Training Id: **2020 NMP1 NRC RO-SRO Admin JPM COO1** Revision: **0.0**

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

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/31/20
Validated By	Dave Mason, Jeremy Spring	7/14/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

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 applicants
   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 US 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 10 Rods have been withdrawn. • An independent verification of control rod positions for RWM group 10 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.

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 applicant 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 significance level 2 reactivity event.

Evaluator Cue:	When the RO applicants have completed the worksheet, inform them their task is complete. When the SRO applicants 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) and Reactor Engineering (H.9.3) are required to be notified. Additionally, an IR would be generated. The applicant may include this in the required notifications, but it is not required to pass this step. Applicant may also state the General Supervisor Operations (H.9.5.3) needs to be notified. Based on the subjectivity of the procedure step, this is not required to pass this step.

TASK STANDARD	Control rod position verification is complete. Mispositioned control rod identified and severity level classified. SRO has determined Shift Manager, Reactor Engineering and the SOS must be notified.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • A plant startup is in progress. • All RWM Group 10 Rods have been withdrawn. • An independent verification of control rod positions for RWM group 10 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 significance 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: **2020 NMP1 NRC RO Admin JPM COO2** Revision: **0.0**

Title: **Develop and get Approval for an Operator Aid**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	5/22/19
Validated By	Jason Quick	7/14/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

Approximate Duration: 20 minutes

Documentation of Performance:

Performer: ______________________________

Evaluator: ______________________________

Start Time: __________ Stop Time: __________ Completion Time __________

Grade: **Pass / Fail**

Comments: ______________________________

____

____

____

____

Evaluators Signature: ______________________ Date: __________

References

A. OP-AA-115-101, Operator Aid Postings

B. NUREG 1123, 2.1.15 (2.7)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to develop and get approval for an Operator Aid.

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

2. Task Information:

   a. NS-OM502-00004, Install and Use Authorized Labels

   b. K/A 2.1.15 (2.7) Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, operations memos, 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 (if required)

   a. Ensure adequate copies of OP-AA-115-101, Operator Aid Postings 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 US 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. • The crew has recently discovered that RMC-29-158, FEEDWATER PUMP 13 VALVE CONTROL Yokogawa controller is difficult to place in MANUAL CONTROL. • Specifically, when shifting the controller from AUTO to MANUAL, the operators have to hold the MAN pushbutton down for 2 to 3 seconds to get the controller to shift into MANUAL. • IMD has been contacted and have setup a repair schedule. The controller is scheduled to be repaired in one week. • While waiting for repairs, IMD has said that the controller will still function and if it is necessary for the operators to shift the controller from AUTO to MAN, the operators will need to hold down the MAN pushbutton for 2 to 3 seconds. • The Unit Supervisor has determined an Operator Aid is to be developed explaining this condition, and a permanent label is NOT required. • The controller is located on F Panel • IR-04324087 is tracking the repair of the controller. • You are the operator assigned to develop the Operator Aid and get signature approval of the Operator Aid through the Operations Director. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	(**Operators Name**), develop and get Operations Department Head approval to post an Operator Aid for RMC-29-158 per OP-AA-115-101. Complete Attachment 1 and 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.

<table>
<tr><th></th><th>PERFORMANCE</th><th>ACT. CODE
P / S / NA</th><th>EVALUATOR</th></tr>
<tr><td>2.</td><td>Obtain a copy of the reference procedure and review / utilize the correct section of the procedure.

Note: Evaluator is to provide OP-AA-115-101, Operator Aid Postings, to the candidate.</td><td>P</td><td>SAT / UNSAT
STD: OP-AA-115-101 Obtained and reviewed.</td></tr>
<tr><td>Evaluator Notes:</td><td colspan="3">The remaining steps may be performed in any order.
The answer key attached to this JPM may be used to assist in the grading of the below steps. The operator may choose to use different words on Attachment 1 and Attachment 2 than what is listed on the answer key. This is acceptable as long as the intent of the Operator Aid documentation is consistent with the intent of the below steps. The Evaluator may use their judgment as to whether or not the intent of the below steps are met.
The operator may choose to fill out all portions of Attachment 1 and 2 prior to presenting the attachments for approval. This is an acceptable action.</td></tr>
<tr><td>3.</td><td>Using the provided blank Operator Aid Review and Approval form, Attachment 1, documents the following information:
A note stating that in order to place RMC-29-158 in MANUAL, the M button must be depressed for 2 to 3 seconds.</td><td>P</td><td>*PASS / FAIL
STD: On the provided Attachment 1, in the ‘Reason for Posting’ box, documents that in order to place RMC-29-158 in MANUAL, the M pushbutton must be depressed for 2 to 3 seconds. Or words to that effect.</td></tr>
<tr><td>Evaluator Note:</td><td colspan="3">The Department Head authorization of the operator aid may be accomplished one of two ways. The operator may write the Department Head name in the Department Head Approval block on the operator aid and present it to the evaluator or the operator may leave the name blank and allow the evaluator to write it in. Either method is acceptable provided the completed tag is presented for approval.</td></tr>
<tr><td>4</td><td>Documents the following additional data on the Operator Aid attachments:</td><td></td><td></td></tr>
</table>

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4a	• Operator Aid number on Attachment 2	P	SAT / UNSAT **STD:** From the Operator Aid Log, Attachment 2, takes the next sequential number, OA-20-03 and documents on Attachment 2
4b	• Operator Aid number on Attachment 1	P	SAT / UNSAT **STD:** Documents the next sequential number, obtained from Attachment 2, on attachment 1. OA-20-03
4c	• Operator Aid Title	P	SAT / UNSAT **STD:** Documents any appropriate title.
4d	• Permanent sign/label required	P	SAT / UNSAT **STD:** Circles 'No' on attachment 1.
4e	• Location	P	***PASS / FAIL** **STD:** Documents the location as 'F Panel' or 'RMC-29-158' on both attachments.
4f	• Reason for Posting / Description	P	***PASS / FAIL** **STD:** Documents RMC-29-158 is difficult to place in manual. The manual pushbutton must be held for 2-3 seconds. (*or words to that effect*)
4g	• Originator Name	P	SAT / UNSAT **STD:** Operator documents their name and date on both attachments.
5	Obtains Department Head Approval **Cue:** As the Department Head, when presented with the Attachment 1, sign in the block labeled "Department Head Approval".	P	SAT / UNSAT **STD:** Routes the completed Attachment 1 to the examiner for approval.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
Evaluator Note:	Unless the operator would like to perform an additional review of all the paperwork, then when the operator requests approval, inform the operator that another operator will perform the action of Operations Approval and attaching the Operator Aid to the panel and their task is complete.		

TASK STANDARD	Attachment 1 and 2 of OP-AA-115-101 completed per the key and routed for approval.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The Plant is operating at 100% power. • The crew has recently discovered that RMC-29-158, FEEDWATER PUMP 13 VALVE CONTROL Yokogawa controller is difficult to place in MANUAL CONTROL. • Specifically, when shifting the controller from AUTO to MANUAL, the operators have to hold the MAN pushbutton down for 2 to 3 seconds to get the controller to shift into MANUAL. • IMD has been contacted and have setup a repair schedule. The controller is scheduled to be repaired in one week. • While waiting for repairs, IMD has said that the controller will still function and if it is necessary for the operators to shift the controller from AUTO to MAN, the operators will need to hold down the MAN pushbutton for 2 to 3 seconds. • The Unit Supervisor has determined an Operator Aid is to be developed explaining this condition, and a permanent label is NOT required. • The controller is located on F Panel • IR-04324087 is tracking the repair of the controller. • You are the operator assigned to develop the Operator Aid and get signature approval of the Operator Aid through the Operations Director.

INITIATING CUE	**(Operators Name)**, develop and get Operations Department Head approval to post an Operator Aid for RMC-29-158 per OP-AA-115-101. Complete Attachment 1 and Attachment 2.

ATTACHMENT 1
Operator Aid Review and Approval
Page 1 of 1

		Op Aid #
Operator Aid Title:		
Permanent Sign/Label Required: Yes No		If Yes, Label Request Submittal Date:
Location:		
Reason for Posting/Description:		
Originator Name:	(Print/ Signature/Date)	
Department Head Approval:	(Print/ Signature/Date)	
Operations Approval:	(Print/ Signature/Date)	

Review Items:

- Does this Operator Aid replicate information from a procedure? ❑ Yes ❑ No
- Should this be incorporated into a procedure? ❑ Yes ❑ No
- Could it be eliminated with better labeling or a placard? ❑ Yes ❑ No

Attach this form to the original Operator Aid placed in the WEC Book. Copies shall be made and distributed as appropriate.

ATTACHMENT 2
Operator Aid Log
Page 1 of 1

OPERATOR AID NUMBER (sequential)	TITLE/DESCRIPTION	REASON FOR POSTING	LOCATION	ORIGINATOR NAME/DATE	POSTED BY NAME/DATE	REMOVED BY NAME/DATE
OA-20-01	MG-167 AC Generator AC Voltage Adjust Rheostat	Unexpected indication	MG-167 control cabinet	Balzer / 2/23/20	Pryor / 2/23/20	
OA-20-02	12 Cleanup Filter Control Panel Switch 35-99	Switch does not operate properly	12 Cleanup Filter control panel	Nichols / 7/15/20	Skiff / 7/15/20	

Exelon Generation®

Training Id: **2020 NMP1 NRC SRO Admin JPM COO2** Revision: **0.0**

Title: **Assess Reportability Requirements For Loss of Offsite Power**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/31/20
Validated By	Dave Mason	7/13/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

Approximate Duration: 30 minutes

Documentation of Performance:

Performer: ______________________

Evaluator: ______________________

Start Time: ________ Stop Time: ________ Completion Time ________

Grade: **Pass / Fail**

Comments: ______________________

Evaluators Signature: ______________________ Date: ________

References

A. EP-AA-111, EP-AA-111, Emergency Classification and Protective Action Recommendations

B. NMP Reportability Manual

C. LS-AA-1400, LS-AA-1400, Event Reporting Guidelines 10 CFR 50.72 and 50.73

D. Unit 1 Technical Specifications

E. NUREG 1123, 2.2.12 (4.1)

Instructor Information

A. JPM Information

1. Description

   a. This JPM is to evaluate the SRO's ability to determine NRC reportability requirements for an event.

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

2. Task Information:

   a. NIP-ECA01-00002 - Perform a Supervisor Review and Operability/Reportability Review of a Condition Report

   b. K/A 2.4.30 (4.1), Knowledge of events related to system operation/status that must be reported to internal organizations or external agencies, such as the State, the NRC, or the transmission system operator.

3. Evaluation / Task Criteria

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

4. Recommended Start Location

   a. Training Classroom

5. JPM Setup (if required)

a. Ensure adequate copies of the NMP Reportability Manual (Books 1 and 2) are available.

b. Ensure adequate copies of the EAL matrices are available.

c. Ensure Tech Specs are available

d. Ensure calculators 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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	• The plant was operating at 100% power with no equipment out of service. • A loss of offsite power, Lines 1 and 4, has occurred. • Emergency Diesel Generator (EDG) 102 failed to start and has been declared inoperable. • Emergency Diesel Generator (EDG) 103 responded as designed. • Maintenance reports that repairs to EDG 102 will take several days. • Power Control reports Line 1 will be returned to service in approximately 12 hours, and Line 4 will be returned to service in approximately 24 hours. • The Shift Manager just declared an Alert per EAL MA1 **Instructor / Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, list the applicable 10CFR50.72 reportability requirements, the reason that they apply, including Tech Specs (if applicable) and the associated time limitations for reporting under that category. Record findings on the sheet provided.

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:** Reportability manual Obtained.

Exelon Generation

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3	Locate and identify applicability of 10 CFR 50.72(a)(1)	P	***PASS / FAIL** **STD:** Identifies reportability per 50.72(a)(1), for declaration of any of the Emergency Classes, within one hour.
4	Locate and identify applicability of 50.72(b)(2)(i). Non-emergency four hour report. Initiation of a plant shutdown required by Tech Specs. ***Note:*** *Must determine that Tech Spec 3.6.3.e(1) applies to accurately determine that this 4 hour report applies.*	P	***PASS / FAIL** **STD:** Refers to Tech Spec 3.6.3.e(1) and determines that with specification not being met, the required action is to initiate a shutdown within one hour and be in cold shutdown within 10 hours. **STD:** Identifies reportability per 50.72(b)(2)(i), for initiation of a plant shutdown required by Tech Specs, within four hours.
5	Locate and identify applicability of 50.72(b)(3)(iv)(A) Non-emergency eight hour report. Event or condition results in valid actuation of Emergency Diesel Generator.	P	***PASS / FAIL** **STD:** Identifies reportability per 50.72(b)(3)(iv)(A) [or may alternately reference 50.72(b)(3)(iv)(B)(8)], for valid actuation of Emergency Diesel Generator, within 8 hours.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
6.	Locate and identify applicability of 50.72(b)(3)(v)(D) Non-emergency eight hour report. Event or condition that could have prevented fulfillment of a safety function needed to mitigate the consequences of an accident. **Note:** *This step is deemed not-critical because of the redundancy with other reports and the subjective nature of this call.*	P	SAT / UNSAT **STD:** Identifies reportability per 50.72(b)(3)(v)(D) for an event or condition that could have prevented fulfillment of a safety function needed to mitigate the consequences of an accident (loss of both offsite power lines, failure of EDG 102), within 8 hours.

TASK STANDARD	Reportability requirements have been determined.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	• The plant was operating at 100% power with no equipment out of service. • A loss of offsite power, Lines 1 and 4, has occurred. • Emergency Diesel Generator (EDG) 102 failed to start and has been declared inoperable. • Emergency Diesel Generator (EDG) 103 responded as designed. • Maintenance reports that repairs to EDG 102 will take several days. • Power Control reports Line 1 will be returned to service in approximately 12 hours, and Line 4 will be returned to service in approximately 24 hours.

INITIATING CUE	**(Operators Name)**, list the applicable 10CFR50.72 reportability requirements, the reason that they apply, including Emergency Classification EAL (if applicable) and Tech Specs (if applicable) and the associated time limitations for reporting under that category. Record findings on the sheet provided.

Exelon Generation

Training Id: **2020 NMP1 NRC RO Admin JPM EC** Revision: **0.0**

Title: **RPS Manual Scram Electrical Print Reading**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/31/20
Validated By	Jeremy Spring	7/14/20
Facility Reviewer	Signature on File / Phil Nichols	11/3/20

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: ______________________

Evaluator: ______________________

Start Time: ________ Stop Time: ________ Completion Time ________

Grade: **Pass / Fail**

Comments: ______________________

Evaluators Signature: ______________________ Date: ________

References

1. C-19859-C Sheet 7
2. NUREG 1123, 2.2.41 (3.5)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to use and interpret station electrical prints. Given an electrical print, the candidate must identify and explain the implications of depressing a manual scram pushbutton.

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

2. Task Information:

   a. N1-212000-01016, Perform or Support Performance of N1-ST-W15, Manual and Automatic Scram Instrument Channel Test

   b. K/A 2.2.41 (3.5), Ability to obtain and interpret station electrical and mechanical drawings.

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. Ensure adequate copies of C-19859-C Sheet 7 are available.
   b. Ensure highlighters 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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • None **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, using station electrical prints, explain how depressing the RPS 12 manual scram pushbutton on E console results in an RPS channel 12 half scram. You may mark the provided prints and/or write the explanation on this sheet. Identify the electrical components that accomplish this action. Also, define what is meant by the term "half scram" and state what would be required for a full scram.

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 necessary electrical print.	P	SAT / UNSAT **STD:** C19859C Sheet 7 Obtained.
3.	Using C-19859-C Sheet 7, locates RPS 12 manual scram pushbutton **Note:** This may be identified by either marking on the electrical print or writing the electrical print number and location on the response sheet.	P	***PASS / FAIL** **STD:** Locates RPS 12 manual scram pushbutton (1S28) on C-19859-C Sheet 7 near drawing coordinate E-6

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Using C-19859-C Sheet 7, identifies relay 12K55 **Note:** This may be identified by either marking on the electrical print or writing the electrical print number and location on the response sheet.	P	***PASS / FAIL** **STD:** Locates relay 12K55 on C-19859-C Sheet 7 near drawing coordinate E-7
5.	Using C-19859-C Sheet 7, identifies contacts 12K55 **Note:** This may be identified by either marking on the electrical print or writing the electrical print number and location on the response sheet. **Note:** The candidate may also identify the contact near drawing coordinate N-2. This is satisfactory but not required, as the task did not require discussion of the backup scram.	P	***PASS / FAIL** **STD:** Locates contact 12K55 on C-19859-C Sheet 7 near drawing coordinates F-2, H-2, J-2, and L-2
6.	Using C-19859-C Sheet 7, identifies relays/solenoids 305-139(B) **Notes:** • This may be identified by either marking on the electrical print or writing the electrical print number and location on the response sheet. • The candidate does not have to identify all eight solenoids/relays on this sheet, as long as a representative sample is identified and some indication is given that there are multiple solenoids/relays.	P	***PASS / FAIL** **STD:** Locates relays/solenoids 305-139(B) on C-19859-C Sheet 7 near drawing coordinates F-5/6 through M-5/6

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
7.	Describes how depressing the RPS 12 manual scram pushbutton on E console results in an RPS half scram **Note:** The candidate does not have to match this description word-for-word, but must include all concepts in their description.	P	***PASS / FAIL** **STD:** Describes the following: • Depressing RPS 12 manual scram pushbutton on E console causes relay 12K55 to de-energize. • Relay 12K55 de-energizing causes contacts 12K55 to open. • Contacts 12K55 opening causes solenoid/relay 305-139(B) to de-energize at each HCU.
8.	Define what is meant by the term "half scram" and state what would be required for a full scram		***PASS / FAIL** **STD:** Describes the following: • A half scram means half of the logic is met to initiate a scram, but no rods move. • The scram logic in the remaining RPS channel needs to de-energize in order to process a full scram.

TASK STANDARD	Relays and contacts affected by depressing RPS 12 manual scram pushbutton are identified on station electrical drawings and operation is explained.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • None

INITIATING CUE	**(Operators Name)**, using station electrical prints, explain how depressing the RPS 12 manual scram pushbutton on E console results in an RPS channel 12 half scram. You may mark the provided prints and/or write the explanation on this sheet. Identify the electrical components that accomplish this action. Also, define what is meant by the term "half scram" and state what would be required for a full scram.

Exelon Generation

Training Id: **2020 NMP1 NRC SRO Admin JPM EC** Revision: **0.0**

Title: **Review and Approval of Completed Surveillance Test, N1-ST-Q6A, Containment Spray System Loop 111 Quarterly Operability Test**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	5/13/19
Validated By	Dave Mason	7/13/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

Approximate Duration: 20 minutes

Documentation of Performance:

Performer: ____________________

Evaluator: ____________________

Start Time: ________ Stop Time: ________ Completion Time ________

Grade: **Pass / Fail**

Comments: ____________________

Evaluators Signature: ____________________ Date: ________

References

A. N1-ST-Q6A, Containment Spray System Loop 111 Quarterly Operability Test

B. Unit 1 Technical Specifications

C. NUREG 1123, 2.2.12 (4.1)

Instructor Information

A. JPM Information

1. Description

    a. This JPM tests the operator's ability to use and comply with facility surveillance procedures. Given a partial copy of N1-ST-Q6A, Containment Spray System Loop 111 Quarterly Operability Test, the candidate will review the results and identify any discrepancies.

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

2. Task Information:

    a. N1-223002-01019, Perform N1-ST-Q5, Primary Containment Isolation Valves Operability Test

    b. K/A 2.2.12 (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. Ensure adequate marked up copies of N1-ST-Q6A, Containment Spray System Loop 111 Quarterly Operability Test are available.

b. Ensure Tech Specs are available

c. Ensure calculators 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 US 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. • N1-ST-Q6A has just been completed up to the Operations Review. • You are the Shift Manager **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, using the completed surveillance provided, complete Section 10.2, SM Review. Record the results of your review and any required actions in the space below. When completed, report findings to the Examiner.

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. **Note:** Evaluator is to provide the marked up copy of N1-ST-Q6A, Containment Spray System Loop 111 Quarterly Operability Test, to the candidate.	P	SAT / UNSAT **STD:** N1-ST-Q6A Obtained. General Test Methods, References / Commitments and the Precaution and Limitation reviewed.
3.	Determines status of the completed surveillance. Reviews N1-ST-Q6A, Containment Spray System Loop 111 Quarterly Operability Test and identifies the following in the remarks section:		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3a	**Note:** May inform examiner verbally of issues	P	***PASS / FAIL** **STD:** Identifies at step 8.1.4.d, the opening stroke time for valve 80-16 is unsat. However, it is marked SAT in step 10.1.1.a. 10.1.1.a should be marked UNSAT for 80-16 C to O.
3b	**Note:** May inform examiner verbally of issues	P	***PASS / FAIL** **STD:** Identifies from the comments in section 10.2, 80-16 was stroked a second time which is not permitted per 4.8.1.b. The original opening time was outside the {IST value} which requires the valve immediately be declared inoperable and no retest be performed.
3c	**Note:** Applicant may also identify the incorrect pressure listed from 8.2.39 was used in the calculation for 8.2.41. However, 8.2.41 remains SAT, regardless of the math error.	P	SAT / UNSAT **STD:** Identifies math error in step 8.2.39.
4.	Notify appropriate Plant Management. **Cue:** Acknowledge the information presented		SAT / UNSAT **STD:** Notifies **EXAMINER / Ops Director** or designee of issues identified.

TASK STANDARD	Determination of the status of this surveillance has been made with the following errors identified: • Valve 80-16 UNSAT stroke time • Non-permitted retest of valve 80-16

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The Plant is operating at 100% power. • N1-ST-Q6A has just been completed up to the Operations Review. • You are the Shift Manager

INITIATING CUE	**(Operators Name**), using the completed surveillance provided, complete Section 10.2, SM Review. Record the results of your review and any required actions in the space below. When completed, report findings to the Examiner.

Exelon Generation

Training Id: **2020 NMP1 NRC RO-SRO Admin JPM RC** Revision: **0.0**

Title: **Radiological Requirements and Heat Stress Requirements Related to Operator Work in High Radiation Areas– Steam Leak in ECIV Room**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/31/20
Validated By	Dave Mason, Jason Quick	7/14/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

Approximate Duration: 15/20 minutes (RO/SRO)

Documentation of Performance:

Performer: ______________________

Evaluator: ______________________

Start Time: ________ Stop Time: ________ Completion Time ________

Grade: **Pass / Fail**

Comments: ______________________

Evaluators Signature: ______________________ Date: ________

References

1. RP-AA-10 - RADIATION PROTECTION PROCESS DESCRIPTION
2. RP-AA-11- EXTERNAL DOSE CONTROL PROGRAM DESCRIPTION
3. RP-AA-12 - INTERNAL DOSE CONTROL PROGRAM DESCRIPTION
4. RP-AA-203 - EXPOSURE CONTROL AND AUTHORIZATION
5. RP-AA-403 - ADMINISTRATION OF THE RADIATION WORK PERMIT PROGRAM
6. RP-AA-460 - CONTROLS FOR HIGH AND LOCKED HIGH RADIATION AREAS
7. RP-AA-460-001 - CONTROLS FOR VERY HIGH RADIATION AREAS
8. SA-AA-111 – HEAT STRESS CONTROL
9. NUREG 1123, 2.3.7 (3.5/3.6)

Instructor Information

A. JPM Information

1. Description

   a. This JPM is used to test knowledge in calculation of overall dose and control mechanisms to allow the operators to continue or perform work in high dose areas. This JPM tests basic mathematics and understanding of heat stress stay times and remaining dose limitations.

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

2. Task Information:

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

   b. K/A 2.3.7 (3.5/3.6), Ability to comply with radiation work permit requirements during normal or abnormal 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. Ensure sufficient copies of the following procedures are available in the exam area:

- RP-AA-10
- RP-AA-11
- RP-AA-12
- RP-AA-203
- RP-AA-403
- RP-AA-460
- RP-AA-460-001
- SA-AA-111

b. Ensure calculators are available.

c. Provide survey map for EC Steam IV Rom

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 US 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.
	• A steam leak has developed in the Emergency Condenser Steam Isolation Valve Room.
	• Entry into the room is required to assist Maintenance with repairing valve 39-15.
	• An updated survey map is provided.
	• RP will post the radiological boundary at the gate at the entrance to the ECIV room.
	• Your current year-to-date exposure is 1800 mRem TEDE.
	• You have not received any dose extension this year.
	• Job conditions are as follows:
	  • You will be performing Moderate Work for a total of 45 minutes at valve 39-15 (near circle 4 on the provided survey map).
	  • The same workers will perform the whole job
	  • You will be wearing a respirator.
	  • You will be wearing work clothes plus vapor impermeable coveralls.
	  • The wet bulb temperature in the room is 93°F.
	  • The dry bulb temperature in the room is 95°F.
	
	Evaluator: *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, address the radiological and heat stress aspects of performing this work, and record your findings on the provided scorecard.

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 procedures and review / utilize the correct section of the procedures.	P	SAT / UNSAT **STD:** Associated procedures obtained

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Addresses radiological and heat stress aspects of working in EC Steam IV Room		
3a	Determines radiological classification of area.	P	***PASS / FAIL** **STD:** Determines area is a Locked High Radiation Area (greater than OR equal to 1000 mrem/hr at 30 cm; < 500 Rad/hr at 1 meter)
3b	Determines highest dose rate in the room and location.	P	***PASS / FAIL** **STD:** 2000 mrem/hr by smear 6
3c	Determines highest dose rate at the work location.	P	***PASS / FAIL** **STD:** 500 mrem/hr
3d	Determines highest contamination level in the room and that location.	P	***PASS / FAIL** **STD:** 25000 dpm/100cm2 at location circle 5
3e	Determines contamination level at the work location.	P	***PASS / FAIL** **STD:** 5000 dpm/100cm2
3f	Determines expected dose for job.	P	***PASS / FAIL** **STD:** 375 mrem (500 mrem/hr x .75 hr)
3g	Determines heat stress stay time.	P	***PASS / FAIL** **STD:** <15 minutes (SA-AA-111, 4.2.1.3.C requires this be classified as High Work Rate)

SRO Only: Provide SRO candidates with the SRO Only cue sheet. This completes the RO portion on the JPM.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Determines dose extension required	P	***PASS / FAIL** **STD:** Determines annual exposure will exceed 2000 mRem dose control level. (1800 mRem + 375 mRem = 2175 mRem
5.	Identifies proper form for dose extension	P	***PASS / FAIL** **STD:** References RP-AA-203 and determines attachment 1 is the required form for dose extension
6.	Determines required approvals for dose extension	P	***PASS / FAIL** **STD:** Identifies required approvals as the Work Group Supervisor and the RP Manager.

