THEN</u> verify at least one charging pump in operation.

Event Description: Letdown Flow Control Valve, CVC-113A, fails closed
 Symptoms/Cues: Letdown Flow Lo, Pressurizer level rise, VCT level lowering

Time	Position	Applicant's Actions or Behavior
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	ATC	6.2 <u>IF</u> necessary to maintain Letdown Backpressure, <u>THEN</u> Letdown Backpressure Controller (CVC-IPIC-0201) may be controlled in MAN.
	Note	The SRO may choose to direct this or not. Manipulation of this controller at this time will not impact Pressurizer level, but will aid in the restoration of Letdown flow.
	ATC	6.3 Place Letdown Flow Control Valve Selector switch to BOTH.
	ATC	6.4 Verify open standby Letdown Flow Cntrl Vlv B Outlet Isolation CVC-114B.
	Note	Directed to field operator – RCA Watch
	ATC	6.5 Slowly open standby Letdown Flow Control Valve Inlet Isolation CVC-111B.
	Note	Directed to field operator – RCA Watch
	ATC	6.6 Slowly close in service Letdown Flow Control Valve Inlet Isolation CVC 111A.
	Note	Directed to field operator – RCA Watch
	ATC	6.7 Close in service Letdown Flow Cntrl Vlv A Outlet Isolation CVC 114A.
	Note	Directed to field operator – RCA Watch
	ATC	6.8 Position Letdown Flow Control Valve Selector switch to select operable flow control valve placed in service.
	ATC	6.9 <u>IF</u> letdown is still in service and Letdown Flow Control valve operates properly, <u>THEN</u> place Letdown Flow Controller (RC-IHIC-0110) in Auto.
	ATC	6.10 <u>IF</u> unable to maintain Pressurizer level with EITHER Letdown Flow Control valve, <u>THEN</u> perform the following: 6.10.1 Close Letdown Stop Valve (CVC 101). 6.10.2 Operate Charging Pumps as necessary to maintain or restore Pressurizer level above the minimum level for operation in accordance with Attachment 1, Pressurizer Level Versus Tave Curve.

Event Description: Letdown Flow Control Valve, CVC-113A, fails closed
 Symptoms/Cues: Letdown Flow Lo, Pressurizer level rise, VCT level lowering

Time	Position	Applicant's Actions or Behavior
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	N/A	7. <u>IF</u> Letdown Backpressure Controller (CVC-IPIC-0201) is NOT operating properly, <u>THEN</u> perform the following:
	N/A	8. <u>IF</u> the in service Letdown Backpressure Control valve (CVC 123A) OR (CVC 123B) is NOT operating properly, <u>THEN</u> place standby Letdown Backpressure Control valve in service as follows:
		9. Locally monitor the following differential pressure indications: <ul style="list-style-type: none"> • Purification Ion Exchanger A DP (CVC-IDPI-0207) • Purification Ion Exchanger B DP (CVC-IDPI-0205) • Deborating Ion Exchanger DP (CVC-IDPI-0203) • Purification Filter DP (CVC-IDPI-0202) • Letdown Strainer DP (CVC-IDPI-0204)
	Note	Directed to field operator – RCA Watch
	ATC	10. <u>IF</u> a high ion exchanger <u>OR</u> filter differential pressure is indicated, <u>THEN</u> remove affected component from service in accordance with OP-002-005, CHEMICAL AND VOLUME CONTROL.
	ATC	11. <u>IF</u> the LETDOWN FLOW CONTROL VALVES controller (RC-IHIC-0110) has been placed in manual to control pressurizer level, <u>THEN</u> match controller process with its output and place in AUTO.
	ATC	12. At SM/CRS discretion, restore the Letdown Backpressure Controller (CVC-IPIC-0201) to AUTO.
	ATC	13. <u>IF</u> Letdown has been secured <u>AND</u> malfunctions have been corrected, <u>THEN</u> restore Charging and Letdown in accordance with Attachment 2.
	SRO	14. <u>IF</u> Letdown flow can <u>NOT</u> be established <u>AND</u> repairs require a Plant shutdown <u>AND</u> cooldown, <u>THEN</u> go to OP-010-005, PLANT SHUTDOWN.

Examiner Note

This event is complete when Letdown is in service with the Letdown and Backpressure controllers at CP-4 in automatic Or As directed by the Lead Evaluator.

Examiner Note

Cue the Simulator Operator when ready for Event 3.

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 2 Event No.: 3 Page **8** of **29**

Event Description:
Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	Recognize and report indications of failed instrument.
		Alarms:
		<ul style="list-style-type: none"> CONDENSATE STORAGE POOL LEVEL HI/LO (Cabinet M, A-1) CONDENSATE STORAGE POOL LEVEL LO-LO (Cabinet M, B-1)
		Indications
		<ul style="list-style-type: none"> EFW-ILI-9013A Level indicator on CP-8 fails low EFW-ILR-9013A Level recorder on CP-8 fails low
	Crew	Dispatch NAO to the Remote Shutdown Panel to investigate failed indicator.
	Booth Cue	If called, NAO reports Condensate Storage Pool Level instrument EFW-ILI-9013 A1 is reading 0% and EFW-ILI-9013B1 is approximately 98%.
	Booth Cue	If called, Work Week Manager or PMI reports a work package will be assembled and a team will be sent to the Control Room.
TECH SPEC CALL		
	SRO	Review Tech Specs based on the failed instrument.
		<ul style="list-style-type: none"> Tech Spec review will require use of Tech Spec 3.3.3.5, 3.3.3.6, and OP-903-013, Monthly Channel Checks. Enter Tech Spec 3.3.3.5 action a (Restore w/in 7 days or Shutdown) Enter Tech Spec 3.3.3.6 action 29 (Restore w/in 30 days or submit special report)
Examiner Note		
This event is complete when the SRO has evaluated Technical Specifications or at Lead Examiner's Discretion.		
Examiner Note		
Cue the Simulator Operator when ready for Event 4		

Event Description: Lowering Main Condenser Vacuum, Plant Power Reduction
 Symptoms/Cues: Condenser Vacuum Alarms, All Condenser Vac Pumps Running

Time	Position	Applicant's Actions or Behavior
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	ATC / BOP	Recognize and report indications of lowering Main Condenser Vacuum
		Alarms
		<ul style="list-style-type: none"> • Vacuum Pump A Auto Start (Cabinet E, E-1)
		<ul style="list-style-type: none"> • Vacuum Pump B Auto Start (Cabinet E, E-2)
		<ul style="list-style-type: none"> • Vacuum Pump C Auto Start (Cabinet E, E-3)
		Indications
		<ul style="list-style-type: none"> • Main Generator MW lowering • Condenser Vacuum dropping on any of the following: <ul style="list-style-type: none"> ○ PMC alarms A01103 and A10203 ○ Wide Range Condenser Vacuum (CD-IPI-1902-B2) ○ Narrow Range Condenser Vacuum (CD-IPI-1901-B) ○ Condenser Vacuum recorder (CD-IPR-1902-A)
		<ul style="list-style-type: none"> • At 26 INHG, standby Condenser Vacuum Pump(s) start
	SRO	Enter and direct the implementation of OP-901-220, Loss of Condenser Vacuum.
OP-901-220, Loss of Condenser Vacuum		
	SRO	1. Notify appropriate personnel that Condenser vacuum is dropping.
	Booth Cue	If called as TGB watch report all Air Evacuation Pumps look normal, Vacuum pump separators are greater than ½ full and there are no indications of a leak. Approximately 5 minutes after being called to investigate, TGB watch should report finding a non-isolable leak upstream of AE-401 A, Condenser Vacuum Breaker A.
	N/A	2. <u>If Reactor trip occurs, then perform OP-902-000, Standard Post Trip Actions, concurrently with this procedure.</u>
<u>NOTE</u>		
Normally, Circulating Water pumps should not be operated with intake bay river water level less than 0.00 Ft (at -0.7 Ft, consideration should be given to securing the Circulating Water pump) or operating current greater than 350 amps as noted on PMC.		

Event Description: Lowering Main Condenser Vacuum, Plant Power Reduction
 Symptoms/Cues: Condenser Vacuum Alarms, All Condenser Vac Pumps Running

Time	Position	Applicant's Actions or Behavior
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	SRO/BOP	<p>3. Verify the following:</p> <ul style="list-style-type: none"> • Sufficient number of Circulating Water Pumps are in operation. • Verify the discharge valves closed for all non-running Circulating Water Pumps. • <u>All</u> operable Condenser Vacuum Pumps are in operation. • <u>All</u> operating Condenser Vacuum Pumps Air Separator sight-glasses are greater than half full of water. • Gland Seal header pressure is maintained between 100 and 140 psig. • Gland Seal pressure being maintained between as follows: <ul style="list-style-type: none"> ○ Between 1.3 to 3.0 PSIG for LP Turbine ○ Between 2.0 to 8.0 PSIG for HP Turbine ○ Between 2.6 to 5.6 PSIG for Main Feedwater Pumps • Hotwell Transfer pump in operation. • Condenser Vacuum Breaker Seals are full of water.
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NOTE

- (1) Condenser Air Evacuation System is designed to maintain a minimum 25" Hg vacuum at full turbine load. If system is unable to maintain greater than 25" Hg vacuum, then excessive air in-leakage may exist. Refer to UNT-005-042, Determination of Main Condenser Air In-leakage, for assistance.
- (2) With the Main Turbine online, power reduction should continue until Condenser vacuum is restored to >26" Hg vacuum.

	SRO	<p>4. <u>If</u> Plant Power is $\geq 35\%$, <u>and</u> the Main Turbine online, <u>then</u> perform the following:</p> <p>4.1 <u>If</u> Condenser vacuum lowers below 26" Hg vacuum, <u>then</u> commence Plant power reduction in accordance with OP-901-212, Rapid Down Power.</p> <p>4.2 <u>If</u> Condenser vacuum has <u>not</u> stabilized, <u>and</u> lowers tto a value of 24.5" Hg vacuum, <u>then</u> perform the following:</p> <ul style="list-style-type: none"> ○ Trip the Reactor. ○ Verify Turbine Trip.
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	Note	Vacuum will stabilize between 25 and 25.5 INHG prompting a rapid plant power reduction.
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Event Description: Lowering Main Condenser Vacuum, Plant Power Reduction
 Symptoms/Cues: Condenser Vacuum Alarms, All Condenser Vac Pumps Running

Time	Position	Applicant's Actions or Behavior
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Examiner Note

A Rapid downpower does not have to be started at 30MW/min, but should attempt to eventually reach that value. The crew will likely start with a load reduction rate of ~20 MW/min and acid flow of 15-20 GPM.

NOTE

- (1) A rapid power reduction is defined as approximately 30 MW/minute load reduction on the main turbine.
- (2) Power Reduction may be stopped at any point.
- (3) Some Steps of this procedure may not be applicable due to plant conditions. In these cases SM/CRS may NA the step.
- (4) Steps within this procedure may be performed concurrently or out of sequence with SM/CRS concurrence.
- (5) During power reduction PMC PID C24650, COLSS DESCENDING PWR TRACK (DUMOUT19), will automatically select and display the correct power indication.OP-010-003, Plant Startup, provides greater detail on which power indications are displayed by PID C24650 based on power level and whether or not the UFM is in service.
- (6) Volume Control Tank (VCT) level may lower during the down power. Charging pump suction swaps to the RWSP at 5.5% VCT level. Makeup to the VCT in accordance with OP-002-005, Chemical and Volume Control, may be necessary if boration from the RWSP is not desired.
- (7) Manual CEA Subgroup Selection should be evaluated per OP-004-015, Reactor Power Cutback, when power reduction is secured above 65% power.
- (8) To assist with Pressurizer Level Control during load reduction, backup Charging Pumps may be started or if a backup Charging pump has auto started then its associated control switch may be placed in ON to prevent equipment cycling.

	ATC	1. Begin RCS Boration by Direct Boration <u>or</u> Borate from the RWSP using Charging Pump(s) by performing Attachment 2, RCS Boration.
	CRS	2. <u>When</u> required power level is reached <u>or</u> if rapid plant power reduction is no longer required, <u>then</u> stabilize power as desired using VCT Makeup in the Dilute Mode by performing Attachment 5, Stabilizing Power.
	ATC	3. Maintain RCS Cold Leg Temperature 536°F to 549°F.
	BOP	4. Commence Turbine load reduction by performing Attachment 4, Main Turbine Load Operation.

Event Description: Lowering Main Condenser Vacuum, Plant Power Reduction
 Symptoms/Cues: Condenser Vacuum Alarms, All Condenser Vac Pumps Running

Time	Position	Applicant's Actions or Behavior
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CAUTION

REFER TO TECHNICAL SPECIFICATION 3.1.3.6 FOR TRANSIENT INSERTION LIMITS.

	ATC	5. Operate CEAs in accordance with Attachment 3, Operation of CEAs for ASI Control, to maintain ASI using CEA Reg. Group 5, 6 or Group P Control Element Assemblies in accordance with OP-010-005, Plant Shutdown, Attachment 9.10, Axial Shape Control Guidelines.

NOTE

To prevent Pressurizer heater cutout, avoid operating with Pressurizer pressure near the heater cutout pressure of 2270 PSIA while on Boron Equalization. **[CR-WF3-2012-01861]**

	ATC	6. Perform Boron Equalization as follows: 6.1 Place available Pressurizer Pressure Backup Heater Control Switches to ON.
	ATC	6.2 Reduce Pressurizer Spray Valve Controller (RC-IHIC-0100) setpoint potentiometer to establish spray flow and maintain RCS pressure 2250 PSIA (2175 – 2265).
	SRO	7. Notify the Woodlands System Load Dispatcher that a rapid power reduction is in progress.
	BOP	8. Announce to Station Personnel over the Plant Paging System that a rapid plant power reduction is in progress.

NOTE

If USBSCAL is not in service, the COLSS Steam Calorimetric will be automatically disabled when MSBSCAL, PMC PID C24246, drops below 95% Power, and will revert back to FWBSCAL, PMC PID C24235. This may result in a step change in COLSS indicated Plant Power (BSCAL) of up to 1.0% when this occurs.

	BOP	9. <u>When</u> Reactor Power consistently indicates less than 98% power, as indicated on PMC PID C24631 [MAIN STEAM RAW POWER (MSBSRAW)], <u>or</u> an alternate point provided by Reactor Engineering, <u>then</u> verify the value of C24648 [BSCAL SMOOTHING VAL. APPLD (DUMOUT17)] automatically changes to 1.
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Event Description: Lowering Main Condenser Vacuum, Plant Power Reduction
 Symptoms/Cues: Condenser Vacuum Alarms, All Condenser Vac Pumps Running

Time	Position	Applicant's Actions or Behavior
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	N/A	10. If C24648 does not automatically change to 1, then inform Reactor Engineering and set the value of 1 for COLSS power smoothing constant K24250, [ADDRSSBL SMOOTHING FOR BSCAL (ALPHA)] in accordance with OP-004-005, Core Operating Limits Supervisory System.
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	BOP	11. Following a Reactor Power change of >15% within a one hour period, direct Chemistry Department to sample Reactor Coolant System (RCS) for an isotopic iodine analysis two to six hours later. [P-1171]
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	BOP	12. Monitor Condensate Polisher differential pressure and remove Polishers from service to maintain system pressure in accordance with OP-003-031, Condensate Polisher/Backwash Treatment.
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NOTE

Ensure that TGB Watch (or other TGB qualified NAO) is ready to secure designated Main Feed Pump prior to Step 17.

	BOP	13. When Reactor Power is approximately 70% or Heater Drain Pump flow is unstable, then remove Heater Drain Pumps from service by taking pump control switches to Stop. [P-14985]
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	SRO	14. When Reactor Power is less than 70% power, then note time in Station Log to track LCO requirements for Technical Specification 3.7.1.7.
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OP-901-212, Rapid Plant Power Reduction, Attachment 2, RCS Boration

	ATC	1. Perform RCS Boration by Direct Boration or Borate from the RWSP using Charging Pump(s) as follows:
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	ATC	1.1 If desired to perform Direct Boration, then perform the following: 1.1.1 Set Boric Acid Makeup Batch Counter to volume of Boric Acid desired.
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	ATC	1.1.2 Verify Boric Acid Makeup Pumps selector switch aligned to desired Boric Acid Makeup Pump A(B).
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Event Description: Lowering Main Condenser Vacuum, Plant Power Reduction
Symptoms/Cues: Condenser Vacuum Alarms, All Condenser Vac Pumps Running

Time	Position	Applicant's Actions or Behavior
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	ATC	1.1.3 Place Direct Boration Valve, BAM-143, control switch to AUTO.
	ATC	1.1.4 Place Makeup Mode selector switch to BORATE.
	ATC	1.1.5 Verify selected Boric Acid Makeup Pump A(B) Starts.
	ATC	1.1.6 Verify Direct Boration Valve, BAM-143, Opens.
NOTE		
The Boric Acid Flow Totalizer will not register below 3 GPM. The Boric Acid Flow Totalizer is most accurate in the range of 10 - 25 GPM.		
	ATC	1.1.7 Verify Boric Acid Flow controller, BAM-IFIC-0210Y, in Manual.
	Note	"CVCS Boric Acid Makeup Flow Hi/Lo" on CP-4 is an expected annunciator. Acid flow can be seen on the red pen of recorder BAM-IFR-0210Y on CP-4.
	ATC	1.1.8 Adjust Boric Acid Flow controller, BAM-IFIC-0210Y, output to >3 GPM flow rate.
	ATC	1.1.9 Verify Boric Acid Makeup Control Valve, BAM-141, Intermediate or Open.
	ATC	1.1.10 Observe Boric Acid flow rate for proper indication.
NOTE		
Opening CVC-507 will render BAM-113A(B) Inoperable. Refer to T.S. 3.1.2.2 (Modes 1-4) or T.S. 3.1.2.1 (Modes 5&6). [CR-WF3-2018-2016 CA-2]		
	ATC	1.2 <u>If</u> desired to Borate from the RWSP using one or two Charging Pump(s), <u>then</u> perform the following: 1.2.1 Open RWSP to Charging Pumps Suction Isolation, CVC-507.
	ATC	1.2.2 Close Volume Control Tank Outlet Isolation, CVC-183.
	ATC	1.2.3 <u>If</u> desired, <u>then</u> start an additional Charging pump.
	ATC	1.3 <u>If</u> desired to secure Direct Boration, <u>then</u> perform the following:

Event Description: Lowering Main Condenser Vacuum, Plant Power Reduction
 Symptoms/Cues: Condenser Vacuum Alarms, All Condenser Vac Pumps Running

Time	Position	Applicant's Actions or Behavior
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		1.3.1 If Boric Acid Makeup Batch Counter has counted down to desired value, <u>then</u> verify Boric Acid Makeup Control Valve, BAM-141, Closed.
	ATC	1.3.2 Verify Boric Acid Flow controller, BAM-IFIC-0210Y, in Manual.
	ATC	1.3.3 Verify both Boric Acid Flow controller, BAM-IFIC-0210Y, output <u>and</u> setpoint potentiometer set to zero.
	ATC	1.3.4 Place Makeup Mode selector switch to MANUAL.
	ATC	1.3.5 Verify Selected Boric Acid Makeup Pump A(B) Stops.
	ATC	1.3.6 Verify Direct Boration Valve, BAM-143, Closed.
	ATC	1.3.7 Place Direct Boration Valve, BAM-143, control switch to CLOSE.
	ATC	1.4 If desired to secure Borating from the RWSP using Charging Pump(s), <u>then</u> perform the following: 1.4.1 Open Volume Control Tank Outlet Isolation, CVC-183.
	ATC	1.4.2 Close RWSP to Charging Pumps Suction Isolation, CVC-507.
OP-901-212, Rapid Plant Power Reduction, Attachment 4, Main Turbine Load Operation		
	BOP	1. Commence Turbine load reduction by performing the following: 1.1 Depress LOAD RATE MW/MIN pushbutton.
	BOP	1.2 Set selected rate in Display Demand Window.
	BOP	1.3 Depress ENTER pushbutton.
	BOP	1.4 Depress REFERENCE pushbutton.
	BOP	1.5 Set desired load in Reference Demand Window.
	BOP	1.6 Depress ENTER pushbutton.

