Exelon Generation.

Training Id: **2015 NRC RO Admin COO1** Revision: **0.0**

Title: **N1-ST-D0 DAILY CHECKS (Partial)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	5/28/14
Validated By	Leigh Mason, Dave Ballard	08/21/2014
Facility Reviewer	Greg Elkins	2/13/15

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-DO, Daily Checks
2. NUREG 1123, 2.1.7 (4.4)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to record and interpret plant surveillance data and identify inoperable equipment. Control room RPV water level readings are taken for N1-ST-DO. Out of spec readings and inoperable equipment are identified by the operator.

2. Task Information:

   a. NS-REL-01001, Perform System Surveillances.

   b. K/A 2.1.7 (4.4), Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

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. Simulator

      1) Simulator will be in 'Freeze'. Therefore this cannot be performed in conjunction with a simulator JPM.

5. JPM Setup (if required)

   a. Provide copies of N1-ST-DO.

   b. Initialize simulator to IC-166

   c. Plant is operating ~15% power

   d. Verify the following overrides are set:

      1) 5M80AO3550 = 73.00
      2) 5M81AO3560 = 75.00
      3) 5M118AO3860 = 76.00
      4) 5M116AO3840 = 68.00
      5) 5AR1TS1AO31000 = 68.00
      6) 13M1AO42680 = 69.00
      7) 9M53AO51270 = 70.50

   e. Take the simulator to Run, and then back to Freeze

   f. Verify average Drywell temperature is less than 130°F

   g. Verify total Recirc flow is 38 Mlbm/hr

   h. Verify FWLC is selected to column 11

   i. Turn off PI monitor

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The plant is operating at approximately 15% power. • N1-ST-DO, Daily Checks, is in progress. • The provided printout shall be used to determine computer point and PI data. • The process computer is unavailable **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, obtain the instrument readings needed from control room panels to complete N1-ST-DO Attachment 4 sections 5.0 and 6.0 only, then complete section 8.4 in the body of the procedure. When completed, report findings and provide completed sections to SRO.

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:** Completed N1-ST-DO is attached as JPM key. Small differences in recorded values may occur due to instrument interpolation.	P	SAT / UNSAT **STD:** N1-ST-DO Obtained, sections 5.0 and 6.0 referenced.
3.	Records section 5.0 readings	P	SAT / UNSAT **STD:** Records Reactor Recirc Pump Inlet Temperature readings on Attachment 4 Section 5.0

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Compare Recirc Pump Inlet Temperature readings and determines readings within 15°F	P	SAT / UNSAT **STD:** Compares readings and determines readings within 15°F of each other
		P	**PASS / FAIL** **STD:** Checks YES block in Section 5.0, indicating the maximum difference in loop temperatures is < 15°F
5.	Record section 6.0 readings **Cue:** Another operator has completed the required Independent Verifications.	P	SAT / UNSAT **STD:** Records RPV water level readings on Attachment 4 section 6.0
6.	Record Total Recirc Flow	P	SAT / UNSAT **STD:** Records total recirc flow in the correct box on Attachment 4 section 6.0
7.	Determines average Drywell temperature **Note:** Since Yarway level indicator deviation is less than 4 inches, Drywell temperature reading is not necessary for task completion.	P	SAT / UNSAT / NA **STD:** Observes average Drywell temperature is less than 125°F
8.	Analyzes Yarway level indicator deviation **Note:** This may be evidenced by the lack of a report to the contrary.	P	**PASS / FAIL** **STD:** Determines Yarway level indicator deviation is less than the 6 inch limit
9.	Analyzes GEMAC level indicator deviation	P	**PASS / FAIL** **STD:** Determines GEMAC level indicator deviation is greater than the 6 inch limit

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
10.	Determines GEMAC level indicators are inoperable	P	**PASS / FAIL** **STD:** Checks INOP option in step 8.4
11.	Provides completed sections to SRO and informs of out of spec readings	P	SAT / UNSAT **STD:** Proper communications used.

TERMINATING CUE	Control room readings are taken. Out of spec readings are identified to SRO and inoperable equipment is identified by the candidate.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at approximately 15% power. • N1-ST-DO, Daily Checks, is in progress. • The provided printout shall be used to determine computer point and PI data. • The process computer is unavailable

INITIATING CUE	**(Operators Name)**, obtain the instrument readings needed from control room panels to complete N1-ST-DO Attachment 4 sections 5.0 and 6.0 only, then complete section 8.4 in the body of the procedure. When completed, report findings and provide completed sections to SRO.

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Training Id: **2015 NRC RO Admin JPM EP** Revision: **0.0**

Title: **Perform CRO Firefighting Checklist**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	5/28/14
Validated By	Leigh Mason	8/21/14
Facility Reviewer	Greg Elkins	2/13/15

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. EPIP-EPP-28, Firefighting
2. NUREG 1123, 2.4.27 (3.4)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to carry out control room actions for a fire in the plant. The operator will execute the CRO Firefighting Checklist.

2. Task Information:

   a. N1-286000-01023, Respond to a Plant Fire

   b. K/A 2.4.27 (3.4), Knowledge of "fire in the plant" 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. Simulator

5. JPM Setup (if required)

   a. None

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The plant is operating at approximately 100% power. • You are the CRO. • You have just received a report from site electricians that there is a significant fire in EDG 102 room. • The OSC has NOT been activated. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform EPIP-EPP-28 Attachment 1, CRO Firefighting 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 of the procedure.	P	SAT / UNSAT **STD:** Obtains a copy of EPIP-EPP-28. References attachment 1, CRO Firefighting Checklist
3.	Place the GAItronics in the "Merge" Mode.	P	SAT / UNSAT **STD:** Places the GAItronics in the "MERGE" mode by placing the switch on the Communications Console in the Control Room to the "MERGE" position.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Sound the fire alarm for 10 seconds and announce the fire event. **Cue:** As the Fire Brigade Leader reply that, "The Fire Brigade is on the way to the assembly area and I will report on the situation as soon as I arrive on the scene."	P	**PASS / FAIL** **STD:** Sounds the fire alarm and makes the following announcement: 'Attention, Attention, this is a drill. A fire has been detected at Unit1 in the EDG 102 room The Nine Mile Point Fire Brigade shall report to the Unit 1 assembly area. All other personnel are to remain clear of the EDG 102 room area.'
5.	Announce evacuation of EDG 102 room.	P	SAT / UNSAT **STD:** Continues on from previous announcement: 'This is a CO2 protected area. All personnel shall immediately evacuate the EDG 102 room and all areas adjacent to and below this location.'
6.	Take the GAItronics system out of the Merge Mode **Cue:** As the Fire Brigade Leader, report the fire is confirmed and you request off-site fire assistance.	P	SAT / UNSAT **STD:** Takes GAItronics out of 'Merge' using the communications console.
7.	Notify the SM of the confirmed fire. **Role Play:** As SM, acknowledge report of confirmed fire.	P	SAT / UNSAT **STD:** Proper communicati0ons used.
8.	Turn up volume on station radio base console, including Oswego County fire frequency	P	SAT / UNSAT **STD:** Volume adjusted appropriately.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
9.	Call Oswego County 911 Center and request off-site fire assistance **Role Play:** As Oswego County 911 Center, acknowledge request for off-site fire assistance.	P	**PASS / FAIL** **STD:** Offsite assistance requested.
10.	Inform the Security Central Alarm Station that off-site fire assistance has been requested **Role Play:** As Security Central Alarm Station, acknowledge report of off-site fire assistance being requested.	P	**PASS / FAIL** **STD:** Security informed that off-site assistance has been requested.
11.	Initiate any Special Operating Procedures OR Emergency Operating Procedures. **Cue:** Inform applicant other operators are performing the necessary SOPs and EOPs.	P	SAT / UNSAT **STD:** Proper communications used.
12.	Check Process Radiation Monitors to determine if there is any rise in effluent activity **Role Play:** If applicant requests status of local area evacuation, report evacuations are still being evaluated.	P	**PASS / FAIL** **STD:** Determine no rise is noted.
13.	Notify Unit 2 SM of the confirmed fire. **Role Play:** As U2 SM, acknowledge report of the confirmed fire in EDG 102 room.	P	SAT / UNSAT **STD:** U2 SM has been notified of confirmed fire.
Evaluator Cue:	The fire is out and your task is complete.		

TERMINATING CUE	Control room actions for the CRO Firefighting Checklist are complete.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at approximately 100% power. • You are the CRO. • You have just received a report from site electricians that there is a significant fire in EDG 102 room. • The OSC has NOT been activated.

INITIATING CUE	**(Operators Name)**, perform EPIP-EPP-28 Attachment 1, CRO Firefighting Checklist.

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Training Id: **2015 NRC SRO Admin COO1** Revision: **0.0**

Title: **Review N1-ST-DO Daily Instrument Checks (Partial)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	5/21/14
Validated By	Pat O'Brien	8/19/2014
Facility Reviewer	Greg Elkins	2/13/15

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-DO, Daily Checks
2. Unit 1 Technical Specifications
3. NUREG 1123, 2.1.7 (4.7)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the senior operator's ability to evaluate plant surveillance data and determine applicable tech spec actions for failed equipment.

2. Task Information:

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

   b. K/A 2.1.7 (4.7), Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.

3. Evaluation / Task Criteria

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

4. Recommended Start Location

   a. Training Classroom

5. JPM Setup (if required)

   a. Provide copy of N1-ST-DO with Attachment 4 section 6.0 and step 8.4 completed with the following values:

Attachment 4 section 6.0:
Low-Low Level Alarms – Checked "NO"
Feedwater Level Column – Checked "11"
E-Panel Vessel Level Indicator – 72"
K-Panel Vessel Level Indicator – 72"
K-Panel Flange Level Indicator – DOWNSCALE
Reactor Vessel Level Recorder – 71"
Wide Range Level Indicator – 7'
GEMAC Level Column (Ch 11/12) – 71" / 79"
GEMAC Level Computer Points (Ch 11/12) – 71.344" / 79.051"
Pi Calculated GEMAC level column difference – 7.680"
RPS Level Column (Ch 11/12) – 73"/76"
Yarway (RPS) Level Column – 73.125"/75.763"
Pi Calculated Yarway level column difference – 2.770"
GEMAC variance – 8"
Computer point variance – 7.707"
Total Recirc Flow – 38.0 Mlbm/hr

Step 8.4:
Check "Pi-Calculated GEMAC Level Delta"
Check "Acceptable Range"

   b. If multiple operators are going to perform the JPM at the same time, ensure each operator has a copy of N1-ST-DO.

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The plant is operating at approximately 67% power. • N1-ST-DO, Daily Checks, is in progress. • Operators have completed the RPV water level instrument readings. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform SRO review of the following section of N1-ST-DO: • Attachment 4 section 6.0 • Step 8.4 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.	P	SAT / UNSAT **STD:** N1-ST-DO Obtained
3.	Review Attachment 4 section 6.0 readings and Step 8.4	P	SAT / UNSAT **STD:** Reviews Attachment 4 section 6.0 and step 8.4 readings
4.	Identifies error in Step 8.4	P	**PASS / FAIL** **STD:** Identifies that GEMAC Level Column Variance is in the INOP range

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
Evaluator Cue:	If Candidate asks for prior readings for comparison, or for Engineering evaluation, report that plant data indicates GEMAC 11 is trending normally and GEMAC 12 indicates higher than expected.		
5.	Determines GEMAC 12 level indicator is inoperable	P	**PASS / FAIL** **STD:** Determines GEMAC 12 level indicator is inoperable
6.	Determines Technical Specification impact	P	**PASS / FAIL** **STD:** Determines a 15 day LCO applies per Technical Specification 3.1.8
7.	Provides completed sections to Examiner and informs of out of spec readings	P	SAT / UNSAT **STD:** Proper communications used

TERMINATING CUE	Control room RPV water level instrument surveillance per N1-ST-DO is reviewed. Out of spec results are identified and the appropriate Technical Specification is determined.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at approximately 67% power. • N1-ST-DO, Daily Checks, is in progress. • Operators have completed the RPV water level instrument readings.

INITIATING CUE	**(Operators Name)**, perform SRO review of the following section of N1-ST-DO: • Attachment 4 section 6.0 • Step 8.4 When completed, report findings to the Examiner.

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Training Id: **2015 NRC RO-SRO Admin COO2** Revision: **0.0**

Title: **Determine Personnel Overtime Availability IAW CNG-SE-1.01-1002**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	5/21/14
Validated By	Pat O'Brien	8/19/2014
Facility Reviewer	Greg Elkins	2/13/15

Approximate Duration: 20/30 minutes (RO/SRO)

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. CNG-SE-1.01-1002
2. NUREG 1123, 2.1.5 (2.9/3.9)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to evaluate plant surveillance data and determine applicable tech spec actions for failed equipment.

2. Task Information:

   a. GAP-FFD02-00002, Maintain working hours within overtime guidelines.

   b. GAP-FFD02-00004, Initiate, review and approve an overtime waiver with Empcenter unavailable.

   c. K/A 2.1.5 (2.9/3.9), Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, 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. Provide copy of CNG-SE-1.01-1002.

   b. If multiple operators are going to perform the JPM at the same time, ensure each operator has a copy of CNG-SE-1.01-1002.

   c. Provide extra copies of CNG-SE-1.01-1002, attachment 1.

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The plant is shutdown for a refueling outage. • Current time is 2200 on November 27, 2014. • An Operator scheduled to work the day shift on November 28, 2014 has called in sick for that shift. • In order to support minimum control room staffing requirements, personnel overtime will be required for the day shift on November 28, 2014 from 0630-1830. • All the overtime hours will be spent performing control room activities. • November 14, 2014 through November 28, 2014 is a fixed 15-day period for work hour rule considerations. • EmpCenter is NOT available. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operator Name)**, 1. From the provided list of personnel working hours, determine who is eligible to work a complete 12 hour shift beginning at 0630 on November 28 without exceeding the limits of CNG-SE-1.01-1002. 2. If a Work Hour Limits Waiver would be required for any individual(s), state the work hour limit(s) which would be exceeded IAW CNG-SE-1.01-1002.

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:** CNG-SE-1.01-1002 Obtained

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Reviews work hours for Reactor Operators #1 through #3	P	**PASS / FAIL** **STD:** Determines the following: RO #1 – Not Eligible – Would work more than 26 hours in a 48 hour period OR <10 hours between shifts. (step 5.2.A.2.a) RO #2 – Not Eligible – Would work more than 72 hours in a 7 day period RO #3 – Eligible
4.	**SRO Only** – Completes CNG-SE-1.01-1002 Attachment 1 Section 1 for RO #2 **Cue:** Give SRO additional cue sheet and blank CNG-SE-1.01-1002 Attachment 1 Section 1. Direct the SRO to complete CNG-SE-1.01-1002, Attachment 1 for RO #2. **Note:** Only items 1) and 2) of CNG-SE-1.01-1002 Attachment 1 Section 1 are deemed critical for evaluation of this step.	P	**PASS / FAIL** **STD:** Completes CNG-SE-1.01-1002 Attachment 1 Section 1 for RO #2, per attached key

TERMINATING CUE	JPM Attachment B completed. **For SROs**, CNG-SE-1.01-1002 Attachment 1 Section 1 completed for RO #2.

STOP TIME	

RO-SRO JPM Handout

INITIAL CONDITIONS	Given: • The plant is shutdown for a refueling outage. • Current time is 2200 on November 27, 2014. • An Operator scheduled to work the day shift on November 28, 2014 has called in sick for that shift. • In order to support minimum control room staffing requirements, personnel overtime will be required for the day shift on November 28, 2014 from 0630-1830. • All the overtime hours will be spent performing control room activities. • November 14, 2014 through November 28, 2014 is a fixed 15-day period for work hour rule considerations. • EmpCenter is NOT available.
INITIATING CUE	**(Operator Name)**, 1. From the provided list of personnel working hours, determine who is eligible to work a complete 12 hour shift beginning at 0630 on November 28 without exceeding the limits of CNG-SE-1.01-1002. 2. If a Work Hour Limits Waiver would be required for any individual(s), state the work hour limit(s) which would be exceeded IAW CNG-SE-1.01-1002.

SRO ONLY Additional JPM Handout

INITIAL CONDITIONS	Given: • ROs #1 and #3 have not been able to be contacted. • RO #2 is the only operator available and will be required to work.

SRO Only INITIATING CUE	**(Operator Name)**, Complete CNG-SE-1.01-1002, Attachment 1, 10 CFR 26 Work Hour Limits Waiver, Section 1, for RO #2 to cover this shift on November 28.

Attachment A – Work Hours

RO #1																		
11/10	11/11	11/12	11/13	11/14	11/15	11/16	11/17	11/18	11/19	11/20	11/21	11/22	11/23	11/24	11/25	11/26	11/27	11/28
OFF	0630 - 1830	0630 - 1830	OFF	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 2030	OFF	OFF	0630 - 1830	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1530	0630 - 2130	?

RO #2																		
11/10	11/11	11/12	11/13	11/14	11/15	11/16	11/17	11/18	11/19	11/20	11/21	11/22	11/23	11/24	11/25	11/26	11/27	11/28
OFF	0630 - 2130	0730 - 1730	OFF	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 2030	0630 - 1830	OFF	OFF	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	0630 - 1830	?

RO #3																		
11/10	11/11	11/12	11/13	11/14	11/15	11/16	11/17	11/18	11/19	11/20	11/21	11/22	11/23	11/24	11/25	11/26	11/27	11/28
0630 - 1830	0630 - 1830	OFF	0630 - 1830	OFF	OFF	0630 - 1830	0630 - 1830	0630 - 1630	0630 - 2030	0630 - 1830	OFF	OFF	0630 - 1830	0630 - 2030	0630 - 1830	0630 - 1830	OFF	?

Attachment B – Answer Sheet

	Eligible to work without a Work Hour Limits Waiver? (Yes/No)	If No, what work hour limit(s) would be exceeded IAW CNG-SE-1.01-1002?
RO #1		
RO #2		
RO #3		

Exelon Generation

Training Id: **2015 NRC RO-SRO Admin EC** Revision: **0.0**

Title: **Perform Daily Thermal Limit Surveillance**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	5/21/14
Validated By	Pat O'Brien	8/19/14
Facility Reviewer	GREG ELKINS	2/13/15

Approximate Duration: 20 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

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

Instructor Information

A. JPM Information

1. Description

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

2. Task Information:

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

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

3. Evaluation / Task Criteria

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

4. Recommended Start Location

   a. Training Classroom

5. JPM Setup (if required)

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

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

   c. Ensure tech specs are available for SROs

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

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

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

START TIME	

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

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Complete N1-RESP-1A section 8.2 **Note:** Refer to KEY for completed surveillance. The items circled in blue are the critical steps (8.2.5, 8.2.6, 8.2.7, and 8.2.9). **Role Play:** If asked how to proceed at step 8.2.6 with MFLCPR above 1.0, acknowledge condition and direct the Candidate to complete the rest of section 8.2.	P	**PASS / FAIL** **STD:** N1-RESP-1A completed per the key
4.	Identify discrepancy in N1-RESP-1A section 8.2 **SRO Only Cue:** Once the SRO Candidate has identified MFLCPR/MCPR violation, direct them to determine the required action for this condition.	P	**PASS / FAIL** **STD:** Identifies that MFLCPR/MCPR have exceeded the limit
5.	**SRO Only** – Determine required action for MFLCPR/MCPR violation	P	**PASS / FAIL** **STD:** Determines Technical Specification 3.1.7.c is not met.
		P	**PASS / FAIL** **STD:** Determines action shall be initiated within 15 minutes to restore operation to within the prescribed limit. If all the operating MCPRs are not returned to within the prescribed limit within two (2) hours, reactor power reductions shall be initiated at a rate not less than 10% per hour until MCPR is within the prescribed limit.

