Facility:	Oyster Creek	Task No.:	COOO00044
Task Title:	Week 4 Safety Related Equipment Verification		
Job Performance Measure No.:	NRC Admin JPM1 (RO)		
K/A Reference:	G2.1.29 (4.1)		
Examinee:		Examiner:	
Facility Evaluator:		Date:	

Method of Testing:

Simulated Performance				Actual Performance	X
Classroom		Simulator	X	Plant	

Read to the Examinee:

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

Initial Conditions:

1. The plant is at rated power

Task Standard:

Three instances of improper EOP Jumper Bypass Plug placement have been identified. The Acceptance Criteria is declared UNSAT (not met)

Required Materials: None.

General References:

1. 680.4.007, Safety Related Equipment Verification, Revision 14

Initiating Cue:

Complete Section 6.4, Week Four Verification, IAW 680.4.007, Safety Related Equipment Verification, starting at Step 6.4.3.

Time Critical Task: No.

Validation Time: 10 Minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provide repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Verify Prerequisites and reviews Precautions and Limitations.

Standard: Verifies Prerequisites and reviews Precautions and Limitations.

Comment:

SAT/UNSAT

Performance Information

Performance Step: 3

Procedure Step: 6.4.3.1

Verify that the bypass plugs are positioned as follows:

1. EOP Bypass Plug Panel in rear of Panel 2R
   - Bypass plug in position BP1
   - Bypass plug in position BP2
   - No other plugs inserted

Standard: Verifies that the bypass plugs are positioned as follows:

1. EOP Bypass Plug Panel in rear of Panel 2R
   - Bypass plug in position BP1
   - Bypass plug in position BP2
   - No other plugs inserted

Comment:

SAT/UNSAT

✓

Performance Step: 4

Procedure Step: 6.4.3.2

Verify that the bypass plugs are positioned as follows:

2. EOP Bypass Plug Panel in rear of Panel 3F
   - BP2, BP4, BP6, BP8, BP10, BP12, BP14
   - No other plugs inserted

Standard: Verifies that the bypass plugs are positioned as follows:

2. EOP Bypass Plug Panel in rear of Panel 3F
   - BP2, BP4, BP6, BP8, BP10, BP12, BP14
   - No other plugs inserted
   - Reports that no plug is located in BP14

Cue: Acknowledge the report and tell the Candidate to continue (Leave the plugs in their current positions)

Comment:

SAT/UNSAT

Performance Information

Performance Step: 5

Procedure Step: 6.4.3.3

Verify that the bypass plugs are positioned as follows

3. EOP Bypass Plug Panel in rear of Panel 6R
   - No plugs inserted

Standard: Verifies that the bypass plugs are positioned as follows

3. EOP Bypass Plug Panel in rear of Panel 6R
   - No plugs inserted

Comment:

SAT/UNSAT

Performance Step: 6

Procedure Step: 6.4.3.4

Verify that the bypass plugs are positioned as follows

4. EOP Bypass Plug Panel in rear of Panel 7R
   - No plugs inserted

Standard: Verifies that the bypass plugs are positioned as follows

4. EOP Bypass Plug Panel in rear of Panel 7R
   - No plugs inserted

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 7

Procedure Step: 6.4.3.5

Verify that the bypass plugs are positioned as follows

5. EOP Bypass Plug Panel in rear of Panel 11R
   - Bypass plug in position BP4
   - No other plugs installed

Standard: Verifies that the bypass plugs are positioned as follows

5. EOP Bypass Plug Panel in rear of Panel 11R
   - Bypass plug in position BP4
   - No other plugs installed
   - Reports that plug is installed in BP2 instead of BP4

Cue: Acknowledge the report and tell the Candidate to continue (Leave the plugs in their current positions)

Comment:

SAT/UNSAT

Performance Information

✓ **Performance Step: 8**

Procedure Step: 6.4.3.6

Verify that the bypass plugs are positioned as follows

6. EOP Bypass Plug Panel inside of Panel 10XF

- Bypass plug in position BP2
- Bypass plug in position BP4
- No other plugs installed

Standard: Verify that the bypass plugs are positioned as follows

6. EOP Bypass Plug Panel inside of Panel 10XF

- Bypass plug in position BP2
- Bypass plug in position BP4
- No other plugs installed
- Reports that plug is installed in BP3

Cue: Acknowledge the report and tell the Candidate to continue (Leave the plugs in their current positions)

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 9

Compare results of this surveillance with Section 7.0, Acceptance Criteria. Record comments/discrepancies.

Standard: Reviews Acceptance Criteria and determines the Acceptance Criteria 7.1.3 is Unsat (has not been met)

Note: For failure of the acceptance criteria, the procedure then directs that the requirements of LS-OC-125 be followed. That procedure has been superseded by LA-AA-125, Corrective Action program, which would require generation of an IR or AR (incident report). The Candidate may state generation of an IR is required. (Not required for critical step.) Writing comments in Step 6.4.4 is not required.

Comment:

SAT/UNSAT

Terminating Cue: Three instances of improper EOP Jumper Bypass Plug placement have been identified. The Acceptance Criteria is declared UNSAT (not met)

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC Admin JPM 1 (RO)

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

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Response:

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Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ______________________ ______________________

Simulator Setup

1. This JPM can be performed at any power level
2. Remove EOP Bypass Plug in rear Panel 3F at position BP14
3. Remove EOP Bypass Plug in rear Panel 11R from position BP4 and place in BP2
4. Place an additional EOP Bypass Plug in Panel inside Panel 10XF in position BP3
5. Place keep procedure 680.4.007 steps 6.4, 6.4.1, 6.4.2

STUDENT HANDOUT

Initial Conditions:

1. The plant is at rated power

Task Cue:

Complete Section 6.4, Week Four Verification, IAW 680.4.007, Safety Related Equipment Verification, starting at Step 6.4.3.

6.3.4 **COMPARE** results of this surveillance with Section 7.0, Acceptance Criteria. Record comments/discrepancies.

Comments:____

____

____

6.4 Week Four Verification

6.4.1 **VERIFY** Section 3.0 prerequisites are satisfied.

_____________________________   Today / Then

Signature   Date / Time

6.4.2 **GO TO** the Control Room

6.4.3 **VERIFY** that the bypass plugs are positioned as follows:

Initial

1. EOP Bypass Plug Panel in rear of Panel 2R.
   - Bypass plug in position BP1. ________
   - Bypass plug in position BP2. ________
   - No other plugs inserted. ________

2. EOP Bypass Plug Panel in rear of Panel 3F.

   - Bypass plugs in the following positions: BP2 ________

     BP4 ________

     BP6 ________

     BP8 ________

     BP10 ________

     BP12 ________

     BP14 ________

   - No other plugs inserted. ________

3. EOP Bypass Plug Panel in rear of Panel 6R.

   - No plugs inserted. ________

4. EOP Bypass Plug Panel in rear of Panel 7R.

   - No plugs inserted. ________

5. EOP Bypass Plug Panel in rear of Panel 11R.

   - Bypass plug in position BP4. ________
   - No other plugs inserted. ________

6. EOP Bypass Plug Panel inside of Panel 10XF.

   - Bypass plug in position BP2. ________
   - Bypass plug in position BP4. ________
   - No other plugs inserted. ________

Completed by: ______________________ ______________________

______________________ ______________________

______________________ ______________________

Signature Date

6.4.4 **COMPARE** results of this surveillance with Section 7.0, Acceptance Criteria. Record comments/discrepancies.

Comments:____

7.0 ACCEPTANCE CRITERIA

7.1 IF any of the following criteria are not met or if any other deviation from proper operation is noted,

THEN follow the requirements of Procedure LS-OC-125.

7.1.1 Instrument Air valves V-6-460, V-6-461, V-6-463, V-6-3028, and V-6-3030 are found in the full open position.

7.1.2 All DC knife switches and breakers are positioned as specified in this procedure.

7.1.3 All EOP bypass plugs are positioned as specified in this procedure.

8.0 ATTACHMENTS

None

Facility: Oyster Creek Task No.: 2220201512

Task Title: Calculate Primary Containment Identified leak Rate IAW 351.2

Job Performance Measure No.: NRC RO Admin JPM 2

K/A Reference: G2.1.20 (4.6)

Examinee: ______________________ Examiner: ______________________

Facility Evaluator: ______________________ Date: ______________________

Method of Testing:

Simulated Performance ________ Actual Performance X

Classroom X Simulator ________ Plant ________

Read to the Examinee:

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

Initial Conditions:

- The plant is at rated power
- The DWEDT Flow Integrator is inoperable
- Both DWEDT Pumps are operable
- This identified leak rate calculation is for 1200 – 1600 today
- The most previous identified leak rate was 19.5 GPM
- The current unidentified leak rate for 1200 – 1600 today is 4.5 GPM
- The switches for the DWEDT Pumps were placed in OFF at 12:33:12 (HH:MM:SS)
- The DRYWELL EQUIP DRAIN TANK HIGH LEVEL alarm annunciated at 12:47:22 (HH:MM:SS)

Initiating Cue:

With the information provided, calculate the Primary Containment identified leak rate IAW 351.2, High Purity Waste System. Determine if any Technical Specification limits have been exceeded.

Required Materials: Calculator

General References:

1. 351.2, High Purity Waste System, revision 84
2. Tech Spec 3.3.D.5

Task Standard:

Determines the current identified leak rate and determines that it does exceed a Technical Specification limit.

Time Critical Task: NO

Validation Time: 8 Minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

✓ Performance Step: 2

Procedure Step: attachment 351.2-6 steps 1,2,3

Calculates elapsed time

Standard: Calculates elapsed time:

- 0 hours
- 14 minutes
- 10 seconds = 0.167 minutes
- **Total Minutes**: 14.167 minutes

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 3

Procedure Step: attachment 351.2-6 step 4

Calculate identified leak rate

Standard: Calculates identified leak rate as:

- (295 gallons)/(14.167 minutes) = 20.8 gpm

Comment:

SAT/UNSAT

✓ Performance Step: 4

Determines Tech Spec applicability

Standard: Determines that a Tech Spec limit has been exceeded.

Note: Tech Spec 3.3.D.1.b is exceeded:

25 gpm total (identified and unidentified Tech Spec limit)

(20.8 gpm identified + 4.5 gpm unidentified = 25.3 gpm actual)

Comment:

SAT/UNSAT

Terminating Cue: Determines the current identified leak rate and determines that it does exceed a Technical Specification limit.

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC RO Admin JPM 2

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

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Response:

____

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Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ______________ ______________

JPM Setup

1. Provide a copy of procedure 351.2 attachment 6 and Tech Spec 3.3.D to the applicant.

STUDENT HANDOUT

Initial Conditions:

- The plant is at rated power
- The DWEDT Flow Integrator is inoperable
- Both DWEDT Pumps are operable
- This identified leak rate calculation is for 1200 – 1600 today
- The most previous identified leak rate was 19.5 GPM
- The current unidentified leak rate for 1200 – 1600 today is 4.5 GPM
- The switches for the DWEDT Pumps were placed in OFF at 12:33:12 (HH:MM:SS)
- The DRYWELL EQUIP DRAIN TANK HIGH LEVEL alarm annunciated at 12:47:22 (HH:MM:SS)

Task Cue:

With the information provided, calculate the Primary Containment identified leak rate IAW 351.2, High Purity Waste System (attached).

Determine if any Technical Specification limits have been exceeded.

Primary Containment identified leak rate: ________________

Tech Specs limit exceeded (Yes/No): ________________

Name: ________________

ATTACHMENT 351.2-6

IDENTIFIED LEAK RATE CALCULATION

1. Time DWEDT Pump Control Switches placed in OFF (Step 11.5.3.3).

   __________ hr. ___________ mins. ____________ secs.

2. Time Drywell Equip Drain Tank Hi Level alarm annunciated (Step 11.5.3.4).

   __________ hr. ____________ mins. ____________ secs.

3. Calculate elapsed time in minutes.

   (____ hr. x 60 min./hr.) = _____ mins.

   Difference in mins. = _____ mins.

   (____ secs. x 1 min./60 secs.) = _____ mins.

   Added Total Minutes = _____ mins.

4. Calculate identified leak rate = $\frac{\text{295 gallons}}{\text{\_\_\_\_ mins.}}$ = ____ gpm

Performed by: ______________________ ______________ ______

OS: ______________________ ______________ ______

Signature Date Time

D. Reactor Coolant System Leakage

1. Reactor coolant system leakage shall be limited to:

   a. 5 gpm unidentified leakage
   b. 25 gpm total (identified and unidentified)
   c. 2 gpm increase in unidentified leakage rate within any 24 hour period while operating at steady state power

2. With the reactor coolant system leakage greater than the limits in 3.3.D.1.a or b above, reduce the leakage rate to within the acceptable limits within 8 hours, or place the reactor in the shutdown condition within the next 12 hours and be in the cold shutdown condition within the following 24 hours.

3. With any reactor coolant leakage greater than the limit in 3.3.D.1.c above, identify the source of leakage within 4 hours, or be in the shutdown condition within the next 12 hours and be in the cold shutdown condition within the following 24 hours.

4. For determination of unidentified leakage, the primary containment sump flow monitoring system shall be operable except as specified below:

   a. With the primary containment sump flow integrator inoperable:

      1. Restore it to operable status within 7 days.
      2. Calculate the unidentified leakage rate utilizing an acceptable alternate means as specified in plant procedures.

   b. If Specification 3.3.D.4a cannot be met, place the reactor in the shutdown condition within the next 12 hours.

5. For determination of identified leakage, the primary containment equipment drain tank monitoring system shall be operable except as specified below:

   a. With the primary containment equipment drain tank monitoring system inoperable:

      1. Restore it to operable status within 7 days.
      2. Calculate the identified leakage rate utilizing an acceptable alternate means as specified in plant procedures.

   b. If Specification 3.3.D.5.a cannot be met, place the reactor in the shutdown condition within the next 12 hours.

Facility: Oyster Creek

Task No.: 3410102411

Task Title: Review a Completed Pre-Critical Checkoff IAW Procedure 201

Job Performance Measure No.: NRC Admin JPM 1 (SRO)

K/A Reference: G2.1.23 (4.4)

Examinee: ______________________ Examiner: ______________________

Facility Evaluator: ______________________ Date: ______________________

Method of Testing:

Simulated Performance ________ Actual Performance X

Classroom X Simulator ________ Plant ________

Read to the Examinee:

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

Initial Conditions:

- The plant has just completed all major activities during a refuel outage
- Preparations are being made for a plant startup
- The REACTOR MODE SELECTOR switch is in REFUEL
- Attachment 201-2, Pre-Critical Checkoff has been completed and is awaiting review

Task Standard:

The plant is deemed NOT ready for an uninterrupted startup to rated power. The correct reasons and required actions are stated.

Required Materials: None

General References:

1. Procedure 201, Plant Startup, Revision 101
2. Technical Specifications

Initiating Cue:

Perform Step 78 of the Pre-Critical Checkoff for Attachment 201-2 ONLY.

From this review, determine if the plant is ready for an uninterrupted startup to rated power.

If the plant is NOT ready, state why and what actions are required to be ready.

Time Critical Task: NO

Validation Time: 30 Minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ___________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Note: The following steps can be performed in any order.

✓ Performance Step: 2

Determines the plant is not ready for an uninterrupted startup to rated power for the following reasons:

Step 12.4.1 shows only 1 operable SRM (SRM 21)

- SRM 22 reads 30000
- SRM 23 reads 2
- SRM 24 is bypassed

TS 3.1.1.K requires a minimum of 2 operable SRMs to support the rodblock function.

Any inoperable SRM must be made operable to withdraw control rods.

Standard: Recognizes the Technical Specification applicability due to the inoperability of three (3) SRMs. Two (2) SRMs must be operable to withdraw control rods.

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 3

Determines the plant is not ready for an uninterrupted startup to rated power for the following reasons:

Step 45.1 shows that MCC 1A24 is not operable.

Technical Specification 3.7 states that the reactor shall not be made critical unless all of the following requirements are satisfied:

The listed buses or panel listed in the TS are energized, and this includes MCC 1A24.

Standard: Recognizes the Technical Specification applicability due to the inoperability of MCC 1A24. MCC 1A24 must be made operable prior to going critical.

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 4

Determines the plant is not ready for an uninterrupted startup to rated power for the following reasons:

Step 73.1 shows that conductivity and chlorides are above the allowable limits.

TS 3.3.E.1 provides the following:

> 3.3.E.1: The reactor coolant quality during power operation with steaming rates to the turbine-condenser of less than 100,000 pounds per hour shall be limited to: conductivity 2 us/cm[s=mhos at 25°C (77°F); chloride ion 0.1 ppm.

TS 3.3.E.2 provides the following:

> 3.3.E.2: When the conductivity and chloride concentration limits given in 3.3.E.1 are exceeded, an orderly shutdown shall be initiated immediately, and the reactor coolant temperature shall be reduced to less than 212°F within 24 hours.

Standard: Recognizes the Technical Specification applicability due high conductivity and chloride values which must be reduced below the limits in TS 3.3.E.1.

Comment:

____

____

SAT/UNSAT ______________________________

Terminating Cue: The plant is deemed NOT ready for an uninterrupted startup to rated power. The correct reasons and required actions are stated.