Event Description: Lowering Main Condenser Vacuum, Plant Power Reduction
 Symptoms/Cues: Condenser Vacuum Alarms, All Condenser Vac Pumps Running

Time	Position	Applicant's Actions or Behavior
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	BOP	1.7 Depress GO pushbutton. 1.7.1 <u>If</u> desired to stop turbine load changes, <u>then</u> depress HOLD pushbutton. 1.7.2 <u>If</u> desired to resume turbine load changes, <u>then</u> depress GO pushbutton. <ul style="list-style-type: none"> • <u>If</u> desired to make changes to turbine load rate, <u>then</u> return to step 1.1 of this attachment.
	N/A	2. <u>If</u> desired to Control Main Turbine Load with DEH in Manual, <u>then</u> perform the following:

OP-901-212, Rapid Plant Power Reduction, Attachment 3, Operation of CEAs for ASI Control

	ATC	CEA Group: Not to Exceed Inches Withdrawn

CAUTION

- (1) REFER TO TECHNICAL SPECIFICATION 3.1.3.6 FOR TRANSIENT INSERTION LIMITS.
- (2) IMPROPER OPERATION OF CEAS IN MANUAL GROUP MODE MAY CAUSE A REACTOR TRIP BASED ON AN OUT-OF-SEQUENCE CONDITION.
- (3) CEA INITIALIZATION PROGRAM MUST BE RUNNING IN THE PLANT MONITORING COMPUTER TO HAVE GROUP STOPS AND SEQUENTIAL PERMISSIVES AVAILABLE.
- (4) IF COMPLYING WITH TS 3.1.3.2 (CEA POS IND) FOR RG 5, RG 6 OR GROUP P, THEN THE AFFECTED GROUP(S) CANNOT BE USED FOR ASI CONTROL.
- (5) IF COMPLYING WITH TS 3.3.1 FOR INOPERABLE CEACS, THEN ASI CONTROL MAY BE LIMITED TO USING ONLY RG 6 INSERTED TO 127.5 INCHES WITHDRAWN. REFER TO TS 3.3.1.

	ATC	1. Operate CEAs in order to maintain ASI using CEA Reg. Group 5, 6 or Group P Control Element Assemblies in accordance with OP-010-005, Plant Shutdown, Attachment 9.4, Axial Shape Control Guidelines.
	ATC	2. <u>If</u> desired to Operate CEAs in Manual Group (MG) Mode, <u>then</u> perform the following: 2.1 Position Group Select switch to desired group.

Event Description: Lowering Main Condenser Vacuum, Plant Power Reduction
 Symptoms/Cues: Condenser Vacuum Alarms, All Condenser Vac Pumps Running

Time	Position	Applicant's Actions or Behavior
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	ATC	2.2 Place Mode Select switch to MG <u>and</u> verify the following: <ul style="list-style-type: none"> • White lights Illuminated on Group Selection Matrix for selected group • MG light Illuminates
	ATC	2.3 Operate CEA Manual Shim switch to WITHDRAW or INSERT group to desired height while monitoring the following: <ul style="list-style-type: none"> • CEA Position Indicator selected CEA group is moving in desired direction • Reactor Power • Reactor Coolant System (RCS) temperature • Axial Shape Index (ASI)
	ATC	2.4 When desired set of moves have been completed, then place Mode Select switch to OFF.
	N/A	3. If desired to Operate CEAs in Manual Individual (MI) Mode, then perform the following:

Examiner Note

This event is complete after the Reactivity Manipulation is satisfied or at Lead Examiner's Discretion.

Examiner Note

The next event is a RCP 2A locked rotor and automatic trip will not occur. A manual reactor trip is required.

Cue the Simulator Operator when ready for Event 5.

Event Description: Steam Generator #2 Tube Rupture

Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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	ATC	Recognize and report indications of RCP trip and no Auto RX Trip
		Alarms:
		<ul style="list-style-type: none"> RCP 2A TRIP/TROUBLE (Cabinet H, A-7)
		<ul style="list-style-type: none"> RCP 2A LUBE OIL PRESSURE LO (Cabinet H, E-7)
		<ul style="list-style-type: none"> RCP 2A VIBRATION HI (Cabinet H, A-8)
		<ul style="list-style-type: none"> RCP 2A CCW FLOW LO (Cabinet H, H-7)
		<ul style="list-style-type: none"> CEA WITHDRAWAL PROHIBIT (Cabinet H, M-7)
		<ul style="list-style-type: none"> RCP 2A CCW FLOW LOST (Cabinet SA(SB), A-3(8))
		<ul style="list-style-type: none"> RPS CHANNEL TRIP LOCAL PWR DENSITY HI (Cabinet K, A-11)
		<ul style="list-style-type: none"> RPS CHANNEL TRIP DNBR LO (Cabinet K, A-12)
		<ul style="list-style-type: none"> LOCAL PWR DENSITY HI PRETRIP A/C(B/D) (Cabinet K, B(C)-11)
		<ul style="list-style-type: none"> DNBR LO PRETRIP A/C(B/D) (Cabinet K, B(C)-12)
		<ul style="list-style-type: none"> RPS CHANNEL TRIP COOLANT FLOW LOST (Cabinet K, D-12)
		<ul style="list-style-type: none"> RPS CHANNEL A(B)(C)(D) TROUBLE (Cabinet K, E(F)(G)(H)-18)
		Indications:
		<ul style="list-style-type: none"> RCP 2A STOP light and Yellow Trip indication
		<ul style="list-style-type: none"> RCP 2A Oil Lift Pumps running
		<ul style="list-style-type: none"> RCP 2A motor amps indicate 0amps
		<ul style="list-style-type: none"> RCP 2A ΔP lowering
		<ul style="list-style-type: none"> Trip indication Channel A(B)(C)(D) HI LOCAL POWER bistables
		<ul style="list-style-type: none"> Pre-Trip indication Channel A(B)(C)(D) HI LOCAL POWER bistables
		<ul style="list-style-type: none"> Trip indication Channel A(B)(C)(D) LOW DNBR bistables
		<ul style="list-style-type: none"> Pre-Trip indication Channel A(B)(C)(D) LOW DNBR bistables
		<ul style="list-style-type: none"> Trip indication Channel A(B)(C)(D) SG LO FLOW bistables
		<ul style="list-style-type: none"> All Reactor Trip breakers remain closed
		<ul style="list-style-type: none"> All CEAs remain withdrawn

Event Description: Steam Generator #2 Tube Rupture
 Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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<u>CRITICAL TASK 1</u>		
Establish Reactivity Control		
<p>This task is satisfied by manually tripping the reactor using the manual pushbuttons, Diverse Reactor Trip, or de-energizing bus 32A and 32B within 1 minute of RCP 2A tripping.</p> <p>This task becomes applicable following the RCP trip. (OP-902-000, 1.a.1)</p>		
	ATC	Attempt to manually trip the reactor using normal trip push buttons and then Diverse Reactor Trip push buttons on CP-2.
	N/A	<p><u>Open</u> BOTH of the following breakers for 5 seconds and THEN close:</p> <ul style="list-style-type: none"> • SST A32 FEEDER • SST B32 FEEDER
OP-902-000, Standard Post Trip Actions		
	Note	<p>During Standard Post Trip Actions, one crew member (typically the BOP) will go to a back panel to restore radiation monitor sample pumps due to some sample pumps requiring restart following a loss of power or voltage dip (i.e. plant loads transfer from UATs to SUTs).</p>
<u>NOTE</u>		
Steps 1 and 2 are immediate actions and satisfy Reactivity Control		
	ATC	<p>1. <u>Determine</u> Reactivity Control acceptance criteria are met:</p> <p>a. <u>Check</u> reactor power is dropping.</p> <p>b. <u>Check</u> startup rate is negative.</p> <p>c. <u>Check</u> less than TWO CEAs are NOT fully inserted.</p>
Examiner Note		
Steps a.1, 1-3 (below) should have already been performed.		
Event 6, SGTR on SG #2, is inserted after immediate operator actions are performed for SPTAs.		
	ATC	<p>a.1 <u>Perform</u> the following as necessary to insert CEAs:</p> <p>1) Manually <u>trip</u> the Reactor.</p> <p>2) Manually <u>initiate</u> DIVERSE REACTOR TRIP.</p>

Event Description: Steam Generator #2 Tube Rupture
 Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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	N/A	3) <u>Open</u> BOTH of the following breakers for 5 seconds and THEN close: <ul style="list-style-type: none"> • SST A32 FEEDER • SST B32 FEEDER 4) Locally <u>open</u> ALL Reactor Trip breakers.
	BOP	2. <u>Verify</u> Main Turbine and Generator tripped: <ol style="list-style-type: none"> a. <u>Check</u> the Main Turbine is tripped: <ul style="list-style-type: none"> • Governor valves closed • Throttle valves closed • Turbine Speed lowering
	BOP	<ol style="list-style-type: none"> b. <u>Check</u> the Main Generator is tripped: <ul style="list-style-type: none"> • GENERATOR BREAKER A tripped • GENERATOR BREAKER B tripped • EXCITER FIELD BREAKER tripped
	BOP	3. <u>Verify</u> maintenance of Vital Auxiliaries <ol style="list-style-type: none"> a. <u>Check</u> station loads are energized from Off-site power as follows: <p><u>Train A</u></p> <ul style="list-style-type: none"> • A1, Non-Safety bus • A2, Non-Safety bus • A3, Safety bus • A-DC Electrical bus • A and C vital AC Instrument Channels <p><u>Train B</u></p> <ul style="list-style-type: none"> • B1, Non-Safety bus • B2, Non-Safety bus • B3, Safety bus • B-DC Electrical bus • B and D vital AC Instrument Channels b. <u>Verify</u> CCW flow to RCPs

Event Description: Steam Generator #2 Tube Rupture
 Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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	ATC	4. <u>Verify</u> RCS Inventory Control: <ol style="list-style-type: none"> a. <u>Check</u> that BOTH of the following conditions exist: <ul style="list-style-type: none"> • Pressurizer level is 7% to 60% • Pressurizer level is trending to 33% to 60% b. <u>Check</u> RCS subcooling is greater than or equal to 28°F.
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Examiner Note

Once the Steam Generator Tube Rupture event is inserted on SG #2, SIAS and CIAS should be manually initiated.

	ATC	5. <u>Check</u> RCS Pressure control: <ul style="list-style-type: none"> • PZR pressure is 1750 psia to 2300 psia • PZR pressure is trending to 2125 psia to 2275 psia
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	ATC	5.2 IF PZR pressure is less than 1684 psia, THEN <u>verify</u> BOTH of the following have initiated. <ul style="list-style-type: none"> • SIAS • CIAS
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CRITICAL TASK 2

Establish Required Safety Injection Flow

This task is satisfied by starting the A,B or both High Pressure Safety Injection Pumps such that Safety Injection flow is greater than or equal to the minimum required per the flow delivery curve in OP-902-009, Appendix 2-E prior to exiting the step (step 7) to establish adequate HPSI flow in OP-902-007.

This task becomes applicable following the Safety Injection Actuation Signal. (OP-902-007, 7.a.)

	BOP	Manually start at least one HPSI Pump following SIAS actuation and failure to auto start.
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	ATC	5.3 IF PZR pressure is less than 1621 psia, THEN <u>verify</u> ONE RCP in each loop is stopped.
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	ATC	5.4 IF PZR pressure is less than the minimum RCP NPSH of Attachments 2A-B, "RCS Pressure and Temperature Limits," THEN <u>stop</u> ALL RCPs.
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Event Description: Steam Generator #2 Tube Rupture

Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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	ATC/BOP	5.5 IF SIAS actuated, AND RWSP on Purification, THEN isolate the RWSP using Appendix 40 "Isolate RWSP from Purification."
	ATC	6. <u>Check</u> Core Heat Removal: <ol style="list-style-type: none"> a. At least ONE RCP is operating. b. Operating loop ΔT less than 13°F. c. RCS subcooling greater than or equal to 28°F.
	BOP	7. <u>Verify</u> RCS Heat Removal: <ol style="list-style-type: none"> a. <u>Check</u> that at least ONE SG level is 10 to 76% NR
	BOP	b. <u>Check</u> Feedwater Control in Reactor Trip Override: <ul style="list-style-type: none"> • MAIN FW REG valves are closed • STARTUP FW REG valves are 13 to 21% open • Operating Main Feedwater pumps are 3800 to 4000 rpm
	BOP	c. <u>Reset</u> Moisture Separator reheaters and <u>check</u> the Temperature Control valves closed.
	ATC	d. <u>Check</u> RCS T _c is 530 to 550°F.
	BOP	e. Check Steam Generator pressure is 885 to 1040 psia.
	BOP	f. <u>Verify</u> EFAS1(2) actuated at associated SG level of 27.4% NR or less.
	BOP	g. <u>Check</u> EFW flow. <ol style="list-style-type: none"> 1) <u>Control</u> EFW Flow using ANY of the following: <ul style="list-style-type: none"> • <u>Maintain</u> EFW FCVs in auto • Appendix 13, "Stabilize RCS Temperature" • At CRS/SM discretion, <u>establish</u> total EFW flow to SG(s) greater than 575 gpm using BOTH associated FCVs in manual. • At CRS/SM discretion, <u>initiate</u> EFW flow to SG using ONE FCV in manual AND <u>restore</u> SG Level to 55 to 70% NR.

Event Description: Steam Generator #2 Tube Rupture
 Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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	ATC	8. <u>Verify</u> Containment Isolation: a. <u>Check</u> Containment pressure is less than 16.4 psia. b. Check NO Containment Area Radiation monitor alarms OR unexplained rise in activity. c. Check NO Steam Plant Activity monitor alarms OR unexplained rise in activity.
	BOP	9. Verify Containment Temperature and Pressure Control: • Check Containment temperature is less than or equal to 120°F. • Check Containment pressure is less than 16.4 psia.
	SRO	10. GO TO Appendix 1, "Diagnostic Flowchart" and diagnose to appropriate EOP.

OP-902-009, Standard Appendices, Appendix 1 Diagnostic Flow Chart

Examiner Note

Appendix 1 is a flow chart used to diagnose to the correct recovery procedure for the event in progress. The steps below will be followed by a YES or NO to indicate proper flow path.

	ATC	Is Reactivity Control met? (YES)
	BOP	Is at least ONE 125 VDC SAFETY bus energized? (YES)
	BOP	Is at least ONE 4.16 KV NON-SAFETY bus energized? (YES)
	BOP	Is at least ONE 4.16 KV SAFETY bus energized? (YES)
	ATC	Is at least ONE RCP running? (YES)
	BOP	Does at least ONE SG have adequate FW? (Note 2) (YES)
	ATC	Is PZR pressure >1750 psia AND stable or rising? (NO)
	ATC	Is RCS Subcooling <28F AND stable or lowering? (NO)
	BOP	Are BOTH SG pressures >885 psia AND stable or rising? (YES)
	ATC	Is CNTMT pressure <16.4 psia AND stable or lowering? (YES)

Event Description: Steam Generator #2 Tube Rupture
 Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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	ATC/BOP	Is SGTR Indicated? (Note 3) (YES)
	SRO	Consider SGTR OP-902-007
	BOP	Are BOTH SG pressures >885 psia AND stable or rising? (Note 5) (YES)
	SRO	Are ALL acceptance criteria satisfied? (NO)
	SRO	Has ANY event been diagnosed? (YES)
	SRO	Can a single event be diagnosed? (Note 4) (YES)
	SRO	GO TO Appropriate EOP
	Note	SRO enters OP-902-007, Steam Generator Tube Rupture Recovery
OP-902-007, Steam Generator Tube Rupture Recovery		
NOTE		
The Shift Chemist should be notified if a SIAS or CIAS has occurred. The secondary sampling containment isolation valves should not be opened following an SIAS or CIAS until directed by the Shift Chemist.		
	BOP	*1. Confirm diagnosis of a SGTR: a. Check Safety Function Status Check acceptance criteria are satisfied. b. IF steam generator sample path is available, THEN direct Chemistry to sample BOTH steam generators for activity.
	Note	If asked to perform step 1.a as the STA, simply acknowledge the request.
	BOP	2. Announce a Steam Generator Tube Rupture is in progress using the plant page.

Event Description: Steam Generator #2 Tube Rupture
 Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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	SRO	*3. Advise the Shift Manager to REFER TO EP-001-001, "Recognition & Classification of Emergency Condition", and implement the Emergency Plan.
	Note	If asked to perform step 3 as the SM, simply acknowledge the request.
	Note	SRO may direct closing MS-401B, MS B Supply to EFW Pump AB, as a preemptive action to isolate a steam path from the ruptured SG to atmosphere.
	SRO	*4. REFER TO Section 6.0, "Placekeeper", and record the time of the reactor trip.
	N/A	*5. IF power has been interrupted to either 3A or 3B safety buses, THEN perform Appendix 20, "Operation of DCT Sump Pumps".
	ATC	*6. Check SIAS has actuated. 6.1 IF pressurizer pressure is less than 1684 psia, THEN verify SIAS has initiated.
	BOP	*7. IF SIAS has initiated, THEN : a. Verify safety injection pumps have started. b. Check safety injection flow is within the following: <ul style="list-style-type: none"> ▪ Appendix 2-E, "HPSI Flow Curve" ▪ Appendix 2-F, "LPSI Flow Curve" c. Verify ALL available charging pumps are operating. d. IF RWSP on Purification, THEN isolate RWSP using Appendix 40 "Isolate RWSP from Purification."
	BOP	*7.b.1 Perform ANY of the following to restore Safety Injection flow: 1) Verify electrical power to Safety Injection pumps and valves 2) Verify the following valves are open: <ul style="list-style-type: none"> • HPSI Cold Leg Injection • LPSI Flow Control 3) Start additional Safety Injection pumps as needed until flow is within the following: (CRITICAL) <ul style="list-style-type: none"> • Appendix 2-E, "HPSI Flow Curve" • Appendix 2-F, "LPSI Flow Curve"

Event Description: Steam Generator #2 Tube Rupture
 Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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CRITICAL TASK 2

Establish Required Safety Injection Flow

This task is satisfied by starting the A, B or both High Pressure Safety Injection Pumps such that Safety Injection flow is greater than or equal to the minimum required per the flow delivery curve in OP-902-009, Appendix 2-E prior to exiting the step (step 7) to establish adequate HPSI flow in OP-902-007.

This task becomes applicable following the Safety Injection Actuation Signal. (OP-902-007, 7.a.)

	Note	Appendix 2E is contained earlier in this guide.
	ATC	*8. IF pressurizer pressure is less than 1621 psia, AND SIAS is actuated, THEN : <ol style="list-style-type: none"> a. Verify ONE RCP in each loop is stopped b. Check Pressurizer pressure is greater than the minimum RCP NPSH of Attachment 2A-B, "RCS Pressure and Temperature Limits."
	Note	Appendix 2A is contained earlier in this guide.
	ATC	*9. IF RCPs are operating, THEN : <ol style="list-style-type: none"> a. Verify CCW available to RCPs. b. IF RCS TC is less than 380°F, THEN verify ONE RCP in each loop is stopped. c. Check RCP operating parameters: <ul style="list-style-type: none"> • NPSH, REFER TO Attachment 2A-D, "RCS P-T Limits" • Bearing Temperatures less than or equal to 225°F • Bleed Off Temperature less than 200°F • Cooling Coils Return CCW temp less than 155°F • At Least Two Seals per RCP operable

Event Description: Steam Generator #2 Tube Rupture
 Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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	BOP	*10. Check CCW operation: <ol style="list-style-type: none"> a. Check a CCW pump is operating for EACH energized 4.16 KV Safety bus: <ul style="list-style-type: none"> • 3A Safety bus • 3B Safety bus b. IF only ONE CCW pump operating, THEN split CCW headers using Appendix 35, "Single CCW Pump Operation." c. Check an Essential chiller is operating for EACH energized 4.16 KV Safety bus: <ul style="list-style-type: none"> • 3A Safety bus • 3B Safety bus
	BOP	11. Commence a rapid RCS cooldown to less than 520°F T _H using the steam bypass valves.
	Note	BOP will: <ul style="list-style-type: none"> • Place 1 Steam Dump permissive switch to Manual [MS-319A(B)(C) MS-320A(B)(C)] (CRITICAL) • Place controller for valve permissive switch placed in manual above to Manual [MS-IHIC-0319-A(B)(C) MS-IHIC-0320-A(B)(C)] (CRITICAL) • Raise output on controller to ~30% (CRITICAL)
	ATC	*12. Depressurize the RCS: <ol style="list-style-type: none"> a. Maintain pressurizer pressure within ALL of the following criteria: <ul style="list-style-type: none"> • Within Appendix 2A-D, "RCS Pressure and Temperature Limits" • Less than 930 psia • Within 50 psi of the most affected steam generator pressure • IF RCPs are operating, greater than the minimum RCP NPSH of Appendix 2A-D, "RCS Pressure and Temperature Limits"
	ATC	b. Operate main or auxiliary pressurizer spray.
	Note	If the crew decides to use main spray, they will need to reset IA-909 to restore Instrument Air to Containment

Event Description: Steam Generator #2 Tube Rupture
 Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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	BOP	c. IF HPSI throttle criteria are met, THEN perform ANY of the following: <ul style="list-style-type: none"> • Control charging and letdown flow • Throttle HPSI flow
	BOP	*13. IF MSIS (low SG pressure) has NOT actuated, AND a controlled cooldown and depressurization is in progress, THEN <u>lower</u> MSIS initiation setpoints as necessary.
	N/A	14. IF SIAS (low PZR pressure) has NOT actuated, AND a controlled cooldown and depressurization is in progress, THEN <u>lower</u> SIAS initiation setpoints as necessary.
	BOP	15. <u>Perform</u> BOTH of the following to protect the Main condenser: <ul style="list-style-type: none"> • <u>Verify</u> CW System in operation. <u>REFER TO</u> OP-003-006, "Circulating Water." • <u>Check</u> Condenser vacuum greater than 14 inches Hg.
	BOP	*16. Determine the most affected steam generator by considering ALL of the following: <ul style="list-style-type: none"> • Steam generator activities • Main steam line radiation levels • Steam generator Blowdown radiation monitor readings • Steam generator level rise when NOT feeding • One steam generator level rising faster than the other with feed and steaming rates being essentially the same for both • Feed flow mismatch between steam generators • Steam flow vs. feed flow mismatch in a steam generator prior to the reactor trip
	BOP	*17. When the RCS T _H is less than 520°F, THEN isolate the most affected steam generator:

Examiner Note

This event is complete after the CRS had directed isolation of the #2 Steam Generator with T_H less than 520°F

OR

At Lead Examiner's Discretion

Event Description: Steam Generator #2 Tube Rupture

Symptoms/Cues: Secondary Radiation Monitor radiation level rising, SG #2 abnormal level rise

Time	Position	Applicant's Actions or Behavior
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Form 3.3-1 Scenario Outline

Facility:	Waterford 3	Scenario #:	3
Scenario Source:		Op. Test #:	1
Examiners:		Applicants/	
		Operators:	
Initial Conditions: 100% Power, EDG A OOS, PTED not available			
Turnover: Maintain 100% power			
Critical Tasks: CT-1: Emergency Borate; CT-2: Energize at least 1 vital AC Bus			

Event No.	Malf. No.	Event Type*	Event Description
1	FW06A	N – BOP TS – SRO	Manually start EFW Pump A. EFW Pump A fails during operability check. (TS 3.7.1.2)
2	RX14A	I/MC – ATC I – SRO	PZR pressure control channel failure low (RC-IPIC-0100X).
3	RD02A11	R-ATC R-BOP TS-SRO	CEA 11 drops into the core. The crew will enter Rapid plant power reduction required iAW OP-901-212.
4	DI-01A07A2S01-1	C/MC-BOP C-SRO	During power reduction, the main turbine will revert to manual control.
5	RD02A57 ED01A ED01B ED01C ED01D	M-All	CEA 57 drops into the core resulting in an automatic Reactor Trip and LOOP
6	RD11A28 RD11A40	C-ATC	Two CEDMs stick out (Critical Task 1 emergency boration required)
7	EG08B	C – BOP	EDG B does not auto start (Critical Task 2, Energize at least 1 vital AC bus).

