Exelon Generation

Training Id: **NMP1 2017 NRC RO Admin JPM EP** Revision: **0.0**

Title: **Actions for External Security Threats**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	4/6/2016
Validated By	Phil Carroll	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. OP-NM-106-104, Security Contingency Event
2. NUREG 1123, 2.4.28 (3.2)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to perform control room operator tasks associated with a security event. The operator will complete a Security Event – Control Room Operator checklist.

2. Task Information:

   a. N1-SOP27.1-00001, Respond to External Security Threats.

   b. K/A 2.4.28 (3.2), Knowledge of procedures relating to a security event (non-safeguards information).

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Simulator
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. U1 Simulator

5. JPM Setup (if required)

   a. Ensure sufficient copies of OP-NM-106-104 Attachment 2 are available.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given:
	• The plant is operating at 100% power.
	• You are the CRO.
	• The NRC calls on the ENS line and informs you of the following:
	  ○ NORAD has reported that two US Airways 737 aircraft have been hijacked from Hancock International Airport in Syracuse, New York.
	  ○ One is headed southeast in the direction of the Indian Point site and one is headed north in the direction of the Fitzpatrick and Nine Mile Point site.
	  ○ The event is classified as a credible, probable airborne threat.
	  ○ The Shift Manager has declared an Alert based on the threat.
	
	Evaluator: *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform actions in response to this security threat in accordance with OP-NM-106-104 attachment 2.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** *Acknowledge repeat back providing correction if necessary.*	P	SAT / UNSAT **STD:** Proper communications used.
2.	Obtains a copy of the reference procedure and reviews/utilizes the correct section	P	SAT / UNSAT **STD:** OP-NM-106-104 attachment 2 obtained.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Notifies Shift Manager of security event. **Role Play:** As Shift Manager, acknowledge report. **Note:** The operator may not notify the SM since the initial conditions indicate the SM has already been notified and has declared an Alert Emergency condition.	P	SAT / UNSAT / NA **STD:** Proper communications used
4.	Checks plant parameters	P	SAT / UNSAT **STD:** Observes major plant parameters using control room instrumentation (ex. Reactor power, pressure and level, Containment conditions)
5.	Notifies Security Site Supervisor **Note:** Security Site Supervisor may be contacted by Gaitronics page or by calling x5222 or x2591	P	**PASS / FAIL** **STD:** Proper communications used
6.	Initiates any Operating, Special Operating or EOPs required **Cue:** Inform that other operators are executing the required Operating, Special Operating and Emergency Operating Procedures	P	SAT / UNSAT **STD:** Proper communications used

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
7.	As directed by Shift Manager, makes announcements. **Cue:** As Shift Manager, provide OP-NM-106-104 attachment 6, Aircraft Attack Announcement (JPM Attachment 1) **Note:** If candidate begins to broadcast announcement over speakers, examiner should direct the candidate to not broadcast over speakers and direct the announcement to the examiner only.		
7a		P	**PASS / FAIL** **STD:** Places GAItronics in Merge
7b		P	**PASS / FAIL** **STD:** Sounds Evacuation Alarm for 5 seconds
7c		P	**PASS / FAIL** **STD:** Announces: Attention All Plant Personnel, this (is a drill / is an actual emergency) Aircraft Impact Imminent. Evacuate the protected area immediately. Report directly to the Learning Center or P-Building. I repeat, this (is a drill / is an actual emergency)
7d		P	SAT / UNSAT **STD:** Repeats Alarm and Announcement

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
7e		P	SAT / UNSAT **STD:** Leaves GAItronics in merge
8	WHEN Security Event NO longer exists, THEN make a termination announcement PER EP-CE-115, Termination and Recovery **Cue:** As Shift Manager, report that Security Contingency Event no longer exists and provide EP-CE-115, Emergency Termination Announcement (JPM Attachment 2) **Note:** If candidate begins to broadcast announcement over speakers, examiner should direct the candidate to not broadcast over speakers and direct the announcement to the examiner only.		
8a		P	SAT / UNSAT **STD:** Sounds Station Alarm for 10 seconds
8b		P	SAT / UNSAT **STD:** Announces: Attention all personnel, attention all personnel. The Alert has been terminated. I repeat, the Alert has been terminated.

TASK STANDARD	The operator has performed the actions listed in OP-NM-106-104, Attachment 2, Security Event, CRO Checklist.

STOP TIME	

Exelon Generation

JPM Handout

INITIAL CONDITIONS	Given:
	• The plant is operating at 100% power.
	• You are the CRO.
	• The NRC calls on the ENS line and informs you of the following:
	  ○ NORAD has reported that two US Airways 737 aircraft have been hijacked from Hancock International Airport in Syracuse, New York.
	  ○ One is headed southeast in the direction of the Indian Point site and one is headed north in the direction of the Fitzpatrick and Nine Mile Point site.
	  ○ The event is classified as a credible, probable airborne threat.
	  ○ The Shift Manager has declared an Alert based on the threat.

INITIATING CUE	**(Operators Name)**, perform actions in response to this security threat in accordance with OP-NM-106-104 attachment 2.

JPM Attachment 1

Attachment 6, Aircraft Attack Announcement

Date: Today
Time: Now

AIRCRAFT ATTACK ANNOUNCEMENT

Instructions:

1. **PLACE** Gaitronics in Merge.
2. **IF** the event is a drill, **MAKE** the following announcement before sounding the station alarm:

   "This is a drill, this is a drill."
3. **SOUND** Station Alarm for five (5) seconds.
4. **ANNOUNCE,**

   "Attention, Attention all personnel, this is (a drill) (an actual emergency).

   An aircraft impact with the site is expected to occur within 30 minutes. Fire Brigade, Shift Radiation Protection, and Shift Chemistry Technicians report to Security East, B.5.b equipment staging area. All remaining on-shift personnel report to your respective Control Room. All remaining personnel evacuate the protected area immediately and report to the P-Building.

   I repeat, this is (a drill) (an actual emergency)."
5. **REPEAT** Alarm **AND** Announcement.
6. **LEAVE** Gaitronics in Merge for the duration of the event.
7. Upon completion, **RETURN** this attachment to the EP Dept.

4.4. Event Termination from an Alert or Higher Classification

NOTE: All actions in this section of procedure are completed or directed by the Corporate Emergency Director.

The process for transition to Recovery is illustrated in Attachment 2, Illustrated Recovery Process.

As conditions improve and additional personnel and resources become available, certain recovery activities should be initiated prior to termination of the emergency. Refer to section 4.2, At an Alert or Higher Determine need for Recovery for recovery planning actions.

Select emergency response facilities or portions thereof may remain activated for some time after event termination during Recovery (for example, the JIC or Communications portions of the EOF).

1. **COMPLETE** EP-CE-111-F-01, Event Termination Checklist, to determine when termination can be performed.

2. When conditions are met (as outlined on Event Termination Checklist):

   A. **If** a Recovery Plan and Organization is required, **then TERMINATE** the event **and ENSURE** Recovery Plan Outline and initial Recovery Organization have been established prior to releasing ERO (Refer to Sections 4.2 and 4.4).

   B. **If** it has been determined that NO Recovery Plan or Organization is needed and all further actions will be performed using the station's normal organizations and processes, **then TERMINATE** the event.

3. **PERFORM** the following after event termination:

   A. **ANNOUNCE** (or direct someone to announce) the following (or similar) message to plant personnel over the public address system:

   "Attention all personnel, attention all personnel. The [Alert, Site Area Emergency, General Emergency] has been terminated. I repeat, the [Alert, Site Area Emergency, General Emergency] has been terminated."

Exelon Generation

Training Id: **NMP1 2017 NRC RO Admin JPM RC** Revision: **0.0**

Title: **Application of Radiation Exposure Limits IAW RP-AA-203 – SDC Room**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	3/25/16
Validated By	Phil Carroll	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. RP-AA-203, Exposure Control and Authorization
2. RP-AA-300, Radiological Survey Program
3. NUREG 1123, 2.3.4 (3.2)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to evaluate radiological survey data against exposure limits in order to determine availability to perform operator tasks.

2. Task Information:

   a. GAP-RPP07-00002, Comply with administrative exposure limits.

   b. K/A 2.3.4 (3.2), Knowledge of radiation exposure limits under normal or emergency conditions.

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Classroom
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Training Classroom

5. JPM Setup (if required)

   a. Provide copy of the SDC room survey map for each operator performing the JPM.

   b. Ensure sufficient copies of RP-AA-203 and RP-AA-300 are available.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is at coasting down at the end of the cycle • Preparations are being made to use of the Shutdown Cooling System during the shutdown/cooldown • Each Shutdown Cooling Pump needs to have its oil changed • Assume NO radiation exposure is received in transit to and from the job location. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, given supporting information, determine which jobs you can complete without exceeding your administrative dose limit. The jobs are to be performed in the order stated. Your current dose is 1915 mrem.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** *Acknowledge repeat back providing correction if necessary.*	P	SAT / UNSAT **STD:** Proper communications used.
2.	Using the provided survey map and job descriptions, calculate the respective dose for each job as follows:		
2a.	Dose for Job 1: (1/2 hour x 50 mrem/hr) = 25 mrem	P	**PASS / FAIL** **STD:** Determines dose for Job 1 is 25 mrem
2b.	Dose for Job 2: (1/2 hour x 60 mrem/hr) = 30 mrem	P	**PASS / FAIL** **STD:** Determines dose for Job 2 is 30 mrem

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
2c.	Dose for Job 3: (1/2 hour x 80 mrem/hr) = 40 mrem	P	**PASS / FAIL** **STD:** Determines dose for Job 3 is 40 mrem
3.	Determines remaining dose the operator is allowed to receive. 2000 mrem – 1915 mrem = 85 mrem	P	SAT / UNSAT **STD:** Determines the operator can receive 85 mrem prior to exceeding administrative dose limits
4.	Determines which jobs can be completed without exceeding administrative dose limits.	P	**PASS / FAIL** **STD:** Determine that jobs 1 and 2 can be performed without exceeding the administrative dose limit. 85 mrem remaining is < the 95 mrem required for jobs 1, 2, and 3. (or 1915 mrem + 95 mrem = 2010 > 2000 mrem administrative limit)

TASK STANDARD	Calculates the dose for each job and determines that only jobs 1 & 2 can be performed without exceeding the administrative dose limit of 2000 mrem/yr.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is at coasting down at the end of the cycle • Preparations are being made to use of the Shutdown Cooling System during the shutdown/cooldown • Each Shutdown Cooling Pump needs to have its oil changed • Assume NO radiation exposure is received in transit to and from the job location.

INITIATING CUE	**(Operators Name)**, given supporting information, determine which jobs you can complete without exceeding your administrative dose limit. The jobs are to be performed in the order stated. Your current dose is 1915 mrem.

JOB DESCRIPTION

1. **JOB 1**
    a. Drain SDC Pump 11 oil
    b. Refill SDC Pump 11 with oil
        i. Total time (for oil drain and refill): 30 minutes at the pump/motor
2. **JOB 2**
    a. Drain SDC Pump 12 oil
    b. Refill SDC Pump 12 with oil
        i. Total time (for oil drain and refill): 30 minutes at the pump/motor
3. **JOB 3**
    a. Drain SDC Pump 13 oil
    b. Refill SDC Pump 13 with oil
        i. Total time (for oil drain and refill): 30 minutes at the pump/motor

Exelon Generation

Training Id: **NMP1 2017 NRC RO-SRO Admin COO1** Revision: **0.0**

Title: **Control Rod Position Verification and Determine Reactivity Severity**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	4/5/2016
Validated By	Kevin Hines	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-OP-42, Process Computer / SPDS
2. N1-OP-5, Control Rod Drive System
3. OP-AA-300, Reactivity Management
4. OP-AA-300-1540, Reactivity Management Administration
5. BWROG-TP-09-025, Monitoring of Reactivity Management Issues
6. NUREG 1123 K/A 2.1.37 (4.3/4.6)
7. Unit 1 Technical Specifications

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's knowledge of reactivity management processes, and tests the operator's ability to determine whether control rod patterns correctly reflect the desired plant lineup by performing a control rod position verification.

   b. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. N1-SOP1.5-03001-07, Concurrent mitigation of control rod mispositiong

   b. NUREG 1123 K/A 2.1.37 (4.3/4.6), Knowledge of procedures, guidelines, or limitations associated with| reactivity management.

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Classroom
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Classroom

5. JPM Setup

   a. Provide sufficient copies of OP-AA-300, Reactivity Management
   b. Provide sufficient copies of OP-AA-300-1540, Reactivity Management Administration
   c. Provide sufficient copies of BWROG-TP-09-025, Monitoring of Reactivity Management Issues
   d. Provide sufficient copies of N1-OP-5 for the SRO candidates
   e. Provide A2 startup sequence completed up to final rod position verification
   f. Provide printout of rod positions from the PPC

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • A plant startup is in progress. • All RWM Group 9 Rods have been withdrawn. • An independent verification of control rod positions for RWM group 9 must be performed prior to moving ahead with the start up. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform the Independent Verification of final control rod positions for RWM group 9 using the plant process computer rod position data.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** *Acknowledge repeat back providing correction if necessary.*	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference handouts.	P	SAT / UNSAT **STD:** Obtains copy of A2 startup sequence and PPC rod position printout.
3.	Identify rod position discrepancy	P	**PASS / FAIL** **STD:** Identifies rod 34-47 is fully inserted and should be at position 12. Rod 30-47 is at position 12 and should be fully inserted.
Evaluator Cue:	When the candidate identifies the control rod position discrepancy, provide the RO/SRO worksheet and all applicable references.		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4	From RO/SRO Worksheet, makes determination of mispositioned control rod in accordance with OP-AA-300-1540, Reactivity Management Administration. **Note:** OP-AA-300-1540 references BWROG Reactivity Controls Review Committee "Guidelines for Excellence," Section 5.0 "Monitoring of Reactivity Management Issues", where mispositioned control rod is clearly defined in definition 'I'.	P	**PASS / FAIL** **STD:** Determines this DOES meet the definition of a mispositioned control rod.
5	From RO/SRO Worksheet, determines the reactivity event severity level in accordance with OP-AA-300-1540, Reactivity Management Administration. **Note:** OP-AA-300-1540 directs the use of BWROG Reactivity Controls Review Committee "Guidelines for Excellence, "Section 5.0 "Monitoring of Reactivity Management Issues", where a mispositioned control rod due to personnel error is example 2-5. (significance level 2).	P	**PASS / FAIL** **STD:** Determines this is a severity level 2 reactivity event.
	Evaluator Cue: When the RO candidates have completed the worksheet, inform them their task is complete. When the SRO candidates have completed the RO/SRO worksheet, provide them with the SRO Only worksheet and N1-OP-5.		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
6	**SRO Only:** Makes determination of who is required to be notified in accordance with N1-OP-5. **Note:** N1-OP-5 step H.9.5.3 directs notifying the General Supervisor Operations. This title was changed to Shift Operations Superintendant (SOS). Either answer is acceptable.	P	**PASS / FAIL** **STD:** Determines Shift Manager (H.9.1), Reactor Engineering (H.9.3), and General Supervisor Operations (H.9.5.3) are required to be notified.

TASK STANDARD	Control rod position verification is complete. Mispositioned control rod identified and severity level classified.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • A plant startup is in progress. • All RWM Group 9 Rods have been withdrawn. • An independent verification of control rod positions for RWM group 9 must be performed prior to moving ahead with the start up.

INITIATING CUE	**(Operators Name)**, perform the Independent Verification of final control rod positions.

RO/SRO Worksheet Handout

- Does this issue meet the definition of a "mispositioned control rod"?

- Investigation reveals that this issue was caused by human error, not an equipment malfunction. What is the associated severity level of this issue?

SRO Only Worksheet

- Determine the required notifications that must be made for this incident in accordance with N1-OP-5.

Exelon Generation

Training Id: **NMP1 2017 NRC RO-SRO Admin EC** Revision: **0.0**

Title: **Perform Daily Thermal Limit Surveillance**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	4/5/2016
Validated By	Kevin Hines	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 20 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-RESP-1A, Daily Thermal Limit Surveillance Short Form
2. 3D Monicore
3. NUREG 1123, 2.2.12 (3.7/4.1)

Exelon Generation

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to evaluate plant thermal limits in accordance with surveillance requirements.

   b. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. NS-REL-03002, Review Results of Surveillance Tests to Ensure Compliance with Specifications.

   b. K/A 2.2.12 (3.7/4.1), Knowledge of Surveillance Procedures.

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Classroom
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Training Classroom

5. JPM Setup (if required)

   a. Provide two 3D Monicore cases ("today's" and "yesterday's"). Yesterday's case should be normal. Today's case should have MFLCPR edited to be above 1.0 with MCPR edited accordingly.

   b. Provide enough copies of N1-RESP-1A completed up to section 8.2.2.

   c. Ensure tech specs are available for SROs

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is operating at approximately 100% power with 5 Recirculation pumps in service. • No change in power or control rod position has occurred since the current 3D Monicore case was generated. • The following data is provided: Computer Point A-390 reads 354°F Computer Point A-392 reads 352°F LEFM Flow correction factor process computer point J385 reads 0.9990 LEFM Flow correction factor process computer point J386 reads 0.9907 LEFM Flow correction factor from CRC Book - West = 0.9990 LEFM Flow correction factor from CRC Book - East = 0.9907 **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform the Daily Thermal Limit Surveillance in accordance with N1-RESP-1A, section 8.2.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** *Acknowledge repeat back providing correction if necessary.*	P	SAT / UNSAT **STD:** Proper communications used.
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure.	P	SAT / UNSAT **STD:** N1-RESP-1A and 3D Monicore cases obtained
Evaluator Note:	Provide copies of N1-RESP-1A and 3D monicore case edits (current and previous day). Only provide N1-OP-16, attachment 4 if requested.		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Complete N1-RESP-1A section 8.2 **Note:** Refer to KEY for completed surveillance. The following steps are the critical steps: 8.2.5, 8.2.6, 8.2.7, and 8.2.9 **Role Play:** If asked how to proceed at step 8.2.6 with MFLCPR above 1.0, acknowledge condition and direct the Candidate to complete the rest of section 8.2.	P	**PASS / FAIL** **STD:** N1-RESP-1A completed per the key
4.	Identify discrepancy in N1-RESP-1A section 8.2 **SRO Only Cue:** Once the SRO Candidate has identified MFLCPR/MCPR violation, direct them to determine the required action for this condition.	P	**PASS / FAIL** **STD:** Identifies that MFLCPR/MCPR have exceeded the limit
5.	**SRO Only** – Determine required action for MFLCPR/MCPR violation	P	**PASS / FAIL** **STD:** Determines Technical Specification 3.1.7.c is not met.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
	(JPM Step 5 continued)	P	**PASS / FAIL** **STD:** Determines action shall be initiated within 15 minutes to restore operation to within the prescribed limit. If all the operating MCPRs are not returned to within the prescribed limit within two (2) hours, reactor power reductions shall be initiated at a rate not less than 10% per hour until MCPR is within the prescribed limit.

TASK STANDARD	Daily thermal limit surveillance completed in accordance with N1-RESP-1A section 8.2, with all discrepancies identified. For SRO Candidates, required actions identified.

STOP TIME	

Exelon Generation

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at approximately 100% power with 5 Recirculation pumps in service. • No change in power or control rod position has occurred since the current 3D Monicore case was generated. • The following data is provided: Computer Point A-390 reads 354°F Computer Point A-392 reads 352°F LEFM Flow correction factor process computer point J385 reads 0.9990 LEFM Flow correction factor process computer point J386 reads 0.9907 LEFM Flow correction factor from CRC Book - West = 0.9990 LEFM Flow correction factor from CRC Book - East = 0.9907

INITIATING CUE	**(Operators Name)**, perform the Daily Thermal Limit Surveillance in accordance with N1-RESP-1A, section 8.2.

Exelon Generation

Training Id: **NMP1 2017 NRC SRO Admin JPM COO2** Revision: **0.0**

Title: **Determine Operator Qualifications Using LMS**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	3/24/16
Validated By	Kevin Hines	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. NUREG 1123, 2.1.8 (4.1)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the senior operator's ability to evaluate an operator's qualifications to perform specific tasks.

   b. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. NS-FLDSUP-001 – Lead Prejob Briefs for Operator Teams

   b. K/A 2.1.8 (4.1), Ability to coordinate personnel activities outside the control room.

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Classroom
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Training Classroom

5. JPM Setup (if required)

   a. Provide copies of LMS printouts for each applicant

   b. Provide copies of OP-CE-109-101

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • A maintenance activity is being planned. • Qualifications need to be verified for the following aspects of the maintenance activity: 1. Write the clearance (tagout) for a system (which will include disabling fire suppression systems) 2. Accept and Release the tagout 3. Hang/remove tags and align systems IAW the clearance 4. Perform duties as the fire watch while the clearance is active **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, Given the LMS sheets and the tasks required, determine which Operator is qualified to perform the tasks.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** *Acknowledge repeat back providing correction if necessary.*	P	SAT / UNSAT **STD:** Proper communications used.
2.	Obtains and Reviews the tasks and the LMS sheets and determines who is qualified to perform the tasks as shown on the KEY and below: **Note:** Applicant can evaluate the operators in any order.	P	SAT / UNSAT **STD:** LMS sheets and task information obtained and reviewed.
2a.	Evaluates RO1	P	**PASS / FAIL** **STD:** Determines RO1 can perform tasks #1, #2, & #3.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
2b.	Evaluates RO2	P	**PASS / FAIL** **STD:** Determines RO2 can perform tasks #1, #3, & #4.
2c.	Evaluates EO1	P	**PASS / FAIL** **STD:** Determines EO1 can perform tasks #3 and #4
2d.	Evaluates EO2	P	**PASS / FAIL** **STD:** Determines EO2 can perform only task #4

TASK STANDARD	Applicant determines which Operators are qualified to perform the tasks using LMS.

STOP TIME	

*******Answer Key*******
Do Not Provide to Applicant

Task Number	Task Description
1	Write a clearance (tagout) for a system (which will include disabling fire suppression systems) Qualification Required: N-NM-SA-CT-WRT
2	Review and approve the clearance Qualification Required: N-CE-SA-CT-HLD
3	Hang/remove the tags and align the systems IAW the clearance Qualification Required: N-NM-SA-CT-AR
4	Perform the duties of a fire watch while the clearance is active Qualification Required: N-AN-SA-FIREWATCH

Is the Operator Qualified to Perform the Task? (Yes / No)				
Operator	**Task 1**	**Task 2**	**Task 3**	**Task 4**
RO 1	Yes	Yes	Yes	No
RO 2	Yes	No	Yes	Yes
EO 1	No	No	Yes	Yes
EO 2	No	No	No	Yes

*******Answer Key*******
Do Not Provide to Applicant

Exelon Generation

JPM Handout

INITIAL CONDITIONS	Given: • A maintenance activity is being planned. • Qualifications need to be verified for the following aspects of the maintenance activity: 1. Write the clearance (tagout) for a system (which will include disabling fire suppression systems) 2. Accept and Release the tagout 3. Hang/remove tags and align systems IAW the clearance 4. Perform duties as the fire watch while the clearance is active

INITIATING CUE	**(Operators Name)**, Given the LMS sheets and the tasks required, determine which Operator is qualified to perform the tasks.

Task Number	**Task Description**
1	Write a clearance (tagout) for a system (which will include disabling fire suppression systems)
2	Review and approve the clearance
3	Hang/remove the tags and align the systems IAW the clearance
4	Perform the duties of a fire watch while the clearance is active

Is the Operator Qualified to Perform the Task? (Yes / No)				
Operator	**Task 1**	**Task 2**	**Task 3**	**Task 4**
RO 1				
RO 2				
EO 1				
EO 2				

Exelon Generation

Training Id: **2017 NRC SRO Admin JPM EP** Revision: **0.0**

Title: **Emergency Event Classification and PARs Based on Dose Assessment**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	4/8/16
Validated By	Kevin Hines	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. NUREG 1123 K/A 2.4.29, (4.4)
2. EP-CE-111, Emergency Classification and Protective Action Recommendations
3. EPIP-EPP-01, Unit 1 EAL Flowchart

Instructor Information

A. JPM Information

1. Description
   a. This JPM tests the SRO's knowledge of the station's Emergency Preparedness program. The SRO will declare an emergency within 15 minutes of indications being made available that an EAL has been exceeded. PARs will be made after the declaration.
   b. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.
2. Task Information:
   a. NS-EP101-03013, Make protective action recommendations as necessary to offsite agencies.
   b. NUREG 1123 K/A 2.4.29 (4.4), Knowledge of the emergency plan.
3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Classroom
Time Critical Task	Yes
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location
   a. Training Classroom
5. JPM Setup
   a. Provide sufficient copies of EAL flowcharts and the Shift Emergency Director packages.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given:
	• You are the Unit 1 Shift Manager.
	• Unit 1 was operating at 100% power.
	• Unit 2 is operating at 100% power.
	• The following conditions have occurred:
	  ○ A loss of coolant accident at Unit 1 has resulted in a Site Area Emergency being declared.
	  ○ An Exclusion Area Evacuation has been directed and is in progress.
	  ○ The time of shutdown is 20 minutes ago.
	  ○ The Dose Assessment team reports 1.1 Rem TEDE at the site boundary.
	  ○ Meteorological data is as follows:

	30 ft	**200 ft**
Wind Speed	8 mph	8 mph
Wind Direction	150°	150°
Stability Class	E	

Evaluator: *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, take the required actions as the Shift Manager / Shift Emergency Director. This is a time critical task.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** *Acknowledge repeat back providing correction if necessary.*	P	SAT / UNSAT **STD:** Proper communications used

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
2.	Obtain a copy of the reference procedure and review/utilize the correct section.	P	SAT / UNSAT **STD:** Obtains EAL Flowchart and Shift Emergency Director binder.
3.	Using given release data and the EAL Flowchart, determine that a General Emergency exists based on dose at the Site Boundary. **Note:** This determination may not be made until JPM step 5.	P	**PASS / FAIL** **STD:** Determines General Emergency, RG1.2, due to dose at the site boundary >1000mrem TEDE.
4	Completes Shift Emergency Director Checklist section 1.1, Entry Into the Emergency Plan. **Role Play:** If requested as Shift Communicator and/or Shift Dose Assessor to report to the control room, acknowledge request.	P	SAT / UNSAT **STD:** Name and date entered in step 1.1.1 SAT / UNSAT **STD:** Communicator and/or Shift Dose Assessor requested to report to the control room.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5	Completes Shift Emergency Director Checklist section 1.2, Emergency Classification and PAR. **Role Play:** If requested as STA to perform peer check, concur with the applicant regardless of accuracy of EAL determination.		**PASS / FAIL** **STD:** Declares the event by announcing the following, "I am declaring a General Emergency at (time) due to dose at the site boundary exceeding 1 Rem and assuming the role as Shift Emergency Director. (Or similar announcement) **The time difference below must be 15 minutes or less:** JPM Start time:_____ Declaration time: _____
		P	**PASS / FAIL** **STD:** Determines an OCA evacuation should be implemented.
	Role Play: If the applicant attempts to make the PA announcement or directs the Emergency PA announcement be made, inform them another operator will perform the announcement they determine appropriate.		SAT / UNSAT **STD:** Completes Emergency PA Announcement form. (Verify General Emergency is selected in Block 4 and OCA Evacuation is selected in Block 9.)
	Cue: If the applicant attempts to complete notification paperwork for PARs, direct them to just determine PARs and inform the examiner.		**PASS / FAIL** **STD:** Determines PARs to evacuate ERPAs 1, 2, 3, 26, 27.

Termination Cue	When PARs have been determined, inform the applicant their task is complete.
TASK STANDARD	Applicant has determined a General Emergency exists and the appropriate PARs

STOP TIME	

JPM Handout

<table>
<tr><td>INITIAL CONDITIONS</td><td>Given:
You are the Unit 1 Shift Manager.
Unit 1 was operating at 100% power.
Unit 2 is operating at 100% power.
The following conditions have occurred:
A loss of coolant accident at Unit 1 has resulted in a Site Area Emergency being declared.
An Exclusion Area Evacuation has been directed and is in progress.
The time of shutdown is 20 minutes ago.
The Dose Assessment team reports 1.1 Rem TEDE at the site boundary.
Meteorological data is as follows:
<table>
<tr><th></th><th>30 ft</th><th>200 ft</th></tr>
<tr><td>Wind Speed</td><td>8 mph</td><td>8 mph</td></tr>
<tr><td>Wind Direction</td><td>150°</td><td>150°</td></tr>
<tr><td>Stability Class</td><td colspan="2">E</td></tr>
</table>
</td></tr>
</table>

INITIATING CUE	**(Operators Name)**, take the required actions as the Shift Manager / Shift Emergency Director. This is a time critical task.