JPM Stop Time: __________

Validation of Completion

JPM Number: NRC SRO Admin JPM 1

Examinee's Name: ____________________

Examiner's Name: ____________________

Date Performed: ____________________

Facility Evaluator: ____________________

Number of Attempts: ____________________

Time to Complete: ____________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ____________________ ____________________

JPM Setup

1. Have Technical Specifications available
2. Have a clean copy of procedure 201 available
3. Have a prepared copy of Attachment 201-2 ready

STUDENT HANDOUT

Initial Conditions:

- The plant has just completed all major activities during a refuel outage
- Preparations are being made for a plant startup
- The REACTOR MODE SELECTOR switch is in REFUEL
- Attachment 201-2, Pre-Critical Checkoff has been completed and is awaiting review

Task Cue:

Perform Step 78 of the Pre-Critical Checkoff for Attachment 201-2 ONLY.

From this review, determine if the plant is ready for an uninterrupted startup to rated power.

If the plant is NOT ready, state why and what actions are required to be ready.

ATTACHMENT 201-2

PRE-CRITICAL CHECKOFF

Initial / Date

1.0 CONTAINMENT SPRAY AND EMERGENCY SERVICE WATER SYSTEMS - PROCEDURE 310

1.1 The system is in standby readiness. BB /Today

1.2 The Containment Spray Pump Compartment doors are closed. BB /Today

2.0 EMERGENCY CORE COOLING SYSTEM - PROCEDURE 308

2.1 The system is in standby readiness. BB /Today

2.2 The Core Spray Pump compartment doors are closed. BB /Today

2.3 The Automatic Depressurization System is in standby readiness. BB /Today

3.0 OPERATION OF THE SAFETY VALVE RELIEF VALVE MONITORING SYSTEM - PROCEDURE 413

3.1 The system is in operation. BB /Today

4.0 ISOLATION CONDENSER SYSTEM - PROCEDURE 307

4.1 The condensers have been filled to a level of 7.4-7.7 ft. BB /Today

Actual Level: NE01A 7.5

NE01B 7.5

4.2 The system is in standby readiness. BB /Today

4.3 All Isolation Condenser steam line pins (for both NE01A and NE01B) have been verified to be removed. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

5.0 REACTOR BUILDING CLOSED COOLING WATER SYSTEM - PROCEDURE 309.2

5.1 The system is in operation. BB /Today

5.2 Running Pump(s) (circle) 1-1 1-2 BB /Today

Heat Exchanger(s) in service (circle) 1-1 1-2 BB /Today

6.0 SHUTDOWN COOLING SYSTEM - PROCEDURE 305

6.1

NOTE

Shutdown Cooling may be left in service until the POAH (Point of Adding Heat) if Reactor coolant temperatures greater than 200° F are anticipated prior to the Reactor being critical.

Shutdown Cooling (SDC) can impact RPV temperature control AND reactivity control. Because of this the point in startup that SDC is removed from service can vary. Earlier in cycle exposure, it may be beneficial to leave SDC in service until the (POAH) to aid in maintaining RPV temperature stable. This would support identifying the POAH (when induced fission is heating the coolant) as well as controlling RPV temperature should an unforeseen delay occur during startup.

For post refuel outages only, consider that the Shutdown Margin Determination (SDM) surveillance (Procedure 1001.27) requires that moderator temperature shall be between 110 and 320 deg F when critical is declared. Special requirements shall be met for moderator temperatures between 212 and 320 deg F (refer to Procedure 1001.27).

For a reactor startup with a predicted positive Moderator Temperature Coefficient (MTC) during the approach to critical or heatup, the reactor coolant temperature should be $\geq$ 200 deg F prior to commencing rod withdrawal. SDC may be removed from service to raise reactor coolant temperature as needed.

The system is in service or in standby readiness. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

6.2 Obtain from Operations Management planned point in Startup at which SDC should be secured. (Circle below) BB /Today

Prior to Mode Switch to Startup / POAH / Other: ______________

7.0 CONTAINMENT AIRBORNE PARTICULATE AND GASEOUS RADIATION MONITOR SYSTEM

7.1 The system is in service. BB /Today

8.0 REACTOR VESSEL HEAD COOLING SYSTEM - PROCEDURE 306

8.1 The system is shutdown. BB /Today

9.0 REACTOR CLEANUP DEMINERALIZER SYSTEM - PROCEDURE 303

9.1 The system is in operation. BB /Today

9.2 Filter Status (circle) A B BYPASSED BB /Today

9.3 Demineralizer Status (circle) I/S BYPASSED BB /Today

10.0 REACTOR RECIRCULATION SYSTEM

10.1 Recirculation flow is 4.8 x 10^4 to 5.5 x 10^4 gpm within the limits of Procedure 301.2. BB /Today

10.2 Verify Identified Leak rate (ILR) on Technical Specification Log Sheet (681.4.004) is at least 0.75 gpm per operating Recirculation Pump. (i.e. ≥ 3.75 gpm if all Recirculation Pumps are in service) If ILR is less than 0.75 gpm per operating pump, initiate an IR. BB /Today

11.0 REACTOR PROTECTION SYSTEM - PROCEDURE 408.12 AND 408.13

11.1 The system is in operation with at least Protection System Panels No. 1 & No. 2. BB /Today

11.2 Protection System Transformer PS-1 is available for service. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

12.0 NUCLEAR INSTRUMENTATION

12.1 All Current-Voltage (I.V.) testing and TDR testing has been completed satisfactorily (System Engineer). BB /Today

12.2 The SRM and IRM cables have been checked to be properly connected to their respective detectors and show no signs of abuse or wear. (I&C Manager) BB /Today

12.3 The APRM-LPRM, IRM, SRM systems are in operation. BB /Today

12.4 Source Range Monitors

12.4.1 At least two source range channels have an observed count rate equal to or greater than 3 counts per second. BB /Today

SRM channel count rates:

21 15 22 30,000 23 2 24 Bypassed BB /Today

12.4.2 SRM detectors at ALL IN position. BB /Today

12.4.3 Channels operable

21 X 22 X 23 X 24 X BB /Today

12.4.4 SRM recorders selected to highest indicating channels (record which are selected)

21 X 22 X 23 X 24 X BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

12.5 Intermediate Range Monitors

12.5.1 IRM detectors at ALL IN position. BB /Today

12.5.2 IRM range switches in Position 1. BB /Today

12.5.3 IRM channels selected for recording. BB /Today

12.5.4 Channels operable:

11 X 12 X 13 X 14 Bypassed BB /Today

15 X 16 Bypassed 17 X 18 X BB /Today

12.6

NOTE

No more than one IRM in each trip system may be bypassed or inoperable.

Average Power Range Monitors

12.6.1 Channels operable:

1 X 2 X 3 Bypassed 4 X BB /Today

5 X 6 X 7 X 8 X BB /Today

12.6.2 On each APRM drawer, verify the number of LPRM inputs bypassed is consistent with Procedure 403 by placing the input selector switch (S9) in the COUNT position. Confirm switch in AVERAGE after verification is completed. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

12.7 The following surveillances have been completed and are expected to remain current during the start-up period or their performance will **not** interrupt the start-up sequence:

12.7.1 SRM Test and Calibration (Front Panel Test) 620.4.004. BB /Today

12.7.2 IRM Test and Calibration (Front Panel Test) 620.4.005. BB /Today

12.7.3 APRM Surveillance Test 620.4.002. BB /Today

13.0 ROD WORTH MINIMIZER

13.1 Programmed with a withdrawal sequence approved by the Manager, Reactor Engineering. BB /Today

13.2 RWM is operable BB /Today

13.3 All operable control rods can be selected with RMC system and the RWM recognizes selection. BB /Today

14.0 CONTROL ROD HYDRAULIC SYSTEM - PROCEDURE 302.1

14.1 Both pumps operable.

Running CRD Pump (circle) A B BB /Today

14.2 All operable scram accumulators are charged. BB /Today

14.3 Control rods that are considered inoperable have been valved out of service. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

15.0 CONTROL ROD DRIVE MANUAL CONTROL SYSTEM - PROCEDURE 302.2

15.1 The system is in operation. BB /Today

15.2 All control rods have been exercised IAW section 10.0 of Procedure 302.2 BB /Today

16.0 STANDBY LIQUID CONTROL SYSTEM - PROCEDURE 304

16.1 The system is in a standby condition. BB /Today

17.0 INSTRUMENT RACKS RK01, RK02, RK03, AND RK04 - PROCEDURE 410

17.1 Verify that the Wide Range GEMAC level transmitter LT-IA12 has been recalibrated in accordance with PM-622021 for "WET LEG" operation (I&C Manager). BB /Today

18.0 CONDENSATE SYSTEM - PROCEDURE 316

18.1 The system is in operation.

Running Pump (circle) A B C BB /Today

18.2 The Condensate System Spill Valve V-2-17 has been manually throttled to 3.5 turns open in accordance with Procedure 316. BB /Today

18.3 The hotwells have been filled to a level of approximately 30" (Panel 5F/6F) and level control is in auto.

Actual level 30 IN BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

~~19.0~~ CONDENSATE TRANSFER SYSTEM - PROCEDURE 316.1

~~19.1~~ The system is in operation.

Running Pump 1-1 Standby Pump 1-2 BB /Today

~~19.2~~ The Condensate Storage Tank is filled to a minimum level of 20 feet (250,000 gallons). BB /Today

~~20.0~~ CONDENSATE DEMINERALIZER AND RESIN REGENERATION AND TRANSFER SYSTEM - PROCEDURE 319

~~20.1~~ The system is in operation and maintaining effluent quality at approximately 0.1 umho/cm.

Demineralizers in service:

(circle) 1-1 1-2 1-3 1-4 1-5 1-6 1-7

Actual effluent quality .1 mho/cm BB /Today

~~21.1~~ REACTOR FEEDWATER SYSTEM - PROCEDURE 317

~~21.1~~ Perform PRE-STARTUP testing:

~~21.1.1~~ LFRV stroke test has been completed. BB /Today

> NOTE
>
> MFRV stroke time should be between 4 to 8 seconds.

~~21.1.2~~ MFRV stroke test has been completed. BB /Today

Record stroke times.

	OPEN	CLOSE
Stroke Time ID11A:	5 sec.	6 sec.
Stroke Time ID11B:	7 sec.	7 sec.
Stroke Time ID11C:	6 sec.	7 sec.

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

21.2 Pre-Operational testing of the feed pumps has been performed. BB /Today

22.0 DIGITAL FEEDWATER CONTROL SYSTEM AND RECIRCULATION FLOW CONTROL SYSTEM - PROCEDURE 418.1

22.1 Both process control computer (DCC X and DCC Y) are in service. BB /Today

22.2 DCC X is in the "CONTROL'G" mode. BB /Today

23.0 HWC - FEEDWATER HYDROGEN INJ. SYS. - PROCEDURE 317.4

23.1 The system is in standby. BB /Today

24.0 SERVICE WATER SYSTEM - PROCEDURE 322

24.1 The system is in operation.

Running Pump 1-1 Standby Pump 1-2 BB /Today

25.0 MAIN CONDENSER CIRCULATING WATER SYSTEM - PROCEDURE 323

25.1 The system is in operation.

Running Pump(s) (circle) 1-1 1-2 1-3 1-4 BB /Today

25.2 At the discretion of the licensed operations supervisor, all condenser halves have been backwashed. BB /Today

26.0 TBCCW CONTINUOUS VENTING PROCEDURE - PROCEDURE 345

26.1 The system is in operation. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

27.0 MAIN STEAM SYSTEM - PROCEDURE 318

27.1 Main Steam Lines are drained. BB /Today

27.2 The gland steam seal regulator is available for service. BB /Today

27.3 The 1st stage and 2nd stage Reheaters are aligned as follows:

Valve Number	Function	Control Location	Position	Initial/Date
V-1-19	HP Turbine Extraction Stm Stop Check Valve (Left)	CR7F	O	BB /Today
V-1-21	2nd Stage Reheater Stop Check Valve (RSCV-2L)	CR7F	C	BB /Today
V-1-28	HP Turbine Extraction Stm Reheater Stop Check Valve	CR7F	O	BB /Today
V-1-34	2nd Stage Reheater Stop Check Valve (RSCV-2R)	CR7F	C	BB /Today
V-1-45	3rd Stage Extraction Stm Bypass Valve(Left)	CR7F	AUTO	BB /Today
V-1-46	3rd Stage Extraction Stm Bypass Valve(Right)	CR7F	AUTO	BB /Today
V-1-73	1st Stg Rhtr 1-3 Shell Side Drain Valve	CR13R	C	BB /Today
V-1-74	Reheater 1-1 Shell Drain Valve 1st Stage (Right)	CR13R	C	BB /Today
V-1-312	2nd Stage MS Reheater 1-2 Regulating Valve (PRV-2R)	Condenser Bay	C	BB /Today
V-1-313	2nd Stage MS Reheater 1-4 Regulating Valve (PRV-2L)	Condenser Bay	C	BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

		Initial / Date
27.4	**CONFIRM** All drain tank alternate drain valve keylock switches are in AUTO position (LIR 1-4).	BB /Today
28.0	CHLORINATION SYSTEM - PROCEDURE 326	
28.1	The system is in service (Chemistry Supv.).	BB /Today
29.0	SCREEN WASH SYSTEM - PROCEDURE 344	
29.1	The system is in operation.	BB /Today
29.2	Screen Wash Pumps in operation.	BB /Today
29.2.1	High Pressure (circle) 1-1 1-2	BB /Today
29.2.2	Low Pressure (circle) 1-3 1-4	BB /Today
29.3	All Traveling screens in operation.	BB /Today
29.4	Trash rake available for service.	BB /Today
30.0	FEEDWATER HEATERS - PROCEDURE 317.1	
30.1	System is available for service.	BB /Today
30.2	**CONFIRM** All Main Flash Tank vents are OPEN IAW instructions contained in Section 2 of Procedure 317.1 (LIR 1-3).	BB /Today
30.3	**CONFIRM** All Main Flash Tank drains are in AUTO position IAW instructions contained in Section 2 of Procedure 317.1 (LIR 1-3).	BB /Today
30.4	All LP Heater vent valves are OPEN (13R).	BB /Today
30.5	**CONFIRM** All Feedwater Heater alternate drain valves are in AUTO position (LIR 1-1).	BB /Today
30.6	**CONFIRM** All Feedwater Heater normal drain valves are in CLOSED position (LIR 1-1)	BB /Today
30.7	**CONFIRM** All Feedwater Heater extraction steam isolation valves are in CLOSED position (7F).	BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

31.0 INSTRUMENT AND SERVICE AIR SYSTEM - PROCEDURE 334

31.1 The system is in operation.

Running compressor (circle) 1-1 1-2 1-3 BB /Today

Standby Compressor (circle) 1-1 1-2 1-3 BB /Today

32.0 TURBINE LUBE OIL SYSTEM - PROCEDURE 315.2

32.1 The system is in operation. BB /Today

32.2 Oil purifier is running. BB /Today

32.3 Running Auxiliary Pump(s). BB /Today

32.4 Turning Gear Oil Pump in AUTO. BB /Today

32.5 D.C. Emergency Oil Pump in AUTO. BB /Today

32.6 Lift Pumps ON. ______/______

33.0 TURBINE GEAR - PROCEDURE 315.3

33.1

> NOTE
>
> The Main Turbine shall be on the turning gear at least 4 hours prior to chest warmup.

The system is in operation. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

~~34.0~~ FIRE PROTECTION SYSTEM - PROCEDURE 333

~~34.1~~ The system valve lineup has been verified by Procedure 645.4.004 (Fire Protection System Engineer). BB /Today

~~34.2~~ The system is in service (Fire Protection System Engineer). BB /Today

~~35.0~~ AIR EXTRACTION AND OFF-GAS SYSTEM - PROCEDURE 325

~~35.1~~ The steam packing exhauster is ready for service. BB /Today

~~35.2~~ The Mechanical Vacuum Pump is ready for service. BB /Today

~~35.3~~ The steam jet air ejectors, their drain tanks and traps are ready for service. BB /Today

~~35.4~~ The steam jet air ejector inlet valves have been cycled to verify proper valve position indication. (Remote vs. Local) BB /Today

> ~~CAUTION~~
>
> A Radiation Protection brief may be required prior to draining the 30” and /or 40” holdup piping.

~~35.5~~ The 30” and 48” drains have both been flushed and drained. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

~~36.0~~ TURBINE GENERATOR STARTUP - PROCEDURE 315.1

~~36.1~~ The main turbine is ready for chest warming. BB /Today

~~36.2~~ Turbine controls are as follows:

Both sets of EPR roughing and final filters have been cleaned or are scheduled to be cleaned prior to completing the 1000 psig DW inspection	BB /Today
Control valves closed	BB /Today
Stop valves, reheat stop intercept valves closed	BB /Today
Bypass valves closed	BB /Today
Load limit setting at 0 percent	BB /Today
Bypass opening jack at 0 percent	BB /Today
Load limit and No. 2 stop valve closed (SELSYN IND.)	BB /Today
Speed load changer set at 100 percent no load	BB /Today
Both vacuum trips in tripped position as indicated by alarms locked in:	
Q-1c COND VAC TRIP 2 10 INCHES	BB /Today
Q-2c COND VAC TRIP 1 22 INCHES	BB /Today
13R indication for VACUUM TRIP 2 & VACUUM TRIP 1 Red TRIP lights lit	BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

~~36.0~~ TURBINE GENERATOR STARTUP - PROCEDURE 315.1 (continued)

Emergency Governor Oil trip reset. Panel 7F EMER GOVERNER OIL TRIP TEST Switch Green RESET light lit and Pull handle is down with Amber Lockout light **Not** lit. BB /Today

> ~~NOTE~~
>
> Alternate indications for the EPR / MPR can be found on Recorder 7F 15 A.
>
> MPR Relay position CH 4, MPR Setpoint CH 5.
>
> EPR Relay position (Cylinder Position) CH 105, EPR setpoint CH 101.