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control

Scenario Quantitative Attributes

1. Malfunctions after EOP entry (1–2)	2
2. Abnormal events (2–4) [<i>Events 2 and 3 credited</i>]	2
3. Major transients (1–2)	1
4. EOPs entered/requiring substantive actions (1–2)	1
5. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	0
6. Preidentified critical tasks (≥ 2)	2

The crew assumes the shift with the reactor at 100% power. Emergency Diesel Generator A is danger tagged out of service and the PTED is not available.

Event 1: The crew turnover includes instructions to complete OP-903-046, Emergency Feed Pump Operability, for Emergency Feedwater (EFW) Pump A. EFW pump A will trip on overcurrent shortly after it is started. The SRO should declare EFW pump A inoperable and enter Tech Spec 3.7.1.2.d.

Event 2: After Technical Specifications have been addressed, Pressurizer Pressure Control Channel RC-IPIC-0100X will fail low. The crew will observe pressurizer pressure alarms and that all PZR heaters are energized. The SRO will implement OP-901-120, Pressurizer Pressure Control Malfunction, Section E₁, Pressurizer Pressure Control Channel Instrument Failure. The SRO should direct the ATC to align the alternate pressurizer pressure channel and verify correct Pressurizer pressure control response.

Event 3: After the alternate pressurizer pressure channel has been placed in service, CEA 11 (Reg. Group 4) drops into the core. The SRO should enter procedure OP-901-102, CEA or CEDMCS Malfunction and proceed to section E₁, CEA Misalignment Greater than 7 inches. The SRO will direct the BOP to adjust turbine load to match T_{AVG} to T_{REF} initially and then perform a rapid plant down power in accordance with OP-901-212, Rapid Plant Power Reduction. RCS direct boration must commence within 15 minutes of the dropped CEA to comply with Technical Specifications and the COLR. The SRO should enter procedure OP-901-501, PMC or COLSS Malfunction. Actions in OP-901-501 are normally performed by the STA. The SRO should evaluate and enter TS 3.1.3.1 action c and TS 3.2.3 action a., and b.

Event 4: During the power reduction, the Main Turbine controls will shift from automatic to manual mode. The SRO will direct the BOP to maintain the turbine load reduction by controlling the turbine in manual mode in accordance with OP-901-212, Rapid Plant Power Reduction. The BOP will be manually changing governor valve position instead of controlling at a certain megawatt per minute rate..

Event 5: After the BOP has lowered Turbine load in manual, CEA 57 will drop into the core. An automatic reactor trip and Loss of Offsite Power will occur simultaneously. The crew will respond using OP-902-000, Standard Post Trip Actions.

Event 6: The ATC should notice that 2 CEAs (40 & 28) have remained stuck out on the reactor trip and Emergency Boration is warranted (**CRITICAL TASK 1**).

Event 7: During the loss of offsite power the B Emergency Diesel Generator will fail to auto start. The BOP should manually start the B EDG using the control switch to prevent the crew from entering the station blackout procedure (**CRITICAL TASK 2**).

The scenario can be terminated after the crew has performed actions in OP-902-003 or at the lead examiner's discretion.

Critical Task	Safety Significance	Cueing	Measurable Performance Indicator	Performance Feedback
<p>CT-1: Establish Reactivity Control</p> <p>This task is satisfied by manually initiating emergency boration using the gravity feed flowpath prior to exceeding the 1 hour Technical Specification requirement when more than 1 CEA is not fully inserted. This is accomplished by opening BAM-113A or BAM-113B and closing CVC-183. This task becomes applicable following the Reactor Trip and the Loss of Offsite Power.</p>	<p>Failure to initiate emergency boration would result in a condition that is not allowed by the facility license as analysis assumes that all CEAs are fully inserted during a reactor trip with the exception of the most reactive rod.</p>	<p>Rod bottom lights extinguished CEAs 40 & 28</p> <p>CEA indicates withdrawn on CEAC</p> <p>Procedurally driven from OP-902-000, Standard Post Trip Actions</p>	<p>Opens BAM-113A or BAM-113B using control switch</p> <p>Closes CVC-183 using control switch</p>	<p>Charging flow \geq 40 gpm on CP-4</p> <p>BAM-113A or BAM-113B open indicating light illuminated</p> <p>CVC-183 closed indicating light illuminated</p>
<p>CT-2: Energize at least 1 vital AC Bus</p> <p>This task is satisfied by manually starting Emergency Diesel generator B using the control switch prior to exceeding the 4 hour coping time for Waterford 3 batteries. This task becomes applicable once the Loss of Offsite power occurs.</p>	<p>Failure to energize at least one emergency bus will result in the plant remaining in a configuration that will not support protection if a subsequent event would occur. This lowers the mitigative capability of the plant. Once the crew transitions to and begins taking actions in an inappropriate procedure without taking action to establish power to at least 1 safety bus when one is available demonstrates a significant performance deficiency regarding protecting critical safety functions.</p>	<p>Control room lighting reduces</p> <p>EDG B start light extinguished</p> <p>Bus 3B is de-energized</p> <p>Procedurally driven from OP-902-000, Standard Post Trip Actions</p>	<p>Starts EDG B using the control switch</p>	<p>Control room lighting brightens</p> <p>EDG B start light illuminated</p> <p>Bus 3B is energized</p> <p>EDG B sequencer is timing out</p>

REFERENCES

Event	Procedures
1	OP-903-046, Emergency Feed Pump Operability Check, Rev. 325 Technical Specification 3.7.1.2
2	OP-901-120, Pressurizer Pressure Control Malfunction, Rev 303
3	OP-901-102, CEA or CEDMCS Malfunction, Rev. 308 OP-901-212, Rapid Plant Power Reduction, Rev.20 OP-901-501, PMC or Core Operating Limit Supervisory System Malfunction, Rev. 20 Technical Specification 3.1.3.1 Technical Specification 3.2.3
4	OP-901-212, Rapid Plant Power Reduction, Attachment 4, Rev.20
5/6/7	OP-902-000, Standard Post Trip Actions, Rev. 17 OP-902-003, Loss of Offsite Power / Loss of Forced Circulation, Rev. 11 OP-902-009, Standard Appendices, Rev. 323
GEN	EN-OP-115, Conduct of Operations, Rev. 31 EN-OP-115-08, Annunciator Response, Rev. 7 OI-038-000, EOP Operations Expectations / Guidance, Rev. 21 OP-100-017, EOP Implementation Guide, Rev 6

Event Description: EFW Pump A trips on overcurrent

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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Examiner Note
Event 1 is a normal plant evolution. The crew will be pre-briefed and ready to start EFW Pump A once they take the shift.

	BOP	Recognizes and reports indications of EFW Pump A trip.
		Alarms:
		<ul style="list-style-type: none"> EFW PUMP A TRIP/TROUBLE (Cabinet M, E-1)
		Indications:
		<ul style="list-style-type: none"> Indicating light for EFW Pump A goes from red to green on CP-8 Amber light illuminates on the lower portion of the control switch for EFW Pump A on CP-8

Examiner Note
The BOP manipulation for starting EFW Pump A is located on CP-8.

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OP-903-046, Emergency Feed Pump Operability Check ,Section 7.1, EFW Pump A Check		
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	BOP	5.1.5 Start EFW Pump A
	Note	After the EFW Pump A trip, the crew may decide to take the control switch for EFW Pump A to the OFF position. The crew should expect annunciator EFW PUMP A UNAVAILABLE (Cabinet M, D-1) if EFW Pump A control switch is taken to OFF.
	Booth Cue	If sent to the breaker, wait 2 minutes and report overcurrent flags on all three phases.
	Booth Cue	If sent to the pump, wait 5 minutes and report an acrid odor in the room but no signs of fire.

TECH SPEC CALL		
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	SRO	Reviews the following Technical Specifications and determines applicable action: <ul style="list-style-type: none"> 3.7.1.2 action d (Restore within 72 hours)
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Event Description: EFW Pump A trips on overcurrent

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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Examiner Note

This event is complete after the SRO evaluates Technical Specifications or at Lead Examiner's Discretion.

Examiner Note

Cue the Simulator Operator when ready for Event 2

Event Description: PZR pressure control channel fails low (RC-IPIC-0100X)

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC	Recognize and report indications of failed pressure instrument.
		Alarms
		<ul style="list-style-type: none"> • PRESSURIZER PRESSURE HI/LO (Cabinet H, E-1) • PRESSURIZER PRESS SIGNAL DEVIATION (Cabinet H, F-1)
		Indications
		<ul style="list-style-type: none"> • Recorder RC-IPR-0100 red pen fails low. • Controller RC-IPIC-0100 process fails low. • Controller RC-IPIC-0100 output goes to 0%. • Both Pressurizer Main Spray Valves go closed.
	Note	The Pressurizer Heaters will be energized due boron equalization. After the spray valves go closed, RCS pressure will rise until all Heaters secure.
	CRS	Enter and direct the implementation of OP-901-120, Pressurizer Pressure Control Malfunction, and use sub-section E1, Pressurizer Pressure Control Channel Instrument Failure.
OP-901-120, Pressurizer Pressure Control Malfunction, E₀ – General		
<u>CAUTION</u>		
STEAM GENERATOR PRESSURES DROPPING CONCURRENTLY WITH DROPPING PRESSURIZER LEVEL MAY BE INDICATIVE OF AN EXCESS STEAM DEMAND.		
	N/A	1. If Pressurizer Pressure <u>and</u> Level are dropping concurrently, OR RCS leakage is otherwise indicated, <u>then go to</u> OP-901-111, Reactor Coolant System Leak.
	N/A	2. If Pressurizer Pressure is dropping and any of the following have occurred, then place Pressurizer Spray Controller (RC-IHIC-0100) to MAN and adjust output to 0%:

Event Description: PZR pressure control channel fails low (RC-IPIC-0100X)

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	CRS	3. If Pressurizer Pressure Channel X/Y recorder (RC-IPR-0100) indicates a Pressurizer Pressure Control Channel instrument has failed, <u>then go to</u> Subsection E1, Pressurizer Pressure Control Channel Instrument Failure.
OP-901-120, E₁ – Pressurizer Pressure Control Channel Instrument Failure		
	ATC	1. Verify control channel instrument failure by checking Pressurizer Pressure Channel X/Y recorder (RC-IPR-0100).
	ATC	2. Transfer Pressurizer pressure control to operable channel using Pressurizer Pressure Channel Selector control switch.
	Note	Position Y should be selected (Y is the operable channel)
	N/A	3. <u>If</u> Pressurizer Pressure control channel is failed high, <u>then</u> perform the following:
	Note	The pressurizer Proportional Heaters will secure on high RCS pressure. The SRO may direct the ATC to reset these Heaters.
	ATC	4. Verify proper operation of Pressurizer Pressure controller (RC-IPIC-0100) <u>and</u> Pressurizer Pressure controlling <u>or</u> being restored to 2250 PSIA.
	SRO	5. Refer to the following Technical Specifications and Technical Requirements: <ul style="list-style-type: none"> • TS 3.2.8 • TS 3.4.3.1 • TRM 3.4.3.1
	SRO	Refers to Technical Specifications. TS entry is not expected. TS 3.2.8 entry required if RCS pressure drops below 2125 PSIA or exceeds 2275 PSIA. Neither condition should be met.
	ATC	Place Pressurizer Spray Controller RC-IHIC-0100 to Auto.

Event Description: PZR pressure control channel fails low (RC-IPIC-0100X)

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	Note	The SRO should direct this after Channel Y has been selected for Pressurizer pressure control.
<p>Examiner Note</p> <p>This event is complete when Pressurizer Pressure Control has been transferred to Channel Y.</p> <p>Or</p> <p>At Lead Examiner's Discretion.</p>		
<p>Examiner Note</p> <p>Cue the Simulator Operator when ready for Event 3</p>		

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC	Recognize and report indications of dropped CEA
		Alarms
		<ul style="list-style-type: none"> CEA WITHDRAWAL PROHIBIT (Cabinet H, M-7)
		<ul style="list-style-type: none"> RPS CHANNEL TRIP LOCAL PWR DENSITY HI (Cabinet K, A-11)
		<ul style="list-style-type: none"> RPS CHANNEL TRIP DNBR LO (Cabinet K, A-12)
		<ul style="list-style-type: none"> LOCAL PWR DENSITY HI PRETRIP A/C (Cabinet K, B-11)
		<ul style="list-style-type: none"> DNBR LO PRETRIP A/C (Cabinet K, B-12)
		<ul style="list-style-type: none"> CEA CHANNEL B DEVIATION (Cabinet K, H-12)
		<ul style="list-style-type: none"> CEA CHANNEL C DEVIATION (Cabinet K, H-13)
		<ul style="list-style-type: none"> CEA CALCULATOR CHNL B TROUBLE (Cabinet K, K-15)
		<ul style="list-style-type: none"> CEA CALCULATOR CHNL C TROUBLE (Cabinet K, K-16)
		<ul style="list-style-type: none"> RPS CHANNEL A TROUBLE (Cabinet K, E-18)
		Indications
		<ul style="list-style-type: none"> Rod bottom light for CEA 11
		<ul style="list-style-type: none"> T_{COLD} dropping
		<ul style="list-style-type: none"> Reactor Power Dropping
		<ul style="list-style-type: none"> LPD and DNBR trips on Channel A (targeted channel)
	Booth Cue	If Work Week Manager or PMI are called, inform the caller that a work package will be assembled and a team will be sent to CEDMCS Alley.
	Booth Cue	If called as RAB, report that there is no apparent cause for the dropped CEA.
Examiner Note		
<p>It is acceptable for the SRO to direct a Main Turbine load reduction before entering the off normal procedure to raise T_{COLD}. If the SRO directs this step, the guidance is located on the next page. Direct boration to the RCS must start within 15 minutes of the dropped CEA. Initial Turbine load reduction to raise T_{COLD} does not constitute start of the power reduction.</p>		
	SRO	Enter and direct the implementation of OP-901-102, CEA or CEDMCS Malfunction.

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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OP-901-102, CEA or CEDMS Malfunction, E₀, General		
	ATC	1. Place CEDMCS Mode Select switch to OFF.
	Note	CEDMCS should already be in OFF.
	N/A	2. <u>If any</u> of the following occur, then manually trip the Reactor and go to OP-902-000, Standard Post Trip Actions: <ul style="list-style-type: none"> • Mode 1, 10 % Power, and one or more Control Element Assemblies drop • Mode 1, 10 % Power, and any Control Element Assemblies are misaligned by >19 inches • Mode 2 and one or more Control Element Assemblies drop • Mode 2 and any Control Element Assemblies are misaligned by >19 inches
	SRO	3. <u>If</u> Control Element Assembly is misaligned >7 inches, <u>then go to</u> section E ₁ , CEA Misalignment Greater Than 7 Inches.
OP-901-102, CEA or CEDMS Malfunction, E₁, CEA Misalignment Greater than 7 inches		
	SRO	1. Match T _{avg} and T _{ref} by performing the following: <ul style="list-style-type: none"> ▪ Adjust Turbine load in accordance with OP-010-004, Power Operations. ▪ Adjust RCS boron concentration in accordance with OP-002-005, Chemical and Volume Control.
	SRO	2. Notify Duty Plant Manager <u>and</u> Duty Engineering.
	SRO	3. Record time of CEA misalignment >7 inches in Station Log.
	SRO	4. <u>If</u> CEA misalignment >19 inches, <u>then go to</u> step 8.

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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CAUTION

A POWER REDUCTION MUST BE STARTED WITHIN 15 MINUTES OF CEA MISALIGNMENT >7 INCHES TO COMPLY WITH TECH SPEC 3.1.3.1.

NOTE

- (1) Complete the required down-power prior to withdrawal of the affected CEA.
- (2) If a Shutdown Bank CEA has dropped or is misaligned and is <145 inches withdrawn, then CEA Group Out of Sequence annunciator (A-7 on Cabinet L) is an expected annunciator when performing ASI Control using Regulating Group CEAs.

	SRO	<p>8. <u>If</u> misalignment >19 inches <u>or</u> affected CEA is <u>not</u> aligned to within 7 inches of <u>all</u> other CEAs in the same group within 15 minutes, <u>then</u> perform the following:</p> <ul style="list-style-type: none"> ▪ Reduce power in accordance with OP-901-212, Rapid Plant Power Reduction to comply with Technical Specification 3.1.3.1. ▪ Maintain T_{avg} at T_{ref} by adjusting turbine load ▪ <u>If</u> PMC is Operable, <u>then</u> verify CEA Pulse Counter indication is correct <u>or</u> enter the correct CEA position in the PMC database. ▪ Declare COLSS Inoperable <u>and</u> enter OP-901-501, PMC or COLSS Inoperable <u>and</u> perform concurrently with this procedure due to COLSS being Inoperable. ▪ Use SEC CAL PWR (C24230), CBTFSP (C24102), BDELTA (C24104), CBDELTA (C24103), <u>or</u> TURB PWR (C24101) for indication during power reduction.
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Examiner Note

COLSS is inoperable due to a dropped CEA so DNBR and LPD can only be determined via CPC; this is an STA function and outside the scope of scenario.

	SRO	<p>9. <u>If either</u> of the following occur, <u>then</u> within one hour declare CEA Inoperable <u>and</u> verify acceptable Shutdown Margin in accordance with OP-903-090, Shutdown Margin:</p> <ul style="list-style-type: none"> ▪ Misaligned CEA is in Shutdown Bank <u>and cannot</u> be withdrawn to ≥ 145 inches [T.S. 3.1.3.5] <p>or</p> <ul style="list-style-type: none"> ▪ <u>Any</u> CEA is misaligned from its group by >7 inches <u>and cannot</u> be aligned [T.S. 3.1.3.1]
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Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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Examiner Note

The procedure directs the <1 hour action of the applicable Technical Specification. The SRO may not have enough time to further evaluate Technical Specifications associated with CEAs and therefore not be able to make an initial determination. It may be necessary to ask after the scenario is concluded.

Examiner Note

The steps below are contained in OP-901-102, CEA or CEDMCS Malfunction that will be performed while performing the rapid plant power reduction steps.

TECH SPEC CALL		
	SRO	Reviews the following Technical Specification and determines applicable actions: <ul style="list-style-type: none"> • 3.1.3.1 action c (Reduce power per COLR; Within 1 hour either, restore CEA or declare CEA inoperable and verify Shutdown Margin is satisfied. After CEA is declared inoperable, within 1 hour align within 7 inches of its group) • 3.2.3 action a (Correct Power Tilt or adjust AZ Tilt allowance in CPCs), action b (Verify AZ Tilt within limits within 2 hours)
	ATC	10. Monitor the following for compliance with Technical Specifications: <ul style="list-style-type: none"> ▪ Linear Heat Rate (LPD) [T.S. 3.2.1] ▪ Departure from Nucleate Boiling Ratio [T.S. 3.2.4] ▪ Azimuthal Power Tilt [T.S. 3.2.3] ▪ ASI [T.S. 3.2.7]
	ATC	11. Perform the following to verify compliance with Technical Specification 3.2.3: <ul style="list-style-type: none"> ▪ Verify COLSS is detecting Azimuthal Power Tilt as influenced by the misaligned CEA. ▪ <u>If</u> measured Azimuthal Power Tilt exceeds the TS Limit specified in the COLR, <u>then</u> comply with Technical Specification Action 3.2.3.b. ▪ <u>If</u> measured Azimuthal Power Tilt exceeds CPC Power Tilt Allowance, <u>then</u> adjust CPC Power Tilt allowance to ≥ the measured value in accordance with OP-004-006, Core Protection Calculator System.