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

STOP TIME	

JPM Handout

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

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

Exelon Generation

Training Id: **2015 NRC SRO Admin RC** Revision: **0.0**

Title: **Determine Radiation Controls – Emergency Exposure for Local MSIV Closure**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	5/21/14
Validated By	Pat O'Brien	8/19/2014
Facility Reviewer	Greg Elkins	2/13/15

Approximate Duration: 20 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. GAP-RPP-07, Internal and External Dosimetry Program
2. S-RAP-RPP-0703, Authorization to Exceed Administrative Dose Limits
3. CNG-EP-1.01-1014, Emergency Exposures and KI
4. NUREG 1123, 2.3.4 (3.7)

Instructor Information

A. JPM Information

1. Description

   a. This JPM is used to test generic knowledge in calculation of overall dose and control mechanisms to allow the selection of individuals to continue or perform work in high dose areas. This JPM tests basic mathematics and understanding of stay times and remaining dose limitations under normal operating conditions given normal quarterly dose limitations.

2. Task Information:

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

   b. K/A 2.3.4 (3.7), Knowledge of radiation exposure limits under normal or emergency conditions.

3. Evaluation / Task Criteria

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

4. Recommended Start Location

   a. Training Classroom

5. JPM Setup (if required)

   a. Ensure sufficient copies of the following procedures are available in the exam area:

      - GAP-RPP-07
      - S-RAP-RPP-0703
      - CNG-EP-1.01-1014
      - EP-Form-ALL08 (2 per applicant)

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The plant is at 15% power. • A Site Area Emergency has been declared due to a steam line rupture with significant fuel damage. • Entry is required into the MSIV Room to close the outboard MSIVs to prevent event escalation. • Job conditions are as follows: o Two individuals are required to complete the job. o Each worker is expected to receive 575 mR in transit to the Main Steam line access door **AND** the same amount again while exiting the plant. o Each worker is expected to spend 2 minutes in an 800 mR/hr field in transit from the Main Steam line access door to the job site. o The job site is against the outer Containment Wall in a 1.9 R/hr field. o The job will take 2 hours at the job site with both workers working the full time. o Each worker is expected to spend 3 minutes in an 800 mR/hr field in transit from the job site to the Main Steam line access door. • Two workers are briefed to complete the task. o Technician 1 – John Technician – Maintenance - SS # 123-45-6789 – TLD # 145678 o Technician 2 – James Worker – Operations – SS# 987-65-4321 – TLD# 235699 • During an initial entry under a modified RWP the workers received the following dose: o Technician 1 received 900 mR on his Electronic Dosimeter from his first entry, resulting in a total exposure of 1678 mR for the year. o Technician 2 received 600 mR on his Electronic Dosimeter from his first entry, resulting in a total exposure of 1399 mR for the year. • The TSC has not been staffed and the RAC is in route to the site. • Emergency exposure controls have not been implemented. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, Anticipate dose to be accumulated by each worker. Authorize work using the appropriate exposure limits to allow completion of the required task per CNG-EP-1.01-1014 and GAP-RPP-07.

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:** CNG-EP-1.01-1014 and GAP-RPP-07 Obtained
3.	For each worker:		
3a	Determine anticipated dose from task performance in the work area.	P	SAT / UNSAT **STD:** Dose Rate *Time = Task Dose 1900 mR/hr * 2hr = 3800 mR
3b	Determine anticipated dose from transit to and from the Main Steam chase	P	SAT / UNSAT **STD:** 2 x Transit dose (To and From) 2*575mR = 1150mR
3c	Determine anticipated dose from transit <u>to</u> the work area in the steam chase.	P	SAT / UNSAT **STD:** Dose Rate *Time=Transit Dose 800mR/hr*(2min/60)=26.7mR
3d	Determine anticipated dose from transit <u>from</u> the work area in the steam chase.	P	SAT / UNSAT **STD:** Dose Rate *Time=Transit Dose 800mR/hr * (3min/60)=40mR
3e	Determine the total dose for each worker from 3a through 3d.	P	**PASS / FAIL** **STD:** Add 3a-3d = 5016.7mR

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Determine that task performance is not allowable per normal controls.	P	SAT / UNSAT **STD:** Determines that total dose is greater than the annual 4000 mR administrative limit for radiation exposure per GAP-RPP-07 and the 5000 mR federal limit
5.	Determines that emergency exposure controls are required per CNG-EP-1.01-1014, step 5.1.A	P	**PASS / FAIL** **STD:** Evaluates the total expected dose and recognizes that emergency exposure controls are required to raise the limit above 5 R for each individual per CNG-EP-1.01-1014
6.	Verifies workers are allowed to receive emergency exposure per step 5.1.C **Cue:** If asked, neither worker meets any of the exclusion criteria.	P	SAT / UNSAT **STD:** Using currently identified workers verifies workers: - are not declared pregnant workers - have not received a previous emergency exposure - have not received a planned special exposure.
7.	Determines EP-Form-All08 is required per step 5.1.E. **Cue:** When the applicant determines EP-Form-All08 is required, provide the form.	P	**PASS / FAIL** **STD:** Determines EP-Form-All08 is required due to anticipated exposure >5R
8.	Completes EP-Form-All08 for technician 1. **Note:** Acceptable range of authorized exposure: Anywhere between 5.016Rem to 25 Rem with be accepted for full credit. Employer is not a critical component of this step.	P	**PASS / FAIL** **STD:** Completes section A of EP-Form-All08 for technician 1.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
9.	Completes EP-Form-All08 for technician 2. **Note:** Acceptable range of authorized exposure: Anywhere between 5.016Rem to 25 Rem with be accepted for full credit. Employer is not a critical component of this step.	P	**PASS / FAIL** **STD:** Completes section A of EP-Form-All08 for technician 2.

TERMINATING CUE	"You may stop here, you have met the termination criteria for this JPM"

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given:
	• The plant is at 15% power.
	• A Site Area Emergency has been declared due to a steam line rupture with significant fuel damage.
	• Entry is required into the MSIV Room to close the outboard MSIVs to prevent event escalation.
	• Job conditions are as follows:
	  o Two individuals are required to complete the job.
	  o Each worker is expected to receive 575 mR in transit to the Main Steam line access door **AND** the same amount again while exiting the plant.
	  o Each worker is expected to spend 2 minutes in an 800 mR/hr field in transit from the Main Steam line access door to the job site.
	  o The job site is against the outer Containment Wall in a 1.9 R/hr field.
	  o The job will take 2 hours at the job site with both workers working the full time.
	  o Each worker is expected to spend 3 minutes in an 800 mR/hr field in transit from the job site to the Main Steam line access door.
	• Two workers are briefed to complete the task.
	  o Technician 1 – John Technician – Maintenance - SS # 123-45-6789 – TLD # 145678
	  o Technician 2 – James Worker – Operations – SS# 987-65-4321 – TLD# 235699
	• During an initial entry under a modified RWP the workers received the following dose:
	  o Technician 1 received 900 mR on his Electronic Dosimeter from his first entry, resulting in a total exposure of 1678 mR for the year.
	  o Technician 2 received 600 mR on his Electronic Dosimeter from his first entry, resulting in a total exposure of 1399 mR for the year.
	• The TSC has not been staffed and the RAC is in route to the site.
	• Emergency exposure controls have not been implemented.

INITIATING CUE	**(Operators Name)**, Anticipate dose to be accumulated by each worker. Authorize work using the appropriate exposure limits to allow completion of the required task per CNG-EP-1.01-1014 and GAP-RPP-07.

Exelon Generation

Training Id: **2015 NRC SRO Admin EP** Revision: **0.0**

Title: **Classify Emergency Event and Perform Initial Notifications**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	5/21/14
Validated By	Pat O'Brien	8/19/2014
Facility Reviewer	Greg Elkins	2/13/15

Approximate Duration: 20 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. NUREG 1123, 2.4.41 (4.6)
2. EPIP-EPP-01 EAL Matrix
3. CNG-EP-1.01-1013, Emergency Classification and PAR
4. CNG-EP-1.01-1015, Emergency Notifications
5. CNG-EP-1.01-1019, Site Emergency Operations
6. EPMP-EPP-0101, Unit 1 Emergency Classification Technical Bases

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the senior operator's knowledge of emergency action thresholds by giving a series of plant conditions and requiring the operator to classify the event and complete a part 1 notification.

2. Task Information:

   a. NS-EP101-03005, Classify emergency events requiring emergency plan implementation.

   b. K/A 2.4.41 (4.6), Knowledge of 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 (if required)

   a. Provide copy of EPIP-EPP-01, UNIT 1 EAL MATRIX

   b. Ensure sufficient copies of the SM/ED checklist packages are available.

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: 1. You are the Unit 1 Shift Manager. 2. Unit 1 was operating at 100% power. 3. Unit 2 is operating at 100% power. 4. The following events have occurred at Unit 1: • EDG 103 was removed from service for corrective maintenance and will not be available for 12 hours. • A loss of both offsite power lines has occurred. • EDG 102 automatically started and supplied Powerboard 102 • Power control estimates several hours until an offsite power line can be restored. • The ERO has not been activated. • Unit 1 is currently still in an operating condition. **Instructor / Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, based on the above conditions, determine the event classification per CNG-EP-1.01-1013 and complete steps 1 through 1.3.2.A of EP-ChLst-MCR01, Shift Manager Checklist. This is a time critical task. Time starts now.

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:** Each SRO applicant will be provided with a partial Shift Manager ERO Guidebook and a copy of the EAL Flowchart.	P	SAT / UNSAT **STD:** Shift Manager ERO forms obtained. EAL Flowchart obtained.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Print name and date on Shift Manager Checklist. (step 1.1.2)		SAT / UNSAT **STD:** Step 1.1.2 complete with applicant name and date.
4.	Call the Shift Communicator and Dose Assessors to the Control Rooms. (step 1.1.3)	P	SAT / UNSAT **STD:** Proper communications used
5.	If entry is due to a security event, the concurrently perform the station specific procedure.	P	SAT / UNSAT **STD:** Determine there is no indication of a security threat.
6.	Using CNG-EP-1.01-1013, classify the event. (step 1.2.2) **Note:** The classification, NOT the use of the references provided in the standard, is used for the pass/fail grading criteria. **Cue:** If applicant requests a peer check, respond that peer checks are not available.	P	**PASS / FAIL** **STD:** Determines Alert, SA1.1 due to: • AC power capability to 4.16 kV emergency buses reduced to a single power source for > 15 min. **AND** • **ANY** additional single power source failure will result in a loss of **all** 4.16 kV emergency bus power.
7.	Declare the event by announcing, "I am declaring an Alert, EAL SA1.1, at (time) due to only having 1 power source available to the emergency 4160V powerboards, and assuming the role as Emergency Director." **Notes:** Similar announcements are acceptable provided all the information listed in step 1.2.2.B is announced. **The time difference must be 15 minutes or less.**	P	**PASS / FAIL** **STD:** Event declared in the control room. Declaration occurred within 15 minutes of JPM start time. **JPM Start Time**_____ **Declaration time**_____

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
8.	Determine if protective actions for onsite personnel are necessary using EP-Form-ALL12, Onsite Protective Measures Flowchart (step 1.2.3) Note: EP-Form-ALL12 will advise to "Consider" implementing protected area evacuation, but does not require it.	P	SAT / UNSAT **STD:** Determine there is no need to perform protected area evacuation and accountability.
9.	Announce or direct PA announcements, for station personnel as necessary using EP-Form-ALL36. (step 1.2.4) **Cue:** When EP-Form-ALL36 is completed, inform the applicant another operator will make the PA announcement.	P	**PASS / FAIL** **STD:** Completes EP-Form-ALL36 per the attached key with step (3) being the only critical step.
10.	Determine appropriate PAR per CNG-EP-1.01-1013, Emergency Classification and PAR. (step 1.2.5)		SAT / UNSAT **STD:** Determine no PARs for the Alert condition.
11.	Complete ERONS notification Details Form, EP-Form-ALL28 (step 1.3.1) Cue: When EP-Form-ALL28 is completed, inform the applicant the Shift Communicator with inform the ERO.		SAT / UNSAT **STD:** Completes EP-Form-ALL28 per the attached key.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12.	Complete station specific initial notification form (Part 1) (step 1.3.2) **Note: The time difference must be 15 minutes or less.**		**PASS / FAIL** **STD:** Completes EP-Form-ALL31 per the attached key with steps (3), (4), (5), (6), and (7)being the only critical steps. **Declaration time**_____ **Part 1 Notification Fact** **Sheet is complete:**_____
Evaluator Cue:	Your task is complete.		

TERMINATING CUE	Alert is declared and Part 1 notification is complete.

STOP TIME	

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JPM Handout

INITIAL CONDITIONS	Given: 1. You are the Unit 1 Shift Manager. 2. Unit 1 was operating at 100% power. 3. Unit 2 is operating at 100% power. 4. The following events have occurred at Unit 1: • EDG 103 was removed from service for corrective maintenance and will not be available for 12 hours. • A loss of both offsite power lines has occurred. • EDG 102 automatically started and supplied Powerboard 102 • Power control estimates several hours until an offsite power line can be restored. • The ERO has not been activated. • Unit 1 is currently still in an operating condition.

INITIATING CUE	**(Operators Name)**, based on the above conditions, determine the event classification per CNG-EP-1.01-1013 and complete steps 1 through 1.3.2.A of EP-ChLst-MCR01, Shift Manager Checklist. This is a time critical task. Time starts now.

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)	40	(mph)	30'	Wind Speed (Main)	35	(mph)
200'	Wind Dir From (Main)	45	(deg)	30'	Wind Dir From (Main)	60	(deg)
200'	Delta Temperature	-1.56	(deg F)	100'	Delta Temperature	-0.81	(deg F)
	Stability Class	D			Stability Class	D	
30'	Air Temperature	80	(deg F)		Precipitation (15 min)	0	(in)

Exelon Generation

Training Id: **2015 NRC JPM S-1** Revision: **0.0**

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

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	03/17/14
Validated By	Leigh Mason	8/20/14
Facility Reviewer	Greg Elkins	2/13/15

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-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 to place 12 SDC loop in service.

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-161.
   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 yellow tagged
   g. Verify SDC 13 suction valve is yellow tagged (38-05)
   h. Verify Malfunction SC01C inserted
   i. Verify Malfunction SC01A on TRG 1 with 60 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 CRS 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 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. • 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 (Step E.3.2)	P	**PASS / FAIL** **STD:** Opens 38-03 by rotating control switch CW to OPEN
3b.	38-04, SDC VALVE 12 PUMP SUCTION (Step E.3.2)	P	**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 a Technical Procedure Step Deletion be processed before proceeding. **Cue:** If Technical Procedure Step Deletion is requested, inform the Operator that the step has been deleted and to proceed.	P	SAT / UNSAT **STD:** Recognizes 38-05 is tagged closed
4.	Fill AND vent the SDC System by performing the following: (Step 3.3)	P	SAT / UNSAT **STD:** Determines fill and vent not required due to initial conditions
5.	Verify all rods inserted UNLESS directed by EOPs (Step 3.4)	P	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: (Step 3.5)	P	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) (Step 3.6)	P	**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: (Step 3.7)	P	SAT / UNSAT **STD:** Determines Reactor pressure is less than 120 psig per initial conditions or simulator setup
8a	Monitor Reactor vessel level (Step 3.7.1)	P	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	SAT / UNSAT **STD:** Determines Reactor water level is stable in subsequent steps
8c	Open 38-13, SDC SYSTEM OUT IV 1 (INSIDE) (Step 3.7.3)	P	**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) (Step 3.7.4)	P	**PASS / FAIL** **STD:** Opens 38-01 by rotating control switch CW to OPEN
9.	Vent Shutdown Cooling pumps using the following valves: (step 3.8)	P	SAT / UNSAT **STD:** Determines venting not required due to initial conditions
10.	Vent heat exchangers using the following valves: (Step 3.9)	P	SAT / UNSAT **STD:** Determines venting not required due to initial conditions
11.	Verify open the following valves: (Step 3.10) • 38-134, SDC PUMP RECIRC VALVE 11 • 38-131, SDC PUMP RECIRC VALVE 12 • 38-128, SDC PUMP RECIRC VALVE 13 **Note:** Candidate may disregard 38-128 because the associated pump is tagged out.		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 3.11.1)		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12a	Verify SD COOLING TCV 11 manual controller selected for zero output demand (Step 3.11.2)	P	SAT / UNSAT **STD:** Observes SD COOLING TCV 11 manual controller selected for zero output demand
12b	Using local indication, verify closed FCV-38-09, SDC 11 FCV (step 3.11.2.b) **Role Play:** Acknowledge direction and report the appropriate loop FCV is closed.	P	SAT / UNSAT **STD:** Dispatches operator to verify closed FCV-38-09
	Role Plays: For each of these dPIS steps, acknowledge direction and then report the appropriate valve position. Candidate may just provide direction to perform actions by procedure step number.		
12c	Verify closed G1, Instrument HP Blocking Valve - SDC Loop 11 (step 3.11.2.c)	P	SAT / UNSAT **STD:** Dispatches operator to verify closed G1
12d	Verify open G3, Instrument Equalizing Valve - SDC Loop 11 (step 3.11.2.d)	P	SAT / UNSAT **STD:** Dispatches operator to verify open G3
12e	Verify closed G2, Instrument LP Blocking Valve - SDC Loop 11 (step 3.11.2.e)	P	SAT / UNSAT **STD:** Dispatches operator to verify closed G2
12f	Place 11 SDC Pump Control Switch in START UNTIL 11 SDC PUMP running light is lit (step 3.11.2.f)	P	**PASS / FAIL** **STD:** Starts SDC pump 11 by rotating control switch CW to START

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12g	Open G2, Instrument LP Blocking Valve - SDC Loop 11 (step 3.11.2.g)	P	SAT / UNSAT **STD:** Dispatches operator to open G2
12h	Close G3, Instrument Equalizing Valve - SDC Loop 11 (step 3.11.2.h)	P	SAT / UNSAT **STD:** Dispatches operator to close G3
12i	Open G1, Instrument HP Blocking Valve - SDC Loop 11 (step 3.11.2.i)	P	SAT / UNSAT **STD:** Dispatches operator to open G1
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	**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.		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
14.	Start 12 SDC Pump as follows: (Step 3.11) **Note:** Pump Seal was NOT discovered de-staged (Step 3.11.1)		
14a	Verify SD COOLING TCV 12 manual controller selected for zero output demand	P	SAT / UNSAT **STD:** Observes SD COOLING TCV 12 manual controller selected for zero output demand
14b	Using local indication, verify closed FCV-38-10, SDC 12 FCV **Role Play:** Acknowledge direction and report the appropriate loop FCV is closed.	P	SAT / UNSAT **STD:** Dispatches operator to verify closed FCV-38-10
	Role Plays: When directed to operate valves in steps 3.11.2.l, m, and n, report the valves have been repositioned as directed.		
14c	Place 12 SDC Pump Control Switch in START UNTIL 12 SDC PUMP running light is lit (Step 3.11.2.o)	P	**PASS / FAIL** **STD:** Starts SDC pump 12 by rotating control switch CW to START
	Role Plays: When directed to operate valves in steps 3.11.2.p, q, and r, report the valves have been repositioned as directed.		
15.	Open respective SD Cooling TCV approximately 10% for selected SDC Loop: 38-10, SD COOLING TCV 12 (step 3.11.3)	P	**PASS / FAIL** **STD:** Opens 38-10 by rotating knurled knob CW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
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	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	SAT / UNSAT **STD:** Rotate knob on controller 38-10 CW or CCW as required for a gradual warmup as indicated on 38-136B.
18.	Inform SM SDC Loop 12 in service **Cue:** Acknowledge report	P	SAT / UNSAT
Evaluator Note:	**Cue:** *Your task is complete.*		

TERMINATING CUE	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. • 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.