MPR set to 250 psig BB /Today

EPR set to 1010 psig BB /Today

Mechanical Pressure Regulator rotating bushing is rotating (refer to Attachment 201-14) BB /Today

~~36.3~~ Turbine supervisory instruments in service. BB /Today

~~37.0~~ AOG BLDG STEAM JET AIR EJECTOR ROOM AND STACKHOUSE AREA HYDROGEN MONITORING SYSTEM - PROCEDURE 411

37.1 The system is in operation BB /Today

~~38.0~~ TURBINE BUILDING CLOSED COOLING WATER SYSTEM - PROCEDURE 309.1

~~38.1~~ The system is in operation BB /Today

~~38.2~~ Running Pump(s) (circle) 1-1 1-2 1-3 BB /Today

Heat exchanger(s) in service (circle) 1-1 1-2 BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

		Initial / Date
39.0	24 KV MAIN GENERATOR ELECTRICAL SYSTEM - PROCEDURE 336.1	
39.1	The main generator is ready for loading and the shaft driven exciter is ready for service.	BB /Today
39.2	At least one isolated phase bus duct cooling fan is running. Running fan(s) 1-1	BB /Today
39.3	Main Transformer M1A Coolers in AUTO IAW Procedure 336.1.	BB /Today
39.3	Main Transformer M1B Coolers in AUTO IAW Procedure 336.1.	BB /Today
39.4	DRMCC in service M1A X	BB /Today
39.5	Calisto in service M1A X	BB /Today
39.6	DGA (Serveron) in service M1A X M1B X	BB /Today
39.7	IDD in service M1A X	BB /Today
39.8	Breather in service (green M1A X power on light illuminated and red error light **not** flashing. Yellow "desiccant drying" light may be on or off.)	BB /Today
39.9	Sudden Pressure Monitor M1A X in service. (green POWER STATUS light illuminated and **no** FAST or SLOW PRESSURE RISE red lights are illuminated)	BB /Today
40.0	HYDROGEN SHAFT SEAL OIL SYSTEM - PROCEDURE 336.2	
40.1	The system is in operation.	BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

41.0 HYDROGEN GAS SYSTEM - PROCEDURE 336.3

41.1 The system is in operation and hydrogen purity has been established at approximately 90 percent but **not** less than 75 percent and 25 psig pressure.

Hydrogen purity 94 percent (Hydrogen Panel)

Hydrogen pressure 26 psig BB /Today

42.0 GENERATOR STATOR COOLING WATER SYSTEM - PROCEDURE 336.4

42.1 The system is in operation.

Running Pump 1-1 Reserve Pump 1-2 BB /Today

42.2 Stator cooling water conductivity is less than 0.5 μmhos/cm.

Actual Conductivity 0.10 μmhos/cm. BB /Today

43.0 34.5 KV AND 13.8 KV ELECTRICAL SYSTEM - PROCEDURE 335

43.1 The system is in operation with both Startup Transformers in service. BB /Today

44.0 4160 VOLT ELECTRICAL SYSTEM - PROCEDURE 337

44.1 The system is in operation with Buses 1A, 1B, 1C, and 1D energized. BB /Today

- 1A BB /Today
- 1B BB /Today
- 1C BB /Today
- 1D BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

	Initial / Date
44.2 Ensure that Breaker EC is open and racked out. **(CM-2)**	BB /Today
44.3 Ensure that Breaker ED is open and racked out. **(CM-2)**	BB /Today
44.4 '69' Permissive Switches for all circuit breakers are in the ON position.	BB /Today
44.5 Bank 5/Bank 6 voltage regulators are available to be placed in service to consider startup transformers operable.	BB /Today

45.0 460 VOLT ELECTRICAL SYSTEM - PROCEDURE 338

45.1 The system is in operation with at least the following USS's and MCC's:

• USS 1A2	BB /Today
• USS 1B2	BB /Today
• MCC 1A21	BB /Today
• MCC 1B21	BB /Today
• MCC 1A21A	BB /Today
• MCC 1B21A	BB /Today
• MCC 1A21B	BB /Today
• MCC 1B21B	BB /Today
• MCC 1A24	NOTE 1/ Today
• MCC 1B24	BB /Today
• USS 1A3	BB /Today
• USS 1B3	BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

	Initial / Date
MCC 1A31	BB /Today
MCC 1B31	BB /Today
MCC 1B32	BB /Today
VMCC 1A2	BB /Today
VMCC 1B2	BB /Today
VMCC 1AB2	BB /Today

45.2 The following 460 Volt Tie Breakers are racked out:

US1T	BB /Today
US2T	BB /Today
US3T	BB /Today

46.0 VITAL POWER SYSTEM - PROCEDURE 339

46.1 The system is in operation with at least the following panels in service:

CIP-3	BB /Today
IP-4C	BB /Today
PAIPP-2 (PDP-733-058)	BB /Today
IP-4	BB /Today
VACP-1	BB /Today
IP-4A	BB /Today
VLDP-1	BB /Today
IP-4B	BB /Today
PAIPP-1 (PDP-733-057)	BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

47.0 125 VDC DISTRIBUTION SYSTEMS "A&B" - PROCEDURE 340.1

47.1 The system is in operation with at least the following energized:

• Distribution Center A	BB /Today
• Distribution Center B	BB /Today
• Panel D	BB /Today
• MCC DC-1	BB /Today
• Panel E	BB /Today

47.2 The battery charger MG-sets and 125 VDC static charger are available for service.

• Battery charger MG-set A	BB /Today
• Battery charger MG-set B	BB /Today
• 125 VDC static charger	BB /Today

48.0 125 VDC DISTRIBUTION SYSTEM "C" - PROCEDURE 340.3

48.1 The system is in operation with at least the following energized:

• Distribution Center "C	BB /Today
• MCC-DC-2	BB /Today
• Panel F	BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

49.0 BATTERY ROOM "C" HVAC - PROCEDURE 328.1

49.1 The system is in operation. BB /Today

~~50.0~~ 24 VDC DISTRIBUTION SYSTEM - PROCEDURE 340.2

~~50.1~~ The system is in operation with both Panels A and B energized

- Panel A BB /Today
- Panel B BB /Today

~~51.0~~ STANDBY DIESEL GENERATORS - PROCEDURE 341

~~51.1~~ Both diesel generators are available and aligned for automatic start:

- EDG - 1 BB /Today
- EDG - 2 BB /Today

~~52.0~~ Electrical Power/Distribution requirements of Technical Specification 3.7.A are met BB /Today

~~53.0~~ RADIOACTIVE WASTE SYSTEM (LIQUID) - PROCEDURE 351.1 AND 351.2

~~53.1~~ The system is available to receive water in accordance with its applicable Operating Procedure. BB /Today

~~54.0~~ RADWASTE BUILDING HEATING AND VENTILATION SYSTEM – PROCEDURE 332

~~54.1~~ The system is in operation. BB /Today

~~55.0~~ AUGMENTED OFF GAS SYSTEM - PROCEDURE 350.1

~~55.1~~ One recombiner train is in recycle. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

		Initial / Date
~~56.0~~	INSTRUMENTATION SETPOINTS – PROCEDURE 420	
~~56.1~~	The area radiation monitor setpoints have been adjusted to the power operation setting per Procedure 420.	BB /Today
~~57.0~~	CONTAINMENT HIGH RANGE RADIATION MONITORING SYSTEM – PROCEDURE 407.4	
~~57.1~~	The system is in normal operation.	BB /Today
~~57.2~~	Setpoints are as specified in Procedure 420.	BB /Today
~~58.0~~	PROCESS RADIATION MONITORING SYSTEM - PROCEDURE 406.1	
~~58.1~~	The system is in operation.	BB /Today
~~59.0~~	STACK RAGEMS SYSTEM - PROCEDURE 406.8	
~~59.1~~	The system is in operation.	BB /Today
~~60.0~~	TURBINE BUILDING RAGEMS SYSTEM - PROCEDURE 406.9	
~~60.1~~	The system is in operation.	BB /Today
~~61.0~~	REACTOR BUILDING HEATING, COOLING AND VENTILATION SYSTEM - PROCEDURE 329	
~~61.1~~	The system is in operation.	BB /Today
~~62.0~~	STANDBY GAS TREATMENT SYSTEM - PROCEDURE 330	
~~62.1~~	The system is in standby readiness.	
	Preferential System selected (circle) 1 2	BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

63.0 OFFICE BUILDING HEATING, COOLING AND VENTILATION SYSTEM - PROCEDURE 331

63.1 The Battery and Motor Generator Room Ventilation System is in operation.

- SF-1-20 BB /Today
- EF-1-20 BB /Today

64.0 TURBINE BUILDING HEATING AND VENTILATION SYSTEM - PROCEDURE 328

64.1 The system is in operation. BB /Today

65.0 DEMINERALIZED WATER TRANSFER SYSTEM - PROCEDURE 320.1

65.1 The system is in operation.

Running Pump 1-1 Standby Pump 1-2 BB /Today

65.2 The Demineralized Water Storage Tank has been filled to a level between the high and low level alarm points. BB /Today

65.3 The demineralized water supply to the drywell has been secured in accordance with Procedure 320.1 BB /Today

66.0 MAKE-UP WATER SYSTEM - PROCEDURE 320

66.1 System available for service. BB /Today

67.0 WELL-DOMESTIC WATER SYSTEM - PROCEDURE 321

67.1 The system is in operation. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

68.0 THERMAL DILUTION PUMPS - PROCEDURE 324

68.1 The system is in operation. BB /Today

68.2 If the discharge canal temperature is greater than 87°F or if the intake canal temperature is less than 60°F, two (2) Dilution Pumps shall be placed in operation.

Intake Temp 66 °F

Discharge Temp 68 °F

Running Pumps (circle) 1-1 1-2 1-3 BB /Today

68.3 Dilution trash cart available. BB /Today

ADMINISTRATIVE

69.0 COMMUNICATION SYSTEM - PROCEDURE 343

69.1 The system is in operation. BB /Today

70.0 Reactor vessel Assembly is complete (Mechanical Maintenance) BB /Today

71.0 Surveillances

71.1 The following surveillances have been completed and are expected to remain current during the start-up period or their performance will **not** interrupt the start-up sequence:

71.2

> NOTE
>
> Technical Specification 4.5.F.3 requires that Procedure 602.4.002, MSIV Closure and IST Test, be performed during each COLD SHUTDOWN unless this test has been performed within the last 92 days.

MSIV Closure and IST Test 602.4.002. BB /Today

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

71.3

> NOTE
>
> 630.3.002 only required to be performed during a refueling outage. (AR A2358948)

Mechanical Vacuum Pump and Off-Gas Holdup Valve V-7-31 Isolation Test 630.3.002. BB /Today

71.4 All requirements of the Refueling Outage Surveillance Schedule and/or the Test Schedule have been completed and documented in accordance with Procedure WC-AA-111. BB /Today

71.5 All work orders and work order activities required for mode switch to startup have been completed or listed on Attachment 10 BB /Today

Attachment 10 Provided by P. Burke / Today
Work Mgmt / Date

72.0 The absorption chamber water volume and temperature are within the following limits:

72.1 Maximum water temperature 90°F Actual 78 °F BB /Today

72.2 Water volume - 92,000 ft^3 (≤ 154") to 82,000 ft^3 (≥ 143")

Actual 150 inches BB /Today

73.0 Reactor Coolant Chemistry

73.1 Reactor coolant quality does **not** exceed the following limits:

	Actual
Conductivity - 1.0 ùS/cm	2.1 ùS/cm
Chlorides - 100 ùg/L	110ppb(ùg/L)
Dose Equivalent iodine - 0.2 ùCi/ml	.05 ùCi/ml
Sulfates - 100 ppb	90 ppb

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

Initial / Date

~~73.2~~ Reactor coolant temperature is in excess of that given by the Pressure and Temperature Limits Report (PTLR) at a given pressure:

160 °F 0 psig Verified: RL BB /Today

~~73.3~~ Obtain effective full power years (EFPY) from Reactor Engineering for PTLR P-T curves.
(Only if following refuel outage)

C. Rios 32 EFPY BB /Today
Reactor Engineering

~~74.0~~ All operable Control Room Recorders are turned on. BB /Today

~~74.1~~ SAR is in service BB /Today

~~75.0~~ The following temporary modifications have been removed and their removal **PHYSICALLY VERIFIED** by the Unit Supervisor:

- Reactor Mode Switch Position Switch Jumper:

No jumpers installed between;

6R TB3 Term 1 Wire # 624 and
6R TB3 Term 2 Wire # 625. S. Rios/Today
Unit Supervisor

7R TB3 Term 1 Wire # 605 and
7R TB3 Term 2 Wire # 606. S. Rios/Today
Unit Supervisor

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

/ Date

• 600 psig Scram Jumpers:

No jumpers installed between;

6R 1K11 Term 2 to 6R 1K17 Term 4.	S. Rios /Today Unit Supervisor
6R 1K12 Term 2 to 6R 1K18 Term 4.	S. Rios /Today Unit Supervisor
7R 2K11 Term 2 to 7R 2K17 Term 4.	S. Rios /Today Unit Supervisor
7R 2K12 Term 1 to 7R 2K18 Term 4.	S. Rios /Today Unit Supervisor

• MSIV Closure Jumpers:

No jumpers installed between;

6R 1K117 Term 1 to 6R 1K117 Term 2.	S. Rios /Today Unit Supervisor
6R 1K118 Term 1 to 6R 1K118 Term 2.	S. Rios /Today Unit Supervisor
7R 2K117 Term 1 to 7R 2K117 Term 2.	S. Rios /Today Unit Supervisor
7R 2K118 Term 1 to 7R 2K118 Term 2.	S. Rios /Today Unit Supervisor

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

/Date

• Shutdown Cooling Isolation Interlocks:

EOP Bypass Panel rear of 3F;

Test Plug Location BP-9 removed.	S. Rios /Today Unit Supervisor
Test Plug Location BP-10 installed.	S. Rios /Today Unit Supervisor
Test Plug Location BP-11 removed.	S. Rios /Today Unit Supervisor
Test Plug Location BP-12 installed.	S. Rios /Today Unit Supervisor

76.0 The following logs have been reviewed to verify that no outstanding work or conditions exist that would prohibit plant startup:

• Active and Suspended Clearances	S. Rios /Today Unit Supervisor
• Control Room Activated Annunciators	S. Rios /Today Unit Supervisor
• Switching Order Book	S. Rios /Today Unit Supervisor
• Temporary Modification Summary Sheets	S. Rios /Today Unit Supervisor

77.0 The Standing Order Book has been reviewed. B. Eagan /Today
Shift Manager

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

/ Date

78.0 The following attachments are complete and the plant is ready for startup:

Attachment 201-1 (started ≤ 2 weeks prior to start up)

Time complete 10:00 Date complete Today B. Eegan/ Today
Shift Manager

Attachment 201-2 and 201-6 (completed ≤ 24 hours prior to start up)

Time complete_________ Date complete_________ ________________/_____
Shift Manager

Attachment 201-4 and 201-5 (completed ≤ 48 hours prior to start up)

Time complete_________ Date complete_________ ________________/_____
Shift Manager

Attachment 201-10 (completed ≤ 48 hours prior to start up)

Time complete_________ Date complete_________ ________________/_____
Shift Manager

79.0 Unit Restart Review completed in accordance with Procedure OP-AA-108-108.

________________/_____
Shift Manager

80.0 3D Monicore has been updated and is ready to support Reactor start up.

________________/_____
Reactor Engineering

ATTACHMENT 201-2
(Continued)

PRE-CRITICAL CHECKOFF

/ Date

81.0

> NOTE
>
> Steps 81.0 and 83.0 are **not** required until after the Mode Switch is in STARTUP and rod withdraw is to begin.
>
> Issuance of the startup Reactivity Maneuver Approval (ReMA) Package may be delayed until 10% Reactor Power with Operations Management approval.

The estimated critical position (ECP) has been determined. ________________/______
Reactor Engineering

82.0 A Reactor startup ReMA Package has been prepared and approved in accordance with Procedure OP-AB-300-1003. ________________/______
Unit Supervisor

83.0 An approved Control Rod Sequence Package for Reactor Startup has been issued per Procedure NF-AB-720. ________________/______
Unit Supervisor

84.0 All Control Room personnel filling positions required for the startup have received Just In Time Training for the startup are listed on and have signed Attachment 16. ________________/______
Unit Supervisor

Exelon Generation	OYSTER CREEK GENERATING STATION PROCEDURE	Number **201**
Title **Plant Startup**		Revision No. 101

ATTACHMENT 201-3

PRE-CRITICAL SYSTEM STATUS EXCEPTION LIST

Any system, or its associated equipment **not** in the condition specified by its applicable Operating Procedure, is listed below with an explanation of the exception.