TASK STANDARD	Radiological and heat stress requirements related to emergency response in the EC Steam IV Room are identified. SRO determines a dose extension is required, identifies proper form, and determines required approvals.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given:
	• The plant is at 100% power.
	• A steam leak has developed in the Emergency Condenser Steam Isolation Valve Room.
	• Entry into the room is required to assist Maintenance with repairing valve 39-15.
	• An updated survey map is provided.
	• RP will post the radiological boundary at the gate at the entrance to the ECIV room.
	• Your current year-to-date exposure is 1800 mRem TEDE.
	• You have not received any dose extension this year.
	• Job conditions are as follows:
	    • You will be performing Moderate Work for a total of 45 minutes at valve 39-15 (near circle 4 on the provided survey map).
	    • The same workers will perform the whole job
	    • You will be wearing a respirator.
	    • You will be wearing work clothes plus vapor impermeable coveralls.
	    • The wet bulb temperature in the room is 93°F.
	    • The dry bulb temperature in the room is 95°F.

INITIATING CUE	**(Operators Name)**, address the radiological and heat stress aspects of performing this work, and record your findings on the provided scorecard.

Scorecard

Answer the following when performing this task:
1.
Classify the room based on radiation level (check one): ☐ Radiation Area ☐ High Radiation Area ☐ Locked High Radiation Area ☐ Very High Radiation Area
2.
Designate the highest dose rate in the room and the location:
3.
Designate the dose rate at the work location:
4.
Designate the highest contamination level in the area and the location:
5.
Designate the contamination level at the work location:
6.
Designate the expected dose for the duration of the job:
7.
Designate the heat stress stay time:

Examiner Scorecard. Do Not Provide to Applicant.

Answer the following when performing this task:
1.
Classify the room based on radiation level (check one): ☐ Radiation Area ☐ High Radiation Area ☒ **Locked High Radiation Area** ☐ Very High Radiation Area
2.
Designate the highest dose rate in the room and the location: **2000 mrem/hr near the smear 6**
3.
Designate the dose rate at the work location: **500 mRem/hr**
4.
Designate the highest contamination level in the area and the location: **25,000 dpm/100cm^2 at circle 5**
5.
Designate the contamination level at the work location: **5,000 dpm/100cm^2**
6.
Designate the expected dose for the duration of the job: **375 mRem**
7.
Designate the heat stress stay time: **<15 minutes**

SRO Only Handout

Cue:

"(Operator's name), determine if a dose extension is required to perform this work. If no extension is required, identify the expected margin to the dose limit upon completion of the task. If an extension is required, identify the form required to be completed for the dose extension and the levels of approval needed for the dose extension. Record your findings on the scorecard below."

SRO Only Scorecard

Answer the following when performing this task:
1.
Is a dose extension required? ☐ No (answer question 2 below only) ☐ Yes (answer questions 3 and 4 below only)
2.
Designate expected margin to dose limit upon completion of the job.
3.
Identify the form required to be completed for the dose extension.
4.
Check all appropriate boxes below for the approvals required for this dose extension. ☐ Work Group Supervisor ☐ Radiation Protection Manager ☐ Plant Manager ☐ Site Vice President

Examiner Scorecard. Do Not Provide to Applicant.

1.
Is a dose extension required? ☐ No (answer question 2 below only) ☒ **Yes (answer questions 3 and 4 below only)**
2.
Designate expected margin to dose limit upon completion of the job. **N/A**
3.
Identify the form required to be completed for the dose extension. **RP-AA-203 Attachment 1**
4.
Check all appropriate boxes below for the approvals required for this dose extension. ☒ **Work Group Supervisor** ☒ **Radiation Protection Manager** ☐ Plant General Manager ☐ Site Vice President

Exelon Generation

Training Id: **NMP1 NRC SRO Admin JPM EP** Revision: **0.0**

Title: **Emergency Event Classification & Notification**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	10/22/20
Validated By	Pat Ryan	10/26/30
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

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 2.4.41, (4.6)
2. EP-CE-111, Emergency Classification and Protective Action Recommendations
3. EP-AA-1013, Add 3, NMP Unit 1 EAL Wallboard

Instructor Information

A. JPM Information

1. Description
   a. This JPM tests the SRO’s ability to classify an event and perform the Station specific Initial Notification Form.
   b. Critical steps are annotated in the Evaluator standard column with a bolded ***Pass/Fail**.
2. Task Information:
   a. NS-EP101-03018, Prepare and Approve a Part 1 Notification Fact Sheet For An Emergency Classification.
   b. NUREG 1123 K/A 2.4.41 (4.6), Knowledge of the emergency action level thresholds and classifications.
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 Cold Shutdown 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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given the following conditions: • The unit has been shutdown since yesterday at 12:05 PM. • Coolant temperature is being maintained 110°F to 130°F with 11 and 12 Shutdown Cooling loops in service • EDG 102 is tagged out for engine maintenance • High winds at the site, gusting to over 50 MPH, result in an extended loss of both Line 1 and Line 4 • EDG 103 starts but does not close in on PB103 due to a breaker fault • RPV water level is 43 inches and slowly lowering • NMP Unit 2 and JAF are both operating with no emergency events in progress **Instructor / Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	The time that conditions are available in the Control Room is upon completion of the initiating cue. **(Operators Name)**, classify this event and complete the station specific initial notification form in accordance with EP-AA-112-100-F-01 SHIFT EMERGENCY DIRECTOR CHECKLIST.

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:** Obtains EAL Flowchart and Shift Emergency Director binder.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
Evaluator Note	• Steps may not be performed in the order exactly as listed in the JPM. • The Operator may choose to utilize the Simplified Classification Sequence guide NMP EP AID EPA-28.		
3.	Starts EP-AA-112-100-F-01, Shift Emergency Director Checklist	P	SAT / UNSAT **STD:** Maintains place keeping throughout performance of this checklist

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	If the event is classified as an ALERT, then perform the following: RECORD the EAL and declaration time	P (1.2.A)	***PASS / FAIL** **STD:** Classifies the event as an **ALERT CA1** **Critical Step Justification:** Emergency classification and declaration shall be completed as soon as possible but no later than 15 from the time indications an EAL threshold being met or exceeded are available in the Control Room. The time written on the ED Checklist or SED job aid will count as declaration time if no announcement is made. **The time difference below must be 15 minutes or less:** JPM Start Time: ______________ Declaration Time: ______________

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	**ANNOUNCE** the event classification, possible escalation paths, and declaration time to the Control Room staff. **Cue**: If asked for a peer check, report that the STA/IA is not available for peer check **DECLARE** the event by announcing the following (from EPA-28): I am declaring a(n) (EAL Classification) at (time) due to (brief reason). Escalation criteria is(are) (Criteria) and I am assuming the role as Shift ED."	P (1.2.B)	SAT/UNSAT **STD:** Announces to Control Room personnel the EAL classification, possible escalation paths, and declaration times.
6.	Calls Shift Communicators and Shift dose Assessors to their respective Control Rooms	P (1.2.C, 1.2.D)	SAT / UNSAT **STD:** Uses Gai-Tronics to call personnel to Control Room
7.	Security Related Events, **GO TO** Step 4.1 Security Related Events. **Note**: Determines NO Security Event is in progress (N/A for this scenario)	P (1.2.F)	SAT / UNSAT **STD:** Determines that this is not a Security Event

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
8.	**If** **<u>all</u>** the ERO has **<u>not</u>** been activated, then DIRECT activation of the ERO Notification using 1, "Actual Event Respond to Facility" **or** 3, "Actual Event Alternative Facility Response" as appropriate, per EP-AA-112-100-F-06. ***Cue****: As Shift Communicator, acknowledge direction to notify ERO* **Note:** Record time SED directs the Shift Communicator to activate the ERO as recorded in the SED Checklist	P (1.2.G)	SAT/UNSAT **STD:** Accurately fills out and completes ERONS Notification Details (CNG) • Circles NMP • Circles "Actual Event Respond to Facility" **Note:** Operator may only call U2 and direct them to activate ERONs. This satisfies the requirement.
9.	**SELECT** the Emergency Public Address Announcements from the form **and DIRECT** performance of the public address announcement within 15 minutes of the event classification using EP-AA-112-F-09 **Cue**: As Shift Communicator, acknowledge direction. Wait 1 minute and then report that Station announcement has been made.	P (1.2.H)	SAT / UNSAT **STD:** Directs Shift communicator to makes Emergency PA Announcement

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
10.	**DIRECT** performance of State/Local notifications within 15 minutes of the event classification as required per the Notifications procedure. • Notification Procedure: (Tab 3) • Notification form: (Tab 4) • Release in Progress Determination Guidance: (Tab 21) • Release in Progress Determination Guidance Technical Basis: (Tab 26) **Cue**: If operators asks for a peer check, report that the STA/IA is not available for peer check Provides the completed form to Shift Communicator and directs them to notify State and Local. **Cue:** As Shift Communicator, acknowledge direction and record time Part 1 Notification received. **Note**: The accurate declaration "CA1" is not required for a passing grade determination. The requirement is the Shift Manager make the correct event classification. In this case the SM/ED needs to declare an "ALERT" to receive credit. (per TQ-AA-155, Attachment 6, Step 2.4)	P (1.2.I)	***PASS / FAIL** **STD:** Accurately fills in and completes all information inside SHADED boxes of Part 1 Notifications. Marks "Nine Mile Point Unit 1" on first row Step 2: B Step 3: B Step 4: Date /Time Step 5: A Step 6: A This notification is required to be completed within 15 minutes of the Emergency Declaration. This means that the state and local are required to be notified within 15 minutes. ***Critical Step Justification:*** *This information is required to be accurate when providing transmitting this information to outside organizations and the NRC* **The time difference below must be 15 minutes or less:** Declaration Time: ____________ Notification Time: ____________

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
11.	The Operator may perform the following steps before completing the Part 1 Notification Fact Sheet. These steps are NOT required to be completed for Satisfactory completion of the JPM		
12.	DIRECT performance of required NRC notifications immediately following notification of the appropriate State and Local agencies: • Notification Procedure: (Tab 20) • Notification Form: (Tab 10)	P (1.2.J)	SAT/UNSAT **STD:** Accurately fills out and completes the Reactor Plant Event Notification Worksheet (NRC Form 361)
13.	**If** a release is in progress, **then**: **Note**: the operator should determine there is NO release in progress based on initial conditions and this step is N/A	P (1.5)	SAT / UNSAT **STD:** Determines that there is not a Release in Progress
14.	**If** the emergency involves any type or size LOCA, **then ENSURE** Control Room(s) emergency ventilation is initiated.	P (1.6)	SAT / UNSAT **STD:** Determines this step is N/A
15	Determines if SAFER FLEX Equipment is deemed necessary (N/A for this scenario)	P (1.7)	SAT / UNSAT **STD:** Determines N/A

Termination Cue	Once the Part 1 Notification Fact Sheet is completed and the Shift communicator is Directed to make State and Local notifications, report "At this time, the JPM is completed"
TASK STANDARD	An ALERT (CA1) has been classified and NMP Notification Fact Sheet-Part 1 (CNG) is completed
STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given the following conditions: • The unit has been shutdown since yesterday at 12:05 PM. • Coolant temperature is being maintained 110°F to 130°F with 11 and 12 Shutdown Cooling loops in service • EDG 102 is tagged out for engine maintenance • High winds at the site, gusting to over 50 MPH, result in an extended loss of both Line 1 and Line 4 • EDG 103 starts but does not close in on PB103 due to a breaker fault • RPV water level is 43 inches and slowly lowering • NMP Unit 2 and JAF are both operating with no emergency events in progress

INITIATING CUE	The time that conditions are available in the Control Room is upon completion of the initiating cue. **(Operators Name)**, classify this event and complete the station specific initial notification form in accordance with EP-AA-112-100-F-01 SHIFT EMERGENCY DIRECTOR CHECKLIST.

Emergency Meteorology Report

Last 15 Minute Emergency Meteorology Report Data							
Data from Nine Mile Point Met System							
Date: XX/XX/XXXX				Time (Local): XX:XX:XX			
Elevated				Ground			
200'	Wind Speed (Main)	37	(mph)	30'	Wind Speed (Main)	32	(mph)
200'	Wind Dir From (Main)	352	(deg)	30'	Wind Dir From (Main)	350	(deg)
200'	Delta Temperature	0.05	(deg F)	100'	Delta Temperature	0.7	(deg F)
	Stability Class	E			Stability Class	C	
30'	Air Temperature	50	(deg F)		Precipitation (15 min)	1.02	(in)

Exelon Generation

Training Id: **2020 NRC NMP1 Simulator JPM S-1** Revision: **0.0**

Title: **Shift Reactor Building Operating Exhaust and Supply Fans (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/3/20
Validated By	Dave Mason	7/13/20
Facility Reviewer	Signature on File / Phil Nichols	11/3/20

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-10, Reactor Building Heating, Cooling, and Ventilating System
2. NUREG 1123 K/A 288000 A4.01, (3.1/2.9)

Exelon Generation

Instructor Information

A. JPM Information

1. Description

    a. This JPM tests the operator's ability to operate the Reactor Building Ventilation System.

    b. This JPM is considered alternate path, because one of the newly started fans displays abnormal operating parameters which should prompt the operator to restore reactor building ventilation back to a functioning lineup.

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

2. Task Information:

    a. N1-288001-01002

    b. K/A 288000 A4.01, (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. Initialize simulator to IC-169
   b. RX Building Supply and Exhaust Fans #11 in service in slow speed.
   c. RB VENT JPM SETUP
      - Event trigger – set TRG 3 to ZDHVF02T==0
      - Overrides assigned to TRG 3 (Delete overrides when Supply Fan 12 switch is taken to STOP.)
         - DI-5485, RB Supply Fan 12 & Inlet Damper, ON
         - AO-1257, React Bldg supply Fan 12 AMP, Analog Value 1
         - DO-9525, Reactor Bldg Supply Fan 12 Green light OFF
         - DO-9526, Reactor Bldg Supply Fan 12 SLOW Red light ON
         - DO-9512, Reactor Bldg Supply Fan 12 Inlet Damper Green light OFF DT=10sec
         - DO-9513, Reactor Bldg Supply Fan 12 Inlet Damper Red light ON

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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • Reactor Building Exhaust Fan #11, and Reactor Building Supply Fan # 11 are in service. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, Shift Reactor Building Ventilation to place Reactor Building Exhaust and Supply Fans #12 in service IAW N1-OP-10 Section F.1.0 and F.2.0.

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-10 obtained. Precautions & limitations reviewed & section F.1.0 and F.2.0 referenced.
3.	Verify operating RX Building supply and exhaust fans in SLOW.	P (F.1.2.a)	SAT / UNSAT **STD:** Visually observe REACTOR BLDG SUPPLY FAN 11 <u>and</u> REACTOR BLDG EXHAUST FAN 11 fans in SLOW red slow light illuminated.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Start REACTOR BLDG EXHAUST FAN 12 on SLOW	P (F.1.2.b)	***PASS / FAIL** **STD:** Rotate REACTOR BLDG EXHAUST FAN 12 control switch CW to the slow position observe red slow light illuminated, green light off.
5.	Confirm damper 202-07, REACTOR BLDG EXHAUST FAN 12 OUTLET DAMPER open.	P (F.1.2.c)	SAT / UNSAT **STD:** Observe 202-07 open red light on, green light off.
6.	Stop REACTOR BLDG EXHAUST FAN 11.	P (F.1.2.d)	***PASS / FAIL** **STD:** Rotate REACTOR BLDG EXHAUST FAN 11 control switch CCW to the Off position.
7.	Confirm damper 202-08, REACTOR BLDG EXHAUST FAN 11 OUTLET DAMPER closed.	P (F.1.2.e)	SAT / UNSAT **STD:** Observe REACTOR BLDG EXHAUST FAN 11 OUTLET DAMPER closed green light on, red light off.
8.	Confirm normal system flow.	P (F.1.3)	SAT / UNSAT **STD:** Observe annunciator L1-2-5 RB VENT EXH FLOW LOW is clear.
9.	Start REACTOR BLDG SUPPLY FAN 12 on SLOW.	P (F.2.2.b)	***PASS / FAIL** **STD:** Rotate REACTOR BLDG SUPPLY FAN 12 control switch CW to the Slow position observe red slow light illuminated, green light off.
10.	Confirm damper FCV 202-04, REACTOR BLDG SUPPLY FAN 12 INLET DAMPER open.	P (F.2.2.c)	SAT / UNSAT / NA **STD:** Observe 202-04 open red light on, green light off

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
Alternate Path	**Note:** Candidate may not notice amps low and continue in procedure to secure Fan 11. There are 2 success paths. 1. Low amps identified after Supply Fan 12 start. Candidate performs steps 11,12,13 and 18, with step 13 a critical step. 2. Low amps not identified after Supply Fan 12 start. Candidate performs steps 14,15,16,17,18, with steps 16 and 17 as critical step.		
11.	Identify low amps on REACTOR BLDG SUPPLY FAN 12.	P	SAT / UNSAT / NA **STD:** Observe low amps on Fan 12 (5-10 amps) with Fan 11 amps remaining at normal (~30 amps).
12.	Inform SM of low amps on REACTOR BLDG SUPPLY FAN 12. **Cue:** As SM, concur and allow Fan 11 to remain in service.	P	SAT / UNSAT / NA **STD:** Recommend Fan 11 remains in service and Fan 12 be shutdown.
13.	Secure REACTOR BLDG SUPPLY FAN 12. **Note:** Booth operator, delete all overrides when Supply Fan 12 is secured.	P	***PASS / FAIL / NA** **STD:** Rotate REACTOR BLDG SUPPLY FAN 12 control switch CCW to the Off position.
14.	Secure REACTOR BLDG SUPPLY FAN 11 **Cue:** If directed from L1-2-4 report the following, as the operator in the field: • Heating Unit is tripped • Inlet Filter differential pressure is normal	P (F.2.2.d)	SAT / UNSAT / NA **STD:** Rotate REACTOR BLDG SUPPLY FAN 11 control switch CCW to the Off position and observe red slow light off, green light illuminated. Observe annunciator L1-3-4 and L1-2-4 alarm Observe RB dp indication rises indicating high negative dp

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
15.	Report abnormal indication to SM **Cue:** As SM, concur and allow Fan 11 to be returned to service and Fan 12 to be shutdown.		SAT / UNSAT / NA **STD:** Recommend returning Fan 11 to service and securing Fan 12
16.	Start REACTOR BLDG SUPPLY FAN 11 on SLOW. *Annunciators L1-3-4 and L1-2-4 clear* *RB dp indication returns to normal*		***PASS / FAIL / NA** **STD:** Rotate REACTOR BLDG SUPPLY FAN 11 control switch CW to the Slow position observe red slow light illuminated, green light off.
17.	Secure REACTOR BLDG SUPPLY FAN 12 **Note:** Booth operator, delete all overrides when Supply Fan 12 is secured. **Note:** Applicant may reference the OP to secure fan 12		***PASS / FAIL / NA** **STD:** Rotate REACTOR BLDG SUPPLY FAN 12 control switch CCW to the Off position and observe red slow light off, green light illuminated.
18.	Notify US/SM that REACTOR BLDG SUPPLY FAN 11 has been returned to service with normal dp and REACTOR BLDG supply FAN 12 is secured. **Cue:** Acknowledge report.	P	SAT / UNSAT / NA **STD:** Proper communications used.

Evaluator Note:	**Cue:** *Your task is complete.*

TASK STANDARD	Misoperation identified on Supply Fan 12. Supply Fan 11 and Exhaust Fan 12 are running.

STOP TIME	

Exelon Generation

JPM Handout

INITIAL CONDITIONS	Given: • Reactor Building Exhaust Fan #11, and Reactor Building Supply Fan # 11 are in service.

INITIATING CUE	**(Operators Name)**, Shift Reactor Building Ventilation to place Reactor Building Exhaust and Supply Fans #12 in service IAW N1-OP-10 Section F.1.0 and F.2.0.

Exelon Generation

Training Id: **2020 NRC NMP1 Simulator JPM S-2** Revision: **0.0**

Title: **Shift Feedwater Pressure and Level Channels**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/10/19
Validated By	Dave Mason	7/13/20
Facility Reviewer	Signature on File / Phil Nichols	11/3/20

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-16, Feedwater System Booster Pump to Reactor
2. NUREG 1123 K/A 259002 A4.06, (3.1/3.2)

Instructor Information

A. JPM Information

1. Description

    a. This JPM tests the operator's ability to locate and operate controls associated with Digital Feedwater Level Control. The operator will shift in-service pressure and level columns and shift to single element control.

    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. N1-259002-01011, Shift Reactor Pressure / Level Columns and Feedwater Modes

    b. K/A 259002 A4.06, (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. A plant shutdown is in progress, <25% power.
    b. Initialize simulator to IC 169
    c. Channel 11 Pressure and Level columns are in service.
    d. Feedwater is in automatic 3-element control

6. JPM Setup (if required)
    a. No steps need to be marked up.
    b. Ensure adequate copies of N1-OP-16, F.10 and Precautions & Limitations 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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • A plant shutdown is in progress • Reactor power is approximately 22% • It is desired to shift pressure and level columns • Also, per N1-OP-43C, Plant Shutdown, FWLC is required to be transferred to single element control. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, shift pressure and level columns to channel 12 and transfer feedwater to single element control per N1-OP-16 section F.10.

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-16 obtained.
3.	Place in service FCV Yokogawa in MANUAL if swapping level / pressure channels. **Note:** The applicant may reference N1-OP-16 section F.5 to place the controller in Manual.	P (10.1)	***PASS / FAIL** **STD:** Depresses "M" on the in-service FCV, RMC-29-156, to place Feedwater in manual
4.	Operate pressure keylock selector switch TRS-36-101 as required to place desired channel in control AND verify corresponding light indication response.	P (10.2)	***PASS / FAIL** **STD:** At E Console, rotates TRS-36-101 clockwise to channel 12. Switch spring returns to normal.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	Verify selected pressure channel ONLY light lit **Note:** Both channel lights will be lit for a short period as the channel input is being transferred. Indicated level will also change slightly.	P (10.2.1)	SAT / UNSAT **STD:** Observes channel 12 light illuminate and channel 11 light extinguish
6.	Operate level keylock selector switch TRS-36-100 as required to place desired channel in control AND verify corresponding light indication response	P (10.3)	***PASS / FAIL** **STD:** At E Console, rotates TRS-36-100 clockwise to channel 12. Switch spring returns to normal.
7.	Verify selected level channel ONLY light lit **Note:** Both channel lights will be lit for a short period as the channel input is being transferred.	P (10.3.1)	SAT / UNSAT **STD:** Observes channel 12 light illuminate and channel 11 light extinguish
8.	Operate feedwater mode selector switch RMC-ID34 as required to place desired feedwater mode in control AND verify corresponding light indication response	P (10.4)	***PASS / FAIL** **STD:** At E Console, rotates RMC-ID34, Single Element / Three Element Control Switch, CCW to "1". Switch spring returns to normal.
9.	Verify selected feedwater mode ONLY light lit	P (10.4.1)	SAT / UNSAT **STD:** Observes single element light illuminate and three element light extinguish
10.	IF FWLC was placed in MANUAL, adjust FW Master Yokogawa PV setpoint to match indicated level on selected level channel.	P (10.5)	SAT / UNSAT **STD:** If necessary, adjusts the in-service FCV setpoint to match indicated level.

Exelon Generation

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
11.	Place in service FCV Yokogawa in AUTO **Note:** The applicant may reference N1-OP-16 section F.5.6 to verify automatic control.	P (10.6)	***PASS / FAIL** **STD:** Depresses "A" on the in-service FCV, RMC-29-156, to place Feedwater in automatic.
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	Reactor Pressure / Level Columns have been shifted to channel 12 and Feedwater Mode has been transferred to single element control.

STOP TIME	

Exelon Generation

JPM Handout

INITIAL CONDITIONS	Given: • A plant shutdown is in progress • Reactor power is approximately 22% • It is desired to shift pressure and level columns • Also, per N1-OP-43C, Plant Shutdown, FWLC is required to be transferred to single element control.

INITIATING CUE	**(Operators Name)**, shift pressure and level columns to channel 12 and transfer feedwater to single element control per N1-OP-16 section F.10.

Exelon Generation

Training Id: **2020 NRC NMP1 Simulator JPM S-3** Revision: **0.0**

Title: **Respond to Recirculation Pump Seal Failure (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/3/20
Validated By	Dave Mason	7/13/20
Facility Reviewer	Signature on File / Phil Nichols	11/3/20

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-1, NSSS
2. NUREG 1123 K/A 202001 A2.10, (3.5/3.9)

Instructor Information

A. JPM Information

1. Description

    a. This JPM tests the operator's ability to respond to the catastrophic failure of a reactor recirculation pump's seals per N1-SOP-1.2, Recirc Pump Seal Failure.

    b. The JPM is considered alternate path because a spurious trip of the associated power board will occur while attempting to isolate the affected loop. The operator will be required to reenergize this bus to complete the task.

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

2. Task Information:

    a. N1-202001-01011, Respond to a reactor recirculation pump seal failure

    b. K/A 202001 A2.10, (3.5/3.9)

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 with 5 recirc loops in operation
   b. Initialize simulator to IC 161
      - **RR06D**, RR Pump 14 Lower (Inner) Seal Failure, FV=50 **Inserted**
      - **RR07D,** RR Pump 14 Upper (Outer) Seal Failure, FV=10 **Inserted**
      - **ED12A**, PB 16A Electrical Fault **TRG 1**

   c. Verify the following event triggers:

Event #	Event Action	Command
1	**hzlrrv03c(4)==1** *(True when 14 RRP Discharge MOV green light on)*	blank
2	**hzled601c==0** *(True when R1041 red light off)*	dmf ed12a

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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is operating at rated conditions • 14 Reactor Recirculation Pump seal degradation is occurring ○ LP seal pressure is 700 psig. • All five Recirculation Pumps are currently operating • Drywell Floor Drain Leak rate has risen by 1.5 gpm **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform the actions for failure of both seals on 14 Reactor Recirculation Pump per N1-SOP-1.2, Recirc Pump Seal 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-1.2 obtained.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Place the affected REACTOR RP MOTOR MG SET control switch to STOP **Cue:** Inform the operator that plant response (i.e. power, level, pressure, etc) will be monitored by other operators	P	***PASS / FAIL** **STD:** Momentarily places REACTOR RP MOTOR 14 MG SET control switch CCW to the STOP position on F Panel. Verifies trip by observing associated red light off, green light on, as well as redundant instrumentation (flow, current, power, frequency, etc)
4.	Give a close signal the associated REACTOR R PUMP BYPASS VALVE	P	***PASS / FAIL** **STD:** Places REACTOR R PUMP 14 BYPASS VALVE control switch CCW to the CLOSE position and verifies valve closure by observing associated green light on, red light off on F Panel (may wait to perform the verification in step 15 or do it again per N1-SOP-1.2).