Exelon Generation

Training Id: **2015 NRC JPM S-2** Revision: **0.0**

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

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	03/17/14
Validated By	Pat O'Brien	8/20/14
Facility Reviewer	GREG ELKINS	2/13/15

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

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

Instructor Information

A. JPM Information

1. Description

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

   b. This JPM is NOT considered alternate path.

2. Task Information:

   a. N1-223003-01004

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

3. Evaluation / Task Criteria

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

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)

    a. The reactor is in a shutdown condition.
    b. Initialize simulator to IC-161.
    c. Verify remote PC05 is inserted with valves open.
    d. Verify some positive pressure in the drywell.

6. JPM Setup (if required)

    a. N1-OP-9 marked up through G.2.6.2.

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The plant is shutdown, <212°F. • The Operations Manager has determined a complete de-inert to 19.5% Oxygen is necessary. • N1-OP-9 is completed through Step G.2.6.2. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*
INITIATING CUE	**(Operators Name)**, vent the Drywell in accordance with N1-OP-9, starting at step G.2.6.3. Secure venting when Drywell pressure is below 0 psig.
START TIME	

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-OP-9 obtained, precautions and limitation reviewed, section G.2.0 referenced
3.	Open the following valves: (Step 2.6)		
3a.	201-10, DW AIR VENT & PURGE ISOLATION VALVE 11	P	**PASS / FAIL** **STD:** Rotates 201-10 control switch CW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3b.	201-08, TOR AIR VENT & PURGE ISOLATION VALVE 11	P	**PASS / FAIL** **STD:** Rotates 201-08 control switch CW
3c.	201-32, DW N2 VENT & PURGE ISOLATION VALVE 11	P	**PASS / FAIL** **STD:** Rotates 201-32 control switch CW
3d.	201-16, TORUS N2 VENT & PURGE ISOLATION VALVE 11	P	**PASS / FAIL** **STD:** Rotates 201-16 control switch CW
4.	Applicant should determine from initial conditions, a full de-inert is required for personnel entry to the Drywell and should select "Approximately 19.5%". (Step 2.7) **Note:** Step 2.8 is N/A	P	SAT / UNSAT **STD:** Determines 19.5% oxygen per the initial conditions.
5.	Notify Chemistry that a Drywell purge is about to commence.	P	SAT / UNSAT **STD:** Proper communications used
6.	Start 201-35, DRYWELL & TORUS VENT & PURGE (Step 2.10)	P	**PASS / FAIL** **STD:** Rotates 201-35 control switch CW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
7.	Verify open the following valves: (Step 2.11) • 201-21, DW & TOR VENT & PURGE FAN INLET BV • 201-22, DW & TOR VENT & PURGE FAN OUTLET BV	P	SAT / UNSAT **STD:** Observes red light on, green light off for both
8.	Throttle open 201-31, DW N2 VENT & PURGE ISOLATION VALVE 12 (Step 2.12)	P	**PASS / FAIL** **STD:** Rotates 201-31 control switch CW
8a.	[redacted]		SAT / UNSAT **STD:** Throttles 201-31 by using pull-to-stop feature of control switch
9.	Throttle open 201-17, TORUS N2 VENT & PURGE ISOLATION VALVE 12 (Step 2.13) **Cue:** After 201-17 is opened, report drywell and torus pressure is below 0 psig for purposes of this JPM (time compression used).	P	**PASS / FAIL** **STD:** Rotates 201-17 control switch CW
9a.	[redacted]		SAT / UNSAT **STD:** Throttles 201-17 by using pull-to-stop feature of control switch

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
10.	When drywell and Torus pressures drops <u>BELOW</u> 0 psig, open the following valves:	P	SAT / UNSAT **STD:** Continues the JPM based on examiner cue.
10a	201-09, DW AIR VENT & PURGE ISOLATION VALVE 12	P	**PASS / FAIL** **STD:** Rotates 201-09 control switch CW
10b	201-07, TOR AIR VENT & PURGE ISOLATION VALVE 12 **<u>Cue:</u>** Another operator will complete this procedure.	P	**PASS / FAIL** **STD:** Rotates 201-07 control switch CW
Evaluator Note:	**Cue:** *Your task is complete.*		

TERMINATING CUE	Drywell vented to atmospheric pressure in accordance with N1-OP-9.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is shutdown, <212°F. • The Operations Manager has determined a complete de-inert to 19.5% Oxygen is necessary. • N1-OP-9 is completed through Step G.2.6.2.
INITIATING CUE	**(Operators Name)**, vent the Drywell in accordance with N1-OP-9, starting at step G.2.6.3. Secure venting when Drywell pressure is below 0 psig.

Exelon Generation

Training Id: **2015 NRC JPM S-3** Revision: **0.0**

Title: **MSIV Stroke Test and Limit Switch Test (N1-ST-Q26)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	03/17/14
Validated By	Pat O'Brien	8/20/14
Facility Reviewer	GREG ELKINS	2/13/15

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-ST-Q26
2. NUREG 1123 K/A 239001 A4.01, (4.2/4.1)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to operate MSIV controls for a surveillance test and verify proper indications.

   b. This JPM is NOT considered alternate path.

2. Task Information:

   a. N1-239001-01026

   b. K/A 239001 A4.01, (4.2/4.1)

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 an operating condition
    b. Initialize simulator to IC 162

6. JPM Setup (if required)
    a. Section 7, prerequisites, and section 8.1 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 CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is operating at 100% power. • All prerequisites for N1-ST-Q26 are complete. • Section 8.1 has been completed. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*
INITIATING CUE	**(Operators Name)**, test Main Steam Line Isolation Valve 112 in accordance with N1-ST-Q26, Section 8.2.
START TIME	

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** N1-ST-Q26 obtained, precautions & limitations reviewed
3.	Prepare to initiate a Half-Scram on CHANNEL 11: (Step 8.2.1)		
3a.	Verify NO RPS Half-Scram signals exist	P	SAT / UNSAT **STD:** Observes all scram solenoid lights energized
3b.	Notify CRO that the following steps will initiate a Half-Scram	P	SAT / UNSAT **STD:** Proper communications used

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3c.	Verify all four MSIV SOV continuity ammeters indicate greater than 100mA **Role Play:** If dispatched to the Aux Control Room, acknowledge the request and report all four MSIV SOV continuity ammeters indicate greater than 100mA	P	SAT / UNSAT **STD:** Dispatch another operator to the Aux Control Room to perform the verification
4.	Place Main Steam Isolation Valve 7% Test Switch to the 112 position (Step 8.2.2)	P	**PASS / FAIL** **STD:** Test switch is rotated to the 112 position
5.	Confirm 01-03 MSIV 112 white test light ON (Step 8.2.3)	P	SAT / UNSAT **STD:** White test light for MSIV 112 is verified
6.	Confirm 01-03 MSIV 112 yellow light OFF (Step 8.2.4) **Note:** Step 8.2.5 will be N/A.	P	SAT / UNSAT **STD:** Yellow light for MSIV 112 is verified de-energized
	Note: JPM steps 7 to 11 will occur in rapid sequence; expect annunciators F1-1-7 and F1-2-1. **Cue:** Notify the candidate that you will be monitoring the valve mimic board for MSIV 112.		
7.	Momentarily place 01-03 MSIV-112 control switch to CLOSE position (Step 8.2.6)	P	**PASS / FAIL** **STD:** Rotates control switch for MSIV 112 momentarily CCW to CLOSE, then releases

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
8.	Confirm RPS Channel 11 Half-Scram indications **Cue:** If F1-1-7 is cleared before candidate completes verification, report that F1-1-7 alarmed and cleared as expected.	P	SAT / UNSAT **STD:** Observes: • CHANNEL 11 SCRAM SOLENOID GROUPS 1, 2, 3, 4, white light off • CHANNEL 11 B.U. SCRAM S.D.V. VENT & DRAIN VALVE red light off • Annunciator F1-1-7, RPS CH 11 MN STM LINE 11 ISOL VALVE CLOSED, alarms • Annunciator F1-2-1, RPS CH 11 AUTO REACTOR TRIP, alarms
9.	Confirm 01-03, MSIV-112 automatic partial closure indications **Cue:** The MSIV 112 mimic light came on and went off as expected.	P	SAT / UNSAT **STD:** Observes: • 01-03 MSIV-112 Green Light ON momentarily • 01-03 MSIV-112 Red Light ON • 01-03 MSIV-112 Mimic Light ON momentarily
10.	Confirm 01-03 MSIV-112 yellow light illuminated BRIGHT	P	SAT / UNSAT **STD:** Observes 01-03 MSIV 112 yellow test light ON brightly

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
11.	Confirm 01-03 MSIV-112 automatic opening indications	P	SAT / UNSAT **STD:** Observes: • 01-03 MSIV-112 Green Light OFF • 01-03 MSIV-112 Red Light ON • 01-03 MSIV-112 Mimic Light OFF
12.	Place MSIV 7% Test Switch to the OFF position **Cue:** Inform candidate that another operator has completed the Independent Verification.	P	**PASS / FAIL** **STD:** Rotates Test Switch to OFF
13.	Confirm 01-03 MSIV 112 White Test Light OFF	P	SAT / UNSAT **STD:** Observes White Test Light for MSIV-112 is OFF
14.	Confirm 01-03 MSIV 112 Yellow Light OFF	P	SAT / UNSAT **STD:** Observes Yellow Light for MSIV-112 is OFF
15.	Depress REACTOR TRIP RESET at Panel E **Note:** F1-2-1 clears		**PASS / FAIL** **STD:** Depresses Rx Trip RESET Button on E-Console

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
16.	Confirm RPS Channel 11 Half-Scram indications clear		SAT / UNSAT **STD:** Observes: • CHANNEL 11 SCRAM SOLENOID Groups 1,2,3,4 White Light ON • CHANNEL 11 BACKUP SCRAM VALVE S.D.V. VENT ND DRAIN VALVE Red Light ON • Annunciator F1-1-7, RPS CH 11 MN STM LINE 11 ISOL VALVE CLOSED, clear • Annunciator F1-2-1, RPS CH 11 AUTO REACTOR TRIP, clear
Evaluator Note:	**Cue:** *Your task is complete.*		

TERMINATING CUE	N1-ST-Q26 completed for MSIV 01-03.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is operating at 100% power. • All prerequisites for N1-ST-Q26 are complete. • Section 8.1 has been completed.
INITIATING CUE	**(Operators Name)**, test Main Steam Line Isolation Valve 112 in accordance with N1-ST-Q26, Section 8.2.

Exelon Generation

Training Id: **2015 NRC JPM S-4** Revision: **0.0**

Title: **Transfer House Loads from Reserve to Normal – N1-OP-30**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	03/17/14
Validated By	Leigh Mason	8/20/14
Facility Reviewer	GREG ELKINS	2/13/15

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-30, 4.16KV, 600V, and 480V House Service
2. NUREG 1123 K/A 262001 A4.04, (3.6/3.7)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to manipulate electrical system controls to parallel two AC sources. The operator will shift house service loads from the reserve transformers to the normal transformers, as is done during a plant start up.

   b. This JPM is NOT considered alternate path.

2. Task Information:

   a. N1-262001-01001

   b. K/A 262001 A4.04, (3.6/3.7)

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 power operating condition
    b. Initialize simulator to IC 162
    c. Verify Powerboards 11 and 12 are ready to be transferred to the normal transformer.

6. JPM Setup (if required)

    a. Provide copy of N1-OP-30

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The reactor is in an operating condition after a recent plant startup • The reserve transformers are supplying house loads • Main Generator load is stable • S-ODP-OPS-112 Attachment 4 has been completed for transferring House loads **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*
INITIATING CUE	**(Operators Name)**, transfer normal house service from the reserve transformers to normal in accordance with N1-OP-30, section E.15.
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-30 obtained. Precautions & limitations reviewed & section E.15 referenced
3.	Confirm Main Generator load stable (Step 15.1)	P	SAT / UNSAT **STD:** Observes main generator megawatts stable (meters on Panels E or A7, digital indication on Panel K). Or determines stable from initial conditions.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Notify J.A. FitzPatrick Control Room at 349-6666 to inform them that house service loads will be transferred to normal AND 115 kV loading will be affected. (Step 15.2) **Role Play:** Acknowledge that Fitzpatrick is notified	P	SAT / UNSAT **STD:** Proper communications used
5.	Perform Attachment 4 of S-ODP-OPS-0112. (Step 15.3)	P	SAT / UNSAT **STD:** Determines S-ODP-OPS-0112 attachment 4 is complete per initial conditions
6.	Confirm Voltage Regulator in service. (Step 15.4)	P	SAT / UNSAT **STD:** Voltage Regulator Transfer switch in Run with Red light on.
7.	Insert Sync Key in Breaker R113 AND perform the following: (Step 15.5)	P	SAT / UNSAT **STD:** Positions Sync. Key in Breaker R113
7a.	Turn Sync Key ON	P	**PASS / FAIL** **STD:** Rotates Sync. Key for Breaker R113 CW to ON
7b.	Confirm incoming voltage slightly above running (board) voltage.	P	SAT / UNSAT **STD:** Observes INCOMING and RUNNING voltages
7c.	IF required, THEN make voltage adjustment with Tap Changer on Transformer 10.	P	SAT / UNSAT / NA **STD:** Adjusts TAP CHGR CONT TRANS 10 to match incoming and running voltages, if required

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
8.	Close Breaker R113 AND immediately open R112 (Step 15.6)	P	**PASS / FAIL** **STD:** Rotates R113 control switch CW to CLOSE, observes red light on and green light off. When R113 is closed, rotates R112 control switch CCW to TRIP, observes green light on and red light off
9.	Leave R112 control switch in neutral position (Step 15.7)	P	SAT / UNSAT **STD:** Releases R112 control switch to NEUTRAL
10.	Place Sync Key in OFF position (Step 15.8)	P	SAT / UNSAT **STD:** Rotates Sync. Key in Breaker R113 CCW to OFF
11.	Remove Sync Key from R113 (Step 15.9)	P	SAT / UNSAT **STD:** Removes Sync. Key from Breaker R113
12.	Insert Sync Key in R122 AND perform the following: (Step 15.10)	P	SAT / UNSAT **STD:** Positions Sync. Key in Breaker R122
12a	Turn Sync Key ON	P	**PASS / FAIL** **STD:** Rotates Sync. Key for Breaker R122 CW to ON
12b	Confirm incoming voltage slightly above running voltage	P	SAT / UNSAT **STD:** Observes INCOMING and RUNNING voltages

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12c	IF required, THEN make voltage adjustment with Tap Changer on Transformer 10.	P	SAT / UNSAT **STD:** Adjusts TAP CHGR CONT TRANS 10 to match incoming and running voltages, if required
13.	Close Breaker R122 AND immediately open R123 (Step 15.11)	P	**PASS / FAIL** **STD:** Rotates R122 control switch CW to CLOSE, observes red light on and green light off. When R122 is closed, rotates R123 control switch CCW to TRIP, observes green light on and red light off
14.	Leave R123 control switch in neutral position (Step 15.12)	P	SAT / UNSAT **STD:** Releases R123 control switch to NEUTRAL
15.	Place Sync Key in OFF position (Step 15.13)	P	SAT / UNSAT **STD:** Rotates Sync. Key in Breaker R122 CCW to OFF
16.	Remove Sync Key from R122 (Step 15.14)	P	SAT / UNSAT **STD:** Removes Sync. Key from Breaker R122
17.	Adjust Power Boards 11 AND 12 voltages to 4160 volts using Tap Changer on Transformer 10. (Step 15.15)	P	SAT / UNSAT / NA **STD:** Adjusts TAP CHGR CONT TRANS 10, if required

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
18.	Notify Electrical Maintenance to complete Attachment 12 of N1-OP-43A to confirm Auto transfer capability. (Step 15.16)	P	SAT / UNSAT **STD:** Proper communications used
Evaluator Note:	**Cue:** Your task is complete.		

TERMINATING CUE	House loads are supplied by the normal transformer – T-10.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The reactor is in an operating condition after a recent plant startup • The reserve transformers are supplying house loads • Main Generator load is stable • S-ODP-OPS-112 Attachment 4 has been completed for transferring House loads
INITIATING CUE	**(Operators Name)**, transfer normal house service from the reserve transformers to normal in accordance with N1-OP-30, section E.15.

Exelon Generation

Training Id: **2015 NRC JPM S-5** Revision: **0.0**

Title: **Shift Reactor Building Operating Exhaust and Supply Fans From #11 to #12 (Faulted)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	03/17/14
Validated By	Pat O'Brien	8/20/14
Facility Reviewer	Greg Elkins	2/13/15

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)

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 not considered alternate path, but it is faulted, 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.

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	No
LOD >1.0	Yes

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)
   a. Initialize simulator to IC-163
   b. RX Building Supply and Exhaust Fans #11 in service.
   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.)
        - 11S68DI54912, RB Supply Fan 12 & Inlet Damper, ON
        - 11M4AO52590, React Bldg supply Fan 12 AMP, Analog Value 1
        - 11DS229LO5624, Reactor Bldg Supply Fan 12 Green light OFF
        - 11DS230LO5625, Reactor Bldg Supply Fan 12 SLOW Red light ON
        - 11DS216LO5617, Reactor Bldg Supply Fan 12 Inlet Damper Green light OFF DT=15sec
        - 11DS217LO5618, 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 CRS 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)**, 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. (Step 1.2.1)	P	SAT / UNSAT **STD:** Visually observe REACTOR BLDG SUPPLY FAN 11 and REACTOR BLDG EXHAUST FAN 11 fans in SLOW red slow light illuminated.
4.	Start REACTOR BLDG EXHAUST FAN 12 on SLOW (Step 1.2.2)	P	**PASS / FAIL** **STD:** Rotate REACTOR BLDG EXHAUST FAN 12 control switch CW to the slow position observe red slow light illuminated, green light off.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	Confirm damper 202-07, REACTOR BLDG EXHAUST FAN 12 OUTLET DAMPER open. (Step 1.2.3)	P	SAT / UNSAT **STD:** Observe 202-07 open red light on, green light off.
6.	Stop REACTOR BLDG EXHAUST FAN 11. (Step 1.2.4)	P	**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. (Step 1.2.5)	P	SAT / UNSAT **STD:** Observe REACTOR BLDG EXHAUST FAN 11 OUTLET DAMPER closed green light on, red light off.
8.	Confirm normal system flow. (Step 1.3)	P	SAT / UNSAT **STD:** Observe annunciator L1-2-5 RB VENT EXH FLOW LOW is clear.
9.	Start REACTOR BLDG SUPPLY FAN 12 on SLOW. (Step 2.2.2)	P	**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. (Step 2.2.3)	P	SAT / UNSAT / NA **STD:** Observe 202-04 open red light on, green light off

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
	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: • Heating Unit is tripped • Inlet Filter differential pressure is normal	P	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.		**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 CRS/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.*		

TERMINATING CUE	Misoperation identified on Supply Fan 12. Supply Fan 11 is running with either Exhaust Fan 11 or 12 running.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • Reactor Building Exhaust Fan #11, and Reactor Building Supply Fan # 11 are in service.
INITIATING CUE	**(Operators Name)**, 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: **2015 NRC JPM S-6** Revision: **0.0**

Title: **Control Rod Exercising Operability Test N1-ST-W1 (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	01/29/2015
Validated By	Kerry Henderson	02/03/15
Facility Reviewer	Greg Elkins	2/13/15

Approximate Duration: 15 minutes

Documentation of Performance:

Performer: _____

Evaluator: _____

Start Time: _____ Stop Time: _____ Completion Time _____

Grade: **Pass / Fail**

Comments: _____

Evaluators Signature: _____ Date: _____

References

1. N1-ST-W1, Control Rod Exercising Operability Test
2. N1-OP-5, Control Rod Drive System

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to perform the weekly control rod exercise surveillance, N1-ST-W1.

   b. This JPM is considered alternate path because rod position indication will be lost while exercising rods, requiring the operator to take actions prescribed in the Control Rod Drive Operating Procedure.