System/Component	Procedure and Section	Exception and Reason
460 Volt Electric, MCC-1A24	201, 201-2	MCC-1A24 is OOS due to a fault identified on the MCC

Facility:	Oyster Creek	Task No.:	2150101022
Task Title:	Review Request to Allow LPRM (input into APRM) Bypass		
Job Performance Measure No.:	NRC Admin JPM 2 (SRO)		
K/A Reference:	2.1.9 (4.5)		
Examinee:		Examiner:	
Facility Evaluator:		Date:	

Method of Testing:

Simulated Performance			Actual Performance		X
Classroom	X	Simulator		Plant	

Read to the Examinee:

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

Initial Conditions:

- The plant is at 17% power with control rod withdrawals in progress
- LPRM 28-33D, which inputs into APRM 5 has been spiking upscale, resulting in spurious ½ scrams
- A Troubleshooting Log has been developed which will remove LPRM 28-33D from the APRM 5 Drawer, and replace it with LPRM 28-41D, which is not currently associated to any APRM.
- A Tech Eval has been approved to swap the LPRM
- Another Licensed Operator is available to support the activity.
- A copy of the Troubleshooting Log and Attachment 403-2, LPRM and APRM Status Information Sheet, is attached.

Initiating Cue:

Review Attachment 403-2. State any actions required, if any.

Review and approve the Troubleshooting Log. If not approved, state why.

Required Materials:

1. Have a copy of Tech Specs Available
2. Have a copy of the Troubleshooting Log and completed attachment 403-2.

General References:

1. 403 Revision 31 LPRM-APRM System Operations
2. MA-AA-716-004, Conduct of Troubleshooting
3. 620.4.002, APRM Surveillance Test – Front Panel Check

Task Standard:

Determine that APRM 5 will be inoperable when bypassed **AND** determines that APRM 5 cannot be bypassed until APRM 6 is restored.

Time Critical Task: NO

Validation Time: 11 minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Procedure Step: Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Procedure Step: Review Troubleshooting Log

Standard: Reviews Troubleshooting Log

Comment:

SAT/UNSAT

✓ Performance Step: 3

Procedure Step: Review Attachment 403-2

Standard: Reviews Attachment 403-2

Determines that APRM 6 is inoperable due to 2 LPRMs in the same radial string being inoperable

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 4

Procedure Step: Determine that APRM 5 will be inoperable when bypassed

Standard: Determine that APRM 5 will be inoperable when bypassed **OR** determines that APRM 5 cannot be bypassed until APRM 6 is restored.

Comment:

SAT/UNSAT

Task Standard: Determine that APRM 5 will be inoperable when bypassed **AND** determines that APRM 5 cannot be bypassed until APRM 6 is restored.

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC SRO Admin JPM 2

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ______________________ ______________________

JPM Setup

Have the following procedures ready:

1. 403 Revision 31 LPRM-APRM System Operations
2. MA-AA-716-004, Conduct of Troubleshooting
3. 620.4.002, APRM Surveillance Test – Front Panel Check

STUDENT HANDOUT

Initial Conditions:

- The plant is at 17% power with control rod withdrawals in progress
- LPRM 28-33D, which inputs into APRM 5 has been spiking upscale, resulting in spurious ½ scrams
- A Troubleshooting Log has been developed which will remove LPRM 28-33D from the APRM 5 Drawer, and replace it with LPRM 28-41D, which is not currently associated to any APRM.
- Another Licensed Operator is available to support the activity.
- A copy of the Troubleshooting Log and Attachment 403-2, LPRM and APRM Status Information Sheet, is attached.

Initiating Cue:

Review Attachment 403-2. State any actions required, if any.

Review and approve the Troubleshooting Log. If not approved, state why.

ATTACHMENT 403-2 LPRM AND APRM STATUS INFORMATION SHEET

NOTE
BYPASSED OR INOPERABLE LPRM'S/APRM'S SHOULD BE MARKED WITH AN "X", THOSE LPRMS WHICH MAY **NOT** BE BYPASSED SHOULD BE MARKED WITH AN "O" AND THOSE OPERABLE LPRMS IN AN APRM CHANNEL THAT IS BYPASSED SHOULD BE MARKED WITH AN "→"

	D (6)
	C (2)
	B (6)
	A (2)
20-49	

x	D (5)
	C (1)
o	B (5)
	A (1)
28-49	

	D (6)
	C (2)
	B (6)
	A (2)
12-41	

x	D (5)
	C (1)
0	B (5)
	A (1)
36-41	

x	D (6)
	C (2)
x	B (6)
	A (2)
04-33	

	D (6)
	C (2)
	B (6)
	A (2)
20-33	

	D (5)
	C (1)
	B (5)
	A (1)
28-33	

0	D (5)
	C (1)
x	B (5)
	A (1)
44-33	

	D (7)
	C (3)
	B (7)
	A (3)
04-25	

	D (7)
	C (3)
	B (7)
	A (3)
20-25	

	D (8)
	C (4)
	B (8)
	A (4)
28-25	

	D (8)
	C (4)
	B (8)
	A (4)
44-25	

	D (7)
	C (3)
	B (7)
	A (3)
12-17	

	D (8)
	C (4)
	B (8)
	A (4)
36-17	

	D (7)
	C (3)
	B (7)
	A (3)
20-09	

	D (8)
	C (4)
	B (8)
	A (4)
28-09	

APRMs:

1	2	3	4	5	6	7	8
					X		

SRO approved: [signature] Date Today Time Then

Verified by RE: [signature] Date Today Time Then

ATTACHMENT 1
Troubleshooting Log
Page 1 of 3

1. Issue Report# 1234567

2. WO or WR or AR Number: R2284057 Station: Oyster Creek

3. Equipment Involved: LPRM 28-33D

4. Person Preparing Activities: K. Hochran

5. Person Performing Activities and Alterations (N/A if same as 4) M. Millett

6. Describe the malfunction of the equipment for which Troubleshooting is going to be performed:

LPRM 28-33D has been spiking upscale, resulting in spurious ½ scrams

b) What changes or work, recent or not so recent (e.g. during a previous outage), have occurred on the component/system that could have contributed to the current malfunction?

NONE

7. Describe how the malfunctioning equipment is supposed to work per its design:

LPRM should remain constant with Reactor Power

8. Describe the Troubleshooting actions or steps for which approval is being requested to determine the cause for the delta between steps 6a and 7 above in the performance of the malfunctioning equipment:

Remove LPRM 28-33D from the APRM 5 Drawer, and replace it with LPRM 28-41D (which is not currently associated to any APRM

ATTACHMENT 1
Troubleshooting Log
Page 2 of 3

9. Troubleshooting Limits or Boundaries: Describe the equipment configuration during the Troubleshooting
(extent of equipment isolated, removed from service, made inoperable, in bypass, controller in manual, etc.) to bound the effects of the Troubleshooting and prevent creating an undesired or unanalyzed equipment configuration (Refer to Attachment 4 for additional risk and rigor consideration):

Trouble Shooting only on APRM 5

10. Describe the condition(s) expected to be found during Troubleshooting:

Once LPRM 28-33D is unplugged spiking on APRM 5 should stop

11. Identify any decision or stop points to evaluate progress or subsequent actions:

LPRM 28-33D is unplugged

Signature Approval of **Supervisor** if in **Simple Troubleshooting**: (N/A if in Complex Troubleshooting)

Date: Today

Approval of **Troubleshooting Team Manager** -- Required if in **Complex Troubleshooting**:
(N/A for Simple Troubleshooting) N/A Date: N/A

Troubleshooting Risk Category per Attachment 4 Risk and Rigor Determination: A

Maintenance Director/designee review/approval N/A Date: N/A
(N/A if not risk category A or B)

Shift Supervisor Approval: ______ Date: ______
(N/A if work is within a Clearance boundary)

ATTACHMENT 1
Troubleshooting Log
Page 3 of 3

12. Results Obtained:

____
____
____
____
____
____
____
____

13. Follow-up Actions Required:

____
____
____
____
____

14. Are there any additional Attachment 1's Yes____ No ____ If Yes, how many? _____
15. ____ Check and attach if there is any additional documentation other than this Attachment 1
Worker:____ Date:____________
16. Is there is need to transition to Complex Troubleshooting ? _______YES ______ NO
If YES, has Maintenance Director or Duty Team Manager been notified?
_______YES ________NO
____ Date: ___________________
Supervisor/Team leader for Simple Troubleshooting
(N/A if form being used during Complex Troubleshooting)
NOTE: Complete this form, sign and date, and retain form with Troubleshooting Plan documentation.

Facility: Oyster Creek Task No.: EQC02022

Task Title: RPS Manual Scram Electrical Print Reading

Job Performance Measure No.: NRC Admin JPM 3 (RO/SRO)

K/A Reference: 2.2.41, RO 3.5/SRO 3.9

Examinee: ______ Examiner: ______

Facility Evaluator: ______ Date: ______

Method of Testing:

Simulated Performance ______ Actual Performance X

Classroom X Simulator ______ Plant ______

Read to the Examinee:

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

Initial Conditions:

1. None.
2. Ask the operator for any questions.

Task Standard:

Relays and contacts affected by depressing RPS 1 manual scram pushbutton are identified on station electrical drawings and operation is explained. For SRO candidates, additionally identify the surveillance requirements for testing the RPS 1 manual scram pushbutton and the Technical Specification impact if the pushbutton becomes inoperable.

Required Materials: None

General References:

1. DWG. NO. GE 237E566 SHEETS - 2,3,& 10

Initiating Cue:

Using station electrical prints, explain how depressing the RPS 1 manual scram pushbutton results in an RPS channel 1 half scram. You may mark the provided prints and/or write the explanation on this sheet. Identify the electrical components that accomplish this action."

Time Critical Task: NO

Validation Time: 8 Minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Obtains a copy of the reference print and reviews/utilizes the correct sheets

Standard: Obtained current revision of DWG. NO. GE 237E566 SHEETS - 2,3,& 10

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 3

Using GE 237E566 SHEETS - 2,3,& 10, locates RPS 1 manual scram pushbutton

Note: This may be identified by either marking on the electrical print or writing the electrical print number and location on the response sheet

Standard: Locates RPS 1 manual scram pushbutton (1S2) on sheet 2 coordinate E-5

Comment:

SAT/UNSAT

✓ Performance Step: 4

Using GE 237E566 SHEETS - 2,3,& 10, identifies relay 1K21A

Standard: Locates relay 1K21A on GE 237E566 on sheet 2 coordinate D-5

Note: This may be identified by either marking on the electrical print or writing the electrical print number and location on the response sheet

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 5

Using GE 237E566 SHEET 3, identifies contacts 1K21A

Note: This may be identified by either marking on the electrical print or writing the electrical print number and location on the response sheet.
Note:
The candidate may also identify additional contacts and relays affected by pressing the 1S2 manual scram pushbutton. This is satisfactory but not required, as the task did not require discussion of the backup scram or any other functions.

Standard: Using GE 237E566 SHEET 3, identifies contacts 1K21A at coordinate H-5, H-4, and H-3

Comment:

SAT/UNSAT

✓ Performance Step: 6

Using GE 237E566 SHEETS 3, identifies relays/solenoids 305-117 and/or 118.

Standard: Using GE 237E566 SHEETS 3, identifies relays/solenoids 305-117 and/or 118 at coordinates B-8

Notes:
- This may be identified by either marking on the electrical print or writing the electrical print number and location on the response sheet.
- The candidate does not have to identify all solenoids/relays on this sheet, as long as a representative sample is identified and some indication is given that there are multiple solenoids/relays.

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 7

Describes how depressing the RPS 1 manual scram pushbutton on E console results in an RPS half scram

Standard: Describes the following:

- Depressing RPS 1 manual scram pushbutton causes relay 1K21A to de-energize.
- Relay 1K21A de-energizing causes contacts 1K21A to open.
- Contacts 1K21A opening causes solenoid/relay 305-117 and/or 118 to de-energize at each HCU.

Notes:

- Solenoid/relay 305-117 and 305-118 do not need to be specifically mentioned, as long as a representative sample is identified and some indication is given that there are multiple 305 solenoids/relays.
- The candidate does not have to match this description word-for-word, but must include all concepts in their description.

Comment:

SAT/UNSAT

RO Terminating Cue: Relays and contacts affected by depressing RPS 1 manual scram pushbutton are identified on station electrical drawings and operation is explained.

RO JPM Stop Time: ___________

Performance Information

Additional SRO Only Cue:

Provide SRO candidates the additional SRO only cue sheet and direct them to determine:

- The surveillance requirement for testing the RPS 1 manual scram pushbutton and
- The Technical Specification impact if the RPS 1 manual scram pushbutton becomes inoperable.

✓ Performance Step: 8

SRO Only: Determines the surveillance requirement for testing the RPS 1 manual scram pushbutton.

Standard: Determines the surveillance requirement for testing the RPS 1 manual scram pushbutton is 1/3 month

Comment:

SAT/UNSAT

✓ Performance Step: 9

SRO Only: Determines the Technical Specification impact if the RPS 1 manual scram pushbutton becomes inoperable.

Standard: Determines Technical Specification 3.1 is not met.

Determines Technical Specification 3.1 requires control rods to be inserted
OR
Determines Technical Specification 3.1 requires placing the RPS 1 system in a tripped condition.

Comment:

SAT/UNSAT

SRO Terminating Cue: Surveillance requirement and Technical Specification impact have been determined.

SRO JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC RO/SRO Admin JPM 3

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ______________________ ______________________

JPM Setup

Have the following references available:

1. GE 237E566 SHEETS - 2,3,& 10

Have SRO ONLY references available:

1. SFCP ref. 5
2. T.S. 3.1

STUDENT HANDOUT

Initial Conditions:

- None

Task Cue:

Using station electrical prints, explain how depressing the RPS 1 manual scram pushbutton results in an RPS channel 1 half scram. You may mark the provided prints and/or write the explanation on this sheet. Identify the electrical components that accomplish this action.

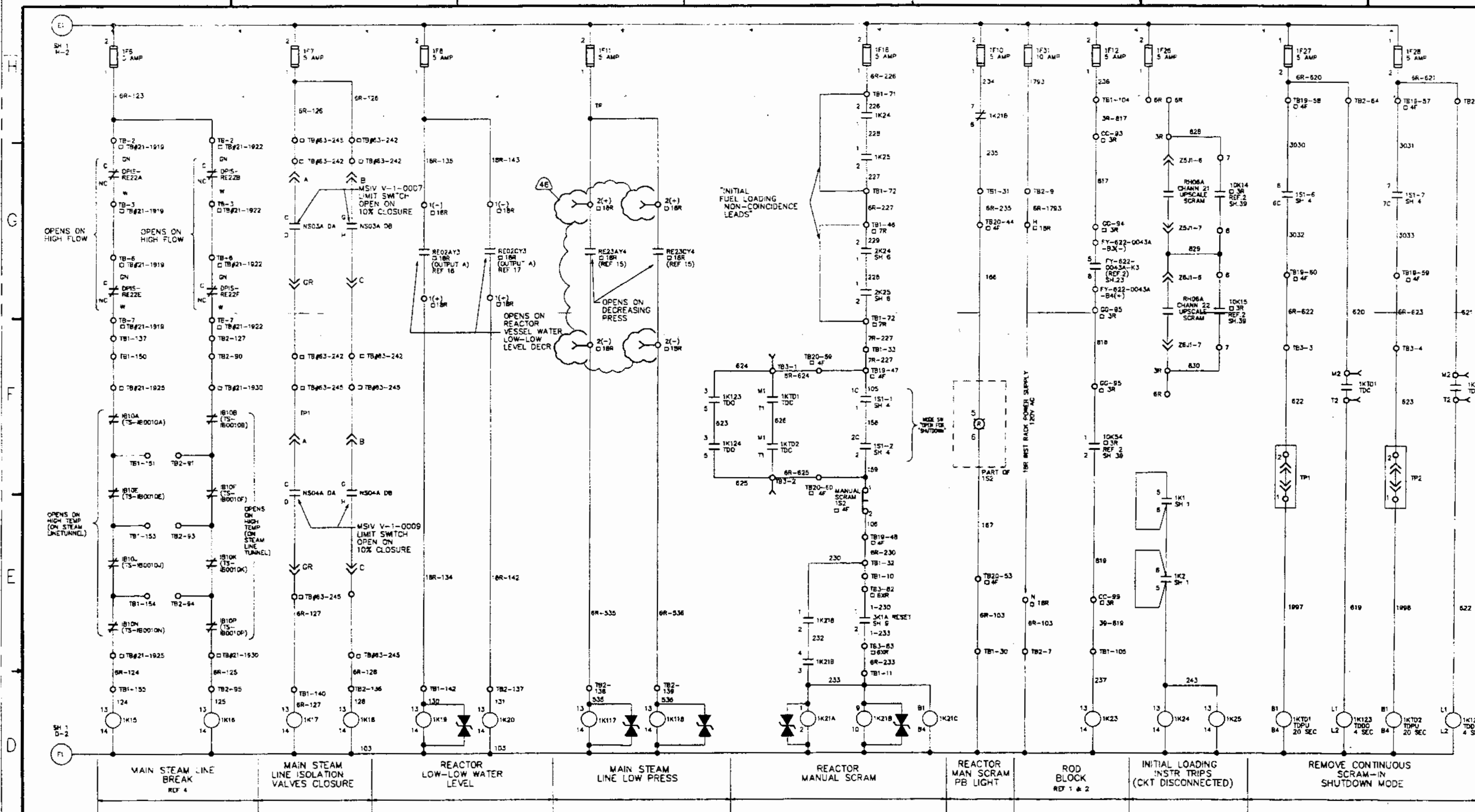
SRO ADDITIONAL STUDENT HANDOUT

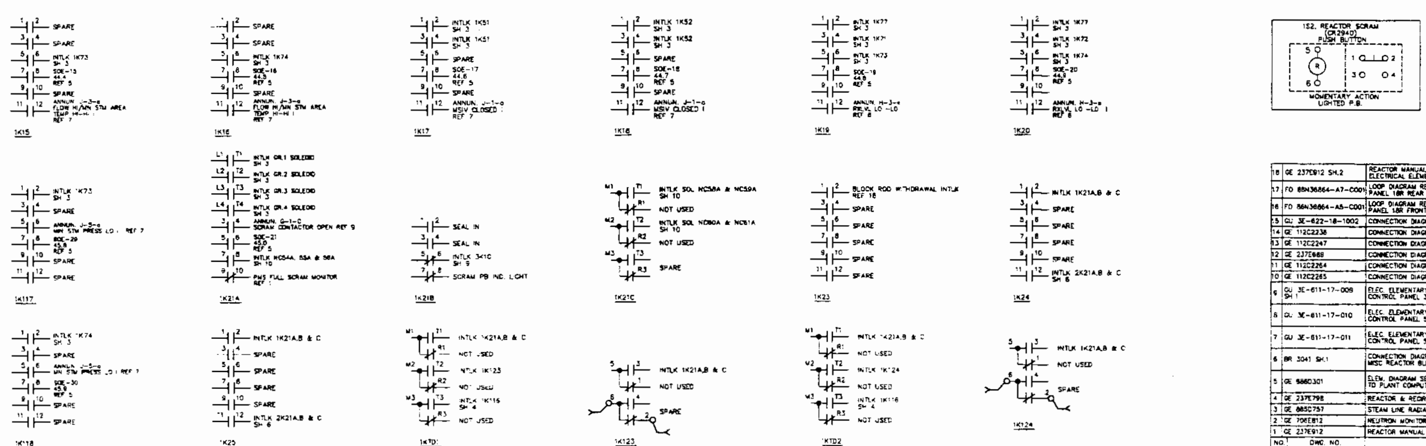
Determine the following:

- The surveillance requirement for testing the RPS 1 manual scram pushbutton

  and

- The Technical Specification impact if the RPS 1 manual scram pushbutton becomes inoperable with the plant at 100% power.