Exelon Generation

Training Id: **2017 NRC SRO Admin JPM RC** Revision: **0.0**

Title: **Determine Actions for Inoperable Service Water Radiation Monitor**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	4/1/16
Validated By	Kevin Hines	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. NUREG 1123 K/A 2.3.15, (3.1)
2. ARP H1-4-5
3. ODCM 3.6.14.a and TBL 3.6.14-1 Inst. 1B
4. DER NM-2003-5168, ODCM Entry Due to SW RM Low Flow
5. DER NM-2004-976, Unplanned LCO – SW RM Low Flow

Instructor Information

A. JPM Information

1. Description
   a. This JPM tests the SRO's knowledge of the Service Water Radiation monitor and the SRO's ability to use the ODCM to determine appropriate actions when the radiation monitor is inoperable.
   b. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.
2. Task Information:
   a. NS-OM207-03002-02, Perform an administrative review to determine operability of a system, structure, or component.
   b. NUREG 1123 K/A 2.3.15 (3.1), Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.
3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Classroom
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location
   a. Training Classroom
5. JPM Setup
   a. Provide a copy of ARP H1-4-5 and a copy of the ODCM

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is operating at 100% power. • High wind conditions (20-25 mph with higher gusts) are present and are expected to continue for the next twelve (12) hours. • H1-4-5, LQ PROCESS RAD MON, has alarmed. • Computer Point F172, SERVICE WATER SKID FAILURE, is in alarm. • Operator reports an EQUIP FAIL Light is shown for the Service Water Discharge Monitor at the J Panel. • Chemistry reports alarm is caused by low sample flow. Flows are reading 0.98 gpm on the east side (TB) and 0.99 gpm on the west side (RB). • Sample flow cannot be adjusted. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, determine the appropriate actions and compensatory measures in response to ARP H1-4-5. Record your findings on the provided attachment.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** *Acknowledge repeat back providing correction if necessary.*	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review/utilize the correct section.	P	SAT / UNSAT **STD:** ARP H1-4-5 obtained. Operator Actions referenced. ODCM obtained. DLCO 3.6.14 referenced. Table D 3.6.14-1 referenced.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Per ARP H1-4-5, if service water monitor alarm, and monitor EQUIP FAIL light is lit, then:		
3a	Notify Radiation Protection Instrument Support for repair. **Role Play:** As RP, acknowledge report.	P	SAT / UNSAT **STD:** Notifies Radiation Protection Instrument Support to initiate repairs.
3b	Initiate LCO sampling (Chemistry). **Role Play:** As Chemistry, acknowledge direction to perform samples.	P	**PASS / FAIL** **STD:** Directs Chemistry to perform DLCO sampling per Table D 3.6.14-1 Instrument 1B action (d); twelve (12) hour grab samples to be collected/analyzed for SW effluent.
4	Reference ODCM and takes appropriate actions.		
4a		P	SAT / UNSAT **STD:** Determines SW Radiation Monitor is inoperable.
4b		P	SAT / UNSAT **STD:** References ODCM DLCO 3.6.14.a and Table D 3.6.14-1 Instrument 1B and note (d) applies.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4c		P	**PASS / FAIL** **STD:** Determines less than the minimum number of radioactive liquid effluent monitoring channels for service water effluent and takes action shown in Table D 3.6.14-1.
4d		P	**PASS / FAIL** **STD:** Determines action (d) applies. Effluent releases via this pathway can continue provided that at least once per twelve (12) hours grab samples are collected and analyzed SW effluent.

TASK STANDARD	Applicable actions per ARP H1-4-5 and ODCM in response to service water radiation monitor low flow condition have been identified and recorded.

STOP TIME	

Attachment 1

*******Answer Key*******
Do Not Provide to Applicant

Determine the appropriate actions in response to these conditions.	
Action	Required By (Document)
Notify Radiation Protection Instrument Support for repair. Direct Chemistry to initiate required LCO sampling	ARP H1-4-5
Determines SW Radiation Monitor is inoperable. Determines less than the minimum number of radioactive liquid effluent monitoring channels for service water effluent and takes action shown in Table D 3.6.14-1.	ODCM DLCO 3.6.14 TABLE D 3.6.14-1.
Determines action identified in note (d) applies. Effluent releases via this pathway can continue provided that at least once per twelve (12) hours grab samples are collected and analyzed.	ODCM DLCO 3.6.14 TABLE NOTE (d)

*******Answer Key*******
Do Not Provide to Applicant

Attachment 2

JPM Scorecard For Applicant Use

Determine the appropriate actions in response to these conditions.	
Action	Required By (Document)

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at 100% power. • High wind conditions (20-25 mph with higher gusts) are present and are expected to continue for the next twelve (12) hours. • H1-4-5, LQ PROCESS RAD MON, has alarmed. • Computer Point F172, SERVICE WATER SKID FAILURE, is in alarm. • Operator reports an EQUIP FAIL Light is shown for the Service Water Discharge Monitor at the J Panel. • Chemistry reports alarm is caused by low sample flow. Flows are reading 0.98 gpm on the east side (TB) and 0.99 gpm on the west side (RB). • Sample flow cannot be adjusted.

INITIATING CUE	**(Operators Name)**, determine the appropriate actions and compensatory measures in response to ARP H1-4-5. Record your findings on the provided attachment.

Exelon Generation

Training Id: **2017 NRC NMP1 Plant JPM P-1** Revision: **0.0**

Title: **Remove ERV Fuses in the Plant**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/22/16
Validated By	Phil Carroll	8/25/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-SOP-1.4, Stuck Open ERV
2. NUREG 1123 K/A 239002 A2.03 4.1/4.2

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to locate and operate equipment associated with the Electromagnetic Relief Valves. The applicants will simulate pulling fuses in the Reactor Building for ERV 111.

   b. This JPM is NOT considered alternate path.

   c. Critical steps are annotated in the Evaluator standard column with a bolded *__Pass/Fail__.

2. Task Information:

   a. N1-218000-01012

   b. K/A 239002, A2.03 4.1/4.2

3. Evaluation / Task Criteria

Evaluation Method	Simulate
Evaluation Location	Plant
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Reactor Building

5. JPM Setup (if required)

   a. Ensure adequate copies of N1-SOP-1.4 are available.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is at 100% power. • Annunciator H3-4-5, "Press Safety/Relief Valves Flow" is in alarm. • ERV 111 has been verified open via the Acoustic Monitor Panel. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, pull the In-Plant Control Power Fuses for ERV-111 in accordance with N1-SOP-1.4, Stuck Open ERV. **Note:** The Electrical Safety PPE requirements for this task have been assessed and are as follows: • Leather gloves • 100% cotton long sleeve shirt and pants OR 100% cotton short sleeve shirt and pants under fire retardant lab coat • Safety glasses or goggles

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary.	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure. **Cue:** Safety equipment is not required to be obtained.	P	SAT / UNSAT **STD:** N1-SOP-1.4 obtained

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Locate Junction Box 11 in the Reactor Building **Note:** Safety equipment is not required to be obtained. However the required equipment should be discussed during the performance of the JPM.	P	SAT / UNSAT **STD:** Locate JB 11 on RB 237' West Side
4.	Pull the positive side fuse for ERV 111, F1 POS	S	***PASS / FAIL** **STD:** Fuse F1 is pulled using fuse pullers, located 237 West side cabinet ERV.
5.	Pull the negative side fuse for ERV 111, F2 NEG	S	***PASS / FAIL** **STD:** Fuse F2 is pulled using fuse pullers, located 237 West side cabinet ERV.
6.	Notify Control Room that ERV 111 fuses have been pulled from cabinet JB 11 on RB 237' **Role play:** As CRO, acknowledge fuses pulled. Notify Operator "ERV 111 indicates closed.	P	SAT / UNSAT **STD:** Proper communications used
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	125 VDC Fuses pulled for ERV 111 and ERV 111 is closed.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is at 100% power. • Annunciator H3-4-5, "Press Safety/Relief Valves Flow" is in alarm. • ERV 111 has been verified open via the Acoustic Monitor Panel.

INITIATING CUE	**(Operators Name)**, pull the In-Plant Control Power Fuses for ERV-111 in accordance with N1-SOP-1.4, Stuck Open ERV. **Note:** The Electrical Safety PPE requirements for this task have been assessed and are as follows: • Leather gloves • 100% cotton long sleeve shirt and pants OR 100% cotton short sleeve shirt and pants under fire retardant lab coat • Safety glasses or goggles

Exelon Generation

Training Id: **2017 NRC NMP1 Plant JPM P-2** Revision: **0.0**

Title: **Inject Boron Into the Reactor Using the Hydro Pump (PRA)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/22/16
Validated By	Phil Carroll	8/25/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-EOP-3, Failure to Scram
2. NUREG 1123 K/A 295037, EA1.10, (3.7 / 3.9)
3. N1-EOP-3.2, Attachment 1

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to locally inject Boron via alternate methods during an emergency.

   b. This JPM is NOT considered alternate path.

   c. Critical steps are annotated in the Evaluator standard column with a bolded *__Pass/Fail__.

2. Task Information:

   a. N1-EOP-3.2-01001, Implement Alternate Boron Injection

   b. K/A 295037, EA1.10, (3.7 / 3.9)

3. Evaluation / Task Criteria

Evaluation Method	Simulate
Evaluation Location	Plant
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Reactor Building Elev. 281

5. JPM Setup (if required)

   a. Prepare a copy of N1-EOP-3.2, up through Attachment 1 to enable P&Ls to be reviewed.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • N1-EOP-3 has been entered due to a failure to scram. • An RO has tried to initiate Liquid Poison from the Control Room but the pumps will not start. • RWCU has isolated. • Radiation Protection is providing continuous monitoring of your activities. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, lineup and inject boron using the Hydro Pump per N1-EOP-3.2, Alternate Boron Injection, Attachment 1.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary.	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-EOP-3.2 obtained, Attachment 1 referenced
3.	Verify RWCU system is isolated	P (3.1)	SAT / UNSAT **STD:** Determines RWCU system is isolated per initial conditions

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Notify Rad Protection to provide continuous monitoring	P (3.2)	SAT / UNSAT **STD:** Determines Rad Protection is providing continuous monitoring per initial conditions
Cue: Once EOP Box 2 is located, prompt candidate to simulate opening the box and describe the equipment to be used.			
5.	Connect air supply hose from 95-157, BV-HSA to Alternate Boron Injection System (in overhead above Hydro Pump area), to the Hydro pump **Note:** 95-157 is in the overhead above a small platform. It is not desired for the candidate to access the valve, since this would require RP coverage for work above 6 feet. Successful completion of this JPM step will be for the candidate to indicate the general location of the valve. **Cue:** Once candidate indicates location of 95-157, report that the air supply hose is connected to 95-157	S (3.3.1)	***PASS / FAIL** **STD:** Indicates location of 95-157 ***PASS / FAIL** **STD:** Attaches one end of air supply hose to Hydro pump air inlet line
6.	Connect high-pressure hose to discharge of Hydro pump	S (3.3.2)	***PASS / FAIL** **STD:** Connects one end of hose to discharge of Hydro pump

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
7.	Connect 2" hose from hose connection downstream of 89-20, Drain – Liquid Poison Tank, to suction of Hydro pump	S (3.3.3)	***PASS / FAIL** **STD:** Connects one end of hose to hose connection downstream of 89-20 ***PASS / FAIL** **STD:** Connects other end of hose to suction of Hydro pump
8.	Unlock and verify closed 89-21, Drain – LP Tank to 55 Gal Drum **Note:** 89-21 is normally locked open	S (3.4.1)	***PASS / FAIL** **STD:** 89-21 is unlocked ***PASS / FAIL** **STD:** 89-21 is closed by rotating handwheel fully clockwise
9.	Unlock and close 42-13, BV-LP Squibb Vlv 11 Outlet	S (3.4.2)	SAT / UNSAT **STD:** 42-13 (LP-11) is closed by unlocking and turning handwheel fully clockwise (RB Elev. 298')
10.	Unlock and close 42-14, BV-LP Squibb Vlv 12 Outlet	S (3.4.3)	SAT / UNSAT **STD:** 42-14 (LP-10) is closed by unlocking and turning handwheel fully clockwise (RB Elev. 298')

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
11.	Unlock and open 41-04, Drain – Liquid Poison Tank	S (3.5.1)	***PASS / FAIL** **STD:** 41-04 (LP-701) is opened by unlocking and turning handwheel fully counter-clockwise
12.	Unlock and open 89-20, Drain – Liquid Poison Tank	S (3.5.2)	***PASS / FAIL** **STD:** 89-20 is opened by unlocking and turning handwheel fully counter-clockwise
13.	Verify Hydro Pump Air inlet Valve closed	S (3.6.1)	SAT / UNSAT **STD:** Hydro pump air inlet valve is closed by verifying handwheel is rotated fully clockwise (at Hydro pump)
14.	Adjust regulator fully clockwise	S (3.6.2)	***PASS / FAIL** **STD:** Rotates regulator fully clockwise
15.	Depress outer collar of adjusting knob downward to lock pressure setting	S (3.6.3)	SAT / UNSAT **STD:** Depresses outer collar of adjusting knob downward
16.	Connect high pressure hose (from Hydro pump discharge) to hose connection upstream of 42-10, Drain – LP Sys Hdr Before Ck Vlvs - 2nd (Step 3.7)	S (3.7)	***PASS / FAIL** **STD:** Connects other end of hose previously attached to Hydro pump discharge to hose connection upstream of 42-10

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
17.	Unlock and open valve 42-10, Drain – LP SYS HDR BEFORE CK VLVS – 2ND.	S (3.8.1)	***PASS / FAIL** **STD:** 42-10 (LP-708) is opened by unlocking and turning handwheel fully counter-clockwise (RB Elev. 281)
18.	Unlock and open valve 42-09, Drain – LP SYS HDR BEFORE CK VLVS – 1ST. **Note:** Common locking mechanism with 42-10.	S (3.8.2)	***PASS / FAIL** **STD:** 42-09 (LP-707) is opened by unlocking and turning handwheel fully counter-clockwise (RB Elev. 281)
19.	Open 95-157, BV-HSA to Alt Boron Injection System **Note:** 95-157 is in the overhead above a small platform. It is not desired for the candidate to access the valve, since this would require RP coverage for work above 6 feet. **Cue:** Report that 95-157 has been opened by another operator	S (3.9)	SAT / UNSAT **STD:** 95-157 is opened
20.	Start pump by opening Air Inlet BV	S (3.10)	***PASS / FAIL** **STD:** Air inlet valve is opened by turning handwheel counter-clockwise
21.	Notifies Control Room liquid poison being injected with the Hydro Pump.	S	SAT / UNSAT
Evaluators Note:	**Cue:** Your task is complete.		

TASK STANDARD	Alternate Boron injection with the hydro pump has been established in accordance with N1-EOP-3.2.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • N1-EOP-3 has been entered due to a failure to scram. • An RO has tried to initiate Liquid Poison from the Control Room but the pumps will not start. • RWCU has isolated. • Radiation Protection is providing continuous monitoring of your activities.

INITIATING CUE	**(Operators Name)**, lineup and inject boron using the Hydro Pump per N1-EOP-3.2, Alternate Boron Injection, Attachment 1.

Exelon Generation

Training Id: **2017 NRC NMP1 Plant JPM P-3** Revision: **0.0**

Title: **Transfer Reactor Trip Bus 141 to I&C Bus 130A**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/22/16
Validated By	Phil Carroll	8/25/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-SOP-30.2, Loss of Powerboard 12 Attachment 3
2. NUREG 1123 K/A 295003, AA1.01, (3.7 / 3.8)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to locally operate AC Distribution components during loss of power situations.

   b. This JPM is NOT considered alternate path.

   c. Critical steps are annotated in the Evaluator standard column with a bolded *__PASS/FAIL__.

2. Task Information:

   a. N1-SOP-30.2-04001, Perform the In-Plant Actions for a Loss of Power Board 12

   b. K/A 295003, AA1.01, (3.7 / 3.8)

3. Evaluation / Task Criteria

Evaluation Method	Simulate
Evaluation Location	Plant
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Turbine Building

5. JPM Setup (if required)

   a. Prepare a copy of N1-SOP-30.2, Attachment 3

   b. Fire retardant lab coat may be required if candidate is wearing short sleeves.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is operating at approximately 50% power • A loss of Powerboard 12 has led to the loss of Reactor Trip Bus 141 **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, restore power to Reactor Trip Bus 141 from I&C Bus 130A, in accordance with N1-SOP-30.2, Attachment 3. **Note:** The Electrical Safety PPE requirements for this task have been assessed and are as follows: • Leather gloves • 100% cotton long sleeve shirt and pants OR 100% cotton short sleeve shirt and pants under fire retardant lab coat • Safety glasses or goggles

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary.	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-SOP-30.2, Attachment 3 obtained

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Confirm I&C Bus 130A power supply is available (PB 13B energized) **Cue:** If candidate looks at any Powerboard 13 voltage indication, report that voltage is 600V **Cue:** If candidate looks at Powerboard 13 breakers, report breaker position as follows: • PB 13A Feeder – Closed • PB 13 A-B Tie – Closed • PB 13 B-C Tie – Closed • PB 13C Feeder - Open	P (1.1)	SAT / UNSAT **STD:** Determines Powerboard 13B is energized by observing voltage present and/or POWERBOARD 13 A TO B SECTION TIE BREAKER closed (TB 277' South)
4.	Open REACTOR TRIP BUS #141 NORMAL SUPPLY FROM M.G. SET #141 (TB 277' East)	P (1.2)	***PASS / FAIL **STD:** Opens breaker REACTOR TRIP BUS #141 NORMAL SUPPLY FROM M.G. SET #141by positioning lever down
5.	Close REACTOR TRIP BUS #141 MAINTENANCE SUPPLY from I&C Bus 130A (TB 277'East)	P (1.3)	***PASS / FAIL **STD:** Closes breaker REACTOR TRIP BUS #141 MAINTENANCE SUPPLY by positioning lever up
6.	Notify CRO that Rx Trip Bus #141 transfer is completed AND ½ scram and Feedwater Heaters may be reset **Role Play:** Acknowledge report. Inform candidate that the ½ scram has been reset. Direct candidate to reset Feedwater Heaters 121-125.	P (1.4)	SAT / UNSAT **STD:** Proper communications used
7.	Reset Feedwater Heater String 12		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
7a		P (3.0)	SAT / UNSAT **STD:** Presses Feedwater Heater 121 HIGH LEVEL TRIP RESET pushbutton (TB 291' North)
7b		P (3.0)	SAT / UNSAT **STD:** Presses Feedwater Heater 122 HIGH LEVEL TRIP RESET pushbutton (TB 291' North)
7c		P (3.0)	SAT / UNSAT **STD:** Presses Feedwater Heater 123 HIGH LEVEL TRIP RESET pushbutton (TB 291' North)
7d		P (3.0)	SAT / UNSAT **STD:** Presses Feedwater Heater 124 HIGH LEVEL TRIP RESET pushbutton (TB 305' North)
7e		P (3.0)	SAT / UNSAT **STD:** Presses Feedwater Heater 125 HIGH LEVEL TRIP RESET pushbutton (TB 305' North)

Evaluators Note:	**Cue:** Your task is complete.
TASK STANDARD	Reactor Trip Bus 141 is energized from I&C Bus 130A and Feedwater Heaters are reset in accordance with N1-SOP-30.2.
STOP TIME	

Exelon Generation

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at approximately 50% power • A loss of Powerboard 12 has led to the loss of Reactor Trip Bus 141

INITIATING CUE	**(Operators Name)**, restore power to Reactor Trip Bus 141 from I&C Bus 130A, in accordance with N1-SOP-30.2, Attachment 3. **Note:** The Electrical Safety PPE requirements for this task have been assessed and are as follows: • Leather gloves • 100% cotton long sleeve shirt and pants OR 100% cotton short sleeve shirt and pants under fire retardant lab coat • Safety glasses or goggles

Exelon Generation

Training Id: **2017 NRC NMP1 Simulator JPM S-1** Revision: **0.0**

Title: **Synchronize Main Generator to Grid, Main Generator Locks Out (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/18/16
Validated By	Phil Carroll	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 20 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-OP-32, Generator
2. N1-SOP-31.1, Turbine Trip
3. NUREG 1123 K/A 245000 A4.02, (3.1/2.9)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to operate controls associated with the Main Generator, including synchronization and loading.

   b. This JPM is considered alternate path because once the Main Generator is given some load, the Main Turbine will trip. The operator will be required to enter and execute the Turbine Trip SOP.

   c. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. N1-245001-01004

   b. K/A 245000 A4.02, (3.1/2.9)

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Simulator
Time Critical Task	No
Alternate Path	Yes
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)

   a. The reactor is in a power operating condition (15-20%)
   b. Initialize simulator to IC 161
   c. The Main Generator is ready to be synchronized
   d. Verify the following malfunction:
      - TC01, Main Turbine Trip **TRG1**

   e. Verify event trigger, **TRG1** is set to activate on "hzleg10c==1&zdeg10SO==0".

   f. Verify the following remote functions:
      - EG11, STATOR COOLING WATER PUMP 11 CONTROL FV=greenf_auto, **TRG2**
      - EG12, STATOR COOLING WATER PUMP 12 CONTROL FV=redf, DT=2, **TRG2**

6. JPM Setup (if required)

   a. N1-OP-32 marked up through step E.3.1. Applicants will start on step E.3.2.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • A plant startup is in progress. • The reactor is operating approximately 18% power. • N1-OP-43A, step E.5.9 is in progress to synchronize and load the turbine and generator. • N1-OP-32 is completed through step E.3.1. • Nine Mile Point Unit 2 Lines 5 and 6 are in-service. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, complete synchronizing the Main Generator to the grid by starting at step E.3.2 of N1-OP-32. Load the Generator until all turbine bypass valves are closed. Then, complete the remainder of section E.3.0.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-OP-32 obtained.
Procedure Note:	"Per N1-OP-25, Startup of Steam Jet Air Ejectors, condenser vacuum should be stabilized at approximately 26 inHg to 26.5 inHg to minimize turbine vibrations leading to a potential turbine trip." If the applicant questions condenser vacuum due to this note, inform the applicant another operator will manage condenser vacuum.		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Verify open R915 and R925 **Note:** There is a short time delay before movement of MOD-18 results in indicating light change and clearing of annunciator A7-1-5 "Generator Switch 18 Open".	P (3.2)	SAT / UNSAT **STD:** Verifies R915 and R925 indicate open by verifying red lights off, green lights on
4.	Close switch SW-18 GENERATOR 1	P (3.3)	***PASS / FAIL** **STD:** Places SW 18 Generator 1 switch to close and verifies green light goes out and red light is on
5.	Insert Sync Key into R915 (R925) SYNCHRONIZING Switch, AND place R915 (R925) SYNCHRONIZING Switch to ON **Note:** If the applicant opts to close R925 before R915, the alternate path will need to be manually initiated by inserting **TRG1**	P (3.4)	***PASS / FAIL** **STD:** Inserts Sync Key into R915 (R925) SYNCHRONIZING Switch, AND places R915 (R925) SYNCHRONIZING Switch to ON
6.	Verifies INCOMING and RUNNING voltages are matched	P (3.5)	SAT / UNSAT **STD:** Adjusts voltage as needed using the Exciter Rheostat
7.	Adjust GOVERNOR Switch UNTIL synchroscope is rotating slowly in the FAST direction	P (3.6)	SAT / UNSAT **STD:** Adjusts generator frequency using by adjusting the GOVERNOR Switch
8.	When INCOMING and RUNNING voltages are matched, AND synchroscope is indicating 3 to 5 degrees lead time, close R915 (R925)	P (3.7)	***PASS / FAIL** **STD:** When synchroscope indicates 3 to 5 degrees lead time, places control switch for R915 (R925) in the CLOSE position

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
9.	Immediately load the generator to 15-60 MWe OR UNTIL all Turbine Bypass Valves Close	P (3.8)	SAT / UNSAT **STD:** Places governor control switch in the RAISE position until all turbine bypass valves are closed (as observed on panel A1, all Turbine BV indicating lights "green")
10.	Place R915 (R925) SYNCHRONIZING Switch to OFF and remove key	P (3.9)	SAT / UNSAT **STD:** Place R915 (R925) SYNCHRONIZING Switch to OFF and remove key
Alternate Path:	When the SYNCHRONIZING Switch is placed in OFF, a trigger with a 10 second time delay will cause a Turbine trip. This initiates the alternate path.		
11.	Executes alarm response procedures or N1-SOP-31.1	P	SAT / UNSAT **STD:** Observes annunciators, determines the Turbine and Generator have tripped and enters N1-SOP-31.1
12.	Verify the following:		
12a	Turbine Stop valves closed	P	SAT / UNSAT **STD:** Visually observes Turbine Stop Valves closed (green lights on)
12b	Turbine Control valves closed	P	SAT / UNSAT **STD:** Visually observes Turbine Control Valves closed (green lights on)

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12c	Turbine Reheat Stop Valves closed Turbine Intercept Valves closed	P	SAT / UNSAT **STD:** Visually observes Combined Reheat Valves closed (green lights on)
12d	Bypass valves maintaining Reactor pressure as necessary	P	SAT / UNSAT **STD:** Visually observes Turbine Bypass Valves open to control reactor pressure (red lights on for several valves)
13.	Verify the following Electrical Distribution system conditions:		
13a	345 Kv Breakers R915, R925 TRIPPED	P	SAT / UNSAT **STD:** Visually observes 345Kv Breakers R915, R925 TRIPPED (Green light on)
13b	MOD 18 OPEN	P	SAT / UNSAT **STD:** Visually observes MOD 18 OPEN (Green light on)
13c	PB 11, PB12 supplied from Reserve Power **Cue:** Another Operator will control RPV water level and pressure. Continue with the actions of SOP-31.1.	P	SAT / UNSAT **STD:** Visually observes PB 11, PB12 supplied from Reserve Power (R123 and R112 CLOSED, Red lights on)
14.	Perform the following:		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
14a	Verify ON, Aux. Oil pumps	P	SAT / UNSAT **STD:** Rotates Aux. Oil Pump switches (2) clockwise, observes red lights illuminate, green lights extinguish
14b	Reset Generator 86 relays	P	***PASS / FAIL** **STD:** Resets 86 relays by rotating control switches clockwise
14c	Restart Stator Water Cooling **Note:** When dispatched to restart Stator Water Cooling, insert trigger 2, then report the task has been completed with time compression.	P	***PASS / FAIL** **STD:** Dispatches operator to restart Stator Water Cooling
14d	Start bearing lift pumps	P	***PASS / FAIL** **STD:** Rotates Bearing lift pump switches (5) clockwise, observes red lights illuminate, green lights extinguish
15.	Shutdown turbine per N1-OP-31 **Cue:** Inform candidate that another operator will be tasked with Turbine shutdown.	P	SAT / UNSAT **STD:** Proper communications used
16.	Verify ATS Gross Failure Lights are OFF	P	SAT / UNSAT **STD:** Observes ATS Gross Failure Lights are OFF

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
17.	Contact Structural Engineering to perform walkdown of System 03 piping and support for damage **Role Play:** If contacted as Structural Engineer, acknowledge request to perform system walkdowns.	P	SAT / UNSAT **STD:** Proper communications used
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	The Main Generator was synched to the grid in accordance with N1-OP-32. Then per N1-SOP-31.1, the Main Turbine is tripped, TCVs, TSVs and Combined Reheat Valves are closed, Generator 86 relays are reset, Stator Water Cooling is restored, Auxiliary Oil pumps are running, and Bearing Lift pumps are on.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • A plant startup is in progress. • The reactor is operating approximately 18% power. • N1-OP-43A, step E.5.9 is in progress to synchronize and load the turbine and generator. • N1-OP-32 is completed through step E.3.1. • Nine Mile Point Unit 2 Lines 5 and 6 are in-service.

INITIATING CUE	**(Operators Name)**, complete synchronizing the Main Generator to the grid by starting at step E.3.2 of N1-OP-32. Load the Generator until all turbine bypass valves are closed. Then, complete the remainder of section E.3.0.