2. Task Information:

   a. N1-214000-01001, Monitor RPIS

   b. K/A 214000, A4.02 (3.8/3.8)

3. Evaluation / Task Criteria

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

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)
   a. Initialize simulator to IC-163
   b. Verify RD08R0231 is assigned to trigger 1
   c. Verify Event Trigger #1 hzlrdin==1&hzlrdself(72)==1
   d. Ensure process computer is not available
6. JPM Setup (if required)
   a. Prepare a copy of N1-ST-W1, marked with step 6.1 – 6.2.4 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 CRS has determined that a verifier is not available and that additional verification will not be provided.

INITIAL CONDITIONS	Given: • The plant is online. • Weekly Control Rod exercising is in progress. • The process computer is unavailable. • N1-ST-W1 is complete through step 6.2.4. • No rods are expected to double notch. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, Complete N1-ST-W1, starting at step 6.2.5. Begin with rod 02-35 and continue with the sequence outlined in attachment 1. Document applicable rod movement information on attachment 1.

START TIME	

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
1.	Provide repeat back of initiating cue **Cue:** *Acknowledge repeat back providing correction if necessary.*	P	SAT / UNSAT **STD:** Proper communications used.
2.	Obtain a copy of N1-ST-W1 and review / utilize the correct section of the procedure	P	SAT / UNSAT **STD:** Obtains copy of N1-ST-W1. Section 6.2 is referenced
3.	Depress the rod select pushbutton for Control Rod to be tested on Rod Map Display at E panel. (Step 6.2.5)	P	SAT / UNSAT **STD:** Depresses pushbutton for control rod 02-35. Observes white light lit.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	RECORD selected control rod's initial position on Attachment 1, Control Rod Exercising Data Sheet. (Step 6.2.6) **Cue:** If the applicant requests status of V138 (step 6.2.7), report V138 has a normal response.	P	SAT / UNSAT **STD:** Records position 48 for control rod 02-35
5.	Confirm the following: (Step 6.2.8) • Rod select pushbutton back lighted on Rod Map Display • Select light illuminated for appropriate Control Rod at F Panel	P	SAT / UNSAT **STD:** Observes both white lights lit.
6.	Step 6.2.9 – "IF Control Rod is expected to double notch..."	P	SAT / UNSAT **STD:** Determine step is NA per initial conditions.
7.	PLACE 4S1, CONTROL ROD MOVEMENT switch to ROD IN position UNTIL ROD IN light illuminates. (Step 6.2.10)	P	**PASS / FAIL** **STD:** Places control rod movement switch to the Rod In position. Observes rod settle at position 46.
8.	Determines steps 6.2.11, 6.2.12, 6.2.14, and 6.2.15 are NA	P	SAT / UNSAT
9.	Record the following on Attachment 1: • New control rod position • Drive-To-Reactor d/p (step 6.2.13)	P	SAT / UNSAT **STD:** Records position 46 for control rod 02-35. And approximately 250 psi differential pressure.
10	Withdraw control rod to initial position as follows: (step 6.2.16)		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
10.a	Confirm the following: • Rod select pushbutton back lighted on Rod Map Display • Select light illuminated for appropriate Control Rod at F Panel	P	SAT / UNSAT **STD:** Observes both white lights lit.
10.b	PLACE CONTROL ROD MOVEMENT switch in ROD OUT NOTCH, UNTIL ROD IN light illuminates.	P	**PASS / FAIL** **STD:** Places control rod movement switch to the Rod Out Notch position. Observes rod settle at position 48.
10.c	CONFIRM next higher even position illuminates at F Panel.	P	SAT / UNSAT **STD:** Observes rod settle at position 48.
10.d	Verify final position equals initial position and record final position on attachment 1. **Examiner note:** Withdraw to position 48 may be performed concurrently with the coupling check.	P	SAT / UNSAT **STD:** Records final position on attachment 1 and confirms initial and final positions are the same.
11.	Perform coupling check (step 6.2.17):		
11.a	SIMULTANEOUSLY PLACE 4S1 to ROD OUT NOTCH AND 4S3, CONTROL ROD N OVERRIDE switch to NOTCH OVERRIDE.	P	**PASS / FAIL** **STD:** Simultaneously places Control Rod Movement Switch to Rod Out Notch and the Control Rod N Override Switch to Notch Override.
11.b	CONFIRM the following: • Position 48 illuminates with red backlighting remains illuminated for Control Rod selected at F Panel • CONTROL ROD OVERTRAVEL annunciator, F3-1-6, does NOT alarm	P	SAT / UNSAT **STD:** Observes position 48 and red backlighting while holding switches.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
11.c	RECORD Withdrawal Stall Flow on Attachment 1.	P	SAT / UNSAT **STD:** Observes stall flow on F Panel. Records on att 1.
11.d	Record Satisfactory coupling check	P	SAT / UNSAT **STD:** Checks appropriate block in attachment 1.
12.	Select next rod to be exercised		
12.a	Depress the rod select pushbutton for Control Rod to be tested on Rod Map Display at E panel. (Step 6.2.5)	P	SAT / UNSAT **STD:** Depresses pushbutton for control rod 02-31. Observes white light lit.
12.b	RECORD selected control rod's initial position on Attachment 1, Control Rod Exercising Data Sheet. (Step 6.2.6) **Cue:** If the applicant requests status of V138 (step 6.2.7), report V138 has a normal response.	P	SAT / UNSAT **STD:** Records position 48 for control rod 02-31 on attachment 1.
13.	Confirm the following: (Step 6.2.8) • Rod select pushbutton back lighted on Rod Map Display • Select light illuminated for appropriate Control Rod at F Panel	P	SAT / UNSAT **STD:** Observes both white lights lit.
14.	Step 6.2.9 – "IF Control Rod is expected to double notch..."	P	SAT / UNSAT **STD:** Determine step is NA per initial conditions.
15.	PLACE 4S1, CONTROL ROD MOVEMENT switch to ROD IN position UNTIL ROD IN light illuminates. (Step 6.2.10)	P	**PASS / FAIL** **STD:** Places control rod movement switch to the Rod In position. Observes rod start to move.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
	When the rod is moved in, RPIS will fail initiating the alternate path. The applicant should determine rod position is unknown and references N1-OP-5, Off Normal section to respond to the loss of rod position indication.		
16.	Verify indicating light NOT burnt out at F Panel. (N1-OP-5 Step H.10.1) **Cue:** Another operator verified the light was not burnt out. **Note:** The applicant may make the determination that a light is not burnt out since all position indication for the rod was lost.	P	SAT / UNSAT **STD:** Determines lights not burnt out.
17.	Notify Reactor Engineering. (N1-OP-5 Step H.10.2) **Cue:** When contacted as Reactor Engineering, acknowledge report.	P	SAT / UNSAT **STD:** Reports loss of rod position indication to Reactor Engineering
18.	IF control rod lacks position indication, THEN perform the following: (N1-OP-5 Step H.10.3)		
18.a	Insert control rod one notch.	P	**PASS / FAIL** **STD:** Momentarily places control rod movement switch to Rod In.

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
18.b	Confirm the following: • ROD IN light illuminates for approximately three seconds. • ROD OUT SETTLE light illuminates for approximately four seconds AFTER ROD IN light extinguishes. • Next lower even position illuminates.	P	SAT / UNSAT **STD:** Observes proper response from RMCS timer lights. Observes next lower rod position does not display.
19.	IF control rod lacks position indication at more than one position AND position CANNOT be determined by other means, THEN perform following: (N1-OP-5 Step H.10.4)		
20.	Fully insert control rod.	P	**PASS / FAIL** **STD:** Places and holds control rod movement sw. to Rod In.
Evaluator Note:	Once control rod 02-31 is being fully inserted, provide the following Cue: **Cue:** Time compression. The rod is fully inserted. Your task is complete, another operator will complete the remainder of the ARP actions.		

TERMINATING CUE	Control Rod 02-31 is being fully inserted.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is online. • Weekly Control Rod exercising is in progress. • The process computer is unavailable. • N1-ST-W1 is complete through step 6.2.4. • No rods are expected to double notch.

INITIATING CUE	**(Operators Name)**, Complete N1-ST-W1, starting at step 6.2.5. Begin with rod 02-35 and continue with the sequence outlined in attachment 1. Document applicable rod movement information on attachment 1.

Exelon Generation®

Training Id: **2015 NRC JPM S-7** Revision: **0.0**

Title: **Place a Second RWCU Pump in Service**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	03/17/14
Validated By	Leigh Mason	8/21/14
Facility Reviewer	GREG ELKINS	2/13/15

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-3, RWCU
2. NUREG 1123 K/A 204000 A4.01, (3.1/3.0)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to operate the RWCU system. The operator will place a second RWCU pump in service and stabilize parameters.

   b. This JPM is NOT considered alternate path.

2. Task Information:

   a. N1-204000-01039

   b. K/A 204000 A4.01, (3.1/3.0)

3. Evaluation / Task Criteria

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

4. Recommended Start Location

   a. Unit 1 Simulator

5. Simulator Setup (if required)
   a. Initialize simulator to IC 164
   b. Verify RWCU pump 12 is running
   c. Verify 33-39, Cleanup PCV 12 (HP) is in AUTO or BAL
   d. Verify 33-40, Cleanup Sys Flow, is in MANUAL
   e. Verify system flow is between 180 – 220 x 10^3 lbm/hr
   f. Verify NRHX outlet temperature (F359) is displayed
   g. Verify RHX outlet temperature (F363) is displayed
   h. Verify nuisance annunciators failed off:
      1) A1-4-6
      2) A2-3-2
      3) A2-4-4

6. JPM Setup (if required)

   a. No steps need to be marked up.

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The plant has scrammed • The Reactor Water Cleanup System is to be lined up to support further plant shutdown • NRHX outlet temperature (F359) and RHX outlet temperature (F363) are displayed on the R-time screen. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*
INITIATING CUE	**(Operators Name)**, place a second Reactor Water Cleanup Pump in service in accordance with N1-OP-3, section E.7. Establish system flow at 325-350 X 10^3 lbm/hr.
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-3 obtained Precautions & limitations reviewed Section E.7.0 referenced

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
3.	Monitor NON-REGENERATIVE HX outlet temp and REGENERATIVE HX inlet temp (Step 7.1) **Cue:** F359 and F363 are indicated on R-time display	P	SAT / UNSAT **STD:** Monitor NON-REGERATIVE HX outlet temp (F359) and REGENERATIVE HX initial temp (F363) during the performance of this section UNTIL system parameters stabilize, AND ensure temperatures do not exceed 120°F as indicated on computer points F359 and F363
4.	Verify adequate margin exists to core thermal power limits to prevent exceeding design or administrative limits when a second cleanup pump is started and flow is raised (8-12 MWth) (Step 7.3)	P	SAT / UNSAT **STD:** Verifies core power is less than 1842 MWth
5.	Verify closed 33-15 CLEANUP PUMP 1 DISCHARGE VALVE (Step 7.4.1)	P	SAT / UNSAT **STD:** Observes green light on, red light off for 33-15 Cleanup Pump 1 Discharge Valve
6.	Adjust 33-40, CLEANUP SYS FLOW, using RMC-33-151 to establish cleanup system flow between 180 x 10^3 and 220 x 10^3 lbm/hr (360 – 440 gpm) (Step 7.4.2)	P	SAT / UNSAT **STD:** Verifies system flow on chart recorder 35-150 or MA station 33-151
7.	Verify Open 33-160, CLEANUP PUMP RECIRC VALVE 11 (Step 7.4.3)	P	SAT / UNSAT **STD:** Observes red light on

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
8.	Verify system pressure as indicated on PI-35-131A is being maintained 80 – 100 psig (Step 7.4.4)	P	SAT / UNSAT **STD:** Observes system pressure on PI-35-131A is 80 – 100 psig
9.	START Cleanup Pump 11 (Step 7.4.5)	P	**PASS / FAIL** **STD:** Rotates control switch for Cleanup Pump 11 CW to start and observes red flag in window, red light on, green light off, and motor amps increase
10.	Perform simultaneously: (Step 7.4.6)		
10a	Slowly jog open 33-15, CLEANUP PUMP 11 DISCHARGE VALVE **Note:** This valve must be opened in small increments to maintain proper system pressure	P	**PASS / FAIL** **STD:** Rotates CLEANUP PUMP 11 DISCHARGE VALVE control switch CW to open, until red light is on and green light is off
10b	Verify system pressure maintained between 80 – 100 psig **Note:** System pressure may momentarily drop below 80 psig while the PCV responds	P	SAT / UNSAT **STD:** Observes proper response of in-service PCV in AUTO OR adjusts in-service PCV in MANUAL while jogging open 33-15 to maintain system pressure 80 – 100 psig
10c	Maintain pump discharge pressure less than 1400 psig by opening 33-40, CLEANUP SYS FLOW, using RMC-33-151	P	SAT / UNSAT **STD:** Adjusts RMC-33-151 as required to maintain discharge pressure below 1400 psig

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
11.	When 33-15, CLEANUP PUMP 11 DISCHARGE VALVE, is fully open, adjust 33-40 using RMC-33-151, CLEANUP SYS FLOW, to maintain desired flow 250 x 10^3 –380 x 10^3 lbm/hr (500 – 760 gpm) (Step 7.4.7) **Note:** 325-350 x 10^3 lbm/hr given in initiating cue	P	**PASS / FAIL** **STD:** Rotates knob CW to raise system flow to approximately 325-350 x 10^3 lbm/hr
Evaluator Note:	**Cue:** *Your task is complete.*		

TERMINATING CUE	Second Reactor Water Cleanup Pump is in service and system flow adjusted to approximately 325-350 x 10^3 lbm/hr.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant has scrammed • The Reactor Water Cleanup System is to be lined up to support further plant shutdown • NRHX outlet temperature (F359) and RHX outlet temperature (F363) are displayed on the R-time screen.

INITIATING CUE	**(Operators Name)**, place a second Reactor Water Cleanup Pump in service in accordance with N1-OP-3, section E.7. Establish system flow at 325-350 X 10^3 lbm/hr.

Exelon Generation

Training Id: **2015 NRC JPM S-8** Revision: **0.0**

Title: **Initiate Liquid Poison Injection, RWCU Fails To Isolate**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	03/07/14
Validated By	Pat O'Brien	8/21/14
Facility Reviewer	Greg Elkins	2/13/15

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-HC Attachment 10
2. NUREG 1123 K/A 211001 A1.08, (3.7/3.8)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to initiate liquid poison and verify proper isolations occur.
   b. This JPM is not considered alternate path.

2. Task Information:

   a. N1-211000-01006

   b. K/A 262001 211001 A1.08, (3.7/3.8)

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 failure to scram
    b. Initialize simulator to IC 165
    c. Verify the following malfunctions are inserted
        - RD33A, RD33C, and RD33E at position 48
        - RD33B and RD33D at position 06
        - CU12 and CU13 to establish RWCU isolation failure
    d. Verify Mode Switch in shutdown
    e. Verify ADS bypassed
    f. Allow conditions to stabilize.

6. JPM Setup (if required)

    a. No steps need to be marked up.

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The plant was operating at 100% power • A failure to scram has occurred **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, inject Liquid Poison into the Reactor Vessel with Liquid Poison pump 11 in accordance with N1-EOP-HC, 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 / NA **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure	P	SAT / UNSAT / NA **STD:** N1-EOP-HC, Attachment 10 obtained.
3.	Place Liquid Poison System keylock selector switch to SYS 11 (Step 1.0)	P	**PASS / FAIL** **STD:** Keylock selector switch is rotated CW to SYS 11

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Confirm: (Step 2.0) • Both explosive valves fire • Liquid Poison pump 11 Starts • RWCU System isolates **Note:** RWCU will fail to isolate	P	SAT / UNSAT **STD:** • Observes squib valves 11 and 12 continuity lights off SAT / UNSAT • Observes Liquid Poison pump 11 red light ON, green light OFF, amps and pressure rise **PASS / FAIL** • Diagnoses failure of RWCU to isolate: RWCU system isolation valves remain open with green lights OFF, red lights ON, RWCU pump in service
5.	Notify CRS that the RWCU system failed to isolate **Role Play:** Acknowledge RWCU System failed to isolate	P	SAT / UNSAT **STD:** Proper communication used (GAP-OPS-01)

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
6.	IF RWCU does NOT automatically isolate THEN manually isolate the RWCU system IAW N1-OP-3 **Note:** The Operator may immediately close RWCU isolation valves 33-01R, 33-02R and 33-04R and/or trip the running RWCU pump. This satisfies JPM steps 7, 8 and/or 12, and is acceptable to be performed prior to referencing the procedure, as it is a backup to a failed automatic operation.	P	SAT / UNSAT **STD:** Refers to N1-OP-3, Section H.11
7.	Provide close signal to both valves below at H panel (Step H.11.1) • Close 33-02R • Close 33-04	P	**PASS / FAIL** **STD:** Closes 33-02R & 33-04 by rotating individual control switches CCW
8.	Secure all operating cleanup pumps (Step H.11.2)	P	SAT / UNSAT **STD:** Secures RWCU pump 12 by rotating control switch CCW to STOP
9.	Open ONE of the following valves • 33-10, Cleanup to Waste Disposal BV • 33-11, Cleanup to Condenser BV (Step H.11.3)	P	SAT / UNSAT **STD:** Opens ONE of the listed valves using common control switch
	Role Play: When asked, state that Rapid Depressurization is NOT required and that RWCU system is to remain pressurized		
10.	Marks step 11.4, N/A, rapid depressurization NOT required	P	SAT / UNSAT **STD:** Step 11.4 marked N/A

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
11.	If high pressure system is to remain pressurized, THEN close 33-41, AO Blocking Valve. (Step H.11.5)	P	SAT / UNSAT **STD:** Closes 33-41, AO Blocking Valve by rotating control switch CCW
12.	Provide close signal at H Panel to 33-01R, CU Return Isolation Valve 1 (inside)(Step H.11.6)	P	**PASS / FAIL** **STD:** Provides close signal at H Panel to 33-01R, CU Return Isolation Valve 1 (inside), by rotating control switch CCW
13.	Adjust in-service PCV AND 33-165, Cleanup to Cond & Waste Flow, as required to maintain Cleanup system pressure less than 110 psig AND minimize reject flow (Step H.11.7)	P	SAT / UNSAT **STD:** Adjusts in-service PCV AND 33-165, Cleanup to Cond & Waste Flow, as required to maintain Cleanup system pressure less than 110 psig AND minimize reject flow
14.	Verify closed the following valves (Step H.11.8) • IV-33-02R • IV-33-04 • IV-33-01R	P	SAT / UNSAT **STD:** Verifies closed the listed valves (green light ON, red light OFF)
Evaluator Note:	**Cue:** *Your task is complete.*		

TERMINATING CUE	Liquid Poison pump 11 injecting into the Reactor Vessel and Reactor Water Cleanup isolated.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant was operating at 100% power • A failure to scram has occurred
INITIATING CUE	**(Operators Name)**, inject Liquid Poison into the Reactor Vessel with Liquid Poison pump 11 in accordance with N1-EOP-HC, Attachment 10.