REVISIONS

REV	ZONE	DESCRIPTION
46	4	ECR OC 10-00539

LEGEND:

- □ 4F – INDICATES DEVICE LOCATED IN CONTROL PANEL 4F.
- □ 3R – INDICATES DEVICE LOCATED IN CONTROL PANEL 3R.
- □ 18R – INDICATES DEVICE LOCATED IN CONTROL PANEL 18R.
- □ 7R – INDICATES DEVICE LOCATED IN CONTROL PANEL 7R.
- □ 6XR – INDICATES DEVICE LOCATED IN CONTROL PANEL 6XR.
- □ TB#21-1919–TERMINAL BOX #21-1919 AT REACTOR BLDG.
- □ TB#21-1922–TERMINAL BOX #21-1922 AT REACTOR BLDG.
- □ TB#21-1925–TERMINAL BOX #21-1925 AT REACTOR BLDG.
- □ TB#21-1930–TERMINAL BOX #21-1930 AT REACTOR BLDG.
- □ TB#63-242 –TERMINAL BOX #63-242 AT REACTOR BLDG.
- □ TB#63-245 –TERMINAL BOX #63-245 AT REACTOR BLDG.
- □ TB#21-1968–TERMINAL BOX #21-1968.
- □ TB#21-1969–TERMINAL BOX #21-1969.
- —< – INDICATES BANANA TEST JACK

NOTES:

1. UNLESS OTHERWISE NOTED ALL DEVICES ARE LOCATED IN CONTROL PANEL 6R

NO.	DWG. NO.	TITLE
18	GE 237E912 SH.2	REACTOR MANUAL CONTROL SYSTEM ELECTRICAL ELEMENTARY DIAGRAM
17	FO 86N36864-A7-C001	LOOP DIAGRAM RE02C PANEL 18R REAR
16	FO 86N36864-A5-C001	LOOP DIAGRAM RE02A PANEL 18R FRONT
15	GU 3E-622-18-1002	CONNECTION DIAGRAM PANEL 18R
14	GE 112C2238	CONNECTION DIAGRAM PANEL 6XR
13	GE 112C2247	CONNECTION DIAGRAM PANEL 4F
12	GE 237E689	CONNECTION DIAGRAM PANEL 3R
11	GE 112C2264	CONNECTION DIAGRAM PANEL 7R
10	GE 112C2265	CONNECTION DIAGRAM PANEL 6R
9	GU 3E-611-17-009 SH 1	ELEC. ELEMENTARY DIAGRAM CONTROL PANEL 3F ANNUN G
8	GU 3E-611-17-010	ELEC. ELEMENTARY DIAGRAM CONTROL PANEL 5F/6F ANNUN H
7	GU 3E-611-17-011	ELEC. ELEMENTARY DIAGRAM CONTROL PANEL 5F/6F ANNUN J
6	BR 3041 SH.1	CONNECTION DIAGRAM MISC REACTOR BLDG TERMINAL BOXES
5	GE 5860301	ELEM. DIAGRAM SELECTED INPUTS TO PLANT COMPUTER
4	GE 237E798	REACTOR & RECIRC LOOP P&ID
3	GE 885C757	STEAM LINE RADIATION MONITOR ELEM.
2	GE 706E812	NEUTRON MONITORING SYSTEM ELEM.
1	GE 237E912	REACTOR MANUAL CONTROL SYSTEM ELEM.

REFERENCES

CAD FILE NAME: GE 237E566 S2 R46

REVISION 28 OF THIS DRAWING WAS REDRAWN FROM GE 237E566 SH 1A REV 37
REVISION 34 OF THIS DRAWING WAS TRANSLATED TO AUTOCAD FROM CADAM FILE: V3E.641.17.0005.002-.3401

SAFETY USE

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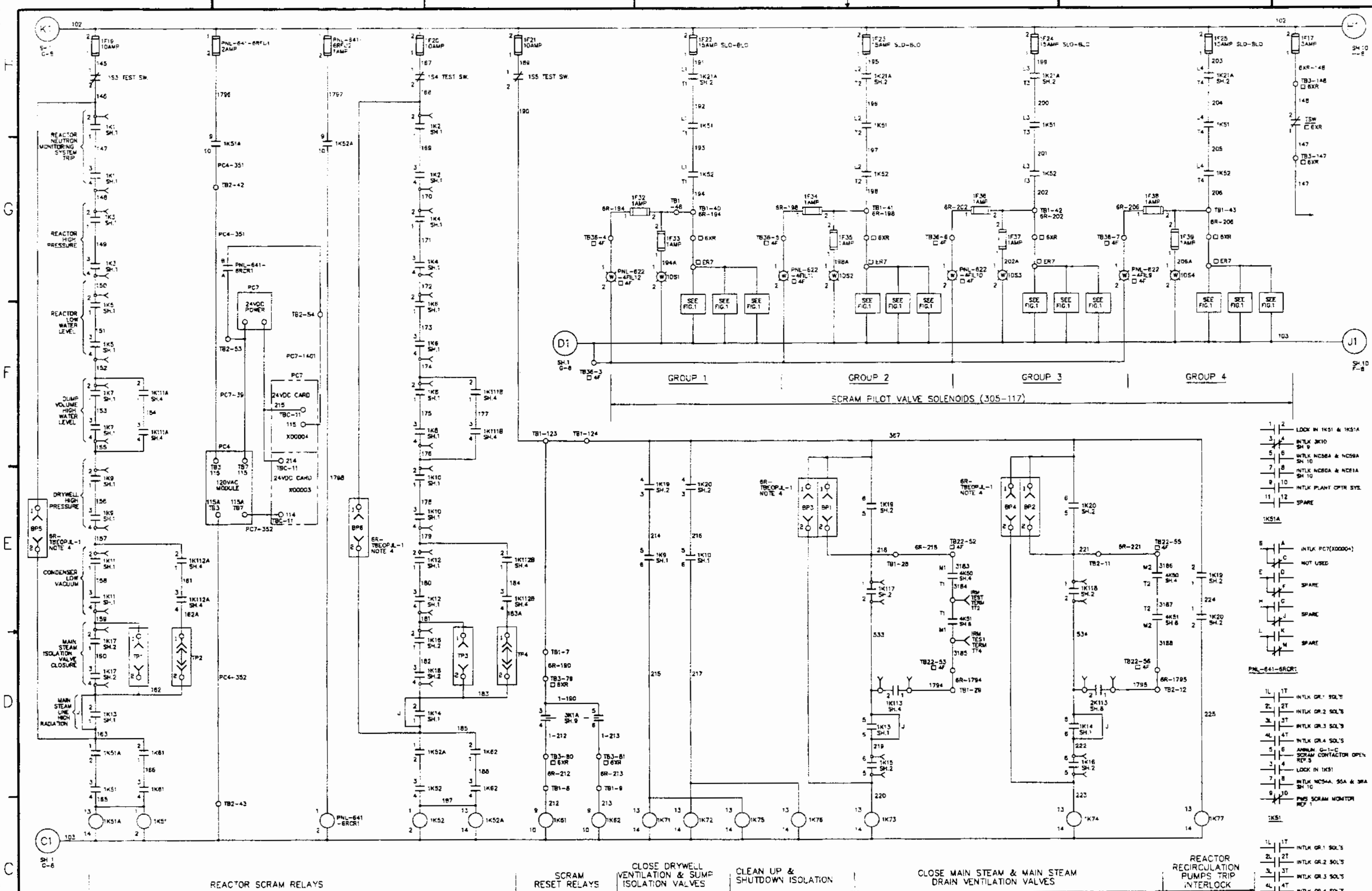
DRAWN: B.VERGARA DATE: 01/13/11
CHECKED: DATE: 1-14-11
ENGINEER: DATE: 1-14-11
ENGINEERING MANAGER: B. OLSEN/SK1 DATE: 01/14/2011

Exelon Nuclear
Oyster Creek Generating Station

REACTOR PROTECTION SYS
ELECTRICAL ELEMENTARY DIAGRAM
CHANNEL 1

OYSTER CREEK | DWG. NO. GE 237E566 | SH. 2 | REV. 46
SCALE: NONE
PIMS #

STICK#7



GROUP 1 | GROUP 2 | GROUP 3 | GROUP 4

SCRAM PILOT VALVE SOLENOIDS (305-117)

REACTOR SCRAM RELAYS | SCRAM RESET RELAYS | CLOSE DRYWELL VENTILATION & SUMP ISOLATION VALVES | CLEAN UP & SHUTDOWN ISOLATION | CLOSE MAIN STEAM & MAIN STEAM DRAIN VENTILATION VALVES | REACTOR RECIRCULATION PUMPS TRIP INTERLOCK

LEGEND:

- □ 4F - INDICATES DEVICE LOCATED IN CONTROL PANEL 4F.
- □ 6XR - INDICATES DEVICE LOCATED IN CONTROL PANEL 6XR.
- □ ER7 - INDICATES DEVICE LOCATED IN CONTROL PANEL ER7.
- o—< - INDICATES BANANA TEST JACK

NOTES:

1. UNLESS OTHERWISE NOTED, ALL DEVICES ARE LOCATED IN CONTROL PANEL 6R.
2. CONTROL ROD NUMBERS & TEST PLUG NUMBERS ARE IDENTIFIED BY SAME DESIGNATION. SEE TABLE
3. CRD TEST PLUGS ARE WIRED TO CHANNEL 1 ONLY.
4. THESE ARE E.O.P. BY-PASS PLUGS.

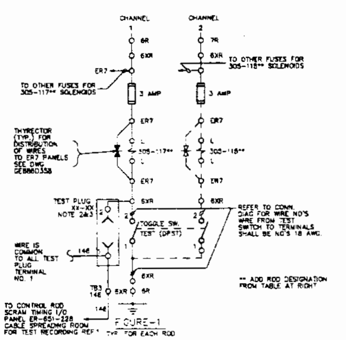
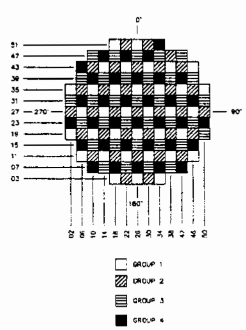
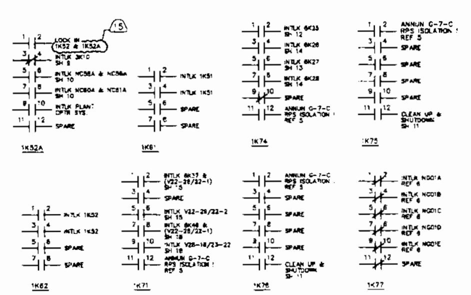


FIGURE-1

TEST PLUG
ROD DESIGNATION NUMBER

GROUP 1	GROUP 2	GROUP 3	GROUP 4
18-03	22-03	14-07	10-07
26-03	30-03	22-07	18-07
34-03	10-11	30-07	26-07
06-11	18-11	38-07	34-07
14-11	26-11	10-15	42-07
22-11	34-11	18-15	06-15
30-11	42-11	26-15	14-15
38-11	06-19	34-15	22-15
46-11	14-19	42-15	30-15
02-19	22-19	50-15	38-15
10-19	30-19	06-23	46-15
18-19	38-19	14-23	02-23
26-19	46-19	22-23	10-23
34-19	02-27	30-23	18-23
42-19	10-27	38-23	26-23
06-27	18-27	46-23	34-23
14-27	26-27	02-31	42-23
22-27	34-27	10-31	50-23
30-27	42-27	18-31	06-31
38-27	50-27	26-31	14-31
46-27	06-35	34-31	22-31
02-35	14-35	42-31	30-31
10-35	22-35	50-31	38-31
18-35	30-35	06-39	46-31
26-35	38-35	14-39	10-39
34-35	46-35	22-39	18-39
42-35	10-43	30-39	26-39
50-35	18-43	38-39	34-39
14-43	26-43	46-39	42-39
22-43	34-43	10-47	06-43
30-43	42-43	18-47	14-47
38-43	38-47	26-47	22-47
46-43	22-51	34-47	30-47
18-51	30-51	42-47	34-51
26-51			





CAD FILE NAME: GE 237E566 S3 R15

REVISION 5 OF THIS DRAWING WAS TRANSLATED TO AUTOCAD FROM CADAM FILE V3E.641.17.0005.003-.0501

NUCLEAR SAFETY RELATED USE

THIS IS A COMPUTER GENERATED DRAWING DO NOT REVISE IT MANUALLY

Exelon Nuclear
Oyster Creek Generating Station

REACTOR PROTECTION SYSTEM ELECTRICAL ELEMENTARY DIAGRAM

CHANNEL 1

DRAWN: B VERGARA 03/19/13

OYSTER CREEK | DWG. NO. GE 237E566 | SH. 3 | REV. 15

SCALE NONE

WA. NO.

STICK #7

REV	ZONE	REVISIONS DESCRIPTION
4		ECR OC 12-00449

LEGEND:

- TB R1100 – TERMINAL BOX # R1100
- TB R1102 – TERMINAL BOX # R1102
- TB R1105 – TERMINAL BOX # R1105
- TB R1106 – TERMINAL BOX # R1106
- TB R1107 – TERMINAL BOX # R1107
- TB R1108 – TERMINAL BOX # R1108
- TB R1051 – TERMINAL BOX # R1051
- TB R1081 – TERMINAL BOX # R1081
- 33 – VALVE POSITION SWITCH
- L – LOCAL TERMINAL
- □ 6R – INDICATES DEVICE LOCATED IN CONT PNL 6R
- □ 7R – INDICATES DEVICE LOCATED IN CONT PNL 7R

NOTES:

1. UNLESS OTHERWISE NOTED ALL DEVICES ARE LOCATED IN CONTROL ROOM PANEL 4F
2. VALVE LIMIT SWITCHES ARE SHOWN WITH THE VALVE IN THE FULL OPEN POSITION.
3. ENERGIZE TO OPEN VALVES.

TYP LIMIT SWITCH CONTACT DEV

LEGEND		VALVE POSITION FULL OPEN	INTERMEDIATE	FULL CLOSED
OPEN LIMIT SWITCH	33-O			
	33-IO			
CLOSE LIMIT SWITCH	33-C			
	33-IC			

LIMIT SWITCH DEVELOPMENT DOES NOT SHOW THE ACTUAL NUMBER OF SWITCH CONTACTS (SHOWN FOR CONTACT OPERATION ONLY)

356A DISCHARGE VOLUME ISOLATION (SDIV) 4F SELECTOR SWITCH

NORMAL — ISOLATE

(TYP. FOR 356B)

CONTACTS	POSITION ISOLATE	NORMAL
1		
2		SPARE

NO	DWG. NO.	TITLE
8	BR 2013 SH. 6	CONTROL AIR SYS FLOW DIAGRAM
7	GE 112C2264	CONNECTION DIAGRAM PANEL 7R
6	GE 112C2265	CONNECTION DIAGRAM PANEL 6R
5	GU 3E-225-18-1000	WIRING DIAGRAM SCRAM DISCHARGE
4	GE 112C2247	CONNECTION DIAGRAM PANEL 4F
3	GE 237E912 SH 6	REACTOR MANUAL CONTROL ELEC ELEMENTARY DIAGRAM
2	GU 3C-733-11-007	PANEL SCHEDULE INSTRUMENT PANLE NO. 4A (IP-4A)
1	GE 237E467 SH 1	FLOW DIAGRAM

REFERENCES

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Exelon. Nuclear
Oyster Creek Generating Station /GE

REACTOR PROTECTION SYSTEM
ELECTRICAL ELEMENTARY DIAGRAM

DRAWN B.VERGARA 03/19/13

OYSTER CREEK

DWG. NO. GE 237E566 | SH. 10 | REV. 4

SCALE: NONE

WA. NO. 328319

DWG NO. GE 237E566 SH 10

SECTION 1 DEFINITIONS

1.1 REFUELING OUTAGE (TS Definition 1.12)

For the purpose of designating frequency of testing and surveillance, a REFUELING OUTAGE shall mean a regularly scheduled REFUELING OUTAGE. Following the first REFUELING OUTAGE, successive tests or surveillances shall be performed at least once per 24 months.