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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NOTE

If the CEA misalignment is due to a dropped rod then the ACTM card for the dropped rod may need to be reset if the CEA is not responding to a withdrawal demand.

	ATC	12. Maintain ASI within ± 0.05 of target ESI to limit potential impact of transient Xenon on core peaking using Manual Group <u>or</u> Manual Sequential.
	N/A	13. <i>Correct cause of CEA misalignment.</i>
	SRO	14. <u>If</u> initial Reactor power is $\geq 75\%$, <u>then</u> notify Chemistry Department to sample Reactor Coolant System for an isotopic iodine analysis within two to six hours due to a power reduction of $\geq 15\%$ in one hour.

OP-901-212, Rapid Plant Power Reduction, E0, General Actions

Examiner Note

A Rapid downpower does not have to be started at 30MW/min, but should attempt to eventually reach that value. The crew will likely start with a load reduction rate of ~20 MW/min and acid flow of 15-20 GPM.

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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NOTE

- (1) A rapid power reduction is defined as approximately 30 MW/minute load reduction on the main turbine.
- (2) Power Reduction may be stopped at any point.
- (3) Some Steps of this procedure may not be applicable due to plant conditions. In these cases SM/CRS may NA the step.
- (4) Steps within this procedure may be performed concurrently or out of sequence with SM/CRS concurrence.
- (5) During power reduction PMC PID C24650, COLSS DESCENDING PWR TRACK (DUMOUT19), will automatically select and display the correct power indication. OP-010-003, Plant Startup, provides greater detail on which power indications are displayed by PID C24650 based on power level and whether or not the UFM is in service.
- (6) Volume Control Tank (VCT) level may lower during the down power. Charging pump suction swaps to the RWSP at 5.5% VCT level. Makeup to the VCT in accordance with OP-002-005, Chemical and Volume Control, may be necessary if boration from the RWSP is not desired.
- (7) Manual CEA Subgroup Selection should be evaluated per OP-004-015, Reactor Power Cutback, when power reduction is secured above 65% power.

	ATC	1. Begin RCS Boration by Direct Boration or Borate from the RWSP using Charging Pump(s) by performing Attachment 2, RCS Boration.
	ATC	2. Maintain RCS Cold Leg Temperature 536°F to 549°F.
	BOP	3. Commence Turbine load reduction by performing Attachment 4, Main Turbine Load Operation.

CAUTION

REFER TO TECHNICAL SPECIFICATION 3.1.3.6 FOR TRANSIENT INSERTION LIMITS.

	ATC	4. Operate CEAs in accordance with Attachment 3, Operation of CEAs for ASI Control, to maintain ASI using CEA Reg. Group 5, 6 or Group P Control Element Assemblies in accordance with OP-010-005, Plant Shutdown, Attachment 9.10, Axial Shape Control Guidelines.

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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NOTE

To prevent Pressurizer heater cutout, avoid operating with Pressurizer pressure near the heater cutout pressure of 2270 PSIA while on Boron Equalization. **[CR-WF3-2012-01861]**

	ATC	5. Perform Boron Equalization as follows: 5.1 Place available Pressurizer Pressure Backup Heater Control Switches to ON.
	ATC	5.2 Reduce Pressurizer Spray Valve Controller (RC-IHIC-0100) setpoint potentiometer to establish spray flow and maintain RCS pressure 2250 PSIA (2175 – 2265).
	SRO	6. Notify the Woodlands System Load Dispatcher that a rapid power reduction is in progress.
	BOP	7. Announce to Station Personnel over the Plant Paging System that a rapid plant power reduction is in progress.

NOTE

If USBSCAL is not in service, the COLSS Steam Calorimetric will be automatically disabled when MSBSCAL, PMC PID C24246, drops below 95% Power, and will revert back to FWBSCAL, PMC PID C24235. This may result in a step change in COLSS indicated Plant Power (BSCAL) of up to 1.0% when this occurs.

	BOP	8. When Reactor Power consistently indicates less than 98% power, as indicated on PMC PID C24631 [MAIN STEAM RAW POWER (MSBSRAW)], or an alternate point provided by Reactor Engineering, then verify the value of C24648 [BSCAL SMOOTHING VAL. APPLD (DUMOUT17)] automatically changes to 1.
	N/A	9. If C24648 does not automatically change to 1, then inform Reactor Engineering and set the value of 1 for COLSS power smoothing constant K24250, [ADDRSSBL SMOOTHING FOR BSCAL (ALPHA)] in accordance with OP-004-005, Core Operating Limits Supervisory System.

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	10. Following a Reactor Power change of >15% within a one hour period, direct Chemistry Department to sample Reactor Coolant System (RCS) for an isotopic iodine analysis two to six hours later. [P-1171]
	BOP	11. Monitor Condensate Polisher differential pressure and remove Polishers from service to maintain system pressure in accordance with OP-003-031, Condensate Polisher/Backwash Treatment.
	BOP	12. When Reactor Power is approximately 70% or Heater Drain Pump flow is unstable, then remove Heater Drain Pumps from service by taking pump control switches to Stop. [P-14985]
	SRO	13. When Reactor Power is less than 70% power, then note time in Station Log to track LCO requirements for Technical Specification 3.7.1.7.

OP-901-212, Rapid Plant Power Reduction, Attachment 2, RCS Boration

	ATC	1. Perform RCS Boration by Direct Boration or Borate from the RWSP using Charging Pump(s) as follows:
	ATC	1.1 If desired to perform Direct Boration, then perform the following: 1.1.1 Set Boric Acid Makeup Batch Counter to volume of Boric Acid desired.
	ATC	1.1.2 Verify Boric Acid Makeup Pumps selector switch aligned to desired Boric Acid Makeup Pump A(B).
	ATC	1.1.3 Place Direct Boration Valve, BAM-143, control switch to AUTO.
	ATC	1.1.4 Place Makeup Mode selector switch to BORATE.
	ATC	1.1.5 Verify selected Boric Acid Makeup Pump A(B) Starts.
	ATC	1.1.6 Verify Direct Boration Valve, BAM-143, Opens.

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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NOTE

The Boric Acid Flow Totalizer will not register below 3 GPM. The Boric Acid Flow Totalizer is most accurate in the range of 10 - 25 GPM.

	ATC	1.1.7 Verify Boric Acid Flow controller, BAM-IFIC-0210Y, in Manual.
	(note)	"CVCS Boric Acid Makeup Flow Hi/Lo" on CP-4 is an expected annunciator. Acid flow can be seen on the red pen of recorder BAM-IFR-0210Y on CP-4.
	ATC	1.1.8 Adjust Boric Acid Flow controller, BAM-IFIC-0210Y, output to >3 GPM flow rate.
	ATC	1.1.9 Verify Boric Acid Makeup Control Valve, BAM-141, Intermediate or Open.
	ATC	1.1.10 Observe Boric Acid flow rate for proper indication.

NOTE

Opening CVC-507 will render BAM-113A(B) Inoperable. Refer to T.S. 3.1.2.2 (Modes 1-4) or T.S. 3.1.2.1 (Modes 5&6). **[CR-WF3-2018-2016 CA-2]**

	ATC	1.2 If desired to Borate from the RWSP using one or two Charging Pump(s), then perform the following: 1.2.1 Open RWSP to Charging Pumps Suction Isolation, CVC-507.
	ATC	1.2.2 Close Volume Control Tank Outlet Isolation, CVC-183.
	ATC	1.2.3 If desired, then start an additional Charging pump.
	ATC	1.3 If desired to secure Direct Boration, then perform the following: 1.3.1 If Boric Acid Makeup Batch Counter has counted down to desired value, then verify Boric Acid Makeup Control Valve, BAM-141, Closed.
	ATC	1.3.2 Verify Boric Acid Flow controller, BAM-IFIC-0210Y, in Manual.
	ATC	1.3.3 Verify both Boric Acid Flow controller, BAM-IFIC-0210Y, output and setpoint potentiometer set to zero.

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC	1.3.4 Place Makeup Mode selector switch to MANUAL.
	ATC	1.3.5 Verify Selected Boric Acid Makeup Pump A(B) Stops.
	ATC	1.3.6 Verify Direct Boration Valve, BAM-143, Closed.
	ATC	1.3.7 Place Direct Boration Valve, BAM-143, control switch to CLOSE.
	ATC	1.4 If desired to secure Borating from the RWSP using Charging Pump(s), then perform the following: 1.4.1 Open Volume Control Tank Outlet Isolation, CVC-183.
	ATC	1.4.2 Close RWSP to Charging Pumps Suction Isolation, CVC-507.

OP-901-212, Rapid Plant Power Reduction, Attachment 4, Main Turbine Load Operation

	BOP	1. Commence Turbine load reduction by performing the following: 1.1 Depress LOAD RATE MW/MIN pushbutton.
	BOP	1.2 Set selected rate in Display Demand Window.
	BOP	1.3 Depress ENTER pushbutton.
	BOP	1.4 Depress REFERENCE pushbutton.
	BOP	1.5 Set desired load in Reference Demand Window.
	BOP	1.6 Depress ENTER pushbutton.
	BOP	1.7 Depress GO pushbutton.

Examiner Note

This event is complete after the Reactivity Manipulation is satisfied and the SRO has evaluated Technical Specifications or at Lead Examiner's Discretion.

Examiner Note

Cue the Simulator Operator when ready for Event 4

Event Description: Dropped CEA #11 / Rapid Plant Power Reduction / Turbine Fails to Manual

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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Examiner Note
The Booth will insert event 4 at approximately 1100 MW. The actions below will be performed by the crew.

	BOP	2. If desired to Control Main Turbine Load with DEH in Manual, then perform the following:

CAUTION

(1) THE LONGER THE "GV RAISE" OR "GV LOWER" PUSHBUTTON IS DEPRESSED, THE FASTER THE GOVERNER VALVES WILL REPOSITION. LOAD ADJUSTMENT SHOULD BE MADE USING SHORT MOMENTARY TAPS OF THESE PUSHBUTTONS TO AVOID EXCESSIVE LOAD CHANGES.

(2) IF THE "MANUAL NOT TRACKING AUTO" LAMP IS ILLUMINATED OR FLASHING, THEN TRANSFER TO MANUAL SHOULD NOT BE PERFORMED WITHOUT VERIFYING TRANSFER TO MANUAL WOULD BE BUMPLESS.

	N/A	2.1 Depress TURBINE MANUAL pushbutton.
	BOP	2.2 If desired to lower Main Turbine load, then perform the following: 2.2.1 Using short momentary taps, depress and release the GV LOWER pushbutton to achieve the desired turbine load.
	N/A	2.3 If desired to raise Main Turbine load, then perform the following: 2.3.1 Using short momentary taps, depress and release the GV RAISE pushbutton to achieve the desired turbine load.

Examiner Note
This event is complete after the BOP has reduced Turbine load in Manual
OR
At Lead Examiner's Discretion

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 1 Event No.: 5/6/7 Page **17** of **25**

Event Description: 2nd CEA drops, Automatic Reactor Trip, LOOP, 2 CEAs Stuck Out, EDG B fails to auto start

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	Recognize and report indications of Reactor Trip and 2 stuck CEAs.
		Alarms:
		<ul style="list-style-type: none"> • Multiple Alarms associated with a Reactor Trip
		Indications:
		<ul style="list-style-type: none"> • Reactor Trip Breakers open
		<ul style="list-style-type: none"> • All rod bottom lights illuminated (except CEA 40 and 65)

Examiner Note

Event 6 can be inserted at any time following event 5. The required actions to restore power to bus 3B will be contained in OP-902-000, Standard Post Trip Actions.

OP-902-000, Standard Post Trip Actions

	Note	During Standard Post Trip Actions, one crew member (typically the BOP) will go to a back panel to restore radiation monitor sample pumps due to some sample pumps requiring restart following a loss of power or voltage dip (i.e. plant loads transfer from UATs to SUTs).
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NOTE

Steps 1 and 2 are immediate actions and satisfy Reactivity Control

	ATC	<ol style="list-style-type: none"> 1. <u>Determine</u> Reactivity Control acceptance criteria are met: <ol style="list-style-type: none"> a. <u>Check</u> reactor power is dropping. b. <u>Check</u> startup rate is negative. c. <u>Check</u> less than TWO CEAs are NOT fully inserted.
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CRITICAL TASK 1

Establish Reactivity Control

This task is satisfied by manually initiating emergency boration using the gravity feed flowpath prior to entering OP-902-003, Loss of Offsite Power / Loss of Forced Circulation. This is accomplished by opening BAM-113A or BAM-113B and closing CVC-183.

This task becomes applicable following the Reactor Trip and the Loss of Offsite Power.

Event Description: 2nd CEA drops, Automatic Reactor Trip, LOOP, 2 CEAs Stuck Out, EDG B fails to auto start
 Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	Note	<p>If the ATC decides to establish emergency boration using the "A" Train of emergency boration (The boric Acid flowpath), then following the loss of offsite power, the ATC is required to reestablish emergency boration using the "B" Train of emergency boration (Open gravity Feed valves). If the ATC establishes emergency boration using the gravity feed flowpath, then the critical task is met.</p>
	ATC	1.c.1. Commence emergency boration.
OP-901-103, Emergency Boration		
	Note	<p>These are immediate action steps for the ATC. There is an operator aid on CP-4 that contains the necessary steps.</p>
	ATC	<p>1. If Charging is available, then perform the following: 1.1 Place Makeup Mode selector switch to MANUAL.</p>
	ATC	<p>1.2 Align borated water source by performing one of the following (a. or b.):</p> <ul style="list-style-type: none"> a. Initiate Emergency Boration using Boric Acid Pump as follows: <ul style="list-style-type: none"> • Open Emergency Boration Valve, BAM-133. • Start one Boric Acid Pump. • Close recirc valve for Boric Acid Pump started: <ul style="list-style-type: none"> • BAM-126A Boric Acid Makeup Pump Recirc Valve A or • BAM-126B Boric Acid Makeup Pump Recirc Valve B <p style="text-align: center;">OR</p>
	Note	<p>The procedure directs that the ATC opens both BAM-113A and BAM-113B, however, the critical task is satisfied by opening either valve.</p>
	ATC	<ul style="list-style-type: none"> b. Initiate Emergency Boration using Gravity Feed as follows: <ul style="list-style-type: none"> • Open the following Boric Acid Makeup Gravity Feed valves: <ul style="list-style-type: none"> • BAM-113A Boric Acid Makeup Gravity Feed Valve A (CRITICAL) • BAM-113B Boric Acid Makeup Gravity Feed Valve B (CRITICAL)

Event Description: 2nd CEA drops, Automatic Reactor Trip, LOOP, 2 CEAs Stuck Out, EDG B fails to auto start
 Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC	1.3 Close VCT Disch Valve, CVC-183. (CRITICAL)
	ATC	1.4 Verify at least one Charging Pump operating and Charging Header flow <u>>40</u> GPM.

OP-902-000, Standard Post Trip Actions

	BOP	2. <u>Verify</u> Main Turbine and Generator tripped: a. <u>Check</u> the Main Turbine is tripped: <ul style="list-style-type: none"> • Governor valves closed • Throttle valves closed • Turbine Speed lowering
	BOP	b. <u>Check</u> the Main Generator is tripped: <ul style="list-style-type: none"> • GENERATOR BREAKER A tripped • GENERATOR BREAKER B tripped • EXCITER FIELD BREAKER tripped
	BOP	3. <u>Verify</u> maintenance of Vital Auxiliaries a. <u>Check</u> station loads are energized from Off-site power as follows: <u>Train A</u> <ul style="list-style-type: none"> • A1, Non-Safety bus • A2, Non-Safety bus • A3, Safety bus • A-DC Electrical bus • A and C Vital AC Instrument Channels <u>Train B</u> <ul style="list-style-type: none"> • B1, Non-Safety bus • B2, Non-Safety bus • B3, Safety bus • B-DC Electrical bus • B and D Vital AC Instrument Channels b. <u>Verify</u> CCW flow to RCPs

Event Description: 2nd CEA drops, Automatic Reactor Trip, LOOP, 2 CEAs Stuck Out, EDG B fails to auto start

Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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CRITICAL TASK 2

Energize at least 1 vital AC Bus

This task is satisfied by manually starting Emergency Diesel generator B using the control switch prior to performing actions in OP-902-005, Station Blackout Recovery.

This task becomes applicable once the Loss of Offsite power occurs.

	BOP	<p>a.1 IF ANY 3A(B) Safety bus is NOT powered from Off-Site Power, THEN perform the following:</p> <ol style="list-style-type: none"> 1) Verify associated EDG started. (CRITICAL) 2) Check EDG Output breaker is closed. 3) IF associated EDG Output breaker is open, THEN perform the following: <ol style="list-style-type: none"> a) Verify stable EDG voltage 3920 - 4350 VAC. b) Verify 3-2 Breaker open. c) IF EDG Output breaker failed to AUTO close, THEN locally close EDG Output breaker. 4) Verify CCW available to EDG.
	ATC	<p>4. <u>Verify</u> RCS Inventory Control:</p> <ol style="list-style-type: none"> a. <u>Check</u> that BOTH of the following conditions exist: <ul style="list-style-type: none"> • Pressurizer level is 7% to 60% • Pressurizer level is trending to 33% to 60% b. <u>Check</u> RCS subcooling is greater than or equal to 28°F.
	ATC	<p>5. <u>Check</u> RCS Pressure control:</p> <ul style="list-style-type: none"> • PZR pressure is 1750 psia to 2300 psia • PZR pressure is trending to 2125 psia to 2275 psia
	ATC	<p>6. <u>Check</u> Core Heat Removal:</p> <ol style="list-style-type: none"> a. At least ONE RCP is operating. b. Operating loop ΔT less than 13°F. c. RCS subcooling greater than or equal to 28°F.

Event Description: 2nd CEA drops, Automatic Reactor Trip, LOOP, 2 CEAs Stuck Out, EDG B fails to auto start
 Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	7. <u>Verify</u> RCS Heat Removal: a. <u>Check</u> that at least ONE SG has BOTH of the following: <ul style="list-style-type: none"> • SG level is 10% to 76% NR • Feedwater is available to restore level within 55%-70% NR.
	BOP	b. <u>Check</u> Feedwater Control in Reactor Trip Override: <ul style="list-style-type: none"> • MAIN FW REG valves are closed • STARTUP FW REG valves are 13% to 21% open • Operating Main Feedwater pumps are 3800 rpm to 4000 rpm
	ATC	c. <u>Check</u> RCS Tc is 530 to 550 °F.
	BOP	d. <u>Check</u> Steam Generator pressure is 885 to 1040 psia.
	Note	<p>This step below is normally performed immediately following a reactor and turbine trip. If the Moisture Separator reheater temperature control valves are not closed when off site power is lost, the BOP should dispatch an operator to locally isolate the MSRs by locally closing the Air Operated valves.</p>
	BOP	e. <u>Reset</u> Moisture Separator reheaters, and <u>check</u> the Temperature Control valves closed.
	ATC	8. <u>Verify</u> Containment Isolation: a. <u>Check</u> containment pressure is less than 16.4 psia. b. <u>Check</u> NO containment area radiation monitor alarms OR unexplained rise in activity. c. <u>Check</u> NO steam plant activity monitor alarms OR unexplained rise in activity.
	BOP	9 <u>Verify</u> Containment Temperature and Pressure Control: a. <u>Check</u> Containment temperature is less than or equal to 120°F. b. <u>Check</u> Containment pressure is less than 16.4 psia.

Event Description: 2nd CEA drops, Automatic Reactor Trip, LOOP, 2 CEAs Stuck Out, EDG B fails to auto start
 Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	SRO	10. <u>GO TO</u> Appendix 1, "Diagnostic Flowchart" and diagnose to appropriate EOP.
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OP-902-009, Standard Appendices, Appendix 1 Diagnostic Flow Chart

Examiner Note

Appendix 1 is a flow chart used to diagnose to the correct recovery procedure for the event in progress. The steps below will be followed by a YES or NO to indicate proper flow path.

Examiner Note

If the ATC chose to use the boric acid flowpath to complete the Emergency Boration steps following the reactor trip, the cue to recheck the lineup and to establish emergency boration is addressed in the first question. If the ATC determines that reactivity control is not met due to no emergency boration, the steps to perform are contained above.