Alternate Path	In the following step, both motor operated valves have lost power. The valves are NOT closed and alternate path is required.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	Simultaneously close Suction AND Discharge Valves	P	SAT / UNSAT **STD:** Simultaneously places and holds, REACTOR R PUMP 14 SUCTION VALVE and REACTOR R PUMP 14 DISCHARGE VALVE control switches CCW to the CLOSE position
6.	Reports to Unit Supervisor that power is lost to REACTOR R PUMP 14 SUCTION VALVE and REACTOR R PUMP 14 DISCHARGE VALVE **Cue:** If the operator recognizes/reports A4-3-1, as SM/US, direct operator to carry out the ARP actions for annunciator A4-3-1, "POWER BD 16 R1041 TRIP" **Role Play**: Provides repeat back of direction	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices **STD:** Current version N1-ARP-A4-3-1 obtained and referenced per HU-AA-104-101, Procedure Use and Adherence
7.	Confirm alarm on computer	P	SAT / UNSAT **STD:** Consults alarm typer and observes E138, PB16A-SUP BK-R1041 TRIP displayed
8.	Verify tripped R1041	P	SAT / UNSAT **STD:** Verifies R1041 tripped by observing associated green light on, red light off on A Panel

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
9.	Start alternate loads on PB 17 as required **Cue:** As SM/US, another operator will be starting alternate loads on PB 17	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
Evaluator Note	**Malfunction ED12A** (PB 16A Electrical Fault) auto deletes allowing PB16A to be re-energized.		
10.	Verify PB 16A clear of faults **Cue:** As SM/US, inform operator that the Electrical Maintenance supervisor, has reported that PB 16A is clear of faults. Maintenance accidently bumped into the powerboard with their tool cart.	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
11.	Obtain SM permission to re-energize PB 16A **Cue:** As SM, grant permission to re-energize PB 16A, using cross-tie breaker.	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12.	Close A-B Tie Breaker 1042 **Note:** After receiving the report that the powerboard is NOT faulted, the operator may opt to re-energize PB-16 using A4-4-2, and close breaker R1041 instead. This is an acceptable action to receive credit for this step.	P	***PASS / FAIL** **STD:** Closes A-B Tie Breaker 1042 (1041) by momentarily placing R 1042 (1041) control switch CW to the CLOSE position and verifies breaker closure by observing associated red light on, green light off, and PB 16A voltage indicated on A Panel
13.	**Cue:** As SM/US, direct operator to complete the isolation of 14 reactor recirculation pump per SOP-1.2 Provide repeat back of direction	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
14.	Simultaneously close Suction <u>AND</u> Discharge Valves	P	***PASS / FAIL** **STD:** Simultaneously places and holds REACTOR R PUMP 14 SUCTION VALVE and REACTOR R PUMP 14 DISCHARGE VALVE control switches CCW to the CLOSE position. Verifies both valves have closed by observing associated green lights illuminated and red lights extinguished on F Panel.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
15.	Verify 14 Reactor Recirculation Pump Bypass valve is shut.	P	SAT / UNSAT ***STD:*** *Verifies valve closure by observing associated green light on, red light off on F Panel*
Evaluator Note	Another Control Room Operator will verify proximity to the Restricted Zone.		
16.	**Cue:** Another Control Room Operator will verify proximity to the Restricted Zone **Role Play**: Provide repeat back	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
17.	Reports 14 reactor recirculation pump has been shutdown and isolated per SOP-1.2 **Role Play:** Acknowledge report	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	Reactor Recirculation Pump 14 has been shutdown and isolated per N1-SOP-1.2, Recirc Pump Seal Failure

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at rated conditions • 14 Reactor Recirculation Pump seal degradation is occurring ○ LP seal pressure is 700 psig. • All five Recirculation Pumps are currently operating • Drywell Floor Drain Leak rate has risen by 1.5 gpm

INITIATING CUE	**(Operators Name)**, perform the actions for failure of both seals on 14 Reactor Recirculation Pump per N1-SOP-1.2, Recirc Pump Seal Failure.

Exelon Generation

Training Id: **2020 NRC NMP1 Simulator JPM S-3** Revision: **0.0**

Title: **Respond to Recirculation Pump Seal Failure (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/3/20
Validated By	Dave Mason	7/13/20
Facility Reviewer	Signature on File / Phil Nichols	11/3/20

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-1, NSSS
2. NUREG 1123 K/A 202001 A2.10, (3.5/3.9)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to respond to the catastrophic failure of a reactor recirculation pump's seals per N1-SOP-1.2, Recirc Pump Seal Failure.

   b. The JPM is considered alternate path because a spurious trip of the associated power board will occur while attempting to isolate the affected loop. The operator will be required to reenergize this bus to complete the task.

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

2. Task Information:

   a. N1-202001-01011, Respond to a reactor recirculation pump seal failure

   b. K/A 202001 A2.10, (3.5/3.9)

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 with 5 recirc loops in operation
   b. Initialize simulator to IC 161
      - **RR06D**, RR Pump 14 Lower (Inner) Seal Failure, FV=50 **Inserted**
      - **RR07D,** RR Pump 14 Upper (Outer) Seal Failure, FV=10 **Inserted**
      - **ED12A**, PB 16A Electrical Fault **TRG 1**

   c. Verify the following event triggers:

Event #	Event Action	Command
1	**hzlrrv03c(4)==1** *(True when 14 RRP Discharge MOV green light on)*	blank
2	**hzled601c==0** *(True when R1041 red light off)*	dmf ed12a

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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is operating at rated conditions • 14 Reactor Recirculation Pump seal degradation is occurring ○ LP seal pressure is 700 psig. • All five Recirculation Pumps are currently operating • Drywell Floor Drain Leak rate has risen by 1.5 gpm **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform the actions for failure of both seals on 14 Reactor Recirculation Pump per N1-SOP-1.2, Recirc Pump Seal 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-1.2 obtained.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Place the affected REACTOR RP MOTOR MG SET control switch to STOP **Cue:** Inform the operator that plant response (i.e. power, level, pressure, etc) will be monitored by other operators	P	***PASS / FAIL** **STD:** Momentarily places REACTOR RP MOTOR 14 MG SET control switch CCW to the STOP position on F Panel. Verifies trip by observing associated red light off, green light on, as well as redundant instrumentation (flow, current, power, frequency, etc)
4.	Give a close signal the associated REACTOR R PUMP BYPASS VALVE	P	***PASS / FAIL** **STD:** Places REACTOR R PUMP 14 BYPASS VALVE control switch CCW to the CLOSE position and verifies valve closure by observing associated green light on, red light off on F Panel (may wait to perform the verification in step 15 or do it again per N1-SOP-1.2).

Alternate Path	In the following step, both motor operated valves have lost power. The valves are NOT closed and alternate path is required.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	Simultaneously close Suction AND Discharge Valves	P	SAT / UNSAT **STD:** Simultaneously places and holds, REACTOR R PUMP 14 SUCTION VALVE and REACTOR R PUMP 14 DISCHARGE VALVE control switches CCW to the CLOSE position
6.	Reports to Unit Supervisor that power is lost to REACTOR R PUMP 14 SUCTION VALVE and REACTOR R PUMP 14 DISCHARGE VALVE **Cue:** If the operator recognizes/reports A4-3-1, as SM/US, direct operator to carry out the ARP actions for annunciator A4-3-1, "POWER BD 16 R1041 TRIP" **Role Play**: Provides repeat back of direction	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices **STD:** Current version N1-ARP-A4-3-1 obtained and referenced per HU-AA-104-101, Procedure Use and Adherence
7.	Confirm alarm on computer	P	SAT / UNSAT **STD:** Consults alarm typer and observes E138, PB16A-SUP BK-R1041 TRIP displayed
8.	Verify tripped R1041	P	SAT / UNSAT **STD:** Verifies R1041 tripped by observing associated green light on, red light off on A Panel

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
9.	Start alternate loads on PB 17 as required **Cue:** As SM/US, another operator will be starting alternate loads on PB 17	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
Evaluator Note	**Malfunction ED12A** (PB 16A Electrical Fault) auto deletes allowing PB16A to be re-energized.		
10.	Verify PB 16A clear of faults **Cue:** As SM/US, inform operator that the Electrical Maintenance supervisor, has reported that PB 16A is clear of faults. Maintenance accidently bumped into the powerboard with their tool cart.	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
11.	Obtain SM permission to re-energize PB 16A **Cue:** As SM, grant permission to re-energize PB 16A, using cross-tie breaker.	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12.	Close A-B Tie Breaker 1042 **Note:** After receiving the report that the powerboard is NOT faulted, the operator may opt to re-energize PB-16 using A4-4-2, and close breaker R1041 instead. This is an acceptable action to receive credit for this step.	P	***PASS / FAIL** **STD:** Closes A-B Tie Breaker 1042 (1041) by momentarily placing R 1042 (1041) control switch CW to the CLOSE position and verifies breaker closure by observing associated red light on, green light off, and PB 16A voltage indicated on A Panel
13.	**Cue:** As SM/US, direct operator to complete the isolation of 14 reactor recirculation pump per SOP-1.2 Provide repeat back of direction	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
14.	Simultaneously close Suction <u>AND</u> Discharge Valves	P	***PASS / FAIL** **STD:** Simultaneously places and holds REACTOR R PUMP 14 SUCTION VALVE and REACTOR R PUMP 14 DISCHARGE VALVE control switches CCW to the CLOSE position. Verifies both valves have closed by observing associated green lights illuminated and red lights extinguished on F Panel.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
15.	Verify 14 Reactor Recirculation Pump Bypass valve is shut.	P	SAT / UNSAT ***STD:*** *Verifies valve closure by observing associated green light on, red light off on F Panel*
Evaluator Note	Another Control Room Operator will verify proximity to the Restricted Zone.		
16.	**Cue:** Another Control Room Operator will verify proximity to the Restricted Zone **Role Play**: Provide repeat back	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
17.	Reports 14 reactor recirculation pump has been shutdown and isolated per SOP-1.2 **Role Play:** Acknowledge report	P	SAT / UNSAT **STD:** Proper communications used IAW HU-AA-101, Human Performance Tools and Verification Practices
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	Reactor Recirculation Pump 14 has been shutdown and isolated per N1-SOP-1.2, Recirc Pump Seal Failure

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at rated conditions • 14 Reactor Recirculation Pump seal degradation is occurring ○ LP seal pressure is 700 psig. • All five Recirculation Pumps are currently operating • Drywell Floor Drain Leak rate has risen by 1.5 gpm

INITIATING CUE	**(Operators Name)**, perform the actions for failure of both seals on 14 Reactor Recirculation Pump per N1-SOP-1.2, Recirc Pump Seal Failure.

Exelon Generation

Training Id: **2020 NRC NMP1 Simulator JPM S-4** Revision: **0.0**

Title: **Place Containment Spray in Torus Cooling (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/3/20
Validated By	Jason Quick	7/15/20
Facility Reviewer	Signature on File / Phil Nichols	11/3/20

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-1, Attachment 16
2. NUREG 1123 K/A 219000, A4.02, (3.7/3.5)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to manipulate the containment spray system into Torus Cooling mode in an emergency.

   b. This JPM is considered alternate path because 80-118, CONT SPRAY TEST TO TORUS FCV will fail to open. N1-EOP-1, Attachment 16 provides direction to the operator in the event this happens.

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

2. Task Information:

   a. N1-226001-01016, Perform cooling of Torus water temperature using Containment Spray

   b. K/A 219000, A4.02, (3.7/3.5)

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 162
    b. Verify failure to scram conditions result in Torus water temperature high (~160ºF).
    c. Ensure all Recirc pump are tripped.
    d. Verify the following overrides are preset:
        - DI-4724 – on (Indication 80-118 fails to open)
        - DI-4725 – off (Indication 80-118 fails to open)
    e. Verify DW cooling fans are tripped.

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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • A high power ATWS has occurred. • An RPV Blowdown has been performed due to exceeding HCTL. • Torus water temperature is approximately 150°F and rising. • All DW cooling fans are tripped. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, place Containment Spray loop 111 in Torus Cooling per N1-EOP-1 attachment 16.

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-1 attachment 16 obtained
3.	Close 80-45 CONT SPRAY BYPASS BV 122	P (Step 3.2)	***PASS / FAIL** **STD:** Closes 80-45 by rotating control switch CCW to CLOSE
4.	Verify closed 80-115, CONT SPRAY TO RAD WASTE IV 12	P (Step 3.3)	SAT / UNSAT **STD:** Observes 80-115 green light on, red light off

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	Verify closed 80-114, CONT SPRAY TO RAD WASTE IV 11	P (Step 3.4)	SAT / UNSAT **STD:** Observes 80-114 green light on, red light off
6.	Verify closed 80-16, CONT SPRAY DISCHARGE IV 111	P (Step 3.5)	***PASS / FAIL** **STD:** Closes 80-16 by rotating control switch CCW to CLOSE
7.	Verify open 80-40, CONT SPRAY BYPASS BV 111	P (Step 3.6)	SAT / UNSAT **STD:** Observes 80-40 green light off, red light on
Alternate Path	The following step reveals the alternate path. Valve 80-118 will fail to open		
8.	Fully open 80-118, CONT SPRAY TEST TO TORUS FCV **Note:** 80-118 will fail to open, creating the alternate path. **Role Play:** If dispatched to manually open 80-118, report the valve is stuck.	P (Step 3.7)	***PASS / FAIL** **STD:** Attempts to open 80-118 by rotating control switch CW to OPEN

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
9.	IF 80-118 fails closed OR can NOT be opened AND the following conditions exist: • Torus cooling is required to establish adequate NPSH for Containment/Core Spray AND • Inside the Containment Spray Initiation Limit (Fig K) THEN perform the following: **Cue:** Once Candidate recognizes that 80-118 cannot be opened, inform them that Torus cooling is required to preserve Containment Spray and Core Spray NPSH.	P	SAT / UNSAT **STD:** Determines from cue that Torus cooling is required SAT / UNSAT **STD:** Determines conditions are inside the Containment Spray Initiation Limit
10.	Close the following IF opened in Step 3.6: • 80-44 • 80-41	P (Step 3.8.1)	SAT / UNSAT **STD:** Determines 80-44 and 80-41 were not previously opened
11.	Reopen the Cont Spray Discharge IV that was closed in Step 3.5	P (Step 3.8.2)	***PASS / FAIL** **STD:** Opens 80-16 by rotating control switch CW to OPEN
12.	Reopen Cont spray BYPASS BVs closed in Step 3.2	P (Step 3.8.3)	***PASS / FAIL** **STD:** Opens 80-45 by rotating control switch CW to OPEN
13.	Trip all Drywell Cooling Fans	P (Step 3.8.4)	SAT / UNSAT **STD:** Recognizes tripped based on initial conditions or visual inspection.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
14.	Verify all Reactor Recirc Pumps are tripped	P (Step 3.8.5)	SAT / UNSAT **STD:** Observes all 5 Recirc pump green lights on, red lights off
15.	Start either: • CONTAINMENT SPRAY RAW WATER PUMP 111 and 112 • CONTAINMENT SPRAY PUMP 111 and 112 OR • CONTAINMENT SPRAY RAW WATER PUMP 121 and 122 • CONTAINMENT SPRAY PUMP 121 and 122	P (Step 3.8.6)	***PASS / FAIL** **STD:** Starts one of the following groups of pumps by rotating control switches CW to START: • CONTAINMENT SPRAY RAW WATER PUMP 111 and 112 • CONTAINMENT SPRAY PUMP 111 and 112 OR • CONTAINMENT SPRAY RAW WATER PUMP 121 and 122 • CONTAINMENT SPRAY PUMP 121 and 122
Evaluator Note:	**Cue:** *Your task is complete.*		

TASK STANDARD	Torus cooling is initiated by initiating containment spray cooling.
STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • A high power ATWS has occurred. • An RPV Blowdown has been performed due to exceeding HCTL. • Torus water temperature is approximately 150ºF and rising. • All DW cooling fans are tripped.

INITIATING CUE	**(Operators Name)**, place Containment Spray loop 111 in Torus Cooling per N1-EOP-1 attachment 16.

Exelon Generation

Training Id: **2020 NMP1 NRC Simulator JPM S-5** Revision: **0.0**

Title: **Alternate RPV Blowdown Through the Reactor Head Vent Valves (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/19/19
Validated By	Jason Quick	7/15/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

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-1, NMP1 EOP Support Procedure
2. N1-EOP-8, RPV Blowdown
3. NUREG 1123 K/A 239001 A2.09, (3.4/3.7)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to operate major EC System valves to reduce RPV pressure via alternate methods.

   b. This JPM is considered alternate path because the normal method of RPV blowdown will be determined to be unavailable. The operator will be required to recognize alternate blowdown systems will be required to depressurize the RPV via alternate methods, in accordance with N1-EOP-8, RPV Blowdown.

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

2. Task Information:

   a. N1-EOP-1-01001, Implement NMP1 EOP Support Procedure (PRA)

   b. K/A 239001 A2.09, (3.4/3.7)

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 shutdown condition (Post-scram)
   b. Initialize simulator to IC 163
   c. Verify the following malfunctions are inserted
      - AD07B, ERV 112 FAILS CLOSED (Burned Out Solenoid)
      - AD07C, ERV 113 FAILS CLOSED (Burned Out Solenoid)
      - AD07D, ERV 121 FAILS CLOSED (Burned Out Solenoid)
      - AD07E, ERV 122 FAILS CLOSED (Burned Out Solenoid)
      - AD07F, ERV 123 FAILS CLOSED (Burned Out Solenoid)
      - MS03A, ONE MSIV FAILS CLOSED (VALVE 122)
      - MS03B, ONE MSIV FAILS CLOSED (VALVE 112)
      - TC12, ALL BYPASS VALVES FAIL - CLOSED (0-100%), FV=100
   d. Verify RPV pressure is at least 72 psi above torus pressure
   e. Override BOJM switch closed.

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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The reactor has been scrammed • MSIVs are closed • RPV Blowdown is required **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, commencing an RPV Blowdown. Initiate Emergency Condensers and open 4 ERVs.

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.	Initiate Emergency Condensers as follows:		
a.	Place 39-05, EMERG CNDSR RET ISOLATION VALVE 11 control switch to OPEN **<u>Note:</u>** It is not necessary to reference N1-EOP-8 since this action is normally directed by the US. Candidate may pull EOP Hardcard Att 9	P	***PASS / FAIL** **STD:** Rotates 39-05, EMERG CNDSR RET ISOLATION VALVE 11 control switch CW to OPEN
b.	Place 39-06, EMERG CNDSR RET ISOLATION VALVE 12 control switch to OPEN	P	***PASS / FAIL** **STD:** Rotates 39-06, EMERG CNDSR RET ISOLATION VALVE 12 control switch CW to OPEN

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Opens ERV 111 **Note:** All other ERVs will fail to open when attempted.	P	***PASS / FAIL** **STD:** Rotates ERV 111 control switch CW to OPEN, observes green and blue lights off, both red lights on
Alternate Path	The alternate path begins when the normal RPV Blowdown method fails. The operator will need to recognize the use of alternate blowdown systems is required to complete the task. Once the operator recognizes Detail 'O' from N1-EOP-8 must be used, the evaluator will cue which alternate blowdown option to use; N1-EOP-1, Attachment 22.		
4.	Attempts to open ERVs 112, 113, 121, 122, and 123	P	SAT / UNSAT **STD:** Rotates control switches for ERVs 112, 113, 121, 122, and 123 CW to OPEN, observes green and blue lights off, both red lights off
5.	Reports only ERV 111 is open and determines alternate blowdown systems must be used. **Cue:** Acknowledge report. If necessary, have the applicant make a recommendation for completing the emergency depressurization. When the applicant makes the determination that alternate blowdown methods from Detail 'O' of N1-EOP-8 must be used, direct the applicant to depressurize the RPV using the Reactor Head Vents per N1-EOP-1, Attachment 22.	P	***PASS / FAIL** **STD:** The critical portion of this step is related to the applicant recognizing the failure of the normal RPV blowdown method, and the requirement of the use of alternate blowdown systems to complete the emergency depressurization.
6.	Obtain a copy of the reference procedure and review/utilize the correct section	P	SAT / UNSAT **STD:** N1-EOP-1 obtained, Attachment 22 referenced
Note:	The remaining JPM steps are from N1-EOP-1, Attachment 22.		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
7.	Unlock AND close motor breaker 37-01, REACTOR HEAD VENT VALVE 11, PB 171B (East Wall) **Evaluator cue:** When requested as in-plant operator, **insert remote ED68**, Reactor Head Vent Valve, and report breaker 37-01 is closed.	P (3.1.1)	SAT / UNSAT **STD:** Dispatches in-plant operator to close breaker 37-01 at PB 171B
8.	Open Reactor Head Vents: • Open 37-01, REACTOR HEAD VENT VALVE 11. (*Panel F)* • Open 37-06, DRYWELL FLOODING VENT BV (*Panel J*).	P (3.1.2)	***PASS / FAIL** **STD:** Rotate 37-01 control switch CW to Open. Spring return to normal. ***PASS / FAIL** **STD:** Rotate 37-06 control switch CW to Open. Spring return to normal.
9.	IF Reactor Head Vent CANNOT be opened AND executing SAP-1…	P (3.2)	SAT / UNSAT **STD:** Determines step 3.2 does not need to be performed.
10.	Lineup EC vents to Main Condenser as follows: Open Main Turbine Bypass Valves at Panel A using BOJM.	P (3.3.1)	SAT / UNSAT **STD:** Attempts to open TBVs using BOJM at Panel A.
11.	IF Main Turbine Bypass Valves CANNOT be opened, THEN open 02-03 DRAIN VALVE TO CONDENSER, at Panel N **Note:** The Turbine Bypass Valves will fail to open.	P (3.3.2)	***PASS / FAIL** **STD:** Opens 02-03 DRAIN VALVE TO CONDENSER, by depressing associated button at Panel N.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12.	Verify open the following Emergency Condenser Vents at Panel K:	P (3.3.3)	
12a	05-02, EMERG COND VENT TO MN STM ISOLATION VALVE 11	P	***PASS / FAIL** **STD:** Rotates 05-02 control switch CW to OPEN, observes red light on, green light off
12b	05-11, EMERG COND VENT ISOLATION VALVE 112	P	SAT / UNSAT **STD:** Observes 05-11 red light on and green light off
12c	05-01R, EMERG COND VENT ISOLATION VALVE 111	P	SAT / UNSAT **STD:** Observes 05-01R red light on and green light off
12d	05-03, EMERG COND VENT TO MN STM ISOLATION VALVE 12	P	***PASS / FAIL** **STD:** Rotates 05-03 control switch CW to OPEN, observes red light on, green light off
12e	05-04R, EMERG COND VENT ISOLATION VALVE 121	P	SAT / UNSAT **STD:** Observes 05-04R red light on and green light off
12f	05-12, EMERG COND VENT ISOLATION VALVE 122	P	SAT / UNSAT **STD:** Observes 05-12 red light on and green light off
13.	Reports that the Reactor is being depressurized using the Emergency Condenser vents to the Main Condenser	P	SAT / UNSAT **STD:** Proper communications used

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

TASK STANDARD	The RPV is being depressurized through the Emergency Condensers, all available ERVs and the Reactor Head Vents.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The reactor has been scrammed • MSIVs are closed • RPV Blowdown is required

INITIATING CUE	**(Operators Name)**, commencing an RPV Blowdown. Initiate Emergency Condensers and open 4 ERVs.

Exelon Generation

Training Id: **2020 NRC NMP1 Simulator JPM S-6** Revision: **0.0**

Title: **Place 11 Shutdown Cooling Loop in Service (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/3/20
Validated By	Dave Mason	7/13/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

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-4, Shutdown Cooling System
2. NUREG 1123 K/A 205000, A4.01, (3.7/3.7)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to operate the SDC system. The operator will attempt to put SDC system 11 in service.

   b. This JPM is considered alternate path because shortly after a SDC pump is started, it will trip. The operator will be expected to make a recommendation, based on plant conditions, to place 12 SDC loop in service.

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

2. Task Information:

   a. N1-205000-01002

   b. K/A 205000, 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. Initialize simulator to IC 168
   b. Verify SDC temperature recorder on.
   c. Update 70-49, 70-54, and 70-58 status to "4".
   d. Verify recirc suction temperature is displayed (computer point A427).
   e. Verify SDC is removed from service (TCVs closed, pumps secured, IVs closed, inlet BVs closed).
   f. Verify SDC Pump 13 in PTL and info/caution tagged
   g. Verify SDC 13 suction valve is info/caution tagged (38-05)
   h. Verify Malfunction SC01C inserted
   i. Verify Malfunction SC01A on TRG 1 with 30 second TD
   j. Verify TRG 1 condition is "ZDSCPSTR(1)==1"
   k. Verify the following remotes are preset:
      - SC01 = close
      - SC02 = installed
      - SC03 = close
   l. Verify remotes SC04A(B)(C) = 100% are preset.

6. JPM Setup (if required)

   a. N1-OP-4, E.3.1 marked complete.

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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The Reactor is shutdown with all control rods inserted. • Reactor pressure is less than 120 psig. • N1-OP-4 has been completed through step E.3.1 for placing Shutdown Cooling in service. • Shutdown Cooling has been filled and vented within the last 24 hours and does not require further filling or venting. • Shutdown Cooling IV fuses/breakers have been installed. • Cooling Water has been placed in service per section E.2.0 • SDC pump 13 is OOS for maintenance. • Reactor water level is being monitored by another operator. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, place Shutdown Cooling loop 11 in service per N1-OP-4 starting at step E.3.2.