Exelon Generation

Training Id: **2017 NRC NMP1 Simulator JPM S-2** Revision: **0.0**

Title: **Startup Control Room Ventilation System**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/17/16
Validated By	Kevin Hines	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

_____

_____

_____

Evaluators Signature: _____ Date: _____

References

1. N1-OP-49, Control Room Ventilation System
2. NUREG 1123 K/A 290003 A4.01, (3.2/3.2)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to startup the control room ventilation system.

   b. This JPM is NOT considered alternate path.

   c. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. N1-288003-01001, Startup the Control Room Ventilation System

   b. K/A 290003 A4.01, (3.2/3.2)

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Simulator
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)

    a. Initialize simulator to IC-161
    b. Verify Control Room Ventilation is secured IAW N1-OP-49, Section G.
    c. Verify Cooling Coil Block Valve selected to 12
    d. Verify EVS Fan 11 in Auto

6. JPM Setup (if required)

    a. Ensure sufficient copies of N1-OP-49 P&L's and Section E are available.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The control room ventilation system is being restarted following maintenance. • N1-OP-49, Attachment 1 valve lineup is complete. • N1-OP-49, Attachment 2 electrical lineup is complete. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, startup the control room ventilation system in accordance with N1-OP-49, Section E, with the following lineup: • Emergency Fan 12 in Auto • Cooling Coil 11 in service • Chilled Water Circulating Pump 11 in service • Control Room Circulating Fan 11 in service

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-OP-49 obtained. Precautions and limitations reviewed. Section E referenced.
3.	Perform the following at the direction of the SM: • Valve Lineup completed per Attachment 1. • Electrical Lineup performed per Attachment 2.	P	SAT / UNSAT / NA **STD:** Determines this step is NA per initial conditions

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Verify the following open: • 210-08, INLET BV 12 • 210-39, INLET BV 11	P (E.3.0)	SAT / UNSAT **STD:** Observes 210-08 red light on, green light off SAT / UNSAT **STD:** Observes 210-39 red light on, green light off
5.	Verify the following closed: • 210-40, 11 CR Emergency Fan Inlet BV (DAMPER) • 210-41, 12 CR Emergency Fan Inlet BV (DAMPER)	P (E.4.0)	SAT / UNSAT **STD:** Observes 210-40 green light on, red light off SAT / UNSAT **STD:** Observes 210-41 green light on, red light off
6.	Place EMER FAN 12 control switch in AUTO.	P (E.5.0)	***PASS / FAIL** **STD:** Places control room emergency fan 12 control switch in Auto
7.	Place EMER FAN 11 control switch in OFF.	P (E.6.0)	***PASS / FAIL** **STD:** Places control room emergency fan 11 control switch in Off
8.	Place COOLING COIL 11 BLOCK VALVE selector switch in position 11.	P (E.7.0)	SAT / UNSAT **STD:** Places Cooling coil 11 in service by rotating selector switch CCW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
9.	Depress START pushbutton for CHILLED WATER CIRCULATING PUMP 11 AND confirm red indicator light lit.	P (E.8.0)	***PASS / FAIL** **STD:** Depresses start button for chilled water circulating pump 11 and observes red light lit.
10.	Starting CHILLER 11 OR CHILLER 12:		
10a	Depress Chiller 11 START pushbutton at the N Panel in the Control Room OR locally at Chiller 11. **Note:** Only one Chiller needs to be started to pass. Candidate may opt to start both.	P (E.9.0)	***PASS / FAIL / NA** **STD:** Depresses CHILLER 11 pushbutton, then observes red light lit
10b	Depress Chiller 12 START pushbutton at the N Panel in the Control Room OR locally at Chiller 12.	P (E.9.0)	***PASS / FAIL / NA** **STD:** Depresses CHILLER 12 pushbutton, then observes red light lit
10c	Confirm at least one lead chiller compressor red indicator light lit.	P (E.9.3)	SAT / UNSAT **STD:** Observes red lights lit for "111 CHILLER COMPRESSOR 112" and/or "121 CHILLER COMPRESSOR 122"
11.	Starting CR Circulating Fan by performing the following: IF Control Room EMER FAN 12 was placed in AUTO, THEN place CONTROL ROOM CIRCULATING FAN 11 in RUN.	P (E.10.2)	***PASS / FAIL** **STD:** Circulating Fan 11 control switch rotated CW to RUN
12.	Inform CRS that the control room ventilation system is operating.	P	SAT / UNSAT / NA **STD:** Proper communications used

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	The control room ventilation system is operating with the following lineup: • Emergency Fan 12 in Auto • Cooling Coil 11 in service • Chilled Water Circulating Pump 11 in service • Control Room Circulating Fan 11 in service

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The control room ventilation system is being restarted following maintenance. • N1-OP-49, Attachment 1 valve lineup is complete. • N1-OP-49, Attachment 2 electrical lineup is complete.

INITIATING CUE	**(Operators Name)**, startup the control room ventilation system in accordance with N1-OP-49, Section E, with the following lineup: • Emergency Fan 12 in Auto • Cooling Coil 11 in service • Chilled Water Circulating Pump 11 in service • Control Room Circulating Fan 11 in service

Exelon Generation

Training Id: **2017 NRC NMP1 Simulator JPM S-3** Revision: **0.0**

Title: **Channel 11 Non-Coincident Scram Test**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/23/16
Validated By	Phil Carroll	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 20 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-ST-R4, Reactor Mode Switch in Refuel, Shutdown and Scram Dump Volume Level Scram Bypass Instrument Channel Test
2. NUREG 1123 K/A 215004 A4.05, (3.1/3.2)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to operate back panel equipment associated with neutron monitoring. The operator will generate a scram signal using SRMs.

   b. This JPM is considered NOT alternate path.

   c. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. NS-OPS-01007

   b. K/A 215004 A4.05, (3.1/3.2)

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Simulator
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)
    a. The reactor is in cold shutdown condition with the Mode Switch in Refuel
    b. Initialize simulator to IC 162

6. JPM Setup (if required)
    a. Provide sufficient copies of N1-ST-R4, section 8.5. Also include P&Ls and Prerequisites.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The reactor is in a shutdown condition with the mode switch in REFUEL. • Non-Coincident Scram testing is to be performed on SRM 11 for Post-Maintenance Testing. • No personnel are working in the CRD Accumulator area. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform N1-ST-R4 Section 8.5, Channel 11 and 12 Non-Coincident Scram Test, for SRM 11 only, steps 8.5.1 through 8.5.13.

START TIME	

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-ST-R4 obtained.
3.	Verify RPS clear of half scrams.	P (8.5.1)	SAT / UNSAT **STD:** Observes channel 11 and 12 white scram lights lit on F Panel.
4.	IF personnel are working in CRD Accumulator area, THEN notify personnel a full scram is to be initiated.	P (8.5.2)	SAT / UNSAT **STD:** Determines step NA per initial conditions.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	Place REFUEL INST. TRIP BYPASS 11 switch on M Panel to NON-COINCIDENT position.	P (8.5.3)	***PASS / FAIL** **STD:** At M Panel, rotate keylock switch for Refuel Inst Trip Bypass 11 CW to Non-Coincident
6.	Place REFUEL INST. TRIP BYPASS 12 switch on M Panel to NON-COINCIDENT position.	P (8.5.4)	***PASS / FAIL** **STD:** At M Panel, rotate keylock switch for Refuel Inst Trip Bypass 12 CW to Non-Coincident
7.	Place SRM 11 Mode Selector switch to PERIOD.	P (8.5.5)	***PASS / FAIL** **STD:** At G Panel, rotates SRM 11 Mode Selector Switch CCW to Period.
8.	Place RESET switch to RAMP AND release	P (8.5.6)	***PASS / FAIL** **STD:** At G Panel, rotates the RESET switch CCW to RAMP, then releases.
9.	Place AND hold RAMP switch to FIXED.	P (8.5.7)	***PASS / FAIL** **STD:** At G Panel, holds RAMP switch CW to FIXED while observing LOG RATE meter indication rising.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
10.	WHEN LOG RATE meter indicates greater than 5 x 10^5 CPS, THEN confirm the following: • Annunciator F1-3-1, RPS CH 11 MAN REACTOR TRIP – alarmed **[T/S]** • Annunciator F1-4-1, RPS CH 11 REFUEL INST TRIP - alarmed • Annunciator F4-3-8, RPS CH 12 MAN REACTORTRIP – alarmed **[T/S]** • Channel 11 White SCRAM SOLENOID GROUPS lights at M Panel - off • Channel 11 SCRAM SOLENOID GROUPS white lights at F Panel - off • Channel 11 Red B.U. SCRAM S.D.V. VENT & DRAIN VALVE light at F Panel - off • Computer Point W022, ***RPS CH11 MAN RX TRIP - YES • Channel 12 White SCRAM SOLENOID GROUPS lights at M Panel - off • Channel 12 SCRAM SOLENOID GROUPS white lights at F Panel - off • Channel 12 Red B.U. SCRAM S.D.V. VENT & DRAIN VALVE light at F Panel - off • Computer Point W068, ***RPS CH12 MAN RX TRIP – YES **Note:** The RAMP switch will need to be released in order to verify the proper plant response on F and E panels. The applicant may request direction. If so, direct the applicant to release the RAMP switch to verify appropriate plant response. The alarms will continue flashing until acknowledged.	P (8.5.8)	SAT / UNSAT **STD:** Verifies appropriate scram signal indications per step 8.5.8.
11.	Release RAMP switch	P (8.5.9	SAT / UNSAT **STD:** Releases RAMP switch and allows switch to return to its normal position.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12.	Place SRM 11 Mode Switch to OPERATE	P (8.5.10)	***PASS / FAIL** **STD:** At G panel, rotates SRM 11 Mode Selector Switch CW to OPERATE
13.	Reset any SRM 11 (SRM 12) alarms.	P (8.5.11)	SAT / UNSAT **STD:** At G Panel, rotates RESET switch CW to TRIP and releases
14.	IF Scram Dump Volume High Level Automatic Scram is indicated (ANN F1-1-8 AND/OR F4-1-1), THEN perform the following:		
a.	Place SCRAM DISCHARGE VOL HIGH LEVEL BYPASS CH 11-1/12-1 switch to BYPASS.	P (8.5.12)	SAT / UNSAT /NA **STD:** On F Panel, rotates SCRAM DISCHARGE VOL HIGH LEVEL BYPASS CH 11-1/12-1 switch CW to BYPASS
b.	Place SCRAM DISCHARGE VOL HIGH LEVEL BYPASS CH 11-2/12-2 switch to BYPASS.	P (8.5.12)	SAT / UNSAT / NA **STD:** On F Panel, rotates SCRAM DISCHARGE VOL HIGH LEVEL BYPASS CH 11-2/12-2 switch CW to BYPASS
c.	Reset Reactor Scram	P (8.5.12)	SAT / UNSAT / NA **STD:** On F Panel, depresses REACTOR TRIP RESET pushbutton and releases.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
15.	Depress REACTOR TRIP RESET pushbutton at E panel AND confirm the following: • Annunciator F1-3-1, RPS CH 11 MAN REACTOR TRIP - clear • Annunciator F1-4-1, RPS CH 11 REFUEL INST TRIP - clear • Annunciator F4-3-8, RPS CH 12 MAN REACTOR TRIP - clear • Channel 11 White SCRAM SOLENOID GROUPS lights at M Panel - lit • Channel 11 SCRAM SOLENOID GROUPS white lights at F Panel - lit • Channel 11 Red B.U. SCRAM S.D.V. VENT & DRAIN VALVE light at F Panel - lit • Computer Point W022, ***RPS CH11 MAN RX TRIP - NO • Channel 12 White SCRAM SOLENOID GROUPS lights at M Panel - lit • Channel 12 SCRAM SOLENOID GROUPS white lights at F Panel - lit • Channel 12 Red B.U. SCRAM S.D.V. VENT & DRAIN VALVE light at F Panel - lit • Computer Point W068, ***RPS CH12 MAN RX TRIP - NO	P (8.5.13)	SAT / UNSAT **STD:** Verfifies appropriate scram signal indications have cleared per step 8.5.13.
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	N1-ST-R4 Section 8.5, Channel 11 and 12 Non-Coincident Scram Test has been completed for SRM 11.

STOP TIME	

Exelon Generation

JPM Handout

INITIAL CONDITIONS	Given: • The reactor is in a shutdown condition with the mode switch in REFUEL. • Non-Coincident Scram testing is to be performed on SRM 11 for Post-Maintenance Testing. • No personnel are working in the CRD Accumulator area.

INITIATING CUE	**(Operators Name)**, perform N1-ST-R4 Section 8.5, Channel 11 and 12 Non-Coincident Scram Test, for SRM 11 only, steps 8.5.1 through 8.5.13.

Exelon Generation

Training Id: **2017 NRC NMP1 Simulator JPM S-4** Revision: **0.0**

Title: **Vent the Drywell Prior to Personnel Entry <212F Per N1-OP-9**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	02/17/16
Validated By	Kevin Hines	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-OP-9, N2 Inerting and H2-O2 Monitoring Systems
2. NUREG 1123 K/A 223001, A4.03, (3.4/3.4)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to locate and operate containment air dilution valves for inerting and de-inerting the containment. The operator will vent the drywell with the reactor <212F.

   b. This JPM is NOT considered alternate path.

   c. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. N1-223003-01004

   b. K/A 223001, A4.03, (3.4/3.4)

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Simulator
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)

    a. The reactor is in a shutdown condition.
    b. Initialize simulator to IC-162.
    c. Verify remote PC05 is inserted with valves open.
    d. Verify some positive pressure in the drywell.

6. JPM Setup (if required)

    a. N1-OP-9 marked up through G.2.7.b.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is shutdown, <212°F. • The Operations Manager has determined a complete de-inert to 19.5% Oxygen is necessary. • N1-OP-9 is completed through Step G.2.7.b. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, vent the Drywell in accordance with N1-OP-9, starting at step G.2.7.c. Secure venting when Drywell pressure is below 0 psig.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-OP-9 obtained, precautions and limitation reviewed, section G.2.0 referenced
3.	Open the following valves:		
3a.	201-10, DW AIR VENT & PURGE ISOLATION VALVE 11	P (Step 2.7)	***PASS / FAIL** **STD:** Rotates 201-10 control switch CW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3b.	201-08, TOR AIR VENT & PURGE ISOLATION VALVE 11	P (Step 2.7)	***PASS / FAIL** **STD:** Rotates 201-08 control switch CW
3c.	201-32, DW N2 VENT & PURGE ISOLATION VALVE 11	P (Step 2.7)	***PASS / FAIL** **STD:** Rotates 201-32 control switch CW
3d.	201-16, TORUS N2 VENT & PURGE ISOLATION VALVE 11	P (Step 2.7)	***PASS / FAIL** **STD:** Rotates 201-16 control switch CW
4.	Applicant should determine from initial conditions, a full de-inert is required for personnel entry to the Drywell and should select "Approximately 19.5%". **Note:** Step 2.9 is N/A	P (Step 2.8)	SAT / UNSAT **STD:** Determines 19.5% oxygen per the initial conditions.
5.	Notify Chemistry that a Drywell purge is about to commence.	P	SAT / UNSAT **STD:** Proper communications used
6.	Start 201-35, DRYWELL & TORUS VENT & PURGE	P (Step 2.11)	***PASS / FAIL** **STD:** Rotates 201-35 control switch CW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
7.	Verify open the following valves: • 201-21, DW & TOR VENT & PURGE FAN INLET BV • 201-22, DW & TOR VENT & PURGE FAN OUTLET BV	P (Step 2.12)	SAT / UNSAT **STD:** Observes red light on, green light off for both
8.	Throttle open 201-31, DW N2 VENT & PURGE ISOLATION VALVE 12	P (Step 2.13)	***PASS / FAIL** **STD:** Rotates 201-31 control switch CW
8a.			SAT / UNSAT **STD:** Throttles 201-31 by using pull-to-stop feature of control switch
9.	Throttle open 201-17, TORUS N2 VENT & PURGE ISOLATION VALVE 12 **Cue:** After 201-17 is opened, report drywell and torus pressure is below 0 psig for purposes of this JPM (time compression used).	P (Step 2.14)	***PASS / FAIL** **STD:** Rotates 201-17 control switch CW
9a.			SAT / UNSAT **STD:** Throttles 201-17 by using pull-to-stop feature of control switch
10.	When drywell and Torus pressures drops BELOW 0 psig, open the following valves:	P	SAT / UNSAT **STD:** Continues the JPM based on examiner cue in JPM step 9.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
10a	201-09, DW AIR VENT & PURGE ISOLATION VALVE 12	P	***PASS / FAIL** **STD:** Rotates 201-09 control switch CW
10b	201-07, TOR AIR VENT & PURGE ISOLATION VALVE 12 **Cue:** Another operator will complete this procedure.	P	***PASS / FAIL** **STD:** Rotates 201-07 control switch CW
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	Drywell vented to atmospheric pressure in accordance with N1-OP-9.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is shutdown, <212°F. • The Operations Manager has determined a complete de-inert to 19.5% Oxygen is necessary. • N1-OP-9 is completed through Step G.2.7.b.

INITIATING CUE	**(Operators Name)**, vent the Drywell in accordance with N1-OP-9, starting at step G.2.7.c. Secure venting when Drywell pressure is below 0 psig.

Exelon Generation

Training Id: **2017 NRC NMP1 Simulator JPM S-5** Revision: **0.0**

Title: **Respond to a Loss of Service Water (PRA) (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/23/16
Validated By	Phil Carroll	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 10 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-SOP-18.1, Loss of Service Water
2. NUREG 1123 K/A 295018, AA1.01, (3.3/3.4)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to safely operate control room systems during a loss of Service Water.

   b. This JPM is considered alternate path because after the standby service water pump is started, it trips, requiring override steps in the SOP to be executed.

   c. Critical steps are annotated in the Evaluator standard column with a bolded **PASS/FAIL**.

2. Task Information:

   a. N1-SOP-18.1-01000, Respond to Service Water Failure (PRA)

   b. K/A 295018, AA1.01, (3.3/3.4)

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Simulator
Time Critical Task	No
Alternate Path	Yes
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)
   a. Initialize Simulator to IC-163
   b. Verify Service Water pump 11 is red flagged and Service Water pump 12 is green flagged
   c. Verify malfunction CW02B is on trigger 1 with a 10 second time delay
   d. Verify trigger 1 command is set to zdcwpstr(4)==1 (Service Water pump 12 control switch in start)
   e. Verify malfunction CW02A is active

6. JPM Setup (if required)
   a. No steps need to be marked up.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is operating at approximately 100% power. • Service Water pump 11 has tripped on overcurrent. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, enter and execute N1-SOP-18.1 for Service Water Failure.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-SOP-18.1 obtained.
3.	Start standby Service Water pump by placing control switch on Panel H to START **Note:** Service Water pump 12 will trip after a 10 second time delay, requiring an alternate path to execute the override for loss of both Service Water pumps	P	***PASS / FAIL** **STD:** Rotates Service Water pump 12 control switch CW to start, observes red light on, green light off, proper pump amps

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Identifies trip of Service Water pump 12	P	SAT / UNSAT **STD:** Observes Service Water pump 12 green light on, red light off, pump amps drop to zero, annunciator H1-2-2 alarms
5.	If neither Service Water pump can be started OR Service Water Header pressure can NOT be restored to greater than 60 psig, then performs the following steps:	P	SAT / UNSAT **STD:** Enters override of N1-SOP-18.1
6.	Start Emergency Service Water pumps	P	***PASS / FAIL** **STD:** Rotates ESW pump 11 control switch CW to start, observes red light on, green light off, proper pump amps ***PASS / FAIL** **STD:** Rotates ESW pump 12 control switch CW to start, observes red light on, green light off, proper pump amps
7.	SCRAM the Reactor AND concurrently execute N1-SOP-1 **Cue:** Another operator will perform SOP-1 actions. Continue in SOP-18.1.	P	***PASS / FAIL** **STD:** Rotates the Reactor Mode Switch CW to Shutdown
8.	Initiate Emergency Condensers **Cue:** Another operator will maintain Reactor pressure per EOP-2.	P	***PASS / FAIL** **STD:** Rotates 39-05 control switch CW to open and/or rotates 39-06 control switch CW to open

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
9.	Close MSIVs		
9a		P	***PASS / FAIL** **STD:** Rotates 01-01 control switch CCW to close
9b		P	***PASS / FAIL** **STD:** Rotates 01-02 control switch CCW to close
9c		P	***PASS / FAIL** **STD:** Rotates 01-03 control switch CCW to close
9d		P	***PASS / FAIL** **STD:** Rotates 01-04 control switch CCW to close
10.	Trip all Rx Recirculation Pumps **Cue:** Another operator will monitor RBCLC and TBCLC temperatures.		
10a		P	***PASS / FAIL** **STD:** Rotates RRP 11 control switch CCW to stop
10b		P	***PASS / FAIL** **STD:** Rotates RRP 12 control switch CCW to stop
10c		P	***PASS / FAIL** **STD:** Rotates RRP 13 control switch CCW to stop

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
10d		P	***PASS / FAIL** **STD:** Rotates RRP 14 control switch CCW to stop
10e		P	***PASS / FAIL** **STD:** Rotates RRP 15 control switch CCW to stop
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	N1-SOP-18.1 actions are completed through the override step for a sequential loss of Service Water pumps.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at approximately 100% power. • Service Water pump 11 has tripped on overcurrent.

INITIATING CUE	**(Operators Name)**, enter and execute N1-SOP-18.1 for Service Water Failure.

Exelon Generation

Training Id: **2017 NRC NMP1 Simulator JPM S-6** Revision: **0.0**

Title: **Secure a Reactor Recirculation Pump, Pump Trips (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/17/16
Validated By	Kevin Hines	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-OP-1, Nuclear Steam Supply System
2. NUREG 1123 K/A 202001 A4.01, (3.7/3.7)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to operate controls associated with the Reactor Recirculation System.

   b. This JPM is considered alternate path because when the operator reduces flow on the pump to be secured, the pump will trip, requiring the operator to respond in accordance with the SOP.

   c. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. N1-202001-01002

   b. K/A 202001 A4.01, (3.7/3.7)

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Simulator
Time Critical Task	No
Alternate Path	Yes
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)

   a. The reactor is in a power operating condition
   b. Initialize simulator to IC 164
   c. Verify the following malfunctions are preset:
      - RR01A, RR Pump 11 Drive Breaker Trip, **TRG 1**
      - **TRG 1** event trigger action set to "HZARRFI(1)<0.44" (Causes drive breaker to trip when individual loop flow reaches $8x10^6$ lbm/hr)

6. JPM Setup (if required)

   a. Verify sufficient copies are available of N1-OP-1 P&L's and section H.1

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The reactor is operating at 90% power • Reactor Recirculation Pump 11 is being removed for maintenance • Reactor power will be allowed to lower for the evolution • Recirculation pump 11 will remain idle and unisolated • Another operator is monitoring computer points during this evolution **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, Remove Recirc Pump 11 from service in accordance with N1-OP-1, section H.1.0

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-OP-1 obtained.
3.	IF Recirc Pump 11 is in Local Lock, THEN continue at Step 1.4	P (H.1.1)	SAT / UNSAT **STD:** Determines Recirc Pump 11 is not in Local Lock.
4.	Place RRECIRC PUMP 11 SPEED CONTROL in BAL and null out Deviation Meter (top meter)	P (H.1.2)	SAT / UNSAT **STD:** Verifies RRECIRC PUMP 11 SPEED CONTROL in BAL and nulls out Deviation Meter (top meter)

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	Place RRECIRC PUMP 11 SPEED CONTROL AUTO/BAL/MAN switch to MAN	P (H.1.3)	***PASS / FAIL** **STD:** Rotates RRECIRC PUMP 11 SPEED CONTROL AUTO/BAL/MAN switch CW to MAN
6.	Verify open REACTOR R PUMP 11 BYPASS VALVE **Note:** Step H.1.5 is N/A per initial conditions	P (H.1.4)	SAT / UNSAT **STD:** Verifies open REACTOR R PUMP 11 BYPASS VALVE by observing red light on, green light off
7.	IF present power level is NOT to be maintained, THEN reduce flow on Reactor Recirc Pump 11 to 6 to 8 x 106 lbm/hr	P (H.1.6)	***PASS / FAIL** **STD:** Slowly reduces Recirculation pump 11 flow to 6 to $8x10^6$ lbm/hr by rotating knob CCW
Alternate Path	The alternate path starts when the operator is lowering pump flow. The recirc pump will trip requiring entry into N1-SOP-1.3, Recirc Pump Trip at Power.		
8.	Recognize Recirc Pump 11 trip and required entry in to N1-SOP-1.3, Recirc Pump Trip at Power.	P	SAT / UNSAT **STD:** Enters N1-SOP-1.3
9.	Verify proximity to restricted zone using P/F map for remaining loop operation	P	SAT / UNSAT **STD:** Using the four loop power to flow map, confirms the restricted zone has not been entered.
10.	Verify ALL operating Recirculation Pumps are within the following limits: Generator MW: 0.790 MW Generator Amps: 240 A RRP Flow: 16.8 x 106 lbm/hr continuous Generator Frequency: 11.5 Hz to 56 Hz	P	SAT / UNSAT **STD:** Verifies recirc pumps 12-15 are operating within required limits.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
11.	Notify SM that: APRMs are inoperable. 8 hr ENS report is required	P	SAT / UNSAT **STD:** Makes required notifications to SM.
12.	Close RECIRC PUMP 11 DISCHARGE VALVE	P	***PASS / FAIL** **STD:** Closes REACTOR R PUMP 11 DISCHARGE VALVE by rotating control switch CCW and holding until green light is on, red light is off, observes lowering loop flow.
13.	**Override Statement:** IF RECIRC PUMP 11 DISCHARGE VALVE is closed, THEN Hold open for 2-3 seconds RECIRC PUMP 11 DISCHARGE VALVE.	P	SAT / UNSAT **STD:** Rotates CW and holds in OPEN position for 2 to 3 seconds, REACTOR R PUMP 11 DISCHARGE VALVE, observes red light on, green light on.
14.	Notify SM that APRMs are operable	P	SAT / UNSAT **STD:** Notifies SM that APRMs are operable.
15.	Green Flag RECIRC PUMP 11 SB switch		SAT / UNSAT **STD:** Green Flags RECIRC PUMP 11 SB switch by rotating CCW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
16.	Place RECIRC PUMP 11 SPEED CONTROL AUTO/BAL/MAN switch to MAN **Note:** This step was performed earlier in the JPM		SAT / UNSAT **STD:** Verifies RECIRC PUMP 11 SPEED CONTROL AUTO/BAL/MAN switch in MAN
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	*Recirc Pump 11 is secured with its associated discharge valve closed.*

STOP TIME	

Exelon Generation

JPM Handout

INITIAL CONDITIONS	Given: • The reactor is operating at 90% power • Reactor Recirculation Pump 11 is being removed for maintenance • Reactor power will be allowed to lower for the evolution • Recirculation pump 11 will remain idle and unisolated • Another operator is monitoring computer points during this evolution

INITIATING CUE	**(Operators Name)**, Remove Recirc Pump 11 from service in accordance with N1-OP-1, section H.1.0

Exelon Generation

Training Id: **2017 NRC NMP1 Simulator JPM S-7** Revision: **0.0**

Title: **Core Spray Quarterly Surveillance, Suction Strainer Clogging (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/17/16
Validated By	Phil Carroll	8/23/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

_____

_____

_____

Evaluators Signature: _____ Date: _____

References

1. N1-ST-Q1C, CS 112 Pump and Valve Operability Test
2. NUREG 1123 K/A 209001 A4.01, (3.8/3.6)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to locate and manipulate control room controls for a Core Spray Surveillance.

   b. This JPM is considered alternate path because once the CSTP 112 is started, suction strainer clogging occurs. The operator will need to secure the pump per ARP direction.

   c. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. N1-209001-01004-01, Align Core Spray System Valves

   b. K/A 209001 A4.01, (3.8/3.6)

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Simulator
Time Critical Task	No
Alternate Path	Yes
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)
   a. Initialize Simulator to IC-165.
   b. Verify Reactor coolant temperature is >212°F.
   c. Verify the following remotes are inserted to power Core Spray valves 40-12 and 40-06:
      - CS01A (40-06) - close
      - CS02A (40-12) - close
   d. Verify a copy of N1-ST-Q1C is marked up through step 6.4.4, with 6.4.4 N/A.
   e. Verify 40-12 is open and 40-06 is closed.
   f. Verify malfunction CS05B is on trigger 1 with a 3 minute ramp from 10% to 98%.
   g. Verify trigger 1 event action is "zdcspstr(5)==1" (core spray topping pump C/S to start).