Exelon Generation

Training Id: **2015 NRC Plant P-1** Revision: **0.0**

Title: **Air Start the Diesel Fire Pump**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	03/18/14
Validated By	Leigh Mason	8/19/14
Facility Reviewer	GREG ELKINS	2/13/15

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-21A, Fire Protection System - Water
2. NUREG 1123 K/A 286000, A3.01 (3.4/3.4)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to locally start the diesel fire pump with a loss of control power.

   b. This JPM is not considered alternate path

2. Task Information:

   a. N1-286000-04039

   b. K/A 286000, A3.01 (3.4/3.4)

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-OP-21A

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • The plant is shutdown • A total loss of DC power has occurred **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*
INITIATING CUE	**(Operators Name)**, start the diesel fire pump per N1-OP-21A, Section H.6
START TIME	

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
1.	Provide repeat back of initiating cue **Cue:** Acknowledge repeat back providing correction if necessary.	P	SAT / UNSAT **STD:** Proper communications used
2.	Obtain a copy of the reference procedure and review / utilize the correct section of the procedure **Cue:** Step 6.1 is complete	P	SAT / UNSAT **STD:** N1-OP-21A obtained. Precautions and limitations reviewed. Section H.6 referenced.
3.	Place Diesel Fire Pump Control Switch to OFF.	S	SAT / UNSAT **STD:** Local Control Switch rotated CW to OFF in Diesel Fire Pump Room
4.	Manually open 100-1211, Solenoid Operated Inlet Valve, to the Woodward Governor.	S	**PASS / FAIL** **STD:** Manually opens 100-1211 by rotating override lever CW

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
5.	Manually close 100-1212, Outlet Blocking Valve, from Woodward Governor.	S	**PASS / FAIL** **STD:** Manually closes 100-1212 by rotating valve CW
6.	Manually open 100-1213, Pump Lubrication Solenoid Valve.	S	**PASS / FAIL** **STD:** Manually opens 100-1213 by rotating override lever CW
7.	Open 100.4-04 (IA-222) OR 100.4-03 (IA-223), Starting Air Bypass valves to provide starting air supply. **Cue:** Engine started and is running	S	**PASS / FAIL** **STD:** IA-222 or IA-223 opened by turning lever on valve such that the operating lever is in-line with the piping.
8.	Upon successful Diesel Fire Pump engine start, close 100.4-04 (IA-222) OR 100.4-03 (IA-223).	S	SAT / UNSAT **STD:** IA-222 or IA-223 (whichever was opened) is closed by turning lever on valve until the handle is perpendicular to the piping
9.	Notifies control room that the diesel fire pump is running	S	SAT / UNSAT
Evaluators Note:	**Cue:** Your task is complete.		

TERMINATING CUE	The Diesel Fire Pump has been manually started.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • The plant is shutdown • A total loss of DC power has occurred
INITIATING CUE	**(Operators Name)**, start the diesel fire pump per N1-OP-21A, Section H.6

Exelon Generation

Training Id: **2015 NRC Plant P-2** Revision: **0.0**

Title: **OATC Actions For Control Room Evacuation (N1-SOP-21.2) (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	Paul Isham	03/18/2014
Validated By	Leigh Mason	08/19/2014
Facility Reviewer	GREG ELKINS	2/13/15

Approximate Duration: 25 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
2. NUREG 1123 K/A 295016 AA1.04 (3.1/3.2)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to execute OATC actions for a control room abandonment. The actions are primarily associated with local operation of electrical distribution components.

   b. This JPM is considered alternate path because after reporting to the Emergency Diesel Generators, a loss of offsite power will occur causing both EDGs to load. The operator will be required to execute override actions for the loss of offsite power and the subsequent Hot EDG.

2. Task Information:

   a. N1-296000-01003-01

   b. K/A 295016 AA1.04 (3.1/3.2)

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. Provide a copy of N1-SOP-21.2

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • You are the OATC. • A Control Room Evacuation has been ordered due to a fire. • The Reactor has been scrammed and all control rods are fully inserted. • The Main Turbine has just been tripped. • Feedwater Pump 13 could NOT be disengaged from the control room. • Powerboard 11 and 12 are energized. **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, perform OATC actions of N1-SOP-21.2, Control Room Evacuation, starting at C."

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 obtained Section 'C' referenced
3.	IF Main Turbine NOT tripped, WHEN Reactor has been scrammed, THEN Trip Main Turbine by rotating AND pulling MASTER TRIP at Front Standard (TB EL 300')	P	SAT / UNSAT **STD:** Determines step is N/A per initial conditions

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	IF Feedwater Pump 13 NOT disengaged, THEN Disengage Feedwater Pump 13 locally **Note:** Once the Candidate has identified the FWP actuator junction boxes, relocate to a quieter, lower dose area. Present the Candidate with a picture of the controls including the stop button and have them show what they would do. **Cue:** Indicated button pushed. The actuator motors have been stopped.	S	**PASS / FAIL** **STD:** FWP actuator junction boxes identified. Stop buttons depressed.
5.	Proceed to PB 11 and 12	P	SAT / UNSAT **STD:** Travels to PB 11 and 12 (TB 261' South)
6.	Is Offsite Power available (voltage on PB 11/12)?	P	SAT / UNSAT **STD:** Determines offsite power is available per initial conditions or by checking volt meters on PB 11/12.
7.	At PB 11 and 12, verify the following:		
7a	Breaker R122 open **Cue:** Breaker R122 green light ON and red light OFF.	S	SAT / UNSAT **STD:** Breaker R122 verified open by observing local indications
7b	Breaker R113 open **Cue:** Breaker R113 green light ON and red light OFF.	S	SAT / UNSAT **STD:** Breaker R113 verified open by observing local indications

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
7c	Breaker R112 closed **Cue:** Breaker R112 red light ON and green light OFF.	S	SAT / UNSAT **STD:** Breaker R112 verified closed by observing local indications
7d	Breaker R123 closed **Cue:** Breaker R123 red light ON and green light OFF.	S	SAT / UNSAT **STD:** Breaker R123 verified closed by observing local indications
7e	11 OR 13 Condensate Pump running **Cue:** Applicable (or both) Condensate Pump breaker red light ON and green light OFF.	S	SAT / UNSAT **STD:** 11 Condensate Pump verified running by observing local indications
7f	11 OR 13 Booster Pump running **Cue:** Applicable (or both) Booster Pump breaker red light ON and green light OFF.	S	SAT / UNSAT **STD:** 11 Booster Pump verified running by observing local indications
7g	One Feedwater Pump running **Cue:** Feedwater Pump breaker red light ON and green light OFF.	S	SAT / UNSAT **STD:** One Feedwater Pump verified running by observing local indications
8.	Proceed to Diesel Generator/PB rooms (TB 261') **Cue:** Direct the candidate to report to Diesel Generator Room 103 first.	P	SAT / UNSAT **STD:** Travels to Diesel Generator Room 103 (TB 261' East)
	Cue: When Diesel Generator Room is entered inform candidate Loss of Offsite Power has just occurred. Both Diesels are supplying their Powerboards.		

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
9.	IF D/G loaded due to Loss of Offsite Power (LOOP), THEN:		
9a	Place D/G Control in LOCAL **Note:** D/G Control switch is labeled "REMOTE AUTO" and "LOCAL START".	S	**PASS / FAIL** **STD:** D/G 103 Control switch placed in LOCAL START
9b	Monitor D/G voltage AND HOT ENGINE light **Cue:** DG 103 HOT ENGINE light is extinguished, DG 103 voltage is normal.	P	SAT / UNSAT **STD:** D/G 103 voltage AND HOT ENGINE light monitored
10.	Proceed to Diesel Generator/PB rooms (TB 261')	P	SAT / UNSAT **STD:** Travels to Diesel Generator Room 102 (TB 261' East)
11.	IF D/G loaded due to Loss of Offsite Power (LOOP), THEN:		
11a	Place D/G Control in LOCAL **Note:** D/G Control switch is labeled "REMOTE AUTO" and "LOCAL START".	S	**PASS / FAIL** **STD:** D/G 102 Control switch placed in LOCAL START
11b	Monitor D/G voltage AND HOT ENGINE light **Cue:** DG 102 HOT ENGINE light is **LIT**, DG 102 voltage is normal.	P	SAT / UNSAT **STD:** D/G 102 voltage AND HOT ENGINE light monitored
12.	IF D/G Control Circuit damage detected as indicated by HOT ENGINE light illuminated, THEN notify CRS and shutdown EDG 102 as follows:	S	SAT / UNSAT **STD:** CRS notified

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
12a	Close 96-82, Air Shutoff Ahead Flex Conn. to Diesel 102 **Cue:** Indicated valve is closed.	S	**PASS / FAIL** **STD:** 96-82, Air Shutoff Ahead Flex Conn, to Diesel 102 closed
12b	Depress red RESET AND FAST STOP pushbutton **Cue:** Indicated pushbutton depressed, EDG 102 rpm lowered to 0, area noise level lowered.	S	**PASS / FAIL** **STD:** Red RESET AND FAST STOP pushbutton depressed
12c	Verify tripped R1022, D/G Output Bkr (PB102) **Cue:** R1022 breaker green light ON and red light OFF.	S	SAT / UNSAT **STD:** R1022, D/G Output Bkr (PB102) verified tripped by observing local indication
12d	Pull CLOSE fuses, R1022 D/G Output Bkr (PB102) **Cue:** Another Operator has pulled the CLOSE fuses	S	SAT / UNSAT **STD:** Proper communications used
13.	Report OATC actions are complete		SAT / UNSAT
Evaluators Note:	**Cue:** *Your task is complete.*		

TERMINATING CUE	OATC actions of N1-SOP-21.2 are complete.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • You are the OATC. • A Control Room Evacuation has been ordered due to a fire. • The Reactor has been scrammed and all control rods are fully inserted. • The Main Turbine has just been tripped. • Feedwater Pump 13 could NOT be disengaged from the control room. • Powerboard 11 and 12 are energized.

INITIATING CUE	**(Operators Name)**, perform OATC actions of N1-SOP-21.2, Control Room Evacuation, starting at ⬇C."

Exelon Generation

Training Id: **2015 NRC JPM P-3** Revision: **0.0**

Title: **Emergency Condenser Initiation From the Remote Shutdown Panel (Alternate Path)**

Approvals:

	Signature / Printed Name	Date
Developed By	/Paul Isham	03/07/2014
Validated By	/ Leigh Mason	08/19/2014
Facility Reviewer	GREG ELKINS	2/13/15

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, Attachment 20
2. NUREG 1123 K/A 295016 AA1.09, (4.0/4.0)

Instructor Information

A. JPM Information

1. Description

   a. This JPM tests the operator's ability to initiate Emergency Condensers from outside the control room in the event of Control Room Abandonment.

   b. This JPM is considered alternate path due to a failure of the automatic EC level control. This requires executing an override step that would not normally be necessary to complete the task.

2. Task Information:

   a. N1-207000-01019

   b. K/A 295016 AA1.09, (4.0/4.0)

3. Evaluation / Task Criteria

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

4. Recommended Start Location

   a. Unit 1 Turbine Building Elevation 261'

5. Simulator Setup (if required)

   a. N/A

6. JPM Setup (if required)

   a. Provide a copy of N1-SOP-21.2, Control Room Evacuation.

B. Read Before Every JPM Performance

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

C. Read Before Each Evaluated JPM

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

INITIAL CONDITIONS	Given: • A control room evacuation has occurred • All control room actions were completed • All control rods are in • RPV Pressure is 900 psig and slowly rising • RPV Level is 72" and stable • The Remote Shutdown Keys (VA-1) have been obtained • You are the CRO • Offsite Power is available • FW and CRD are available • Other operators are performing the manual vessel isolation and removing ERV fuses **Evaluator:** *Ask trainee if he/she has any questions after presenting initial conditions*

INITIATING CUE	**(Operators Name)**, Place Emergency Cooling Loop 11 in service in accordance with N1-SOP-21.2 CRS/CRO actions and commence normal RPV cooldown.

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 obtained and reviewed.
3.	Go to Remote Shutdown Panel #11 **Cue:** The EC System has NOT isolated	P	SAT / UNSAT **STD:** Proceed to RSP 11, TB 250' South

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
4.	Place the Channel 11 CONTROL TRANSFER keylock switch in EMERG position to transfer control to the RSP.	S	**PASS/FAIL** **STD:** Rotate the control switch to the emergency position
5.	Verify open 39-07 and 39-09 **Cue:** 39-07 and 39-09 are open (if necessary).	S	SAT / UNSAT **STD:** Observe red lights on, green lights off.
6.	Control RPV cooldown by cycling open and closed 39-05, EMERGENCY CONDENSER COND RTN IV 11 **Cue:** 39-05 is open. Reactor Pressure is 900 psig and slowly lowering. RPV water level is 72" and stable.	S	**PASS/FAIL** **STD:** Rotate control switch for valve 39-05 CW to the open position, observe red light energized, green light out.
	Note: The following cue indicates that AUTO shell level control has failed. **Cue:** If the candidate references EC shell water level indicator, inform them that EC shell water level is 5.5' and slowly lowering		
7.	Place EC 111/112 Level Control Transfer Switch to Local	S	**PASS/FAIL** **STD:** Rotate control switch CW to the Local position.
8.	Verify AUTO control by observing "A" on status panel **Cue:** EC shell water level is 5.0' and slowly lowering.	S	SAT / UNSAT **STD:** Observe "A" illuminated on status panel
9.	Depress A/M key pad	S	**PASS/FAIL** **STD:** Manual mode selected by depressing the A/M key pad

	PERFORMANCE	ACT. CODE P / S / NA	EVALUATOR
10.	Verify M is displayed **Cue:** M is illuminated	S	SAT / UNSAT **STD:** Observe "M" is illuminated on status panel
11.	Control level by depressing arrows on key pad **Cue:** EC Condenser Shell is 6.4' and stable. Reactor Pressure is 850 psig and slowly lowering.	S	**PASS/FAIL** **STD:** Level is raised in the EC Condenser Shell by depressing the key pad arrows.
12.	Report that #11 EC Condenser in service and EC shell level control is in manual.	P	SAT / UNSAT **STD:** Proper communications used. (GAP-OPS-01)
Evaluator Note:	**Cue:** Your task is complete.		

TERMINATING CUE	Emergency Cooling Loop 11 placed in service in accordance with N1-SOP-21.2, and EC Shell level is controlled in manual.

STOP TIME	

JPM Handout

INITIAL CONDITIONS	Given: • A control room evacuation has occurred • All control room actions were completed • All control rods are in • RPV Pressure is 900 psig and slowly rising • RPV Level is 72" and stable • The Remote Shutdown Keys (VA-1) have been obtained • You are the CRO • Offsite Power is available • FW and CRD are available • Other operators are performing the manual vessel isolation and removing ERV fuses

INITIATING CUE	**(Operators Name)**, Place Emergency Cooling Loop 11 in service in accordance with N1-SOP-21.2 CRS/CRO actions and commence normal RPV cooldown.

Exelon Generation®

Copy ____ of ____

Training Id: **NRC 2015 Scenario 2** Revision: **0.1**

Title: **Recirc Flow Unit Failure, EC Initiation, Fuel Failure, Un-isolable MSL Break, PB 12 Fails to Fast Transfer, FW Pump 11 Trip, Turbine Building Ventilation Trips**

	Signature / Printed Name	Date
Developed By	Paul Isham	6/2/14
Validated By	Pat O'Brien	8/20/14
	Leigh Mason	8/20/14
	Dave Ballard	8/20/14
Facility Reviewer	Greg Elkins	2/13/15

References

1. N1-OP-19, Circulating Water System
2. N1-OP-1, NSSS
3. N1-SOP-1, Reactor Scram
4. N1-SOP-1.1, Emergency Power Reduction
5. N1-SOP-25.2, Fuel Failure or High Activity in Reactor Coolant or Off Gas
6. N1-SOP-30.2, Loss of PB 12
7. N1-EOP-1, NMP1 EOP Support Procedure
8. N1-EOP-2, RPV Control
9. N1-EOP-6, Radioactivity Release Control
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 50-55% power. Containment Spray pump 112 and Reactor Building Exhaust Fan 12 are 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.

Then, Recirculation flow unit 11 fails upscale. The crew will respond per the alarm response procedure and the CRS will determine the Tech Spec impact.

Then, an inadvertent EC initiation occurs. The crew will respond to isolate the EC and the CRS will determine the Tech Spec impact.

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)**.

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

2. Critical Tasks

CT-1, Given fuel failure causing Main Steam Line radiation levels to approach and/or exceed 3.75 times normal full power background, scram the Reactor, 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.*

CT-2, Given an un-isolable primary system discharging outside of primary and secondary containments and off-site release rate approaching the General Emergency level, perform an RPV Blowdown, 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.*

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 3.6.2.a and g

   b. TS 3.1.3.b

6. EAL Classification

   a. Site Area Emergency EAL RS1.2 – >100mRem TEDE at site boundary

7. Special Orders

   a. None

B. Initial Conditions

1. IC Number

   a. IC-152

2. Presets / With Triggers

   a. Malfunctions

1)	**CT01B,** CT Pump 112 Trip	**Inserted**
2)	**HV01B,** Reactor Building Exhaust Fan Trip 12	**Inserted**
3)	**ED27,** PB 12 Auto Transfer Failure	**Inserted**
4)	**NM36A,** RECIRC FLOW CONVERTER CHANNEL 11 FAILURE - UPSCALE	**TRG 1**
5)	**EC03B,** EC RETURN VALVE FAILS OPEN(IV 39-06)	**TRG 2**
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)	**FW03A,** FEEDWATER PUMP TRIP 11	**Inserted**
9)	**MS13A,** MSIV FAILS OPEN MS01-01(111), FV=10%	**Inserted**
10)	**MS13C,** MSIV FAILS OPEN MS01-03(112), FV=10%	**Inserted**

   b. Remotes

1)	**ED40A,** I&C Bus 130 NC Supply Breaker from IC XFMR (PB13B), Open	**TRG 15**
2)	**ED40B,** I&C Bus 130 NO Supply Breaker from PB 167A, Closed, DT=5sec	**TRG 15**

   c. Overrides

1)	**11S30DI54110**, POS_1 1L9/203-01A POS A, FV=on, DT=2:00	**TRG 5**
2)	**11S30DI54111**, POS_2 1L9/203-01A POS C, FV=off, DT=2:00	**TRG 5**

(Turbine Building Ventilation exhaust fan 11 trips)

3)	**11S31DI54112**, POS_1 1L9/203-01A POS A, FV=on, DT=1:00	**TRG 6**
4)	**11S31DI54113**, 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 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

f. Equipment Out of Service

1) Containment Spray Pump 112 in PTL with yellow tag
2) Containment Spray suction isolation valve 112 closed with yellow tag
3) Reactor Building Exhaust Fan 12 secured with yellow tag
4) Circulating Water Pump 11 secured with no tag

g. Support Documentation

1) RMI 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) Update Divisional Status Board
4) DW Cooling Fan 11 secured

SHIFT TURNOVER INFORMATION

ON COMING SHIFT: ☐ N ■ D DATE: Today

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

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

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

- LCO Status (SRO)
- Shift Turnover Information Sheet

Evolutions/General Information/Equipment Status:

- Reactor power is approximately 55%.
- Containment Spray pump 112 is out of service for maintenance (Day 1 of planned 2 day window; 15 day LCO per TS 3.3.7.b).
- Reactor Building Exhaust Fan 12 is out of service for maintenance.