1.2 STAGGERED TEST BASIS

A Staggered Test Basis shall consist of:

A. A test schedule for n systems, subsystems, trains or other designated components obtained by dividing the specified test interval into n equal subintervals.

B. The testing of one system, subsystem, train or other designated component at the beginning of each subinterval.

NOTE: Certain words within this document are capitalized based on their TS definition, or consistent with their capitalization within the respective TS/Bases section.

OYSTER CREEK NUCLEAR GENERATING STATION
SURVEILLANCE FREQUENCY CONTROL PROGRAM
LIST OF SURVEILLANCE FREQUENCIES

SURVEILLANCE REQUIREMENT	DESCRIPTION	FREQUENCY
TS Section 4.1	**PROTECTIVE INSTRUMENTATION**	
4.1	Instrumentation shall be checked, tested, and calibrated as indicated in SFCP Tables 4.1.1 and 4.1.2 using the definitions given in TS Section 1.	SFCP Tables 4.1.1 and 4.1.2 unless otherwise noted in TS Tables 4.1.1 and 4.1.2

OYSTER CREEK NUCLEAR GENERATING STATION
SURVEILLANCE FREQUENCY CONTROL PROGRAM
LIST OF SURVEILLANCE FREQUENCIES

MINIMUM CHECK, CALIBRATION AND TEST FREQUENCY FOR PROTECTIVE INSTRUMENTATION

Instrument Channel		Check	Calibrate	Test	Remarks (Applies to Test & Calibration)
1.	High Reactor Pressure	1/d	Note3	1/3 mo.	
2.	High Drywell Pressure (SCRAM)	N/A	1/3 mo.	1/3 mo.	By application of test pressure
3.	Low Reactor Water Level	1/d	Note3	1/3 mo.	
4.	Low-Low Water Level	1/d	Note3	1/3 mo.	
5.	High Water Level in SCRAM Discharge Volume				
	a. Digital	N/A	1/12 mo.	1/12 mo.	By varying level in sensor columns
	b. Analog	N/A	Note3	1/3 mo.	
6.	Low-Low-Low Water Level	N/A	1/3 mo.	1/3 mo.	By application of test pressure
7.	High Flow in Main Steamline	1/d	1/3 mo.	1/3 mo.	By application of test pressure
8.	Low Pressure in Main Steamline	N/A	1/3 mo.	1/3 mo.	By application of test pressure
9.	High Drywell Pressure (Core Cooling)	1/d	1/3 mo.	1/3 mo.	By application of test pressure
10.	Main Steam Isolation Valve (SCRAM)	NIA	N/A	1/3 mo.	By exercising valve

MINIMUM CHECK, CALIBRATION AND TEST FREQUENCY FOR PROTECTIVE INSTRUMENTATION

Instrument Channel		Check	Calibrate	Test	Remarks (Applies to Test & Calibration)
11.	APRM Level	N/A	1/3d	N/A	Verify the absolute difference between the APRM channels and the calculated power is ≤ 2% rated thermal power [plus any gains required by LSSS 2.3.A.1]
	APRM SCRAM Trips • Flow based neutron flux – high • Fixed neutron flux – high or inop • Downscale	Note 2	1/3 mo.	1/3 mo.	Using built-in calibration equipment During POWER OPERATION
12.	APRM Rod Blocks	Note 2	1/3 mo.	1/3 mo.	Upscale and downscale
13.	DELETED				
14.	High Radiation in Reactor Building				
	Operating Floor	1/s	1/3 mo.	1/3 mo.	Using gamma source for calibration
	Ventilation Exhaust	1/s	1/3 mo.	1/3 mo.	
15.	High Radiation on Air Ejector Off-Gas		1/3 mo.	1/3 mo.	Using built-in calibration equipment
		1/s			Channel Check
		1/mo.			Source check
			1/24 mo.		Calibration according to established station calibration procedures
				1/24 mo.	Note a

MINIMUM CHECK, CALIBRATION AND TEST FREQUENCY FOR PROTECTIVE INSTRUMENTATION

Instrument Channel		Check	Calibrate	Test	Remarks (Applies to Test & Calibration)
16.	IRM Level	N/A	Each Startup	N/A	
	IRM Scram	*	*	*	Using built-in calibration equipment
17.	IRM Blocks	N/A	Prior to startup and shutdown	Prior to startup and shutdown	Upscale and downscale
18.	Condenser Low Vacuum	N/A	1/24 mo.	1/24 mo.	
19.	Manual Scram Buttons	N/A	N/A	1/3 mo.	
20.	High Temperature Main Steamline Tunnel	N/A	1/24 mo.	Each refueling outage	Using heat source box
21.	SRM	*	*	*	Using built-in calibration equipment
22.	Isolation Condenser High Flow ΔP (Steam & Water)	N/A	1/3 mo.	1/3 mo.	By application of test pressure
23.	Turbine Trip Scram	N/A	N/A	1/3 mo.	
24.	Generator Load Rejection Scram	N/A	1/3 mo.	1/3 mo.	
25.	Recirculation Loop Flow	N/A	1/24 mo.	N/A	By application of test pressure
26.	Low Reactor Pressure Core Spray Valve Permissive	N/A	1/3 mo.	1/3 mo.	By application of test pressure

MINIMUM CHECK. CALIBRATION AND TEST FREQUENCY FOR PROTECTIVE INSTRUMENTATION

Instrument Channel		Check	Test	Calibrate	Remarks (Applies to Test & Calibration)
27.	Scram Discharge Volume (Rod Block)				
	a) Water level high	N/A	Each refueling outage	1/12 mo.	Calibrate by varying level in sensor column
	b) Scram Trip bypass	N/A	N/A	Each refueling outage	
28.	Loss of Power				
	a) 4.16 KV Emergency Bus Undervoltage (Loss of Voltage)	1/d	1/24 mo.	1/mo.	
	b) 4.16 KV Emergency Bus Undervoltage (Degraded Voltage)	1/d	1/24 mo.	1/mo.	
29.	Drywell High Radiation	N/A	Each refueling outage	Each refueling outage	
30.	Automatic Scram Contactors	N/A	1/mo.	N/A	Note 1
31.	Core Spray Booster Pump Differential Pressure	N/A	1/3 mo.	1/3 mo.	By application of a test pressure

MINIMUM CHECK, CALIBRATION AND TEST FREQUENCY FOR PROTECTIVE INSTRUMENTATION

Instrument Channel	Check	Calibrate	Test	Remarks (Applies to Test & Calibration)
32. LPRM Level				
a) Electronics	N/A	1/12 mo	1/12 mo	
b) Detectors	N/A	Note 4	N/A	
33. RWCU HELB High Temperature	N/A	Each refueling outage	1/3 mo.	Perform Channel Tests using the test switches

* Calibrate prior to startup and normal shutdown and thereafter check 1/s and test 1/wk until no longer required.

Legend:
N/A = Not Applicable
1/s = Once per shift
1/d = Once per day
1/3d = Once per 3 days
1/wk = Once per 7 days
1/mo. = Once per 31 days
1/3 mo. = Once every 91 days
1/12 mo. = Once every 365 days
1/24 mo. = Once every 730 days

MINIMUM CHECK, CALIBRATION AND TEST FREQUENCY FOR PROTECTIVE INSTRUMENTATION

NOTE 1: Each automatic scram contactor is required to be tested at least once per 31 days. When not tested by other means, the monthly test can be performed by using the subchannel test switches.

NOTE 2: At least daily during reactor POWER OPERATION, the reactor neutron flux peaking factor shall be estimated and flow-referenced APRM scram and rod block settings shall be adjusted, if necessary, as specified in Section 2.3 Specifications A.1 and A.2.

NOTE 3: Calibrate electronic bistable trips by injection of an external test current once per 3 months. Calibrate transmitters by application of test pressure once per 12 months.

NOTE 4: Perform LPRM detectors calibration every 1000 MWD/MT Average Core Exposure

The following notes are only for Item 15 of Table 4.1.1:

A channel may be taken out of service for the purpose of a check, calibration, test or maintenance without declaring the channel to be inoperable.

a. The CHANNEL FUNCTIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exists:

1) Instrument indicates measured levels above the alarm setpoint.
2) Instrument indicates a downscale failure.
3) Instrument controls not set in operate mode.
4) Instrument electrical power loss.

3.1 PROTECTIVE INSTRUMENTATION

Applicability: Applies to the operating status of plant instrumentation which performs a protective function.

Objective: To assure the OPERABILITY of protective instrumentation.

Specifications:

A. The following operating requirements for plant protective instrumentation are given in Table 3.1.1:

1. The reactor mode in which a specified function must be OPERABLE including allowable bypass conditions.

2. The minimum number of OPERABLE instrument channels per OPERABLE trip system.

3. The trip settings which initiate automatic protective action.

4. The action required when the limiting conditions for operation are not satisfied.

B. 1. Failure of four chambers assigned to any one APRM shall make the APRM inoperable.

2. Failure of two chambers from one radial core location in any one APRM shall make that APRM inoperable.

C. 1. Any two (2) LPRM assemblies which are input to the APRM system and are separated in distance by less than three (3) times the control rod pitch may not contain a combination of more than three (3) inoperable detectors (i.e., APRM channel failed or bypassed, or LPRM detectors failed or bypassed) out of the four (4) detectors located in either the A and B, or the C and D levels.

2. A Travelling In-Core Probe (TIP) chamber may be used as an APRM input to meet the criteria of 3.1.B and 3.1.C.1, provided the TIP is positioned in close proximity to one of the failed LPRM's. If the criteria of 3.1.B.2 or 3.1.C.1 cannot be met, POWER OPERATION may continue at up to rated power level provided a control rod withdrawal block is OPERATING or at power levels less than 61% of rated power until the TIP can be connected, positioned and satisfactorily tested, as long as Specification 3.1.B.1 and Table 3.1.1 are satisfied.

Bases: The plant protection system automatically initiates protective functions to prevent exceeding established limits. In addition, other protective instrumentation is provided to initiate action which mitigates the consequences of accidents or terminates operator control. This specification provides the limiting conditions for operation necessary to preserve the effectiveness of these instrument systems.

Table 3.1.1 defines, for each function, the minimum number of OPERABLE instrument channels for an OPERABLE trip system for the various functions specified. There are usually two trip systems required or available for each function. The specified limiting conditions for operation apply for the indicated modes of operation. When the specified limiting condition cannot be met, the specified Actions Required shall be undertaken promptly to modify plant operation to the condition indicated in a normal manner. Conditions under which the specified plant instrumentation may be out-of-service are also defined in Table 3.1.1.

Except as noted in Table 3.1.1 an inoperable trip system will be placed in the tripped condition. A tripped trip system is considered OPERATING since by virtue of being tripped it is performing its required function. All sensors in the untripped trip system must be OPERABLE, except as follows:

1. The high temperature sensor system in the main steam line tunnel has eight sensors in each protection logic channel. This multiplicity of sensors serving a duplicate function permits this system to operate for twenty month nominal intervals without calibration. Thus, if one of the temperature sensors causes a trip in one of the two trip systems, there are several cross checks that would verify if this were a real one. If not, this sensor could be removed for service. However, a minimum of two of eight are required to be OPERABLE and only one of the two is required to accomplish a trip in a single trip system.

2. One APRM of the four in each trip system may be bypassed without tripping the trip system if core protection is maintained. Core protection is maintained by the remaining three APRM's in each trip system as discussed in Section 7.5.1.8.7 of the Updated FSAR.

3. One IRM channel in each of the two trip systems may be bypassed without compromising the effectiveness of the system. There are few possible sources of rapid reactivity input to the system in the low power low flow condition. Effects of increasing pressure at zero or low void content are minor, cold water from sources available during startup is not much colder than that already in the system, temperature coefficients are small, and control rod patterns are constrained to be uniform by operating procedures backed up by the rod worth minimizer. Worth of individual rods is very low in a uniform rod pattern. Thus, of all possible sources of reactivity input, uniform control rod withdrawal is the most probable cause of significant power rise. Because the flux distribution associated with uniform rod withdrawals does not involve high local peaks, and because several rods must be moved to change power by a significant percentage of rated, the rate of power rise is very slow. Generally the heat flux is in near equilibrium with the fission rate. In an assumed uniform rod withdrawal approach to the scram level, the rate of power rise is no more than five percent of rated per minute, and three OPERABLE IRM instruments in each trip system would be more than adequate to assure a scram before the power could exceed the safety limit. In many cases, if properly located, a single OPERABLE IRM channel in each trip system would suffice.

4. When required for surveillance testing, a channel is made inoperable. In order to be able to test its trip function to the final actuating device of its trip system, the trip system cannot already be tripped by some other means such as a mode switch, interlock, or manual trip. Therefore, there will be times during the test that the channel is inoperable but not tripped. For a two channel trip system, this means that full reliance is being placed on the channel that is not being tested. A channel may be placed in an inoperable status for up to 6 hours for required surveillance without placing the trip system in the tripped condition provided at least one OPERABLE channel in the same trip system is monitoring that parameter.

5. Allowed outage times (AOT) to permit restoration of inoperable instrumentation to OPERABLE status are provided in Table 3.1.1. AOTs vary depending on type of function and the number of inoperable channels per function. If an inoperable channel cannot be restored to OPERABLE status within the AOT, the channel or the associated trip system must be placed in the tripped condition. Placing the inoperable channel in trip (or the associated trip system in trip) conservatively compensates for the inoperability and allows operation to continue. Alternatively, if it is not desired to place the channel (or trip system) in trip (e.g., as in the case where placing the inoperable channel in trip would result in a full scram) the Action Required must be taken.

AOTs discussed in 4 (6 hours for surveillance) and 5 (repair AOTs in Table 3.1.1, Notes nn, oo and pp) above have been determined in accordance with References 1 through 6 except for instrumentation in Table 3.1.1, Sections M and N. Note kk has been provided to specify a 2 hour surveillance AOT for those instruments.

Bypasses of inputs to a trip system other than the IRM and APRM bypasses are provided for meeting operational requirements listed in the notes in Table 3.1.1. Note 'a' allows the "high water level in scram discharge volume" scram trip to be bypassed in the refuel mode. In order to reset the safety system after a scram condition, it is necessary to drain the scram discharge volume to clear this scram input condition. (This condition usually follows any scram, no matter what the initial cause might have been.) In order to do this, this particular scram function can be bypassed only in the refuel position. Since all of the control rods are completely inserted following a scram, it is permissible to bypass this condition because a control rod block prevents withdrawal as long as the switch is in the bypass condition for this function.

The manual scram associated with moving the mode switch to shutdown is used merely to provide a mechanism whereby the reactor protection system scram logic channels and the reactor manual control system can be energized. The ability to reset a scram twenty (20) seconds after going into the SHUTDOWN MODE provides the beneficial function of relieving scram pressure from the control rod drives which will increase their expected lifetime.

To permit plant operation to generate adequate steam and pressure to establish turbine seals and condenser vacuum at relatively low reactor power, the main condenser vacuum trip is bypassed until 600 psig. This bypass also applies to the main steam isolation valves for the same reason.

The action required when the minimum instrument logic conditions are not met is chosen so as to bring plant operation promptly to such a condition that the particular protection instrument is not required; or the plant is placed in the protection or safe condition that the instrument initiates. This is accomplished in a normal manner without subjecting the plant to abnormal operations conditions. The action and out-of-service requirements apply to all instrumentation within a particular function, e.g., if the requirements on any one of the ten scram functions cannot be met then control rods shall be inserted.

The trip level settings not specified in Specification 2.3 have been included in this specification. The bases for these settings are discussed below.

The high drywell pressure trip setting is ≤ 3.5 psig. This trip will scram the reactor, initiate core spray, initiate primary containment isolation, initiate automatic depressurization in conjunction with low-low-low-reactor water level, initiate the standby gas treatment system and isolate the reactor building. The scram function shuts the core down during the loss-of-coolant accidents. A steam leak of about 15 gpm and a liquid leak of about 35 gpm from the primary system will cause drywell pressure to reach the scram point; and, therefore, the scram provides protection for breaks greater than the above.

High drywell pressure provides a second means of initiating the core spray to mitigate the consequences of loss-of-coolant accident. Its trip setting of ≤3.5 psig initiates the core spray in time to provide adequate core cooling. The break size coverage of high drywell pressure was discussed above. Low-low water level and high drywell pressure in addition to initiating core spray also causes isolation valve closure. These settings are adequate to cause isolation to minimize the offsite dose within required limits.

It is permissible to make the drywell pressure instrument channels inoperable during performance of the integrated primary containment leakage rate test provided the reactor is in the COLD SHUTDOWN condition. The reason for this is that the Engineered Safety Features, which are effective in case of a LOCA under these conditions, will still be effective because they will be activated (when the Engineered Safety Features system is required as identified in the technical specification of the system) by low-low reactor water level.*

The scram discharge volume has two separate instrument volumes utilized to detect water accumulation. The high water level is based on the design that the water in the SDIV's, as detected by either set of level instruments, shall not be allowed to exceed 29.0 gallons; thereby, permitting 137 control rods to scram. To provide further margin, an accumulation of not more than 14.0 gallons of water, as detected by either instrument volume, will result in a rod block and an alarm. The accumulation of not more than 7.0 gallons of water, as detected in either instrument volume will result in an alarm.