6. JPM Setup (if required)

   a. Verify adequate copies of N1-ST-Q1C marked up through step 6.4.4.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is in a power operating condition. • N1-ST-Q1C, Core Spray 112 Pump and Valve Operability Test, is in progress for post-maintenance testing. • The procedure is complete up to step 6.4.5. • Operators are on-station in the field for test support. • Exercising of 81-28 in step 6.4.16 is not required. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform Core Spray pump 112 testing per N1-ST-Q1C starting at step 6.4.5.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review/utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-ST-Q1C obtained, section 6.4 referenced
3.	Verify closed 40-12, CORE SPRAY DISCHARGE IV 11 (OUTSIDE)	P (Step 6.4.5)	***PASS / FAIL** **STD:** Closes 40-12 by rotating control switch CCW to CLOSE
4.	IF this test is being performed with Reactor coolant temp less than 212°F, THEN unlock AND close the following valves:	P	SAT / UNSAT **STD:** Determines Reactor coolant temperature is >212°F

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	Verify closed the following valves: • 50-132, BV - CS LOOP 11 KEEP FILL COND SUPPLY • 40-18, BV - COND TO CS LOOP 11 KEEP FILL SYSTEM **Role Play:** Acknowledge direction. Report 50-132 and 40-18 are closed.	P (Step 6.4.7)	SAT / UNSAT **STD:** Directs field operator to close valves 50-132 and 40-18
6.	Unlock AND verify closed 38-178, BV-SDC WTR SEAL FROM CS LOOP 11 (SDC Rm) **Role Play:** Acknowledge direction. Report 38-178 is unlocked and closed.	P (Step 6.4.9)	SAT / UNSAT **STD:** Directs field operator to unlock and close valve 38-178
7.	Verify open 40-06, CORE SPRAY LOOP 11 TEST VALVE TO TORUS	P (6.4.10)	***PASS / FAIL** **STD:** Opens 40-06 by rotating control switch CW to OPEN
8.	Verify unlocked 81-86, MANUAL PCV - CS LOOP 11 TEST TO TORUS **Role Play:** Acknowledge direction. Report 81-86 is unlocked.	P (6.4.11)	SAT / UNSAT **STD:** Directs field operator to unlock 81-86
9.	Establish communications between 81-86 AND Control Room **Role Play:** Acknowledge direction. Report communications established.	P (6.4.12)	SAT / UNSAT **STD:** Directs field operator at 81-86 to establish communications with Control Room
10.	Verify full open 81-86 **Role Play:** Acknowledge direction. Report 81-86 is full open.	P (6.4.13)	SAT / UNSAT **STD:** Directs field operator to verify 81-86 full open

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
11.	Notify SM to log entry into appropriate LCO for plant conditions **Role Play:** Acknowledge direction. Report the appropriate LCO has been entered.	P (6.4.14)	SAT / UNSAT **STD:** Notifies SM to log entry into appropriate LCO
12.	Start Core Spray Pump 112 **Role Play:** When asked, inform candidate that you will perform the concurrent verification. When required, agree with the candidate's action.	P (6.4.15.1)	***PASS / FAIL** **STD:** Starts Core Spray Pump 112 by rotating control switch CW to START
13.	Start Core Spray Topping Pump 112 **Role Play:** When asked, inform candidate that you will perform the concurrent verification. When required, agree with the candidate's action.	P (6.4.15.2)	***PASS / FAIL** **STD:** Starts Core Spray Topping Pump 112 by rotating control switch CW to START
Alternate Path:	When Core Spray Topping Pump 112 control switch is taken to START, trigger 1 inserts the suction strainer clogging malfunction that leads to the alternate path. The next few steps may be N/A depending on how quickly the Candidate observes the malfunction. The malfunction gets worse over time. Eventually Core Spray flow will drop to 0. K2-2-6, CORE SPRAY PUMP 111-112 SUCT P. LOW, may alarm. The ARP includes a step, "IF cavitation exists AND pump is in test mode, THEN secure pump". K2-4-6 will also direct securing the pump.		
14.	IF required to support completion of step 6.4.15, THEN STOP AND RESTART Core Spray Loop 11 pumps, OTHERWISE MARK this step N/A.	P (6.4.15.3)	SAT / UNSAT / NA **STD:** Determines step is N/A based on initial conditions

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
15.	WITHIN approximately 3 minutes of pump start, THROTTLE 81-86, to achieve Core Spray flow of 140 to 145 X 10^4 lbm/hr FI 81.1-20 (Control Room). **Role Play:** Acknowledge direction. Report 81-86 has been throttled (if necessary).	P (6.4.15.4)	SAT / UNSAT / NA **STD:** Directs operator to throttle 81-86 as necessary
16.	Verify the following: • Check valve 81-28 is exercised to full open position as determined by Non-Intrusive Test equipment. • Check valve 81-28 is exercised to the closed position as determined by Non-intrusive test equipment.	P (6.4.16)	SAT / UNSAT / NA **STD:** Determines step is N/A based on initial conditions
17.	Valve in the temporary ΔP Cell **Role Play:** Acknowledge direction. Report temporary ΔP Cell is valved in.	P (6.4.17.1)	SAT / UNSAT / NA **STD:** Directs IMD to valve in temporary ΔP Cell
18.	VENT CSP 112 temporary pressure gauge to floor drain, allowing any discolored water to clear **Role Play:** Acknowledge direction. Report Core Spray pump 112 temporary pressure gauge has been vented.	P (6.4.17.2)	SAT / UNSAT / NA **STD:** Directs field operator to vent CSP 112 temporary pressure gauge
19.	VENT CSTP 112 discharge pressure gauge at PI-81.1-04R to floor drain, allowing any discolored water to clear **Role Play:** Acknowledge direction. Report Core Spray Topping pump 112 discharge pressure gauge has been vented.	P (6.4.17.3)	SAT / UNSAT / NA **STD:** Directs field operator to vent CSTP 112 discharge pressure gauge

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
20.	Throttle 81-86 as necessary to establish 135 (132 to 137) inches of water as indicated on temporary ΔP Cell **Role Play:** Acknowledge direction. 81-86 has been throttled and the temporary ΔP Cell indicates 135 inches of water.	P (6.4.18)	SAT / UNSAT / NA **STD:** Directs field operator to throttle 81-86
21.	WHEN pump combination has been run in a stable condition for at least 2 minutes as indicated on the calibrated stopwatch, THEN record the following: **Cue:** Two minutes have elapsed. **Role Play:** If asks for direction on how to respond to malfunction, direct Candidate to make a recommendation and then carry out that recommendation.	P (6.4.19)	SAT / UNSAT / NA **STD:** Begins recording various system parameters ***PASS / FAIL** **STD:** Recognizes abnormal system parameters
22.	Secures Core Spray Pump 112 and Core Spray Topping Pump 112 **Note:** Procedural direction to secure Core Spray Pump 112 is found in ARP K2-4-6. Core Spray Topping Pump 112 should be secured first. However, when Core Spray Pump 112 is secured, Core Spray Topping Pump 112 will automatically trip. Candidate may trip pump first then follow up with the ARP.	P	SAT / UNSAT **STD:** Stops Core Spray Topping Pump 112 by rotating control switch CCW to STOP ***PASS / FAIL** **STD:** Stops Core Spray Pump 112 by rotating control switch CCW to STOP
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	Core Spray pump 112 secured from surveillance testing due to indications of suction strainer clogging.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is in a power operating condition. • N1-ST-Q1C, Core Spray 112 Pump and Valve Operability Test, is in progress for post-maintenance testing. • The procedure is complete up to step 6.4.5. • Operators are on-station in the field for test support. • Exercising of 81-28 in step 6.4.16 is not required.

INITIATING CUE	**(Operators Name)**, perform Core Spray pump 112 testing per N1-ST-Q1C starting at step 6.4.5.

Exelon Generation

Training Id: **2017 NRC NMP1 Simulator JPM S-8** Revision: **0.0**

Title: **EDG 103 Control Room Start Following Station Blackout**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	2/17/16
Validated By	Terry Bockman	10/7/16
Facility Reviewer	Pat O'Brien	

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

_____

_____

_____

Evaluators Signature: _____ Date: _____

References

1. N1-OP-45, Emergency Diesel Generators
2. NUREG 1123 K/A 295003 AA1.02, (4.2/4.3)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to operate the Emergency Diesel Generator and associated electric plant controls from the control room.

   b. This JPM is not considered alternate path.

   c. Critical steps are annotated in the Evaluator standard column with a bolded **Pass/Fail**.

2. Task Information:

   a. N1-264000-01004

   b. K/A 295003 AA1.02, (4.2/4.3)

3. Evaluation / Task Criteria

Evaluation Method	Perform
Evaluation Location	Simulator
Time Critical Task	No
Alternate Path	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)

    a. The reactor is in a SBO condition
    b. Initialize simulator to IC 140
        - Mode switch in Shutdown
        - Malfunctions ED01A, ED02A, EG01, DG01A, DG01B all inserted
        - AFTER at least 3:00 minutes, delete malfunction **DG01B,** DG 103 Fail To Start (Man and Auto), to allow a restart from the control room.
        - Ensure only one EC is in service.

6. JPM Setup (if required)

    a. Provide sufficient copies of N1-OP-45, section H.19.

B. Read Before Every JPM Performance

1. For the performance of this JPM, I will act as all those you need to talk to. Prior to providing direction to perform this task, I will provide you with the initial conditions and answer any questions. During task performance, I will identify the steps to be simulated, or discuss and provide cues as necessary. (Note, read the next only if conducting a plant JPM). With the exception of accessing panels, no plant equipment will be physically manipulated. Repositioning of devices will be simulated by discussion and acknowledged by my cues.

C. Read Before Each Evaluated JPM

1. This evaluated JPM is a measure of your ability to perform this task independently. The CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	• A Station Blackout has occurred • N1-SOP-33A.2 Station Blackout is being implemented • EDG 102 troubleshooting is in progress • EDG 103 trouble shooting is complete and repairs have been made • EDG 103 is now available and ready to return to service **Instructor / Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, Perform a control room start of EDG 103 and energize PB 103 from the EDG 103, per N1-OP-45 section H.19.0.

START TIME	

	PERFORMANCE	**ACT. CODE** P / S / NA	**EVALUATOR**
1.	Provide repeat back of initiating cue	P	SAT / UNSAT **STD:** 3 way communications are conducted
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** Current version of procedure obtained. Precautions & limitations are reviewed.
3. Verify the following for EDG 103:			
3.1	Power Board 103 is de-energized.	P (H.19.1.1)	SAT / UNSAT **STD:** Observe PB 103 AC VOLTS indicate 0 on A Panel.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.2	Normal Supply BKR R1013, PB 103 in PULL TO LOCK. *Alarm A5-1-2, Trans 101S Aux Fdr 1013 R1013 Trip clears*	P (H.19.1.2)	***PASS / FAIL** **STD:** R1013 control switch in PTL position per N1-OP-45. **Critical Step Justification:** If this step is not performed, an uncontrolled engine start will occur following engine EM Stop reset.
3.3	Supply BKR R1053, PB 17 (B Section) CLOSED.	P (H.19.1.3)	SAT/UNSAT **STD:** Observe Breaker R1053 red light on and green light off.
3.4	BREAKER R1052, PB 17 Bus Tie (A to B Section) OPEN.	P (H.19.1.4)	SAT/UNSAT **STD:** Observe Breaker R1052 green light on and red light off.
3.5	BV-96-103 EDG103, Starting Air Block Valve OPEN. **Cue:** Report air block valve is open.	P (H.19.1.5)	SAT/UNSAT **STD:** Acknowledge report using proper 3 way communications.
3.6	R1032, Diesel Generator 103 Output Breaker, OPEN AND Green Flagged.	P (H.19.1.6)	SAT/UNSAT **STD:** Observe control switch in green flag position and green light on and red light off.
3.7	Exceptions to Standby Lineup have been evaluated by SM for impact on DG operation. **Cue:** Report no exceptions to lineup that impact DG operation.	P (H.19.1.7)	SAT/UNSAT **STD:** 3 way communications are conducted
3.8	Lubricating AND coolant levels normal. **Cue:** Report both levels are normal.	P (H.19.1.8)	SAT/UNSAT **STD:** 3 way communications are conducted

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Verify Over-Speed Trip RESET (handle horizontal). **Cue:** Report over-speed trip is reset.	P (H.19.2)	SAT/UNSAT **STD:**3 way communications are conducted
5.	Depress 48X RESET button inside Control Cabinet. **Cue:** Report 48X reset button has been depressed.	P (H.19.3)	SAT/UNSAT **STD:**3 way communications are conducted
6.	Verify Speed Droop Set to 0 (Zero). **Cue:** Report speed droop is set to 0.	P (H.19.4)	SAT/UNSAT **STD:**3 way communications are conducted
7.	Verify CLOSED DG103 CONT POWER BKR (DG 103 Control Cabinet). **Cue:** Report control power breaker is closed.	P (H.19.5)	SAT/UNSAT **STD:**3 way communications are conducted
8.	Verify LOCKOUT 86DG3 Relay Reset (A5-Panel).	P (H.19.6)	SAT/UNSAT **STD:** Observe 86DG3 is reset on A Panel.
9.	Verify relays reset by taking DIESEL GEN 103 Control Switch to EM STOP. *Alarm A5-3-5 DSL GEN 103 START-RUN OFF NORMAL clears*	P (H.19.7)	***PASS / FAIL** **STD:** Switch place to EM STOP and released. **Critical Step Justification:** If this step is not performed, the engine will not start in subsequent steps.
	NOTE: DG 103 will be started with an Auto Start Signal to assure the Governor Circuit has DC power from the Battery.		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
10.	Place in NEUTRAL (green flagged) R1013, PB 103 Normal Supply Breaker (DG103 will Auto Start). *GEN 103 Voltmeter and frequency rise as engine starts*	P (H.19.8)	***PASS / FAIL** **STD:** R1013 control switch place in NEUTRAL. Green light is ON and red light is off. **Critical Step Justification:** If this step is not performed, the engine will not start.
11.	Confirm DG output at approximately 60 Hz/4160V.	P (H.19.9)	SAT/UNSAT **STD:** Observe GEN 103 Voltmeter reads about 4150 volts and frequency is about 60 Hz.
12.	Place Sync Key in R1032 SYN AND place to ON.	P (H.19.10)	***PASS / FAIL** **STD:** Sync Key inserted for R1032 and positioned to ON. Observe INCOMING AC VOLTS rise. **Critical Step Justification:** If this step is not performed, R1032 will not close, preventing bus from energizing.
13.	Close R1032 Diesel Generator 103 Output Breaker.	P (H.19.11)	***PASS / FAIL** **STD:** R1032 control switch position to close breaker. Red light on and green light off. **Critical Step Justification:** If this step is not performed, R1032 will not close, preventing bus from energizing.
14.	Confirm normal voltage on PB 103.	P (H.19.12)	SAT/UNSAT **STD:** Observe PB 103 AC VOLTS indicate about 4160 AC VOLTS.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
15.	Enter N1-SOP-33A.1. **Cue:** As US, inform operator that another operator will implement N1-SOP-33A.1 actions.	P (H.19.13)	SAT/UNSAT **STD:** Acknowledge report using proper 3 way communications.
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	EDG 103 started and PB 103 energized

STOP TIME	

JPM Handout

INITIAL CONDITIONS	• A Station Blackout has occurred • N1-SOP-33A.2 Station Blackout is being implemented • EDG 102 troubleshooting is in progress • EDG 103 trouble shooting is complete and repairs have been made • EDG 103 is now available and ready to return to service

INITIATING CUE	**(Operators Name)**, Perform a control room start of EDG 103 and energize PB 103 from the EDG 103, per N1-OP-45 section H.19.0.

Facility: Nine Mile Point Unit 1 Scenario No.: NRC-1 Op-Test No.: LC1 15-1

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: The plant is operating at approximately 1% in 5 loop operation during a startup. ESW Pump 12 is out of service for maintenance.

Turnover: The reactor is critical at approximately 1% power. Perform N1-ST-W15, Manual and Automatic Scram Instrument Channel Test. Continue the startup IAW N1-OP-43A, starting with control rod withdrawals.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N –BOP, SRO	Perform N1-ST-W15, Sections 6.2 and 6.3 (partial), Channel 11 Auto and Manual Scram Tests N1-ST-W15
2	N/A	R - ATC, SRO	Withdraw control rods N1-OP-43A, N1-OP-5
3	RD04	C –ATC, SRO SRO-TS	Stuck control rod N1-OP-5, Technical Specifications
4	NM01C	I – ATC, SRO SRO-TS	SRM Fails Upscale N1-OP-38A, Technical Specifications
5	CW05A CW05B	C –All	Loss of all TBCLC requires scram and MSIV isolation N1-SOP-24.1, N1-SOP-1
6	RP05A RP05B	I –BOP, SRO	RPS fails to scram the reactor, ARI is successful N1-EOP-2, N1-SOP-1
7	EC02	M –All	EC 11 Steam Leak in the Reactor Building ARP K1-1-1, K1-3-4, N1-SOP-1, N1-EOP-2, N1-EOP-5
8	EC07A EC08A EC08B	C –All	EC 11 will not isolate, requiring a RPV Blowdown N1-EOP-8

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

Facility: **Nine Mile Point Unit 1** Scenario No.: **NRC-1**		Op-Test No.: **LC1 15-1**
1. Total malfunctions (5-8) **Events 3, 4, 5, 6, 7, 8**	6	
2. Malfunctions after EOP entry (1-2) **Event 6, 7, 8**	3	
3. Abnormal events (2-4) **Events 3, 4, 5, 6**	4	
4. Major transients (1-2) **Event 7**	1	
5. EOPs entered/requiring substantive actions (1-2) **N1-EOP-2, N1-EOP-5**	2	
6. EOP contingencies requiring substantive actions (0-2) **N1-EOP-8**	1	
7. EOP Based Critical tasks (2-3)	2	
CRITICAL TASK DESCRIPTIONS:		**CRITICAL TASK JUSTIFICATION:**
CT-1.0: Given a complete loss of TBCLC, the crew will insert a manual reactor scram in accordance with N1-SOP-24.1.		TBCLC provides cooling to major heat loads in the plant, including Recirc Pump MG sets and Instrument Air Compressors. Either of which, when lost, greatly reduces the level of safety of the reactor.
CT- 2.0: Given conditions requiring a scram and failure of an RPS channel to trip, the crew will manually initiate Alternate Rod Insertion (ARI) to shutdown the reactor, in accordance with N1-SOP-1 and/or N1-EOP-3.		Inserting control rods during a transient lowers reactor power, which reduces challenges to the plant during the transient. With RPS failing to trip, the crew must rely on backup shutdown methods to ensure control rods are inserted to provide long term, stable, core shutdown.
CT- 3.0: Given an un-isolable Emergency Condenser leak outside Primary Containment and two general area temperatures above the maximum safe limit, execute N1-EOP-8, RPV Blowdown, in accordance with N1-EOP-5.		An un-isolable primary system discharging outside of Primary Containment resulting in two general area temperatures above the maximum safe limit indicates a wide-spread problem posing a direct and immediate threat to Secondary Containment. A blowdown minimizes flow through the break, rejects heat to the suppression pool in preference to outside the containment, and places the primary system in the lowest possible energy state.

SCENARIO SUMMARY

The scenario begins at approximately 1% power with a startup in progress. ESW pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking. Control rod withdrawal has been halted for the turnover and to permit the crew to perform N1-ST-W15, Manual Scram Instrument Channel Test, sections 6.1 to 6.3 for Channel 11 only. The surveillance test results will be satisfactory.

After completion of the surveillance test the crew will resume withdrawing control rods in approach to criticality. The second control rod to be moved will be stuck. The crew will enter N1-OP-5, Section H.13 and raise drive water pressure to move the control rod. The control rod will withdraw with increased drive water pressure.
Next, an SRM upscale trip will occur. The crew will respond per ARP F3-4-1 and N1-OP-38A to bypass the SRM.

Then, a complete loss of TBCLC occurs requiring a manual reactor Scram (**Critical Task**). The Mode Switch will fail to scram the Reactor, however manual ARI actuation will result in successful control rod insertion (**Critical Task**).

Next, a steam leak will develop from Emergency Condenser 11. The crew will attempt to isolate the leak, however the Emergency Condenser will fail to isolate both automatically and manually. Two General Areas of the Reactor Building will exceed the maximum safe temperatures. The crew will blowdown the Reactor per N1-EOP-8 (**Critical Task**).

Exelon Generation

Copy ____ of ____

Training Id: **NMP1 NRC 2017 Scenario 1** Revision: **0.0**

Title: **Low Power, Stuck Rod, SRM Fails Upscale, Loss of TBCLC, Un-isolable Steam Leak into Secondary Containment**

	Signature / Printed Name	Date
Developed By	Paul Isham	3/17/16
Validated By	Kevin Hines	8/24/16
	Josh House	
	Phil Carroll	
Facility Reviewer	Pat O'Brien	

References

1. N1-ST-W15, Manual and Automatic Scram Instrument Channel Test
2. N1-OP-43A, Plant Startup
3. N1-OP-5, Control Rod Drive System
4. N1-OP-38A, Source Range Monitor
5. N1-SOP-24.1, TBCLC Failure
6. N1-SOP-1, Reactor Scram
7. N1-EOP-2, RPV Control
8. N1-EOP-5, Secondary Containment Control
9. N1-EOP-1, NMP1 EOP Support Procedure
10. N1-EOP-8, RPV Blowdown
11. Unit 1 Technical Specifications

Instructor Information

A. Scenario Description

Sequence of Events / Expected Crew Response:

The scenario begins at approximately 1% power with a startup in progress. Containment Spray Pump 112 is out of service for maintenance. Steam Packing Exhauster 12 is out of service due to high vibrations. Control rod withdrawal has been halted for the turnover and to permit the crew to perform N1-ST-W15, Manual Scram Instrument Channel Test, sections 6.1 to 6.3 for Channel 11 only. The surveillance test results will be satisfactory.

After completion of the surveillance test the crew will resume withdrawing control rods in approach to criticality. The second control rod to be moved will be stuck. The crew will enter N1-OP-5, Section H.13 and raise drive water pressure to move the control rod. The control rod will withdraw with increased drive water pressure.

Next, an SRM upscale trip will occur. The crew will respond per ARP F3-4-1 and N1-OP-38A to bypass the SRM.

Then, a complete loss of TBCLC occurs requiring a manual reactor Scram (**Critical Task**). The Mode Switch will fail to scram the Reactor, however manual ARI actuation will result in successful control rod insertion (**Critical Task**).

Next, a steam leak will develop from Emergency Condenser 11. The crew will attempt to isolate the leak, however the Emergency Condenser will fail to isolate both automatically and manually. Two General Areas of the Reactor Building will exceed the maximum safe temperatures. The crew will blowdown the Reactor per N1-EOP-8 (**Critical Task**).

1. Termination Criteria
    a. RPV water level controlled in assigned band, RPV Blowdown in progress

2. Critical Tasks

CT-1, Given a complete loss of TBCLC, the crew will insert a manual reactor scram in accordance with N1-SOP-24.1.

Justification:

Safety Significance: *TBCLC provides cooling to major heat loads in the plant, including Recirc Pump MG sets and Instrument Air Compressors. Either of which, when lost, greatly reduces the level of safety of the reactor.*

Cueing: *Annunciators and TBCLC indications are available in the control room that will indicate a loss of TBCLC. N1-SOP-24.1 gives direction to Scram the reactor under these conditions.*

Measurable Performance Indicators: *The crew will manually scram the reactor*

Performance Feedback: *Operation of the Mode Switch, RPS pushbuttons, and/or ARI will provide sufficient performance feedback to the evaluators.*

CT-2, Given conditions requiring a scram and failure of an RPS channel to trip, the crew will manually initiate Alternate Rod Insertion (ARI) to shutdown the reactor, in accordance with N1-SOP-1 and/or N1-EOP-3.

Justification:

Safety Significance: *Inserting control rods during a transient lowers reactor power, which reduces challenges to the plant during the transient. With RPS failing to trip, the crew must rely on backup shutdown methods to ensure control rods are inserted to provide long term, stable, core shutdown.*

Cueing: *Control rod position, Reactor power indications, and RPS lights will indicate an electric failure to scram. N1-SOP-1 provides direction to initiate ARI.*

Measurable Performance Indicators: *Manipulation of the Mode Switch and manual ARI will provide observable action for the evaluation team.*

Performance Feedback: *Control rod position and Reactor power will provide performance feedback regarding success of crew actions to insert control rods.*

CT-3, Given an un-isolable Emergency Condenser leak outside Primary Containment and two general area temperatures above the maximum safe limit, execute N1-EOP-8, RPV Blowdown, in accordance with N1-EOP-5.

Justification:

Safety Significance: *An un-isolable primary system discharging outside of Primary Containment resulting in two general area temperatures above the maximum safe limit indicates a wide-spread problem posing a direct and immediate threat to Secondary Containment. A blowdown minimizes flow through the break, rejects heat to the suppression pool in preference to outside the containment, and places the primary system in the lowest possible energy state.*

Cueing: *Multiple annunciators will provide indications of a primary system discharging into Secondary Containment. Emergency Condenser valve position indicators will provide indication that the system is un-isolable. Field reports will provide indication that two general areas is above the maximum safe temperature limit. N1-EOP-5 provides direction to blowdown the Reactor.*

Measurable Performance Indicators: *The crew will manually open ERVs.*

Performance Feedback: *ERV instrumentation will provide indication that these valves are functioning properly once placed in service. Multiple Reactor pressure indicators and annunciators will provide performance feedback regarding the success of the blowdown.*

3. Length
   a. ~60 minutes
4. Mitigation Strategy Code
   a. SC1, Primary System Leak in Secondary Containment, Blowdown Required
5. Technical Specifications
   a. TS 3.1.6 – CRD
   b. TS 3.5.1 - SRM
6. EAL Classification
   a. Site Area Emergency per EAL FS1.1 (Loss or potential loss of ANY two fission product barriers)
7. Special Orders
   a. None

B. Initial Conditions

1. IC Number

   a. IC-171

2. Presets / With Triggers

   a. Malfunctions

1)	**CT01B,** CT Pump 112 Trip	**Inserted**
2)	**RD04R3447,** 34-47 Control Rod Failure - Stuck	**Inserted**
3)	**RP05B,** Reactor Protection System Failure to Scram Ch 12	**Inserted**
4)	**EC07A,** Emergency Condenser 11 Fails to Isolate	**Inserted**
5)	**EC08A,** EC Loop 11 Stm IV Fail to Close 111, FV=50	**Inserted**
6)	**EC08B,** EC Loop 11 Stm IV Fail to Close 112, FV=50	**Inserted**
7)	**CW05B,** Turbine Building Closed Loop Cooling Pump Trip 12	**Inserted**
8)	**NM01C,** SRM CHANNEL 13 FAILURE - UPSCALE	**TRG 3**
9)	**CW05A,** Turbine Building Closed Loop Cooling Pump Trip 11	**TRG 5**
10)	**EC02,** Steam Supply Line Break in RB, FV=20**%**	**TRG 7**

   b. Remotes

1) None

   c. Overrides

1) None

   d. Annunciators

1) None

e. Event Triggers

Event #	Event Action	Command
TRG 1, Activates when CRD drive water pressure is raised above 300 psig to delete stuck rod	rdpnep01>290	dmf rd04r3447
TRG 7, Initiates EC Steam leak when mode switch is placed in shutdown	zdrpstdn==1	**Blank**

f. Equipment Out of Service

1) Containment Spray Pump 112 in PTL with info tag
2) Containment Spray suction isolation valve 112 closed with info tag
3) Steam Packing Exhauster 12 secured with info tag

g. Support Documentation

1) Control Rod Withdrawal Sequence marked up to current rod (18-47, pg. 16 of A2 Startup)
2) ReMA for plant startup
3) N1-OP-43A marked up to appropriate step for place in startup (E.3.12)
4) N1-ST-W15 marked complete through 6.2.1

h. Miscellaneous

1)

SHIFT TURNOVER INFORMATION

ON COMING SHIFT: ☐ N ■ D DATE: Today

PART I: To be performed by the oncoming Operator before assuming the shift.

- Control Panel Walkdown (all panels) (SRO, ROs)

PART II: To be reviewed by the oncoming Operator before assuming the shift.

- LCO Status (SRO)
- Shift Turnover Information Sheet

Evolutions/General Information/Equipment Status:

- Reactor startup and heatup is in progress, with the Reactor at approximately 275 psig
- Containment Spray Pump 112 is out of service for maintenance. Steam Packing Exhauster 12 is out of service due to high vibrations.
- Rod withdrawal has been suspended for completion of N1-ST-W15, Manual and Automatic Scram Instrument Channel Test, for PMT of maintenance
- APRM Gains have been adjusted for the startup IAW N1-REP-12

PART III: Remarks/Planned Evolutions:

- Perform N1-ST-W15, Manual and Automatic Scram Instrument Channel Test, Sections 6.2 and 6.3 for Channel 11. Perform steps 6.2 and 6.3.1 – 6.3.7, only (APRM 11 only is to be tested)
- Continue withdrawing control rods per the ReMA, starting at rod 18-47 from position 12 to 48.

Shift Turnover

Instructor Actions / Plant Response	Operator Actions
Take the Simulator out of freeze before the crew enters for the pre-shift walkdown. • Verify annunciator sound turned on • If recording scenario, start the recording device during the pre-shift walkdown	
Allow no more than 5 minutes to walkdown the panels.	**Crew** • Walkdown panels • Conduct shift turnover brief • Assume the shift

Event #1: Perform Manual and Automatic Scram Instrument Channel Test

Event Information	• A Plant startup is in progress • Crew will perform partial scram instrument channel test. • Test will be Sat

Note: N1-ST-W15 is marked up for PMT, with all steps in section 6.2 required, and steps 6.3.1 through 6.3.7 required.	**SRO** • Directs execution of N1-ST-W15 • Provides oversight for evolution
	RO • Monitors plant parameters • Provides concurrent verification when required

	BOP
	• Acknowledges direction from the SRO
	• Verifies no half-scrams are present
	• Notifies RO that the following step will initiate a half scram
	• Depresses REACTOR TRIP 11 pushbutton at E Panel AND verifies the following:
	  • Channel 11 White SCRAM SOLENOIDS GROUPS LIGHTS (4) at M panel – off
	  • Channel 11 White SCRAM SOLENOIDS GROUPS LIGHTS (4) at F panel – off
	  • Channel 11 Red BU SCRAM/SDV Vent and Drain Valve light at F panel – off
	  • Annunciator F1-3-1, RPS Ch. 11 MAN RX TRIP – alarming
	  • Computer printout W022, ***RPS Ch. 11 MAN RX TRIP YES

Event 1 continued
 	
Note: Annunciator F1-4-1 will also alarm. The mode switch in startup makes this an expected alarm. The crew may not recognize this initially.
	BOP continued
	• Depresses REACTOR TRIP RESET pushbutton at E Panel AND verifies the following:
	  • Channel 11 White SCRAM SOLENOIDS GROUPS LIGHTS (4) at M panel – on
	  • Channel 11 White SCRAM SOLENOIDS GROUPS LIGHTS (4) at F panel – on
	  • Channel 11 Red BU SCRAM/SDV Vent and Drain Valve light at F panel – on
	  • Annunciator F1-3-1, RPS Ch. 11 MAN RX TRIP – clear
	  • Computer printout W022, ***RPS Ch. 11 MAN RX TRIP NO
	• Logs momentary drop in CRD air pressure
	• Verifies no half-scrams are present
	• Notifies RO that the following step will initiate a half scram
	• Places RPS Channel 11/1 APRM 11 S-10 switch in STANDBY position
	• Verifies the following:
	  • Annunciator F1-2-1, RPS CH 11 AUTO REACTOR TRIP - alarm
	  • Channel 11 White SCRAM SOLENOIDS GROUPS LIGHTS (4) at M panel – off
	  • Channel 11 White SCRAM SOLENOIDS GROUPS LIGHTS (4) at F panel – off
	  • Channel 11 Red BU SCRAM/SDV Vent and Drain Valve light at F panel – off
	  • Computer printout W023 ***RPS CH 11/1 RX NMON 11 – TRIP

Event 1 continued
 	
Evaluator Cue: If requested, perform Concurrent Verification
 	
Evaluator Cue: If crew attempts to complete acceptance criteria, inform them that another operator will perform that action. Direct the crew to continue on with the startup.
	BOP continued
	
	• Places Channel 11 RPS APRM 11 S-10 switch to OPERATE position
	• Obtains concurrent verification
	• Depresses REACTOR TRIP RESET pushbutton at E Panel AND verifies the following:
	  • Annunciator F1-2-1, RPS CH 11 AUTO REACTOR TRIP - clear
	  • Channel 11 White SCRAM SOLENOIDS GROUPS LIGHTS (4) at M panel – on
	  • Channel 11 White SCRAM SOLENOIDS GROUPS LIGHTS (4) at F panel – on
	  • Channel 11 Red BU SCRAM/SDV Vent and Drain Valve light at F panel – on
	  • Computer printout W023 ***RPS CH 11/1 RX NMON 11 – NORM
	• Logs momentary drop in CRD air pressure
	• Notify the SRO/Crew that N1-ST-W15 has been successfully completed

Events #2 & #3: Withdraw Control Rods, Stuck Control Rod

Event Information	• Crew will withdraw rods per the rod movement sheet and RMI • Second rod to move will be stuck. • Raising drive water pressure will free the rod.