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.2.11, it is desired to stop both Circulating Water Priming pumps. A Plant Operator is standing by in the screen house.
- Continue Reactor power ascension with Recirculation flow per the provided RMI and N1-OP-43B. N1-OP-43B Section F.3.0 is in progress.

ATTACHMENT 2: REACTIVITY MANEUVER INSTRUCTION

Reactivity Maneuver: Power Ascension from 55% **Step:** 1

INITIAL CONDITIONS/STEP DESCRIPTION

RE presence required in the Control Room? Yes___ No_✓_
If YES above, RE presence not required for steps ___.

Initial conditions to be verified prior to initiation of step:

Parameter	Expected Range	Actual	Parameter	Expected Range	Actual
CTP	1030-1070 MWth				

Description of Step:

Raise Reactor power to approximately 65% with Recirculation flow per N1-OP-43B.

Critical parameters to be monitored DURING Step:
Critical parameters not used must be deleted OR marked N/A

Critical Parameter	Limit	Owner	Frequency	Contingency
Recirc Flow	67.5 Mlbm/hr	RO	Continuous	Stop evolution and consult RE.
CTP	1850 MWth	RO	Continuous	Lower power to less than 1850 MWth with Recirculation flow.
Rod line	108%	RO	15 minutes	Stop evolution and consult RE.

RMI evaluated against approved power profile: ■ N/A □.

Other Comments:

Step Prepared by: *Alex Reed* / Today (RE/STA / Date) Step Reviewed by: Jack Dean / Today (RE/STA/SRO / Date)

Approval to perform Step John Aaron / Today (Shift Manager / Date) Step Completed by: _____ / _____ (SRO / Date)

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 55% 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 RMI

	SRO • Directs power ascension with Recirculation flow in accordance with N1-OP-43B and the Reactivity Maneuver Instruction (RMI) • Provides oversight of reactivity maneuver
Note: 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

Note:
Recommend initiating the next event when Reactor power is between 55-60% 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: Recirculation Flow Unit Fails Upscale

Event Information	• Recirc flow unit 11 fails upscale. • Crew responds per ARP F2-2-6 – no manipulations made. • CRS makes Tech Spec determination.

When directed by lead examiner, **insert malfunction**: **NM36A,** RECIRC FLOW CONVERTER CHANNEL 11 FAILURE- UPSCALE **TRG 1** *Comparator trip occurs resulting in a Rod Block.* *The "FLOW COMPARATOR" lamps on the Rod Block Display (PANEL E) will light.* *The upscale light on Flow Converter 11 (G Panel) will light* *Expected Annunciators:* *F2-2-6, APRM FLOW UNIT 11* *F3-2-1, APRM FLOW UNIT 12* *F3-4-4, ROD BLOCK*	**CREW** • Recognize/report Recirculation flow unit 11 failed upscale
	SRO • Acknowledges reports from crew • Directs response with ARP F2-2-6 • Consults Tech Spec Tables 3.6.2.a and 3.6.2.g • Declares APRMs 11-14 inoperable for the upscale scram and rod block functions • Determines a half scram must be placed on RPS channel 11 within 1 hour • Contacts I&C Department for troubleshooting
	ATC • Verifies proper power to flow ratio on Power Flow Map on E Panel

Event 3 continued	**BOP** • Executes ARP F2-2-6 • Confirms alarm by observing the following: o Computer Printout o APRM Flow Comparator on G Panel o LPRM/APRM Trip Auxiliary Panels on G Panel o Rod Block Monitor on E Panel

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 • CRS 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.	**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: o 39-08R EC STM ISOLATION VALVE 122, and/or o 39-10R EC STM ISOLATION VALVE 121

Events #5 and #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 fast 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:** Emergency Condenser 12 is inoperable from a previous event, however, it is still available for pressure control if the crew opts to use it. **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
 	
Note: All CRAM rods are already inserted and E Console indication of recirc flow is lost due to earlier malfunctions, thus limiting the ability of N1-SOP-1.1.
	ATC
	• If directed, performs emergency power reduction per N1-SOP-1.1
	• **Places Mode Switch in Shutdown** **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

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.	**BOP** • 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 CRS/Crew of rising Main Steam Line Radiation Monitor levels • Notifies CRS if MSL Rad Monitors approach/exceed 3.75 X Normal Full Power Background (NFPB)

Event 5 & 6 continued
 	
Note:
High pressure Feedwater will be unavailable until Powerboard 12 is re-energized.
	BOP continued
	• 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

Note:
At the examiner's discretion, move on to next event when PB 12 has been re-energized.
	ATC/BOP
	• Executes N1-SOP-30.2
	
	N1-SOP-30.2 Actions:
	• 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, and #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:**

11S30DI54110, POS_1 1L9/203-01A POS A, FV=on, DT=2:00

11S30DI54111, 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

Events 7, 8, & 9 continued Verify the following **overrides** are **automatically inserted** when Turbine Building exhaust fan 12 is started: **TRG 6** **11S31DI54112, POS_1 1L9/203-01A POS A, DT=30, FV=on, DT=1:00** **11S31DI54113, 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*	

Events 7, 8, & 9 continued **Role Plays:** When the crew has determined both Turbine Building exhaust fans are inoperable, or when requested as RP/Chemistry to assess dose, wait 2 minutes then report as Off-Site Dose Assessment Manager that dose at the site boundary is 50 mr/hr TEDE and rising. Three minutes later, report that dose at the site boundary is 500 mrem TEDE and rising. **Evaluator Cue:** After the report is made to the crew that dose at the site boundary exceeds 100mrem TEDE, inform the CRS that the Shift Manager is declaring a Site Area Emergency per EAL RS1.2 due to offsite release rate. Three minutes after previous field report, report that dose at the site boundary is 800 mrem TEDE and rising. Three minutes later, report that dose at the site boundary is 950 mrem TEDE and rising. Three minutes later, report that dose at the site boundary is 1100 mrem TEDE and rising. 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.	**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 • May direct rapid depressurization with Emergency Condenser 11 >100°F/hr • Determines off-site release rate is approaching the General Emergency level • Enters N1-EOP-8, RPV Blowdown • Directs initiation of EC 11 • **Directs open 4 ERVs** **CT-2**

	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 Condenser 11 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 • **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

Exelon Generation®

Copy ____ of ____

Training Id: **NRC 2015 Scenario 3** Revision: **0.1**

Title: **Condensate Pump S/D, Sequence Exchange, MSL Rad Monitor Failure, RBCLC TCV Failure, RPS MG Set Trip, Instrument Air Leak, ATWS, Feedwater IVs Stick**

	Signature / Printed Name	Date
Developed By	/Paul Isham	6/2/14
Validated By	Pat O'Brien	8/20/14
	Leigh Mason	8/20/14
	Dave Ballard	8/20/14
Facility Reviewer	Greg Elkins	2/13/15

References

1. N1-OP-5, Control Rod Drive System
2. N1-OP-15A, Condensate System
3. N1-OP-48, Motor Generator Sets
4. N1-SOP-11.1, RBCLC Failure
5. N1-SOP-1, Reactor Scram
6. N1-SOP-16.1, Feedwater System Failures
7. N1-SOP-20.1, Instrument Air Failure
8. N1-EOP-2, RPV Control
9. N1-EOP-3, Failure to Scram
10. N1-EOP-1, NMP1 EOP Support Procedure
11. Unit 1 Technical Specifications

Instructor Information

A. Scenario Description

Sequence of Events / Expected Crew Response:

The crew assumes the shift at approximately 85% power. Containment Spray pump 112 and Reactor Building Exhaust Fan 12 are 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.

After the pump has been removed from service, the crew will conduct a rod pattern exchange. During the rod pattern exchange, a Main Steam Line Rad monitor will fail inoperable. The SRO will address Tech Specs.

Next, the Reactor Building Closed Loop Cooling (RBCLC) Temperature Controller will fail such that RBCLC temperatures rise. This failure will require placing the RBCLC controller in manual and restoring the effected equipment to normal temperatures.

Then, RPS MG set 141 will trip. The crew will enter SOP-16.1 due to the resulting partial loss of Feedwater heating. The crew must recover the RPS trip bus by shifting to its alternate supply. 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**).

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 lowering CRD system air pressure, the crew will insert a manual reactor scram before control rods begin drifting, in accordance with N1-ARP-F3 and/or N1-SOP-20.1.

Justification:

Safety Significance: *Lowering CRD system air pressure can result in various rods drifting to unpredictable locations in the core. This can lead to an unanalyzed rod pattern and localized power peaking resulting in fuel damage.*

Cueing: *Annunciators on L1 and F3 will provide indication for lowering plant air pressures. Procedures direct inserting a manual reactor scram for lowering CRD system air pressure.*

Measurable Performance Indicators: *Inserting a manual reactor scram will provide observable actions for the evaluation team*

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

CT-2, Given a failure of the reactor to scram with power above 6% and RPV water level above -41 inches, the crew will terminate and prevent all injection except boron and CRD, in accordance with N1-EOP-3.

Justification:

Safety Significance: *High Reactor power after a scram 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.*

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

Justification:

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

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

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.*

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 3.1.8 (b), TS 3.6.2 (h)

6. EAL Classification

   a. Site Area Emergency per EAL SS3.1 - An automatic Scram failed to shut down the reactor as indicated by reactor power >6% AND Manual 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-153

2. Presets / With Triggers

   a. Malfunctions

1)	**CT01B,** CT Pump 112 Trip	**Inserted**
2)	**HV01B,** Reactor Building Exhaust Fan Trip 12	**Inserted**
3)	**RM51A,** PRM Steam Line Rad Mon 111, Norm Malfunction, FV=0	**TRG 1**
4)	**CW19,** RBCLC Temperature Controller Failure, FV=minimum cooling	**TRG 2**
5)	**RP01B,** Reactor Trip Bus Motor Generator Trips 141	**TRG 4**
6)	**RD34,** Loss of CRD Instrument Air Pres., RT=5:00, FV=20	**TRG 6**
7)	**IA01,** Loss of Instrument Air, RT=5:00, FV=40	**TRG 6**
8)	**RD33A,** Control Rod Bank Blocked Bank 1, FV=12	**Inserted**
9)	**RD33B,** Control Rod Bank Blocked Bank 2, FV=12	**Inserted**
10)	**RD33C,** Control Rod Bank Blocked Bank 3, FV=18	**Inserted**
11)	**RD33D,** Control Rod Bank Blocked Bank 4, FV=12	**Inserted**
12)	**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)	**RP02,** Rx Trip Bus 141 Pwr Source, FV=maint	**TRG 27**
3)	**MS05,** FW Htr String 12 Reset, FV=reset	**TRG 30**
4)	**MS02,** HP FW Htr 125 Reset, FV=reset	**TRG 30**
5)	**FW24,** Removal of HPCI Fuses FU8/FU9, FV=pulled	**TRG 23**

c. Overrides

1) **OVR-5s5di307** POS_1 1F10/31-03A PULL OU, On (FWIV Failure) **Inserted**

2) **OVR-5s6di3010** 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 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 n15scen3trg20.bat

f. Equipment Out of Service

1) Containment Spray Pump 112 in PTL with yellow tag

2) Containment Spray suction isolation valve 112 closed with yellow tag

3) Reactor Build Exhaust Fan 12 secured with yellow tag

g. Support Documentation

1) N1-OP-15A section H.9.0, completed through step 9.3

2) RMI and Rod Movement Sheets for sequence exchange

h. Miscellaneous

1) Protect the following equipment: EDG 103, PB 103

2) Update Divisional Status Board

3) Secure DW Cooling fan 11

4) Ensure batch file "n15scen3trg20.bat" is in the root batch file directory with the following commands:
   a. dmf rd33a
   b. dmf rd33b
   c. dmf rd33c
   d. dmf rd33d
   e. dmf rd33e

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%.
- A rod sequence exchange is in progress and has been placed on hold due to an oil leak from Condensate pump 11 motor.
- Containment Spray pump 112 is out of service for maintenance (Day 1 of planned 2 day window; 15 day LCO per TS 3.3.7.b).
- Reactor Building Exhaust Fan 12 is out of service for maintenance.

PART III: Remarks/Planned Evolutions:

- Shutdown Condensate pump 11 per N1-OP-15A section H.9.0. Then place the control switch in PTL.
- Continue the Control Rod Sequence Exchange per RMI.

ATTACHMENT 2: REACTIVITY MANEUVER INSTRUCTION

Reactivity Maneuver: Rod Sequence Exchange **Step:** 1

INITIAL CONDITIONS/STEP DESCRIPTION

RE presence required in the Control Room? Yes___ No__✓__
If YES above, RE presence not required for steps ____.

Initial conditions to be verified prior to initiation of step:

Parameter	Expected Range	Actual
Recirc Flow	54 - 58 Mlbm/hr	56 Mlbm/hr

Parameter	Expected Range	Actual

Description of Step:

Complete attached rod movement sheets.

Critical parameters to be monitored DURING Step:
Critical parameters not used must be deleted OR marked N/A

Critical Parameter	Limit	Owner	Frequency	Contingency
CTP	1850 MWth	RO	Continuous	Lower recirculation flow or insert last notch

RMI evaluated against approved power profile: ■ N/A □.

Other Comments:

Power may rise to as high as 90% on highest reading APRM by the end of the rod withdrawals.

Step Prepared by: *Alex Reed* / Today (RE/STA / Date) Step Reviewed by: *Jack Dean* / Today (RE/STA/SRO / Date)

Approval to perform Step *John Aaron* / Today (Shift Manager / Date) Step Completed by: _____ / _____ (SRO / Date)

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Insert

NMP1 ROD MOVEMENT SHEET

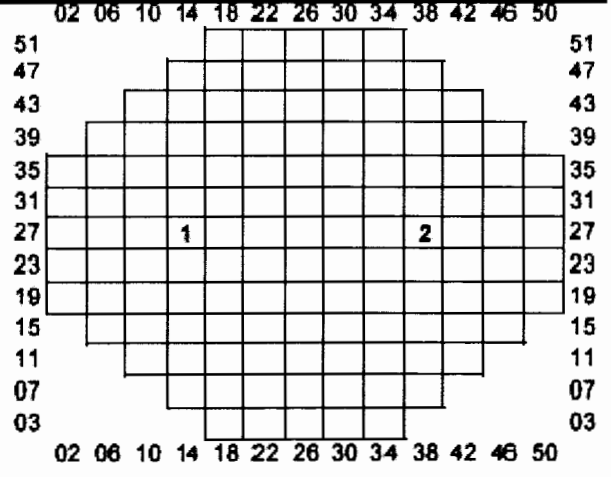
Step: 1

Page: 1 of 3

FROM: 48	TO: 12

Control Rod	From	Initials / To	Move Complete	NI Check (as Expected)	Coupling Check	Full Out Light	Comments
14-27	48	12	PFI	√	N/A	N/A	
38-27	48	12	PFI	√	N/A	N/A	

Additional Qualified Individual confirms rod position by reselecting rods or by using OD-7 printout	PFI



Prepared by Alex Reed Date Today

Verified by Jake Darrow Date Today

Insert

NMP1 ROD MOVEMENT SHEET

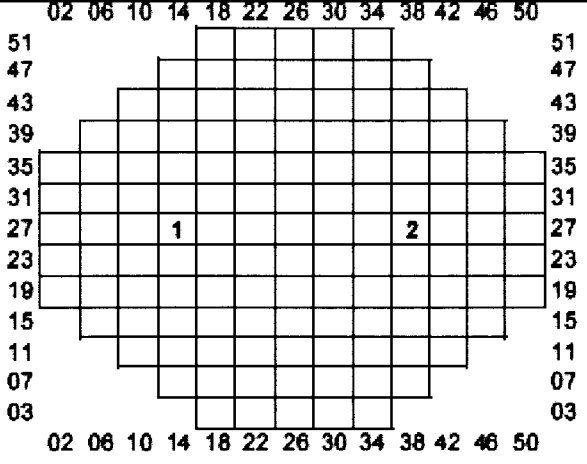
Step: 1

Page: 2 of 3

FROM: 12	TO: 08

Control Rod	From	Initials / To	Move Complete	NI Check (as Expected)	Coupling Check	Full Out Light	Comments
14-27	12	08			N/A	N/A	
38-27	12	08			N/A	N/A	

Additional Qualified Individual confirms rod position by reselecting rods or by using OD-7 printout



Prepared by Alex Reed Date Today

Verified by Jake Darrow Date Today

Withdrawal

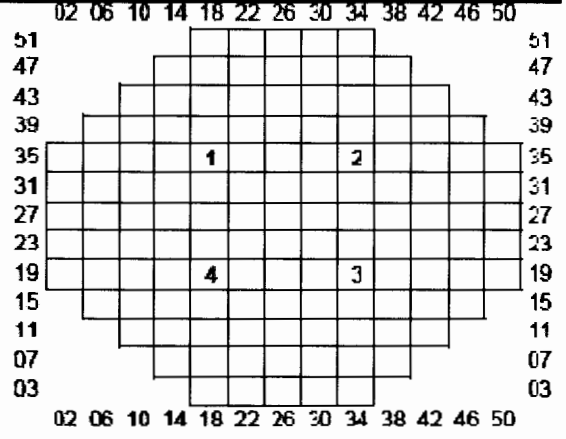
NMP1 ROD MOVEMENT SHEET

Step:_ 1
Page:_ 3 of 3

FROM: 04	TO: 08

Control Rod	From	Initials / To	Move Complete	NI Check (as Expectec)	Coupling Check	Full Out Ligh:	Comments
18-35	**04**	**08**			**N/A**	**N/A**	
34-35	**04**	**08**			**N/A**	**N/A**	
34-19	**04**	**08**			N/A	N/A	
18-19	**04**	**08**			N/A	N/A	

Additional Qualified Individual confirms rod position by reselecting rods or by using OD-7 printout



Prepared by Alex Reed Date Today

Verified by Jake Darrow Date Today

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 places 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
	RO • Monitors plant parameters

Role Play: 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.
 	
Role Play: 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).
 	