	ATC	Is Reactivity Control met? (Note 1) (YES)
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Note 1: Reactivity Control Criteria

- Reactor Power lowering
- Startup rate negative
- Maximum of ONE CEA NOT fully inserted **OR Emergency Boration in progress**
- Reactor Power < 10-4% (15 min)

	BOP	Is at least ONE 125 VDC SAFETY bus energized? (YES)
	BOP	Is at least ONE 4.16 KV NON-SAFETY bus energized? (NO)
	SRO	Consider LOOP/LOFC OP-902-003
	BOP	Is at least ONE 4.16 KV SAFETY bus energized? (YES)
	ATC	Is at least ONE RCP running? (NO)
	SRO	Consider LOOP/LOFC OP-902-003
	BOP	Does at least ONE SG have adequate FW? (Note 2) (YES)
	ATC	Is PZR pressure >1750 psia AND stable or rising? (YES)

Event Description: 2nd CEA drops, Automatic Reactor Trip, LOOP, 2 CEAs Stuck Out, EDG B fails to auto start
 Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	ATC	Is PZR level > 7% AND stable or rising? (YES)
	BOP	Are BOTH SG pressures >885 psia AND stable or rising? (Note 5) (YES)
	SRO	Are ALL acceptance criteria satisfied? (NO)
	SRO	Has ANY event been diagnosed? (YES)
	SRO	Can a single event be diagnosed? (Note 4) (YES)
	SRO	GO TO Appropriate EOP
	Note	SRO goes to OP-902-003, Loss of Offsite Power / Loss of Forced Circulation
OP-902-003, Loss of Offsite Power/Loss of Forced Circulation Recovery Procedure		
	Crew	*1. Confirm diagnosis of a LOOP/LOFC: a. Monitor the SFSCs and check Acceptance Criteria are satisfied.
	Crew	2. Announce a Loss of Offsite Power or a Loss of Forced Circulation is in progress using the plant page.
	SRO	* 3. Advise the Shift Manager to implement the Emergency Plan using EP-001-001, "Recognition & Classification of Emergency Condition".
	SRO	* 4. <u>REFER TO</u> Section 6.0, "Placekeeper" and <u>record</u> the time of the reactor trip.
	SRO	* 5. IF power has been interrupted to either 3A or 3B safety buses, THEN <u>perform</u> Appendix 20, "Operation of DCT Sump Pumps"
	Note	SRO should direct this action to a non-licensed operator.

Event Description: 2nd CEA drops, Automatic Reactor Trip, LOOP, 2 CEAs Stuck Out, EDG B fails to auto start
 Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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	BOP	* 6. IF offsite power has been lost, THEN <u>check</u> the Sequencer has timed out for at least ONE 4.16KV safety bus.
	BOP	* 7. <u>Check</u> CCW operation a. Check a CCW pump is operating for EACH energized 4.16 KV safety bus. <ul style="list-style-type: none"> • 3A Safety bus • 3B Safety bus
	Note	The 3B Safety Bus will be the only energized safety bus with CCW Pump B as the only operating CCW pump.
	BOP	b. IF only ONE CCW pump operating, THEN <u>split</u> CCW headers using Appendix 35, "Single CCW Pump Operation."
	Note	The crew should split CCW headers per Appendix 35.
OP-902-009, Standard Appendices – Appendix 35, Single CCW Pump Operation		
	BOP	1. IF only ONE CCW pump operating, THEN split CCW headers as follows: c. IF CCW Pump B is operating, THEN close CCW Suction and Discharge Header Tie Valves: <ul style="list-style-type: none"> • CC 127B/115B, AB TO B • CC 200A/727, A TO AB
	BOP	2. IF an isolated CCW Train does NOT have an operating CCW pump, THEN <u>perform</u> ALL of the following for the AFFECTED CCW Train: <ul style="list-style-type: none"> • <u>Pull</u> EDG A Overspeed Trip Device • <u>Place</u> HPSI A to "OFF." • <u>Place</u> LPSI A to "OFF." • <u>Place</u> CS Pump A to "OFF." • IF HPSI AB aligned for service, THEN <u>place</u> Assignment Switch to "NORM."

Event Description: 2nd CEA drops, Automatic Reactor Trip, LOOP, 2 CEAs Stuck Out, EDG B fails to auto start
 Symptoms/Cues:

Time	Position	Applicant's Actions or Behavior
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OP-902-003, Loss of Offsite Power/Loss of Forced Circulation Recovery Procedure (Cont.)		
	BOP	*7. c. <u>Check</u> an Essential chiller is operating for EACH energized 4.16 KV Safety bus: <ul style="list-style-type: none"> • 3A Safety bus • 3B Safety bus
	Note	BOP will check Essential Chiller B running on CP-18
	ATC/BOP	* 8. <u>Check</u> CCW flow to RCPs.
	Note	If CCW to RCPs is lost for greater than 10 minutes, then CCW to RCPs is not restored. Otherwise the crew will attempt to restore by checking valve alignment on CP-2 and CP-8.
	BOP	* 9. Perform BOTH of the following: <ul style="list-style-type: none"> • Verify CW System in operation. REFER TO OP-003-006, "Circulating Water." • Check Condenser vacuum greater than 14" Hg.
	BOP	9.1 Perform the following: <ol style="list-style-type: none"> a. Verify BOTH MSIVs are closed: <ul style="list-style-type: none"> • MS 124A, MSIV 1 • MS 124B, MSIV 2 b. Verify ALL Steam Generator Blowdown Isolation valves are closed: <ul style="list-style-type: none"> • BD 102A, STM GEN 1 (IN) • BD 102B, STM GEN 2 (IN) • BD 103A, STM GEN 1 (OUT) • BD 103B, STM GEN 2 (OUT)
Examiner Note This event is complete after step 9 to protect the Main Condenser (close MSIVs and SG Blowdown Isolation valves) are performed and step 7 for verifying proper CCW operation are completed.		

Form 3.3-1 Scenario Outline

Facility:	Waterford 3	Scenario #:	4
Scenario Source:		Op. Test #:	1
Examiners:		Applicants/	
		Operators:	
Initial Conditions: 100% Power, EDG A OOS, PTED not available			
Turnover: Reduce power to remove Heater Drain Pump A from service per OP-003-034 and OP-010-005.			
Critical Tasks: CT-1: Establish Reactivity Control; CT-2: LPSI Pump to replace CS Pump			

Event No.	Malfunction No.	Event Type*	Event Description
1	N/A	R- ATC R-BOP N-SRO	Downpower to remove Heater Drain Pump from service per OP-003-034 and OP-010-005.
2	RP04B5 AO-07A2M11-1 AO-07A2AR5-1	I – BOP I – SRO TS – SRO	RWSP Level Instrument, SI-ILI-0305B, fails low and generates an RAS trip requiring TS 3.3.2 entry and bypassing the affected trip bistable.
3	CV01B	C – ATC TS – SRO	Charging Pump B trips on overcurrent requiring implementation of OP-901-112, Charging or Letdown malfunction.
4	SG05A	C – BOP N – SRO	SG #1 Level ILT-1105 fails high requiring implementation of OP-901-201
5	FW03A	C-ATC	Main Feedwater Pump A overspeed trip resulting in a Rx Cutback. OP-901-101 immediate operator action.
6	RD02A01	C-ATC	On Rx Cutback, CEA 1 falls into core resulting in an unanalyzed rod pattern requiring a manual RX trip (Critical Task 1, establish Rx control)
7	RC23A CS04A	M – ALL	Loss of Coolant Accident occurs inside containment and valve CS-125A (Containment Spray Hdr A Isolation) fails closed
8	DI-08A04S22-1 CS01B	C/MC – BOP C – SRO	Containment Spray Pump B trips and cannot be restarted requiring entry into OP-902-008, Functional Recovery and action taken to align Low Pressure Safety Injection pump to provide Containment Spray (Critical Task 2, align LPSI pump to replace CS pump prior to exiting Appendix 28 of OP-902-009)
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (TS)Tech Spec, (MC)Manual Control			

Scenario Quantitative Attributes

1. Malfunctions after EOP entry (1–2)	1
2. Abnormal events (2–4) <i>[Events 3,4 and 5 credited]</i>	3
3. Major transients (1–2)	1
4. EOPs entered/requiring substantive actions (1–2)	2
5. Entry into a contingency EOP with substantive actions (≥ 1 per scenario set)	1
6. Preidentified critical tasks (≥ 2)	2

The crew assumes the shift with the reactor at 100% power. Emergency Diesel Generator A is danger tagged out of service and the PTED is not available.

Event 1: Crew should commence a power reduction per OP-003-034, Feed Heater Vents and Drains, and OP-010-005, Plant Shutdown, in preparation of removing Heater Drain Pump A from service.

Event 2: After power has been reduced, RWSP Level instrument, SI-ILI-0305B, fails low and generates an RAS trip on channel B. The ATC operator should review the annunciators for this failure. The CRS should evaluate Tech Specs and enter Tech Spec 3.3.2 and determine that the Plant Protection System bistable (18) for Low RWSP Level must be bypassed within 1 hour on Channel B. Tech Spec 3.3.3.5 and 3.3.3.6 should be referenced but not entered.

Event 3: Charging Pump B trips. Per the Annunciator Response Procedure, the SRO should direct the ATC to start a standby charging pump after verifying a suction path available or isolate Letdown using CVC-101, Letdown Stop Valve. The SRO should implement OP-901-112, Charging or Letdown Malfunction, Section E₁, Charging Malfunction. If Letdown is isolated, Charging and Letdown should be re-initiated using Attachment 2 of OP-901-112. The SRO should review and enter Technical Specification 3.4.3.2 and TRM 3.13.3, TRM 3.1.2.4. TRM 3.1.2.4 and Technical Specification 3.4.3.2 may be exited after aligning Charging Pump AB to replace Charging Pump B.

Event 4: SG #1 Level, ILT-1105, fails high. The SRO should direct placing Feedwater Level Control for SG #1 in manual and matching feedwater flow to steam flow. The crew should enter OP-901-201, Steam Generator Level Control Malfunction, and establish a SG level band while maintaining SG level control in manual.

Event 5: Main Feedwater Pump A overspeed trip resulting in an automatic Rx Cutback. The ATC should take action to place the CEDM Mode Select switch to AS (Auto Sequential) per OP-901-101, Reactor Power Cutback and verify only the selected subgroups dropped.

Event 6: Following the main feedwater pump trip, an automatic Reactor Power Cutback will occur. CEA #1 will also drop on the RXC. This requires the ATC to manually trip the Reactor due to an unanalyzed rod pattern. **(Critical Task 1)**

Event 7: After the Reactor trip, and during Standard Post Trip Actions, a large Break LOCA is inserted on a ramp. The break flow will exceed Charging capacity and the SRO should direct manual initiation of SIAS/CIAS. Containment pressure will rise to and exceed 17.7 psia resulting in a Containment Spray actuation. CS-125A is failed closed resulting in spray flow on the B train only. The crew should diagnose to OP-902-002, Loss of Coolant Accident Recovery.

Event 8: After the crew diagnoses to OP-902-002, Loss of Coolant Accident Recovery, Containment Spray Pump B trips and cannot be restarted requiring entry into OP-902-008, Functional Recovery due to not meeting Safety Function in OP-902-002. The SRO should prioritize and take action taken to align Low Pressure Safety Injection pump to provide Containment Spray. BOP should perform the steps in OP-902-009, Standard Appendices, Attachment 28, to align LPSI Pump B to replace CS Pump B. **(Critical Task 2, align LPSI pump B to replace CS pump B prior to exiting Appendix 28 of OP-902-009)**

The scenario can be terminated once all CT's are complete (Reactor Tripped and LPSI Pump B aligned to replace CS pump B) AND event 7 is completed or at the lead examiner's discretion.

Critical Task	Safety Significance	Cueing	Measurable Performance Indicator	Performance Feedback
<p>CT-1: Establish Reactivity Control</p> <p>This task is satisfied by manually tripping the Reactor by using the manual trip pushbuttons, Diverse Reactor trip pushbuttons, or by de-energizing busses 32A and 32B within 1 minute of an incorrect CEA pattern.</p> <p>This task becomes applicable following the Reactor Power Cutback and CEA # 1 dropping.</p>	<p>Failure to trip the reactor when an unanalyzed CEA pattern exists will result in operating the plant in a manner that would violate a condition of the facility license. OPS management standard documented in WTRN-OPS-CRITTASK.</p> <p>(WTRN-OPS-CRITTASK, CT-1)</p>	<p>CEA rod bottom lights extinguished</p> <p>CEAC positions</p> <p>OP-901-101 IOA verifies correct rod pattern for a cutback</p>	<p>Depresses two Reactor Trip pushbuttons on CP-2 or CP-8 within 1 minute of recognition of unanalyzed rod pattern.</p>	<p>Reactor Trip breakers open</p> <p>All CEA rod bottom lights illuminated</p> <p>Reactor power lowering</p>
<p>CT-2: Establish Containment Temperature and Pressure Control</p> <p>This task is satisfied by aligning LPSI Pump B to replace CS Pump B within 30 minutes of the loss of Containment Spray flow. This task becomes applicable following CS Pump B tripping resulting in no Containment Spray flow with a LOCA in progress and Containment pressure greater than 17.7 psia. E-plan upgrade criteria would be met for Potential Loss of the Containment barrier without a train of Containment Spray flow at ≥ 1750 gpm.</p>	<p>Failure to take action to establish containment pressure and temperature control may result in containment pressure exceeding maximum design and therefore exceed design leakage of containment. This would lead to a degradation of a fission product barrier. OPS management Standard documented in WTRN-OPS-CRITTASK.</p> <p>(WTRN-OPS-CRITTASK, CT-15)</p>	<p>LPSI pump light status on CP-8</p> <p>CS Pump light status on CP-8</p> <p>Containment pressure</p> <p>OP-902-008, Functional recovery CPTC continuing actions</p> <p>OP-902-009, Standard Appendices.</p>	<p>The crew takes action to manually align an available LPSI pump to replace a CS pump.</p>	<p>Adequate CS flow indication on CP-8.</p>

REFERENCES

Event	Procedures
1	OP-003-034, Feed Heater Vents and Drains, Rev 029 OP-010-005, Plant Shutdown, Rev 343
2	OP-009-007, Plant Protection System, Rev. 22 OP-903-013, Monthly Channel Checks, Rev. 23 Technical Specification 3.3.2
3	OP-500-007, Control Cabinet G, Rev. 25 OP-901-112, Charging or Letdown Malfunction, Rev 11 Technical Specification 3.4.3.2 Technical Requirement 3.1.2.4 Technical Requirement 3.13.3
4	OP-901-201, Steam Generator Level Control Malfunction, Rev. 007
5	OP-901-101, Reactor Power Cutback, Rev. 010
6	OP-901-101, Reactor Power Cutback, Rev. 010
7/8	OP-902-000, Standard Post Trip Actions, Rev. 17 OP-902-002, Loss of Coolant Accident Recovery, Rev. 21 OP-902-008, Functional Recovery Procedure, Rev. 31 OP-902-009, Standard Appendices, Rev. 323
Gen	EN-OP-115, Conduct of Operations, Rev. 31 EN-OP-115-08, Annunciator Response, Rev. 7 OI-038-000, EOP Operations Expectations / Guidance, Rev. 21 OP-100-017, EOP Implementation Guide, Rev 6

Event Description: Lower plant power to remove a Heater Drain Pump from service

Time	Position	Applicant's Actions or Behavior
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OP-010-005, Plant Shutdown		
<p><u>NOTE</u></p> <p>Power may be stabilized at SM/CRS discretion at any point during performance of this section. The Senior Line Manager for Plant Shutdown <u>shall</u> be the Operations Manager <u>or</u> designee, <u>or</u> a qualified Duty Plant Manager. Performance of an Infrequently Performed Test or Evolution (IPTE) Brief shall <u>not</u> preclude full compliance with any Technical Specification <u>or</u> procedurally required Plant Shutdown.</p>		
<p><u>CAUTION</u></p> <p>THE FOLLOWING SECTION HAS THE POTENTIAL TO AFFECT CORE REACTIVITY.</p>		
	N/A	<p>9.1.1 <u>If</u> performing a planned Plant Shutdown involving power reduction of >30%, <u>then</u> the Operations Manager (OM) <u>shall</u> evaluate the use of IPTE controls in accordance with EN-OP-116, Infrequently Performed Tests or Evolutions. At the direction of the OM the following Infrequently Performed Test or Evolutions (IPTE) controls should be complied with:</p>
	CREW	<p>9.1.2 <u>Prior to</u> commencing power reduction, notify Load Dispatcher.</p>
	CREW	<p>9.1.3 Announce to Station Personnel that a power reduction is in progress over the Plant Paging System.</p>
	CREW	<p>9.1.4 Perform Boron Equalization in accordance with Attachment 9.9, Boron Equalization.</p>
	N/A	<p>9.1.5 At SM/CRS discretion start a second Charging Pump in accordance with OP-002-005, Chemical Volume Control.</p>
	CREW	<p>9.1.6 <u>When</u> required power level is reached, <u>and</u> plant is not being shut down, <u>then</u> stabilize power using Attachment 9.12, Stabilizing Power.</p>

Event Description: Lower plant power to remove a Heater Drain Pump from service

Time	Position	Applicant's Actions or Behavior
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NOTE

- (1) BSCAL is not a good indication of instantaneous power during power maneuvers. Additionally, once the smoothing factor is applied at approximately 98% MSBSRAW (PMC PID C24631), BSCAL becomes a time weighted average of power recorded over approximately 20 minutes. The following tables list COLSS calculated powers available during power maneuvering to monitor instantaneous power:
- (2) During power ascension PMC PID C24649 COLSS ASCENDING PWR TRACK (DUMOUT 18) will automatically select and display the correct power indication. During power reduction PMC PID C24650 COLSS DESCENDING PWR TRACK (DUMOUT 19) will automatically select and display the correct power indication.

UFM not in service	
Reactor Power $\geq 95\%$	MSBSRAW PMC PID C24631
Reactor Power $<95\%$ and $\geq 35\%$	FWBSRAW PMC PID C24630
Reactor Power $<35\%$	BDELT PMC PID C24104
UFM in service	
Reactor Power $\geq 95\%$	MSBSRAW PMC PID C24631
Reactor Power $<95\%$ and $\geq 40\%$	USBSRAW PMC PID C24629
Reactor Power $<40\%$ and $\geq 35\%$	FWBSRAW PMC PID C24630
Reactor Power $<35\%$	BDELT PMC PID C24104

	ATC	9.1.7 Begin Reactor Coolant System boration in accordance with attachment 9.10, RCS Boration.
	CREW	9.1.8 Maintain RCS T_{cold} 536°F to 549°F during the downpower.
	BOP	9.1.9 <u>When</u> Average Reactor Coolant Temperature (T_{avg}) begins to drop, <u>then</u> reduce Generator load to match T_{avg} and Reference Temperature(T_{ref}) in accordance with Attachment 9.13, Main Turbine Load Operations.

Event Description: Lower plant power to remove a Heater Drain Pump from service

Time	Position	Applicant's Actions or Behavior
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CAUTION

CONTROL RODS SHOULD NEVER BE WITHDRAWN OR MANUALLY INSERTED EXCEPT IN A DELIBERATE CAREFULLY CONTROLLED MANNER WHILE CLOSELY MONITORING THE REACTOR'S RESPONSE.

	ATC	9.1.10 Operate CEA Reg. Group %, 6 or Group P in accordance with 9.11, Operation of CEAs, to maintain ASI per Attachment 9.4, Axial Shape Control Guidelines.(Refer to T.S. 3.1.3.6)

NOTE

(1) IF USBSCAL is not in service, the COLSS Steam Calorimetric will be automatically disables when MSBSCAL (PMC PID C24246) drops below 95% Power and will revert to FWBSCAL (PMC PID 24235). This may result in a step change in COLSS indicated Plant Power (BSCAL) of up to 1.0% when this occurs.

	CREW	9.1.11 <u>When</u> reactor power consistently indicates less than 98% power, as indicated on computer point C24631, MAIN STEAM RAW POWER (MSBSRAW), or an alternate point provided by Reactor Engineering, <u>then</u> verify the value of C24648, BSCAL SMOOTHING VAL. APPLD (DUMOUT 17), automatically changes to 1.

OP-010-005, Attachment 9.10, RCS Boration

CAUTION

- (1) THIS SECTION HAS THE POTENTIAL TO AFFECT CORE REACTIVITY. **[INPO 06-006]**
- (2) AT LEAST ONE REACTOR COOLANT PUMP IN EACH LOOP SHOULD BE OPERATING PRIOR TO PERFORMING DIRECT BORATION OPERATIONS TO ENSURE PROPER CHEMICAL MIXING.
- (3) THIS EVOLUTION SHOULD BE CROSS-CHECKED AND COMPLETED PRIOR TO LEAVING CP-4.

	ATC	9.10.1.1 Inform SM/CRS that this Section is being performed.

Event Description: Lower plant power to remove a Heater Drain Pump from service

Time	Position	Applicant's Actions or Behavior
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NOTE

When performing a Plant down power where final RCS Boron Concentration needs to be determined, the following Plant Data Book figure(s) will assist the Operator in determining the required RCS Boron PPM change.