Note: Verify **TRG 1 activates** to **automatically delete malfunction RD04R3447** when CRD drive water pressure is raised, to allow the stuck rod to move.	**SRO** • Directs RO to withdraw rods per Startup Rod Sequence and N1-OP-5 section F.1.0 • Provides oversight for reactivity manipulation • Acknowledges control rod 34-47 is stuck • Directs RO to perform N1-OP-5 section H.13.0 for the stuck control rod • Acknowledges control rod 34-47 moves with higher drive water pressure

Note: Operator will withdraw one control rod prior to the stuck rod.	**RO**
	• Withdraws control rod 18-47 per the rod sequence sheet
	  • Verifies Control Rod Power is On
	  • Depresses Rod Select pushbutton for control rod 18-47
	  • Places 4S1 Control Rod Movement switch to the rod out notch position
	  ○ Observes SRM and period response
	  ○ Observes RMCS, RPIS and CRD indications

Events 2 and 3 continued **Note:** Numerous steps in the stuck rod procedure are dependent upon how the operator interprets RMCS and CRD indications. **Role Play:** If dispatched to perform HCU valve lineup, wait 1 minute and report that HCU 34-47 valve lineup is complete (time compression used). **Note:** Allow enough control rod movement to evaluate operator's ability to perform the reactivity manipulation, and then move on to event 4. It is not necessary to move all rods on page 16 of the startup sequence.	**RO Continued** • Attempts to withdraw control rod 34-47 per the rod sequence sheet • Diagnoses stuck control rod • Notifies SRO/Crew • Places 4S1 Control Rod Movement switch to the rod out notch position while monitoring RMCS and CRD indications • May de-select and re-select rod and re-attempt notch withdrawal • May request HCU valve lineup and re-attempt notch withdrawal • May request operator observe stabilization valve response and re-attempt notch withdrawal • Confirms drive water pressure raised 50 psid and re-attempts notch withdrawal • Notifies the SRO/crew that the control rod is un-stuck • Resumes normal control rod withdrawal
Role Play: If dispatched to observe stabilization valve response, immediately report that you are on station. When rod withdrawal is attempted, immediately report normal stabilization valve operation.	**BOP** • Monitors plant parameters • Confirms normal drive water pressure • May request operator observe stabilization valve response and re-attempt notch withdrawal • Raises drive water pressure in 50 psid increments • Returns drive water pressure to normal

Event #4: SRM Upscale Failure

Event Information	• A Plant startup is in progress • SRM 13 fails upscale • Crew will bypass the SRM • SRO will address Tech Specs

When directed by lead examiner, **insert malfunction**: **NM01C, SRM CHANNEL 13 FAILURE - UPSCALE** **TRG 3** *SRM 13 indicates upscale* *Expected Annunciators:* *F3-4-1, SRM 13-14* *F4-4-8, RPS CH 12 REFUEL INST TRIP*	**CREW** • Acknowledges/reports annunciators • Diagnoses SRM 13 failed upscale
	SRO • Directs execution of ARP F3-4-1 • Determines Technical Specification 3.5.1 allows bypassing SRM 13 • Determines Technical Specification 3.5.3 does not apply under current plant conditions • Directs bypassing SRM 13 per N1-OP-38A
	ATC • Monitors plant parameters

Event 4 continued	**BOP**
	• Executes ARP F3-4-1
	• Confirms computer point
	• Observes E Panel to determine which of the following off-normal conditions exist AND on which channel:
	  • DOWNSCALE OR INOP light
	  • UPSCALE HI COUNT light
	  • UPSCALE HI-HI light
	• Monitors period meter on G Panel
	• Monitors count rate meter on G Panel
	• Verifies correct position of detector in core on E Panel
	• Bypasses SRM 13 per N1-OP-38A section H.1.0
	• Determines operability of all SRMs:
	  • Verifies all SRMs are reading consistent with current plant condition
	  • Verifies Control Room Logs for inoperable SRMs
	  • Observes IF the SRM switch is in bypass
	• Coordinates with SRO to verify Tech Specs 3.5.1 AND 3.5.3 will be met when desired SRM is bypassed
	• Places BYPASS switch to bypass position for SRM 13

Events #5 & #6: Loss of all TBCLC Requires Scram and MSIV Isolation, RPS Fails to De-Energize

Event Information	• Loss of all TBCLC will require manual scram and MSIV isolation • RPS fails to de-energize requiring ARI to insert rods

When directed by examiner, **insert malfunction**: **CW05A**, Turbine Building Closed Loop Cooling Pump Trip 11, True **TRG 5** *TBCLC header pressure drops* *TBCLC Pump 12 attempts to start and trips* *-H1-1-4, TB COOLING WTR PUMP 11 TRIP / TROUBLE* -H1-3-4, TURBINE BLDG COOLING WATER PRESS TEMP MAKEUP FLOW	**RO** • Recognize and report loss of TBCLC Pump 11 • Recognize and report failure of TBCLC Pump 12 to auto start • May recognize TBCLC Pump 12 attempted to start and tripped. • Recognize and report annunciators H1-1-4 and H1-3-4
	RO • Provide a critical parameter update
Note: The crew is likely to initiate ARI based on the immediate actions of SOP-1, Reactor Scram. Alternately, the crew may enter EOP-3 for direction to initiate ARI. **Note:** CRS may just direct the operator to execute the override steps of N1-SOP-24.1 vice giving individual direction for each step.	**SRO** • Acknowledge reports on TBCLC • Verifies execution of ARPs • Directs execution of N1-SOP-24.1, TBCLC Failures • Acknowledge override requirements from N1-SOP-24.1 • **Directs reactor scram** **CT-1** • **Directs ARI initiated** **CT-2** • Directs pressure control on ECs and to shut the MSIVs • Directs all recirc pumps tripped

	BOP • Recognizes failure of TBCLC pump 12 • Enters N1-SOP-24.1 • Informs crew of override requirements to scram the reactor. • **Initiates ARI when RPS fails to de-energize** **CT-2** • Initiates ECs • Shuts MSIVs • Trips all recirc pumps

	RO
	• **Places Mode Switch in Shutdown**
	CT-1
	• Depresses RPS pushbuttons
	• Performs scram verification actions of N1-SOP-1, Reactor Scram:
	  • Confirms all rods inserted
	  • Observes Reactor power lowering
	  • Places IRMs on range 9
	  • Inserts IRM and SRM detectors
	  • Down-ranges IRMs as necessary
	• Controls Reactor pressure as directed

Events #7 & #8: Un-isolable EC Steam Leak into Secondary Containment

Event Information	• The reactor has been scrammed from a low power condition • An EC Steam leak occurs whch leads to blowdown.

Verify the following **malfunctions** are **automatically inserted** when the mode switch is taken to SHUTDOWN: **EC02,** Steam Supply Line Break in RB, FV=20% **TRG 7** *Reactor Building D/P lowers* *Rising temperatures, pressures and radiation levels in the Secondary Containment* *RBEVS auto-starts* *RBVS isolates* *Expected Annunciators:* *L1-3-4, REACT. BLDG/ATM DIFF PRESS* *L1-4-3, REACT BLDG VENT RAD MONITOR OFF NORMAL* *L1-3(4)-6, EMER VENT SYS CHANNEL 11(12) RELAY OPERATE* *MFP2 2-1-1-7, REAC BLDG 318 LOCAL PNL NO.7 FIRE* *K1-4-3, EMER COOLING SYSTEM 11 STEAM LEAK AREA T HI* *K1-4-5, EMER COOLING SYSTEM 12 STEAM LEAK AREA T HI* *L1-3-3, CONTINUOUS AIR RAD MONITOR* *H1-4-8, AREA RADIATION MONITORS* Verify the following **malfunctions** are **preset**: **EC07A,** Emergency Condenser 11 Fails to Isolate **EC08A,** EC Loop 11 Stm IV Fail to Close 111, FV=50 **EC08A,** EC Loop 11 Stm IV Fail to Close 112, FV=50 *Emergency Condenser 11 isolation valves will not close*	**CREW** • Acknowledge/report annunciators • Recognize/report Emergency Condenser 11 steam leak • Recognize/report failure of Emergency Condenser 11 to isolate

Events 7 and 8 continued **Note:** By this point in the scenario, EC 12 temperature monitor will likely be in alarm also, due to the close proximity of the temperature switches. Therefore the crew will possibly isolate EC 12 and not place it in service for the Blowdown.	**SRO** • Acknowledges reports • Enters N1-EOP-5 on high Reactor Building Vent rad levels, high Reactor Building area temps / rad levels, and/or loss of RB D/P • Directs manual isolation of EC11 • Directs Reactor Building evacuation • Acknowledges manual isolation failure • Directs dispatching of an operator and RP tech to obtain general area temps and rad levels in the Reactor Building • When Reactor Building Ventilation exhaust radiation exceeds 5 mR/hr, directs verification of RB Vent isolation and RBEVS initiation • Determines area temperatures and/or radiation levels are above setpoints in Tables T and R, and transitions to N1-EOP-5 circle 27 • Determines a primary system is discharging into the Reactor Building and the discharge cannot be isolated, and transitions to N1-EOP-5 circle 28 • May direct anticipatory blowdown with TBVs and/or Emergency Condenser 12 with cooldown in excess of 100°F/hr • Acknowledges reports of Reactor Building temperatures and radiation levels • When report is received that 2 General Areas temperatures are above 135°F, enters N1-EOP-8, RPV Blowdown • Answers “Are all control rods inserted to at least position 04” YES • Answers “Drywell pressure?” <3.5 psig • May direct initiation of Emergency Condenser 12 • Answers “Torus water level?” >8 ft • **Directs open 4 ERVs** **CT-3**

Events 7 & 8 continued
 	
Note: No General Area temperature information is available until an Operator has been dispatched to the Reactor Building to monitor area temperatures. The timeline of field reports may be adjusted by examiner as necessary for evaluation purposes.
 	
Role Play: When directed as Operator and RP tech to obtain General Area temperatures and radiation levels in the Reactor Building:
 	
Wait approximately 4 minutes and report RB 318' west side temperature is 125°F and rising, radiation level is 2 mr/hr and rising. Also report that you see steam coming from the area of the EC steam IV room.
 	
Note: When one general area temperature is reported above 135°F and a second general area temperature is reported as approaching 135°F, the crew is likely to perform an anticipatory blowdown per EOP-2.
 	
Wait approximately 2 more minutes and report RB 318' west side temperature is 137°F and rising, radiation level is 4 mr/hr and rising. Report RB 318' east side temperature is 123°F and rising, radiation level is 2 mr/hr and rising.
 	
Wait approximately 3 more minutes and report RB 318' west side temperature is 145°F and rising, radiation level is 6 mr/hr and rising. Report RB 318' east side temperature is 136°F and rising, radiation level is 3 mr/hr and rising.
	BOP/ATC
	
	• Attempts to isolate Emergency Condenser 11 by closing the following valves per ARP K1-4-3:
	  • 39-07R, EC STM ISOLATION VALVE 112
	  • 39-09R, EC STM ISOLATION VALVE 111
	  • 39-05, EMERG CNDSR COND RET ISOLATION VALVE 11
	  • 39-11R, EMERG CNDSR STM SUPPLY DRAIN IV 111
	  • 39-12R, EMERG CNDSR STM SUPPLY DRAIN IV 112
	  • 05-01R, EMERG COND VENT ISOLATION VALVE 111
	  • 05-11, EMERG COND VENT ISOLATION VALVE 112
	• Reports failure of 39-07R and 39-09R to close
	• Dispatches operator and RP tech to obtain Reactor Building General Area temperatures and radiation levels
	• Notifies crew of reports on General Area temperatures and radiation levels
	• Performs RPV water level control actions of N1-SOP-1, Reactor Scram:
	  • Restores RPV level to 53-95" by controlling injection and rejecting through RWCU

	BOP/ATC Continued
	• Verifies RPV water level above 53”
	• Verifies 11/12 FWP controllers in MANUAL and set to zero output
	• Places FWP BYPASS Valve 11 or 12 in AUTO, sets to 65-70 inches
	• If RPV level reaches 85 inches and rising, then:
	  • Verifies off all FW Pumps
	  • Secures CRD Pumps not required
	• May initiate Emergency Condenser 12
	• **Opens 4 ERVs**
	CT-3

Event Termination Criteria	• RPV water level controlled in assigned band • RPV Blowdown in progress

Facility: Nine Mile Point Unit 1 Scenario No.: NRC-2 Op-Test No.: LC1 15-1

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: The plant is operating at approximately 100% power. ESW Pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking. PB 11 is aligned to reserve power in preparation for cross-tying PB 16.

Turnover: Lower reactor power to 98% using recirc flow. Cross-tie PB 16A to PB 16B with PB 16B supplying. Then, return PB-11 to normal.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	R-ATC, SRO	Lower reactor power with recirc. N1-OP-1
2	N/A	N-BOP, SRO	Cross-tie PB 16A to PB 16B N1-OP-30
3	RD02	C –ATC, SRO	Control Rod 26-35 Drifts Out N1-SOP-5.2
4	FW02A Override	C – BOP, SRO	Feedwater Booster Pump 11 Trips with Failure of Feedwater Booster Pump 13 to Auto-start N1-SOP-16.1, Technical Specifications
5	RP25	C-All	Respond to trip of Reactor Protection System (RPS) UPS 172 Technical Specification N1-SOP-40.1
6	CU11	M -All	RWCU break in the Secondary Containment requiring scram N1-EOP-2, N1-EOP-5
7	CU14	C -All	Failure of the RWCU Isolation Valves to isolate N1-EOP-5, N1-EOP-8
8	Overrides	C – ATC, SRO	Mode Switch Fails to Scram N1-SOP-1

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

Facility: **Nine Mile Point Unit 1** Scenario No.: **NRC-2**		Op-Test No.: **LC1 15-1**
1. Total malfunctions (5-8) **Events 3, 4, 5, 6, 7, 8**	6	
2. Malfunctions after EOP entry (1-2) **Events 7, 8**	2	
3. Abnormal events (2-4) **Events 3, 4, 5**	3	
4. Major transients (1-2) **Event 6**	1	
5. EOPs entered/requiring substantive actions (1-2) **N1-EOP-2, N1-EOP-5**	2	
6. EOP contingencies requiring substantive actions (0-2) **N1-EOP-8**	1	
7. EOP Based Critical tasks (2-3)	2	
CRITICAL TASK DESCRIPTIONS:		**CRITICAL TASK JUSTIFICATION:**
CT-1.0: Given an un-isolable RWCU leak outside primary containment and one general area temperature above the maximum safe limit, the crew will insert a manual reactor scram, in accordance with N1-EOP-5.		With an un-isolable primary system discharging outside of Primary Containment resulting in general area temperature above the maximum safe limit, the Reactor must be scrammed. This reduces the rate of energy production and thus the heat input, radioactivity release, and break flow into the Secondary Containment. This also ensures the Reactor is shutdown prior to need for a blowdown.
CT- 2.0: Given an un-isolable RWCU leak outside primary containment and two general area temperatures above the maximum safe limit, the crew will execute N1-EOP-8, RPV Blowdown, in accordance with N1-EOP-5.		An un-isolable primary system discharging outside of Primary Containment resulting in two general area temperatures above the maximum safe limit indicates a wide-spread problem posing a direct and immediate threat to Secondary Containment. A blowdown minimizes flow through the break, rejects heat to the suppression pool in preference to outside the containment, and places the primary system in the lowest possible energy state.

SCENARIO SUMMARY

The scenario begins at approximately 100% power. ESW pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking. The crew will start by lowering Reactor power to approximately 98% with Recirculation flow. Then the crew will cross-tie PB 16A to PB 16B.

Following the power board transfer, a control rod will begin to drift out. The crew will select the drifting control rod and drive it full in. The crew will dispatch an operator to valve out the affected Hydraulic Control Unit to prevent the control rod from continuing to drift.
Then, Feedwater Booster pump 11 will trip. The standby Feedwater Booster pump will fail to auto-start. The crew will manually start the standby Feedwater Booster pump to restore normal system pressures. The SRO will determine the Tech Spec impact for loss of a redundant HPCI component.

RPS UPS 172 will develop an internal fault and drop out the #12 RPS system and RPS Bus 12. The crew will respond to the trip of UPS per N1-SOP-40.1. The SRO will direct the bus be repowered from I&C Bus 130A and will determine the most limiting Tech Spec condition. The BOP and the RO will reset ½ scram and ½ isolations and perform recovery actions after the bus is repowered. The SRO will determine Tech Spec 3.1.2, 3.6.11 and 3.4.4 are the limiting 7 day LCO's applicable with the RPS 12 Bus tripped.

A Reactor Water Cleanup system line break will occur in the Secondary Containment downstream of the Supply Isolation Valves. Reactor Water Cleanup will fail to isolate on high area temperature. The crew will attempt to isolate the system, but the valves will fail to fully close. This break will require a scram (**Critical Task)** and RPV blowdown (**Critical Task)** due to exceeding the Maximum Safe Value for general area temperatures. The Mode Switch will fail to scram the Reactor, however either RPS pushbuttons or manual ARI actuation will result in successful control rod insertion.

Exelon Generation.

Copy ____ of ____

Training Id: **NMP1 NRC 2017 Scenario 2** Revision: **0.0**

Title: **Control Rod Drift, FWBP Trip, Trip of RPS UPS 172, Un-isolable RWCU Break in the RB, Mode Switch Fails**

	Signature / Printed Name	Date
Developed By	Paul Isham	3/11/16
Validated By	Kevin Hines	8/24/16
	Josh House	
	Phil Carroll	
Facility Reviewer	Pat O'Brien	

References

1. N1-OP-30, 4.16 KV, 600V, and 48V House Service
2. N1-SOP-5.1, Control Rod Drift
3. N1-SOP-16.1, Feedwater Failures
4. N1-SOP-40.1, Loss of RPS
5. N1-SOP-1, Reactor Scram
6. N1-EOP-2, RPV Control
7. N1-EOP-5, Secondary Containment Control
8. N1-EOP-1, NMP1 EOP Support Procedure
9. N1-EOP-8, RPV Blowdown
10. Unit 1 Technical Specifications

Instructor Information

A. Scenario Description

Sequence of Events / Expected Crew Response:

The scenario begins at approximately 100% power. ESW pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking. The crew will start by lowering Reactor power to approximately 98% with Recirculation flow. Then the crew will cross-tie PB 16A to PB 16B.

Following the power board transfer, a control rod will begin to drift out. The crew will select the drifting control rod and drive it full in. The crew will dispatch an operator to valve out the affected Hydraulic Control Unit to prevent the control rod from continuing to drift.

Then, Feedwater Booster pump 11 will trip. The standby Feedwater Booster pump will fail to auto-start. The crew will manually start the standby Feedwater Booster pump to restore normal system pressures. The SRO will determine the Tech Spec impact for loss of a redundant HPCI component.

RPS UPS 172 will develop an internal fault and drop out the #12 RPS system and RPS Bus 12. The crew will respond to the trip of UPS per N1-SOP-40.1. The SRO will direct the bus be repowered from I&C Bus 130A and will determine the most limiting Tech Spec condition. The BOP and the RO will reset ½ scram and ½ isolations and perform recovery actions after the bus is repowered. The SRO will determine Tech Spec 3.1.2, 3.6.11 and 3.4.4 are the limiting 7 day LCO's applicable with the RPS 12 Bus tripped.

A Reactor Water Cleanup system line break will occur in the Secondary Containment downstream of the Supply Isolation Valves. Reactor Water Cleanup will fail to isolate on high area temperature. The crew will attempt to isolate the system, but the valves will fail to fully close. This break will require a scram (**Critical Task)** and RPV blowdown (**Critical Task)** due to exceeding the Maximum Safe Value for general area temperatures. The Mode Switch will fail to scram the Reactor, however either RPS pushbuttons or manual ARI actuation will result in successful control rod insertion.

1. Termination Criteria

   a. RPV water level controlled in assigned band, RPV Blowdown in progress

2. Critical Tasks

CT-1, Given an un-isolable RWCU leak outside primary containment and one general area temperature above the maximum safe limit, the crew will insert a manual reactor scram, in accordance with N1-EOP-5.

Justification:

Safety Significance: *With an un-isolable primary system discharging outside of Primary Containment resulting in general area temperature above the maximum safe limit, the Reactor must be scrammed. This reduces the rate of energy production and thus the heat input, radioactivity release, and break flow into the Secondary Containment. This also ensures the Reactor is shutdown prior to need for a blowdown.*

Cueing: *Multiple annunciators will provide indications of a primary system discharging into Secondary Containment. RWCU valve position indicators will provide indication that the system is un-isolable. Field reports will provide indication that a general area is above the maximum safe temperature limit. N1-EOP-5 provides direction to scram the Reactor.*

Measurable Performance Indicators: *Rotation of the Mode Switch to SHUTDOWN or depressing the manual scram pushbuttons will provide observable actions for the evaluation team.*

Performance Feedback: *Control rod position and Reactor power indications will provide performance feedback regarding the success of the scram.*

CT-2, Given an un-isolable RWCU leak outside primary containment and two general area temperatures above the maximum safe limit, the crew will execute N1-EOP-8, RPV Blowdown, in accordance with N1-EOP-5.

Justification:

Safety Significance: *An un-isolable primary system discharging outside of Primary Containment resulting in two general area temperatures above the maximum safe limit indicates a wide-spread problem posing a direct and immediate threat to Secondary Containment. A blowdown minimizes flow through the break, rejects heat to the suppression pool in preference to outside the containment, and places the primary system in the lowest possible energy state.*

Cueing: *Multiple annunciators will provide indications of a primary system discharging into Secondary Containment. RWCU valve position indicators will provide indication that the system is un-isolable. Field reports will provide indication that two general areas is above the maximum safe temperature limit. N1-EOP-5 provides direction to blowdown the Reactor.*

Measurable Performance Indicators: *The crew will manually open ERVs.*

Performance Feedback: *ERV instrumentation will provide indication that these valves are functioning properly once placed in service. Multiple Reactor pressure indicators and annunciators will provide performance feedback regarding the success of the blowdown.*

3. Length

   a. ~60 minutes

4. Mitigation Strategy Code

   a. SC1, Primary System Leak in Secondary Containment, Blowdown Required

5. Technical Specifications

   a. TS 3.2.5

   b. 3.1.7.e

   c. 3.6.3

   d. 3.1.8.b (FWBP)

6. EAL Classification

   a. Site Area Emergency per EAL FS1.1 – Loss or potential loss of any two fission product barriers. (RWCU Isolation Failure and Release Outside Primary Containment)

   b. Unusual Event per EAL SU8.1 also occurs during scenario.

7. Special Orders

   a. None

B. Initial Conditions

1. IC Number

   a. IC-152

2. Presets / With Triggers

   a. Malfunctions

1)	**NM10A,** IRM CHANNEL 11 FAILURE- UPSCALE	**Inserted**
2)	**CW03B,** EMERGENCY SERVICE WATER PUMP TRIP 12	**Inserted**
3)	**RD02R2627,** 26-27 Control Rod Failure – Drift Out, Driveable	**TRG 1**
4)	**RD03R2627,** 26-27 Control Rod Failure – Accumulator Trouble	**TRG 25**
5)	**FW02A,** FEEDWATER BOOSTER PUMP TRIP 11	**TRG 2**
6)	**RP25,** Loss of Both UPS 172A and 172B	**TRG 3**
7)	**CU11,** CU Coolant Leak Outside of Drywell, FV=45	**TRG 5**
8)	**CU14,** CU Isolation Valves Stuck Open	**Inserted**

   b. Remotes

1)	**RD07,** Reset of Rod Drift Alarm, FV=reset	**TRG 26**
2)	**RP04,** RPS Bus 12 Power Source, FV=maint	**TRG 4**
3)	**FW24.** Removal of HPCI Fuses FU8/FU9, FV = pulled	**TRG 7**

   c. Overrides

1)	**7S43DI4116,** POS_3 4H17/51-02A C FRM B, FV=off (FWBP 12 auto-start failure)	**Inserted**
2)	**13S70DI4674,** POS_1 1E67 REAC. SW.-RUN, FV=on	**Inserted**
3)	**13S70DI4675,** POS_2 1E67 REAC. SW.-SHUTDOWN, FV=off	**Inserted**

   d. Annunciators

1) None

e. Event Triggers

Event #	Event Action	Command
TRG 21, Energizes RWCU IV 33-01 green light when control switch is taken to close	zdcu301c==1	ior 9ds51lo51912 (0 0) true
TRG 22, Energizes RWCU IV 33-02 green light when control switch is taken to close	zdcu302c==1	ior 9ds53lo51914 (0 0) true
TRG 23, Energizes RWCU IV 33-04 green light when control switch is taken to close	zdcu304c==1	ior 9ds55lo5200 (0 0) true
TRG 29, After scram, allows Mode Switch logic to reposition to prevent MSIV closure on low pressure	rd:rpscm(1)==1	dor 13S70DI4674
TRG 30, After scram, allows Mode Switch logic to reposition to prevent MSIV closure on low pressure	rd:rpscm(1)==1	dor 13S70DI4675

f. Equipment Out of Service

1) ESW Pump 12 in PTL with info tag
2) IRM 11 bypassed with info tag and off normal

g. Support Documentation

1) N1-OP-30 marked up through step H.20.1.2 showing PB-11 is aligned to reserve power.
2) ReMA for power reduction

h. Miscellaneous

1) Protect the following equipment: EDG 103, PB 103
2) Ensure PB-11 aligned to reserve power
3) FWBP 12 is green flagged
4) DW Cooling Fan 11 secured

SHIFT TURNOVER INFORMATION

ON COMING SHIFT: ☐ N ☐ D DATE: Today

PART I: To be performed by the oncoming Operator before assuming the shift.

- Control Panel Walkdown (all panels) (SRO, ROs)

PART II: To be reviewed by the oncoming Operator before assuming the shift.

- LCO Status (SRO)
- Shift Turnover Information Sheet

Evolutions/General Information/Equipment Status:

- Reactor power is approximately 100%.
- ESW Pump 12 is out of service for maintenance
- IRM 11 is bypassed due to spiking
- N1-OP-30 is completed up through H.20.1.2 in preparation for transformer maintenance. Power Board 11 is aligned to reserve power.

PART III: Remarks/Planned Evolutions:

- Lower Reactor power to approximately 98% (1813MWth) per ReMA
- Cross-tie Powerboard 16A to Powerboard 16B in accordance with N1-OP-30, starting at step H.20.1.3. PB 11 is to remain aligned to reserve power.

Shift Turnover

Instructor Actions / Plant Response	Operator Actions
Take the Simulator out of freeze before the crew enters for the pre-shift walkdown. • Verify annunciator sound turned on • If recording scenario, start the recording device during the pre-shift walkdown	
Allow no more than 5 minutes to walkdown the panels.	**Crew** • Walkdown panels • Conduct shift turnover brief • Assume the shift

Event #1: Lower Reactor Power with Recirc Flow

Event Information	• The crew lowers power with recirc flow with the provided REMA • No complications

	SRO • Directs power reduction with Recirculation flow in accordance with N1-OP-43B and the Reactivity Maneuver Instruction (REMA) • Provides oversight of reactivity maneuver
	ATC • Acknowledges direction from SRO • Lowers Recirculation flow with master Recirculation flow controller • Monitors APRMs • Monitors Recirculation flow • Monitors Feedwater flow and RPV water level • Observes power-to-flow map restrictions

	BOP
	• Monitors individual RRPs for response
	  • Individual M/A-Speed Control stations trending uniformly
	  • Individual RRP indications trending normally for speed decrease
	• Monitors Feedwater controls for proper response
	  • FWP 13 FCV responding to power change
	  • RPV water level remains within program band (65” - 83”)

Event #2: Cross-tie PB16A to PB16B

Event Information	• PB 11 is aligned to reserve power • Crew cross-ties PB16A to PB16B per N1-OP-30

	SRO • Direct the crew to cross tie PB16A to PB16B, with PB16B supplying per N1-OP-30
Note: The crew will be informed that loads have been minimized during the pre-job brief. **Note:** Crew will be informed during turnover JAF notification and S-ODP-OPS-0112, Attachment 4 have been completed	**BOP** • Acknowledges direction from SRO • References N1-OP-30, Section H.20
-A4-4-4, POWER BD. 16 BKR BY-PASS SW alarms	**BOP** <u>Starts at step H.20.1.3</u> • Update crew that annunciator A4-4-4 will alarm • Place PB16 SUPPLY-BUS TIE BREAKER INTERLOCK BYPASS SWITCH in BYPASS at panel B5
-A4-4-4, POWER BD. 16 BKR BY-PASS SW clears **Note:** As soon as A4-4-4 clears proceed to the next event **Role Play:** If contacted to mark amps on PB-16 supply transformer, report amps as indicated by the simulator.	**BOP** • Close R1042, 16 PB Bus Tie Sect A To Sect B • Open R1041, Supply Bkr To 17 PB (A Section) • Update crew that annunciator A4-4-4 will clear • Place PB16 SUPPLY-BUS TIE BREAKER INTERLOCK BYPASS SWITCH in NORMAL at panel B5 (step 20.1.6) • Determines PB-11 will remain aligned to reserve per the turnover sheet. • Verifies <962 amps on PB-16 supply transformer.