Role Play: 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
	• 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

Event #2: Rod Sequence Exchange

Event Information	• The crew will perform a rod sequence exchange

Note: Lead examiner may move to the next event once sufficient action is observed on the reactivity manipulation.	**SRO** • Directs performance of Control Rod Sequence Exchange per RMI and N1-OP-5 • Provides oversight for reactivity manipulation

Note: RMI includes rods 14-27, 38-27, 18-35, 34-35, 34-19, and 18-19	**RO**
	• Acknowledges direction from SRO
	• Obtains copy of RMI
	• 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

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

Event #3: Main Steam Line Radiation Monitor Failure

Event Information	• A MSL Rad monitor will fail inoperable • The CRS will address Tech Specs

When directed by the examiner, **insert malfunction**: **RM51A,** PRM Steam Line Rad Mon 111, Norm Malfunction, FV=0 **TRG 1** *Expected Annunciator:* *F1-2-7, MAIN STEAM RAD MONITOR CH 11 HI/LO*	**CREW** • Acknowledge/report Annunciator F1-2-7, MAIN STEAM RAD MONITOR CH 11 HI/LO • Diagnose failure of MSL Rad Monitor 111
Role Play: When requested to investigate the MSL rad monitor failure, report that you will begin an immediate investigation	**SRO** • Acknowledges report of MSL Rad Monitor alarm • Directs execution of ARP for F1-2-7 • Acknowledges MSL Rad Monitor has failed • Informs WEC, requests investigation of the failure • Enters TS Table 3.6.2.h (requires placing channel in the tripped condition within 12 hours or verifying Mechanical Vacuum pump isolated) • Briefs crew on failure of MSL Rad Monitor
	RO • Monitors plant parameters
	BOP • Executes ARP for F1-2-7 • Goes to back panel or checks PPC and determines the other MSL Rad Monitors indicate normal readings • Observes downscale light on MSL Rad Monitor Ch 11 and diagnoses the Monitor is INOP • Notifies crew MSL Rad Monitor Ch 11 is INOP

Event #4: RBCLC Temperature Control Valve Failure

Event Information	• RBCLC TCV fails to minimum cooling • Crew responds per N1-SOP-11.1

As directed by lead examiner, **insert malfunction**: **CW19,** RBCLC Temperature Controller Failure, FV=minimum cooling **TRG 2** *TCV 70-137 closes and bypass opens* *RBCLC water temperature rises* *Temperatures of components cooled by RBCLC rise* *Expected Annunciator:* *H1-4-1, R BUILDING COOLING WATER PRESS TEMP MAKEUP FLOW (~4.5 minutes)*	**CREW** • Recognize/report rising RBCLC temperatures • Diagnose failure of RBCLC automatic temperature control
	SRO • Acknowledges report of RBCLC TCV failure • Directs execution of ARP H1-4-1 • May direct entry into SOP-11.1, RBCLC Failure • Directs manual control of RBCLC temperature
	RO • Monitor plant parameters • Monitor RRPs and other components cooled by RBCLC

Event 4 continued
 	
Note:
Crew may recognize failure of TBCLC temperature controller prior to the annunciator alarming, and may take manual control without referencing the ARP.
	BOP
	• Executes ARP H1-4-1
	• May enter N1-SOP-11.1, RBCLC Failure
	• Monitors equipment cooled by RBCLC
	• Places RBCLC Temperature Controller 70-23B in manual (N1-OP-11, Section H.13 may be referenced)
	  • Depress the A/M Button until red LED is illuminated next to "M"
	  • Turns knurled knob as required to open/close RBCLC TCV
	• Manually adjust RBCLC Temperature Controller to maintain RBCLC temp between 57°F and 95°F

Event #5: RPS MG Set 141 Trip

Event Information	• RPS MG Set 141 trips causing a half scram on RPS 12.

As directed by the examiner, **insert malfunction**: **RP01B,** Reactor Trip Bus Motor Generator Trips 141 **TRG 4**	**CREW** • Recognize/report RPS 12 half scram • Diagnose trip of RPS MG set 141
Scram solenoid lights for RPS 12 de-energize *Feedwater temperature slowly lowers* *Reactor power slowly rises* *Expected annunciators: (Immediate)* *F4-3-2, RX. TRIP BUS M-G SET 141 TROUBLE* *F4-3-8, RPS CH 12 MAN REACTOR TRIP* *F4-2-8, RPS CH 12 AUTO REACTOR TRIP*	**SRO** • Acknowledges reports • Directs execution of ARP F4-3-2 • Directs entry into OP-48, H.5 • Directs entry into SOP-16.1 for loss of Feedwater heating • May direct emergency power reduction per SOP-1.1 if needed to control Feedwater temperatures or Reactor power • Provides oversight of reactivity changes
	RO • Monitors plant parameters • Lowers power per SOP-1.1 as required to control Feedwater temperatures or Reactor power • Resets half scram
Role Play: When dispatched as operator to investigate problem with MG Set 141, wait two minutes then report that you can smell burnt insulation in the vicinity of MG Set 141 motor. Report that the drive motor breaker tripped on overcurrent. If asked, report no overvoltage trip occurred.	**BOP** • Executes ARP F4-3-2 • Dispatches an operator to investigate MG Set 141 • Determines I & C Bus 130A is available • Obtains SRO permission to perform dead bus transfer of Reactor Trip Bus 141

Event 5 Continued **Role Play:** When dispatched as operator to transfer Reactor Trip Bus 141 to I&C Bus 130A, wait 2 minutes and **insert remote**: **RP02,** Rx Trip Bus 141 Pwr Source, FV=maint **TRG 27** Then report Reactor Trip Bus 141 has been re-energized from I&C Bus 130A, and that half scram and Feedwater heaters can be reset. **Role Play:** When dispatched as operator to reset Feedwater heaters, wait 2 minutes and **insert remotes**: **MS05,** FW Htr String 12 Reset, FV=reset **MS02,** HP FW Htr 125 Reset, FV=reset **TRG 30** Then report 12 Feedwater heaters have been reset.	**BOP Continued** • Dispatches an operator to perform dead bus transfer of Reactor Trip Bus 141 per OP-48 section H.5.0 • Enters SOP-16.1 due to loss of Feedwater heating • Monitors Feedwater temperatures • Acknowledges that Reactor Trip Bus 141 is re-energized • Coordinates with RO to reset half scram • Dispatches operator to reset Feedwater heaters

Event #6: 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=5:00, FV=40 **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* *CRD air pressure lowers – Reaches 60# at ~4 minutes* *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 CRD air pressure < 60 psig • **Directs manual Reactor scram (CT-1.0)** • Acknowledges scram report
	RO • Monitors plant parameters • **Places Mode Switch in SHUTDOWN (CT-1.0)** • 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 CRD air pressure • Reports when CRD air pressure lowers below 60 psig

Events #7 and #8: 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 7 and 8 continued	SRO Continued

	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-2.0)**
	• 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 7 and 8 continued	**SRO continued**
	EOP-3 Power Leg Actions:
	• 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-3.0)**
	• If power is oscillating more than 25% or before Torus temperature reaches 110°F:
	  • Records Liquid Poison tank level
	  • **Directs Liquid Poison injection (CT-3.0)**
	  • 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 7 and 8 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-3.0)**
	• 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-3.0)**

Events 7 and 8 continued
 	
Role Play: When directed as PO to pull HPCI fuses FU-8 and FU-9, wait one minute and **insert remote**:
 	
FW24, Removal of HPCI Fuses FU8/FU9, FV=pulled
TRG 23
 	
Then report that HPCI fuses FU-8 and FU-9 have been pulled
	BOP
	• Bypasses ADS
	• **Terminates and prevents all injection except boron and CRD per N1-EOP-1 Att 24 (CT-2.0):**
	  • 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 PO to remove fuses FU-8 and FU-9 from Panel IS34 in the Aux Control Room
	  • Verifies closed, FEEDWATER PUMP 13 BLOCKING VALVE
	  • Verifies in MAN, FWP 11 BYPASS VALVE, AND set to zero output
	  • Verifies in MAN, FWP 12 BYPASS VALVE, AND set to zero output
	• Informs SRO when RPV water level reaches -41 inches

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Copy ____ of ____

Training Id: **NRC 2015 Scenario 4** Revision: **0.0**

Title: **Restore RRP to Service, Loss of Reactor Building Ventilation, RRMG M/A Station Failure, Steam Line Break in the Drywell, Failure of HPCI, Containment Spray Pump Trip**

	Signature / Printed Name	Date
Developed By	Paul Isham	6/2/14
Validated By	Pat O'Brien	8/20/14
	Leigh Mason	8/20/14
	Dave Ballard	8/20/14
Facility Reviewer	Greg Elkins	2/13/15

References

N1-OP-1, Nuclear Steam Supply System

N1-OP-43B, Normal Power Operations

N1-OP-10, Reactor Building Heating, Cooling, and Ventilation System

N1-SOP-1.3, Recirc Pump Trip at Power

N1-SOP-1, Reactor Scram

N1-EOP-2, RPV Control

N1-EOP-4, Primary Containment Control

N1-EOP-5, Secondary Containment Control

N1-EOP-1, NMP1 EOP Support Procedure

N1-EOP-8, RPV Blowdown

Unit 1 Technical Specifications

Instructor Information

A. Scenario Description

Sequence of Events / Expected Crew Response:

The crew assumes the shift with the plant operating at 90% power and four recirculation loops in service. Containment Spray pump 112 and Reactor Building Exhaust Fan 12 are out of service for maintenance. Immediately after assuming the shift the crew will be directed to restore Recirculation Pump 11 to service and return to full power. The crew will assess plant conditions and lower power with Recirculation Flow until flow is less than 50 Mlbm/hr. They will then return Recirculation Pump 11 to service.

After the crew has placed the recirc pump in service, #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. Entry into N1-EOP-5, Secondary Containment Control is required. SRO determines the secondary containment TS is still satisfied.

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.

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 pump 111 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 water level controlled in assigned band, RPV Blowdown in progress, Primary Containment pressure controlled per N1-EOP-1 attachment 17

2. Critical Tasks

CT-1, 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

Justification:

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

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

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

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

CT-2, 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 below the Pressure Suppression Pressure limit, in accordance with N1-EOP-4.

Justification:

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

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

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

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

3. Length

   a. ~60 minutes

4. Mitigation Strategy Code
   a. PC4, RPV Blowdown due to PSP
5. Technical Specifications
   a. TS 3.2.5
   b. TS 3.6.2 Tables a and g
   c. TS 3.1.7.e
6. EAL Classification
   a. Alert, EAL FA1.1 – 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-154

2. Presets / With Triggers

   a. Malfunctions

1)	**CT01B,** CT Pump 112 Trip	**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=60	**TRG 3**
6)	**EC01,** Steam Supply Line Break in PC, FV=11	**TRG 5**
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)	**CS07,** CS Injection Valves Failure to Auto Open	**Inserted**

   b. Remotes

1)

   c. Overrides

None

   d. Annunciators

None

e. Event Triggers

Event #	Event Action	Command
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 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
TRG 25, Delete slot temperature rise malfunction when the recirc pump is secured.	zdrrmgpl(5)==1	dmf rr09e

f. Equipment Out of Service

1) Containment Spray Pump 112 in PTL with yellow tag
2) Containment Spray suction isolation valve 112 closed with yellow tag
3) Reactor Build Exhaust Fan 12 secured with yellow tag
4) Recirc Pump 11 secured, ready for start

g. Support Documentation

1) N1-OP-1 marked up through step H.4.4
2) N1-OP-43B marked up through step 2.6
3) RMI for lowering recirc flow to 50 Mlbm/hr

h. Miscellaneous

1) Protect the following equipment: EDG 103, PB 103
2) Update Divisional Status Board
3) Ensure LPRM downscale pushbuttons are depressed on rod block monitor
4) DW Cooling Fan 11 Secured

SHIFT TURNOVER INFORMATION

ON COMING SHIFT: ☐ N ■ D DATE: Today

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

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

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

- LCO Status (SRO)
- Shift Turnover Information Sheet

Evolutions/General Information/Equipment Status:

- Reactor power is approximately 90%.
- Containment Spray pump 112 is out of service for maintenance (Day 1 of planned 2 day window; 15 day LCO per TS 3.3.7.b).
- Reactor Building Exhaust Fan 12 is out of service for maintenance.
- RRP 11 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 11 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. N1-OP-43B signed off up to step 2.7.
- Reactor power is at 90% and must be lowered until recirc flow <50 Mlbm/hr to support starting RRP 11.
- After starting Recirc Pump 11 MG set, operate it on the master flow controller for one hour while maintenance takes readings before returning to 100% power.

ATTACHMENT 2: REACTIVITY MANEUVER INSTRUCTION

Reactivity Maneuver: Recirc Pump Restoration **Step:** 1

INITIAL CONDITIONS/STEP DESCRIPTION

RE presence required in the Control Room? Yes___ No__✓__
If YES above, RE presence not required for steps ____.

Initial conditions to be verified prior to initiation of step:

Parameter	Expected Range	Actual	Parameter	Expected Range	Actual
Recirc Flow	51-54 Mlbm/hr				

Description of Step:

1. Lower recirculation flow to 49-50 Mlbm/hr.
2. Start 11 RRP per N1-OP-1
3. Raise reactor Power to 98% with recirc flow
4. Raise reactor Power to 100% with recirc flow over one hour

Critical parameters to be monitored DURING Step:
Critical parameters not used must be deleted OR marked N/A

Critical Parameter	Limit	Owner	Frequency	Contingency
CTP	1850 MWth	RO	Continuous	Lower recirculation flow or insert cram rods

RMI evaluated against approved power profile: ■ N/A □.

Other Comments:

After Starting recirc pump 11 MG set and placing it on the master controller, operate it for 1 hour prior to returning to 100% power.

Step Prepared by: *Alex Reed* / Today Step Reviewed by: *Jack Dean* / Today
RE/STA Date RE/STA/SRO Date

Approval to perform Step *John Aaron* / Today Step Completed by: _____ / _____
Shift Manager Date SRO Date

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: Power Reduction with Recirc Flow for RRP Restoration

Event Information	• The crew will reduce reactor power with recirc flow in order to restore recirc pump 11 to service following repairs

Note: Reactivity brief and procedure review will be conducted prior to the crew entering the simulator.	**SRO** • Directs RO to lower core flow to <50 Mlbm/hr IAW RMI • Supervises reactivity maneuver
	RO • Reduces recirc flow IAW RMI • Continuously observes the following: - APRMs lowering - Recirc flow lowering - Steam and feedwater flow lowering - Vessel level normal • Lower recirc flow until <50 Mlbm/hr • Report when recirc flow is <50 Mlbm/hr
	BOP • Monitors individual RRP for response – Individual M/A-Speed Control stations trending uniformly – Individual RRP indications trending normally for lowering speed • Monitors feed water controls for proper response – FWP 13 FCV responding to power change • RPV Water Level remains within program band (65" - 83")

Event #2: Restore Recirc Pump 11 to Service

Event Information	• The plant is operating in 4 loop operation • The crew will restore RRP 11 to service

Note: Crew directed to start RRP 11 in pre-brief, starting at N1-OP-1, step H.4.5.	**SRO** • Direct start up of RRP 11, using N1-OP-1, starting at step H.4.5 • Supervise reactivity manipulation • Acknowledge report that RRP 11 is in service • Determine TS 3.1.7.e no longer applies and the LCO Actions can be exited
	RO • 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

Event 2 Continued
 	
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.
 	
Role Play: As PO sent to Aux Control Room, wait one minute then report you have reset 50SR Pump Motor Stalled Rotor Target
 	
Role Play: As PO, when requested report MG set oil temperature is 120°F and stable.
	BOP
	
	• Verify recirculation flow < 50 x 10^6 lb/hr
	• Verify RRP 11 GEMAC in MAN and matched with other four GEMACs but no greater than 50%
	• Verify RRP 11 discharge valve closed
	• Verify RRP 11 suction and discharge bypass valves are open
	• Make a plant announcement for start of RRP 11
	• Place RRP 11 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)
	• 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 PO to reset 50SR Pump Motor Stalled Rotor Target (Aux Control Room)
	• Dispatch PO 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 #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.
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). ii. Per SC-3, ensure RBEVS started and RB ventilation isolated • Determine that with the reactor building isolated and RBEVS running and maintaining reactor building negative pressure within the limit, entry into Tech Spec actions for Secondary Containment IS NOT REQUIRED. o TS 3.4.2 and TS 3.4.4 requirements are met

Event 3 Continued	**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
	  o Verify open 202-36, EM VENTILATION FROM REACTOR BLDG BV
	  o Verify closed 202-47, EM VENTILATION TIE BV
	  o Verify closed 202-74, EM VENTILATION LOOP 11 COOLING BV
	  o 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 o Place REACTOR BLDG SUPPLY FANS 11 and 12 in OFF o Place REACTOR BLDG EXHAUST FANS 11 and 12 in OFF o Place control switch for 202-31, REACTOR BLDG EXHAUST ISOLATION VALVE 12 and 202-32, REACTOR BLDG EXHAUST ISOLATION VALVE 11 in CLOSE o 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 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
	RO • 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=60 **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
	RO • 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

Role Play: 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.
 	
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.
 	
Note: 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 trip RR Pump 15:
	  • 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, removes 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, #7, and #8: Steam Leak Inside Drywell, Vacuum Breaker Fails Open, Failure of HPCI and Core Spray to Initiate, Trip of Containment Spray Pump 111

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 5** *Drywell humidity, pressure and temperature rise* *Drywell leakage rises* *Expected annunciators:* *H2-1-1, Drywell Floor Drain Level High* *H2-4-7, Drywell Water Leak Detection Sys* *K2-4-3, Drywell Pressure High-Low* *F1-1-5(4-1-4), RPS Ch 11(12) Drywell Press High* Verify the following **malfunctions** are **preset**: **FW28A,** HPCI Mode Failure to Initiate 11 **FW28B,** HPCI Mode Failure to Initiate 12 **CT01A,** CT Pump 111 Trip **CS07,** CS Injection Valves Failure to Auto Open *RPV water level slowly lowering* *Containment Spray pump 111 red light off, green light on and amps go to zero* *Core Spray IVs do NOT open at 365 psig* *Expected annunciator:* *K1-1-7, Containment Spray Pump 111 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 pump 111

Events 5, 6, 7, and 8 continued 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-1** • 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 o 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**

	• 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 pump 111 trip
	• May direct rapid depressurization with ECs in anticipation of RPV Blowdown
	• Determines Torus pressure cannot be maintained within Pressure Suppression Pressure limit
	• **Enters N1-EOP-8, RPV Blowdown**
	CT-2
	  • 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

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.	

Events 5, 6, 7, and 8 continued	**RO**
	• Monitors plant parameters
	• When directed, places Mode Switch in Shutdown
	• Provides scram report
	• Performs N1-SOP-1, Reactor Scram, scram verification actions
	  • Places IRMs on range 9
	  • Inserts IRM and SRM detectors
	  • Down-ranges IRMs as necessary to monitor power decrease
	  • If recirc pumps have not yet tripped, reduces recirc flow to 25-43 Mlbm/hr
	  • Maintains RPV pressure below 1080 psig and in assigned band

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

Events 7, 8, and 9 continued
 	
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.
	RO/BOP
	• Places Containment Spray pumps in PTL
	• Closes MSIVs, as directed
	• Reports when Torus pressure exceeds 13 psig or Drywell temperature approaches 300°F
	• Verifies Recirc pumps tripped
	• Trips Drywell cooling fans
	• Initiates Containment Spray per N1-EOP-1 attachment 17
	  • Diagnoses/reports Containment Spray pump 111 trip
	  • Verifies started Containment Spray pumps 121 and 122
	  • If 80-118 is open for Torus Cooling:
	  • Opens 80-35
	  • Closes 80-118
	  • Verifies open 80-40 and 80-45
	• Prevents Core Spray injection installing EOP-1 attachment 4 jumpers (17, 18, 19, 24, 25, 26), if directed
	• Initiates both ECs
	• **Opens 4 ERVs**
	
	CT-2

Event Termination Criteria	• RPV Blowdown in progress • Primary Containment pressure controlled per N1-EOP-1 attachment 17

Exelon Generation®

Copy ____ of ____

Training Id: **NRC 2015 Scenario 5** Revision: **0.0**

Title: **ERV Inadvertently Opens, Powerboard 16A Fault, Loss of All RBCLC, Loss of High Pressure Feedwater, Coolant Leak Inside Primary Containment, RPV Flooding**

	Signature / Printed Name	Date
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References

1. N1-OP-33A, 115 KV System
2. N1-SOP-1.4, Stuck Open ERV
3. N1-SOP-1.1, Emergency Power Reduction
4. N1-SOP-11.1, RBCLC Failure
5. N1-SOP-1, Reactor Scram
6. N1-EOP-2, RPV Control
7. N1-EOP-4, Primary Containment Control
8. N1-EOP-1, NMP1 EOP Support Procedure
9. N1-EOP-7, RPV Flooding
10. Unit 1 Technical Specifications

Instructor Information

A. Scenario Description

Sequence of Events / Expected Crew Response:

The scenario begins at approximately 100% power. Containment Spray pump 112 and Reactor Building Exhaust Fan 12 are out of service for maintenance. The crew will remove Line 4 from service for maintenance. The CRS will determine the Tech Spec impact.