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-OP-4 obtained, precautions & limitations reviewed, & section E.3.0 referenced
3.	Open the following valves: (Step 3.2)		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3a.	38-03, SDC VALVE 11 PUMP SUCTION	P (Step E.3.2)	***PASS / FAIL** **STD:** Opens 38-03 by rotating control switch CW to OPEN
3b.	38-04, SDC VALVE 12 PUMP SUCTION	P (Step E.3.2)	***PASS / FAIL** **STD:** Opens 38-04 by rotating control switch CW to OPEN
3c.	38-05, SDC VALVE 13 PUMP SUCTION **Note:** Candidate may request an SQR one-time procedure change be processed before proceeding. **Cue:** If SQR one-time procedure change is requested, inform the Operator that the step can be left open and to proceed.	P (Step E.3.2)	SAT / UNSAT **STD:** Recognizes 38-05 is tagged closed
4.	Fill AND vent the SDC System by performing the following:	P (Step 3.3)	SAT / UNSAT **STD:** Determines fill and vent not required due to initial conditions
5.	Verify all rods inserted UNLESS directed by EOPs	P (Step 3.4)	SAT / UNSAT **STD:** Determines all rods are inserted per initial conditions or simulator setup

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
6.	IF SDC IV fuses AND breakers have NOT been installed, THEN perform the following:	P (Step 3.5)	SAT / UNSAT **STD:** Determines SDC IV fuses and breakers have been installed per initial conditions or simulator setup
7.	Open IV-38-02, SDC SYSTEM IN IV 12 (OUTSIDE)	P (Step 3.6)	***PASS / FAIL** **STD:** Opens 38-02 by rotating control switch CW to OPEN
8.	WHEN Reactor pressure is less than 120 psig, un-isolate Shutdown Cooling System as follows:	P (Step 3.7)	SAT / UNSAT **STD:** Determines Reactor pressure is less than 120 psig per initial conditions or simulator setup
8a	Monitor Reactor vessel level	P (Step 3.7.1)	SAT / UNSAT **STD:** Determines another operator is monitoring Reactor water level per initial conditions
8b	IF Reactor vessel level begins to go down WHILE un-isolating Shutdown Cooling System, THEN isolate Shutdown Cooling System AND determine cause of reduction in Reactor Vessel level	P (Step 3.7.2)	SAT / UNSAT **STD:** Determines Reactor water level is stable in subsequent steps
8c	Open 38-13, SDC SYSTEM OUT IV 1 (INSIDE)	P (Step 3.7.3)	***PASS / FAIL** **STD:** Opens 38-13 by rotating control switch CW to OPEN

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
8d	Open 38-01, SDC SYTEM IN IV 11 (INSIDE)	P (Step 3.7.4)	***PASS / FAIL** **STD:** Opens 38-01 by rotating control switch CW to OPEN
9.	Vent Shutdown Cooling pumps using the following valves:	P (step 3.8)	SAT / UNSAT **STD:** Determines venting not required due to initial conditions
10.	Vent heat exchangers using the following valves:	P (Step 3.9)	SAT / UNSAT **STD:** Determines venting not required due to initial conditions
11.	Verify open the following valves: • 38-134, SDC PUMP RECIRC VALVE 11 • 38-131, SDC PUMP RECIRC VALVE 12 • 38-128, SDC PUMP RECIRC VALVE 13 **<u>Note:</u>** Candidate may disregard 38-128 because the associated pump is tagged out.	P (Step 3.10)	SAT / UNSAT **STD:** Observes green light off, red light on for all
12.	Start 11 SDC Pump as follows: (Step 3.11)	**Note:** Pump Seal was NOT discovered de-staged (Step 3.11.2)	
12a	Verify Cooling Water in Service per N1-OP-4 Section E	P (Step 3.11.1)	SAT / UNSAT **STD:** Determines this is already complete per the initial conditions.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12b	Verify SD COOLING TCV 11 manual controller selected for zero output demand	P (Step 3.11.3.a)	SAT / UNSAT **STD:** Observes SD COOLING TCV 11 manual controller selected for zero output demand
12g	Place 11 SDC Pump Control Switch in START UNTIL 11 SDC PUMP running light is lit	P (Step 3.11.3.b)	***PASS / FAIL** **STD:** Starts SDC pump 11 by rotating control switch CW to START
Alternate Path	11 SDC pump will fail, initiating the alternate path.		
13.	Open respective SD Cooling TCV approximately 10% for selected SDC Loop: • 38-09, SD COOLING TCV 11 **NOTE:** 1 minute after 11 SDC pump in service, verify tripped 11 SDC pump (event trigger). Alarm K3-1-1, SDC Pump 11 trip, comes in on the pump trip. The alarm response procedure gives direction to start another pump.	P (Step 3.11.4)	***PASS / FAIL / NA** **STD:** Opens 38-09 by rotating knurled knob CW **Note:** Step may be NA if pump trips prior to executing.
	Cue: If applicant does not make a recommendation to place another SDC pump in service, ask "What would you recommend?". **Role Play:** If candidate asks about normalizing SDC loop 11, tell them to leave SDC loop 11 as is.		
14.	Start 12 SDC Pump as follows: (Step 3.11)	**Note:** Pump Seal was NOT discovered de-staged (Step 3.11.2)	

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
14a	Verify SD COOLING TCV 12 manual controller selected for zero output demand	P (Step 3.11.3.c)	SAT / UNSAT **STD:** Observes SD COOLING TCV 12 manual controller selected for zero output demand
14c	Place 12 SDC Pump Control Switch in START UNTIL 12 SDC PUMP running light is lit (Step 3.11.2.o)	P (Step 3.11.3.d)	***PASS / FAIL** **STD:** Starts SDC pump 12 by rotating control switch CW to START
15.	Open respective SD Cooling TCV approximately 10% for selected SDC Loop: 38-10, SD COOLING TCV 12	P (Step 3.11.4)	***PASS / FAIL** **STD:** Opens 38-10 by rotating knurled knob CW
16.	If reactor water flashing occurs in SDC System, reduce reactor water flow via selected SDC cooling TCV and maximize RBCLC cooling water flow. **Cue:** No flashing observed.	P (Step 3.11.5)	SAT / UNSAT **STD:** Pump amp indicator observed as steady.
17.	Adjust SDC COOLING TCV 12 for gradual warmup of the system. **NOTE:** Operator will monitor temperatures on panel recorder. **NOTE:** Operator may choose not to make any further adjustments based on the rate at which the loop is warming up with 38-10 10% open. **Cue:** Tell operator no further adjustments in the system are required.	P (Step 3.11.6)	SAT / UNSAT **STD:** Rotate knob on controller 38-10 CW or CCW as required for a gradual warmup as indicated on 38-136B.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
18.	Inform SM SDC Loop 12 in service **Cue:** Acknowledge report	P	SAT / UNSAT

Evaluator Note:	**Cue:** *Your task is complete.*

TASK STANDARD	Applicant recognizes failure of Shutdown Cooling Pump 11. Shutdown Cooling Loop 12 placed in service.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The Reactor is shutdown with all rods in. • Reactor pressure is less than 120 psig. • N1-OP-4 has been completed through step E.3.1 for placing Shutdown Cooling in service. • Shutdown Cooling has been filled and vented within the last 24 hours and does not require further filling or venting. • Shutdown Cooling IV fuses/breakers have been installed. • Cooling Water has been placed in service per section E.2.0 • SDC pump 13 is OOS for maintenance. • Reactor water level is being monitored by another operator.

INITIATING CUE	**(Operators Name)**, place Shutdown Cooling loop 11 in service per N1-OP-4 starting at step E.3.2.

Exelon Generation

Training Id: **2020 NRC NMP1 Simulator JPM S-7** Revision: **0.0**

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

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/3/20
Validated By	Dave Mason	7/13/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

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 168

6. JPM Setup (if required)

   a. Provide sufficient copies of N1-ST-R4, section 8.5. Also include P&Ls and completed 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 US 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:** Verfifies 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.	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	

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: **2020 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	Signature on File / Paul Isham	1/3/20
Validated By	Jeremy Spring	7/15/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

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 164
      - 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 US 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

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
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
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 placed to EM STOP and released. **Critical Step Justification:** If this step is not performed, the engine will not start in subsequent steps.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
	NOTE: DG 103 will be started with an Auto Start Signal to assure the Governor Circuit has DC power from the Battery.		
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* **Note:** If EDG 103 is allowed to run for an extended period of time with PB-103 de-energized, an EDG off-normal annunciator may alarm. If necessary, cue the operator to continue with the procedure.	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.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
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.
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 Cue:	*Your task is complete.*
Evaluator Note:	The procedure does not direct removal of the Sync Key. Verify the Sync Key is removed prior to performing JPM with another applicant.

TASK STANDARD	EDG 103 has been started and PB 103 is energized from EDG 103.

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.

Training Id: **2020 NRC NMP1 Plant JPM P-1** Revision: **0.0**

Title: **Respond to CLC Makeup Tank Level Alarm (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/30/20
Validated By	Dave Mason	7/16/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

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-ARP H1-1-4
2. NUREG 1123 K/A 295018, AA2.04 (2.9/2.9)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to locally interpret indications associated with degraded cooling water conditions.

   b. This JPM is considered alternate path because CLC makeup tank level does not respond as expected, requiring the operator to take additional mitigating actions.

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

2. Task Information:

   a. N1-208000-01001, Respond to Annunciator H1-4-4

   b. K/A 295018, AA2.04 (2.9/2.9)

3. Evaluation / Task Criteria

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

4. Recommended Start Location

   a. Unit 1 Turbine Building

5. JPM Setup (if required)

   a. Prepare a copy of ARP H1-4-4

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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The Control Room has received annunciator H1-4-4, CLOSED LOOP COOL MAKEUP TANK LEVEL HIGH-LOW. • Computer point B115, CLC MU TK LVL – HIGH, is in alarm. • Control Room indications show CLC Makeup tank level is 7’ and rising. • Annunciator H1-4-5, LQ PROCESS RAD MON, is NOT in alarm. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform the field actions for the high CLC Makeup tank level per ARP H1-4-4.

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:** ARP H1-4-4 obtained
Evaluator Note:	All valves listed in this JPM are located on Turbine Building elevation 351’. The applicant may also do a visual inspection of a level control valve on Turbine Building elevation 261’.		
3.	Check status of annunciator H1-4-5 AND if in alarm, perform applicable actions of Ann. H1-4-5 AND continue with actions below	P	SAT / UNSAT **STD:** Determines from initial conditions that H1-4-5 is NOT in alarm

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Close 71-229, BV-CLC MAKE-UP TANK INLET FROM MAKE-UP LCV **<u>Cue:</u>** The indicated handwheel is rotated fully in the indicated direction.	P	***PASS / FAIL** **STD:** Closes 71-229 by rotating handwheel fully CW
5.	Open 71-224, DRAIN - CLC MAKE-UP TANK **<u>Cue:</u>** The indicated handwheel is rotated in the direction indicated.	P	***PASS / FAIL** **STD:** Opens 71-224 by rotating handwheel CCW
Alternate Path	The alternate path is revealed in the following step.		
6.	WHEN level is restored to normal range, close 71-224, DRAIN - CLC MAKE-UP TANK **<u>Cue:</u>** CLC Makeup tank level indicates 6’ and slowly lowering. **<u>Cue:</u>** The indicated handwheel is rotated fully in the direction indicated.	P	SAT / UNSAT **STD:** Observes CLC Makeup tank level ***PASS / FAIL** **STD:** Closes 71-224 by rotating handwheel fully CW
7.	IF level is steady, THEN reopen 71-229 and monitor operation **<u>Cue:</u>** CLC Makeup tank level indicates 7’ and slowly rising.	P	SAT / UNSAT **STD:** Observes CLC Makeup tank level SAT / UNSAT **STD:** Does NOT reopen 71-229

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
8.	IF level continues to rise, THEN throttle 71-224, CLC MU TANK DRAIN as necessary and notify SM **Cue:** The indicated handwheel is rotated in the direction indicated. **Cue:** CLC Makeup tank level indicates 6' and stable.	P	***PASS / FAIL** **STD:** Opens 71-224 by rotating handwheel CCW SAT / UNSAT **STD:** Observes CLC Makeup tank level
9.	Reports task completion.	P	SAT / UNSAT **STD:** Proper communications used
Evaluator Note:	**Cue:** Your task is complete.		

TASK STANDARD	CLC makeup tank level restored to normal band in accordance with N1-ARP-H1-4-4.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The Control Room has received annunciator H1-4-4, CLOSED LOOP COOL MAKEUP TANK LEVEL HIGH-LOW. • Computer point B115, CLC MU TK LVL – HIGH, is in alarm. • Control Room indications show CLC Makeup tank level is 7’ and rising. • Annunciator H1-4-5, LQ PROCESS RAD MON, is NOT in alarm.

INITIATING CUE	**(Operators Name)**, perform the field actions for the high CLC Makeup tank level per ARP H1-4-4.

Exelon Generation

Training Id: **2020 NRC NMP1 Plant JPM P-2** Revision: **0.0**

Title: **Initiate Emergency Condenser Locally (PRA)**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/10/20
Validated By	Dave Mason	7/16/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

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-OP-13, Emergency Cooling System
2. NUREG 1123 K/A 2070000 A2.08 (3.8/3.8)

Exelon Generation

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to locate and operate the components to locally initiate Emergency Condensers.

   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. N1-207000-01017, Verify Emergency Condenser Initiation (PRA)

   b. K/A 2070000 A2.08 (3.8/3.8)

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 sufficient copies of N1-OP-13, Section H.2. Include Precautions and Limitations.

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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The Reactor has failed to scram and N1-EOP-3 has been entered. • The Emergency Condenser Condensate Return Valves have failed to open. • N1-OP-13 section H.2 is complete through step 2.3. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, place Emergency Condenser Loop 11 in service by opening the Condensate Return Valve locally in accordance with N1-OP-13 starting at step H.2.4.

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-13 obtained, precautions & limitations reviewed & section H.2 referenced
3.	Close 113-529, BV-IA Manifold Supply **Cue:** The indicated handwheel is rotated fully in the direction indicated.	P	***PASS / FAIL** **STD:** 113-529 handwheel rotated fully CW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Remove cap from 113-530, Vent-IA Manifold **Note:** A wrench is hanging below the air pipe. **Cue:** The cap is removed.		***PASS / FAIL** **STD:** Cap removed from 113-530 by rotating CCW
5.	Open 113-530 **Cue:** The indicated handwheel is rotated fully in the direction indicated. Air flow is heard. **Role Play:** If contacted as Control Room, report that Emergency Condenser 11 has gone into service.		***PASS / FAIL** **STD:** 113-530 handwheel rotated fully CCW

Evaluator Note:	**Cue:** *Your task is complete.*

TASK STANDARD	Emergency Condenser Loop 11 has been placed in service locally.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The Reactor has failed to scram and N1-EOP-3 has been entered. • The Emergency Condenser Condensate Return Valves have failed to open. • N1-OP-13 section H.2 is complete through step 2.3.

INITIATING CUE	**(Operators Name)**, place Emergency Condenser Loop 11 in service by opening the Condensate Return Valve locally in accordance with N1-OP-13 starting at step H.2.4.

Exelon Generation

Training Id: **2020 NRC NMP1 Plant JPM P-3** Revision: **0.0**

Title: **Lineup to Flood the Reactor Vessel Using the Diesel Fire Pump**

Approvals:

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/10/20
Validated By	Dave Mason	7/16/20
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

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-21.2, Control Room Evacuation
2. NUREG 1123 K/A 295031 EA1.08 (3.8/3.9)

A. JPM Information

1. Description

   a. This JPM tests the operator’s ability to locate and operate components associated with the firewater system and use the system to maintain reactor water level in 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. N1-286000-01021, Use Fire Water as an alternate source for maintaining reactor water level.

   b. K/A 295031 EA1.08 (3.8/3.9)

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 Turbine Building

5. JPM Setup (if required)

   a. Provide a copy of N1-SOP-21.2, Attachment 10.

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 US has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The Control Room has been evacuated due to a fire. • N1-SOP-21.2, Control Room Evacuation, has been entered. • RPV injection is immediately required. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, inject water into the RPV in accordance with N1-SOP-21.2, Attachment 10

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-21.2, Attachment 10 obtained
3.	Unlock the following valves: (Step 3.1) (Turbine Building 261 near Hydro Pump) **Note:** The lock on these valves would require a VA-1 key		
3a	100-33, BV-FIREWATER TO FEEDWATER INLET **Cue:** Valve 100-33 is unlocked	S	***PASS / FAIL** **STD:** Using a VA-1 key, simulates unlocking 100-33

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3b	29-411, BV-FIRE WATER TO FEEDWATER INLET 2ND **Cue:** Valve 29-411 is unlocked	S	***PASS / FAIL** **STD:** Using a VA-1 key, simulates unlocking 29-411
3c	29-07, BV-FIREWATER TO FEEDWATER OUTLET **Cue:** Valve 29-07 is unlocked	S	***PASS / FAIL** **STD:** Using a VA-1 key, simulates unlocking 29-07
3d	29-413, BV-FEEDWATER TO FEEDWATER LEAKBY FLOWGLASS **Cue:** Valve 29-413 is unlocked	S	***PASS / FAIL** **STD:** Using a VA-1 key, simulates unlocking 29-413
4.	Close 29-413, BV-FEEDWATER TO FEEDWATER LEAKBY FLOWGLASS (Step 3.2)	S	***PASS / FAIL** **STD:** Simulates closing 29-413 by rotating the hand wheel CW
5.	IF RPV injection is immediately required, THEN skip to Step 3.5	P	SAT / UNSAT **STD:** Recognizes RPV injection is immediately required based on initial conditions, and moves ahead in the procedure to step 3.5.
6.	WHEN Directed, THEN throttle open, as directed, the following valves to begin injection into RPV: (Step 3.5) **Note:** Opening these valves will Auto-Start the fire pump(s) on low fire water header pressure.		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
6a	29-07, BV-FIREWATER TO FEEDWATER OUTLET	S	***PASS / FAIL** **STD:** Simulates opening 29-07 by rotating the hand wheel CCW
6b	29-411, BV-FIRE WATER TO FEEDWATER INLET 2ND	S	***PASS / FAIL** **STD:** Simulates opening 29-411 by rotating the hand wheel CCW
6c	100-33, BV-FIREWATER TO FEEDWATER INLET	S	***PASS / FAIL** **STD:** Simulates opening 100-33 by rotating the hand wheel CCW
7.	Verify the following valves closed:		
7a	29-146, BV-FW PUMP 11 WARMUP *(TB 291, North Wall)*	S	SAT / UNSAT **STD:** Simulates 29-146 verified closed, hand wheel fully CCW
7b	29-152, BV-FW-PUMP 12 WARMUP *(TB 291, North wall)*	S	SAT / UNSAT **STD:** Simulates 29-152 verified closed, hand wheel fully CCW
7c	29-128, BV-FW-PUMP 13 WARMUP *(TB 305, SW of 13 FCV)*	S	SAT / UNSAT **STD:** Simulates 29-128 verified closed, hand wheel fully CCW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
8.	IF Step 3.4 was NOT performed previously, THEN perform step 3.4		SAT / UNSAT **STD:** Determines step doesn't require any action since the fire pumps auto-start.
Evaluator Note:	**Cue:** *Your task is complete. Another operator will complete any remaining actions.*		

TASK STANDARD	The fire water system is lined up and injecting water into the RPV.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The Control Room has been evacuated due to a fire. • N1-SOP-21.2, Control Room Evacuation, has been entered. • RPV injection is immediately required.

INITIATING CUE	**(Operators Name)**, inject water into the RPV in accordance with N1-SOP-21.2, Attachment 10

Facility: Nine Mile Point Unit 1 Scenario No.: NRC-1 Op-Test No.: LC1 19-1 NRC

Examiners: ______________________ Operators: ______________________

Initial Conditions: The plant is operating at approximately 50% power. Reactor Building Exhaust Fan 12 is out of service for maintenance. IRM 11 is bypassed due to spiking.

Turnover: Start Circulating Water pump 11. Raise Reactor power with Recirculation flow.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP, SRO	Start Circulating Water Pump 11 N1-OP-19
2	N/A	R – ATC, SRO	Raise Reactor Power with Recirculation Flow N1-OP-1, N1-OP-43B
3	HV01A HV02	C-BOP TS-SRO	Reactor Building Exhaust Fan 11 trips. Requires RBEVS initiation. L1-3-4, L1-1-5, N1-EOP-5, N1-OP-10, Technical Specifications
4	RR65E RR09E	I –All TS-SRO	RR pump 15 Blind Controller failure and delayed pump trip. Discharge valve fails to shut. N1-SOP-1.3, Tech Spec 3.1.7
5	RX01	C – All	Fuel Failure N1-SOP-25.2, N1-SOP-1.1, N1-SOP-1
6	ED27 FW03A	C – BOP	Powerboard 12 Fails to Auto Transfer and Feedwater Pump 11 Trips N1-SOP-30.2, N1-SOP-1
7	MS01	M – All	Main Steam Line Break in Turbine Building N1-EOP-2, N1-EOP-6
8	MS13A MS13C	C – All	Two MSIVs Fail to Close N1-EOP-6, N1-EOP-8
9	Overrides	C – ATC	Turbine Building Ventilation Exhaust Fans Trip N1-EOP-6, 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 19-1 NRC**		
1. Malfunctions after EOP entry (1-2) **Event 6, 7, 8, 9**	4	
2. Abnormal events (2-4) **Events 3, 4, 5, 6**	4	
3. Major transients (1-2) **Event 7**	1	
4. EOPs entered/requiring substantive actions (1-2) **N1-EOP-2, N1-EOP-6**	2	
5. Entry into contingency EOP with substantive actions (at least 1 per scenario set) **N1-EOP-8**	1	
6. Preidentified Critical tasks (at least 2)	2	

CRITICAL TASK DESCRIPTIONS:	CRITICAL TASK JUSTIFICATION:
CT-1.0: Given fuel failure causing elevated Main Steam Line radiation levels, scram the Reactor within 15 minutes of exceeding 3.75 times normal full power background, in accordance with N1-SOP-25.2.	High Main Steam Line radiation levels indicate fuel failure and release of fission products to the Reactor coolant. A Reactor scram is required by N1-SOP-25.2 and reduces the rate of energy production and thus the heat input, radioactivity release, and flow down the Main Steam Lines. Scramming the Reactor also allows further mitigating actions, such as Reactor isolation and depressurization.
CT- 2.0: Given an un-isolable primary system discharging outside of primary and secondary containments, commence N1-EOP-8, RPV Blowdown, before off-site release rate exceeds the General Emergency level, in accordance with N1-EOP-6.	An un-isolable primary system discharging outside of Primary and Secondary Containments resulting in off-site release rates approaching the General Emergency limit indicates a significant problem posing a direct and immediate threat to the health and safety of the public. 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. This will lower the release of radioactivity to the environment and lower the dose received by the public.

SCENARIO SUMMARY

The scenario begins at approximately 50% power. IRM 11 is bypassed due to spiking and Reactor Building Exhaust Fan 12 is out of service for maintenance. Circulating Water pump 11 is out of service following maintenance. The crew will start Circulating Water pump 11, then raise Reactor power with recirculation flow.

After the crew has raised reactor power, #11 RB exhaust fan will trip. The crew will diagnose the fan trip and a positive RB pressure. With #12 RB exhaust fan OOS, the crew will start the Reactor Building Emergency Ventilation System (RBEVS) to restore a negative RB pressure. One RBEVS train will trip. Entry into N1-EOP-5, Secondary Containment Control is required. SRO determines TS 3.4.4 must be entered for the inoperable RBEVS system.

Next, RRP 15 flow rises due to a blind controller failure. The crew will take the M/A station to manual, and the rise will stop. RRMG 15 will develop a high slot temperature, requiring the crew to remove it from service.

Next, fuel failure will occur due to the previous transients. The crew will respond per N1-SOP-25.2, Fuel Failure or High Activity in Rx Coolant or Off-Gas. This includes performing an emergency power reduction per N1-SOP-1.1, and eventually scramming the Reactor per N1-SOP-1 **(Critical Task)**. When the Generator trips after the scram, Powerboard 12 will fail to transfer to reserve power. The crew will execute N1-SOP-30.2, Loss of Powerboard 12, to re-energize the powerboard. Feedwater Pump 11 will trip shortly after the reactor scram.

Following the scram, a Main Steam line break will occur. The MSIVs will fail to close both automatically and manually, leading to an un-isolable leak into the Turbine Building. The running Turbine Building ventilation exhaust fan will trip. The crew will start the standby Turbine Building ventilation exhaust fan, however it will trip after a short time delay. This will allow an un-monitored, ground level release from the Turbine Building. The crew will enter N1-EOP-6, Radioactivity Release Control. Field reports will indicate off-site release rates approaching the General Emergency level. The crew will perform an RPV Blowdown per N1-EOP-8 **(Critical Task)**.

Copy ____ of ____

Training Id: **NMP1 NRC 2020 Scenario** Revision: **0.0**

Title: **Simulator Scenario #1**

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/28/20
Validated By	Dave Mason	7/15/20
	Jason Quick	
	Jeremy Spring	
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

References

1. N1-OP-1, Nuclear Steam Supply System
2. N1-OP-19, Circulating Water System
3. N1-OP-43B, Normal Power Operations
4. N1-OP-10, Reactor Building Heating, Cooling, and Ventilation System
5. N1-SOP-1.3, Recirc Pump Trip at Power
6. N1-SOP-1, Reactor Scram
7. N1-SOP-1.1, Emergency Power Reduction
8. N1-SOP-25.2, Fuel Failure or High Activity in Reactor Coolant or Off Gas
9. N1-EOP-2, RPV Control
10. N1-EOP-4, Primary Containment Control
11. N1-EOP-6, Radioactivity Release Control
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 50% power. IRM 11 is bypassed due to spiking and Reactor Building Exhaust Fan 12 is out of service for maintenance. Circulating Water pump 11 is out of service following maintenance. The crew will start Circulating Water pump 11, then raise Reactor power with recirculation flow.

After the crew has raised reactor power, #11 RB exhaust fan will trip. The crew will diagnose the fan trip and a positive RB pressure. With #12 RB exhaust fan OOS, the crew will start the Reactor Building Emergency Ventilation System (RBEVS) to restore a negative RB pressure. One RBEVS train will trip. Entry into N1-EOP-5, Secondary Containment Control is required. SRO determines TS 3.4.4 must be entered for the inoperable RBEVS system.

Next, RRP 15 flow rises due to a blind controller failure. The crew will take the M/A station to manual, and the rise will stop. RRMG 15 will develop a high slot temperature, requiring the crew to remove it from service.

Next, fuel failure will occur due to the previous transients. The crew will respond per N1-SOP-25.2, Fuel Failure or High Activity in Rx Coolant or Off-Gas. This includes performing an emergency power reduction per N1-SOP-1.1, and eventually scramming the Reactor per N1-SOP-1 **(Critical Task)**. When the Generator trips after the scram, Powerboard 12 will fail to auto transfer to reserve power. The crew will execute N1-SOP-30.2, Loss of Powerboard 12, to re-energize the powerboard. Feedwater Pump 11 will trip shortly after the reactor scram.

Following the scram, a Main Steam line break will occur. The MSIVs will fail to close both automatically and manually, leading to an un-isolable leak into the Turbine Building. The running Turbine Building ventilation exhaust fan will trip. The crew will start the standby Turbine Building ventilation exhaust fan, however it will trip after a short time delay. This will allow an un-monitored, ground level release from the Turbine Building. The crew will enter N1-EOP-6, Radioactivity Release Control. Field reports will indicate off-site release rates approaching the General Emergency level. The crew will perform an RPV Blowdown 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 fuel failure causing elevated Main Steam Line radiation levels, scram the Reactor within 15 minutes of exceeding 3.75 times normal full power background, in accordance with N1-SOP-25.2.

Justification:

Safety Significance: High Main Steam Line radiation levels indicate fuel failure and release of fission products to the Reactor coolant. A Reactor scram reduces the rate of energy production and thus the heat input, radioactivity release, and flow down the Main Steam Lines. Scramming the Reactor also allows further mitigating actions, such as Reactor isolation and depressurization.