- 1.2. Power Defect Vs Power Level
- 1.4.3 Inverse Boron Worth Vs. T_{mod} at BOC
- 1.4.4 Inverse Boron Worth Vs. T_{mod} at Peak Boron
- 1.4.5 Inverse Boron Worth Vs. T_{mod} at MOC
- 1.4.6 Inverse Boron Worth Vs. T_{mod} at EOC

	ATC	9.10.1.2 At SM/CRS discretion, calculate volume of Boric Acid to be added on Attachment 9.8, Calculation of Boric Acid Volume for Direct Boration.
	ATC	9.10.1.3 Set Boric Acid Makeup Batch Counter to volume of Boric Acid desired.
	ATC	9.10.1.4 Verify Boric Acid Makeup Pumps selector switch aligned to desired Boric Acid Makeup Pump A(B).
	ATC	9.10.1.5 Place Direct Boration Valve, BAM-143, control switch to AUTO.
	ATC	9.10.1.6 Place Makeup Mode selector switch to BORATE.
	ATC	9.10.1.7 Verify selected Boric Acid Makeup Pump A(B) Starts.
	ATC	9.10.1.8 Verify Direct Boration Valve, BAM-143, Opens.

NOTE

The Boric Acid Flow Totalizer will not register below 3 GPM. The Boric Acid Flow Totalizer is most accurate in the range of 10 - 25 GPM.

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Event Description: Lower plant power to remove a Heater Drain Pump from service

Time	Position	Applicant's Actions or Behavior
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	ATC	9.10.1.9 If manual control of Boric Acid flow is desired, <u>then</u> perform the following: 9.10.1.9.1 Verify Boric Acid Flow controller, BAM-IFIC-0210Y, in Manual. 9.10.1.9.2 Adjust Boric Acid Flow controller, BAM-IFIC-0210Y, output to >3 GPM flow rate.
	N/A	9.10.1.10 If automatic control of Boric Acid flow is desired, <u>then</u> perform the following: 9.10.1.10.1 Place Boric Acid Flow controller, BAM-IFIC-0210Y, in Auto. 9.10.1.10.2 Adjust Boric Acid Flow controller, BAM-IFIC-0210Y, setpoint potentiometer to >3 GPM flow rate.
	ATC	9.10.1.11 Verify Boric Acid Makeup Control Valve, BAM-141, Intermediate <u>or</u> Open.
	ATC	9.10.1.12 Observe Boric Acid flow rate for proper indication.
	ATC	9.10.1.13 <u>When</u> Boric Acid Makeup Batch Counter has counted down to desired value, <u>then</u> verify Boric Acid Makeup Control Valve, BAM-141, Closed.

Examiner Note

The step below is only applicable if the ATC adds acid in small batches.

NOTE

Step 9.10.1.14 may be repeated as necessary to achieve desired total boron addition for plant conditions.

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Event Description: Lower plant power to remove a Heater Drain Pump from service

Time	Position	Applicant's Actions or Behavior
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	ATC	9.10.1.14 <u>If</u> additional boric acid addition is required <u>and</u> with SM/CRS permission, <u>then</u> perform the following: 9.10.1.14.1 Reset Boric Acid Makeup Batch Counter. 9.10.1.14.2 Verify Boric Acid Makeup Control Valve, BAM-141, Intermediate <u>or</u> Open. 9.10.1.14.3 Observe Boric Acid flow rate for proper indication. 9.10.1.14.4 <u>When</u> Boric Acid Makeup Batch Counter has counted down to desired value, <u>then</u> verify Boric Acid Makeup Control Valve, BAM-141, Closed.
	ATC	9.10.1.15 Verify Boric Acid Flow controller, BAM-IFIC-0210Y, in Manual.
	ATC	9.10.1.16 Verify <u>both</u> Boric Acid Flow controller, BAM-IFIC-0210Y, output <u>and</u> setpoint potentiometer set to zero.
	ATC	9.10.1.17 Place Makeup Mode selector switch to MANUAL.
	ATC	9.10.1.18 Verify Selected Boric Acid Makeup Pump A(B) Stops.
	ATC	9.10.1.19 Verify Direct Boration Valve, BAM-143, Closed.
	ATC	9.10.1.20 Place Direct Boration Valve, BAM-143, control switch to CLOSE.

OP-010-005, Attachment 9.13 Main Turbine Load Operations

CAUTION

THE FOLLOWING SECTION HAS THE POTENTIAL TO AFFECT CORE REACTIVITY. REACTOR POWER, RCS TEMPERATURE, AND MAIN GENERATOR MW LOAD SHOULD BE CLOSELY MONITORED DURING PERFORMANCE OF THIS SECTION. **[INPO 06-006]**

	BOP	9.13.1 To change Load/Rate perform the following:
		9.13.1.1 Depress LOAD/RATE MW/MIN pushbutton.
	BOP	9.13.1.2 Depress appropriate numerical pushbuttons for desired load rate.
	BOP	9.13.1.3 Depress ENTER pushbutton.

Event Description: Lower plant power to remove a Heater Drain Pump from service

Time	Position	Applicant's Actions or Behavior
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<u>NOTE</u>		
Prior to changing Reference Demand, Main Turbine load <u>must not</u> be changing.		
	BOP	9.13.2 To change Main Turbine load, perform the following: 9.13.2.1 Depress REF pushbutton.
	BOP	9.13.2.2 Depress appropriate numerical pushbuttons for desired MW load.
	BOP	9.13.2.3 Depress ENTER pushbutton.
	BOP	9.13.2.4 Depress GO pushbutton.
	BOP	9.13.2.5 Verify Turbine load change stops at the desired MW load.
Examiner Note This event is complete when the Reactivity Manipulation is met. OR As directed by the Lead Evaluator.		

Event Description: RWSP level instrument failure

Time	Position	Applicant's Actions or Behavior
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	ATC	Recognize and report indications of failed channel.
		Alarms:
		<ul style="list-style-type: none"> ESFAS CHANNEL TRIP RWSP LEVEL LO (Cabinet K, F-17)
		<ul style="list-style-type: none"> RPS CHANNEL B TROUBLE (Cabinet K, F-18)
		Indications
		<ul style="list-style-type: none"> RWSP Level instrument, SI-ILI-0305B on CP-7 indicates failed low
		<ul style="list-style-type: none"> LO RWT LEVEL trip lamp lit on CP-7 Channel B.
	ATC	<ul style="list-style-type: none"> Recognize and report indications of failed channel.

Examiner Note

All BOP manipulations for OP-009-007 are located at CP-10 except as noted.

OP-009-007, Plant Protection System, Section 6.2, Trip Channel Bypass Operation

	SRO	6.2.1 Refer to Attachment 11.11, PPS Bistable Bypass Chart to assist in determination of Trip Channels requiring placement in bypass.
	Note	<p>SRO determines the following bistables are affected and need to be bypassed:</p> <ul style="list-style-type: none"> 18 – LO RWT LEVEL
	BOP	6.2.2 To place a bistable in or remove a bistable from bypass, go to Attachment 11.10, Trip Channel Bypass Operation.

Event Description: RWSP level instrument failure

Time	Position	Applicant's Actions or Behavior
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OP-009-007, Plant Protection System ,Attachment 11.10, Trip Channel Bypass Operation		
<u>CAUTION</u>		
<p>(1) ATTEMPTING TO PLACE MORE THAN ONE TRIP CHANNEL IN BYPASS REMOVES BOTH TRIP CHANNELS FROM BYPASS.</p> <p>(2) PRIOR TO PLACING ANY TRIP CHANNEL IN BYPASS, VERIFY BYPASS PUSH BUTTONS ON DE-ENERGIZED PPS BAY NOT DEPRESSED.</p>		
	Note	BOP circles Channel B.
	BOP	11.10.1 To Bypass a Trip Channel, perform the following: 11.10.1.1 Circle the bistable numbers selected for bypass under Step 11.10.1.4.
	Note	BOP circles bistable number 18 in Step 11.10.1.4 table
	BOP	11.10.1.2 Check desired Trip Channel is <u>not</u> Bypassed on another PPS Channel.
	BOP	11.10.1.3 Open key-locked portion of BCP in desired PPS Channel.
	Note	The crew should expect annunciator RPS CABINET CONDITION ABNORMAL (Cabinet L, B-1) to actuate when the PPS Channel door is opened.
	BOP	11.10.1.4 Depress Bypass push buttons for the desired Trip Channels (placekeep below).
	Note	BOP depresses pushbuttons for bistable 18 using placekeeping table.
	Note	The crew should expect annunciator RPS BISTABLE BY-PASS (Cabinet K, B-18) to actuate when the first bistable is bypassed in the PPS Channel.
	BOP	11.10.1.5 Check all selected bistable Bypass push buttons remain in a Depressed state.

Event Description: RWSP level instrument failure

Time	Position	Applicant's Actions or Behavior
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	BOP	11.10.1.6 Check all selected bistable Bypass lights Illuminate on BCP for the desired Trip Channels.
	CREW	11.10.1.7 Check all selected bistable Bypass lights Illuminate on ROM for the desired Trip Channels.
	Note	Crew verifies correct bistables lit on CP-7 PPS Channel B Remote Operator Module.

TECH SPEC CALL

	SRO	Reviews the following Technical Specifications and determines applicable actions: <ul style="list-style-type: none"> • 3.3.2 - Functional Unit 5b, action 19 (Bypass w/in 1 hr) • 3.3.1 – Not applicable • 3.3.3.5 – Not applicable • 3.3.3.6 – Not applicable

Examiner Note

This event is complete when bistables are bypassed and Technical Specifications have been addressed or at Lead Examiner's Discretion.

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 4 Event No.: 3 Page **11** of **44**
 Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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Examiner Note		
Cue the Simulator Operator when ready for Event 3		

	ATC	Recognize and report indications of Charging Pump B trip.
		Alarms:
		<ul style="list-style-type: none"> • CHARGING PUMPS HEADER FLOW LO (Cabinet G, H-5) • CHARGING PUMP B TRIP/TROUBLE (Cabinet G, B-6)
		Indications:
		<ul style="list-style-type: none"> • Charging Pump B indicates OFF • Charging flow lowering • PZR level lowering • Letdown flow lowering
	Booth Cue	If called to investigate the breaker, report overcurrent flags are tripped on all 3 phases for Charging Pump B.
	Booth Cue	If called to investigate the pump and motor, report that an acrid odor is present near motor but there is no fire.

Examiner Note		
The SRO may direct the ATC to verify a suction source and start a standby Charging Pump per the Annunciator Response Procedure, prior to entering the off normal.		

OP-500-007, Control Room Cabinet G, Attachment 4.16		
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	ATC	<p>1. <u>If</u> the ONLY operating Charging Pump has tripped, <u>then</u> perform the following:</p> <p>1.1 Ensure one of the following suction sources available with sufficient inventory:</p> <ul style="list-style-type: none"> • CVC-183, VCT DISCH VLV, OPEN • CVC-507, RWSP to Charging Pump Suction, OPEN <p>1.2 Start a standby Charging Pump.</p> <p>1.3 Verify Charging Flow \geq 44gpm.</p> <p>1.4 Go to OP-901-112, Charging or Letdown Malfunction</p>
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Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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	ATC / BOP	<p>2. Any of the following conditions have occurred or are still present:</p> <ol style="list-style-type: none"> Overcurrent Ground Low oil pressure Low suction pressure <p>2.1 Verify VCT overpressure and charging pump suction aligned. (VCT Outlet Valve, CVC-183 open)</p> <p>2.2 Refer to OP-901-112, Charging/Letdown Malfunction</p> <p>2.3 Dispatch an operator to the charging pump breaker</p> <p>2.4 <u>If</u> the charging pump is still running and a ground is indicated by the white light, <u>then</u> Trip the charging pump <u>and</u> investigate cause of ground.</p> <p>2.5 <u>If</u> the charging pump has Tripped <u>and</u> the reason is not apparent, <u>then</u> have the operator reset the breaker locally.</p> <p>2.6 Dispatch an operator to the charging pump to verify proper oil level and that the charging pump is aligned properly for starting.</p> <p>2.7 Attempt to Start the charging pump and monitor all indications.</p>
OP-901-112, Charging or Letdown Malfunction, E₀ – General		
	N/A	1. Stop turbine load changes.
	N/A	2. <u>IF</u> malfunction is due to failure of the Pressurizer Level Control System, <u>THEN</u> go to OP-901-110, PRESSURIZER LEVEL CONTROL MALFUNCTION.
	SRO	3. <u>IF</u> a Charging Malfunction is indicated, <u>THEN</u> go to Subsection E ₁ , Charging Malfunction.
OP-901-112, Charging or Letdown Malfunction, E₁ – Charging Malfunction		

Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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NOTE

1. If all Charging Pumps are secured, then LETDOWN STOP VALVE (CVC 101) will close on high REGEN HX TUBE OUTLET temperature if RCS is $\geq 470^{\circ}\text{F}$.
2. Opening CVC-507 will render BAM-113A(B) Inoperable. Refer to T.S. 3.1.2.2 (Modes 1-4) or T.S. 3.1.2.1 (Modes 5&6).

CAUTION

THE REACTOR COOLANT SYSTEM WILL BE BORATED IF A CHARGING PUMP IS STARTED WITH THE RWSP AS THE MAKEUP WATER SOURCE.

	ATC	<ol style="list-style-type: none"> 1. <u>IF</u> Charging Pumps have tripped, <u>THEN</u> perform the following: <ol style="list-style-type: none"> 1.1 Verify open <u>EITHER</u> VCT DISCH VALVE (CVC 183) <u>OR</u> RWSP TO CHARGING PUMP (CVC 507). 1.2 <u>IF</u> Letdown has <u>NOT</u> isolated, <u>THEN</u> attempt to restart Charging Pump(s). 1.3 <u>IF</u> the Charging Pump can <u>NOT</u> be restarted, <u>THEN</u> verify closed LETDOWN STOP VALVE (CVC 101). 1.4 <u>IF</u> the reason for the Charging pump trip is corrected <u>AND</u> Pressurizer level is in normal operating band, <u>THEN</u> place Charging and Letdown in service in accordance with Attachment 2.

Examiner Note

The crew will perform Charging Pump switch manipulations in accordance with tables below.

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Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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TABLE 6.2-2

ASSIGNED TO TRIP ON SIAS	POSITION
A	A
AB	NORM
B	B

This table is used to determine "Pump AB Assignment" switch position. In order for Charging pump AB to be properly aligned to start on SIAS, "B" must be selected. This table is located in OP-002-005.

TABLE 2 PUMP IN LEAD POSITION

PUMP IN LEAD	POSITION
B	AB - A
A	B - AB
AB	A - B

This table is used to select Standby Charging pump start order using the "Standby Charging Pumps Selector" switch. This switch has no bearing on pump operability. It simply selects which pump starts first(second) on PZR deviation from setpoint. Its position depends on which pump the crew starts after Charging Pump B trips. This table is located in OP-002-005.

Examiner Note

Attachment 2, Restoring Charging and Letdown, are included below in the event letdown is secured. Section E₁ – Charging Malfunction continues subsequently.

OP-901-112, Attachment 2, Restoring Charging and Letdown

	ATC	1) Verify Pressurizer Level Controller, RC-ILIC-0110 is in AUTO.
	ATC	2) Verify Letdown Control Valves Back Pressure controller, CVC-IPIC-0201, is in manual and at 60% output.
	ATC	3) Verify Volume Control Tank level is between 37%-76%.

Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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	ATC	4) Ion Exchanger Bypass, CVC-140 to BYPASS.
	ATC	5) Place Letdown Control Valves Flow controller, RC-IHIC-0110, is in manual and at 0% output.
	ATC	5.1) Verify Letdown Flow Control Valve A(B), CVC-113A(B) is CLOSED.
	ATC	6) Verify the following valves are open: <ul style="list-style-type: none"> Letdown Inside Containment Isolation, CVC-103 Letdown Outside Containment Isolation, CVC-109
	ATC	7) Open Letdown Stop Valve, CVC-101
	ATC/BOP	8) Verify CCW is available to the Letdown Heat Exchanger
	ATC	9) Verify Letdown Control Valves Temp controller, CVC-ITIC-0223 is in AUTO with the set point potentiometer set at ~38.5 (108 F)
	ATC	10) Verify VCT Discharge Valve, CVC-183 is OPEN
	ATC	11) Verify the following valves OPEN: <ul style="list-style-type: none"> Charging Line 1A Shutoff Valve, CVC-218A Charging Line 2A Shutoff Valve, CVC-218B
	ATC/BOP	12) Record RCS Cold Leg Temperature _____ F.
	ATC/BOP	13) Record Regen Hx Outlet Header to Letdown Hx Temperature, CVCIT10221(Regen HX Tube Outlet) _____ F.
	ATC/BOP	14) Record Regen Hx to RC Loop 2A Outlet Header Temperature, CVCIT10229(Regen HX Shell Outlet) _____ F.
	SRO/ATC	15) Determine initial Letdown Flow Rate using table 1 as seen below.

Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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Table 1

REGEN HX SHELL OUTLET TEMP (CVC ITI-0229)	INITIAL LETDOWN FLOW RATE (CVC-IFI-0202)
<200°F	10 GPM
200°F - 250°F	16 GPM
251°F - 300°F	24 GPM
301°F - 350°F	30 GPM
351°F - 400°F	36 GPM
>400°F	40 GPM

NOTE

- To minimize thermal transients in the system, Letdown and Charging flows should be started as close together as possible.
- Letdown back pressure may be difficult to control when RCS pressure is < 475 psia (< 460 psig).
- Letdown back pressure should be maintained greater than the saturation pressure (P_{sat}) for Regen Hx Tube Outlet Temp (CVC-ITI-0221) to preclude flashing in the Letdown Heat Exchanger

When opening Letdown Flow Control Valve A(B), CVC-113A(B), then small incremental steps should be used. Letdown back pressure should not exceed 520 psig, to prevent lifting Letdown Heat Exchanger Inlet Relief to HUTs, CVC-115 (setpoint is 650 psig)

	ATC	16) Re-establish Charging and Letdown flow as follows: 16.1) Start desired Charging Pump A(B)(AB) by placing control switch to ON.
	ATC	16.2) Perform the following actions concurrently: <ul style="list-style-type: none"> • Adjust Letdown Control Valves Flow controller, RC-IHIC-0110, to the initial Letdown Flow Rate determined in step 15. • While raising Letdown flow, adjust Letdown Control Valves Back Pressure controller, CVC-IPIC-0201, to control Letdown back pressure at 460 psig.

Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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	ATC	17) Perform the following actions concurrently: <ul style="list-style-type: none"> Using Letdown Control Valves Flow controller, RC-IHIC-0110, slowly raise Letdown flow at 10 gpm per minute, to gradually raise Letdown back pressure as indicated on CVC-IPIC0201. While raising Letdown flow, adjust Letdown Control Valves Back Pressure controller, CVC-IPIC-0201, to control Letdown back pressure at ~460 psig. 								
	ATC	18) Align Charging Pumps for normal operation as follows: 18.1) Verify standby Charging Pump A(B)(AB) control switch(es) in OFF.								
	ATC	18.2) Verify Standby Charging Pumps selector switch in the appropriate position for the Charging Pump A(B)(AB) started (pump in lead)								
<u>TABLE 2 PUMP IN LEAD POSITION</u>										
<table border="1"> <thead> <tr> <th>PUMP IN LEAD</th> <th>POSITION</th> </tr> </thead> <tbody> <tr> <td>B</td> <td>AB - A</td> </tr> <tr> <td>A</td> <td>B - AB</td> </tr> <tr> <td>AB</td> <td>A - B</td> </tr> </tbody> </table>			PUMP IN LEAD	POSITION	B	AB - A	A	B - AB	AB	A - B
PUMP IN LEAD	POSITION									
B	AB - A									
A	B - AB									
AB	A - B									
	ATC	18.3) Place standby Charging Pump A(B)(AB) control Switch(es) to AUTO.								
	ATC	19) Continue to adjust Pressurizer level to programmed level using Letdown Control Valves Flow controller, RC-IHIC-0110.								
	ATC	20) When Pressurizer level is within 3% of programmed level, then balance Letdown flow with Charging flow as follows: 20.1) Determine required Letdown flow by subtracting total RCP Control Bleedoff flow from Charging flow.								
	ATC	20.2) Adjust Letdown Control Valves Flow controller, RC-IHIC-0110, to the required flow.								

Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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	ATC	21) Verify Letdown Control Valves Flow controller, RC-IHIC-0110, output is within 3% of process indication.
	ATC	22) Place Letdown Control Valves Flow controller, RC-IHIC-0110, in AUTO.
	ATC	23) Place Letdown Control Valves Back Pressure controller, CVC-IPIC-0201, in auto by performing the following: 23.1) Adjust Letdown Control Valves Back Pressure controller, CVC-IPIC-0201, to 460 psig.
	ATC	23.2) Verify Letdown Control Valves Back Pressure controller, CVC-IPIC-0201, process is within 3% of setpoint.
	ATC	23.3) Place Letdown Control Valves Back Pressure controller, CVC-IPIC-0201, to AUTO.
	ATC	24) Place Charging Pump AB Assignment switch to the appropriate position for the Charging Pump A(B)(AB) to be assigned to trip on SIAS.
	SRO/ATC	25) If in Mode 1, then verify that COLSS Charging and Letdown constants are correct for the Charging Pump configuration in accordance with OP-004-004, Core Operating Limit Supervisory System Operation.
	ATC	26) Place the appropriate CVC Purification Ion Exchanger A(B)(C) in service as follows: 26.1) Verify VCT Inlet/Bypass to Holdup Tanks, CVC-169, aligned to the VCT and control switch is in AUTO.
	ATC	26.2) Verify Letdown Heat Exchanger Outlet temperature, CVC-ITI-0224 is <120 F.
	ATC	26.3) Align Ion Exchanger Bypass, CVC-140, to ion exchanger(s) by placing control switch to AUTO.
	ATC	26.4) Verify Letdown flow is between 30 and 126 gpm.

Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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	NAO	26.5) Verify Purification Ion Exchanger A(B)(C) Differential Pressure is <20 psid (locally).
OP-901-112, Charging or Letdown Malfunction, E₁ – Charging Malfunction (cont.)		
	N/A	2. <u>IF</u> normal Charging flow can <u>NOT</u> be established <u>AND</u> Pressurizer level falls below minimum Pressurizer level for operation in accordance with Attachment 1, Pressurizer Level Versus Tave Curve, <u>THEN</u> perform the following:
	ATC/BOP	3. <u>IF</u> the PMC is available, <u>THEN</u> display PMC Group CVCS and monitor Charging System parameters to determine cause of Charging malfunction.
	SRO	4. Inspect Charging System for possible cause of malfunction.
	N/A	5. <u>IF</u> a Charging Line rupture has occurred, <u>THEN</u> perform the following:
<u>CAUTION</u>		
IF HPSI PUMPS ARE OPERATING, <u>THEN</u> CHARGING PUMPS SHOULD <u>NOT</u> BE ALIGNED TO HPSI HEADER.		
<u>NOTE</u>		
Aligning Charging to HPSI Train A renders HPSI train A INOPERABLE and Charging Pumps INOPERABLE. Enter TS 3.5.2 and 3.1.2.4. Refer to TS 3.5.3.		
	N/A	6. <u>IF</u> flow can <u>NOT</u> be established through the normal Charging Pump discharge path, <u>THEN</u> align Charging Pumps to discharge through HPSI Header A as follows:
	N/A	7. <u>WHEN</u> repairs have been completed to the Charging Header, <u>THEN</u> restore Charging Pumps discharge alignment to normal as follows:
TECH SPEC CALL		

Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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	SRO	Reviews and enters the following Technical Specification: <ul style="list-style-type: none"> • 3.4.3.2 (Restore w/in 30 days) • TRM 3.1.2.4 (Restore within 72 hours) • TRM 3.13.3 (Restore w/in 45 days)
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Examiner Note

The SRO may align the AB Charging pump to replace the B Charging pump to allow exit of Technical Specification 3.4.3.2 & TRM 3.1.2.4.

OP-002-005, Section 6.2, Charging Pump Operations

CAUTION

(1) THE CONTROL SWITCH FOR AT LEAST ONE OPERABLE CHARGING PUMP SHALL REMAIN IN AUTO OR ON AT ALL TIMES.

(2) REFER TO TS 3.1.2.4.

	ATC	6.2.10 Verify Standby Charging Pumps selector switch in the appropriate Position for the Charging Pump started (Pump in Lead) per Table 6.2-1.
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TABLE 6.2-1

PUMP IN LEAD	POSITION
B	AB - A
A	B - AB
AB	A - B

	ATC	6.2.11 Place control switch(es) for Standby Charging Pump A(B)(AB) to AUTO.
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Event Description: Charging Pump B Trip

Time	Position	Applicant's Actions or Behavior
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	ATC	6.2.12 Place Pump AB Assignment switch to the appropriate Position for the Charging Pump A(B)(AB) to be Assigned to Trip on SIAS, per Table 6.2-2.
	Note	Position 'B' will be selected due to inoperable pump B.

TABLE 6.2-2

ASSIGNED TO TRIP ON SIAS	POSITION
A	A
AB	NORM
B	B

Examiner Note

This event is complete after the ATC aligns the AB Charging pump to replace the B Charging pump and the SRO has evaluated Technical Specifications or at Lead Examiner's discretion.

Examiner Note

Cue the Simulator Operator when ready for Event 4

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 4 Event No.: 4 Page **22** of **44**
 Event Description: SG #1 Level, ILT-1105, fails high
 Symptoms/Cues: SG feed flow/steam flow mismatch, SG level alarms

Time	Position	Applicant's Actions or Behavior
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		Recognize and report indications of failed instrument.
		Alarms:
		<ul style="list-style-type: none"> • SG 1 FW Contl Lvl Signal Dev/Pwr Lost
		<ul style="list-style-type: none"> • SG 1 Level Hi/Lo
		Indications
		<ul style="list-style-type: none"> • Controllers for SG 1 shift to Manual: <ul style="list-style-type: none"> ○ Main Feedwater Regulating Valve A Controller ○ Startup Feedwater Regulating Valve B Controller ○ Main Feedwater Pump B Speed Controller
	SRO	Enter and direct the implementation of OP-901-201, Steam Generator Level Control Malfunction.

OP-901-201, Steam Generator Level Control Malfunction, Section E0, General

	CRS	1. Go to Attachment 1, General Actions.
	SRO	Did a Reactor Trip occur? NO-Continues through flow chart
	SRO/BOP	Observe the affected Steam Generator FWCS controllers AND note ANY controllers that are behaving erratically. Steam Generator 1 FW IFIC 1111 , S/G 1 FWCS Master Controller FW IHIC 1111 , S/G 1 Main FRV Controller FW IHIC 1105 , S/G 1 S / U FRV Controller FW IHIC 1107 , SGFP A Speed Controller Steam Generator 2 FW IFIC 1121 , S/G 2 FWCS Master Controller FW IHIC 1121 , S/G 2 Main FRV Controller FW IHIC 1106 , S/G 2 S / U FRV Controller FW IHIC 1108 , SGFP B Speed Controller
	Note	BOP determines that no controllers are malfunctioning.

Event Description: SG #1 Level, ILT-1105, fails high
 Symptoms/Cues: SG feed flow/steam flow mismatch, SG level alarms

Time	Position	Applicant's Actions or Behavior
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	SRO/BOP	1. Place appropriate controllers for the affected FWCS in manual AND establish control of S/G level (See Notes 1 & 2).
	Note	BOP determines proper controllers have transferred to Manual automatically.
	SRO/BOP	Is the output of the affected FWCS Master Controller behaving erratically? NO – continues through flowchart
	SRO/BOP	Verify SGFP Discharge pressure for BOTH SGFP's is matched AND is greater than S/G pressures.
	N/A	Stop turbine load changes except to match Tave and Tref.
	SRO/BOP	Review the following guidelines AND restore S /G level to 50-70% NR: 1. IF one SGFP Speed controller is in auto, THEN use its output to help set the SGFP Speed controller that is in manual. 2. Momentary taps on the raise AND lower buttons of the Main Feedwater Reg Valve Controller have a noticeable impact on associated Steam Generator level. 3. Use the Startup Feedwater Reg Valve Controller to control Steam Generator level at low power levels. 4. Use indications on the unaffected FWCS controllers to help set affected FWCS controllers.
	BOP	Check the following Control Channel indicators to determine if a Control Channel has failed: (See Note 3) <ul style="list-style-type: none"> • FW IFR 1111, Steam Generator 1 Feedwater Flow (green pen) • FW IFR 1011, Steam Generator 1 Steam Flow (red pen) • FW IFR 1121, Steam Generator 2 Feedwater Flow (green pen) • FW IFR 1021, Steam Generator 2 Steam Flow (red pen) • SG ILR1111, Steam Generator 1 Downcomer Level (green pen) • SG ILR1105, Steam Generator 1 Downcomer Level (red pen) • SG ILR1121, Steam Generator 2 Downcomer Level (green pen) • SG ILR1106, Steam Generator 2 Downcomer Level (red pen)

Event Description: SG #1 Level, ILT-1105, fails high
 Symptoms/Cues: SG feed flow/steam flow mismatch, SG level alarms

Time	Position	Applicant's Actions or Behavior
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	Note	BOP determines SG-ILR-1105, Steam Generator 1 Downcomer Level (red pen) is the failed instrument.
	SRO/BOP	Control Channel level deviation of >10%?
		YES – continues through flow chart
	BOP	Verify applicable controllers shifted to manual per automatic actions.
	Note	Controllers for SG 1 that shift to Manual: Main Feedwater Regulating Valve A Controller Startup Feedwater Regulating Valve A Controller Main Feedwater Pump A Speed Controller
	SRO	Determine AND correct the cause of the malfunction.
		<ul style="list-style-type: none"> ○ Coverage of the flow chart in Attachment 1 should conclude that the failed instrument is the problem.
		<ul style="list-style-type: none"> ○ The SRO should discuss with the BOP necessary contingency actions necessary with the listed controllers in MANUAL. This should include actions on a Reactor trip or on Steam Generator High Level Override.

Examiner Note

This event is complete when the flow chart in Attachment 1 has been completed and the contingencies have been discussed and the BOP has performed manual control during the subsequent power reduction
 Or
 As directed by the Lead Evaluator

This failure requires additional actions by the BOP during the power reduction and after the Reactor trip later in the scenario.

Examiner Note

Cue the Simulator Operator when ready for Event 5

Form 3.3-2 Required Operator Actions

Op. Test No.: 1 Scenario No.: 4 Event No.: 5/6 Page **25** of **44**

Event Description: Main Feedwater Pump A overspeed trip / Reactor Cutback / Inappropriate CEA pattern, Manual Rx Trip

Symptoms/Cues: SG feed flow lowering, SG level lowering, Feedwater Pump speed lowering

Time	Position	Applicant's Actions or Behavior
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	BOP	Recognize and report indications of Feedwater Pump A trip and Reactor Cutback
		Alarms
		<ul style="list-style-type: none"> • FWPT A TRIP OVERSPEED (Cabinet F, K-15)
		<ul style="list-style-type: none"> • FWPT A FLOW LO (Cabinet F, M-16)
		<ul style="list-style-type: none"> • FWPT A FLOW LO-LO (Cabinet F, N-16)
		<ul style="list-style-type: none"> • REACTOR PWR CUTBACK ACTUATION (Cabinet H, K-5)
		Indications
		<ul style="list-style-type: none"> • Steam Generator levels lowering
		<ul style="list-style-type: none"> • Feedwater flow lowering
		<ul style="list-style-type: none"> • Feedwater Pump speed lowering
		<ul style="list-style-type: none"> • T_{COLD} dropping
		<ul style="list-style-type: none"> • Reactor Power Dropping
		<ul style="list-style-type: none"> • Rod bottom lights
	CRS	Enter and direct the implementation of OP-901-101, Reactor Power Cutback.

Examiner Note

The SRO should direct a manual Reactor Trip due to incorrect rod configuration following the Reactor Power Cutback

	ATC	Place Control Element Drive Mechanism Mode Select switch to AS.
	ATC	Verify selected subgroups dropped.
OP-901-101, E₀, General		
	ATC	1. <u>If</u> Reactor Power Cutback has <u>not</u> occurred <u>or</u> the correct rod pattern has not dropped, <u>then</u> trip the Reactor <u>and go to</u> OP-902-000, Standard Post Trip Actions.

CRITICAL TASK 1

Establish Reactivity Control

This task is satisfied by manually tripping the reactor using the manual pushbuttons, Diverse Reactor Trip, or de-energizing bus 32A and 32B within 1 minute an incorrect CEA pattern.

This task becomes applicable following the Reactor Power Cutback and CEA # 1 dropping.

Time	Position	Applicant's Actions or Behavior
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	ATC	Attempt to manually trip the reactor using normal trip push buttons.
	N/A	Manually initiate DIVERSE REACTOR TRIP.
	N/A	Open BOTH of the following breakers for 5 seconds and THEN close: <ul style="list-style-type: none"> • SST A32 FEEDER • SST B32 FEEDER
OP-902-000, STANDARD POST TRIP ACTIONS		
	Note	During Standard Post Trip Actions, one crew member (typically the BOP) will go to a back panel to restore radiation monitor sample pumps due to some sample pumps requiring restart following a loss of power or voltage dip (i.e. plant loads transfer from UATs to SUTs).
<u>NOTE</u>		
Steps 1 and 2 are immediate actions and satisfy Reactivity Control		
	ATC	1. <u>Determine</u> Reactivity Control acceptance criteria are met: <ol style="list-style-type: none"> a. <u>Check</u> reactor power is dropping. b. <u>Check</u> startup rate is negative. c. <u>Check</u> less than TWO CEAs are NOT fully inserted.
Examiner Note		
Steps a.1, 1 (below) should have already been performed.		
	ATC	Manually trip the reactor using normal trip push buttons.

Time	Position	Applicant's Actions or Behavior
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	N/A	Manually initiate DIVERSE REACTOR TRIP.
	N/A	Open BOTH of the following breakers for 5 seconds and THEN close: <ul style="list-style-type: none"> • SST A32 FEEDER • SST B32 FEEDER
	N/A	4) Locally <u>open</u> ALL Reactor Trip breakers.
	BOP	2. <u>Verify</u> Main Turbine and Generator tripped: <ol style="list-style-type: none"> a. <u>Check</u> the Main Turbine is tripped: <ul style="list-style-type: none"> • Governor Valves closed • Throttle Valves closed • Turbine speed lowering
	BOP	b. <u>Check</u> the Main Generator is tripped: <ul style="list-style-type: none"> • GENERATOR BREAKER A tripped • GENERATOR BREAKER B tripped • EXCITER FIELD BREAKER tripped
	BOP	3. <u>Verify</u> maintenance of Vital Auxiliaries <ol style="list-style-type: none"> a. <u>Check</u> station loads are energized from Off-site power as follows: <p><u>Train A</u></p> <ul style="list-style-type: none"> • A1, Non-Safety bus • A2, Non-Safety bus • A3, Safety bus • A-DC Electrical bus • A and C vital AC Instrument Channels <p><u>Train B</u></p> <ul style="list-style-type: none"> • B1, Non-Safety bus • B2, Non-Safety bus • B3, Safety bus • B-DC Electrical bus • B and D vital AC Instrument Channels b. <u>Verify</u> CCW flow to RCPs

Time	Position	Applicant's Actions or Behavior
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Event 6 Loss of Coolant Accident; CS-125A failed closed.		
	ATC	4. <u>Verify</u> RCS Inventory Control: <ol style="list-style-type: none"> a. <u>Check</u> that BOTH of the following conditions exist: <ul style="list-style-type: none"> • Pressurizer level is 7% to 60% • Pressurizer level is trending to 33% to 60% b. <u>Check</u> RCS subcooling is greater than or equal to 28°F.
	ATC	5. Check RCS Pressure control: <ul style="list-style-type: none"> • Pressurizer pressure is 1750 psia to 2300 psia • Pressurizer pressure is trending to 2125 psia to 2275 psia
	ATC	5.2 – IF PZR pressure is less than 1684 psia, THEN <u>verify</u> BOTH of the following have initiated: <ul style="list-style-type: none"> • SIAS • CIAS
	ATC	5.3 – IF PZR pressure is less than 1621 psia, THEN <u>verify</u> ONE RCP in each loop is stopped.
	ATC	5.4 - IF PZR pressure is less than the minimum RCP NPSH of Attachments 2A-B, "RCS Pressure and Temperature Limits," THEN stop ALL RCPs.
	ATC	5.5 - IF SIAS actuated, AND RWSP on Purification, THEN isolate the RWSP using Appendix 40 "Isolate RWSP from Purification."
	ATC	6. Check Core Heat Removal: <ol style="list-style-type: none"> a. At least ONE RCP is operating. b. Operating loop deltaT less than 13°F. c. RCS subcooling greater than or equal to 28°F.

Time	Position	Applicant's Actions or Behavior
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	BOP	7. <u>Verify</u> RCS Heat Removal: a. <u>Check</u> that at least ONE SG level is 10 to 76% NR
	BOP	b. <u>Check</u> Feedwater Control in Reactor Trip Override: <ul style="list-style-type: none"> • MAIN FW REG valves are closed • STARTUP FW REG valves are 13 to 21% open • Operating Main Feedwater pumps are 3800 to 4000 rpm
	BOP	c. <u>Reset</u> Moisture Separator reheaters and <u>check</u> the Temperature Control valves closed.
	ATC	d. Check RCS TC is 530 to 550 °F.
	BOP	e. Check Steam Generator pressure is 885 psia to 1040 psia.
	BOP	f. <u>Verify</u> EFAS1(2) actuated at associated SG level of 27.4% NR or less.
	BOP	g. <u>Check</u> EFW flow. 1) <u>Control</u> EFW Flow using ANY of the following: <ul style="list-style-type: none"> • <u>Maintain</u> EFW FCVs in auto • Appendix 13, "Stabilize RCS Temperature" • At CRS/SM discretion, <u>establish</u> total EFW flow to SG(s) greater than 575 gpm using BOTH associated FCVs in manual. • At CRS/SM discretion, <u>initiate</u> EFW flow to SG using ONE FCV in manual AND <u>restore</u> SG Level to 55 to 70% NR.
	ATC	8. <u>Verify</u> Containment Isolation: a. <u>Check</u> Containment pressure is less than 16.4 psia. b. <u>Check</u> NO Containment Area Radiation monitor alarms OR unexplained rise in activity. c. <u>Check</u> NO Steam Plant Activity monitor alarms OR unexplained rise in activity

Time	Position	Applicant's Actions or Behavior
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	ATC	a.1 IF CNTMT pressure is greater than or equal to 17.1 psia, THEN verify ALL of the following: <ul style="list-style-type: none"> • CIAS is initiated • SIAS is initiated • MSIS is initiated
	BOP	9. Verify Containment Temperature and Pressure Control: <ul style="list-style-type: none"> • Check Containment temperature is less than or equal to 120°F. • Check Containment pressure is less than 16.4 psia.
	ATC/BOP	9.1 <u>Verify</u> at least three Containment Fan Coolers are operating. 9.2 IF Containment pressure is greater than or equal to 17.1 psia, THEN verify ALL available Containment Fan Coolers are operating in emergency mode. 9.3 IF Containment pressure is greater than or equal to 17.7 psia, THEN verify ALL of the following: <ul style="list-style-type: none"> • CSAS is initiated • ALL available Containment Spray pumps are delivering flow greater than 1750 gpm • ALL RCPs are stopped
	SRO	10. GO TO Appendix 1, "Diagnostic Flowchart" and diagnose to appropriate EOP.

OP-902-009, Standard Appendices, Revision 323, Appendix 1 Diagnostic Flow Chart

Examiner Note

Appendix 1 is a flow chart used to diagnose to the correct recovery procedure for the event in progress. The steps below will be followed by a YES or NO to indicate proper flow path.

	ATC	Is Reactivity Control met? (YES)
	BOP	Is at least ONE 125 VDC SAFETY bus energized? (YES)

Time	Position	Applicant's Actions or Behavior
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	BOP	Is at least ONE 4.16 KV NON-SAFETY bus energized? (YES)
	BOP	Is at least ONE 4.16 KV SAFETY bus energized? (YES)
	ATC	Is at least ONE RCP running? (NO)
	SRO	Consider LOOP/LOFC OP-902-003
	BOP	Does at least ONE SG have adequate FW? (Note 2) (YES)
	ATC	Is PZR pressure >1750 psia AND stable or rising? (NO)
	ATC	Is RCS Subcooling <28F AND stable or lowering? (YES)
	ATC/BOP	Is SGTR Indicated? (Note 3) (NO)
	SRO	Consider LOCA OP-902-002
	ATC	Is CNTMT pressure <16.4 psia AND stable or lowering? (NO)
	ATC	Are CNTMT Rad monitor(s) in alarm or unexplained rise? (YES)
	SRO	Consider LOCA OP-902-002
	ATC/BOP	Is SGTR Indicated? (Note 3) (NO)

Time	Position	Applicant's Actions or Behavior
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	BOP	Are BOTH SG pressures >885 psia AND stable or rising? (Note 5) (YES)
	SRO	Are ALL acceptance criteria satisfied? (NO)
	SRO	Has ANY event been diagnosed? (Note 4) (YES)
	SRO	Can a single event be diagnosed? (Note 4) (YES)
	BOP	GO TO Appropriate EOP
	Note	SRO goes to OP-902-002, Loss of Coolant Accident Recovery.
	CREW	When Containment Temperature rises above 200 F, update crew on need to use bracketed parameters due to harsh environment in Containment.
OP-902-002, Loss of Coolant Accident Recovery, Revision 021		
	Note	The Shift Chemist should be notified if a SIAS or CIAS has occurred. The secondary sampling containment isolation valves should not be opened following an SIAS or CIAS until directed by the Shift Chemist.
	SRO	*1. Confirm diagnosis of a LOCA: a. Monitor the SFSCs and check Safety Function Status Check Acceptance criteria are satisfied. b. IF SG sample path is available, THEN direct Chemistry to sample BOTH SGs for activity.
	CREW	2. Announce a Loss of Coolant Accident is in progress using the plant page.

Event Description: Loss of Coolant Accident occurs following Reactor Trip, CS-125A is failed closed.

Time	Position	Applicant's Actions or Behavior
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Examiner Note

This event is complete when the crew has diagnosed into OP-902-002, Loss of Coolant Accident, Containment Spray has actuated, all RCPs are stopped.

Or

at Lead Examiner's Discretion.

Examiner Note

Cue the Simulator Operator when ready for Event 8

It takes approximately 30 seconds from when the simulator operator initiates Event 8 for the first indication to be present to the applicants.