Event #3: Control Rod Drift

Event Information	• Reactor power is near rated conditions. • Control Rod drift • Rod will remain inserted when valved out of service

When directed by examiner, **insert malfunction**: **RD02R2627,** 26-27 Control Rod Failure – Drift Out, Driveable **TRG 1** *Reactor power rises* *Rod 26-27 position indication rises* *Expected Annunciators:* *F3-2-6, CONTROL ROD DRIFT*	**CREW** • Acknowledges/reports annunciator F3-2-6 • Observes control rod 26-27 drifting outward
	SRO • Acknowledges report from crew • Directs execution of N1-SOP-5.2 • Reviews Tech Spec 3.1.1
Note: The first four steps listed for SOP-5.2 are Immediate Actions (IA). These will likely be performed prior to the RO referencing the procedure. The procedure should then be referenced to verify correct execution and complete remaining steps.	**RO** • Executes N1-SOP-5.2 • Identifies drifting rod (IA) • Turns on Control Rod Power (IA) • Selects rod 26-27 (IA) • Inserts rod 26-27 to position 00 using Emergency Rod In (IA) • Determines rod can be fully inserted • Releases emergency rod in switch • Determines rod is drifting out again • Inserts control rod with Emergency Rod In and holds switch • Acknowledges that HCU is valved out • Releases emergency rod in switch • Determines control rod does not drift

Role Play: When directed as operator to valve out HCU, acknowledge order and wait 2 minutes, then **insert malfunction**: **RD03R2627,** 26-27 Control Rod Failure – Accumulator Trouble **TRG 25** Verify the following **malfunction** is **automatically deleted:** **RD02R2627,** 26-27 Control Rod Failure – Drift Out Report HCU for control rod 26-27 is valved out. **Role Play:** When directed as operator to reset the control rod drift alarm, wait 1 minute, then **insert remote:** **RD07,** Reset of Rod Drift Alarm, FV=reset **TRG 26** Then report task completion. **Role Play:** If dispatched as operator to disarm the HCU, acknowledge the report and wait one minute, then report the control rod has been disarmed.	**BOP** • Monitors reactor pressure and level • Peer checks RO • Reduces reactor recirc flow to lower power 85-90%. • Dispatches operator to valve out HCU • Dispatches operator to reset control rod drift alarm • If required, dispatches operator to disarm the control rod

Event #4: Feedwater Booster Pump Trip

Event Information	• FWBP 11 will trip and FWBP 12 will fail to auto start • The crew will respond by starting the standby FWBP • SRO will evaluate tech specs

When directed by lead examiner, **insert malfunction**: **FW02A,** FEEDWATER BOOSTER PUMP TRIP 11 **TRG 2** The following **override** prevents Feedwater Booster Pump 12 from Auto Starting on low header discharge pressure: **OVR-7S43DI4116 POS_3 4H17/51-02A C FRM B, FV=off** **Inserted** *RPV water level lowers* *Feedwater Booster Pump header pressure lowers* *Expected Annunciators:* *H3-1-6, REACTOR FW BOOSTER P11 TRIP* *H2-3-5, HWC Trouble*	**CREW** • Acknowledge/report annunciator H3-1-6 REACTOR FW BOOSTER P11 TRIP • Diagnose trip of Feedwater Booster Pump 11
	SRO • Acknowledges report • If BOP does not manually start FWBP 12, directs starting FWBP 12 • Enters Tech Spec 3.1.8.b • Determines redundant component inoperable in HPCI train 11, thus 15 day LCO applies • Initiates surveillance requirement 4.1.8.c for redundant component operability verification • Notifies WEC/WWM • Notifies Ops Management

Event 4 continued	**ATC** • Monitors plant parameters • May perform Emergency Power Reduction per N1-SOP-1.1 as required to maintain RPV water level
Role Play: When dispatched as Operator to investigate, wait 2 minutes, then report: • FWBP 11 breaker tripped on overcurrent • No abnormal indications at FWBP 12 breaker • No abnormal indications at FWBP 11 or 12. **Role Play:** When dispatched as Operator to swap HWC, wait 5 minutes and report that HWC injection has been transferred from FWBP 11 to FWBP 12.	**BOP** • Report alarm and respond per H3-1-6 • Confirms alarm on computer (E049 RX FW BOOST PMP 11 TRIP) • Recognizes/diagnoses failure of the standby pump to automatically start • Manually starts FWBP 12 • Notifies crew of failure of FWBP 12 to auto start • Dispatches operators to shift Hydrogen Water Chemistry injection from FWBP 11 to FWBP 12 • May green flag FWBP 11

Events #5: Trip of RPS UPS 172

Event Information	• The crew will respond to a trip of RPS UPS 172 and swap to the maintenance supply • SRO will evaluate Tech Specs

When directed by lead examiner, **insert malfunction**: **RP25,** Loss of Both UPS 172A and 172B **TRG 3** *RPS Channel 12 half scram* *RBEVS initiates* *CREVS initiates* *RRP MG Set Scoop Tubes Lock up* *Multitude of control room annunciators are expected.*	
	RO • Recognize/report loss of RPS Bus 12 • Recognize/report half scram. • Recognize/report lock up RRP MG Set Scoop Tubes. • Recognize/report loss of normal R.B. vent and start of RBEVS.
Role Play As Elec. Maint., wait five minutes report that a fault on the supply breaker to the UPS will prevent restoration of the UPSs for a day or two.	**SRO** • Acknowledge report from the crew. • Direct respond to loss of RPS Bus 12 per N1-SOP-40.1 • Direct EM to investigate UPS 172A.

Role Play: As in-plant operator, if directed to transfer RPS Bus 12 to the maintenance bus, wait approximately 2 minutes and insert the following remote: **RP04**, RPS BUS 12 POWER SOURCE, MAINT **TRG4**	**RO** • Acknowledge direction from the SRO. • Enter N1-SOP-40.1 and update crew • Confirms Computer Point G187 Restores per N1-OP-40 • Dispatch in-plant operator to transfer RPS Bus 12 to maintenance bus. • Acknowledge report from plant operator and update crew • Discuss priorities with SRO • Reset RPS Channel 12 Containment High Pressure signals (Back panel) • Reset half scram
Note: Per N1-OP-40, the following Tech Specs may apply throughout this transient: 3.6.3, 3.1.2, 3.1.6, 3.1.8, 3.4.4, and 3.4.5 The plant is in a 14 day LCO per 3.6.3 **Note:** The SRO may also opt to enter N1-SOP-16.1 due to the loss of FW Heating.	**SRO** • Acknowledge report that RPS Bus 12 is re-energized • Direct restoration priorities using N1-SOP-40.1

Note: The subsequent actions will be prioritized and may not happen before next event. Lead examiner may move on to next event once half scram is reset.
 	
After RPS Bus 12 is re-energized, the BOP would normally perform the following:
 	
• Reset ATWS LOV
• Reset ATWS Ch. 12 Trouble per ARP F3-4-3
• Restore RPS Bus 12 Loads
  ○ Close 77.3-16 (15), Off Gas Vacuum Pump 12 (11) FCV
  ○ Restore Feedwater Control System 12 to the normal power source
  ○ Give 77-03 an open signal
  ○ Give close signals to Emergency Cooling CRVs 39-05 and 39-06
  ○ Closes N2 Supply 12 PCV
  ○ Reset EC Vent Rad Monitors
  ○ Reset Containment Spray Raw Water Rad Monitors
  ○ Give SJAE Interstage Blocking Valves on H-Panel an OPEN signal
  ○ Resets APRM flow units
  ○ Resets LPRM alarms on auxiliary drawers
• Restore Reactor Building Ventilation
• Reset Reactor Building Vent Radiation Monitors
• Restore Normal Control Room Ventilation	

Events #6, #7, and #8: RWCU Leak in the Secondary Containment, Failure of the RWCU Isolation Valves, Failure of Mode Switch to Scram

Event Information	• Unisolable RWCU leak into Reactor Building • RPV Blowdown will be required • Crew may anticipate blowdown • Mode switch fails to scram

When directed by lead examiner, **insert malfunction**: **CU11,** CU Coolant Leak Outside of Drywell, FV=45 **TRG 5** *Rising temperatures, pressures and radiation levels in the Secondary Containment* *RBEVS auto-starts (if secured from previous event)* *RBVS isolates (if restored from previous event)* *RWCU IVs fail to close on isolation signal and manually* *Expected Annunciators:* *H1-4-8, AREA RADIATION MONITORS* *L1-4-3, REACT BLDG VENT RAD MONITOR OFF NORMAL* *L1-3(4)-6, EMER VENT SYS CHANNEL 11(12) RELAY OPERATE (~1 min)* *K3-3-4, CLEAN-UP SYS LEAK AREA T HI (~5 min)* *L1-3-3, CONTINUOUS AIR RAD MONITOR (~1 min)* *K3-1-6, CU Pump 12 Trip* *Later Reactor Building D/P goes to Zero* Verify the following **malfunctions** are **preset**: **CU14,** CU Isolation Valves Stuck Open Verify the following **overrides** are **preset:** **13S70DI4674,** POS_1 1E67 REAC. SW.-RUN, FV=on **13S70DI4675,** POS_2 1E67 REAC. SW.-SHUTDOWN, FV=off	**CREW** • Diagnoses/reports leak from RWCU into secondary containment • Diagnoses/reports RWCU failed to isolate • Recognize/report failure of Mode Switch

Event 6, 7 and 8 continued **Note:** RBEVS initiation will only be necessary if normal RB ventilation was restored following the loss of RPS 12.	**SRO** • Acknowledges reports • Enters N1-EOP-5, Secondary Containment Control, on high Reactor Building Vent rad levels, high Reactor Building area temperatures loss of D/P and rad levels • Directs RWCU system isolation • Directs Reactor Building evacuation • Acknowledges report that RWCU failed to isolate both automatically and manually • Directs dispatching of an operator and RP tech to obtain general area temperatures and radiation levels in the Reactor Building • When Reactor Building Ventilation exhaust radiation exceeds 5 mR/hr, directs verification of RB Vent isolation and RBEVS initiation • Determines area temperatures and radiation levels are above setpoints in Tables T and R, and transitions to N1-EOP-5 circle 27 • Determines a primary system is discharging into the Reactor Building and the discharge cannot be isolated, and transitions to N1-EOP-5 circle 28 • Before any area temperature or radiation level reaches 135°F or 8 R/hr, respectively: • **Directs manual scram (CT-1.0)** • Acknowledges scram report

Event 6, 7 and 8 continued	**SRO continued**
Note: Anticipatory blowdown is likely to be directed from N1-EOP-2 once one Reactor Building General Area temperature is above 135°F with a second temperature trending towards 135°F.	• Enters N1-EOP-2, RPV Control on low RPV water level • Answers "Are all control rods inserted to at least position 04?" YES • Directs entry into N1-SOP-1, Reactor Scram • Directs RPV water level control 53-95" using Feedwater/Condensate and CRD • Directs RPV pressure maintained <1080 psig using Emergency Condensers & TBVs • May direct anticipatory blowdown with Emergency Condensers with cooldown in excess of 100°F/hr • Acknowledges reports of Reactor Building temperatures and radiation levels • When report is received that 2 General Areas temperatures are above 135°F, enters N1-EOP-8, RPV Blowdown • Answers "Are all control rods inserted to at least position 04" YES • Answers "Drywell pressure?" <3.5 psig • Directs initiation of Emergency Condensers • Answers "Torus water level?" >8 ft • **Directs open 4 ERVs (CT-2.0)**

Event 6, 7 and 8 continued
 	
When control rods insert, verify **triggers 29 and 30 automatically initiate** and **delete** the following **overrides**:
13S70DI4674, POS_1 1E67 REAC. SW.-RUN
13S70DI4675, POS_2 1E67 REAC. SW.-SHUTDOWN
	RO
	• Makes evacuation announcements due to steam leak
	• Places Reactor Mode Switch to SHUTDOWN
	• Recognizes/reports failure of Mode Switch to scram
	• Depresses RPS manual scram pushbuttons and/or manually initiates ARI
	• Provides scram report
	• Performs scram verification actions of N1-SOP-1, Reactor Scram:
	  • Confirms all rods inserted
	  • Observes Reactor power lowering
	  • Places IRMs on range 9
	  • Inserts IRM and SRM detectors
	  • Down-ranges IRMs as necessary
	• Reduces Recirc Master flow to 25-43 x 10^6 lbm/hr
	• Verifies main turbine and generator tripped
	• Controls RPV pressure as directed using Emergency Condensers or TBVs

Event 6, 7 and 8 continued
 	
Role Play: If dispatched to attempt RWCU valve closures, acknowledge direction and delay action.
 	
Note: No General Area temperature information is available until an operator has been dispatched to the Reactor Building to monitor area temperatures. The timeline of field reports may be adjusted by examiner as necessary for evaluation purposes.
 	
Role Play: When directed as operator and RP tech to obtain General Area temperatures and radiation levels in the Reactor Building:
 	
Wait 4 minutes and report RB 261' east side temperature is 125°F and rising, radiation level is 100 mr/hr and rising. Also report that you see steam coming from the area of the RWCU rooms.
 	
Wait 2 more minutes and report RB 261' east side temperature is 137°F and rising, radiation level is 150 mr/hr and rising. Report RB 261' west side temperature is 123°F and rising, radiation level is 35 mr/hr and rising.
 	
Wait 3 more minutes and report RB 261' east side temperature is 145°F and rising, radiation level is 175 mr/hr and rising. Report RB 261' west side temperature is 136°F and rising, radiation level is 45 mr/hr and rising.
	BOP
	• Attempts to isolate RWCU by closing 33-01R, 33-02R and 33-04R
	• Recognizes/reports failure of RWCU IVs (33-01R, 33-02R and 33-04R) to close
	• Dispatches operator and RP tech to obtain Reactor Building General Area temperatures and radiation levels
	• Notifies crew of reports on General Area temperatures and radiation levels
	• Performs RPV water level control actions of N1-SOP-1:
	• Restores RPV water level to 53-95" by controlling injection. (unable to reject through RWCU)
	• Determines #13 FWP was running
	• Determines RPV water level is recovering
	• Verifies at least one Electric FW Pump running
	• Terminates 13 FWP injection as follows:
	  • Places FWP 13 FCV in manual and closes
	  • Disengages 13 FWP
	  • Gives 29-10, FEEDWATER PUMP 13 BLOCKING VALVE a CLOSE signal
	• Verifies RPV water level above 53"
	• Verifies 11/12 FWP controllers in MANUAL and set to zero output
	• Resets HPCI signal
	• Places 11 or 12 FWP BYPASS Valve in AUTO, sets to 65-70"
	• If RPV level reaches 85 inches and rising, then:
	  • Verifies off all Feedwater Pumps
	  • Secures CRD Pumps not required
	  • Closes FWIVs if required
	  • Closes MSIVs if required

Event 6, 7 and 8 continued	**BOP continued**
	• Maintains RPV water level in assigned band
	• Notifies crew of reports on General Area temperatures and radiation levels
	• When EOP-8, RPV Blowdown, is entered:
	  • Verifies Emergency Condensers in service
	  • Verifies open 39-05
	  • Verifies open 39-06
	  • **Opens 4 ERVs (CT-2.0)**

Event Termination Criteria	• RPV Blowdown in progress

Facility: Nine Mile Point Unit 1 Scenario No.: NRC-3 Op-Test No.: LC1 15-1

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: The plant is operating at approximately 100% power. ESW Pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking.

Turnover: Remove Line 4 from service per N1-OP-33A to support National Grid maintenance.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Remove Line 4 from Service N1-OP-33A, Technical Specifications
2	AD05	C – BOP, SRO R – ATC	ERV Inadvertently Opens N1-SOP-1.4, N1-SOP-1.1, Technical Specifications
3	ED04	C – All	Powerboard 11 Electrical Fault N1-SOP-30.1, N1-SOP-1.3, N1-SOP-1.1, Technical Specifications
4	EC01	M – All	Steam Leak in Primary Containment N1-SOP-1, N1-EOP-2, N1-EOP-4, N1-EOP-8
5	PC10A PC10C	C – All	Torus to Drywell Vacuum Breaker Inadvertently Opens N1-EOP-4
6	FW28A FW28B FW06 CS07	C – BOP, SRO	HPCI Fails to Auto-Initiate, Feedwater Pump 13 Disengages, and Core Spray Valves Fail to Auto-Open N1-EOP-2
7	Overrides	C – ATC, SRO	Partial Primary Containment Isolation Failure N1-SOP-40.2
8	CT01A	C – All	Containment Spray Pump 111 Trips N1-EOP-4

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

Facility: **Nine Mile Point Unit 1** Scenario No.: **NRC-3**		Op-Test No.: **LC1 15-1**
1. Total malfunctions (5-8) **Events 2, 3, 4, 5, 6, 7, 8**	7	
2. Malfunctions after EOP entry (1-2) **Events 5, 6, 7, 8**	4	
3. Abnormal events (2-4) **Events 2, 3, 7**	3	
4. Major transients (1-2) **Event 4**	1	
5. EOPs entered/requiring substantive actions (1-2) **N1-EOP-2, N1-EOP-4**	2	
6. EOP contingencies requiring substantive actions (0-2) **N1-EOP-8**	1	
7. EOP Based Critical tasks (2-3)	2	
CRITICAL TASK DESCRIPTIONS:		**CRITICAL TASK JUSTIFICATION:**
CT-1.0: Given an inadvertently open ERV at power, close the ERV or insert a manual scram prior to Torus temperature exceeding 110°F, in accordance with N1-SOP-1.4		A manual Reactor scram is required before Torus temperature exceeds 110°F. This reduces the rate of energy production and thus heat input to the Torus. Additionally, this allows evaluating the success of the Reactor scram before boron injection would be required due to Torus temperature in the event of a failure to scram. Closing the ERV prior to the need for the scram avoids the need for these more substantial actions, prevents challenging the plant with a scram, and stops heat input to the Torus.
CT-2.0: Given a LOCA in the Drywell and a failure of HPCI to initiate, inject with preferred and alternate injection systems to restore and maintain RPV water level above -84 inches, in accordance with N1-EOP-2.		Maintaining Reactor water level above -84 inches ensures adequate core cooling through the preferred method of core submergence. This protects the integrity of the fuel cladding.
CT- 3.0: Given a LOCA in the Drywell and degraded Containment Spray capability, execute N1-EOP-8, RPV Blowdown, when it is determined Torus pressure cannot be maintained below the Pressure Suppression Pressure limit, in accordance with N1-EOP-4.		A Blowdown is required to limit further release of energy into the Primary Containment and to ensure that the RPV is depressurized while pressure suppression capability is still available. This protects the integrity of the Primary Containment.

SCENARIO SUMMARY

The scenario begins at approximately 100% power. ESW pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking. The crew will remove Line 4 from service for maintenance. The SRO will determine the Tech Spec impact.

Next, ERV 111 will inadvertently open. The crew will enter N1-SOP-1.4, Stuck Open ERV. The crew will perform an emergency power reduction to approximately 85% power, then take actions to close ERV 111 **(Critical Task)**. These actions will close the ERV, but leave it inoperable. The SRO will determine the Tech Spec impact.

Next, Powerboard 11 will de-energize due to an electrical fault. This will cause loss of multiple major loads, including a second Recirculation pump, a Service Water pump, and a Circulating Water pump. The crew will respond per N1-SOP-30.1. This will include lowering Reactor power to restore the plant within single Circulating Water pump operating limitations. The SRO will determine the Tech Spec impact of this power loss.

Next, a steam leak will develop inside Primary Containment. The crew will scram the Reactor and execute N1-EOP-2, RPV Control, and N1-EOP-4, Primary Containment Control. After the scram, Feedwater pump 13 will dis-engage early and Feedwater will fail to automatically shift to the HPCI flow-control mode on low Reactor water level. At lower Reactor pressure, Core Spray Isolation Valves will also fail to automatically open. The crew will be able to restore and maintain Reactor water level by manually injecting with preferred and alternate systems (**Critical Task**). Multiple primary containment isolation valves will fail to close on either manual or automatic containment isolation. The crew will be able to manually close these valves. Two Torus-to-Drywell vacuum breakers will fail open, resulting in some steam escaping from the Drywell directly into the Torus airspace. When the crew initiates Containment Spray, Containment Spray pump 111 will trip. These failures will further degrade Primary Containment pressure control. The Pressure Suppression Pressure (PSP) will be exceeded. The crew will blowdown the Reactor per N1-EOP-8 (**Critical Task**).

Exelon Generation.

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Training Id: **NMP1 NRC 2017 Scenario 3** Revision: **0.0**

Title: **ERV Inadvertently Opens, Loss of PB 11, Steam Leak in Containment, HPCI & CS Fail to Auto-Initiate, Containment Isolation Partially Fails, Containment Spray Pump Trips**

	Signature / Printed Name	Date
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	Josh House	
	Phil Carroll	
Facility Reviewer	Pat O'Brien	

References

1. N1-OP-33A, 115 KV System
2. N1-SOP-1.4, Stuck Open ERV
3. N1-SOP-1.1, Emergency Power Reduction
4. N1-SOP-30.1, Loss of Power Board 11
5. N1-SOP-1, Reactor Scram
6. N1-SOP-40.2, Vessel/Containment Isolation
7. N1-EOP-2, RPV Control
8. N1-EOP-4, Primary Containment Control
9. N1-EOP-1, NMP1 EOP Support Procedure
10. N1-EOP-8, RPV Blowdown
11. Unit 1 Technical Specifications

Instructor Information

A. Scenario Description

Sequence of Events / Expected Crew Response:

The scenario begins at approximately 100% power. ESW pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking. The crew will remove Line 4 from service for maintenance. The SRO will determine the Tech Spec impact.

Next, ERV 111 will inadvertently open. The crew will enter N1-SOP-1.4, Stuck Open ERV. The crew will perform an emergency power reduction to approximately 85% power, then take actions to close ERV 111 **(Critical Task)**. These actions will close the ERV, but leave it inoperable. The SRO will determine the Tech Spec impact.

Next, Powerboard 11 will de-energize due to an electrical fault. This will cause loss of multiple major loads, including a second Recirculation pump, a Service Water pump, and a Circulating Water pump. The crew will respond per N1-SOP-30.1. This will include lowering Reactor power to restore the plant within single Circulating Water pump operating limitations. The SRO will determine the Tech Spec impact of this power loss.

Next, a steam leak will develop inside Primary Containment. The crew will scram the Reactor and execute N1-EOP-2, RPV Control, and N1-EOP-4, Primary Containment Control. After the scram, Feedwater pump 13 will dis-engage early and Feedwater will fail to automatically shift to the HPCI flow-control mode on low Reactor water level. At lower Reactor pressure, Core Spray Isolation Valves will also fail to automatically open. The crew will be able to restore and maintain Reactor water level by manually injecting with preferred and alternate systems (**Critical Task**). Multiple primary containment isolation valves will fail to close on either manual or automatic containment isolation. The crew will be able to manually close these valves. Two Torus-to-Drywell vacuum breakers will fail open, resulting in some steam escaping from the Drywell directly into the Torus airspace. When the crew initiates Containment Spray, Containment Spray pump 111 will trip. These failures will further degrade Primary Containment pressure control. The Pressure Suppression Pressure (PSP) will be exceeded. The crew will blowdown the Reactor per N1-EOP-8 (**Critical Task**).

1. Termination Criteria

   a. RPV water level controlled in assigned band
   b. RPV Blowdown in progress
   c. Primary Containment pressure maintained per N1-EOP-4

2. Critical Tasks

CT-1, Given an inadvertently open ERV at power, close the ERV or insert a manual scram prior to Torus temperature exceeding 110°F, in accordance with N1-SOP-1.4

Justification:

Safety Significance: *A manual Reactor scram is required before Torus temperature exceeds 110°F. This reduces the rate of energy production and thus heat input to the Torus. Additionally, this allows evaluating the success of the Reactor scram before boron injection would be required due to Torus temperature in the event of a failure to scram. Closing the ERV prior to the need for the scram avoids the need for these more substantial actions, prevents challenging the plant with a scram, and stops heat input to the Torus.*

Cueing: *ERV position, ERV acoustic monitors, ERV tailpipe temperature, Torus temperature, Reactor pressure, and steam flow indicate an open ERV. N1-SOP-1.4 provides direction to close the ERV or scram the Reactor.*

Measurable Performance Indicators: *Pulling ERV fuses, directing an operator to pull ERV fuses in the field, rotating the Mode Switch to SHUTDOWN, and/or depressing the manual scram pushbuttons will provide observable actions for the evaluation team.*

Performance Feedback: *ERV position, ERV acoustic monitors, ERV tailpipe temperature, Torus temperature, Reactor pressure, and steam flow will provide performance feedback regarding success of crew actions to close the ERV. Control rod position and Reactor power will provide performance feedback regarding success of crew actions to scram the Reactor.*

CT-2, Given a LOCA in the Drywell and a failure of HPCI to initiate, inject with preferred and alternate injection systems to restore and maintain RPV water level above -84 inches, in accordance with N1-EOP-2.

Justification:

Safety Significance: *Maintaining Reactor water level above -84 inches ensures adequate core cooling through the preferred method of core submergence. This protects the integrity of the fuel cladding.*

Cueing: *Multiple Reactor water level indicators and annunciators will provide indications of lowering Reactor water level. N1-EOP-2 provides multiple procedure steps directing injection with preferred and alternate injection systems.*

Measurable Performance Indicators: *Manipulation of pumps and/or valves in the preferred or alternate injection system(s) will provide observable actions for the evaluation team.*

Performance Feedback: *Multiple Reactor water level indicators and annunciators will provide performance feedback regarding the success of injection with preferred and alternate injection systems.*

CT-3, Given a LOCA in the Drywell and degraded Containment Spray capability, execute N1-EOP-8, RPV Blowdown, when it is determined Torus pressure cannot be maintained below the Pressure Suppression Pressure limit, in accordance with N1-EOP-4.

Justification:

Safety Significance: *A Blowdown is required to limit further release of energy into the Primary Containment and to ensure that the RPV is depressurized while pressure suppression capability is still available. This protects the integrity of the Primary Containment.*

Cueing: *Multiple Primary Containment pressure indicators and annunciators will provide indications. N1-EOP-4 provides direction to monitor the Pressure Suppression Pressure limit and blowdown if required.*

Measurable Performance Indicators: *The crew will manually open valves to initiate Emergency Condensers. The crew will manually open ERVs.*

Performance Feedback: *Emergency Condenser and ERV instrumentation will provide indication that these systems are functioning properly once placed in service. Multiple Reactor pressure indicators and annunciators will provide performance feedback regarding the success of the blowdown.*

3. Length

   a. ~60 minutes

4. Mitigation Strategy Code

   a. PC4, RPV Blowdown due to PSP

5. Technical Specifications

   a. TS 3.6.3.b

   b. TS 3.1.5.b

   c. TS 3.1.8.b

6. Special Orders

   a. None

B. Initial Conditions

1. IC Number

   a. IC-153

2. Presets / With Triggers

   a. Malfunctions

1)	**NM10A,** IRM CHANNEL 11 FAILURE- UPSCALE	**Inserted**
2)	**CW03B,** EMERGENCY SERVICE WATER PUMP TRIP 12	**Inserted**
3)	**FW28A,** HPCI MODE FAILURE TO INITIATE 11	**Inserted**
4)	**FW28B,** HPCI MODE FAILURE TO INITIATE 12	**Inserted**
5)	**CS07,** CS Injection Valves Failure to Auto Open	**Inserted**
6)	**CT01A,** CT Pump 111 Trip	**Inserted**
7)	**AD05**, ERV 111 Failure - Opens Inadvertently	**TRG 1**
8)	**ED04,** PB 11 Electrical Fault	**TRG 2**
9)	**EC01,** Steam Supply Line Break in PC, FV=11%	**TRG 3**
10)	**FW06,** SHAFT DRIVEN FEEDWATER PUMP CLUTCH FAILS - DISENGAGES, DT=20 seconds	**TRG 23**
11)	**PC10A,** BV 68-01 Fails Open, Delay= 30 sec	**TRG 23**
12)	**PC10C,** BV 68-03 Fails Open, Delay=30 sec	**TRG 23**

   b. Remotes

1)	**AD01A,** ERV 111 Fuses, Pulled	**TRG 27**
2)	**AD07,** Acoustic Monitor Alarm Reset, RESET	**TRG 28**

   c. Overrides

1)	**11S33DI5423,** SET 1010 RPS CH.11 BYPASS SW, FV=on (Partial primary containment isolation failure)	**Inserted**
2)	**11S34DI5424,** SET 1010 RPS CH.12 BYPASS SW, FV=on (Partial primary containment isolation failure)	**Inserted**

d. Annunciators

1) None

e. Event Triggers

Event #	Event Action	Command
TRG 23 – Initiates when the mode switch is taken to SHUTDOWN	zdrpstdn==1	imf ec01 (0 0) 30 4:00 11
TRG 24 – Initiates when Containment Spray flow is initiated	ctfdw>100	imf ec01 (0 0) 45 1:00 30

f. Equipment Out of Service

1) ESW Pump 12 in PTL with info tag

2) IRM 11 bypassed with info tag and off normal

g. Support Documentation

1) N1-OP-33A Section H.12 marked up to Step H.12.9.

h. Miscellaneous

1) Ensure Drywell cooling fan 11 is secured with control switch in neutral.