Cueing: Multiple annunciators and radiation monitors will provide indications of fuel failure. N1-SOP-25.2 directs scramming 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.

Bounding Criteria: *Time limit based on Operations representative recommendation.*

CT-2, Given an un-isolable primary system discharging outside of primary and secondary containments, commence N1-EOP-8, RPV Blowdown, before off-site release rate exceeds the General Emergency level, in accordance with N1-EOP-6.

Justification:

Safety Significance: An un-isolable primary system discharging outside of Primary and Secondary Containments resulting in off-site release rates approaching the General Emergency limit indicates a significant problem posing a direct and immediate threat to the health and safety of the public. 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. This will lower the release of radioactivity to the environment and lower the dose received by the public.

Cueing: Multiple annunciators will provide indications of a primary system discharging into the Turbine Building. MSIV valve position indicators will provide indication that the system is un-isolable. Field reports will provide indication that off-site release rate approaches the General Emergency level. N1-EOP-6 provides direction to blowdown the Reactor.

Measurable Performance Indicators: The crew will manually initiate Emergency Condensers and 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.

Bounding Criteria: *Based on procedural requirements in N1-EOP-6. ERVs do not need to be opened before offsite release rate exceeds the GE level. N1-EOP-8 must be entered and working toward opening ERVs.*

3. Length
   a. ~60 minutes
4. Mitigation Strategy Code
   a. RR4, Primary system leak outside of primary and secondary containment, RPV Blowdown required due to General Emergency release rate approached
5. Technical Specifications
   a. TS 3.4.4
   b. TS 3.1.7.e
6. EAL Classification
   a. General Emergency EAL RG1 – Dose assessment indicates >1000mRem TEDE at site boundary

7. Special Orders

   a. None

B. Initial Conditions

1. IC Number

   a. IC-151

2. Presets / With Triggers

   a. Malfunctions

1)	**NM10A,** IRM CHANNEL 11 FAILURE- UPSCALE	**Inserted**
2)	**HV01B,** Reactor Building Exhaust Fan Trip 12	**Inserted**
3)	**HV01A,** Reactor Building Exhaust Fan Trip 11	**TRG 1**
4)	**RR65E,** RR Pump 15 Blind Controller Input Signal Failure, FV=95, RT=5min	**TRG 2**
5)	**RR09E,** RR Pump 15 MG Slot Temperature Increase, DT=30sec, RT=10min, FV=80	**TRG 3**
6)	**RX01,** FUEL CLADDING FAILURE, FV=34, IV=10, RT=5:00	**TRG 4**
7)	**MS01,** Steam Line Break Outside PC Area, FV=12, IV=5, RT=4:00	**TRG 5**
8)	**HV02A,** RB Emergency Ventilation Fan Trip 11	**TRG 12**
9)	**HV02B,** RB Emergency Ventilation Fan Trip 12	**TRG 15**
10)	**FW03A,** FEEDWATER PUMP TRIP 11	**Inserted**
11)	**ED27,** PB 12 Auto Transfer Failure	**Inserted**
12)	**MS13A,** MSIV FAILS OPEN MS01-01(111), FV=10%	**Inserted**
13)	**MS13C,** MSIV FAILS OPEN MS01-03(112), FV=10%	**Inserted**

   b. Remotes

1)	**CW16**, CW DP Buzzer ON/OFF, Off	**Inserted**
2)	**AT10,** Lake Water Temperature, RV=38	**Inserted**

c. Overrides

1) **DO-3141**, ON NG03B-A G, FV=Off (RRP 15 discharge valve green light) **Inserted**

2) **DO-3140**, ON NG03B-A R, FV=On (RRP 15 discharge valve red light) **Inserted**

3) **DI-5355**, POS_2 1L9/203-01A POS A, FV=on, DT=2:00 **TRG 5**

4) **DI-5356**, POS_2 1L9/203-01A POS C, FV=off, DT=2:00 **TRG 5**

(Turbine Building Ventilation exhaust fan 11 trips)

5) **DI-5357**, POS_2 1L9/203-01A POS A, FV=on, DT=1:00 **TRG 6**

6) **DI-5358**, POS_2 1L9/203-01A POS C, FV=off, DT=1:00 **TRG 6**

(Turbine Building Ventilation exhaust fan 12 trips)

d. Annunciators

1) None

e. Event Triggers

Event #	Event Action	Command
TRG 6, Initiates when Turbine Building exhaust fan 12 is started	zdhvtbft(6)==0	**Blank**
TRG 10, Ramps up fuel failure once the stack isolates	hzlog002g==1	imf rx01 (0 0) 45 8:00 34
TRG 3, Initiates when RRP 15 M/A station is taken to manual to initiate slot temperature rise.	zdrrmam(5)==1	**Blank**
TRG 22, Initiates when RRP 15 M/A station is taken to manual to delete M/A station oscillations	zdrrmam(5)==1	dmf rr65e
TRG 25, Delete slot temperature rise malfunction when the recirc pump is secured.	hzlrrmgt(5)==1	dmf rr09e

f. Equipment Out of Service

1) Reactor Build Exhaust Fan 12 secured with info/caution tag

2) IRM 11 bypassed with info/caution tag

3) Circulating Water Pump 11 secured with no tag

g. Support Documentation

1) REMA for power ascension with recirc flow

2) Markup N1-OP-19 Section E.2.0 up to step E.2.7

3) Markup N1-OP-43B Section F.3.0 to the appropriate steps for 50% power level (up to F.3.25 with steps 3.20 and 3.23 still open)

h. Miscellaneous

1) Ensure TB Exhaust Fan 11 is in service
2) Protect the following equipment: EDG 103, PB 103, PB 12, Circ Water pump 12
3) 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 50%.
- Reactor Building Exhaust Fan 12 is out of service for maintenance.
- IRM 11 is bypassed due to spiking.
- Maintenance is complete for Circulating Water Pump 11 and it is ready to be returned to service.

PART III: **Remarks/Planned Evolutions:**

- Start Circulating Water pump 11 per N1-OP-19 Section E.2.0. The section is complete up to step E.2.7. In step E.2.12, it is desired to stop both Circulating Water Priming pumps. A Plant Operator is standing by in the screen house. All personnel have been verified clear of all water boxes and the surrounding areas.
- Continue Reactor power ascension with Recirculation flow per the provided ReMA and N1-OP-43B. N1-OP-43B Section F.3.0 is in progress.

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: Start Circulating Water Pump 11

Event Information	• The Plant is operating approximately 50% power • The crew will start Circ Water Pump 11 per N1-OP-19

	SRO • Directs starting Circulating Water pump 11 per N1-OP-19 Section E.2.0 • Provides oversight for evolution

Role Play:
When requested, report a good start on Circulating Water pump 11.
 	
Role Play:
When requested, report normal circulating water pump discharge pressure in Screen House.
 	
Role Play:
If asked as Shift Manager, direct securing both Water Box Priming pumps.
	BOP
	• Reviews N1-OP-19 Section E.2.0
	• Verifies running CRD Pump flow greater than 60 GPM
	• Starts 74-01, CONDSR CIRCULATING WATER PUMP 11
	• Closes 74-20, FISH SCREEN DRAIN VALVE 11
	• Contacts Operator to confirm normal circulating water pump discharge pressure in Screen House
	• Verifies the following pumps are stopped per SM direction:
	  ◦ 75-09, COND. WATER BOX PRIMING PUMP NO. 11
	  ◦ 75-08, COND. WATER BOX PRIMING PUMP NO. 12

	ATC • Monitors plant parameters

Event #2: Power Ascension With Recirculation Flow

Event Information	• The crew will raise power with recirc flow per the REMA

	SRO • Directs power ascension with Recirculation flow in accordance with N1-OP-43B and the Reactivity Maneuver Instruction (REMA) • Provides oversight of reactivity maneuver
<u>Note:</u> N1-OP-43B includes the following power-to-flow map restrictions: • PRIOR to exceeding 65% flow, verify greater than 50% Rod Line OR that RIP region will NOT be entered. • PRIOR to 100% rodline raise recirc flow to greater than 59% flow (approximately 40 x 106 lb/hr) to avoid the flow biased control rod block line.	**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

<u>Note:</u>
Recommend initiating the next event when Reactor power is between 50-55% power.
	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: Loss of Normal Reactor Building Ventilation

Event Information	• A trip of RB Exhaust Fan 11 occurs with RB Exhaust Fan 12 OOS for maintenance. • The crew will need to re-establish negative RB D/P with RBEVS

As directed by lead examiner, **insert malfunction:** **HV01A,** Reactor Building Exhaust Fan Trip 11 **TRG 1**	**CREW** • Recognize/report L1-3-4, REACT BLDG/ATM DIFF PRESS, in alarm. • Recognize/report L1-1-5, RB VENT EXH FAN 11- 12 TRIP - VIB, in alarm. • Recognize/report exhaust fan 11 tripped. • Recognize/report RBEVS train tripped tripped
L1-1-5, RB VENT EXH FAN 11–12 TRIP–VIB *L1-2-4, RB VENT SUP SYSTEM* *L1-2-5, RB VENT EXH FLOW LOW* *L1-3-4, REACT BLDG/ATM DIFF PRESS* *RB dP drops to 0"*	**SRO** • Acknowledge report L1-3-4, REACT BLDG/ATM DIFF PRESS, in alarm. • Acknowledge report L1-1-5, RB VENT EXH FAN 11- 12 TRIP - VIB, in alarm. • Acknowledge report exhaust fan 11 tripped. • Direct actions of L1-3-4 and L1-1-5 to be performed. • Acknowledge reactor building negative pressure is degraded low. • Recognize entry condition for N1-EOP-5, Secondary Containment Control. • Determine no emergency exists (activation of emergency plan not required). • Per ARP, ensure RBEVS started and RB ventilation isolated • Acknowledge trip of one RBEVS train. • Determine that with one RBEVS train inoperable, a 7 day LCO is required per TS 3.4.4.e

Event 3 Continued
 	
Console Operator
 	
When the **first** RBEVS train is started, insert the respective malfunction to trip the RBEVS fan. Then delete the malfunction for the other RBEVS fan.
 	
If RBEVS fan 11 is started, insert the following malfunction:
 	
TRG 12 HV02A, RB Emergency Ventilation Fan Trip 11
 	
Then, delete malfunction **HV02B** allowing RBEVS fan 12 to operate
 	
-OR-
 	
If RBEVS fan 12 is started, insert the following malfunction:
 	
TRG 15 HV02B, RB Emergency Ventilation Fan Trip 12
 	
Then, delete malfunction **HV02A** allowing RBEVS fan 11 to operate
	BOP
	• Acknowledge direction to perform actions of L1-3-4, L1-1-5
	• Monitor Reactor Building D/P
	• Inform SRO D/P is zero
	• Start RBEVS per N1-OP-10
	  ○ Verify open 202-36, EM VENTILATION FROM REACTOR BLDG BV
	  ○ Verify closed 202-47, EM VENTILATION TIE BV
	  ○ Verify closed 202-74, EM VENTILATION LOOP 11 COOLING BV
	  ○ Verify closed 202-75, EM VENTILATION LOOP 12 COOLING BV
	
	If starting RBEVS 11
	• Place 202-37, EM VENTILATION LOOP 11 INLET BV control switch to OPEN
	• Verify open 202-37, EM VENTILATION LOOP 11 INLET BV
	• Start 202-53, EVS FAN 11
	• Verify open 202-34, EM VENT EXHAUST FAN 11 OUTLET BV
	• Confirm proper operation of 202-50, EM VENT EXHAUST FAN 11 INLET FCV, by observing flow indication and Rx Bldg DP
	
	If starting RBEVS 12
	• Place 202-38, EM VENTILATION LOOP 12 INLET BV control switch to OPEN
	• Verify open 202-38, EM VENTILATION LOOP 12 INLET BV
	• Start 202-33, EVS FAN 12
	• Verify open 202-35, EM VENT EXHAUST FAN 12 OUTLET BV
	• Confirm proper operation of 202-51, EM VENT EXHAUST FAN 12 INLET FCV, by observing flow and Rx Bldg DP

Event 3 Continued	**BOP Continued**

	• Isolate reactor building ventilation per N1-OP-10
	  ○ Place REACTOR BLDG SUPPLY FANS 11 and 12 in OFF
	  ○ Place REACTOR BLDG EXHAUST FANS 11 and 12 in OFF
	  ○ Place control switch for 202-31, REACTOR BLDG EXHAUST ISOLATION VALVE 12 and 202-32, REACTOR BLDG EXHAUST ISOLATION VALVE 11 in CLOSE
	  ○ Place control switch for 202-15, REACTOR BLDG SUPPLY ISOLATION VALVE 11 and 202-16, REACTOR BLDG SUPPLY ISOLATION VALVE 12 in CLOSE
	• Report RBEVS in service and reactor building ventilation isolated

Event #4: Recirc Pump 15 M/A Failure and High Temperature Trip

Event Information	• The plant is operating with 5 recirc loops in service at less than rated power. • RRP15 flow rises due to a blind controller failure, but stops when placed in Manual • RRP15 runs a high slot temperature and must be tripped

As directed by lead examiner, **insert malfunction**: **RR65E,** RR Pump 15 Blind Controller Input Signal Failure, FV=95, RT=5min **TRG 2** *APRMs, MWth, MWe, all rise*	**CREW** • Diagnose/report Recirc pump 15 parameters are elevated.
	SRO • Acknowledges report of power rising • May direct entry into N1-SOP-1.5 • May direct entry into N1-OP-1, Sect H for the Recirculation System failures • Directs taking manual control of RR Pump 15 M/A station • Acknowledges report that RR Pump 15 is in manual and able to be controlled
	ATC • Monitors plant parameters
	BOP • Recognizes and reports RR Pump 15 controller rising • Nulls deviation meter on RR Pump 15 (may reference N1-OP-1, Sect. F.1.0) • Places RR Pump 15 M/A station in MAN • Verifies failure stops • Notifies SRO/Crew that RR Pump 15 is in manual and that the malfunction has stopped

Verify the following **malfunction** is **automatically inserted** when the RRP 15 M/A station is taken to MAN: **RR09E,** RR Pump 15 MG Slot Temperature Increase, DT=30sec, RT=10:00, FV=80 **TRG 3** *Expected Annunciator:* *F2-2-5, REACT RECIRC MG SET 15 ~6 min* *Expected Computer Points:* *B399 RRMG 15 GEN SLOT TEMP C ~ 5min* *A130 RRMG 15 GEN SLOT TEMP HIGH ~6 min* *B404 RRP 15 MTR Slot Temp High*	**CREW** • Acknowledge/report Annunciator F2-2-5 • Observe computer points A130 and B399 in alarm
Note: If the crew does not take action to secure the pump after a reasonable time trip RR Pump 15 by **inserting malfunction RR01E**. **Note:** N1-OP-1 directs lowering power per N1-OP-43B. However, due to the emergent nature of this event, the crew will likely lower power using the guidance of N1-SOP-1.1, Emergency Power Reduction. **Role Play:** If contacted as the Ops Director regarding the high temperature, direct the crew to remove the MG Set from service.	**SRO** • Acknowledges RRMG 15 high slot temperature • Directs execution of ARP F2-2-5 • Directs a reactor power reduction • Provides oversight of reactivity manipulation • May direct a trip of RR Pump 15 and entry into N1-SOP-1.3 • May direct entry into N1-SOP-1.5 after the trip • May direct removing RR Pump 15 from service using N1-OP-1, Sect H.1.0 • Enter T.S. 3.6.2 for inoperable APRMs while RR Pump 15 Discharge Valve is open if the pump is tripped • Enters T.S. 3.1.7.e for partial loop operation. With one recirc loop isolated, power must be limited to 90.5%.

Note: If necessary and as directed by the lead examiner, manually raise malfunction RR09E in 3% intervals over a 1 minute ramp to drive the crew to secure the recirc pump.	**ATC** • Monitors plant parameters • When directed, lowers power with recirculation flow • Verifies P/F Map updated for 4 loop operation • Lowers Recirc flow as necessary to remain within flow limits for 4 loop operation • Monitors plant limits for 4 loop operation

<u>Role Play:</u> If requested to check Turbine Building Ventilation and MG Set Ventilation, wait 3 minutes, then report that everything is normal with the ventilation. Report that the generator end of RRMG 15 is very hot to the touch.
 	
<u>Note:</u> N1-OP-1 directs lowering power per N1-OP-43B. However, due to the emergent nature of this event, the crew will likely lower power using the guidance of N1-SOP-1.1, Emergency Power Reduction.
 	
<u>Note:</u> Verify **TRG 25 inserts** to **automatically delete** RR09E when the recirc pump is tripped.
	BOP
	• Enters ARP F2-2-5
	• Enters N1-OP-1, Sect F.4
	• Dispatches operator to verify proper operation of MG Set Area Ventilation, TB Track Bay AND Roll door position(s), and MG Set Area Coolers.
	• Verifies Reactor Recirc Pump parameters are within the following limits:
	    • Generator MW 0.790 MW
	    • Generator Amps 240 A
	    • RRP Flow 16.8 X 106 lbm/hr
	    • Generator Frequency 11.5 Hz to 56 Hz
	• Verifies total recirculation flow is evenly balanced between all operating RRPs
	• When Generator slot temperature continues to rise and approaches or exceeds 120°C, reduces loading on affected RRMG by lowering power per N1-OP-43B
	If directed to <u>trip</u> RR Pump 15: (N1-SOP-1.3)
	    • Places RR Pump MOTOR 15 MG SET switch to STOP
	    • Enters N1-SOP-1.3
	    • Notifies SRO the APRMs are inop
	    • Close RR Pump 15 Discharge Valve
	    • Holds Discharge Valve in OPEN position for 2 to 3 seconds
	    • Records time
	    • Notifies SRO the APRMs are operable
	If directed, <u>removes</u> RR Pump 15 from service using N1-OP-1, Sect H.1
	    • Verifies open RR Pump 15 Bypass Valve
	    • Lowers flow on RR Pump 15 to 6 to 8 x 10^6 lbm/hr
	    • Closes RR Pump 15 Discharge Valve
	    • When the Discharge Valve is closed, places RR Pump MOTOR 15 MG SET switch to STOP
	    • Holds Discharge Valve in OPEN position for 2 to 3 seconds

Events #5 & #6: Fuel Failure, PB 12 Fails to Fast Transfer.

Event Information	• A fuel failure occurs due to the power ascension earlier. • The crew will manually scram the reactor. • PB 12 will not auto transfer but will be available • FWP 11 will trip

When directed by the lead examiner, **insert malfunction**: **RX01,** FUEL CLADDING FAILURE, FV=34, IV=10, RT=5:00 **TRG 4** *Rising off-gas radiation levels* *Rising main steam line radiation levels* *Expected Annunciators:* *H1-1-7, OFF GAS HIGH RADIATION* *H1-2-7, OFF GAS RAD MON 11-12 FILTER ΔP SAMPLE FLOW* *H1-3-7, MAIN CNDSR OG TIMER STARTED ISOL TD 15 M* *H1-4-8, AREA RADIATION MONITORS* *F1-2-7, MAIN STEAM RAD MONITOR CH 11 HI/LO (later)* *F4-2-2, MAIN STEAM RAD MONITOR CH 12 HI/LO (later)* Verify the following **malfunctions** are **preset**: **ED27,** PB 12 Auto Transfer Failure **FW03A,** FEEDWATER PUMP TRIP 11 *Powerboard 12 voltage drops to zero after Generator trip* *Feedwater pump 11 starts and then immediately trips*	**CREW** • Acknowledges/reports annunciator H1-1-7, OFF GAS HIGH RADIATION • Recognizes rising offgas and main steam line radiation levels • Diagnoses fuel failure

Note: Normal Full Power Background (NFPB) Main Steam Line (MSL) radiation levels are approximately 410 mR/hr at this power level. Any value between 400-500 mR/hr is reasonable. This makes a reasonable range of 1500-1875 mR/hr for the 3.75 times NFPB benchmark. The crew may establish a lower threshold for executing the scram and vessel isolation. Alternately, if the crew scrams and closes MSIVs early, 3.75 times NFPB may not be reached. **Note:** High pressure Feedwater will be unavailable until Powerboard 12 is re-energized. **Note:** Recommend initiating the next event once the crew has stabilized the plant post-scram and PB 12 is re-energized.	**SRO** • Acknowledges reports • Directs entry into N1-SOP-25.2, Fuel Failure/High Activity • May direct emergency power reduction per N1-SOP-1.1 as necessary to control radiation levels • Provides oversight for reactivity manipulation • **Directs Reactor scram** **CT-1** • Acknowledges scram report • Enters N1-EOP-2, RPV Control, on low Reactor water level • Answers "Are all control rods inserted to at least position 04?" Yes • Directs entry into N1-SOP-1, Reactor Scram • Directs Reactor water level control 53-95" using Feedwater/Condensate and CRD • Directs Reactor pressure control 800-1000 psig on Turbine Bypass Valves or Emergency Condenser 11 • May direct MSIVs closed • Directs manual vessel isolation and entry into N1-SOP-40.2 if Main Steam Line radiation levels reach 3.75 x Normal Full Power Background (NFPB) • Enters N1-EOP-5, Secondary Containment Control, on high area radiation levels • Acknowledges failure of Powerboard 12 to transfer to reserve power • Directs entry into N1-SOP-30.2, Loss of Powerboard 12

Events 5 & 6 continued	**ATC**

	• If directed, performs emergency power reduction per N1-SOP-1.1
	• **Places Mode Switch in Shutdown or depresses RPS pushbuttons**
	CT-1
	• 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
	• May perform a manual vessel isolation by placing both Vessel Isolation Ch 11 and Ch 12 Control Switches on the E Panel to ISOLATION, if necessary

Event 5 & 6 continued	**BOP**

Role Play: When dispatched as Chemistry to take samples, acknowledge request.
 	
Role Play: When directed to close Turbine Building Roof Vents, Sidewall Vents and Roll Doors, wait 2 minutes then report the Turbine Building Roof Vents, Sidewall Vents and Roll Doors are CLOSED. Also report that RP is with you, and they have detected higher than normal rad levels near the offgas piping.
 	
Note: Normal Full Power Background (NFPB) Main Steam Line (MSL) radiation levels are approximately 410 mR/hr at this power level. Any value between 400-500 mR/hr is reasonable. This makes a reasonable range of 1500-1875 mR/hr for the 3.75 times NFPB benchmark.
 	
Note:
High pressure Feedwater will be unavailable until Powerboard 12 is re-energized.
	• Executes N1-SOP-25.2
	• Notifies Chemistry to sample offgas and reactor coolant for gross activity
	• Directs operator to close Turbine Building Roof Vents, Sidewall Vents and Roll Doors
	• Monitors ARMs and rad monitors to determine plant radiation levels
	• Notifies US/Crew of rising Main Steam Line Radiation Monitor levels
	• Notifies US if MSL Rad Monitors approach/exceed 3.75 X Normal Full Power Background (NFPB)
	
	• Performs Reactor water level control actions of N1-SOP-1:
	  ◦ Attempts to restore RPV water level to 53-95" by controlling injection and rejecting through RWCU, as necessary
	  ◦ Determines both electric Feedwater pumps NOT running
	• May close MSIVs
	• May verify Vessel Isolation per N1-SOP-40.2

Event 5 & 6 continued	ATC/BOP

<u>Event 5 & 6 continued</u>
 	
<u>Role Play:</u> If contacted to check PB 12, wait two minutes and report that you see nothing abnormal at the powerboard.
 	
<u>Note:</u>
At the examiner's discretion, move on to next event when PB 12 has been re-energized.
	ATC/BOP
	• Executes N1-SOP-30.2
	
	<u>N1-SOP-30.2 Actions:</u>
	• Verifies Reactor scram due to less than 3 operating Recirculation loops
	• Verifies Service Water pump 11 running
	• Continuously monitors for thermal hydraulic instability
	• Verifies:
	  • TBCLC pump 11 running
	  • IAC 11 running
	  • RBCLC system running
	• Re-energizes Powerboard 12:
	  • Answers "Are A5-4-1, A5-4-2, A5-1-8, OR A5-2-8 in alarm?" No
	  • Obtains SRO permission to re-energize Powerboard 12
	  • Verifies open Breaker R122
	  • Inserts Sync. Key into R123 AND rotates clockwise to ON
	  • Closes Breaker R123
	  • Rotates Sync. Key counterclockwise to OFF AND removes
	  • Closes Breakers R124 and R121

Events #7, #8, & #9: Main Steam Line Break in Turbine Building, MSIVs Fail to Close, Turbine Building Ventilation Exhaust Fan Trips

Event Information	• Fuel failure is complicated by a MSL break in the TB • Two MSIVs fail to isolate • Lose TB Exhaust ventilation leading to unmonitored ground level release.