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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OP-902-002, Loss of Coolant Accident Recovery, Revision 021

	BOP	Recognize and report indications of Spray Pump B Trip
		Alarms
		CNTMT SPRAY PUMP B TRIP/TROUBLE (Cabinet N, B-14)
		Indications
		Containment Spray Pump B indicates OFF (GREEN)
		Containment Spray flow indicates 0 GPM
	SRO	Determine Containment Pressure and Temperature Control Safety Function not met
	SRO	<p>SAFETY FUNCTION:</p> <p>8. Containment Temperature and Pressure Control Condition 2</p> <ul style="list-style-type: none"> a. Containment fan coolers > 1 operating in emerg mode b. <u>Containment spray pump ≥ 1 operating with flow ≥ 1750 gpm</u> c. Containment pressure < 50 psia d. Hydrogen < 3.4%
	SRO	<p>a.1 GO TO ONE of the following:</p> <ul style="list-style-type: none"> ▪ Appendix 1, "Diagnostic Flowchart" ▪ OP-902-008, "Functional Recovery Procedure"

Examiner Note

Appendix 1 "Diagnostic Flowchart" will not provide guidance for this event. OP-902-008, "Functional Recovery Procedure" is the procedure to recover from this event.

OP-902-008, Functional Recovery

	BOP	<p>Announce the Event</p> <p>1. <u>Announce</u> that the Functional Recovery Procedure is in progress using the plant page.</p>
	N/A	<p>Classify the Event</p> <p>*2. <u>Advise</u> the Shift Manager to implement the Emergency Plan using EP-001-001, "Recognition & Classification of Emergency Condition".</p>

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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	SRO	<p>Implement Placekeeping</p> <p>3. <u>REFER TO</u> the "Placekeeper", and <u>record</u> the time of the reactor trip.</p>
	N/A	<p>RCP Trip Strategy</p> <p>4. IF PZR pressure is less than 1621 psia, AND SIAS is actuated, THEN <u>perform</u> the following:</p> <p>a) <u>Verify</u> ONE RCP in each loop is stopped.</p> <p>b) IF PZR pressure is less than the minimum RCP NPSH of Appendix 2A-D, "RCS Pressure and Temperature Limits", THEN <u>stop</u> ALL RCPs.</p>
	N/A	<p>Verify RCP Operating Limits</p> <p>*5. IF RCPs are operating, THEN <u>perform</u> the following:</p> <p>a. IF a CSAS is initiated, THEN <u>stop</u> ALL RCPs.</p> <p>b. <u>Verify</u> CCW available to RCPs.</p> <p>c. IF RCS TC is less than 380°F [384°F], THEN <u>verify</u> ONE RCP in each loop is stopped.</p> <p>d. Monitor RCP operating parameters.</p>
<p><u>NOTE</u></p> <p>The Shift Chemist should be notified if a SIAS or CIAS has occurred. The secondary sampling containment isolation valves should not be opened following an SIAS or CIAS until directed by the Shift Chemist.</p>		
	BOP	<p>Sample BOTH Steam Generators</p> <p>6. <u>Direct</u> Chemistry to sample BOTH SGs for activity and boron.</p>
<p><u>Note</u></p> <ul style="list-style-type: none"> ▪ If a Temporary Diesel Generator is the source of AC power, the Verify Equipment Ventilation step must still be performed. ▪ Door Stops and Ceiling Access Panel tool located in Shift Manager Office. ▪ Portable emergency lighting is available in NFPA 805 lockers located at LCP-43, Remote Shutdown Panel and +35 RAB Relay Room and Shift Manager Office. 		
	N/A	<p>Verify Equipment Ventilation</p> <p>*7. IF AC power is lost to BOTH 3A and 3B safety buses and, THEN <u>perform</u> the following within 30 minutes from the onset of SBO:</p>

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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NOTE

- If a Temporary Diesel Generator is available and ready to load within 30 minutes of SBO onset, then load stripping via the associated Attachment 7-A or 7-B should not be necessary.
- Performing Attachment 7-A and 7-B will remove DC control power from the EDGs including loss of EDG Annunciator Panels and CP-1 indicating lights. An EDG will not start with control power removed.

	N/A	Reduce Switchgear Battery Loads *8. IF AC power is lost to BOTH 3A and 3B safety buses THEN <u>direct</u> NAOs to perform ALL the following within 30 minutes from the onset of SBO:
	N/A	Restore Operation of DCT Sump Pumps *9. IF power has been interrupted to either 3A or 3B safety buses, THEN perform Appendix 20, "Operation of DCT Sump Pumps".
	SRO	Identify Success Paths *10. <u>Identify</u> success paths to be used to satisfy each safety function using BOTH of the following: <ul style="list-style-type: none"> ▪ Resource Assessment Trees ▪ Safety Function Tracking Sheet
	Note	1. Reactivity Control RC-1 2. Maintenance of Vital Auxiliaries (DC) MVA-DC-1 3. Maintenance of Vital Auxiliaries (AC) MVA-AC-1 4. RCS Inventory Control IC-2 5. RCS Pressure Control PC-2 6. RCS and Core Heat Removal HR-2 7. Containment Isolation CI-1 8. Containment Pressure and Temperature Control CPTC-2
	SRO	Perform Safety Function Status Checks *11. <u>Perform</u> Safety Function Status Checks using Section 6.0, "Safety Function Status Check".

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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<p>Examiner Note Safety Function Status</p> <p>1. RC-1 – Met 2. MVA-DC-1 – Met 3. MVA-AC-1 – Met 4. IC-2 – Met 5. PC-2 – Met 6. HR-2 – Met 7. CI-1 – NOT Met 8. CPTC-2 – NOT Met</p>		
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	SRO	<p>Prioritize Success Paths *12. <u>Prioritize</u> Safety Functions based on ALL of the following:</p> <ul style="list-style-type: none"> a. Instructions for those Safety Functions which do NOT meet any success path. b. Instructions for those Safety Functions for which success path one criteria is NOT met. c. Instructions for the remaining Safety Functions.
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	Note	<p>Result of Prioritization</p> <ul style="list-style-type: none"> 1. Containment Isolation CI-1 2. Containment Pressure and Temperature Control CPTC-2 3. RCS Inventory Control IC-2 4. RCS Pressure Control PC-2 5. RCS and Core Heat Removal HR-2 6. Reactivity Control RC-1 7. Maintenance of Vital Auxiliaries (DC) MVA-DC-1 8. Maintenance of Vital Auxiliaries (AC) MVA-AC-1
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	SRO	<p>Implement Success Paths 13. <u>Implement</u> success paths based on prioritization from previous step.</p>
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Examiner Note

The SRO may decide that by establishing Containment Pressure and Temperature control, that this would satisfy the Containment Isolation Safety Function. The SRO may decide to implement CPTC-2 in parallel with CI-1 to restore both Safety Functions. This guide contains CI-1 steps below followed by CPTC-2 steps. They may be done in parallel but CI-1 is the #1 priority. If there should be any delay with replacing CS Pump B with LPSI Pump B then the SRO should isolate Containment.

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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OP-902-008, Functional Recovery, CI-1		
	SRO	<p>Verify Containment Isolation</p> <p>* 1. IF ANY of the following conditions exist:</p> <ul style="list-style-type: none"> • Containment pressure is greater than 17.1 psia • SIAS is actuated due to low RCS pressure • Containment Area Radiation monitors greater than the Hi Alarm setpoint <p>THEN perform the following:</p> <ol style="list-style-type: none"> a. <u>Check</u> CIAS is initiated. b. <u>Verify</u> ALL Containment Fan coolers are operating in Emergency mode. c. IF CNTMT pressure greater than 17.7 psia, THEN <u>check</u> BOTH CS pumps operating.
	SRO	<p>CONTINGENCY ACTIONS</p> <p>c.1 IF ANY CS-125, Containment Spray Header Isolation is open, AND the associated CS pump is NOT operating, THEN <u>close</u> the valve using Attachment 21-A, "CS-125 Override."</p>
	N/A	<p>Determine Most Affected SG</p> <p>* 2. IF a SGTR is indicated by ANY of the following:</p> <ul style="list-style-type: none"> • SG activities • Main Steam Line radiation levels • SG Blowdown Radiation monitor readings • SG level rise when NOT feeding • One SG level rising faster than the other with feed and steaming rates being essentially the same for both • Feed flow mismatch between SGs • Steam flow verses feed flow mismatch in a SG prior to the reactor trip <p>THEN <u>isolate</u> the MOST AFFECTED SG using the Heat Removal success path in use:</p> <ul style="list-style-type: none"> • HR-1 steps 8 thru 26 • HR-2 steps 13 thru 31
	SRO	<p>CCW Leakage</p> <p>* 3. <u>Check</u> RCS to CCW boundary is intact by ALL of the following:</p> <ul style="list-style-type: none"> • CCW Radiation monitor AB Hi Alarm clear • No abnormal rise in CCW Radiation monitor AB reading • No unexplained rise in CCW Surge Tank level

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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	SRO	<p>Check CI-1 Acceptance Criteria</p> <p>* 4. <u>Check</u> CI-1, Automatic/Manual Isolation is satisfied by ANY of the following:</p> <p>Condition 1</p> <ul style="list-style-type: none"> a. IF Steam Plant Activity monitor alarms or an unexplained rise in Steam Plant activity exists, THEN ALL release paths from the MOST AFFECTED SG to the environment are closed. b. Containment pressure is less than 17.1 psia. c. NO Containment Area Radiation monitor alarms or unexplained rise. d. IF SGTR diagnosed, THEN SG pressure less than 1000 psia [960 psia] and affected SG ADV is closed. <p>Condition 2</p> <ul style="list-style-type: none"> a. IF Steam Plant Activity monitor alarms or an unexplained rise in Steam Plant activity exists, THEN ALL release paths from the MOST AFFECTED SG to the environment are closed. b. Each Containment penetration required to be closed for current plant conditions has an isolation valve closed. c. IF SGTR diagnosed, THEN SG pressure less than 1000 psia [960 psia] and affected SG ADV is closed.
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OP-902-009, Standard Appendices, Attachment 21-A (step 1 for CS-125A, step 2 for CS-125B)

Examiner Note:

CI-1 is the first priority. Actions the SRO should take is to have the BOP direct the NAO to take the keyswitch to override. The last action to close Close CS-125B will be in the control room. If there is any delay (ie. CS Pump B will not start) then the valve should be taken closed to meet CI-1.

	BOP	2. Override CS 125B, CNTMT Spray HDR B Isolation as follows: 2.a <u>Place</u> CNTMT Spray Pump B control switch to "OFF."
	NAO	2.b <u>Obtain</u> key 76 from SM office

Examiner Note

CNTMT SPRAY HDR B ISOL VLV IN CSAS OVERRIDE (Cabinet N, K-14) will actuate upon the execution of the step below to place the keyswitch for CS-125B in OVERRIDE.

	BOOTH	2.c <u>Place</u> Keyswitch, Containment Spray 125B Override, to "OVERRIDE" (located on the side of Auxiliary Panel 2, +35 Relay Rm)

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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	BOP	2.d <u>Place</u> CS-125B, CNTMT SPRAY HEADER B ISOL valve to "OPEN" and THEN to "CLOSE."
	SRO	Transition back to OP-902-008, Functional Recovery
OP-902-008, Functional Recovery, CPTC-2, Containment Spray		
	BOP	<p>Verify Containment Spray Actuation</p> <p>*1. IF containment pressure is greater than 17.7 psia, THEN perform BOTH of the following:</p> <ul style="list-style-type: none"> a. <u>Check</u> CSAS is initiated. b. <u>Verify</u> ALL containment spray pumps are delivering flow greater than 1750 gpm.
	BOP	<p>CONTINGENCY ACTIONS</p> <p>b.1 IF ANY CS-125, Containment Spray Header Isolation is open, AND the associated CS pump is NOT operating, THEN <u>close</u> the valve using Appendix 21-A, "CS-125 Override."</p>
	NOTE	Steps for Appendix 21-A are on the previous page.
	SRO	<p>Containment Cooling Emergency Mode</p> <p>* 2. IF ANY of the following conditions exist:</p> <ul style="list-style-type: none"> • Containment pressure is greater than 17.1 psia • SIAS is actuated due to low RCS pressure <p>THEN <u>perform</u> the following:</p> <ul style="list-style-type: none"> a. <u>Check</u> CIAS is initiated. b. <u>Verify</u> ALL available Containment Fan coolers are operating in Emergency mode.
	N/A	<p>Containment Spray Termination</p> <p>* 3. IF CS pumps are operating, AND ALL of the following conditions are satisfied:</p> <ul style="list-style-type: none"> • Containment pressure is less than 16.7 psia and stable or lowering • Containment spray is NOT required for containment cooling. • Containment Spray is NOT required for iodine removal <p>THEN <u>reset</u> CSAS actuation using Attachment 5-E, "CSAS Reset Procedure."</p>

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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	BOP	<p>Verify Hydrogen Analyzers in Service</p> <p>* 4. <u>Verify</u> Hydrogen Analyzers in service by performing the following:</p> <p><u>Train A</u></p> <p>a. <u>Place</u> Train A H2 ANALYZER CNTMT ISOL VALVE keyswitch to "OPEN." (Key 216)</p> <p>b. <u>Place</u> H2 ANALYZER A POWER to "ON."</p> <p>c. <u>Check</u> H2 ANALYZER A PUMPS indicate on.</p> <p><u>Train B</u></p> <p>a. <u>Place</u> Train B H2 ANALYZER CNTMT ISOL VALVE keyswitch to "OPEN." (Key 217)</p> <p>b. <u>Place</u> H2 ANALYZER B POWER to "ON."</p> <p>c. <u>Check</u> H2 ANALYZER B PUMPS indicate on.</p>
	ATC	<p>Monitor CNTMT Radiation Levels</p> <p>* 5. <u>Monitor</u> CNTMT radiation levels for the following purposes:</p> <ul style="list-style-type: none"> • To provide input to TSC for evaluation of the impact to potential environmental releases. • IF CNTMT radiation levels are high, AND environmental releases are anticipated, THEN <u>request</u> the TSC/EOF to evaluate containment iodine removal.
	SRO	<p>Evaluate CNTMT Hydrogen Level</p> <p>* 6. <u>Evaluate</u> the need for Containment Hydrogen Purge as follows:</p> <p>a. <u>Request</u> TSC/EOF to evaluate the need to perform Containment Hydrogen purge.</p> <p>b. <u>Perform</u> Containment Hydrogen purge as directed by TSC/EOF using Appendix 16, "Operate CARS."</p>
	SRO	<p style="text-align: center;"><u>NOTE</u></p> <p>Hydrogen concentration acceptance criteria may be omitted until a hydrogen analyzer is in service.</p>

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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	SRO	<p>Check CTPC-2 Acceptance Criteria</p> <p>* 7. <u>Check</u> CTPC-2, Containment Spray is satisfied by ANY of the following:</p> <p>Condition 1</p> <ol style="list-style-type: none"> BOTH CS pumps delivering flow greater than or equal to 1750 gpm. CNTMT pressure is less than 50 psia. Hydrogen concentration less than 3.4% OR plant management (TSC/EOF) notified. <p>Condition 2</p> <ol style="list-style-type: none"> At least ONE Containment Fan Cooler is operating in the emergency mode. At least ONE CS pump delivering flow greater than or equal to 1750 gpm. CNTMT pressure is less than 50 psia. Hydrogen concentration less than 3.4% OR plant management (TSC/EOF) notified.
	SRO	7.1 IF the Containment Temperature and Pressure safety function still NOT met, THEN REFER TO CTPC Continuing Actions.
OP-902-008, Functional Recovery, CPTC Continuing Actions		
	SRO	<p>Continue Efforts to Restore Safety Functions</p> <p>* 1. IF the Containment Temperature and Pressure safety function still NOT met, THEN <u>pursue</u> CTPC and other jeopardized safety functions in parallel.</p>
	SRO	<p>Evaluate further conditions and actions</p> <p>* 2. <u>Evaluate</u> further conditions and actions to restore the CTPC safety function:</p> <ol style="list-style-type: none"> The urgency of other jeopardized safety functions. The rate of change of Containment pressure and potential for damage to the containment. The feasibility of restoring a success path by restoring ANY of the following: <ul style="list-style-type: none"> • Vital auxiliaries necessary to operate systems or components in the success paths • Manual operation of valves Use of alternate components to implement a success path <u>REFER TO</u> Appendix 28, "Aligning LPSI to Replace CS"

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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OP-902-009, Standard Appendices, Appendix 28-B, Aligning LPSI B to Replace CS B		
CRITICAL TASK 2		
ESTABLISH CONTAINMENT TEMPERATURE AND PRESSURE CONTROL		
<p>This task is satisfied by manually aligning an available LPSI pump to replace a CS pump prior to exiting the step to align a LPSI pump to replace a CS pump in Appendix 28.</p>		
<p>This task becomes applicable following the initiation of a Containment Spray Actuation Signal.</p>		
	SRO	1. <u>Obtain</u> TSC concurrence prior to performing this evolution.
	BOP	2 <u>Verify</u> LPSI Pump B control switch in "OFF." (CRITICAL)
	BOP	3 <u>Verify</u> Containment Spray Pump B control switch in "OFF."
	BOP	4 <u>Place</u> SI-129B, LPSI FLOW CONTROL VALVE to "AUTO." (Key 146) (CRITICAL)
	BOP	5 <u>Place</u> SI-IFIC-0306, LPSI FLOW CONTROLLERS HEADER 1A/1B in "MAN." (CRITICAL)
	BOP	6 <u>Adjust</u> SI-IFIC-0306, LPSI FLOW CONTROLLERS HEADER 1A/1B to 0% output. (CRITICAL)
	BOP	7 <u>Verify</u> ALL of the following valves Closed: (CRITICAL) <ul style="list-style-type: none"> ▪ SI-415B, LPSI SHUTDOWN TEMP CONTROL valve (Key 147) ▪ SI-138B, LPSI FLOW CONTROL COLD LEG 1B ▪ SI-139B, LPSI FLOW CONTROL COLD LEG 1A
	BOP	8 <u>Open</u> SI-125B/SI-412B, SHDN HX B ISOL valves. (Key 145) (CRITICAL)
	BOP	9 <u>Verify</u> CS-125B, CNTMT SPRAY HEADER B ISOL valve open. (CRITICAL)
	BOP	10 <u>Start</u> LPSI Pump B. (CRITICAL)
	BOP	11 <u>Verify</u> Containment Spray Header B flow.

Op. Test No.: 1 Scenario No.: 4 Event No.: 8 Page **44** of **44**

Event Description: Containment Spray Pump B Trips and cannot be restarted. Critical Task 2, align LPSI pump B to replace CS Pump B.

Time	Position	Applicant's Actions or Behavior
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Examiner Note

This event is complete after the BOP has established Containment Spray flow in accordance with OP-902-009, Standard appendices, Appendix 28

OR

At Lead Examiner's Discretion

Facility: Waterford 3			Date of Exam: 8/21/2023			Operating Test No.: 1											
A P P L I C A N T	E V E N T T Y P E	Scenarios												T O T A L	M I N I M U M*		
		1			2			3			4						
		P O S I T I O N			P O S I T I O N			P O S I T I O N			P O S I T I O N						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
												R	I	U			
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX		1											1	1	0	
	NOR	1												1	1	1	
	I/C	2,4,6,7	6	2,6,7										4	4	2	
	MAJ	5	5	5										2	2	1	
	Man. Ctrl		3	4										1	1	0	
	TS	2,3												0	2	2	
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX				4	4								1	1	0	
	NOR				4									1	1	1	
	I/C				1,2	2,5	1,7							4	4	2	
	MAJ				5,6	5,6	5,6							2	2	1	
	Man. Ctrl						7							1	1	0	
	TS				1,3									0	2	2	
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX							3	3					1	1	0	
	NOR								1					1	1	1	
	I/C							2,4	2,6	7				4	4	2	
	MAJ							5	5	5				2	2	1	
	Man. Ctrl								2					1	1	0	
	TS							1,3						0	2	2	
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX										1			1	1	0	
	NOR										1		1	1	1	1	
	I/C										2,4,8	3,5,6	2,4,8	4	4	2	
	MAJ										7	7	7	2	2	1	
	Man. Ctrl											3	4,8	1	1	0	
	TS										2,3			0	2	2	

Form 3.4-1 Events and Evolutions Checklist

Form 3.4-1 Instructions for the Events and Evolutions Checklist

1. Mark the applicant license level for each simulator operating test number.
2. For the set of scenario columns, fill in the associated event number from Form 3.3-1, "Scenario Outline," to show the specific event types being used for the applicant while in the assigned crew position for that scenario.

* Minimums are subject to the instructions in Section C.2, "License Level Criteria."

KEY: RX = Reactivity Manipulation; NOR = Normal Evolution; I/C = Instrument/Component Failure; MAJ = Major Transient; Man. Ctrl = Manual Control of Automatic Function; TS = Technical Specification Evaluation; RO = Reactor Operator; SRO-I or I = Instant Senior Reactor Operator; SRO-U or U = Upgrade Senior Reactor Operator; SRO = Senior Reactor Operator; ATC = At the Controls; and BOP = Balance of Plan