2) Protect the following equipment: EDG102, EDG 103, PB 102, PB 103, Line 1, MOD 8106.

SHIFT TURNOVER INFORMATION

ON COMING SHIFT: ☐ N ☐ D DATE: Today

PART I: To be performed by the oncoming Operator before assuming the shift.

- Control Panel Walkdown (all panels) (SRO, ROs)

PART II: To be reviewed by the oncoming Operator before assuming the shift.

- LCO Status (SRO)
- Shift Turnover Information Sheet

Evolutions/General Information/Equipment Status:

- Reactor power is approximately 100%.
- ESW Pump 12 is out of service for maintenance
- IRM 11 is bypassed due to spiking

PART III: Remarks/Planned Evolutions:

- Remove Line 4 from service per N1-OP-33A Section H.12 to support National Grid maintenance. The procedure has been completed up to Step H.12.9.

Shift Turnover

Instructor Actions / Plant Response	Operator Actions
Take the Simulator out of freeze before the crew enters for the pre-shift walkdown. • Verify annunciator sound turned on • If recording scenario, start the recording device during the pre-shift walkdown	
Allow no more than 5 minutes to walkdown the panels.	**Crew** • Walkdown panels • Conduct shift turnover brief • Assume the shift

Event #1: Remove Line 4 From Service

Event Information	• Initial reactor power is ~100% • The crew will remove line 4 from service

	SRO • Directs removing Line 4 from service per N1-OP-33A Section H.12 • Provides oversight for evolution • Determines Technical Specification 3.6.3.b requires returning Line 4 to service within 7 days.
Role Play: When asked as Operator to confirm R40 position, immediately report all three phases of R-40 are open.	**BOP** • Reviews N1-OP-33A Section H.12 • (step H.12.9) Verifies Auto Reclosure for R-40 breaker is OFF • Opens breaker R-40 • Dispatches Operator to confirm R-40 open locally on ALL 3 phases • Notifies SM to review TS for appropriate LCO applicability • Continues at Section H.9.0, Loss of 115 KV Line 4
	ATC • Monitors plant parameters • Provides peer checks as needed

Event #2: ERV 111 Inadvertently Opens

Event Information	• ERV 111 Inadvertently Opens • Operators will respond per SOP-1.4 to attempt to shut the ERV and SOP1.1 to lower power. • The ERV will shut when fuses are pulled

When directed by lead examiner, **insert malfunction**: **AD05,** ERV 111 Failure – Opens Inadvertently **TRG 1** *ERV 111 opens* *Reactor pressure lowers slightly* *Reactor power lowers and then rises slightly* *Torus temperature rises* *Torus level rises* *Expected annunciators:* *F1-4-8, STEAM LINE DETECTION SYS FLOW OFF NORM* *F2-4-1, MAIN STM LINE ELECTROMATIC RELIEF VALVE OPEN* *H3-4-5, PRESS SAFETY/RELIEF VALVES FLOW*	**CREW** • Acknowledges/reports annunciators • Diagnoses ERV 111 has inadvertently opened

Event 2 continued	**SRO** • Acknowledges reports • Directs entry into N1-SOP-1.4, Stuck Open ERV • Directs emergency power reduction to approximately 85% power • Provides oversight for reactivity manipulation • Determines that ERV 111 is inoperable per TS 3.1.5.b, requiring a 10 hour shutdown • **Directs taking action to close ERV 111 or directs a manual scram prior to Torus temperature exceeding 110°F, in accordance with N1-SOP-1.4** **CT-1** • Acknowledges that ERV 111 has closed • Enters N1-EOP-4 if Torus temp rises above 85°F or Torus level rises above 11.25' - Directs Containment Spray to PTL • May direct initiation of Torus Cooling per N1-EOP-1 att 16 or N1-SOP-1.4
	ATC • Performs emergency power reduction per N1-SOP-1.1 • Reduces Recirculation master controller to lower power to approximately 85% • Monitors APRMs • Monitors Recirculation flow • Monitors Feedwater flow and RPV water level • Monitors position on power to flow map • **If Torus temperature approaches 110°F, inserts manual Reactor scram** **CT-1**

Event 2 continued **Role Play:** When directed as Operator to go to Auxiliary Control Room and verify ERV 111 is open, wait one minute and report ERV 111 is open. Subsequent reports on acoustic monitor status may be given immediately, with close attention paid to the actual status of the ERV. **Note:** Safety glasses, gloves, and long sleeves or a lab coat are required for pulling fuses in F panel. **Role Play:** If the Operator is directed to pull fuses in the RB wait 3 minutes and **insert remote**: **AD01A,** ERV 111 Fuses, FV=pulled **TRG 27** Report fuses are pulled. **Role Play:** When directed as operator to reset the acoustic monitor, wait 1 minute and **insert remote**: **AD07,** Acoustic Monitor Alarm Reset, FV=reset **TRG 28** Report acoustic monitor is reset.	**BOP** • Enters N1-SOP-1.4 • Determines ERV 111 is open using: - Valve indicating lights on F panel - Red ERV flow indicating light on F panel • Sends an operator to the Aux Control Room to verify ERV open using Acoustic Monitor • May send an operator to RB 237' to standby for pulling local ERV fuses • Attempts to close ERV 111 by performing one or all of the following: - Depresses ADS Timer Reset pushbuttons - Cycles Control Switch for ERV 111 - **Pulls control power fuses F15 and F30 in F panel (ERV 111)** ○ **OR** - **Directs operator to pull ERV 111 fuses on RB 237'** **CT-1** • Checks with operator in Aux Control Room to see if ERV is still open • Determines/verifies ERV closes • Directs reset of acoustic monitor • Notifies crew that ERV 111 has closed • Monitors Torus temperature • Reports if/when Torus temperature exceeds 85°F or Torus level exceeds 11.25' - Places Containment Spray pumps in PTL if directed

	BOP continued • Places Torus cooling in service when directed, per N1-SOP-1.4, att 2 or N1-EOP-1 att 16: - Close CONT SPRAY BYPASS BV(s) for selected loop - Verifies closed 80-115 - Verifies closed 80-114 - Verifies closed Cont Spray Discharge IV for selected loop - Verifies open CONT SPRAY BYPASS BV for selected loop - Fully opens 80-118 - Starts Containment Spray Raw Water pump in selected loop - Starts Containment Spray pump in selected loop

Event #3: Powerboard 11 Electrical Fault

Event Information	• 4160V Power board 11 de-energizes and will not be available for the remainder of the scenario.

When directed by lead examiner, **insert malfunction**:
 	
ED04, PB 11 Electrical Fault
TRG 2
 	
Reactor power lowers due to RRP trips
Reactor water level rises due to RRP trips
Expected Annunciators:
A4-1-1, PB 11 R113 TRIP
A4-4-2, POWER BD 16 LOW BUS VOLTAGE
L1-3-4, REACT BLDG/ATM DIFF PRESS
Also the following equipment trips:
Reactor Recirculation Pump 11/12
Drywell Fans 14, 15, 16
Condensate Pump 11
Circulating Water Pump 11
Service Water Pump 11
RBCLC Pump 11
TBCLC Pump 11
IAC 11
Reactor Building Exhaust Fan 11
	CREW
	• Diagnose/report loss of PB 11
	• Recognize/report loss of:
	  • Reactor Recirculation Pump 11/12
	  • Drywell Fans 14, 15, 16
	  • Condensate Pump 11
	  • Circulating Water Pump 11
	  • Service Water Pump 11
	  • RBCLC Pump 11
	  • TBCLC Pump 11
	  • IAC 11
	  • Reactor Building Exhaust Fan 11
	• Recognize/report drop in Reactor power
	• Recognize/report lowering condenser vacuum
	• Recognize/report loss of Reactor Building D/P

Note: On the loss of Powerboard 11, Recirc pumps 11 and 12 trip. The APRMs are inoperable due to reverse flow through the tripped Recirc loops. The APRMs will be declared operable once the discharge valves are closed.	**SRO** • Acknowledges reports from crew • Directs entry into N1-SOP-30.1 • Directs Emergency Power Reduction per N1-SOP-1.1 to stabilize condenser vacuum, as necessary • Provides oversight for reactivity manipulation • Directs entry into N1-SOP-1.3, Recirculation Pump Trip • Directs RO to re-energize Powerboards 16A and 13A-15A • May enter N1-EOP-5, Secondary Containment Control, on loss of Reactor Building D/P • Directs restoration of Reactor Building D/P with either RBVS or RBEVS • May direct entry into N1-SOP-6.1 for loss of Spent Fuel Pool Cooling, as time permits • Reviews Technical Specifications • Acknowledges that the APRMs are inoperable while the RRP discharge valves are still open • Determines Technical Specification 3.1.7.e limits Reactor power to 90% in 3 loop operation • Determines Core Operating Limits Report (COLR) requires APLHGR and MCPR penalties • Determines Technical Specification 3.1.8.b is entered again for loss of power to Feedwater pump 11 and Condensate pump 11 • May enter EOP-4 if DW conditions permit.

	ATC • Acknowledges direction from SRO • Confirms plant is stable by verifying: - No thermal hydraulic Instability - 3 Recirc pumps running - Not operating in the Restricted Zone • Executes N1-SOP-1.1, Emergency Power Reduction, to lower recirc flow and/or insert CRAM rods to stabilize condenser vacuum, as required • Determines plant operating point on the 3-loop power to flow curves
Role Play: If dispatched to investigate Powerboard 11, wait 2 minutes then report that the normal supply breaker (R113) tripped on overcurrent. If dispatched to investigate Powerboard 16A, wait 2 minutes then report that there are no problems evident at Powerboard 16. Report that electrical maintenance has also looked at the Powerboard and concurs with re-energizing it. **Role Play:** If dispatched to lineup Steam Packing Exhauster 12, wait 4 minutes, then **insert remote**: **MS09, SPE 12 SUCTION VLV, FV=open** Then report task completion. If asked to also close suction valve to Steam Packing Exhauster, wait 2 minutes, then **insert remote**: **MS08, SPE 11 SUCTION VLV, FV=close** Then report task completion.	**BOP** • Executes N1-SOP-30.1, Loss of Power Board 11 • Starts Service Water pump 12 • Coordinates with ATC to monitor APRMs and LPRMs • Verifies TBCLC pump 12 running • Verifies IAC 12 and/or 13 running • Verifies RBCLC pump 12 running • Verifies Steam Packing Exhauster 12 running • Answers “Are A4-4-6, A4-4-7, A4-1-3 OR A5-2-8 in alarm” YES Determines Power Board 11 is faulted and cannot be reenergized

Event 3 continued	**BOP continued**

Role Play: As operator when directed to energize Powerboards 13A-15A, acknowledge order. If asked about status during remainder of scenario, report that you are being briefed by the WEC.
 	
Role Play: As operator when directed to restore Offgas vacuum pump, acknowledge order. If called for a status on actions, report that you are being briefed by the WEC.
 	
Role Play: As operator when directed to investigate Spent Fuel Pool Cooling, wait 3 minutes and then report that SFPC pump 11 has tripped.
	• Restores power to Powerboard 16A as follows:
	  • Opens R1041
	  • Closes R1042
	  • Verifies Power Board 16B amps <962
	• Dispatches operator to re-energize Power Boards 13A, 14A, and 15A
	• Notifies SRO that APRMs are inoperable
	• Closes Recirc pump 11 and 12 discharge valves
	• Holds open for 2-3 seconds Recirc pump 11 and 12 discharge valve
	• Records time when Recirc pump 11 and 12 discharge valve is cracked open
	• Executes N1-SOP-1.3, Recirc Pump Trip, as time permits
	• Dispatches operator to restore Offgas Vacuum Pump
	• Enters N1-SOP-6.1 for loss of Spent Fuel Pool Cooling, as time permits
	Dispatches operator to investigate loss of Spent Fuel Pool Cooling, as time permits

Event 3 continued	**BOP continued**

	• Respond to either annunciator (or as directed by SRO) and restore RB D/P:
	  • L1-1-5, RB VENT EXH FAN 11-12 TRIP – VIB
	  ○ Verifies closed Reactor Building Exhaust Fan 11 outlet damper
	  ○ Starts Reactor Building Exhaust Fan 12
	  • L1-3-4, REACT BLDG/ATM DIFF PRESS
	  ○ Starts RBEVS per OP-10
	
	Possible actions in OP-10 Section H.1.0 to start RBEVS
	• Verifies open 202-36, EM VENTILATION FROM REACTOR BLDG BV
	• Verifies closed the following valves:
	  • 202-47, EM VENTILATION TIE BV
	  • 202-74, EM VENTILATION LOOP 11 COOLING BV
	  • 202-75, EM VENTILATION LOOP 12 COOLING BV
	• Places 202-37(38), EM VENTILATION LOOP 11(12) INLET BV control switch to OPEN
	• Verifies open 202-37(38), EM VENTILATION LOOP 11(12) INLET BV
	• Starts 202-53(33), EVS FAN 11(12)
	• Verifies open 202-34(35), EM VENT EXHAUST FAN 11(12) OUTLET BV
	• Confirms proper operation of 202-50(51), EM VENT EXHAUST FAN 11(12) INLET FCV, by observing indicating lights and flow indication
	• Notifies Rad Protection that the Reactor Building Emergency Ventilation system is in service

Role Play: As RP, acknowledge report that RBEVS is in service and RBVS is secured.	

Event #4, #5, #6, #7, #8: Steam Leak Inside Primary Containment, Vacuum Breaker Fails Open, Failure of HPCI to Auto-Initiate, Partial Primary Containment Isolation Failure, and Trip of Containment Spray Pump 111

Event Information	• A steam leak develops in the Primary Containment • The crew will scram the reactor • Feedwater fails to operate in HPCI mode, so the crew will need to operate manually • Primary containment parameters are complicated by Torus to Drywell vacuum breakers opening and the partial failure of the containment to isolate. • The crew will need to blow down the reactor in an attempt to avoid violating PSP.

When directed by the lead examiner, **insert malfunction**: **EC01, Steam Supply Line Break in PC, FV=11** **TRG 3** *Drywell humidity, pressure and temperature rise* *Drywell leakage rises* *Expected annunciators:* *H2-1-1, Drywell Floor Drain Level High* *H2-4-7, Drywell Water Leak Detection Sys* *K2-4-3, Drywell Pressure High-Low* *F1-1-5(4-1-4), RPS Ch 11(12) Drywell Press High* Verify the following **malfunctions** are **preset**: **FW28A, HPCI Mode Failure to Initiate 11** **FW28B, HPCI Mode Failure to Initiate 12** **CT01A, CT Pump 111 Trip** **CS07, CS Injection Valves Failure to Auto Open** *Feedwater pump 12 running but not injecting* *RPV water level slowly lowering* *Containment Spray pump 111 red light off, green light on and amps go to zero* *Core Spray IVs do NOT open at 365 psig* *Expected annunciator:*	**CREW** • Diagnose/report degrading containment parameters • Acknowledge/report annunciators • Diagnose failure of HPCI to automatically initiate • Diagnose partial failure of primary containment isolation • Diagnose the trip of Containment Spray pump 111

K1-1-7, Containment Spray Pump 111 Trip Fail to Run	
Events 4, 5, 6, 7 & 8 continued Verify the following **malfunctions automatically insert** when the mode switch is taken to SHUTDOWN: **FW06, SHAFT DRIVEN FEEDWATER PUMP CLUTCH FAILS – DISENGAGES, Delay=20 seconds** **EC01, Steam Supply Line Break in PC, IV=11, RT=4:00, FV=30** **PC10A, BV 68-01 Fails Open, Delay=:30** **PC10C, BV 68-03 Fails Open, Delay=:30** **TRG 23** *Containment conditions further degrade* *Feedwater pump 13 disengages* *Reactor water level remains low* *Two Torus-to-Drywell vacuum breakers indicate open* *Expected annunciator:* *K1-4-6, Torus-DW Vac Relief Check Valve Open* Verify the following **overrides** are **PRESET** to cause partial primary containment isolation failure: **11S33DI5423, SET 1010 RPS CH.11 BYPASS SW, FV=on** **11S34DI5424 SET 1010 RPS CH.12 BYPASS SW, FV=on**	**SRO** • Acknowledges reports • Directs manual scram • Acknowledges scram report • Enters N1-EOP-2 on low RPV water level • Directs N1-SOP-1 actions • Directs RPV water level controlled 53-95" with Condensate/FW and CRD • **When notified of the failure of HPCI to initiate, directs manual control of Feedwater (preferred and alternate injection systems)** **CT-2** • Directs RPV pressure controlled 800-1000 psig with Turbine Bypass Valves or Emergency Condensers • May direct closure of MSIVs to limit cooldown rate • Enters N1-EOP-4 due to high drywell pressure and temperature ○ Direct lockout of Containment Spray pumps • Re-enters N1-EOP-2 due to high drywell pressure • Directs execution of N1-SOP-40.2 for isolation verification • Acknowledges partial failure of primary containment isolation Directs/acknowledges manual closure of primary containment isolation valves

Verify the following **malfunction automatically inserts** when Containment Spray flow is initiated to the Drywell:
 	
EC01, Steam Supply Line Break in PC, IV=30, RT=1:00, FV=45
 	
Note: Core Spray injection will only be prevented if not needed for core cooling. If the crew has not yet re-established RPV injection when this step is evaluated, the Core Spray jumpers may not be installed until later. EOP-2 step P-1 provides continuous guidance for this consideration.
	SRO continued
	
	• When Torus pressure exceeds 13 psig or Drywell temperature approaches 300°F:
	  • Answers "Below the Containment Spray Initiation Limit?" – Yes
	  • Verifies all Recirc pumps tripped
	  • Directs trip of all Drywell cooling fans
	  • Directs operation of Containment Spray per N1-EOP-1 attachment 17
	• Evaluates/monitors position on Pressure Suppression Pressure curve
	• Acknowledges report of Containment Spray pump 111 trip
	• May direct rapid depressurization with ECs in anticipation of RPV Blowdown
	• Determines Torus pressure cannot be maintained within Pressure Suppression Pressure limit
	• **Enters N1-EOP-8, RPV Blowdown**
	
	CT-3
	
	  • Answers "Are all control rods inserted to at least 04?" YES
	  • Answers "Drywell pressure?" At or above 3.5 psig
	  • May direct prevention of Core Spray injection per N1-EOP-1 attachment 4
	  • Directs EC initiation
	  • Answers "Torus water level?" Above 8.0 ft
	  • Directs open 4 ERVs

Events 4, 5, 6, 7 & 8 continued
 	
Note:
 	
The failed primary containment isolation valves are controlled by three control switches.
	ATC
	
	• Monitors plant parameters
	• When directed, places Mode Switch in Shutdown
	• Provides scram report
	• Performs N1-SOP-1, Reactor Scram, scram verification actions
	  • Places IRMs on range 9
	  • Inserts IRM and SRM detectors
	  • Down-ranges IRMs as necessary to monitor power decrease
	  • If recirc pumps have not yet tripped, reduces recirc flow to 25-43 Mlbm/hr
	  • Maintains RPV pressure below 1080 psig and in assigned band
	• Executes N1-SOP-40.2
	  • Recognizes/reports failure of multiple primary containment isolation valves to automatically close
	  • Manually closes the following valves:
	  • 201.7-01 & 02, 201.2-110 & 111, 201.2-109 & 112 (11 H2O2)
	  • 201.2-23 & 24, 201.2-29 & 30 (12 H2O2)
	  • 201.7-08 & 09, 201.7-10 & 11 (Drywell CAM)
	  • Reports primary containment isolation valves have been manually closed

Events 4, 5, 6, 7 & 8 continued
 	
Note: Feedwater level control actions will vary depending on when the operator diagnoses the failure of HPCI to automatically control injection through Feedwater flow control valves 11 and 12.
	BOP
	• Monitors/reports degrading Containment parameters
	• Performs RPV water level control actions of N1-SOP-1, Reactor Scram:
	  • Restores RPV level to 53-95" by controlling injection and rejecting through RWCU
	  • Determines #13 FWP was running
	  • Determines RPV water level is recovering
	  • Terminates 13 FWP injection as follows:
	  • Closes 13 FWP VALVE CONTROL
	  • Disengages 13 FWP
	  • Closes 29-10, Feedwater Pump 13 Blocking Valve
	  • Verifies RPV water level above 53"
	  • Verifies 11/12 FWP controllers in MANUAL and set to zero output
	  • Places FWP BYPASS Valve 11 or 12 in AUTO, sets to 65-70 inches
	  • If RPV level reaches 85 inches and rising, then:
	  • Verifies off all FW Pumps
	  • Secures CRD Pumps not required
	  • Diagnoses failure of HPCI to automatically initiate
	  • Notifies SRO/Crew of HPCI failure
	  • **Manually controls RPV injection to restore and maintain level**
	
	CT-2

Events 4, 5, 6, 7 & 8 continued
 	
Note: Core Spray pumps may be placed in PTL if needed before EOP-1 attachment 4 jumpers can be installed due to scenario progression and resource limitations. If Core Spray pumps are placed in PTL, at least one Core Spray pump should be restarted after jumper installation for App J water seal. Core Spray may also be used as an alternate injection source.
	ATC/BOP
	• Places Containment Spray pumps in PTL
	• Closes MSIVs, as directed
	• Reports when Torus pressure exceeds 13 psig or Drywell temperature approaches 300°F
	• Verifies Recirc pumps tripped
	• Trips Drywell cooling fans
	• Initiates Containment Spray per N1-EOP-1 attachment 17
	  • Diagnoses/reports Containment Spray pump 111 trip
	  • Verifies started Containment Spray pumps 121 and 122
	  • If 80-118 is open for Torus Cooling:
	  • Opens 80-35
	  • Closes 80-118
	  • Verifies open 80-40 and 80-45
	• Prevents Core Spray injection installing N1-EOP-1 attachment 4 jumpers (17, 18, 19, 24, 25, 26), if directed
	• Initiates both ECs
	• **Opens 4 ERVs**
	
	CT-3

Event Termination Criteria	• RPV water level controlled in assigned band • RPV Blowdown in progress • Primary Containment pressure maintained per N1-EOP-4

Facility: Nine Mile Point Unit 1 Scenario No.: NRC-4 Op-Test No.: LC1 15-1

Examiners: _____ Operators: _____
_____ _____
_____ _____

Initial Conditions: The plant is operating at approximately 95% power. ESW Pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking.

Turnover: Start TBCLC Pump 12 and secure TBCLC Pump 11. Then, raise Reactor power to 98% with Recirculation flow.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Swap Running TBCLC Pumps N1-OP-24
2	N/A	R – ATC, SRO	Raise Reactor Power with Recirculation Flow N1-OP-1, N1-OP-43B
3	NM19A	I-ATC, SRO	APRM #13 fails upscale, half scram, bypass. ARP Tech Spec
4	RD36A	C –BOP, SRO	Control Rod Drive Flow Control Valve 44-151 fails closed, requiring shifting to the alternate FCV N1-SOP-5.1, Tech Spec
5	CW16A	C-BOP, SRO	Service Water Adams Strainer 11 High D/P N1-OP-18, ARP H1-3-2
6	MC01	C –ATC, SRO	Loss of main condenser vacuum N1-SOP-25.1, N1-SOP-1.1, N1-SOP-1
7	RD33	M -ALL	ATWS N1-EOP-2, N1-EOP-3
8	TC12	C -ALL	All Turbine Bypass Valves Fail Closed N1-EOP-8

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

Facility: **Nine Mile Point Unit 1** Scenario No.: **NRC-4**		Op-Test No.: **LC1 15-1**
1. Total malfunctions (5-8) **Events 3, 4, 5, 6, 7, 8**	6	
2. Malfunctions after EOP entry (1-2) **Event 8**	2	
3. Abnormal events (2-4) **Events 3, 4, 5**	3	
4. Major transients (1-2) **Event 6**	1	
5. EOPs entered/requiring substantive actions (1-2) **N1-EOP-2**	1	
6. EOP contingencies requiring substantive actions (0-2) **N1-EOP-3, N1-EOP-8**	2	
7. EOP Based Critical tasks (2-3)	3	
CRITICAL TASK DESCRIPTIONS:		**CRITICAL TASK JUSTIFICATION:**
CT-1.0: Given a failure of the reactor to scram with power above 6% and RPV water level above -41 inches, the crew will terminate and prevent all injection except boron and CRD, in accordance with N1-EOP-3.		High Reactor power after a scram is attempted indicates a challenge to nuclear fuel and to plant heat sinks. In the event of a loss of the normal heat sink, this may result in adding heat to the Torus and challenging the Primary Containment. Lowering Reactor power reduces these challenges.
CT- 2.0: Given a failure of the reactor to scram with power above 6%, the crew will lower reactor power by inserting control rods or injecting boron, in accordance with N1-EOP-3.		Inserting control rods lowers Reactor power, which reduces challenges to the plant during a failure to scram. Additionally, inserting control rods ultimately provides a long-term, stable core shutdown. Boron injection will lower power, however, alone may not provide a stable shutdown condition.
CT- 3.0: Given a failure to scram and the inability to restore and maintain RPV water level above -109 inches with the preferred ATWS injection systems, the crew will execute N1-EOP-8, RPV Blowdown and restore and maintain RPV water level above -109 inches with preferred and alternate ATWS injection systems, in accordance with N1-EOP-3.		Reactor water level must be maintained above limits to ensure adequate core cooling. With only low pressure systems available to inject and Reactor pressure above the pressure limits of these systems, Reactor pressure must be quickly lowered to allow injection. This protects the integrity of the fuel cladding.

SCENARIO SUMMARY

The scenario begins at approximately 95% power. ESW pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking. The crew is to start TBCLC pump 12 and secure TBCLC pump 11 per N1-OP-24 section F.1. After the TBCLC pumps are successfully shifted, the crew will raise reactor power with recirc.

Then, APRM 13 will fail upscale causing a half scram. The crew will bypass the APRM and reset the half scram. The CRS will make a Tech Spec call. When the half scram is reset, the Control Rod Drive Flow Control Valve fails closed, requiring shifting to the alternate FCV. After CRD flow is returned to normal, Service Water Adams Strainer 11 will clog, resulting in a high D/P annunciator in the control room. The crew will dispatch an Operator to manually backwash the strainer. When this is unsuccessful at clearing the alarm, the crew will place Service Water pump 12 in service.

Main condenser vacuum will begin to degrade as a result of air in-leakage. The crew will enter N1-SOP-25.1. Power will be lowered per N1-SOP-1.1 and the reactor will be scrammed before vacuum lowers to 22.1" Hg. When the scram is inserted, control rods will only partially insert. The crew will enter N1-EOP-3 to respond to the failure to scram. The crew will terminate and prevent all injection except boron and CRD **(Critical Task)**. The ATWS will be complicated with the failure of TBVs to open. The crew will initiate liquid poison injection and/or take actions in accordance with N1-EOP-3.1 to insert control rods **(Critical Task)**.

Exelon Generation.

Copy ____ of ____

Training Id: **NMP1 NRC 2017 Scenario 4** Revision: **0.0**

Title: **Swap TBCLC Pumps, APRM Upscale Failure, CRD FCV Failure, Adams Strainer Clogging, Loss of Condenser Vacuum, ATWS without TBVs**

	Signature / Printed Name	Date
Developed By	Paul Isham	3/11/16
Validated By	Kevin Hines	8/24/16
	Josh House	
	Phil Carroll	
Facility Reviewer	Pat O'Brien	

References

1. N1-OP-24, TBCLC Water System
2. N1-OP-1, NSSS
3. N1-OP-18, Service Water System
4. N1-OP-43B, Normal Power Operations
5. N1-SOP-1.1, Emergency Power Reduction
6. N1-SOP-5.1, Loss of Control Rod Drive
7. N1-SOP-1, Reactor Scram
8. N1-SOP-25.1, Unplanned Loss of Condenser Vacuum
9. N1-EOP-2, RPV Control
10. N1-EOP-3, Failure to Scram
11. N1-EOP-1, NMP1 EOP Support Procedure
12. N1-EOP-8, RPV Blowdown
13. Unit 1 Technical Specifications

Instructor Information

A. Scenario Description

Sequence of Events / Expected Crew Response:

The scenario begins at approximately 95% power. ESW pump 12 is out of service for maintenance. IRM 11 is bypassed due to spiking. The crew is to start TBCLC pump 12 and secure TBCLC pump 11 per N1-OP-24 section F.1. After the TBCLC pumps are successfully shifted, the crew will raise reactor power with recirc.

Then, APRM 13 will fail upscale causing a half scram. The crew will bypass the APRM and reset the half scram. The CRS will make a Tech Spec call. When the half scram is reset, the Control Rod Drive Flow Control Valve fails closed, requiring shifting to the alternate FCV. After CRD flow is returned to normal, Service Water Adams Strainer 11 will clog, resulting in a high D/P annunciator in the control room. The crew will dispatch an Operator to manually backwash the strainer. When this is unsuccessful at clearing the alarm, the crew will place Service Water pump 12 in service.