When directed by the lead examiner, **insert malfunctions**: **MS01,** Steam Line Break Outside PC Area, FV=12, IV=5, RT=4:00 **TRG 5** *Main Steam tunnel temperatures rise* *Turbine Building radiation levels rise* *Expected Annunciators:* *F1-2-2, RPS CH 11 MAIN STM LINE BREAK* *F2-3-2, MAIN STM LINE BREAK AREA TEMP HIGH* *F4-2-7, RPS CH 12 MAIN STM LINE BREAK* *H1-4-8, AREA RADIATION MONITORS* The following **overrides** also **insert** on **TRG 5:** **DI-5355, POS_2 1L9/203-01A POS A, FV=on, DT=2:00** **DI-5356, POS_2 1L9/203-01A POS C, FV=off, DT=2:00** *Turbine Building exhaust fan 11 trips on a time delay*	**CREW** • Acknowledges/reports annunciators H1-1-7, OFF GAS HIGH RADIATION • Diagnoses Main Steam Line break

<u>**Events 7, 8, & 9 continued**</u> Verify the following **overrides** are **automatically inserted** when Turbine Building exhaust fan 12 is started: **TRG 6** **DI-5357, POS_2 1L9/203-01A POS A, DT=30, FV=on, DT=1:00** **DI-5358, POS_2 1L9/203-01A POS C, DT=30, FV=off, DT=1:00** *Turbine Building exhaust fan 12 trips* Verify the following malfunctions are preset: **MS13A,** MSIV FAILS OPEN MS01-01(111), FV=10% **MS13C,** MSIV FAILS OPEN MS01-03(112), FV=10% *Two MSIVs fail mid-position on closure*	
<u>**Role Plays:**</u> When the crew has determined both Turbine Building exhaust fans are inoperable, **-OR-** as directed by the lead examiner, **-OR-** when requested as RP to assess dose, wait 2 minutes then report as Off-Site Dose Assessment Manager that dose assessment indicates 50 mr/hr TEDE and rising at the site boundary. Three minutes later, report that dose is 500 mrem TEDE and rising at the site boundary. (Criteria for SAE RS1 is met) Three minutes after previous field report, report that dose assessment indicates 800 mrem TEDE and rising at the site boundary. Three minutes later, report that dose assessment indicates 950 mrem TEDE and rising at the site boundary. Three minutes later, report that dose assessment indicates 1100 mrem TEDE and rising at the site boundary. (Criteria for GE RG1 is met)	**SRO** • Acknowledges reports • Directs MSIVs closed • Directs Turbine Building evacuation • Acknowledges failure of two MSIVs to close • May direct cooldown using Turbine Bypass Valves or Emergency Condensers <100°F/hr • Acknowledges trip of Turbine Building exhaust fan 11 • Directs start of Turbine Building exhaust fan 12 • Acknowledges trip of Turbine Building exhaust fan 12 • Dispatches personnel to monitor on-site/off-site radiation levels • Acknowledges off-site release rate reports • Enters N1-EOP-6 due to off-site release rate above Alert level (RN10A/B >1.5x10E5 cps) • May direct rapid depressurization with Emergency Condensers >100°F/hr

If asked for an update between reports, give an extrapolated value for dose at the site boundary. If dispatched into the plant for any other task, wait 2 minutes and then report that there is excessive steam in the Turbine Building and you have backed out.	• Determines off-site release rate is approaching the General Emergency level • Enters N1-EOP-8, RPV Blowdown • Directs initiation of ECs • **Directs open 4 ERVs** **CT-2**
Events 7, 8, & 9 continued	**ATC/BOP** • Reports failure of MSIVs to automatically close on high steam tunnel temperature • Attempts to manually close MSIVs • Reports failure of two MSIVs to close • Makes Turbine Building evacuation announcement • May open Turbine Bypass Valves or initiate Emergency Condensers to cooldown <100°F/hr • Reports trip of Turbine Building exhaust fan 11 • Starts Turbine Building exhaust fan 12 • Reports trip of Turbine Building exhaust fan 12 • Dispatches personnel to monitor on-site/off-site radiation levels • Acknowledges/reports off-site release rate reports • May perform rapid depressurization with Emergency Condenser 11 >100°F/hr • Initiates EC 11/12 • **Open 4 ERVs** **CT-2** • Controls Reactor water level 53-95" using Condensate/Feedwater and CRD

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 19-1 NRC

Examiners: ____________________ Operators: ____________________

Initial Conditions: The plant is operating at approximately 85% power. Reactor Building Exhaust Fan 12 is out of service for maintenance. IRM 11 is bypassed due to spiking.

Turnover: Shutdown Condensate Pump 11 for maintenance due to a motor oil leak and place in Pull-To-Lock. Then Perform a Rod Sequence Exchange.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N –BOP TS-SRO	Condensate Pump 11 shutdown N1-OP-15A, Technical Specifications
2	N/A	R –ATC, SRO	Rod Sequence Exchange N1-OP-5, ReMA
3	RD04	C-ATC	Stuck control rod **(2017 NRC Scenario 1)** N1-OP-5
4	EC03B	C– BOP, TS-SRO	Emergency Condenser 12 Inadvertent Initiation ARP K1-1-5, N1-OP-13, Technical Specifications
5	RD34 IA01	C –All	Instrument air leak, Reactor scram required N1-SOP-20.1, N1-SOP-1
6	RD33	M –All	ATWS N1-EOP-2, N1-EOP-3
7	Overrides	C –All	Feedwater Isolation Valves 11 and 12 fail to isolate N1-EOP-3

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

Facility: **Nine Mile Point Unit 1** Scenario No.: **NRC-2** Op-Test No.: **LC1 19-1 NRC**		
1. Malfunctions after EOP entry (1-2) **Event 6, 7**	2	
2. Abnormal events (2-4) **Events 3, 4, 5**	3	
3. Major transients (1-2) **Event 6**	1	
4. EOPs entered/requiring substantive actions (1-2) **N1-EOP-2**	1	
5. Entry into contingency EOP with substantive actions (at least 1 per scenario set) **N1-EOP-3**	1	
6. Preidentified Critical tasks (at least 2)	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, within 15 minutes of failure to scram indications, in accordance with N1-EOP-3.	High Reactor power after a scram represents 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, within 15 minutes of failure to scram indications, 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 <u>may</u> not provide a stable shutdown condition.

SCENARIO SUMMARY

The scenario begins at approximately 85% power. IRM 11 is bypassed due to spiking and Reactor Building Exhaust Fan 12 is out of service for maintenance. The crew is directed to remove Condensate Pump 11 from service immediately for maintenance due to a motor oil leak. This requires entry into TS 3.1.8 for a redundant HPCI component.

After the pump has been removed from service, the crew will conduct a rod pattern exchange. During the rod pattern exchange, a control rod becomes stuck. The crew will enter N1-OP-5, Section H.13 and raise drive water pressure to move the control rod. While the control rod is stuck, entry into Tech Spec 3.1.1.a(2) is required.

Then, an inadvertent EC initiation occurs. The crew will respond to isolate the EC and the SRO will determine Tech Spec 3.1.3.b requires a 7 day LCO.

Next, an Instrument Air leak will occur in the piping to the CRD system. The crew will insert a manual Reactor scram as CRD air pressure lowers below 60 psig (**Critical Task**).

When the scram occurs the control rods will not fully insert. The crew must terminate and prevent injection (**Critical Task**). When the operator attempts to close Feedwater Isolation Valves 11 and 12, the valves will fail to isolate Feedwater flow. The crew must diagnose the failure and place the Feedwater pumps in Pull-To-Lock to terminate feeding the RPV. The crew will lower Reactor power by inserting control rods per EOP-3.1 and/or using Liquid Poison (**Critical Task**).

Exelon Generation

Copy ____ of ____

Training Id: **NMP1 NRC 2020 Scenario** Revision: **0.0**

Title: **Simulator Scenario #2**

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/28/20
Validated By	Dave Mason	7/15/20
	Jason Quick	
	Jeremy Spring	
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

References

1. N1-OP-5, Control Rod Drive System
2. N1-OP-15A, Condensate System
3. N1-OP-13, Emergency Cooling System
4. N1-SOP-20.1, Instrument Air Failure
5. N1-SOP-1, Reactor Scram
6. N1-EOP-2, RPV Control
7. N1-EOP-3, Failure to Scram
8. N1-EOP-1, NMP1 EOP Support Procedure
9. Unit 1 Technical Specifications

Instructor Information

A. Scenario Description

Sequence of Events / Expected Crew Response:

The scenario begins at approximately 85% power. IRM 11 is bypassed due to spiking and Reactor Building Exhaust Fan 12 is out of service for maintenance. The crew is directed to remove Condensate Pump 11 from service immediately for maintenance due to a motor oil leak. This requires entry into TS 3.1.8 for a redundant HPCI component.

After the pump has been removed from service, the crew will conduct a rod pattern exchange. During the rod pattern exchange, a control rod becomes stuck. The crew will enter N1-OP-5, Section H.13 and raise drive water pressure to move the control rod.

Then, an inadvertent EC initiation occurs. The crew will respond to isolate the EC and the SRO will determine Tech Spec 3.1.3.b requires a 7 day LCO.

Next, an Instrument Air leak will occur in the piping to the CRD system. The crew will insert a manual Reactor scram as IAS air pressure lowers below 70 psig.

When the scram occurs the control rods will not fully insert. The crew must terminate and prevent injection (**Critical Task**). When the operator attempts to close Feedwater Isolation Valves 11 and 12, the valves will fail to isolate Feedwater flow. The crew must diagnose the failure and place the Feedwater pumps in Pull-To-Lock to terminate feeding the RPV. The crew will lower Reactor power by inserting control rods per EOP-3.1 and/or using Liquid Poison (**Critical Task**).

1. Termination Criteria

   a. RPV water level controlled in assigned band, Reactor power < 6%, Control rod insertion in progress or complete

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, within 15 minutes of failure to scram indications, in accordance with N1-EOP-3.

Justification:

Safety Significance: High Reactor power after a scram represents 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 trip Recirculation pumps and terminate and prevent injection based on Reactor power.

Measurable Performance Indicators: Manipulation of Recirculation pump control switches, Feedwater system components, and Core Spray jumpers will provide observable actions for the evaluation team.

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

Bounding Criteria: Time limit based on Operations representative recommendation.

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, within 15 minutes of failure to scram indications, 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.

Measurable Performance Indicators: Manipulation of RPS, CRD, 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 lower power by inserting control rods or injecting Boron.

Bounding Criteria: Time limit based on Operations representative recommendation.

3. Length

    a. ~60 minutes

4. Mitigation Strategy Code

    a. AT1, ATWS requiring RPV water level to be lowered, no Blowdown

5. Technical Specifications

    a. TS 3.1.1

    b. TS 3.1.3

    c. TS 3.1.8

6. EAL Classification

    a. Alert per EAL MA3 - An automatic Scram failed to shut down the reactor as indicated by reactor power >6% AND Manual/ARI actions taken at the reactor control console failed to shut down the reactor as indicated by reactor power >6%

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)	**HV01B,** Reactor Building Exhaust Fan Trip 12	**Inserted**
3)	**RD04R1827,** 18-27 Control Rod Failure - Stuck	**Inserted**
4)	**EC03B,** EC RETURN VALVE FAILS OPEN(IV 39-06)	**TRG 2**
5)	**RD34,** Loss of CRD Instrument Air Pres., RT=5:00, FV=20	**TRG 6**
6)	**IA01,** Loss of Instrument Air, RT=6:00, FV=65	**TRG 6**
7)	**RD33A,** Control Rod Bank Blocked Bank 1, FV=12	**Inserted**
8)	**RD33B,** Control Rod Bank Blocked Bank 2, FV=12	**Inserted**
9)	**RD33C,** Control Rod Bank Blocked Bank 3, FV=18	**Inserted**
10)	**RD33D,** Control Rod Bank Blocked Bank 4, FV=12	**Inserted**
11)	**RD33E,** Control Rod Bank Blocked Bank 5, FV=12	**Inserted**

   b. Remotes

1)	**FW01A,** Condensate Pump 11 Discharge Valve 50-10, FV=close	**TRG 25**
2)	**FW52A,** RMC-29-439 Switch: HPCI Channel 11 Power Switch, RV = Off	**TRG 23**
3)	**FW52B,** RMC-29-440 Switch: HPCI Channel 12 Power Switch, RV = Off	**TRG 23**

   c. Overrides

1)	**DI-2936** Inop 1F10/31-03A PULL OU, On (FWIV Failure)	**Inserted**
2)	**DI-2939** Pos_1 1F10/31-03A PULL OU, On (FWIV Failure)	**Inserted**

d. Annunciators

1) **F1-1-8**, Fail Off **TRG10**
2) **F3-1-4**, Fail Off **TRG10**
3) **F4-1-1**, Fail Off **TRG10**

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 rd04r1827
TRG 20 – Activates when ARI is overridden, RPS has been reset and SDV has drained to allow a manual scram to achieve full inward rod movement	hzlrp12g1==1&&zdrrarov==1&&anxstat2(177)==0	bat n20scen2trg20.bat

f. Equipment Out of Service

1) Reactor Build Exhaust Fan 12 secured with info/caution tag
2) IRM 11 bypassed with info/caution tag

g. Support Documentation

1) N1-OP-15A section G.1.0, completed through step G.1.3
2) ReMA and Rod Movement Sheets for sequence exchange

h. Miscellaneous

1) DW Cooling Fan 11 secured
2) Ensure batch file "n20scen2trg20.bat" is in the root batch file directory (NMP1PRE / NMP1 / OPENSIM_U1 / Batch)

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 85%.
- Reactor Building Exhaust Fan 12 is out of service for maintenance.
- IRM 11 is bypassed due to spiking.
- A rod sequence exchange is in progress and has been placed on hold due to an oil leak from Condensate pump 11 motor.

PART III: **Remarks/Planned Evolutions:**

- Shutdown Condensate pump 11 per N1-OP-15A section G.1.0, starting at G.1.4. Perform through step G.1.7. Then place the control switch in PTL in preparation for a clearance.
- Continue the Control Rod Sequence Exchange per ReMA. Scram time testing will not be performed this shift.

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: Shutdown Condensate Pump 11

Event Information	• The crew will shutdown Condensate Pump 11 and place in PTL

	SRO • Directs shutdown of Condensate pump 11 per N1-OP-15A, Section H.9.0 • Provides oversight for evolution • Enters T.S. 3.1.8.b for removal of a redundant HPCI component from service, 15 day LCO
	ATC • Monitors plant parameters

<u>Role Play:</u> When directed to slowly close 50-10, acknowledge order, wait approximately 1 minute and **insert remote**:
 	
FW01A, Condensate Pump 11 Discharge Valve 50-10, FV=close
TRG 25
 	
Then report 50-10 is 90% closed.
 	
<u>Role Play:</u> If contacted as operator to report local FW pump suction pressure, immediately report FW pump suction pressure based on simulator value of FWBP discharge pressure minus 50 psig (~300 psi).
 	
<u>Role Play:</u> When directed to fully close 50-10, acknowledge order, wait approximately 15 seconds and report valve is fully closed.
	BOP
	• Acknowledges direction to shutdown Condensate pump 11
	• May notifies SRO to enter LCO for HPCI
	• Monitors Feedwater Booster pump suction pressure (computer point D454 ~ 123 psig)
	• Directs operator in field to slowly close 50-10, BV - COND PMP 11 DISCHARGE
	• WHEN the Condensate Pump 11 discharge valve is 90% closed, places the pump control switch in PTL
	• Verifies:
	  • Maximum Condensate pump motor current ≤ 135 amps
	  • Minimum FW Booster pump suction pressure within the acceptable range of curve shown in OP-15C attachment 4 (minimum pressure at 85% flow (~6 mlbs/hr) is 72 psig)
	  • Minimum FW pump suction pressure ≥ 200 psig
	• Directs operator in field to fully close 50-10, BV - COND PMP 11 DISCHARGE
	• Verifies no abnormal Main Condenser air in-leakage is occurring

Events #2 & #3: Rod Sequence Exchange, Stuck Control Rod

Event Information	• Reactor power is approximately 85% • The crew will perform a rod sequence exchange • One control rod is stuck and can be freed by raising drive water pressure

<u>Note:</u> Lead examiner may move to the next event once the stuck rod has been freed and is no longer stuck.	**SRO** • Directs performance of Control Rod Sequence Exchange per RMI and N1-OP-5 • Provides oversight for reactivity manipulation • Acknowledges control rod 18-27 is stuck • Directs RO to perform N1-OP-5 section H.13.0 for the stuck control rod • Acknowledges control rod 18-27 moves with higher drive water pressure • Determines entry into Tech Spec 3.1.1.a(2) is required while the control rod is stuck.

<u>Note:</u> RMI includes rods 14-27, 38-27, 18-27, and 34-27	**ATC**
	• Acknowledges direction from SRO
	• Obtains copy of ReMA
	• Withdraws control rods per rod movement sheets and N1-OP-5
	    • Turns control rod power on
	    • Selects rod
	    • Uses CONTROL ROD MOVEMENT switch to notch rod
	• Monitors APRM indications

Note: Verify **TRG1** automatically inserts when drive water pressure is raised, to delete the stuck rod malfunction.	**ATC** • Determines control rod 18-27 is stuck • Performs N1-OP-5 section H.13.0 for the stuck control rod • Raises drive water pressure by approximately 50 psig • Determines control rod 18-27 is no longer stuck

	BOP
	• Monitors Feedwater controls for proper response
	    • FWP 13 FCV responding to power change
	    • RPV water level remains within program band (65” - 83”)

Event #4: Inadvertent Initiation of Emergency Condenser 12

Event Information	• Emergency Condenser 12 goes into service inadvertently • The crew will isolate the EC per the ARPs • SRO makes Tech Spec determination.

When directed by lead examiner, **insert malfunction**: **EC03B,** EC RETURN VALVE FAILS OPEN (IV 39-06) **TRG 2** *EC 12 Condensate Return Valve (39-06) opens* *Reactor power rises* *Reactor water level initially rises* *Expected Annunciators:* *K1-1-5, EMER COND CONDEN RET ISOL VALVE 12 OPEN*	**CREW** • Recognize/report Emergency Condenser 12 initiation • Recognize/report Reactor power and water level rising • Recognize/report no valid Emergency Condenser initiation signal
Role Play: If dispatched to investigate 39-06, wait 2 minutes and then report that there is a significant air leak on the air supply line to 39-06. If asked, the leak is not isolable.	**SRO** • Acknowledges reports from crew • Directs response with ARP K1-1-5 • Directs securing Emergency Condenser 12 • Declares Emergency Condenser 12 inoperable but available • Enters a 7 day LCO per Tech Spec 3.1.3.b • May direct entry into N1-SOP-1.5, Unplanned Reactor Power Change
Note: The next event should NOT be inserted until Reactor water level has stabilized from this event.	**BOP** • Executes ARP K1-1-5 • Closes: ○ 39-08R EC STM ISOLATION VALVE 122, and/or ○ 39-10R EC STM ISOLATION VALVE 121

Event #5: Instrument Air Leak

Event Information	• Lowering Instrument Air pressure and CRD air pressure leads to a manual reactor Scram.

As directed by lead examiner, **insert malfunctions**: **RD34,** Loss of CRD Instrument Air Pres, RT=5:00, FV=20 **IA01,** Loss of Instrument Air, RT=6:00, FV=65 **TRG 6**	**CREW** • Recognizes/reports lowering instrument air pressure • Observes start of standby IAC
Instrument air pressure lowers *Backup Instrument Air Compressor (IAC) loads* *Standby Instrument Air Compressor (IAC) starts* *Instrument air pressure lowers – Reaches 70# at ~4 minutes* *CRD air pressure lowers* *Expected Annunciators:* *L1-4-7, INST AIR BACK-UP VALVE OPEN* *F3-3-2, CRD CONTROL AIR PRESSURE HI-LO (~2 min)*	**SRO** • Acknowledges reports • Directs execution of ARP F3-3-2 • May direct entry into SOP-20.1 • May direct execution of ARP L1-4-7 • Acknowledges instrument air pressure < 70 psig • Directs manual Reactor scram • Acknowledges scram report
	RO • Monitors plant parameters • Places Mode Switch in SHUTDOWN or depresses RPS pushbuttons • Provides scram report
Role Play: When directed as operator check for air leaks, acknowledge order. Wait 2 minutes and report air leakage on Reactor Building 237' West, near the HCUs and it cannot be isolated.	**BOP** • Executes ARP F3-3-2 • If directed executes ARP L1-4-7 • Dispatches Operator to check for air leaks • Monitors instrument air pressure • Reports when instrument air pressure lowers below 60 psig

Events #6 & #7: ATWS with Failure of FW Isolation Valves to Isolate

Event Information	• ATWS with Failure of FW Isolation Valves to Isolate • Crew responds per N1-EOP-3

Verify the following **malfunctions** are **preset:** **RD33A, Control Rod Bank Blocked Bank 1, FV=12** **RD33B, Control Rod Bank Blocked Bank 2, FV=12** **RD33C, Control Rod Bank Blocked Bank 3, FV=18** **RD33D, Control Rod Bank Blocked Bank 4, FV=12** **RD33E, Control Rod Bank Blocked Bank 5, FV=12** *Control rods partially insert* *Reactor power remains > 6%*	**CREW** • Diagnose failure of control rods to insert • Diagnose Reactor power above 6%
	SRO • Enters EOP-2, RPV Control, due to Reactor power above 6% when scram required • Answers "Are all rods inserted to at least position 04?" NO • Answers "Will the reactor stay shutdown without boron?" NO • Exits EOP-2, enters EOP-3, Failure to Scram • Directs ADS bypassed • Directs prevention of Core Spray injection per EOP-1 att 4 • May enter EOP-4 on high torus temperature ◦ Directs lockout of Containment Spray pumps except pump(s) used for torus cooling

Events 6 and 7 continued	SRO Continued

Note: Due to the loss of air to FW FCVs, the applicant may direct local manual control of the FW FRVs. Use the remote **FW25** or **FW26** to manually adjust FW at the applicant's direction.	EOP-3 Level Leg Actions:
	• Directs bypass of low-low RPV water level MSIV isolation per EOP-1 att 2
	• Determines Reactor power is above 6% and RPV water level is above -41 inches
	• **Directs terminate and prevent of all RPV injection except boron and CRD per EOP-1 att 24 (CT-1.0)**
	• Directs RPV level lowered to at least -41 inches
	• Directs RPV water level controlled -109 to -41 inches with Condensate/FW and CRD
	
	EOP-3 Pressure Leg Actions:
	• If any ERV is cycling:
	  ◦ Directs initiation of Emergency Condensers
	  ◦ Directs ERVs opened to lower RPV pressure to less than 965 psig
	• Directs RPV pressure controlled below 1080 psig using TBVs, ECs and/or ERVs
	• Monitors Figure M, Heat Capacity Temperature Limit

Events 6 and 7 continued	SRO continued

<u>Events 6 and 7 continued</u>	**SRO continued**
	<u>EOP-3 Power Leg Actions:</u>
	• Directs initiation of ARI
	• Answers “Is the Turbine Generator On-line?” NO
	• Answers “Reactor power?” Above 6%
	• Directs Recirc pumps verified tripped
	• **Directs execution of EOP-3.1, Alternate Rod Insertion (CT-2.0)**
	• If power is oscillating more than 25% or before Torus temperature reaches 110°F:
	    • Records Liquid Poison tank level
	    • **Directs Liquid Poison injection (CT-2.0)**
	    • Acknowledges first Liquid Poison pump injecting

	RO • Depresses RPS pushbuttons • Initiates ARI • Bypasses Core Spray IV interlocks per N1-EOP-1 Att 4 by installing six jumpers (17, 18, 19, 24, 25, 26) inside Panel N • Bypasses low-low RPV water level MSIV isolation per EOP-1 att 2 by installing four jumpers (1, 2, 8, 9) inside Panel N • Performs EOP-3.1, Section 3 (driving rods) and/or 4 (manual scrams) (see actions below) • Inserts SRMs • Inserts IRMs • Controls IRM recorders and range switches as required to monitor power • Reports when APRMs are < 6% • Reports status of control rod insertion

Events 6 and 7 continued	RO Continued

Note: Control rods will successfully insert using RMCS.
 	
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.
 	
Note: When ARI is overridden, the scram is reset, and annunciator F4-1-1 clears, then **TRG 20** will **activate**. Verify this occurs and the **RD33 malfunctions all delete**. This allows all control rods to insert on the next manual scram attempt.
 	
As directed by the examiner, if it's desired to 'time compress' scramming to all rods in, **insert TRG 10** to fail off appropriate annunciators and **insert TRG 20** to remove ATWS malfunctions all AFTER verifying the scram is reset.
	Possible EOP-3.1 Section 3 Actions:
	• Verify a CRD Pump running
	• Place Reactor Mode Switch in REFUEL
	• Place ARI OVERRIDE switch in OVERRIDE
	• Installed RPS jumpers (5, 6, 12, 13)
	• Reset the scram
	• **Insert 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 of 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 EOP-3.1 Section 4 Actions:
	• Place ARI OVERRIDE switch in OVERRIDE
	• Installed RPS jumpers (5, 6, 12, 13)
	• Reset the scram
	• Verify open 44-167, Charging Water Header Blocking Valve (RB 237')
	• **When the SDV is drained, then initiate a manual scram (CT-2.0)**

Events 6 and 7 continued	BOP

Role Play: When directed as in plant operator to place HPCI keylock selector switches Ch11 and Ch 12 in OFF, wait one minute and **insert remotes**:
 	
FW52A, RMC-29-439 Switch: HPCI Channel 11 Power Switch, RV = Off
FW52B, RMC-29-440 Switch: HPCI Channel 12 Power Switch, RV = Off
TRG 23
 	
Then report that HPCI switches are off.
	• Bypasses ADS
	• **Terminates and prevents all injection except boron and CRD per N1-EOP-1 Att 24 (CT-1.0):**
	  • Attempts to close both FEEDWATER ISOLATION Valves 11 and 12
	  • Determines FWIVs will not close and places FWPs 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
	  • Directs EO to place HPCI keylock selector switches 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
	• Informs SRO when RPV water level reaches -41 inches

	BOP continued
	• If any ERV is cycling:
	  • Initiates Emergency Condensers
	    • IF initiating EC Loop 11, places 39-05, EMERG CNDSR COND RET ISOLATION VALVE 11 control switch in OPEN
	    • IF initiating EC Loop 12, places 39-06, EMERG CNDSR COND RET ISOLATION VALVE 12 control switch in OPEN (and opens steam IVs if isolated due to previous event)
	    • Subsequently controls EC valves per EOP-HC att 9
	  • Manually opens ERVs to lower RPV pressure to 965 psig
	• Controls RPV pressure below 1080 psig with TBVs, ECs and/or ERVs
	• Verifies all Recirc Pumps tripped
	• Initiates Liquid Poison as directed
	  • Reports initial tank level
	  • Starts Liquid Poison pump 11 or 12
	  • Verifies RWCU isolated

Event Termination Criteria	• RPV water level controlled in assigned band • Reactor power < 6% • Control rod insertion in progress or complete

Facility: Nine Mile Point Unit 1 Scenario No.: NRC-3 Op-Test No.: LC1 19-1 NRC

Examiners: ______________ Operators: ______________

Initial Conditions: The plant is operating at approximately 87% power. Reactor Building Exhaust Fan 12 is out of service for maintenance. IRM 11 is bypassed due to spiking.

Turnover: Recirc Pump 11 MG set has been repaired and is ready to be returned to service. Restore 11 recirc pump to service.
After starting Recirc Pump 11 MG set and placing in service, operate it for one hour while maintenance takes readings before returning to 100% power.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N –BOP, SRO	Restore Recirc Pump 15 to service
2	NM19C	I-ATC, SRO	APRM 13 fails upscale ARP **(2017 NRC Scenario 4)**
3	AD05A	C –BOP R-ATC TS-SRO	ERV Inadvertently opens **(2017 NRC Scenario 3)** N1-SOP-1.4, N1-SOP-1.1, Technical Specifications
4	ED05	C-All TS-SRO	Powerboard 12 Electrical Fault N1-SOP-30.2, N1-SOP-1.3, N1-SOP-1.1, Technical Specifications
5	EC01	M -All	Steam leak inside Drywell N1-EOP-2, N1-EOP-4
6	PC10A PC10C	C-All	Failed open Torus to Drywell vacuum breaker N1-EOP-4 **(2017 NRC Scenario 3)**
7	FW28A FW28B CS07	C –BOP, SRO	HPCI fails to initiate, Core Spray fails to auto-inject N1-EOP-2 **(2017 NRC Scenario 3)**
8	CT01A CT01B	C- ATC, SRO	Containment Spray pumps 111 and 112 trip N1-EOP-8, 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 19-1 NRC**
1. Malfunctions after EOP entry (1-2) **Event 6, 7, 8**	3	
2. Abnormal events (2-4) **Events 2, 3, 4**	3	
3. Major transients (1-2) **Event 5**	1	
4. EOPs entered/requiring substantive actions (1-2) **N1-EOP-2, N1-EOP-4**	2	
5. Entry into contingency EOP with substantive actions (at least 1 per scenario set) **N1-EOP-8**	1	
6. Preidentified Critical tasks (at least 2)	3	

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 110ºF, in accordance with N1-SOP-1.4	A manual Reactor scram is required before Torus temperature exceeds 110ºF. 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, the crew will inject with preferred and alternate injection systems to restore and maintain RPV water level above -84 inches, in accordance with N1-EOP-2. Injection with preferred and alternate injection systems may be initiated before RPV level lowers to -84 inches, but must be initiated within 15 minutes of RPV water level lowering below -84 inches.	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, the crew will execute N1-EOP-8, RPV Blowdown, when it is determined Torus pressure cannot be maintained inside the Pressure Suppression Pressure (PSP) limit, in accordance with N1-EOP-4. N1-EOP-8 may be entered prior to exceeding PSP, but must be executed within 15 minutes of exceeding PSP.	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 87% power. IRM 11 is bypassed due to spiking and Reactor Building Exhaust Fan 12 is out of service for maintenance.