Detailed analyses of transients have shown that sufficient protection is provided by other scrams below 45% power to permit bypassing of the turbine trip and generator load rejection scrams. However, for operational convenience, 40% of rated reactor ~~thermal power~~THERMAL POWER has been chosen as the setpoint below which these trips are bypassed. This setpoint is coincident with bypass valve capacity.

A low condenser vacuum scram trip of 20 inches Hg has been provided to protect the main condenser in the event that vacuum is lost. A loss of condenser vacuum would cause the turbine stop valves to close, resulting in a turbine trip transient.

The low condenser vacuum trip provides a reliable backup to the turbine trip. Thus, if there is a failure of the turbine trip on low vacuum, the reactor would automatically scram at 20 inches Hg. The condenser is capable of receiving bypass steam until 7 inches Hg vacuum thereby mitigating the transient and providing a margin.

The settings to isolate the isolation condenser in the event of a break in the steam or condensate lines are based on the predicted maximum flows that these systems would experience during operation, thus permitting operation while affording protection in the event of a break. The settings correspond to a flow rate of less than three times the normal flow rate of $3.2X10^5$ lb/hr. Upon initiation of the alternate shutdown panel, this function is bypassed to prevent spurious isolation due to fire induced circuit faults.

*Correction 11/30/87

The setting of ten times the stack release limit for isolation of the air-ejector offgas line is to permit the operator to perform normal, immediate remedial action if the stack limit is exceeded. The time necessary for this action would be extremely short when considering the annual averaging which is allowed under 10 CFR 20.106, and, therefore, would produce insignificant effects on doses to the public.

Four radiation monitors are provided which initiate isolation of the reactor building and operation of the standby gas treatment system. Two monitors are located in the ventilation ducts, one is located in the area of the refueling pool and one is located in the reactor vessel head storage area. The trip logic is basically a 1 out of 4 system. Any upscale trip will cause the desired action. Trip settings of 17 mr/hr in the duct and 100 mr/hr on the refueling floor are based upon initiating standby gas treatment system so as not to exceed allowed dose rates of 10 CFR 20 at the nearest site boundary.

The SRM upscale of $5X10^5$ CPS initiates a rod block so that the chamber can be relocated to a lower flux area to maintain SRM capability as power is increased to the IRM range. Full scale reading is 1×10^6 CPS. This rod block is bypassed in IRM Ranges 8 and higher since a level of 5×10^5 CPS is reached and the SRM chamber is at its fully withdrawn position.

The SRM downscale rod block of 100 CPS prevents the instrument chamber from being withdrawn too far from the core during the period that it is required to monitor the neutron flux. This downscale rod block is also bypassed in IRM Ranges 8 and higher. It is not required at this power level since good indication exists in the Intermediate Range and the SRM will be reading approximately 5×10^5 CPS when using IRM Ranges 8 and higher.

The IRM downscale rod block in conjunction with the chamber full-in position and range switch setting, provides a rod block to assure that the IRM is in its most sensitive condition before startup. If the two latter conditions are satisfied, control rod withdrawal may commence even if the IRM is not reading at least 5%. However, after a substantial neutron flux is obtained, the rod block setting prevents the chamber from being withdrawn to an insensitive area of the core.

The APRM downscale setting of $\geq 2/150$ full scale is provided in the RUN MODE to prevent control rod withdrawal without adequate neutron monitoring.

High flow in the main steamline is set at 120% of rated flow. At this setting the isolation valves close and in the event of a steam line break limit the loss of inventory so that fuel clad perforation does not occur. The 120% flow would correspond to the ~~thermal~~THERMAL POWER ~~power~~ so this would either indicate a line break or too high a power.

Temperature sensors are provided in the steam line tunnel to provide for closure of the main steamline isolation valves should a break or leak occur in this area of the plant. The trip is set at 50°F above ambient temperature at rated power. This setting will cause isolation to occur for main steamline breaks which result in a flow of a few pounds per minute or greater. Isolation occurs soon enough to meet the criterion of no clad perforation.

The low-low-low water level trip point is set at 4'8" above the top of the active fuel and will prevent spurious operation of the automatic relief system. The trip point established will initiate the automatic depressurization system in time to provide adequate core cooling.

Specification 3.1.B.1 defines the minimum number of APRM channel inputs required to permit accurate average core power monitoring. Specifications 3.1.B.2 and 3.1.C.1 further define the distribution of the OPERABLE chambers to provide monitoring of local power changes that might be caused by a single rod withdrawal. Any nearby, OPERABLE LPRM chamber can provide the required input for average core monitoring. A Travelling Incore Probe or Probes can be used temporarily to provide APRM input(s) until LPRM replacement is possible. Since APRM rod block protection is not required below 61% of rated power, ~~as discussed in Section 2.3, Limiting Safety System Settings,~~ operation may continue below 61% as long as Specification 3.1.B.1 and the requirements of Table 3.1.1 are met. For operation along the flow control line and at power levels less than 61% of rated, the inadvertent withdrawal of a single control rod does not result in MCPR less than the Fuel Cladding Integrity Safety Limit, even assuming there is no control rod block action. In order to maintain reliability of core monitoring in that quadrant where an APRM is inoperable, it is permitted to remove the OPERABLE APRM from service for calibration and/or test provided that the same core protection is maintained by alternate means.

In the rare event that Travelling In-core Probes (TIPs) are used to meet the requirements 3.1.B or 3.1.C, the licensee may perform an analysis of substitute LPRM inputs to the APRM system using spare (non-APRM input) LPRM detectors and change the APRM system as permitted by 10 CFR 50.59.

Under assumed loss-of-coolant accident conditions and certain loss of offsite power conditions with no assumed loss-of-coolant accident, it is inadvisable to allow the simultaneous starting of emergency core cooling and heavy load auxiliary systems in order to minimize the voltage drop across the emergency buses and to protect against a potential diesel generator overload. The diesel generator load sequence time delay relays provide this protective function and are set accordingly. The repetitive accuracy rating of the timer mechanism as well as parametric analyses to evaluate the maximum acceptable tolerances for the diesel loading sequence timers were considered in the establishment of the appropriate load sequencing.

Manual actuation can be accomplished by the operator and is considered appropriate only when the automatic load sequencing has been completed. This will prevent simultaneous starting of heavy load auxiliary systems and protect against the potential for diesel generator overload.

Also, the Reactor Building Closed Cooling Water and Service Water pump circuit breakers will trip whenever a loss-of-coolant accident condition exists with a concurrent loss of offsite power. This is justified by Amendment 42 of the Licensing Application which determined that these pumps were not required during this accident condition.

The drywell high radiation setpoint will ensure a timely closure of the large vent and purge isolation valves to prevent releases from exceeding ten percent of the dose guideline values allowed by 10 CFR 100. The containment vent and purge isolation function is provided in response to NUREG 0737 Item II E.4.2.7.

Temperature switches are provided at the entrance of the RWCU Pump Room to detect a line break downstream of the RWCU isolation valves. A line break will raise room temperature. Before the room temperature exceeds 180°F, the switches will trip and close the RWCU isolation valves. This ensures that a high energy line break will automatically be detected and isolated, even if an RWCU System isolation is not initiated by a LO-LO reactor water level signal. System isolation at this temperature will minimize the impact on off-site releases and the environmental qualification profiles for the Reactor Building.

References:

(1) NEDC-30851P-A, "Technical Specification Improvement Analyses for BWR Reactor Protection System."

(2) NEDC-30936P-A, "BWR Owners' Group Technical Specification Improvement Methodology (With Demonstration for BWR ECCS Actuation Instrumentation)," Parts 1 and 2.

(3) NEDC-30851P-A, Supplement 1, "Technical Specification Improvement Analysis for BWR Control Rod Block Instrumentation."

(4) NEDC-30851P-A, Supplement 2, "Technical Specification Improvement Analysis for BWR Isolation Instrumentation Common to RPS and ECCS Instrumentation."

(5) NEDC-31677P-A "Technical Specification Improvement Analysis for BWR Isolation Actuation Instrumentation."

(6) GENE-770-06-1-A, "Bases for Changes to Surveillance Test Intervals and Allowed Out-of-Service Times for Selected Instrumentation Technical Specifications."

TABLE 3.1.1 - PROTECTIVE INSTRUMENTATION REQUIREMENTS

Function	Trip Setting	Reactor Modes in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run	Minimum Number of OPERABLE or OPERATING [tripped] Trip Systems	Minimum Number of Instrument Channels Per OPERABLE Trip System	Action Required*
A. Scram								
1. Manual Scram		X	X	X	X	2	1	Insert control rods
2. High Reactor Pressure	**		X(s)	X(ll)	X	2	2(nn)	
3. High Drywell Pressure	≤ 3.5 psig		X(u)	X(u)	X	2	2(nn)	
4. Low Reactor Water Level	**		X	X	X	2	2(nn)	
5. a. High Water Level in Scram Discharge Volume North Side	≤ 29 gal.		X(a)	X(z)	X(z)	2	2(nn)	
b. High Water Level in Scram Discharge Volume South Side	≤ 29 gal.		X(a)	X(z)	X(z)	2	2(nn)	
6. Low Condenser Vacuum	≥ 20 in. hg.			X(b)	X	1	3(mm)(nn)	
7. DELETED								

Function	Trip Setting	Reactor Modes in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run	Minimum Number of OPERABLE or OPERATING [tripped] Trip Systems	Minimum Number of Instrument Channels Per OPERABLE Trip System	Action Required*
8. Average Power Range Monitor (APRM)	**		X(c,s)	X(c)	X(c)	2	3(nn)	
9. Intermediate Range Monitor (IRM)	**		X(d)	X(d)		2	3(nn)	
10. Main Steamline Isolation Valve Closure	**		X(b,s)	X(b)	X	2	4(nn)	
11. Turbine Trip Scram	**				X(j)	2	4(nn)	
12. Generator Load Rejection Scram	**				X(j)	2	2(nn)	
13. APRM Downscale/IRM Upscale	**				X(c)	2	3(nn)	
B. Reactor Isolation								
1. Low-Low Reactor Water Level	**	X	X	X	X	2	2(oo)	Close Main Steam Isolation Valves and Closed Isolation Condenser Vent Valve or PLACE IN COLD SHUTDOWN
2. High Flow in Main Steamline A	≤120% rated	X(s)	X(s)	X	X	2	2(oo)	

Function	Trip Setting	Reactor Modes in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run	Minimum Number of OPERABLE or OPERATING [tripped] Trip Systems	Minimum Number of Instrument Channels Per OPERABLE Trip System	Action Required*
3. High Flow in Main Steam-line B	≤120% rated	X(s)	X(s)	X	X	2	2(oo)	
4. High Temperature in Main Steamline Tunnel	≤Ambient at Power + 50°F	X(s)	X(s)	X	X	2	2(oo)	
5. Low Pressure in Main Steamline	**			X(cc)	X	2	2(oo)	
6. DELETED								
C. Isolation Condenser Initiation								
1. High Reactor Pressure	**	X(s)	X(s)	X(ll)	X	2	2(pp)	PLACE IN COLD SHUTDOWN CONDITION
2. Low-Low Reactor Water Level	≥7'2" above TOP of ACTIVE FUEL	X(s)	X(s)	X	X	2	2(pp)	
D. Core Spray								
1. Low-Low Reactor Water Level	**	X(t)	X(t)	X(t)	X	2	2(pp)	Consider the respective core spray loop inoperable and comply with Spec 3.4
2. High Drywell Pressure	≤ 3.5 psig	X(t)	X(t)	X(t)	X	2(k)	2(k)(pp)	
3. Low Reactor Pressure (valve permissive)	≥ 285 psig	X(t)	X(t)	X(t)	X	2	2(pp)	

Function	Trip Setting	Reactor Modes in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run	Minimum Number of OPERABLE or OPERATING [tripped] Trip Systems	Minimum Number of Instrument Channels Per OPERABLE Trip System	Action Required*
E. Containment Spray								
Comply with Technical Specification 3.4								
F. Primary Containment Isolation								
1. High Drywell Pressure	≤ 3.5 psig	X(u)	X(u)	X(u)	X	2(k)	2(k)(oo)	Isolation containment or PLACE IN COLD SHUTDOWN CONDITION
2. Low-Low Reactor Water Level	≥ 7'2" above TOP of ACTIVE FUEL	X(u)	X(u)	X(u)	X	2	2(oo)	
G. Automatic Depressurization								
1. High Drywell Pressure	≤ 3.5 psig	X(v)	X(v)	X(v)	X	2(k)	2(k)	See note h
2. Low-Low-Low Reactor Water Level	≥ 4'8" above TOP of ACTIVE FUEL	X(v)	X(v)	X(v)	X	2	2	See note h
3. Core Spray Booster Pump d/p Permissive	> 21.2 psid	X(v)	X(v)	X(v)	X	Note i	Note i	See note i
H. Isolation Condenser Isolation (See Note hh)								
1. High Flow Steam Line	≤ 20 psig P	X(s)	X(s)	X	X	2	2(oo)	Isolate affected Isolation Condenser comply with Spec 3.8. See note dd
2. High Flow Condensate Line	≤ 27" P H_2O	X(s)	X(s)	X	X	2	2(oo)	

Function	Trip Setting	Reactor Modes in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run	Minimum Number of OPERABLE or OPERATING [tripped] Trip Systems	Minimum Number of Instrument Channels Per OPERABLE Trip System	Action Required*
I. Offgas System Isolation								
1. High Radiation In Offgas Line (e)	≤ 2000 mRem/hr	X(s)	X(s)	X	X	1(ii)	2(ii)	See note jj
J. Reactor Building Isolation and Standby Gas Treatment System Initiation								
1. High Radiation Reactor Building Operating Floor	≤ 100 mR/hr	X(w)	X(w)	X	X	1	1	Isolate Reactor Building and Initiate Standby Gas Treatment System or Manual Surveillance for not more than 24 Hours (Total for all instruments under J) in any 30-day period.
2. Reactor Building Ventilation Exhaust	≤ 17 mR/hr	X(w)	X(w)	X	X	1	1	
3. High Drywell Pressure	≤ 3.5 psig	X(u)	X(u)	X	X	1(k)	2(k)	
4. Low-Low Reactor Water Level	≥ 7'2" above TOP of ACTIVE FUEL	X	X	X	X	1	2	
K. Rod Block								
1. SRM Upscale	≤ 5x10^5 cps		X	X(1)		1	2	No control rod withdrawals permitted
2. SRM Downscale	≥ 100cps(f)		X	X(1)		1	2	
3. IRM Downscale	≥ 5/125 fullscale (g)		X	X		2	3	

Function	Trip Setting	Reactor Modes in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run	Minimum Number of OPERABLE or OPERATING [tripped] Trip Systems	Minimum Number of Instrument Channels Per OPERABLE Trip System	Action Required*
K. Rod Block (Cont'd.)								
4. APRM Upscale	**		X(s)	X	X	2	3(c)	
5. APRM Downscale	≥ 2/150 fullscale				X	2	3 (c)	
6. IRM Upscale	≤ 108/125 fullscale		X	X		2	3	
7. a) Water Level High Scram Discharge Volume North	≤ 14 gallons		X(z)	X(z)	X(z)	1	1 per Instrument Volume	
b) Water Level High Scram Discharge Volume South	≤ 14 gallons		X(z)	X(z)	X(z)	1	1 per Instrument Volume	
L. Condenser Vacuum Pump Isolation								
Deleted								
M. Diesel Generator Load Sequence Timers	Time Delay after energization of Relay							
1. CRD Pump	60 sec ± 15%	X	X	X	X	2(m)	1(n)(kk)	Consider the pump inoperable and comply with Spec 3.4.D (See note q)

Function	Trip Setting	Reactor Modes in Which Function Must Be Operable: Shutdown	Refuel	Startup	Run	Minimum Number of OPERABLE or OPERATING [tripped] Trip Systems	Minimum Number of Instrument Channels Per OPERABLE Trip System	Action Required*
M. Diesel Generator Load Sequence Timers (Cont'd.)								
2. Service Water Pump (aa)	120 sec ± 15% (SK1A) (SK2A) 10 sec. ± 15% (SK7A) (SK8A)	X	X	X	X	2(o)	2(p)(kk)	Consider the pump inoperable and comply within 7 days (See note q)
3. Reactor Building Closed Cooling Water Pump (bb)	166 sec ± 15%	X	X	X	X	2(m)	1(n)(kk)	Consider the pump inoperable and comply within 7 days (See note q)
N. Loss of Power								
a. 4.16 KV Emergency Bus Undervoltage (Loss of Voltage)	**	X(ff)	X(ff)	X(ff)	X(ff)	2	1(kk)	
b. 4.16 KV Emergency Bus Undervoltage (Degraded Voltage)	**	X(ff)	X(ff)	X(ff)	X(ff)	2	3(kk)	See note cc
O. Containment Vent and Purge Isolation								
1. Drywell High Radiation	≤ 74.6 R/hr	X(u)	X(u)	X(u)	X	1	1	Isolate vent & Purge pathways or PLACE IN COLD SHUTDOWN CONDITION
P. RWCU HELB Isolation								
1. RWCU Pump Room High Temperature	≤ 180°F	X(s)	X(s)	X	X	2	2(oo)	Close isolation valves V-16-1, V-16-2, V-16-14, & V-16-61

* Action required when minimum conditions for operations are not satisfied. Also permissible to trip inoperable trip system. A channel may be placed in an inoperable status for up to six hours for required surveillance without placing the trip system in the tripped condition provided at least one OPERABLE instrument channel in the same trip system is monitoring that parameter.