Main condenser vacuum will begin to degrade as a result of air in-leakage. The crew will enter N1-SOP-25.1. Power will be lowered per N1-SOP-1.1 and the reactor will be scrammed before vacuum lowers to 22.1" Hg. When the scram is inserted, control rods will only partially insert. The crew will enter N1-EOP-3 to respond to the failure to scram. The crew will terminate and prevent all injection except boron and CRD **(Critical Task)**. The ATWS will be complicated with the failure of TBVs to open. The crew will initiate liquid poison injection and/or take actions in accordance with N1-EOP-3.1 to insert control rods **(Critical Task)**.

1. Termination Criteria
    a. RPV water level controlled in assigned band above -109"
    b. RPV Blowdown in progress, Liquid Poison injection or control rod insertion in progress

2. Critical Tasks

CT-1, Given a failure of the Reactor to scram with power above 6% and RPV water level above -41 inches, the crew will terminate and prevent all injection except boron and CRD, in accordance with N1-EOP-3.

Justification:

Safety Significance: *High Reactor power after a scram is attempted indicates a challenge to nuclear fuel and to plant heat sinks. In the event of a loss of the normal heat sink, this may result in adding heat to the Torus and challenging the Primary Containment. Lowering Reactor power reduces these challenges.*

Cueing: *Control rod position and Reactor power indications will indicate a failure to scram with Reactor power above 6%. N1-EOP-3 provides direction to terminate and prevent injection based on Reactor power.*

Measurable Performance Indicators: *Manipulation of Feedwater system components and Core Spray jumpers will provide observable actions for the evaluation team.*

Performance Feedback: *Feedwater flow, Reactor water level, and Reactor power will provide performance feedback regarding the success of crew actions.*

CT-2, Given a failure of the reactor to scram with power above 6%, the crew will lower reactor power by inserting control rods or injecting boron, in accordance with N1-EOP-3.

Justification:

Safety Significance: *Inserting control rods lowers Reactor power, which reduces challenges to the plant during a failure to scram. Additionally, inserting control rods ultimately provides a long-term, stable core shutdown. Boron injection will lower power, however, alone may not provide a stable shutdown condition.*

Cueing: *Control rod position and Reactor power indications will indicate a failure to scram. N1-EOP-3 provides direction to insert control rods or inject Boron.*

Measurable Performance Indicators: *Manipulation of RPS, CRD, liquid poison, and RMCS controls will provide observable actions for the evaluation team.*

Performance Feedback: *Control rod position and Reactor power will provide performance feedback regarding success of crew actions to insert control rods or inject poison .*

CT-3, Given a failure to scram and the inability to restore and maintain RPV water level above -109 inches with the preferred ATWS injection systems, the crew will execute N1-EOP-8, RPV Blowdown and restore and maintain RPV water level above -109 inches with preferred and alternate ATWS injection systems, in accordance with N1-EOP-3.

Justification:

Safety Significance: *Reactor water level must be maintained above limits to ensure adequate core cooling. With only low pressure systems available to inject and Reactor pressure above the pressure limits of these systems, Reactor pressure must be quickly lowered to allow injection. This protects the integrity of the fuel cladding.*

Cueing: *Multiple Reactor water level and pressure indications and annunciators will indicate low Reactor water level with Reactor pressure too high for available injection systems to inject. N1-EOP-3 provides direction to initiate a blowdown.*

Measurable Performance Indicators: *Manipulation of Emergency Condenser valve and ERV control switches will provide observable actions for the evaluation team.*

Performance Feedback: *Emergency Condenser and ERV instrumentation will provide indication that these systems are functioning properly once placed in service. Multiple Reactor pressure indicators and annunciators will provide performance feedback regarding the success of the blowdown. Multiple level indications will provide feedback of the success of the ATWS low pressure injection systems.*

3. Length
   a. ~60 minutes
4. Mitigation Strategy Code
   a. AT2, High Power ATWS, RPV Blowdown due to Low Reactor Water Level
5. Technical Specifications
   a. TS 3.1.6 CRD
   b. 3.1.7.e
   c. 3.1.8
6. EAL Classification
   a.
7. Special Orders
   a. None

B. Initial Conditions

1. IC Number

   a. IC-154

2. Presets / With Triggers

   a. Malfunctions

1)	**NM10A,** IRM CHANNEL 11 FAILURE- UPSCALE	**Inserted**
2)	**CW03B,** EMERGENCY SERVICE WATER PUMP TRIP 12	**Inserted**
3)	**RD33A,** Control Rod Bank Blocked Bank 1, FV=24	**Inserted**
4)	**RD33B,** Control Rod Bank Blocked Bank 2, FV=18	**Inserted**
5)	**RD33C,** Control Rod Bank Blocked Bank 3, FV=22	**Inserted**
6)	**RD33D,** Control Rod Bank Blocked Bank 4, FV=18	**Inserted**
7)	**RD33E,** Control Rod Bank Blocked Bank 5, FV=24	**Inserted**
8)	**TC12,** All Bypass Valves Fail Closed (0-100%)	**Inserted**
9)	**FW03A,** Feedwater Pump Trip 11	**Inserted**
10)	**FW03B,** Feedwater Pump Trip 12	**Inserted**
11)	**NM19C,** APRM Channel 13 Failure – Upscale	**TRG 1**
12)	**RD36A,** CRD FCV 44-151 FAILURE – CLOSED	**TRG 2**
13)	**CW16A,** SW Pump 11 Strainer 72-05 Clogging, FV=10%	**TRG 4**
14)	**MC01,** Main Condenser Air Inleakage, FV=13.5	**TRG 5**
15)	**FW06,** Shaft Driven Feedwater Pump Clutch Fails – Disengage	**TRG 6**

   b. Remotes

1)	**FW24,** Removal of HPCI Fuses FU8/FU9, FV=pulled	**TRG 10**
2)	**RD05,** CRD FLOW CONTROL VALVE ISOL, FINAL VALUE=nc30b	**TRG 16**

   c. Overrides

1) None

d. Annunciators

1) None

e. Event Triggers

Event #	Event Action	Command
TRG 6, Activates 13 FWP disengage action when Reactor water level is below -41 inches.	zarrlc11<0.37	**Blank**
TRG 16, Swaps CRD FCV when operator operates switch in Control room	zdrdfcvb==1	**Blank**

f. Equipment Out of Service

1) ESW Pump 12 in PTL with info tag

2) IRM 11 bypassed with info tag and off normal

g. Support Documentation

1) ReMA for raising power with recirc

h. Miscellaneous

1) None

SHIFT TURNOVER INFORMATION

ON COMING SHIFT: ☐ N ☐ D DATE: Today

PART I: To be performed by the oncoming Operator before assuming the shift.

- Control Panel Walkdown (all panels) (SRO, ROs)

PART II: To be reviewed by the oncoming Operator before assuming the shift.

- LCO Status (SRO)
- Shift Turnover Information Sheet

Evolutions/General Information/Equipment Status:

- Reactor power is approximately 95%.
- ESW Pump 12 is out of service for maintenance
- IRM 11 is bypassed due to spiking

PART III: Remarks/Planned Evolutions:

- Start TBCLC pump 12 and secure TBCLC pump 11, per N1-OP-24 section F.1. An operator is standing by at the pump. Three Heat Exchangers are in service.
- Raise reactor power with recirc per the ReMA

Shift Turnover

Instructor Actions / Plant Response	Operator Actions
Take the Simulator out of freeze before the crew enters for the pre-shift walkdown. • Verify annunciator sound turned on • If recording scenario, start the recording device during the pre-shift walkdown	
Allow no more than 5 minutes to walkdown the panels.	**Crew** • Walkdown panels • Conduct shift turnover brief • Assume the shift

Event #1: Swap TBCLC Pumps

Event Information	• Crew will start TBCLC Pump 12 and secure TBCLC pump 11

NOTE: The crew may hesitate to perform the pump swap based on the notes outlining TBCLC and SW parameters in the beginning of the procedure. If asked, report that the parameters are within acceptable range.	**SRO** • Directs starting TBCLC pump 12 and securing TBCLC pump 11 per N1-OP-24, Sect F.1.0 • Provides oversight for evolution
	RO • Monitors plant parameters
Role Plays: If directed to vent TBCLC pump 12, wait 30 seconds and report that the pump has been vented. If asked about TBCLC pump starts/stops, immediately report SAT pump starts/stops.	**BOP** • Reviews N1-OP-24, Sect F.1.0 • Starts TBCLC pump 12 • May direct operator to vent TBCLC pump 12 and close the vent when venting is complete • Monitors system pressure and pump amps • Stops TBCLC Pump 11 and place its control switch in Auto-Start • Notifies the SRO/Crew that TBCLC pump 12 is in service and TBCLC pump 11 in standby

Event #2: Raise Reactor Power with Recirculation Flow

Event Information	• Crew will raise power per the provided ReMA

	SRO • Directs power ascension with Recirculation flow in accordance with N1-OP-43B and the ReMA • Provides oversight of reactivity maneuver
Note: When sufficient reactivity change has been observed, move on to the next event per the lead examiner's discretion.	**ATC** • Acknowledges direction from SRO • Raises Recirculation flow with master Recirculation flow controller • Monitors APRMs • Monitors Recirculation flow • Monitors Feedwater flow and RPV water level • Observes power-to-flow map restrictions

	BOP
	• Monitors individual RRPs for response
	  • Individual M/A-Speed Control stations trending uniformly
	  • Individual RRP indications trending normally for speed increase
	• Monitors Feedwater controls for proper response
	  • FWP 13 FCV responding to power change
	  • RPV water level remains within program band (65" - 83")

Event #3: APRM 13 Upscale Failure

Event Information	• APRM 13 fails upscale • Crew bypasses APRM and resets half scram IAW ARPs

When directed by examiner, insert malfunction: **NM19C** APRM CHANNEL 13 FAIL UPSCALE **TRG 1** *APRM 13 Fails Upscale* *The following annunciators alarm* *F2-1-6 APRM 11-14* *F1-1-1 RPS CH 11 REACT NEUTRON MONITOR* *F1-2-1 RPS CH 11 REACTOR AUTO TRIP* *F3-4-4 ROD BLOCK*	**ATC** • Recognize/report RPS Channel 11 trip • Reports APRM 13 Upscale

Role Play: As WEC/Mgmt. acknowledge report from SRO. Advise that you will provide requested assistance.
 	
The APRM will not be repaired during the scenario.
 	
Note: Technical Specification requirements from Tables 3.6.2.a and 3.6.2.g are satisfied with only one APRM failed.
	SRO
	• Acknowledges report from RO
	• Directs RO/BOP to follow ARPs for failed APRM, Half-SCRAM and ROD BLOCK
	• Contacts WEC/Management and informs them of failed instrument. Requests assistance in correcting problem.
	• Reviews Technical Specifications for impact of failed instrument.
	  ○ TS 3.6.2.a requires 2 operable trip systems and 3 operable channels per system to cause a SCRAM on High Flux
	  ○ TS 3.6.2.g requires 2 operable trip systems and 3 operable channels per system to initiate a ROD BLOCK on High Flux
	• Determines that APRM 13 may be bypassed
	• Directs RO to bypass APRM 13 and reset RPS Channel 11 trip.

Event 3 continued	**BOP**
	• Acknowledges direction from SRO
	• Obtains ARP F2-1-6 and executes
	  ○ Verifies alarm computer points B183 (ROD BLOCK) and D052 (UPSCALE HIHI FLUX)
	  ○ Observes LPRM-APRM Auxiliaries Drawer (Panel "G") and determines that APRM 13 has an upscale condition
	  ○ If required, bypass APRM per N1-OP-38C.
	• Obtains/reviews ARP F1-1-1
	  ○ Confirm RPS Channel 11 tripped
	  ○ Confirms other channel readings are normal/
	  ○ Obtains/reviews ARP F1-2-1
	  ○ Determines that failed APRM caused trip
	  ○ When cause is corrected (APRM is bypassed), reset RPS Channel 11
	• Obtains/reviews ARP F3-4-4
	  ○ Confirms alarm by observing computer point C067 RWM ROD BLOCK
	  ○ Determines caused by failed APRM
	• When directed to verify APRM 13 bypassed, observes APRM 13 bypass light on Panel "G" (LPRM-APRM AUXILIARIES DRAWER)

Note: When APRM 13 is bypassed F2-1-6, F3-4-4 and F1-1-1 should all clear. The LPRM-APRM Auxiliaries drawer will indicate the HIHI condition until the APRM is bypassed then the BYPASS indicating light will also be illuminated. Following the bypassing of APRM 13 and the reset of the half-scram, all annunciators will be clear.	**ATC** • Completes RO actions for ARP F2-1-6 • Determines that APRM 13 has UPSCALE/HI-HI condition • Monitors other APRM channels to determine that power is stable/unchanged • Verifies proper power to flow ratio on 5-Loop Operating Curve

Event 3 continued **Bypass APRM**	**BOP** • Bypasses APRM 13 per N1-OP-38C • Places APRM BYPASS joystick on Panel "E" to "APRM 13" position • Confirm APRM BYPASS light lit on E Panel. • Confirm APRM BYPASS light lit on LPRM-APRM auxiliaries drawer (G Panel). • Confirm computer printout "APRM BYPASS YES".

Reset RPS Channel 11 Trip	**ATC**
	• After APRM bypassed reset RPS Channel 11 trip
	  • Verifies F1-1-1 clear
	  • Depress SCRAM RESET pushbutton on "E"
	  • Verifies F1-2-1 clear and resets annunciators
	  • Report APRM 13 bypassed and ARP actions completed to SRO

Event #4: CRD Flow Control Valve Failure

Event Information	• Crew will swap to alternate FCV in accordance with N1-SOP-5.1 • SRO will determine tech specs

When actions for the voltage regulator failure are complete and when directed by the examiner, **insert malfunction:** **RD36A,** CRD FCV 44-151 FAILURE – CLOSED **TRG 2**	**CREW** • Acknowledge/report annunciator F3-1-5, CRD CHARGING WTR PRESS HI/LO • Diagnose CRD FCV 11 is closed
CRD charging water pressure rises *CRD drive water pressure lowers* *CRD cooling water pressure and flow lower* *Expected Annunciator:* *F3-1-5, CRD CHARGING WTR PRESSURE HI/LO*	**SRO** • Acknowledge report from the crew • Direct entry into N1-SOP-5.1, LOSS OF CRD • Acknowledge report that CRD FCV has failed • Acknowledge report that CRD FCV has been shifted and is in AUTO • Enter Technical Specifications 3.1.6.c while CRD flow less than 50 gpm.
	ATC • Monitor plant parameters

Role Play: As PO, when directed to transfer CRD FCV, wait 1 minute and inform the control room that you are standing by **Role Play:** As PO, when directed to open 44-148 and 44-152, wait 1 minute and report task completion (Step 5.4.1) **Role Play:** As PO, when directed to countdown and swap transfer switch, give simulated countdown and report task completion (see note below), as required **Note:** When the control room operator takes the CRD Flow Control Transfer Switch to "VALVE 12" TRG 16 will automatically **insert remote:** **RD05,** CRD FLOW CONTROL VALVE ISOL, FINAL VALUE=nc30b **TRG 16** This precludes the console operator from having to time the insertion of this remote. **Role Play:** As PO, when directed to close 44-150 and 44-153, wait 1 minute and report task completion.	**BOP** • Acknowledge direction from SRO • Execute N1-SOP-5.1 • Answers "Is a CRD pump operating" YES • Determines need to switch CRD Flow Control Valves per N1-OP-5 Section F.5.0: • Dispatch PO to report to RB 237' and establish communications • Place CRD Flow Control in MAN and 0 demand • Direct PO open 44-148 and 44-152 • Direct PO to count-down to place RB air transfer switches in UP position while you place CRD FCV transfer switch in VALVE 12 position at F panel • Places CRD FCV transfer switch in VALVE 12 position • Direct PO close 44-150 and 44-153 • Monitor flow • Place CRD Flow Control in AUTO

Events #5: Service Water Adams Strainer Clogging

Event Information	• Service Water Adams Strainer begins clogging. • Backwashing does not fix the problem. • Crew will start a second SWP

When directed by examiner, **insert malfunction**: **CW16A,** SW Pump 11 Strainer 72-05 Clogging, FV=10% **TRG 4** *Expected Annunciator:* *H1-3-2, SERVICE WTR P STR 11-12 TRIP-LO VOLT DIFF PRESS*	**CREW** • Acknowledge/respond to annunciator H1-3-2, SERVICE WTR P STR 11-12 TRIP-LO VOLT DIFF PRESS
	SRO • Acknowledges report • Directs entry into ARP for H1-3-2 • Acknowledges report that SW strainer BV-72-408, Backwash Valve is open and that D/P is not lowering • Determines the alarm cannot be cleared • Directs shifting to SWP 12 per N1-OP-18 section F.2.0 • Acknowledges report that SWP 12 has been started • Acknowledges report of current D/P
	ATC • Monitors plant parameters

Role Play: When directed as PO to investigate, wait two minutes, then report that Service Water pump 11 Strainer D/P is 10 psid and slowly rising due to a small amount of grass coming in the intake. **Role Play:** When directed as PO to verify strainer backwash valve, 72-408 open, immediately report that 72-408 is open, backwash is in progress, but it does not appear to be lowering D/P **Role Play:** If directed to perform SWP start actions, acknowledge report and report completion. **Role Play:** When directed as PO to report on pump start, immediately report that SWP 12 is operating normally **Role Play:** When requested as PO after start of Service Water Pump 12, report Service Water Pump 12 Adams Strainer D/P is 3 psid, and report that Service Water Pump 11 Adams Strainer D/P is 9 psid (if still running)	**BOP** • Enters ARP for H1-3-2 • Directs an PO to the Intake area to check the SW Pump Strainer • IF strainer D/P is high perform the following: • Confirms BV-72-408, ADAMS STRNR 11 Backwash VLV open • Determines the alarm cannot be cleared • Starts SWP 12 per N1-OP-18, Sect. F. • Places the SERVICE WTR PUMP 12 control switch at H Panel in Start • Observes normal motor running current, system flow, and discharge pressure

Event #6: Loss of Main Condenser Vacuum

Event Information	• Loss of Condenser Vacuum leads to a reactor Scram

When directed by examiner, **insert malfunction**: **MC01,** Main Condenser Air Inleakage, FV=13.5 **TRG 5** *Main condenser vacuum slowly lowers* *Offgas flow rises* *Expected Annunciator:* *A1-3-4, CONDENSER VACUUM BELOW 24" HG*	**CREW** • Recognize/report lowering main condenser vacuum • Acknowledge/report annunciators: • A1-3-4, CONDENSER VACUUM BELOW 24" HG
	SRO • Acknowledges reports • Directs execution of N1-SOP-25.1, Unplanned Loss of Condenser Vacuum • Directs Emergency Power Reduction per N1-SOP-1.1 to stabilize condenser vacuum • Provides oversight for reactivity manipulation • Determines condenser vacuum can NOT be maintained above 22.1" Hgv • Directs a Reactor Scram • When vacuum approaches 7.0" Hgv, direct closing the MSIVs

Event 6 continued	**RO** • Monitor plant parameters • Lower recirc flow and insert cram rods per N1-SOP-1.1 to stabilize vacuum • When directed to manually scram: • Places Reactor Mode Switch in SHUTDOWN • Recognizes control rods did NOT fully insert • Pushes manual scram pushbuttons • Reports failure to scram

Role Play: If dispatched as operator to check for condenser leaks, acknowledge order. If asked about status, report that you have not found any leaks yet.	**BOP**
	• Executes N1-SOP-25.1, Unplanned Loss of Condenser Vacuum
	• Verifies proper operation of the following:
	  • Circ Water System
	  • SJAEs
	  • Off Gas System
	  • Condensate System
	  • Turbine Gland Seal System
	• Dispatches operator to check for condenser leakage
	• Attempts manual initiation of ARI

Events #7 & #8: ATWS with a Failure of All TBVs to Open

Event Information	• High Power ATWS with no TBVs and no High Pressure Injection • Ultimately leads to Blowdown

The following **malfunctions** are **preset**: **RD33A,** CONTROL ROD BANK BLOCKED BANK 1, FV=24 **PRESET** **RD33B,** CONTROL ROD BANK BLOCKED BANK 2, FV=18 **PRESET** **RD33C,** CONTROL ROD BANK BLOCKED BANK 3, FV=22 **PRESET** **RD33D,** CONTROL ROD BANK BLOCKED BANK 4, FV=18 **PRESET** **RD33E,** CONTROL ROD BANK BLOCKED BANK 5, FV=24 PRESET *Control rods partially insert* *Reactor power remains > 6%* Verify the following **malfunction** is **automatically inserted** when Reactor water level lower below -41 inches or manually initiated when directed by the examiner: **FW06,** Shaft Driven Feedwater Pump Clutch Fails – Disengage **TRG 6** *Feedwater flow lowers*	**CREW** • Diagnose failure of control rods to insert • Diagnose loss of all HP Injection • May recognize/report failure of TBVs to open

Reactor water level lowers	

Events 7 and 8 continued
 	
Note: Turbine Bypass Valves are not available.
	SRO
	• Acknowledges report of failure to scram
	• Enters N1-EOP-2 due to reactor power above 6% when scram required
	• Answers "All rods in to at least 04" NO
	• Answers "Will the reactor stay shutdown without boron" NO
	• Exits N1-EOP-2, enters N1-EOP-3
	• Directs ADS bypassed
	• Directs prevention of Core Spray injection per N1-EOP-1 Att 4
	
	EOP-3 Level Leg Actions (Initial)
	• Directs bypass of the low-low RPV water level MSIV isolation per N1-EOP-1 Att 2
	• Determines Reactor power is above 6% and RPV water level is above -41 inches
	• **Directs terminate and prevent of all injection except boron and CRD per N1-EOP-1 Att 24 CT-1.0**
	• Directs RPV water level lowered to at least -41 inches
	EOP-3 Pressure Leg Actions
	• If an ERV is cycling:
	  • Directs initiation of Emergency Condensers
	  • Directs open ERVs to lower RPV pressure to less than 965 psig
	• Directs RPV pressure controlled below 1080 psig using Emergency Condensers, and ERVs
	• Monitors Figure M, Heat Capacity Temperature Limit

Events 7 and 8 continued
 	
Note: The most likely high-capacity injection system is Condensate and Feedwater Booster pumps with N1-EOP-1 Att 25 and/or 26. If SRO determines inadequate level response is observed with these systems, Core Spray is available with N1-EOP-1 Att 4.
	SRO continued
	EOP-3 Power Leg Actions
	• Directs initiation of ARI
	• Answers "Turbine Generator on-line?" NO
	• Answers "Reactor power?" Above 6%
	• Verifies Recirc Pumps tripped
	• **Directs execution of N1-EOP-3.1**
	• **If power oscillates more than 25% or before Torus water temperature reaches 110°F:**
	  • **Records Liquid Poison tank level**
	  • **Directs Liquid Poison injection**
	CT-2.0
	EOP-3 Level Leg Actions (Subsequent)
	• Acknowledges RPV water level below -41 inches
	• If Torus temperature is above 110°F, then directs level lowered until:
	  • Power drops below 6%, OR
	  • Level drops to -84 inches (TAF)
	• Records final actual level
	• Directs RPV injection with Condensate/Feedwater and CRD
	• Acknowledges report that Condensate/Feedwater is not available for injection
	• When RPV water level cannot be maintained above -109 inches, enters N1-EOP-8, RPV Blowdown
	• Answers "Are all control rods inserted to at least position 04?" NO
	• Answers "Will the reactor stay shutdown without boron?" NO/UNKNOWN
	• Directs terminate and prevent of all RPV injection except boron and CRD per N1-EOP-1 Att 24
	• Directs initiation of Emergency Condensers

Events 7 and 8 continued	**SRO continued**
	• Answers "Torus water level?" Above 8 feet • **Directs open 4 ERVs** **CT-3.0** • Returns to N1-EOP-3 at circle 10 • Answers "Is any ERV open?" YES • Waits until RPV pressure is below 264 psig • Answers "Was level intentionally lowered before you entered N1-EOP-8?" YES • Returns to circle 9 • **Directs RPV injection between -109 inches and previous final actual level with preferred and alternate ATWS injection systems** **CT-3.0** • Acknowledges report of RPV water level restored above -109 inches
Note: Since TBVs are not available, Pressure control will be on the ECs and ERVs. Use of the ERVs will cause torus temperature to rise toward EOP entry conditions.	N1-EOP-4, Primary Containment Control, Actions • Acknowledges degrading Primary Containment parameters • Enters N1-EOP-4 on high Torus Water temperature • Answers "Has Containment Spray Initiated? ○ If NO, directs Containment Spray pumps placed in PTL • May eventually direct action to initiate Torus Cooling

Note: Control rods will successfully insert using RMCS	**RO** • Provides scram report • Bypasses Core Spray IV interlocks per N1-EOP-1 Att 4 by installing six jumpers inside Panel N (17, 18, 19, 24, 25, 26) • Bypass low-low MSIV isolation per N1-EOP-1 Att 2 by installing four jumpers inside Panel N (1, 2, 8, 9) • **When directed, performs N1-EOP-3.1, Section 3 (driving rods) and/or 4 (manual scrams) (See actions below)** • Reports when APRMs <6% • Reports status of control rod insertion • **Injects Liquid Poison, if directed** **CT 2.0**

Events 7 and 8 continued
 	
Note: RO will likely have to fully open the CRD flow control valve and/or close 44-04 in order to achieve rod movement via RMCS; these methods are preferential to closing 44-167 due to ability to perform from the control room and not preventing further scram attempts by blocking the charging water header
	RO Continued
	Possible N1-EOP-3.1 Section 3 Actions:
	• Verifies a CRD Pump running
	• Places Reactor Mode Switch in REFUEL
	• Places ARI OVERRIDE switch in OVERRIDE
	• Installs RPS jumpers (5, 6, 12, 13)
	• Resets the scram
	• **Inserts rods to 00 using EMER ROD IN starting with high power regions of core (use LPRM indications)**
	CT-2.0
	• If more drive pressure is required, then perform one or more of the following:
	  • Fully open CRD Flow Control Valve (F panel)
	  • Close 44-04, Control Rod Drive Water Cont V (F Panel)
	  • Close 44-167, Charging Water Header Blocking Valve (RB 237')
	
	Possible N1-EOP-3.1 Section 4 Actions:
	• Places ARI OVERRIDE switch in OVERRIDE
	• Installs RPS jumpers (5, 6, 12, 13)
	• Resets the scram
	• Verify open 44-167, Charging Water Header Blocking Valve (RB 237')
	When the SDV is drained, then initiate a manual scram

Events 7 and 8 continued
 	
Role Play
If directed to pull HPCU fuses FU-8 and FU-9 from Panel IS34 in the Aux Control Room, wait approximately 2 minutes and **insert remote**:
 	
FW24, Removal of HPCI Fuses FU8/FU9, FV=pulled
TRG 10
	BOP
	• Bypasses ADS
	• **Terminates and prevents all injection except boron and CRD per N1-EOP-1 Att 24:**
	CT-1.0
	  • Closes both Feedwater Isolation Valves 11 and 12 OR places Feedwater pumps 11 and 12 in PTL
	  • Selects Manual on 11, 12 and 13 FWP Valve Control selector switches
	  • Closes 11, 12 and 13 Feedwater FCV (Knurled Knob) full counterclockwise
	  • Places FW LVL SETPOINT SETDOWN to OVERRIDE
	  • Directs operator to remove fuses FU-8 and FU-9 from Panel IS34 in the Aux Control Room
	  • Verifies closed, FEEDWATER PUMP 13 BLOCKING VALVE
	  • Verifies in MAN, FWP 11 BYPASS VALVE, AND set to zero output
	  • Verifies in MAN, FWP 12 BYPASS VALVE, AND set to zero output
	• May re-open Feedwater Isolation Valve
	• Informs SRO when RPV water level reaches -41 inches

Events 7 and 8 continued	**BOP continued**
	• If any ERV is cycling:
	  • Initiates Emergency Condensers
	  • Manually opens ERVs to lower RPV pressure <965 psig
	• Controls RPV pressure below 1080 psig with Emergency Condensers and ERVs
	• Initiates ARI
	• Verifies all Recirc Pumps tripped
	• Initiates Liquid Poison as directed
	  • Reports initial tank level
	  • **Starts Liquid Poison pump 11 or 12** **CT-2.0**
	  • Verifies RWCU isolated
	• Places Containment Spray pumps in PTL (Either before they initiate, or once Drywell pressure lowers to below 3.5 psig)
	• Acknowledges direction to re-establish RPV injection with Condensate/Feedwater and CRD
	• Attempts to re-inject with Condensate/Feedwater per EOP-1 Att 24:
	  • Reopens at least one Feedwater Isolation Valve 11 and / or 12, if closed
	  • Reports no high pressure Feedwater pumps are available for injection
	  • Determines Feedwater Booster Pump 12 is available

Events 7 and 8 continued	**BOP continued** • Re-terminates RPV injection per EOP-1 Att 24 ○ Verifies closed 11, 12, and 13 Feedwater FCVs • Verifies ECs are initiated • **Opens 4 ERVs** **CT-3.0** • **Re-establishes RPV injection using Feedwater Booster Pump and/or Core Spray per N1-EOP-1 Att 4, 24, 25, or 26** **CT-3.0** • Reports RPV water level restored above -109 inches

Event Termination Criteria	• RPV water level controlled in assigned band above -109” • RPV Blowdown in progress • Liquid Poison injection or control rod insertion in progress