Immediately after assuming the shift the crew will be directed to restore Recirculation Pump 15 to service and return to full power. The crew will assess plant conditions and verify Recirculation Flow is less than 50 Mlbm/hr. They will then return Recirculation Pump 15 to service.

After the crew has placed the recirc pump in service, APRM 13 will fail upscale causing a half scram. The crew will bypass the APRM and reset the half scram.

When the half scram is reset, 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 12 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-30.2. 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.

A steam leak will then develop in the Primary Containment. The crew will insert a scram. Following the scram, HPCI will fail to initiate, requiring manual action to establish injection with preferred and/or alternate injection systems to maintain RPV water level **(Critical Task)**.

When the crew attempts to spray the Containment, Containment Spray pumps 111 and 112 will trip. The two remaining Containment Spray pumps will be insufficient to avoid violating PSP, and the crew will perform an RPV Blowdown **(Critical Task)**.

Copy ____ of ____

Training Id: **NMP1 NRC 2020 Scenario** Revision: **0.0**

Title: **Simulator Scenario #3**

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/28/20
Validated By	Dave Mason	7/15/20
	Jason Quick	
	Jeremy Spring	
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

References

1. N1-OP-1, Nuclear Steam Supply System
2. N1-OP-43B, Normal Power Operations
3. N1-SOP-1.1, Emergency Power Reduction
4. N1-SOP-1.4, Stuck Open ERV
5. N1-SOP-1, Reactor Scram
6. N1-SOP-1.3, Recirc Pump Trip at Power
7. N1-SOP-30.2, Loss of Power Board 12
8. N1-EOP-2, RPV Control
9. N1-EOP-4, Primary Containment Control
10. N1-EOP-1, NMP1 EOP Support Procedure
11. N1-EOP-8, RPV Blowdown
12. Unit 1 Technical Specifications

Instructor Information

A. Scenario Description

Sequence of Events / Expected Crew Response:

The scenario begins at approximately 87% power. IRM 11 is bypassed due to spiking and Reactor Building Exhaust Fan 12 is out of service for maintenance.

Immediately after assuming the shift the crew will be directed to restore Recirculation Pump 15 to service and return to full power. The crew will assess plant conditions and verify Recirculation Flow is less than 50 Mlbm/hr. They will then return Recirculation Pump 15 to service.

After the crew has placed the recirc pump in service, APRM 13 will fail upscale causing a half scram. The crew will bypass the APRM and reset the half scram.

When the half scram is reset, 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 12 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-30.2. 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.

A steam leak will then develop in the Primary Containment. The crew will insert a scram. Following the scram, HPCI will fail to initiate, requiring manual action to establish injection with preferred and/or alternate injection systems to maintain RPV water level **(Critical Task)**.

When the crew attempts to spray the Containment, Containment Spray pumps 111 and 112 will trip. The two remaining Containment Spray pumps will be insufficient to avoid violating PSP, and the crew will perform an RPV Blowdown **(Critical Task)**.

1. Termination Criteria

    a. RPV Blowdown in progress, Primary Containment pressure controlled per N1-EOP-1 attachment 17

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 110ºF, in accordance with N1-SOP-1.4

Justification:

Safety Significance: A manual Reactor scram is required before Torus temperature exceeds 110ºF. 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 ERV closure actions 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.

Bounding Criteria: Based on procedural requirements in N1-SOP-1.4. A manual reactor scram must be inserted before Torus water temperature reaches 110F.

CT-2, Given a LOCA in the Drywell and a failure of HPCI to initiate, the crew will inject with preferred and alternate injection systems to restore and maintain RPV water level above -84 inches, in accordance with N1-EOP-2. Injection with preferred and alternate injection systems may be initiated before RPV level lowers to -84 inches, but must be initiated within 15 minutes of RPV water level lowering below -84 inches.

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.

Bounding Criteria: Time limit based on Operations representative recommendation.

CT-3, Given a LOCA in the Drywell and degraded Containment Spray capability, the crew will execute N1-EOP-8, RPV Blowdown, when it is determined Torus pressure cannot be maintained inside the Pressure Suppression Pressure (PSP) limit, in accordance with N1-EOP-4. N1-EOP-8 may be entered prior to exceeding PSP, but must be executed within 15 minutes of exceeding PSP.

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.

Bounding Criteria: Time limit based on Operations representative recommendation.

3. Length

   a. ~60 minutes

4. Mitigation Strategy Code

   a. PC4, RPV Blowdown due to PSP

5. Technical Specifications

   a. TS 3.1.5

   b. TS 3.1.7

   c. TS 3.1.8

6. EAL Classification

   a. Alert, EAL FA1 – Any loss or any potential loss of either fuel clad barrier or RCS barrier.

7. 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)	**HV01B,** Reactor Building Exhaust Fan Trip 12	**Inserted**
3)	**NM19C,** APRM Channel 13 Failure – Upscale	**TRG 1**
4)	**AD05A**, ERV 111 Failure - Opens Electrically, 2 + c/w F-PNL FUSE	**TRG 3**
5)	**ED05,** PB 12 Electrical Fault	**TRG 5**
6)	**EC01,** Steam Supply Line Break in PC, FV=11	**TRG 7**
7)	**PC10A,** BV 68-01 Fails Open	**TRG 23**
8)	**PC10C,** BV 68-03 Fails Open	**TRG 23**
9)	**FW28A,** HPCI MODE: FWP 11 AUTO-START FAIL	**Inserted**
10)	**FW28B,** HPCI MODE: FWP 12 AUTO-START FAIL	**Inserted**
11)	**CT01A,** CT Pump 111 Trip	**Inserted**
12)	**CT01B,** CT Pump 112 Trip	**Inserted**
13)	**CS07,** CS Injection Valves Failure to Auto Open	**Inserted**

   b. Remotes

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

   c. Overrides

1) None

d. Annunciators

1) None

e. Event Triggers

Event #	Event Action	Command
TRG 23, Initiated when Mode Switch is taken to Shutdown to increase the size of the leak.	zdrpstdn==1	imf ec01 (0 0) 30 4:00 11
TRG 24, Initiates when Containment Spray flow is initiated to increase size of the leak.	ctfdw>100	imf ec01 (0 0) 45 1:00 30

f. Equipment Out of Service

1) Reactor Build Exhaust Fan 12 secured with info/caution tag
2) IRM 11 bypassed with info/caution tag
3) Recirc Pump 15 secured, ready for start

g. Support Documentation

1) N1-OP-1 marked up through step H.4.4
2) ReMA for 15 Recirc Pump start

h. Miscellaneous

1) DW Cooling Fan 15 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 87%.
- Reactor Building Exhaust Fan 12 is out of service for maintenance.
- IRM 11 is bypassed due to spiking.
- RRP 15 removed from service for repairs and is ready to be returned to service. TS 3.1.7.e. Four loop operation.

PART III: Remarks/Planned Evolutions:

- Start RRP 15 per N1-OP-1, H.4.0, and return to five-loop operation. N1-OP-1, H.4.0, signed off up to step H.4.5. It is not intended to maintain power during recirc pump restoration.
- Reactor power is at 87%. Verify recirc flow <50 Mlbm/hr to support starting RRP 15.
- After starting Recirc Pump 15 MG set, operate it on the master flow controller for one hour while maintenance takes readings before returning to 100% 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: Restore Recirc Pump 15 to Service

Event Information	• The plant is operating in 4 loop operation • The crew will restore RRP 15 to service

Note: Crew directed to start RRP 15 in pre-brief, starting at N1-OP-1, step H.4.5.	**SRO** • Direct start up of RRP 15, using N1-OP-1, starting at step H.4.5 and the ReMA • Supervise reactivity manipulation • Acknowledge report that RRP 15 is in service • Determine TS 3.1.7.e no longer applies and the LCO Actions can be exited
	ATC • Continuously observe the following: - APRMs - Recirc flow • Monitor P/F map and transfer from 4 loop to 5 loop map when the startup is performed

CAUTIONS from N1-OP-1
• Failure to raise Recirc Pump speed during opening of discharge valve may result in stalled rotor and pump trip due to reverse flow.
• To Prevent backflow thru the RRP, discharge valve should be opened before MG frequency lowers to 20 Hz. Frequency will raise, then drop quickly, then raise again before SLOWLY lowering. Discharge BV should be opened when frequency is slowly lowering.
	BOP
	• Verify recirculation flow < 50 x 10^6 lb/hr
	• Verify RRP 15 GEMAC in MAN and matched with other four GEMACs but no greater than 50%
	• Verify RRP 15 discharge valve closed
	• Verify RRP 15 suction and discharge bypass valves are open
	• Make a plant announcement for start of RRP 15
	• Place RRP 15 control switch to START and observe indications
	  • MG MOTOR starts, Amp Meter Amps increase then decrease
	  • MG Generator accelerates to proper speed (approx 50 - 60 Hz)
	  • Generator Field Bkr closes
	  • Generator slows toward 20% speed (Approximately 11.5 Hz)

Role Play: As EO sent to Aux Control Room, wait one minute then report you have reset 50SR Pump Motor Stalled Rotor Target **Role Play:** As EO, when requested report MG set oil temperature is 120°F and stable.	**BOP Continued** • WHEN speed (Frequency Meter) is between 30 and 25 Hz, open REACTOR R PUMP DISCH VALVE • Verify RRP 11 maintained less than or equal to OP limits • Adjust pump speed to match other pumps • Null RRP 11 controller and shift to BAL or AUTO • Verify power/flow map updated to five loop requirements • Dispatch EO to reset 50SR Pump Motor Stalled Rotor Target (Aux Control Room) • Dispatch EO to check MG set oil temperature locally • May perform N1-ARP-F2-1-1 action to depress PUMP MOTOR VIBRATION RESET pushbutton on F Panel, clearing annunciator F2-1-1

Event #2: 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.

<table>
<tr>
<td>

Event 2 continued

</td>
<td>

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)

</td>
</tr>
<tr>
<td>

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.

</td>
<td>

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

</td>
</tr>
</table>

Event 2 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 #3: 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**: **AD05A,** ERV 111 Failure – Opens Inadvertently **TRG 3** *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 3 continued	**SRO** • Acknowledges reports • Directs entry into N1-SOP-1.4, Stuck Open ERV • Directs emergency power reduction to approximately 85% power per N1-SOP-1.1 • 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 110ºF, 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 • Lowers power to approximately 85% using recirc flow and/or cram rods • Monitors APRMs • Monitors Recirculation flow • Monitors Feedwater flow and RPV water level • Monitors position on power to flow map • **If Torus temperature approaches 110ºF, inserts manual Reactor scram** **CT-1**

Event 3 continued	BOP
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, no metal, 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 or place the ERV switches to PWR-OFF in the RB wait 3 minutes and **insert remote**: **AD01A,** ERV 111 Fuses, FV=pulled **TRG 27** Report fuses are pulled -or- switches are in PWR-OFF position. **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.	• 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 or place ERV switches to PWR-OFF 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 #4: Powerboard 12 Electrical Fault

Event Information	• 4160V Power board 12 de-energizes and will not be available for the remainder of the scenario.

When directed by lead examiner, **insert malfunction**:
 	
ED05, PB 12 Electrical Fault
TRG 5
 	
Reactor power lowers due to RRP trips
Reactor water level rises due to RRP trips
Expected Annunciators:
A5-1-6, PB 12 R122 TRIP
A5-4-7, POWER BD 17 LOW BUS VOLTAGE
Also the following equipment trips:
Reactor Recirculation Pump 14/15
Three Drywell Fans
Condensate Pump 13
Circulating Water Pump 12
Service Water Pump 12
TBCLC Pump 12
IAC 12
Reactor Building Exhaust Fan 12 (already OOS)
	CREW
	• Diagnose/report loss of PB 12
	• Recognize/report loss of:
	  • Reactor Recirculation Pump 14/15
	  • Three Drywell Fans
	  • Condensate Pump 13
	  • Circulating Water Pump 12
	  • Service Water Pump 12
	  • RBCLC Pump 13
	  • TBCLC Pump 12
	  • IAC 12
	• Recognize/report drop in Reactor power
	• Recognize/report lowering condenser vacuum

Note: On the loss of Powerboard 12, Recirc pumps 14 and 15 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. Prior to discharge valves being closed, 3.6.2.a requires inserting control rods.	**SRO** • Acknowledges reports from crew • Directs entry into N1-SOP-30.2, Loss of PB 12 • 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 17A and 13B/C-15B/C • 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 • 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 12 and Condensate pump 13, 15 day LCO • 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

<u>Role Play:</u> If dispatched to investigate Powerboard 12, wait 2 minutes then report that the normal supply breaker (R122) tripped on overcurrent. If dispatched to investigate Powerboard 17A, wait 2 minutes then report that there are no problems evident at Powerboard 17. Report that electrical maintenance has also looked at the Powerboard and concurs with re-energizing it. **<u>Role Play:</u>** If dispatched to lineup Steam Packing Exhauster 11, wait 4 minutes, then **insert remote**: **MS08, SPE 11 SUCTION VLV, FV=open** Then report task completion. If asked to also close suction valve to Steam Packing Exhauster 12, wait 2 minutes, then **insert remote**: **MS09, SPE 12 SUCTION VLV, FV=close** Then report task completion.	**BOP** • Executes N1-SOP-30.2, Loss of Power Board 12 • Starts Service Water pump 11 • Coordinates with ATC to monitor APRMs and LPRMs • Verifies TBCLC pump 11 running • Verifies IAC 11 running • Verifies RBCLC pumps running • Verifies Steam Packing Exhauster 11 running • Observes annunciator A5-2-8 in alarm • Determines Power Board 12 is faulted and cannot be reenergized

Event 4 continued	BOP continued

DW Cooling Fans 11, 12, & 13 are restored, if not green flagged previously. DW temperatures begin to lower
 	
Role Play: As operator when directed to energize Powerboards 13B/C-15B/C, 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.
	• Restores power to Powerboard 17A as follows:
	  • Opens R1051
	  • Closes R1052
	  • Verifies Power Board 17B amps <962
	• Dispatches operator to re-energize Power Boards 13 B/C, 14 B/C, and 15 B/C per attachment 4
	• Notifies SRO that APRMs are inoperable
	• Closes Recirc pump 14 and 15 discharge valves
	• Holds open for 2-3 seconds Recirc pump 14 and 15 discharge valve
	• Records time when Recirc pump 14 and 15 discharge valve is cracked open
	• Executes N1-SOP-1.3, Recirc Pump Trip, as time permits
	• Dispatches operator to restore Offgas Vacuum Pump

Event 4 continued	BOP continued

<u>Role Play:</u> As RP, acknowledge report that RBEVS is in service and RBVS is secured.	• 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
	    o Verifies closed Reactor Building Exhaust Fan 12 outlet damper
	    o Starts Reactor Building Exhaust Fan 11
	  • L1-3-4, REACT BLDG/ATM DIFF PRESS
	    o Starts RBEVS per OP-10
	<u>Possible actions in OP-10 Section H.1.0 to start RBEVS</u>
	• 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

Events #5, #6, #7, and #8: Steam Leak Inside Drywell, Vacuum Breaker Fails Open, Failure of HPCI and Core Spray to Initiate, Trip of Containment Spray Pumps 111 and 112

Event Information	• EC Steam line Break in the Drywell with multiple system failures

When directed by the lead examiner, **insert malfunction**: **EC01,** Steam Supply Line Break in PC, FV=11 **TRG 7** *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 **CT01B,** CT Pump 112 Trip **CS07,** CS Injection Valves Failure to Auto Open *RPV water level slowly lowering* *Containment Spray pump 111 red light off, green light on and amps go to zero* *Containment Spray pump 112 red light off, green light on and amps go to zero* *Core Spray IVs do NOT open at 365 psig* *Expected annunciator:* *K1-1-7, Containment Spray Pump 111 Trip Fail to Run* *K1-1-8, Containment Spray Pump 112 Trip Fail to Run*	**CREW** • Diagnose/report degrading containment parameters • Acknowledge/report annunciators • Diagnose failure of HPCI to automatically initiate • Diagnose the trip of Containment Spray pumps 111 and 112

<u>Events 5, 6, 7, and 8 continued</u> Verify the following **malfunctions automatically insert** when the mode switch is taken to SHUTDOWN: **EC01,** Steam Supply Line Break in PC, IV=11, RT=4:00, FV=30 **PC10A,** BV 68-01 Fails Open **PC10C,** BV 68-03 Fails Open **TRG 23** *Containment conditions further degrade* *Two Torus-to-Drywell vacuum breakers indicate open* *Expected annunciator:* *K1-4-6, Torus-DW Vac Relief Check Valve Open* 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 **TRG 24**	**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 (if available) 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 and low RPV water level

Events 5, 6, 7, and 8 continued	SRO continued

Role Play: If directed to perform in-plant actions to line up Containment Spray Raw Water to Containment Spray, acknowledge order, but delay any field actions.
 	
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. N1-EOP-2 step P-1 provides continuous guidance for this consideration.
	• 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 EOP-1 attachment 17
	• Evaluates/monitors position on Pressure Suppression Pressure curve
	• Acknowledges report of Containment Spray pumps 111 and 112 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 EOP-1 attachment 4
	  • Directs EC initiation
	  • Answers "Torus water level?" Above 8.0 ft
	  • Directs open 4 ERVs

Events 5, 6, 7, and 8 continued	ATC

	• Monitors plant parameters
	• When directed, places Mode Switch in Shutdown or depresses RPS pushbuttons
	• 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

Events 5, 6, 7, and 8 continued	BOP

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.	• Monitors/reports degrading Containment parameters
	• Performs RPV water level control actions of SOP-1, Reactor Scram:
	  • Restores RPV level to 53-95” by controlling injection and rejecting through RWCU
	  • Starts 11 MDFWP
	  • 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 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 all FW Pump FCVs closed
	    • 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 7, 8, and 9 continued	RO/BOP

Note: Core Spray pumps may be placed in PTL if needed before N1-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.	• 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 pumps 111 and 112 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 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 Blowdown in progress • Primary Containment pressure controlled per N1-EOP-1 attachment 17

Facility: Nine Mile Point Unit 1 Scenario No.: NRC-4 Op-Test No.: LC1 19-1 NRC

Examiners: ______________________ Operators: ______________________

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

Turnover: Lower Torus water level to 10.8 feet per N1-OP-14 using Containment Spray 111.

Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N – BOP	Transfer Torus Water to the Waste Collection Tank N1-OP-14
2	CT01A	C-BOP TS-SRO	Containment Spray Pump 111 Trip Technical Specifications
3	TC03A	C-ATC, SRO	EPR Fails High N1-SOP-31.2
4	RP20B	TS-SRO	Drywell Pressure transmitter Failed Low Technical Specifications
5	PC05 CW06B	C – BOP, SRO R-ATC	Seismic Event with Circulating Water Pump trip. N1-SOP-28, N1-SOP-1.1
6	EG11	C –All	Degraded 345KV Grid conditions N1-SOP-33B.1, N1-SOP-1
7	RR29	M –All	Coolant leak in Drywell N1-EOP-2, N1-EOP-4
8	FW03A FW03B	C –All	Trip of Feedwater Pumps N1-EOP-2, 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 19-1 NRC**		
1. Malfunctions after EOP entry (1-2) **Events 7, 8**	2	
2. Abnormal events (2-4) **Events 2, 3, 4, 5, 6**	5	
3. Major transients (1-2) **Event 7**	1	
4. EOPs entered/requiring substantive actions (1-2) **N1-EOP-2, N1-EOP-4**	2	
5. Entry into contingency EOP with substantive actions (at least 1 per scenario set) **N1-EOP-8**	1	
6. Preidentified Critical tasks (at least 2)	2	

CRITICAL TASK DESCRIPTIONS:	**CRITICAL TASK JUSTIFICATION:**
CT-1.0: Given a LOCA in the Drywell with Drywell temperature approaching 300F or Torus pressure exceeding 13 psig, initiate Containment Sprays prior to exceeding the Pressure Suppression Pressure limit, in accordance with N1-EOP-4.	Initiating Containment Sprays reduces Primary Containment pressure. This reduces stresses on the Drywell and Torus, assists in avoiding “chugging” that may cause fatigue failure of the LOCA downcomers, and avoids the need for a blowdown. These benefits reduce challenges to the fuel cladding, the RPV, and the Primary Containment.
CT- 2.0: Given a LOCA with degraded high pressure injection capability, the crew will depressurize the RPV and inject with Preferred and Alternate Injection Systems to restore and maintain RPV water level above -84 inches, in accordance with N1-EOP-2. Injection with preferred and/or alternate injection systems must be performed within 15 minutes of performing an RPV blowdown.	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.

SCENARIO SUMMARY

The scenario begins at approximately 100% power. IRM 11 is bypassed due to spiking and Reactor Building Exhaust Fan 12 is out of service for maintenance. Torus water level is at the high end of the normal band. The crew will lower Torus Water Level in accordance with N1-OP-14 using 111 Containment Spray System. Containment Spray pump 111 will trip requiring the SRO to make a Tech Spec call.

Then, the EPR fails high. The MPR automatically takes control of pressure at a value about 5 psig above the initial pressure. The crew will enter N1-SOP-31.2, remove the EPR from service and return reactor pressure to the initial value.

Next, one of the four drywell pressure transmitters fails downscale, preventing that channel from actuating protective functions. The transmitter inputs to RPS, Core Spray, Containment Spray and Automatic Depressurization Systems (ADS). Tech Spec 3.6.2 entry is required.

Next, a seismic event occurs causing one of the circulating water pumps to trip. The crew will respond by lowering power per N1-SOP-1.1 in order to maintain condenser vacuum. Then, a grid disturbance develops, resulting in lowering frequency and voltage on the 345KV power lines. The crew will enter N1-SOP-33B.1 and monitor grid frequency to determine action times for tripping the turbine. As the grid continues to degrade, the crew will scram the Reactor.

A coolant leak in the Drywell will develop following the scram. The crew will enter N1-EOP-4 and re-enter N1-EOP-2. The crew will initiate Containment Sprays to prevent exceeding Pressure Suppression Pressure, in accordance with N1-EOP-4 (**Critical Task)**. The remaining high pressure Feedwater pump will trip, causing RPV water level to lower to the top of active fuel (TAF). With the degraded high pressure injection capability, the crew will enter RPV Blowdown before RPV water level drops below -109 inches, in accordance with N1-EOP-2 (**Critical Task)**.

Copy ____ of ____

Training Id: **NMP1 NRC 2020 Scenario**   Revision: **0.0**

Title: **Simulator Scenario #4**

	Signature / Printed Name	Date
Developed By	Signature on File / Paul Isham	1/29/20
Validated By	Dave Mason	7/15/20
	Jason Quick	
	Jeremy Spring	
Facility Reviewer	Signature on File / Phil Nichols	10/30/20

References

1. N1-OP-14, Containment Spray System
2. N1-SOP-28, Seismic Event
3. N1-SOP-1.1, Emergency Power Reduction
4. N1-SOP-31.2, Pressure Regulator Malfunctions
5. N1-SOP-33B.1, Major 345 KV Grid Disturbances
6. N1-SOP-1, Reactor Scram
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. IRM 11 is bypassed due to spiking and Reactor Building Exhaust Fan 12 is out of service for maintenance. Torus water level is at the high end of the normal band. The crew will lower Torus Water Level in accordance with N1-OP-14 using 111 Containment Spray System. Containment Spray pump 111 will trip requiring the SRO to make a Tech Spec call.

Then, the EPR fails high. The MPR automatically takes control of pressure at a value about 5 psig above the initial pressure. The crew will enter N1-SOP-31.2, remove the EPR from service and return reactor pressure to the initial value.

Next, one of the four drywell pressure transmitters fails downscale, preventing that channel from actuating protective functions. The transmitter inputs to RPS, Core Spray, Containment Spray and Automatic Depressurization Systems (ADS). Tech Spec 3.6.2 entry is required.

Next, a seismic event occurs causing one of the circulating water pumps to trip. The crew will respond by lowering power per N1-SOP-1.1 in order to maintain condenser vacuum. Then, a grid disturbance develops, resulting in lowering frequency and voltage on the 345KV power lines. The crew will enter N1-SOP-33B.1 and monitor grid frequency to determine action times for tripping the turbine. As the grid continues to degrade, the crew will scram the Reactor.

A coolant leak in the Drywell will develop following the scram. The crew will enter N1-EOP-4 and re-enter N1-EOP-2. The crew will initiate Containment Sprays to prevent exceeding Pressure Suppression Pressure, in accordance with N1-EOP-4 (**Critical Task)**. The remaining high pressure Feedwater pump will trip, causing RPV water level to lower to the top of active fuel (TAF). With the degraded high pressure injection capability, the crew will enter RPV Blowdown before RPV water level drops below -109 inches, in accordance with N1-EOP-2 (**Critical Task)**.

1. Termination Criteria

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

2. Critical Tasks

CT-1, Given a LOCA in the Drywell with Drywell temperature approaching 300F or Torus pressure exceeding 13 psig, initiate Containment Sprays prior to exceeding the Pressure Suppression Pressure limit, in accordance with N1-EOP-4.

Justification:

Safety Significance: Initiating Containment Sprays reduces Primary Containment pressure. This reduces stresses on the Drywell and Torus, assists in avoiding “chugging” that may cause fatigue failure of the LOCA downcomers, and avoids the need for a blowdown. These benefits reduce challenges to the fuel cladding, the RPV, and the Primary Containment.

Cueing: Multiple Primary Containment pressure and temperature indications and annunciators will indicate degrading conditions. N1-EOP-4 provides direction to initiate Containment Sprays.

Measurable Performance Indicators: Manipulation of Containment Spray pump control switches will provide observable actions for the evaluation team.