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

Next, Powerboard 16A will develop an electrical fault. This will cause a loss of power to three Drywell cooling fans. The crew will start an additional Drywell cooling fan to stabilize Drywell temperature and pressure. The electrical loss will also affect EDG 103 auxiliary equipment. The CRS will determine the Tech Spec impact.

Next, the running RBCLC pumps will trip. The standby RBCLC pump will trip upon being started. The crew will enter N1-SOP-11.1, RBCLC Failure. The crew will scram the Reactor, trip Recirculation pumps, initiate Emergency Condensers, and shut the MSIVs. The high pressure Feedwater pumps will fail to operate on the scram, complicating Reactor water level control.

Once the crew stabilizes the plant after the scram, a coolant leak will develop inside the Primary Containment. The crew will re-enter N1-EOP-2, RPV Control, and N1-EOP-4, Primary Containment Control. Containment parameters will degrade and the crew will initiate Containment Sprays **(Critical Task)**. The elevated Containment temperature will cause the Fuel Zone level indications to become erratic. With all other Reactor water level indicators downscale, the crew will execute N1-EOP-7, RPV Flooding, to lower Reactor pressure and flood the Reactor to the Main Steam lines **(Critical Task)**.

1. Termination Criteria

   a. RPV Flooding in progress
   b. Reactor water level on scale or upscale
   c. Containment pressure and temperature controlled in accordance with N1-EOP-4

2. Critical Tasks

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

Justification:

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

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

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

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

CT-2, Given a LOCA in the Drywell, 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.*

CT-3, Given the plant with RPV water level unknown, execute N1-EOP-7, RPV Flooding, in accordance with N1-EOP-2.

Justification:

Safety Significance: *With Reactor water level unknown, the status of core cooling is unknown. RPV flooding is required to establish conditions to cool the core. This protects the fuel cladding integrity.*

Cueing: *Multiple Reactor water level indications will indicate either downscale or invalid. N1-EOP-2 provides direction to implement N1-EOP-7, RPV Flooding.*

Measurable Performance Indicators: *Manipulation of ERVs, MSIVs, ECIVs, and injection system controls provide observable actions for the evaluation team.*

Performance Feedback: *ERV, MSIV, and ECIV position indications, Reactor pressure, ERV tailpipe temperatures, and ERV acoustic monitors provide performance feedback regarding success of RPV flooding actions.*

3. Length

   a. ~60 minutes

4. Mitigation Strategy Code

   a. RL4, loss of all RPV level indication (non-ATWS), RPV Blowdown, RPV Flooding.

5. Technical Specifications

   a. TS 3.6.3 (b)

   b. TS 3.1.5 (b)

6. EAL Classification

   a. Site Area Emergency per FS1.1 – Loss or potential loss of ANY two fission product barriers.

7. Special Orders

   a. None

B. Initial Conditions

1. IC Number

   a. IC-155

2. Presets / With Triggers

   a. Malfunctions

1)	**CT01B**, CT Pump 112 Trip	**Inserted**
2)	**HV01B,** Reactor Building Exhaust Fan Trip 12	**Inserted**
3)	**AD05**, ERV 111 Failure - Opens Inadvertently	**TRG 1**
4)	**ED12A**, PB 16A Electrical Fault	**TRG 3**
5)	**CW04A**, RBCLC Pump 11 Trip	**TRG 4**
6)	**CW04B**, RBCLC Pump 12 Trip	**TRG 4**
7)	**CW04C**, RBCLC Pump 13 Trip	**TRG 4**
8)	**FW03A**, FEEDWATER PUMP TRIP 11	**TRG 5**
9)	**FW03B**, FEEDWATER PUMP TRIP 12	**TRG 5**
10)	**FW06**, SHAFT DRIVEN FEEDWATER PUMP CLUTCH FAILS – DISENGAGES	**TRG 5**
11)	**CU01**, CU COOLANT LEAK INSIDE OF DRYWELL, FV=70, RT=5:00	**TRG 6**
12)	**EC01**, Steam Supply Line Break in PC, FV=5, RT=5:00	**TRG 6**
13)	**VICP20168_FE CP-201-68**, Fuel Zone Erratic Failure	**TRG 7**
14)	**VICP20169_FE CP-201-69**, Fuel Zone Erratic Failure	**TRG 7**

   b. Remotes

1)	**AD01A**, ERV 111 Fuses, FV=pulled	**TRG 27**
2)	**AD07**, Acoustic Monitor Alarm Reset, FV=reset	**TRG 28**
3)	**FW24.** Removal of HPCI Fuses FU8/FU9, FV = pulled	**TRG 9**

c. Overrides

1) **OVR-5M76AO3510 1F1/36-20** FV= -33.84 (LLL downscale indication) **TRG 7**

2) **OVR-5M75AO3500 1F1/36-19** FV= -33.84 (LLL downscale indication)

d. Annunciators

1) None

e. Event Triggers

Event #	Event Action	Command
TRG 5 - Activates on Reactor scram to insert loss of Feedwater.	zdrpstdn==1	**Blank**
TRG 7 – Activates on DW temp >200°F, LLL level below -20", and Containment Spray flow to Drywell >100 gpm to insert Fuel Zone erratic indication.	hzarrl19<0.075&&hzarrl20<0.075&&pctdw8 >200&&ctfdw>100	**Blank**

f. Equipment Out of Service

1) Containment Spray pump 112 in PTL with yellow tag

2) Containment Spray suction isolation valve 112 closed with yellow tag

3) Reactor Building Exhaust fan 12 OOS with yellow tag

g. Support Documentation

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

h. Miscellaneous

1) Ensure Drywell cooling fan 11 is secured with control switch in neutral.
2) Protect the following equipment: EDG102, EDG 103, PB 102, PB 103, Line 1, MOD 8106.
3) Update Divisional Status Board.

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%.
- Containment Spray pump 112 is out of service for maintenance (Day 1 of planned 2 day window; 15 day LCO per TS 3.3.7.b).
- Reactor Building Exhaust Fan 12 is out of service for maintenance.

PART III: Remarks/Planned Evolutions:

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

Shift Turnover

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

Event #1: Remove Line 4 From Service

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

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

Event Termination Criteria	• Line 4 removed from service

Event #2: ERV 111 Inadvertently Opens

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

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

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

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

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

Event #3: Powerboard 16A Electrical Fault

Event Information	• The plant experiences an electrical fault on PB 16A • The crew will take action to mitigate further degradation to the plant.

When directed by examiner, **insert malfunction**: **ED12A,** PB 16A Electrical Fault **TRG 3** *Three Drywell cooling fans de-energize* *Drywell pressure and temperature rise* *Spent Fuel Pool Cooling pump 11 trips* *RBCLC pump 11 trips* *Expected Annunciators:* *L4-3-6, DRYWELL COOLING FAN TRIP-VIB* *A4-3-1, POWER BD. 16 R1041 TRIP* *A4-4-2, POWER BD. 16 LOW BUS VOLTAGE* *L1-4-5, FUEL POOL ANNUNCIATOR*	**CREW** • Recognize/report loss of Powerboard 16A • Recognize/report trip of three Drywell cooling fans • Recognize/report trip of RBCLC pump 11 • Recognize/report Spent Fuel Pool trouble alarm
	SRO • Directs execution of ARPs • Directs start of Drywell cooling fan 11 • May direct lowering RBCLC temperature • May direct Reactor power reduction per N1-SOP-1.1 • If Drywell average temperature exceeds 150°F, enters N1-EOP-4 • Directs placing Containment Spray pumps in PTL • Directs entry into N1-SOP-6.1, Loss of SFP/Rx Cavity Level/Decay Heat Removal • May direct start of RBCLC pump 12

Event 3 continued	**ATC** • Monitors plant parameters • If directed, lowers Reactor power per N1-SOP-1.1
Role Play: If requested to investigate Powerboard 16A, wait 2 minutes, then report the feeder breaker is tripped and there is an acrid odor in the area. Electrical Maintenance does NOT recommend re-energizing Powerboard 16A. **Role Play:** If requested to investigate SFPC trouble, wait 2 minutes, then report SFPC pump 11 tripped. If directed to restore SFPC, acknowledge order, but delay any action for rest of scenario.	**BOP** • Executes ARPs • Dispatches operator/maintenance to investigate Powerboard 16A • Dispatches operator to investigate Spent Fuel Pool alarm • Acknowledges/reports Powerboard 16A is faulted • Starts Drywell cooling fan 11 • May green flags Drywell cooling fans 14, 15, and 16 • May start RBCLC pump 12 • May green flag RBCLC pump 11 • If directed, lowers RBCLC temperature per N1-OP-11: o Places RBCLC TCV in manual: o Depresses the A/M Button UNTIL red LED is illuminated next to "M" o Verifies 70-23B.V is displayed in the LED readout o IF 70-23B.V is NOT displayed, THEN depresses the "D" button UNTIL the display shows 70-23B.V o Adjusts RBCLC temperature as desired o May lower RBCLC TCV automatic setpoint per N1-OP-11 Section H.24.0

Event 3 continued	**BOP continued** o May place RBCLC TCV back in automatic: o Depresses the A/M Button UNTIL green LED is illuminated next to "A" o Verifies 70-23B.P is displayed in the LED readout o IF 70-23B.P is NOT displayed, THEN depresses the "D" button UNTIL the display shows 70-23B.P o Verifies TCV-70-137 is responding properly to automatic control • If directed, places Containment Spray pumps in PTL

Events #4 and #5 : All RBCLC Pumps Trip, Feedwater Pumps Fail to Operate

Event Information	• A trip of the running RBCLC pumps occurs with no standby pump available. • The crew will execute the override actions of N1-SOP-11.1. • A loss of all HP feed water occurs on the scram.

When directed by lead examiner, **insert malfunction**: **CW04A,** RBCLC Pump 11 Trip **CW04B,** RBCLC Pump 12 Trip **CW04C,** RBCLC Pump 13 Trip **TRG 4** *RBCLC pumps trip* *RBCLC pressure lowers* *RBCLC temperature* *Expected Annunciators:* *H1-1-1, REACTOR BLDG COOL PUMP 11 TRIP-V-SUCT* *H1-2-1, REACTOR BLDG COOL PUMP 12 TRIP-V-SUCT* *H1-3-1, REACTOR BLDG COOL PUMP 13 TRIP-V-SUCT* *H1-4-1, R BUILDING COOLING WATER PRESS TEMP MAKEUP FLOW* *K2-4-3, DRYWELL PRESSURE HIGH-LOW* *K3-4-4, CLEAN-UP SYSTEM ISOLATION*	**CREW** • Recognize/report trip of all RBCLC pumps • Later: o Recognize/report Feedwater pump 11 and 12 trips o Recognize/report Feedwater pump 13 disengages o Recognize/report low Reactor water level

Events 4 and 5 continued	**SRO**
Verify the following **malfunctions** are **automatically inserted** when the Reactor scrams: **FW03A,** FEEDWATER PUMP TRIP 11 **FW03B,** FEEDWATER PUMP TRIP 12 **FW06,** FW06, SHAFT DRIVEN FEEDWATER PUMP CLUTCH FAILS – DISENGAGES **TRG 5** *Feedwater pumps 11 and 12 trip immediately after starting, Feedwater pump 13 disengages* *Reactor water level remains lower than normal* *Expected Annunciators:* *H3-1-7, REACTOR FW PUMP 11 TRIP OVERLOAD SUCTION HI-LEVEL* *H3-2-7, REACTOR FW PUMP 12 TRIP OVERLOAD SUCTION HI-LEVEL* *H3-4-8, REACTOR FW SHAFT P13 CLUTCH TROUBLE* *F2-3-3, REACT VESSEL LEVEL HIGH-LOW* **Note:** Expected initial RPV water level control band is narrower (ex. 0" to 95").	• Acknowledges reports • Directs entry into N1-SOP-11.1 • Direct start of standby RBCLC pump • Acknowledges trip of all RBCLC pumps • Directs execution of override, including: o Manual Reactor scram o Trip Recirculation pumps o Initiate Emergency Condensers o Close MSIVs o Trip RWCU pump • Acknowledges scram report • Enters N1-EOP-2, RPV Control, on low RPV water level • Answers "Are all control rods inserted to at least position 04?" YES • Directs entry into N1-SOP-1, Reactor Scram • Acknowledges trip of Feedwater pumps • Directs RPV water level controlled between -84" and 95" using CRD and/or Liquid Poison • Directs RPV cooldown <100°F/hr using Emergency Condensers • Enters N1-EOP-4, Primary Containment Control, on high Drywell temperature o Directs lockout of Containment Spray pumps

Events 4 and 5 continued	**ATC** • Places Reactor Mode Switch to SHUTDOWN • Provides scram report • Performs scram verification actions of N1-SOP-1, Reactor Scram: • Confirms all rods inserted • Observes Reactor power lowering • Places IRMs on range 9 • Inserts IRM and SRM detectors • Down-ranges IRMs as necessary • Verifies main turbine and generator tripped • Controls RPV pressure as directed using Emergency Condensers
Note: Depending on timing, Lo-Lo Reactor water level may trip Recirculation pumps, initiate Emergency Condensers, and close MSIVs before operator action. **Note:** RWCU will likely trip on high temperature before operator action. **Note:** Recommend initiating next event shortly after the reactor is scrammed.	**BOP** • Executes N1-SOP-11.1 • Attempts to start standby RBCLC pump • Informs crew of need to execute override • Enters N1-SOP-1 • Informs crew of Feedwater pump trips and low Reactor water level • Trips Recirculation pumps • Initiates Emergency Condensers • Closes MSIVs • Verifies RWCU pump tripped • May maximize CRD flow by starting second CRD pump and/or taking FCV to manual and opening further • May start Liquid Poison • Places Containment Spray pumps in PTL

Events #6 and #7: Coolant Leak Inside Primary Containment and Fuel Zone Level Instrument Erratic Indication

Event Information	• A reactor coolant leak develops in the drywell • When containment parameters degrade sufficiently, fuel zone level instrumention will begin to give erratic indication and drive the crew into RPV Flooding.

When directed by examiner, **insert malfunctions**: **CU01,** CU Coolant Leak Inside of Drywell, RT=5:00, FV=70 **EC01,** Steam Supply Line Break in PC, RT=5:00, FV=5 **TRG 6** *Containment parameters degrade* *RPV water level lowers* *Expected annunciators:* *H2-4-7, DRYWELL WATER LEAK DETECTION SYS* *K2-4-3, DRYWELL PRESSURE HIGH-LOW* *L1-4-4, DRYWELL – TORUS TEMP HIGH* *F1-1-5, RPS CH 11 DRYWELL PRESS HIGH* *F4-1-4, RPS CH 12 DRYWELL PRESS HIGH* *F1-2-3, RPS CH 11 REACTOR LEVEL LOW-LOW* *F4-2-6, RPS CH 12 REACTOR LEVEL LOW-LOW* *F1-3-3, RPS CH 11 REACTOR LEVEL LOW-LOW-LOW* *F4-3-6, RPS CH 12 REACTOR LEVEL LOW-LOW-LOW*	**CREW** • Recognize/report degrading Containment parameters

Events 6 and 7 continued	**SRO**

	• Acknowledges reports from the crew
	• Re-enters N1-EOP-4 on high Drywell pressure
	• Re-enters N1-EOP-2 on high Drywell pressure
	• Transitions to Alternate Level Control leg of N1-EOP-2
	• Direct ADS bypassed
	• Verifies EC initiation
	• If either Drywell temperature approaches 300°F or Torus pressure exceeds 13 psig:
	  o Answers "Below the Containment Spray Initiation Limit?" Yes
	  o Verifies all Recirc pumps tripped
	  o Directs trip of all Drywell cooling fans
	  o **Direct Containment Sprays per N1-EOP-1 attachment 17**
	CT-2

Note: Due to an already low RPV water level when Drywell pressure reaches 3.5 psig, Containment Spray may auto-start before the crew can prevent it. In accordance with the EOPs, the crew will then verify proper operation per N1-EOP-1 attachment 17. In this case, Critical Task 2 shall be evaluated as "Not Applicable".	
Verify the following **malfunction** is **automatically inserted** when DW temp is above 200°F, LLL level indicates below -20", and Containment Spray has been initiated: **VICP20168_FE CP-201-68,** Fuel Zone Erratic Failure **VICP20169_FE CP-201-69,** Fuel Zone Erratic Failure **TRG 7** *Fuel Zone indications give sporadic numbers* *All other RPV water level instruments are either downscale or below minimum usable levels*	• Monitors location on Pressure Suppression Pressure curve • Acknowledges sporadic readings of Fuel Zones • Acknowledges RPV water level is unknown • **Exits N1-EOP-2, enters N1-EOP-7, RPV Flooding** **CT-3**

Events 6 and 7 continued	**SRO continued** • Answers "Are all control rods inserted to at least position 04?" Yes • Answers "Torus water level?" Above 8.0 ft • Directs open 4 ERVs • Directs injection to flood the RPV to the main steam lines using low pressure Feedwater, CRD, Core Spray or Alternate Injection Systems • Answers "Can any ERV be opened?" Yes • Directs MSIVs and EC steam IVs verified closed • Acknowledges RPV water level rising
	ATC/BOP • Places Containment Spray pumps in PTL, or verifies proper operation per N1-EOP-1 attachment 17 • Bypasses ADS • Verifies EC initiation • Monitors Containment parameters • Reports if either Drywell temperature approaches 300°F or Torus pressure exceeds 13 psig

Events 6 and 7 continued	**ATC/BOP Continued**
	• If Containment Spray did not auto-start earlier:
	  • Verifies all Recirc pumps tripped
	  • Trips all Drywell cooling fans
	  • **Initiates Containment Sprays per N1-EOP-1 attachment 17:**
	CT-2
	  • Verifies started, two Containment Spray pumps
	  • IF required to lower Containment pressure, start additional Containment Spray Pumps
	  • Reports Containment pressure and temperature lowering
	• Recognizes/reports sporadic Fuel Zone values
	• Recognizes/reports RPV water level is unknown
	• **Opens 4 ERVs**
	• **Injects to flood the RPV to the main steam lines using low pressure Feedwater, CRD, Core Spray or Alternate Injection Systems**
	CT-3
	• Verifies MSIVs and EC steam IVs closed
	• Monitors for indications of successful flooding
	• Reports RPV water level rising

Event Termination Criteria	• RPV Flooding in progress • Reactor water level on scale or upscale • Containment pressure and temperature controlled in accordance with N1-EOP-4.

	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
	  • 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