Performance Feedback: Containment Spray flow and lowering Primary Containment pressure and temperature indications will provide performance feedback regarding success of crew actions to initiate Containment Sprays.

Bounding Criteria: Based on procedural requirements in N1-EOP-4. Exceeding the Pressure Suppression limit would require an RPV Blowdown.

CT-2, Given a LOCA with degraded high pressure injection capability, the crew will depressurize the RPV and inject with Preferred and Alternate Injection Systems to restore and maintain RPV water level above -84 inches, in accordance with N1-EOP-2. Injection with preferred and/or alternate injection systems must be performed within 15 minutes of performing an RPV blowdown.

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. As well as operating ERVs for depressurization

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

Bounding Criteria: Time limit based on Operations representative recommendation to allow RPV pressure to lower to within the capacity of low pressure injection sources.

3. Length

   a. ~60 minutes

4. Mitigation Strategy Code

   a. RL2, LOCA Results in RPV Water Level Below TAF, Blowdown and Recover Level with Low Pressure Systems

5. Technical Specifications

    a. TS 3.3.7.b for trip

    b. TS 3.3.7.d for water seal

    c. TS 3.6.2

6. EAL Classification

    a. Unusual Event EAL HU4- Confirmed Seismic

    b. Alert EAL FA1 – Loss of RCS barrier

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)	**HV01B,** Reactor Building Exhaust Fan Trip 12	**Inserted**
3)	**CT01A,** Containment Spray Pump Trip 111	**TRG 1**
4)	**TC03A,** EPR – FAILS HIGH	**TRG 2**
5)	**RP20B,** RPS 11 DW PT 201.2-476A FAILED LOW	**TRG 3**
6)	**PC05,** Seismic Event Triggered	**TRG 5**
7)	**CW06B,** Circulating Water Pump Trip 12	**TRG 5**
8)	**EG11,** 345 KV Power Grid Transient, RT=7:00, RSV=355, SV=345	**TRG 6**
9)	**RR29,** RR Loop Rupture on Pump 15 Suction Line, DT=3:00, RT=7:00, FV=17	**TRG 10**
10)	**FW03A,** Feedwater Pump Trip 11, DT=2:00	**TRG 10**
11)	**FW03B,** Feedwater Pump Trip 12	**Inserted**

   b. Remotes

1)	**AT10,** Lake Water Temperature, RV=37	**Inserted**
2)	**MC02,** OG2,4 12 SIDE PRI JET VAP SUCT VLVS, FV=0	**TRG 15**
3)	**MC04,** MS14,16 12 SIDE PRI JET STM VLVS, FV=0, DT = 2 Min	**TRG 15**

   c. Overrides

1) None

   d. Annunciators

1) None

e. Event Triggers

Event #	Event Action	Command
TRG 10, Triggers the LOCA and the trip of FW pump 11 when the mode switch is taken to SHUTDOWN	zdrpstdn==1	**Blank**

f. Equipment Out of Service

1) Reactor Build Exhaust Fan 12 secured with info/caution tag

2) IRM 11 bypassed with info/caution tag

g. Support Documentation

1) N1-OP-14, completed to section H.1.3

h. Miscellaneous

1) 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%.
- Reactor Building Exhaust Fan 12 is out of service for maintenance.
- IRM 11 is bypassed due to spiking.

PART III: **Remarks/Planned Evolutions:**

- Lower Torus Water level to 10.8 feet per N1-OP-14 using Containment Spray 111 starting at step H.1.3. Operators are standing by in the reactor building and screenhouse.

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.	**<u>Crew</u>** • Walkdown panels • Conduct shift turnover brief • Assume the shift

Events #1 & #2: Transfer Torus Water to the Waste Collection Tank, Containment Spray Pump 111 Trips

Event Information	• Crew will lower torus water level per N1-OP-14 • SRO makes Tech Spec call on trip of containment spray pump

	SRO • Direct lower torus water level to waste collector tank using N1-OP-14, using Containment Spray 111 • Acknowledge reports from BOP • Acknowledge trip of Containment Spray Pump 111
Role Play: When requested as the plant operator, immediately report no gap on 80-16. **Role Play:** When directed to shut 93-65, wait 1 minute and report 93-65 is closed. **Role Play:** As the plant operator in the screen house, immediately report proper lubrication flow and the seal line temperature feels consistent with lake temperature. (N1-OP-14 steps H.1.9.1 and 1.9.2) *K1-4-8, CONTAINMENT SPRAY LOOP 11* PRESSURE LOW	**BOP** • Acknowledge direction from the SRO • Close the following valves: ◦ 80-45 ◦ 80-16 • Direct a plant operator to verify there is no gap on 80-16. • Open 80-118 • Verify open 80-40 • Direct plant operator to unlock and close 93-65 • Notify SRO to log BV-93-65 closed • Make a plant announcement for starting Containment Spray Pump 111 and Containment Spray Raw Water Pump 111 • Start raw water pump • Direct plant operator to verify proper packing lubrication and flow • Start Containment Spray Pump 111

<u>Events 1 and 2 continued</u> **<u>Role Play:</u>** As the operator in Rad Waste, after 80-118 has been throttled in the shut direction for approximately 5 seconds, inform the control room that flow is high enough.	**BOP** • Open 80-115 • Open 80-114 • Contact Rad Waste and have them standby to monitor flow • Throttle close on 80-118 • Acknowledge report from Rad Waste • Inform the SRO that water is being transferred from the TORUS
As Directed by the examiner, **insert malfunction**, **CT01A**, Containment Spray Pump Trip 111 **TRG 1** *Containment Spray Pump 111 trips*	
<u>Role Play:</u> When asked, inform the control room you were nearby and heard a "pop" and saw a small puff of smoke on the pump motor when it tripped. There is no fire.	**CREW** • Recognize and report trip of Containment Spray Pump 111 • Direct EO to investigate the trip of the pump • Reference the ARP for K1-1-7
Note: At the examiner's discretion, the scenario can move on to event 3 prior to waiting for the containment spray lineup being returned to normal.	**SRO** • Direct RO to return containment spray lineup to normal using N1-OP-14 • Determines 15 day LCO per TS 3.3.7

<u>Role Play:</u>
If directed to vent 60.1-20 and 60.1.21, wait one minute and report the task is complete.
 	
<u>Role Play:</u>
As plant operator, wait 1 minute and inform the control room you have completed step G.1.23
	BOP
	• Acknowledge direction from the SRO
	• Open 80-118
	• Close 80-114 and 80-115
	• Green Flag Containment Spray Pump
	• Stop Containment Spray Raw Water Pump 111
	• Direct the in-plant operator to vent the following pressure indicators
	  ◦ PI-60.1-20
	  ◦ PI-60.1-21
	• Place Containment Spray Raw Water Pump 111 in pull to lock
	• Swap Containment Spray Raw Water Pump 111 discharge to Core Spray 11 (after 10 minutes)
	• Direct EO to perform steps G.1.6 - G.1.23

Events 1 and 2 continued
 	
Role Play:
Wait 1 minute and report 93-57 is closed and 93-65 is locked open and both were independently verified.
	BOP
	• Acknowledge report from plant operator
	• Realign Containment Spray Pump 111 discharge to the heat exchanger
	• Have realignment independently verified
	• Direct the plant operators to perform and independently verify the following:
	  ◦ 93-57 is closed
	  ◦ 93-65 is opened and locked

Role Play: When directed to close 80-178 and 80-182, wait approximately 1 minute and report the valves are closed. **Role Play:** As the plant operator, wait approximately 1 minute and report valve 80-178 in Step G.2.15 is open.	**BOP** • Acknowledge report from plant operators • Inform SRO to log 93-65 is locked open • Green flag Containment Spray Raw Water Pump 111 and have in independently verified • Place Containment Spray Pump 111 in PTL • Direct plant operators to close 80-178 • Close 80-01 • Direct the PO to unlock and close 80-182 • Close 80-40 • Verify 80-16 is closed • Direct the PO to perform steps G.2.5 - G.2.15

	BOP
	• Acknowledge report from plant operator
	• Open 80-01
	• Green flag Containment Spray Pump 111
	• Verify closed the following
	  ◦ 80-44
	  ◦ 80-41
	• Open the following valves:
	  ◦ 80-16
	  ◦ 80-40
	  ◦ 80-45
	• Verify 80-118 is closed

Event #3: EPR Fails High

Event Information	• Plant is operating at or near rated conditions • The EPR fails high • MPR takes control at new higher pressure • Crew will restore pressure to pre-transient value

When directed by the examiner, **insert** the following **malfunction**: **TRG2** **TC03A**, EPR – FAILS HIGH, FV=TRUE	
Power spike approximately 10% before retuning to original value *RPV pressure rise approximately 6 psig* *EPR servo stroke drops to 0* *-A2-4-4, TURBINE MECHANICAL PRESS REG IN CONTROL* *-A2-4-5, TURBINE ELECTRICAL PRESS. REG. PRESS. VOLTS.* *EPR Setpoint fails high*	**RO** • Recognize and report A2-4-4 • Recognize changes in power and RPV pressure and updates crew
The following annunciators may flash in an out as pressure changes: *F3-4-4, ROD BLOCK* *F2-1-8, APRM 11-14* F3-1-1, APRM 15-18	**SRO** • Updates crew on entry into N1-SOP-31.2 • Directs RO to execute N1-SOP-31.2 • Establishes oversight of SOP execution • Contacts the SM • May direct power reduction to maintain less than rated. (N1-SOP-1.1)
	RO • Enters N1-SOP-31.2 and updates crew • Make station announcement

Role Play:
If dispatched to the Front Standard to look for any abnormal indications as to why the EPR failed, **wait** 2 minutes and **report** there are no indications on the Front Standard for the EPR failure.
 	
Role Play:
If dispatched to the Aux. Control Room to check to indications as to why the EPR failed, **wait** 1 minute and **report** there are no indications available to indicate why the EPR failed.
	RO
	• Determines RPV pressure is higher and stable with MPR in control (EPR failure)
	• Verify MPR takes control by observing the following:
	  ◦ A2-4-4 alarmed
	  ◦ Pressure stable approx. 3 to 5 psig higher
	  ◦ Control valves slightly closed
	• Place EPR switch to OFF
	• Verify EPR % servo stroke remains at 0%
	• Adjust MPR to control reactor pressure as directed by SRO.
	• Pressure under control? YES
	• Return Reactor pressure to pre-transient value as directed by SRO.
	• Refers to N1-OP-31
	• Informs SRO that the COLR needs to be referenced.

Role Play: If directed as Reactor Engineering to evaluate Thermal Limits, acknowledge the direction. This will not be completed by the end of the scenario. **Role Play** • Acknowledge report to Ops and Plant Management. • Acknowledge report to the Duty Manager. • As WEC/FIN, acknowledge request to engage the organization to troubleshoot and repair of the EPR.	**SRO** • Conduct a post transient brief • Evaluate the COLR • Determine that no thermal limit adjustments are required • Notifies WEC, Duty Manager, and SOS of EPR failure

Event #4: Drywell High Pressure Transmitter 201.2-476A fails downscale

Event Information	• Drywell High Pressure Transmitter 201.2-476A fails downscale • SRO reviews tech spec impact

When directed by examiner, **insert malfunction**: **RP20B** RPS 11 DW PT 201.2-476A FAILED LOW **TRG 3** *ANALOG TRIP SYSTEM CHANNEL 11 TROUBLE red light illuminates. Red light is located on upper left side of F Panel. No Annunciator.* **Role Play:** WHEN dispatched to RPS Cabinets, report Drywell Pressure transmitter 201.2-476A is downscale with gross failure lit. All other DW pressure transmitters are reading correctly for current DW pressure.	**CREW** • Identifies and reports ANALOG TRIP SYSTEM CHANNEL 11 TROUBLE red light illuminated. • Dispatches operator to Reactor Building 281 to check RPS cabinets • May refer to drawing C-18014-C sheet 1 and table to determine functions of affected instrument.
Note: Tech Specs 3.6.2.a, b, d, e, f and l all apply. 3.6.2.a Scram Note (o) “With one channel required by Table 3.6.2.a inoperable in one or more parameters, place the inoperable channel and/or that trip system in the tripped condition within 12 hours. 3.6.2.d Note (f) requires placing channel in tripped condition within 24 hours or take the action required by Specification 3.6.2.a for that parameter. This requires tripping the channel in 12 hours. 3.6.2.e Note (c) also applies the same way. 3.6.2.l is 7 day LCO for CREVS. 3.4.5 must also be entered for CREVS system. 3.6.2.a – Instrumentation that Initiates a Scram 3.6.2.b - Instrumentation that Initiates PCIS 3.6.2.d - Instrumentation that Initiates Core Spray 3.6.2.e - Instrumentation that Initiates Cont. Spray 3.6.2.f - Instrumentation that Initiates ADS 3.6.2.l - Instrumentation that Initiates CREVS	**SRO** • Declares DWP transmitter inoperable. • Enter Tech Spec 3.6.2 for instruments that initiate scram, primary coolant or containment isolation, core spray initiation, containment spray initiation and ADS initiation. • Determines transmitter must be placed in the tripped condition within 12 hours. • Notifies the WEC. • Notifies Ops Management. • Conducts crew brief/update.

Event #5: Seismic Event with Circulating Water Pump Trip

Event Information	• A seismic event occurs which cause a Circ Water pump to trip. • The crew will perform actions for a seismic event as well as lower reactor power to maintain condenser vacuum.

When directed by examiner, **insert malfunction**: **PC05,** Seismic Event Triggered **TRG 5** **CW06B,** Circulating Water Pump Trip 12 **TRG 5** *H2-1-6, Seismic Detection Equipment Event* *H2-2-4, CIRCULATING WTR PUMP 12 TRIP OVERLOAD* *Circulating Water Pump 12 motor amps drops to zero* *Water Box Level South drops downscale* *Condenser Vacuum begins to lower*	**CREW** • Recognize/report seismic event • Recognizes and reports annunciator H2-2-4 • Recognizes loss of Circulating Water Pump 12 • Recognizes lowering of condenser vacuum
Note: When the operator assumes ownership of condenser vacuum, the SRO will set a limit above 22.1" vacuum for scramming the plant.	**SRO** • Acknowledges reports • Directs execution of N1-SOP-28, Seismic Event • Updates crew on entry into N1-SOP-1.1 and N1-SOP-25.1 • Directs RO to execute N1-SOP-25.1 • Assigns ownership of condenser vacuum with directions to scram at a specific threshold value • Directs and emergency power reduction per N1-SOP-1.1 to maintain vacuum above 25" • Establish oversight of power reduction

Event 5 continued	**BOP**
Role Play: If contacted as Unit 2 or JAF, report that you have also experienced a seismic event and that you have confirmed the seismic event with JAF or Unit 2 (as appropriate). Report that Unit 2 seismic recorders indicated >0.075g. **Role Play:** If contacted as IMD to interpret seismic data on the J panel, acknowledge request. **Role Play:** When dispatched to inspect plant equipment / investigate leakage, wait 3 minutes, then report no damage found. **Role Play:** If dispatched to investigate CW Pump 12 trip, wait approximately 2 minutes and report CW Pump 12 tripped on overcurrent	• Executes N1-SOP-28, Seismic Event • Confirms seismic event indicator on J panel • Contacts Unit 2 and JAF to confirm seismic event • Notifies I&C to interpret seismic data • Notifies SRO to review EAL HU4 • Answers "Did event cause any auto system(s) response?" No • Notifies SRO to suspend ALL activities AND transient initiations NOT essential for safe operation UNTIL inspections are completed • Dispatches operators to inspect plant equipment for damage
Note: Cram rods are inserted (approximately 4) *Condenser vacuum stabilizes above 26"*	**ATC** • Acknowledges direction from SRO • Reference ARP for H2-2-4 • Enters N1-SOP-25.1 • Reference N1-OP-19, Section H.3 • Monitors plant delta temperatures to ensure plant is not exceeding the SPDES permit • Informs crew that power needs to be lowered to maintain condenser vacuum > 26" • Enters N1-SOP-1.1 • Reduces RRP flow to about 85% power • Inserts cram rods

Event 5 continued	ATC Continued
Role Play When dispatched to isolate the south side SJAEs, wait approximately 15 minutes and **insert** the following **remotes:** **MC02**, OG2,4 12 SIDE PRI JET VAP SUCT VLVS, Close **MC04**, MS14,16 12 SIDE PRI JET STM VLVS, Close, DT = 2 Min **TRG 15** Report task completion and SJAE steam header pressure at 150 psig. The scenario will move on to the next event prior to completion of this role play. **MC04**, MS14,16 12 SIDE PRI JET STM VLVS, Close, DT = 2 Min	• Receives SRO concurrence to isolate south side SJAEs • Dispatches an inplant operator to isolate the south side SJAEs by closing the following valves ◦ 76-50 (OG-2), BV - PRI JET 11 - VAPOR CNDSR 12 UPPER ◦ 76-56 (OG-4), BV PRI JET 14 - VAPOR CNDSR 12 LOWER ◦ 76-61 (OG-6), BV - SPARE JET - VAPOR CNDSR 12 UPPER ◦ 76-58 (OG-8), BV - SPARE JET - VAPOR CNDSR 12 LOWER ◦ 06.2-01 (MS-14), BV - PRI JET 11 - STM CNDSR 12 UPPER ◦ 06.2-04 (MS-16), BV - PRI JET 14 - STMCNDSR 12 LOWER • Dispatches a plant operator verify SJAE steam header pressure is at 150 psig • Acknowledges report from the field • Closes 74-06, Fish Screen 12 • Opens 74-21, Fish Screen 12 Drain Valve • Places CONDENSER WATER BOX BLOCKING VALVE 121 and CONDENSER WATER BOX VENT VALVE 122 control switch in VENT • Monitors Process Computer Point B460, Turbine Exhaust Hood Temperature • Monitors north side water box level

Events #6: Degraded 345 KV

Event Information	• Grid instabilities lead to a Reactor Scram and Turbine trip

When directed by examiner, **insert malfunction**: **EG11,** 345 KV Power Grid Transient, RT=7:00, IV=355, FV=345 **TRG 6** *345KV frequency and voltage lower* *Expected annunciators:* *A6-3-3, 345 KV Sys Frequency High – Low (first ~30sec)* *A8-1-3, 115 KV Bus Low Voltage (second)* *A6-2-6, 345 KV Bus Voltage High-Low (later)*	**CREW** • Acknowledges/reports annunciators • Diagnoses/reports lowering 345 KV grid frequency
Note: Turbine operational time limit changes as grid conditions continue to degrade: Variation from 60 Hz — Operation Time ± 0.6 Hz — Unlimited ± 0.6 Hz to 1.4 Hz — 90 minutes ± 1.4 Hz to 1.9 Hz — 12 minutes > ± 1.9 Hz — 0 minutes **Note:** 1.9Hz variation occurs at ~6.5 minutes after the malfunction is inserted.	**SRO** • Acknowledges reports • Directs execution of ARPs • Directs entry into N1-SOP-33B.1, Major 345 KV Grid Disturbances • Directs entry into N1-SOP-33A.3, Major 115 KV Grid Disturbances • Acknowledges report that turbine operational time limit is exceeded for current frequency variation • 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 • Directs RPV pressure controlled 800-1000 psig with Turbine Bypass Valves or Emergency Condensers

Event 6 continued	ATC

Role Play: If contacted as operator to check for abnormal indications (pump operation, Aux Control Room panels, breaker targets, etc.) due to the grid disturbance, wait 2 minutes and report there are no abnormal indications.	• Monitors plant parameters
	• When directed, places Mode Switch in Shutdown or depresses RPS pushbuttons
	• Provides scram report
	• Performs N1-SOP-1, Reactor Scram, scram verification actions
	  ◦ Places IRMs on range 9
	  ◦ Inserts IRM and SRM detectors
	  ◦ Downranges IRMs as necessary to monitor power decrease
	  ◦ Reduces Recirc Master flow to 25-43 x 10^6 lb/hr
	  ◦ Maintains RPV pressure below 1080 psig and in assigned band

Role Play: If contacted as Power Control regarding grid voltage or frequency, give current values based on the simulator instructor station. **Role Play:** If contacted as Power Control regarding status of offsite power, inform that thunderstorms have caused a loss of some generation and you do not currently have an estimated time for restoration. **Role Play:** If contacted as Power Control regarding the low voltage post contingency alarm, inform that the low voltage post contingency alarm is NOT alarming.	**BOP** • Executes ARPs • May execute N1-SOP-33A.3 • Executes N1-SOP-33B.1 • Monitors 345 KV grid frequency and determines magnitude of frequency variation • Contacts Power Control and obtains 345 KV line frequency • Updates crew on turbine operational time limit as grid frequency lowers • May notify Power Control of turbine operational time limit • May place Turbine Vibration chart recorder in fast speed

<table>
<tr>
<td>
<u>Event 6 continued</u>
<u>Note:</u> If the crew fails to insert a manual reactor scram for a prolonged period of time following grid frequency lowering below 58.1 Hz, the lead examiner may choose to force the scenario progression by inserting malfunction:
TC01, Main Turbine Trip
</td>
<td>
BOP continued

When grid frequency lowers to 58.1 Hz, notifies crew that turbine must be tripped and Reactor must be scrammed
Performs SOP-1, Reactor Scram, level actions:

Restores RPV level to 53-95” by controlling injection and rejecting through RWCU, as necessary
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 13 FWP VALVE CONTROL 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, if required
Places 12 FWP BYPASS Valve in AUTO, sets to 65-70 inches
If RPV level reaches 85” and rising, then:

Verifies all Feedwater Pumps OFF
Secures CRD Pumps not required
Maximizes RWCU reject flow
Closes FWIVs if required
Closes MSIVs if required

Maintains RPV water level in assigned band

</td>
</tr>
</table>

Events #7 & #8: LOCA with Degraded High Pressure Injection

Event Information	• A LOCA occurs in the Primary Containment • MD FWPs trip

Verify the following **malfunctions** are **automatically inserted** when the mode switch is taken to Shutdown: **RR29,** RR Loop Rupture on Pump 15 Suction Line, DT=3:00, RT=7:00, FV=17 **FW03A,** Feedwater Pump Trip 11, DT=2:00 **TRG 10** *Initial response:* *Drywell humidity, pressure and temperature rise* *Drywell leakage rises* *RPV level and pressure lower* *Expected annunciators:* *H2-4-7, Drywell Water Leak Detection Sys* *K2-4-3, Drywell Pressure High-Low* *F1-1-5, RPS Ch 11 Drywell Press High* *F4-1-4, RPS Ch 12 Drywell Press High* *Delayed response:* *Feedwater Pump trips*	**CREW** • Diagnose/report degrading containment parameters

<u>Events 7 and 8 continued</u>
 	
<u>Note:</u> If Torus cooling is in service candidate will use EOP-1, att 17, sect. 3.2.3
	SRO
	• Acknowledges reports
	• Enters N1-EOP-4 due to high drywell pressure and temperature
	• Re-enters N1-EOP-2 due to high drywell pressure and low RPV level
	• Directs Containment Spray pumps locked out (unless pump is in Torus cooling)
	• Acknowledges trip of Feedwater pump 11 & 12
	• When torus pressure exceeds 13 psig or drywell temperature approaches 300°F:
	    • Answers “Below the Containment Spray Initiation Limit?” – Yes
	    • Verifies all Recirc pumps are tripped
	    • Directs trip of all Drywell cooling fans
	    • **Directs operation of Containment Spray per EOP-1 attachment 17 (CT-1.0)**
	• Evaluates/monitors position on Pressure Suppression Pressure curve
	• Directs RPV injection with CRD and/or Liquid Poison
	• May direct closure of MSIVs and pressure control using Emergency Condensers
	• Transitions to alternate level control leg of EOP-2
	• May direct vessel/containment isolation per N1-SOP-40.2

Events 7 and 8 continued	SRO continued

Note: Most likely injection sources are Core Spray, Condensate/Feedwater, CRD and/or Liquid Poison.	• Directs ADS bypassed
	• Directs verification of EC initiation
	• Answers "Are 2 or more Subsystems available?" – Yes (Both loops of Core Spray available)
	• Waits until RPV water level drops to -84 inches
	• Answers "Is any Subsystem lined up with a pump running?" – Yes (Both loops of Core Spray running)
	• Answers "Is any injection source lined up with a pump running?" – Yes
	• Enters EOP-8, RPV Blowdown:
	    • Answers "Are all control rods inserted to at least position 04?" – Yes
	    • Answers "Drywell pressure?" – At or above 3.5 psig
	    • Directs EC initiation
	    • Answers "Torus water level?" – Above 8.0 ft
	    • **Directs open 4 ERVs (CT-2.0)**
	• Verifies injection of entire contents of Liquid Poison tank
	• **Directs injection with available systems to restore and maintain RPV water level above -84 inches (CT-2.0)**
	• Directs installation of Core Spray jumpers (EOP-1 attachment 4) to allow control of Core Spray IVs
	• Transitions back to normal level control leg of EOP-2
	• Directs restoration of RPV level to 53-95 inches

Events 7 and 8 continued	ATC/BOP

Note: If Torus cooling is in service candidate will use EOP-1, att 17, sect. 3.2.3	• Updates crew on reactor and containment parameters
	• Locks out Containment Spray pumps
	• Recognizes/reports trip of Feedwater pump 11
	• Maximizes RPV injection with CRD and Liquid Poison
	• When torus pressure exceeds 13 psig or drywell temperature approaches 300°F:
	    • Verifies all Recirc pump are tripped
	    • Trips all Drywell cooling fans
	    • **Initiates Containment Spray per N1-EOP-1 attachment 17 (CT-1.0)**
	        • Verifies started two Containment Spray pumps (111 or 122 preferred)
	• May start additional Containment Spray and Containment Spray Raw Water pumps as necessary
	• Bypasses ADS
	• Verifies EC initiation
	    • Verifies 39-05 and 39-06 open or previously open
	• May secure ECs for pressure control
	    • If RPV water level is above 5”, then closes 39-05 and/or 39-06
	    • If RPV water level is below 5”, then closes EC steam IVs
	• When RPV water level drops below -84 inches:
	    • Initiates ECs
	        • Verifies open 39-05
	        • Verifies open 39-06
	        • Opens steam IVs as necessary
	    • **Opens 4 ERVs (CT-2.0)**
	• Verifies Liquid Poison injection to inject entire contents of Liquid Poison tank

Events 7 and 8 continued	ATC/BOP Continued
Note: Available injection systems include: • Condensate/FW Booster (preferred-Att 25/26) • CRD • Core Spray • Containment Spray Raw Water valved to Core Spray • Fire Water • Liquid Poison	• **Injects with available systems to restore and maintain RPV water level above -84 inches (CT-2.0)** • Bypasses Core Spray IV interlocks per N1-EOP-1 Att 4 by installing six jumpers (17, 18, 19, 24, 25, 26) inside Panel N • Throttles Core Spray IVs as necessary to control RPV water level • Restores RPV water level to 53-95 inches

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