** See Specification 2.3 for Limiting Safety System Settings.

Notes:

a. Permissible to bypass, with control rod block, for reactor protection system reset in REFUEL MODE.

b. Permissible to bypass below 600 psig in REFUEL and STARTUP MODES.

c. One (1) APRM in each OPERABLE trip system may be bypassed or inoperable provided the requirements of Specification 3.1.C and 3.10.C are satisfied. Two APRM's in the same quadrant shall not be concurrently bypassed except as noted below or permitted by note.

   Any one APRM may be removed from service for up to six hours for test or calibration without inserting trips in its trip system only if the remaining OPERABLE APRM's meet the requirements of Specification 3.1.B.1 and no control rods are moved outward during the calibration or test. During this short period, the requirements of Specifications 3.1.B.2, 3.1.C and 3.10.C need not be met.

d. The IRMs shall be inserted and OPERABLE until the APRMs are OPERABLE and reading at least 2/150 full scale.

e. Offgas system isolation trip set at ≤2,000 mRem/hr. Air ejector isolation valve closure time delay shall not exceed 15 minutes.

f. Unless SRM chambers are fully inserted.

g. Not applicable when IRM on lowest range.

h. With one or more instrument channel(s) inoperable in one ADS trip system, place the relay contact(s) for the inoperable signal in the tripped condition within 4 days, or declare ADS inoperable and take the action required by Specification 3.4.B.3.

   With one or ore instrument channel(s) inoperable in both ADS trip systems, restore ADS initiation capability in at least one trip system within 1 hour, or declare ADS inoperable and take the action required by Specification 3.4.B.3.

Individual electromatic relief valve control switches shall not be placed in the "Off" position for more than 8 hours (total time for all control switches) in any 30-day period and only one relief valve control switch may be placed in the "Off" position at a time.

i. With two core spray systems OPERABLE:

1. A maximum of two core spray booster pump differential pressure (d/p) switches may be inoperable provided that the switches are in opposing ADS trip system [i.e., only: either RV-40 A&D or RV-40 B&C]. Place the relay contacts associated with the inoperable d/p switch(es) in the de-energized position, within 24 hours. Restore the inoperable d/p switch(es) within 8 days, or declare ADS inoperable and take the action required by Specification 3.4.B.3;

or,

2. If two inoperable d/p switches are in the same ADS trip system [i.e., RV-40 A&B or RV-40 C&D], place the relay contacts associated with the inoperable d/p switch(es) in the de-energized position, within 24 hours. Restore the inoperable d/p switches within 4 days, or declare ADS inoperable and take the action required by Specification 3.4.B.3.

With only one core spray system OPERABLE:

If one or more d/p switches become inoperable in the OPERABLE core spray system, declare ADS inoperable and take the action required by Specification 3.4.B.3.

j. Not required below 40% of rated reactor THERMAL POWER.

k. All four (4) drywell pressure instrument channels may be made inoperable during the integrated primary containment leakage rate test (See Specification 4.5), provided that the plant is in the COLD SHUTDOWN condition and that no work is performed on the reactor or its connected systems which could result in lowering the reactor water level to less than 4'8" above the TOP OF THE ACTIVE FUEL.

l. Bypass in IRM Ranges 8, 9, and 10.

m. There is one time delay relay associated with each of two pumps.

n. One time delay relay per pump must be OPERABLE.

o. There are two time delay relays associated with each of two pumps. One timer per pump is for sequence starting (SK1A, SK2A) and one timer per pump is for tripping the pump circuit breaker (SK7A, SK8A).

p. Two time delay relays per pump must be OPERABLE.

q. Manual initiation of affected component can be accomplished after the automatic load sequencing is completed.

r. Time delay starts after closing of containment spray pump circuit breaker.

s. These functions not required to be OPERABLE with the reactor temperature less than 212°F and the vessel head removed or vented or during REACTOR VESSEL PRESSURE TESTING.

t. These functions may be inoperable or bypassed when corresponding portions in the same core spray system logic train are inoperable per Specification 3.4.A.

u. These functions not required to be OPERABLE when PRIMARY CONTAINMENT INTEGRITY is not required to be maintained.

v. These functions not required to be OPERABLE when the ADS is not required to be OPERABLE.

w. These functions must be OPERABLE only when irradiated fuel is in the fuel pool or reactor vessel and SECONDARY CONTAINMENT INTEGRITY is required per Specification 3.5.B.

y. Deleted.

z. The bypass function to permit scram reset in the SHUTDOWN or REFUEL MODE with control rod block must be OPERABLE in this mode.

aa. Pump circuit breakers will be tripped in 10 seconds ± 15% during a LOCA with a concurrent Loss of Offsite Power (LOOP) by relays SK7A and SK8A.

bb. Pump circuit breakers will trip instantaneously during a LOCA with a concurrent Loss of Offsite Power (LOOP).

cc. Only applicable during STARTUP MODE while OPERATING in IRM range 10.

dd. If any isolation condenser inlet (steam side) isolation valve becomes or is made inoperable in the open position during the RUN MODE comply with Specification 3.8.E. If an AC motor-operated outlet (condensate return) isolation valve becomes or is made inoperable in the open position during the RUN MODE comply with Specification 3.8.F.

ee. With the number of OPERABLE channels one less than the Minimum Number of OPERABLE Instrument Channels per OPERABLE Trip System, operation may proceed until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.

ff. This function is not required to be OPERABLE when the associated safety bus is not required to be energized or fully OPERABLE as per applicable sections of these Technical Specifications.

gg. Deleted

hh. The high flow trip function for "B" Isolation Condenser is bypassed upon initiation of the alternate shutdown panel. This prevents a spurious trip of the Isolation Condenser in the event of fire induced circuit damage.

ii. Instrument shall be OPERABLE during main condenser air ejector operation except that a channel may be taken out-of-service for the purpose of a check, calibration, test, or maintenance without declaring it inoperable.

jj. With no channel OPERABLE, main condenser offgas may be released to the environment for as long as 72 hours provided the stack radioactive noble gas monitor is OPERABLE. Otherwise, be in at least SHUTDOWN CONDITION within 24 hours.

kk. One channel may be placed in an inoperable status for up to two hours for required surveillance without placing the trip system in the tripped condition.

ll. This function not required to be OPERABLE with the reactor vessel head removed or unbolted.

mm. "Instrument Channel" in this case refers to the bellows which sense vacuum in each of the three condensers (A, B, and C), and "Trip System" refers to vacuum trip systems 1 and 2.

nn. With one required channel inoperable in one Trip System, within 12 hours, restore the inoperable channel or place the inoperable channel and/or that Trip System in the tripped▲ condition.

With two or more required channels inoperable:

1. Within one hour, verify sufficient channels remain OPERABLE or tripped▲ to maintain trip capability, and

2. Within 6 hours, place the inoperable channel(s) in one Trip System and/or that Trip System▲▲ in the tripped condition▲, and

3. Within 12 hours, restore the inoperable channels in the other Trip System to an OPERABLE status or tripped▲.

Otherwise, take the Action Required.

▲ An inoperable channel or Trip System need not be placed in the tripped condition where this would cause the Trip Function to occur. In these cases, if the inoperable channel is not restored to OPERABLE status within the required time, the Action Required shall be taken.

▲▲ This action applies to that Trip System with the most inoperable channels; if both Trip Systems have the same number of inoperable channels, the action can be applied to either Trip System.

oo. With one required channel inoperable in one Trip System, either

1. Place the inoperable channel in the tripped condition within

   a. 12 hours for parameters common to Scram Instrumentation, and
   b. 24 hours for parameters not common to Scram Instrumentation.

or

2. Take the Action Required.

With one required channel inoperable in <u>both</u> Trip Systems.

1. Place the inoperable channel in one Trip System in the tripped condition within one hour, and

2. a. Place the inoperable channel in the remaining Trip System in the tripped condition within

   (1) 12 hours for parameters common to Scram Instrumentation, and
   (2) 24 hours for parameters not common to Scram Instrumentation,

   b. Take the Action Required.

pp. With one or more required channels inoperable per Trip System:

1. For one channel inoperable, within 24 hours place the inoperable channel in the tripped condition or take the Action Required.

2. With more than one channel inoperable, take the Action Required.

Performance Information

Facility: Oyster Creek Task No.: RPT00001

Task Title: Authorize Emergency Exposures

Job Performance Measure No.: NRC Admin JPM 4 (SRO)

K/A Reference: 2.3.4 (3.7)

Examinee: ______________ Examiner: ______________

Facility Evaluator: ______________ Date: ______________

Method of Testing:

Simulated Performance ______ Actual Performance X

Classroom X Simulator ______ Plant ______

Read to the Examinee:

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

Initial Conditions:

- The plant was at rated power when a severe earthquake occurred.
- Chemistry has confirmed fuel failures.
- Many plant systems have either failed to automatically isolate or are currently leaking from breaks or incomplete system isolations.
- An emergency has been declared by the Shift Manager but no emergency operating facilities have been activated.
- The RP Manager has forwarded 3 Authorization for Emergency Exposure forms to you for your approval. Personal information on the volunteers to perform the 3 different jobs is also provided.

Task Standard:

Determines that authorization should **not** be provided to Alan Able (JOB A) since it will only result in a dose of 3.75 Rem (25/60 hour x 9 Rem/hr).

Determines that authorization should not be provided to Bob Blake (JOB B) since he already has had an emergency exposure of >25 Rem before.

Determines that authorization should be authorized for Chris Cat (JOB C). He has had no prior emergency exposure > 25 Rem, and his expected exposure is > 5 Rem (35/60 x 11 = 6.4 Rem)

Required Materials: None

Performance Information

General References:

1. EP-AA-113 Revision 12

Initiating Cue:

Authorize or NOT authorize the 3 Authorization For Emergency Exposure forms provided to you from the RP Manager. If not authorized, state why.

Time Critical Task: NO

Validation Time: 30 Minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Note: The following steps can be performed in any order.

✓ Performance Step: 2

Evaluates and determines authorization for Emergency Exposure for Alan Able (JOB A)

Standard: Determines that authorization should **not** be provided to Alan Able (JOB A) since it will only result in a dose of 3.75 Rem (25/60 hour x 9 Rem/hr).

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 3

Evaluates and determines authorization for Emergency Exposure for Bob Blake (JOB B)

Standard: Determines that authorization should not be provided to Bob Blake (JOB B) since he already has had an emergency exposure of >25 Rem before.

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 4

Evaluates and determines authorization for Emergency Exposure for Chris Cat (JOB C)

.

Standard: Determines that authorization should be authorized for Chris Cat. He has had no prior emergency exposure > 25 Rem, and his expected exposure is > 5 Rem (35/60 x 11 = 6.4 Rem)

Comment:

____

____

SAT/UNSAT ______________________________

Terminating Cue: Determines that only the Authorization for Emergency Exposure form for Chris Cat should be authorized, and that the others should not be authorized.

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC SRO Admin JPM 4

Examinee's Name: ____________________

Examiner's Name: ____________________

Date Performed: ____________________

Facility Evaluator: ____________________

Number of Attempts: ____________________

Time to Complete: ____________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ____________________ ____________________

JPM Setup

1. Have a calculator available
2. Have a copy of EP-AA-113 Revision 12 available if the candidate requests
3. Hand out the 3 student copies of EP-AA-113-F-02, Authorization For Emergency Exposure, Revision B, to each candidate
4. Provide the **Personal information on the volunteers to perform the 3 different jobs** to each candidate

STUDENT HANDOUT

Initial Conditions:

- The plant was at rated power when a severe earthquake occurred.
- Chemistry has confirmed fuel failures.
- Many plant systems have either failed to automatically isolate or are currently leaking from breaks or incomplete system isolations.
- An emergency has been declared by the Shift Manager but no emergency operating facilities have been activated.
- The RP Manager has forwarded 3 Authorization for Emergency Exposure forms to you for your approval. Personal information on the volunteers to perform the 3 different jobs is also provided.

Task Cue:

Authorize or NOT authorize the 3 Authorization for Emergency Exposure forms provided to you from the RP Manager. If not authorized, state why.

Personal information on the volunteers to perform the 3 different jobs.

JOB A	**PURPOSE**: To enter the Trunion Room to manually close the MSIVs to secure the steam leak into the Turbine Building. **DOSE RATE**: 9 R/hour. **JOB DURATION**: 25 minutes				
Volunteer:	Alan Able	Age:	44	Prior Lifetime	No
Employee ID:	00111			Emergency Exposure?	
Current Dose:	1000 mrem				

JOB B	**PURPOSE**: To rescue an unconscious worker in the Drywell. **DOSE RATE**: 30 R/hour. **JOB DURATION**: 55 minutes				
Volunteer:	Bob Blake	Age:	47	Prior Lifetime	Yes
Employee ID:	00222			Emergency Exposure?	28 Rem
Current Dose:	1150 mrem				

JOB C	**PURPOSE**: To close the RWCU isolation valves to stop a leak in the Reactor Building and to rescue a trapped worker who could drown from the flooding. **DOSE RATE**: 11 R/hour. **JOB DURATION**: 35 minutes				
Volunteer:	Chris Cat	Age:	40	Prior Lifetime	No
Employee ID:	00333			Emergency Exposure?	
Current Dose:	1400 mrem				

PERSONNEL PROTECTIVE ACTIONS

1. PURPOSE

1.1. This procedure provides the necessary guidance used in determining onsite personnel protective actions during an event.

Assembly, Accountability and Evacuation	**REFER** to Section 4.1
Habitability	**REFER** to Section 4.2
Emergency Exposure Limits	**REFER** to Section 4.3
KI Assessment	**REFER** to Section 4.4

2. TERMS AND DEFINITIONS

2.1. Accountability - Accountability is the process of verifying the location of personnel who are inside the Protected Area. That is, any personnel within the Protected Area who have not carded into the card reader will be identified as missing (unaccounted for). Accountability is required to be completed within 30 minutes of its initiation (the names of any missing persons identified by security and the number of missing provided to the Station Emergency Director).

Accountability must be conducted at a Site Area or General Emergency, if not previously initiated. Accountability may be conducted at the Alert level following TSC activation, at the discretion of the Station Emergency Director.

2.2. Assembly - Assembly occurs at a Site Area Emergency (or at the discretion of the Station Emergency Director). On-duty and ERO personnel assemble in the emergency response facilities. All other non-essential personnel, contractors and visitors report to their designated Assembly Area. The Assembly Area is used to coordinate the need for any immediate additional resources and to establish an ERO shift relief roster and schedule.

2.3. Evacuation - A site evacuation is required at the Site Area Emergency classification level immediately following completion of Accountability actions. Site evacuation may be called for at any lower classification; however, conditions that require a site evacuation are inherently defined as Site Area Emergency events and should be classified as such.

Evacuation can involve the movement of large numbers of personnel outside of the Protected Area by keying out of the turnstiles. Evacuation may warrant station egress control by Security. Security will provide specific instructions to personnel leaving the Protected Area. Evacuees may be directed to a Relocation Center (offsite assembly areas) for monitoring and decontamination, or sent home. Other situations that involve the evacuation of personnel from occupied localized onsite areas are controlled on a case-by-case basis.

2.4. OCA – Owner Controlled Area. Company owned property on which a nuclear station is located and may include Exelon Nuclear leased-lands adjacent to that nuclear station.

2.5. Protected Area – Area controlled by Security and surrounded by a double fence. Access is normally gained through the Main Access Facility (or Gatehouse).

2.6. Release - A '*Release in Progress*' is defined as ANY radioactive release that is a result of, or associated with, the emergency event.

2.7. Thyroid Blocking Agent - an agent which when properly administered to an individual will result in sufficient accumulation of stable iodine in the thyroid to prevent significant uptake of radioiodine. Potassium Iodide (KI) is such an agent.

3. **RESPONSIBILITIES**

3.1. The Shift Manager (Shift Emergency Director) will perform the responsibilities of the Station Emergency Director until relieved.

3.2. The Station Emergency Director is responsible for the following protective actions:

- Authorization of emergency exposure greater than 5 Rem (per EPA-400 lower limits).
- Authorization for issuance of KI to Exelon Nuclear emergency workers and/or onsite personnel.
- Direction of Assembly, Accountability and Evacuation of personnel.

3.3. The respective Radiation Protection Manager (TSC or EOF) is responsible for approval of emergency exposures below 5 Rem (EPA-400 lower limits) for Exelon personnel associated with response actions under their facility's direction.

3.4. The Security Shift Supervisor (or Security Coordinator when the TSC is activated) is responsible for performing Accountability, controlling site access, and coordinating Site and OCA Evacuations.

3.5. The Security Coordinator in the TSC is responsible for coordinating activities between the TSC and the Security force.

3.6. The Maintenance Manager is responsible for coordinating Search and Rescue Teams and Assembly Area rosters.

4. MAIN BODY

NOTE: Protective Actions for the onsite workers shall be based on preventing or minimizing radiological exposures to the emergency workers onsite.

4.1. Assembly, Accountability and Evacuation

4.1.1. Protective Measure Guidelines

1. **Accountability** is required to be conducted at a Site Area or General Emergency, if not previously initiated and maintained. Accountability may be conducted at the Alert level at the discretion of the Station Emergency Director, or Shift Manager (Shift Emergency Director) prior to TSC activation.

   A. Accountability and evacuation of non-essential site personnel should also be considered when a security-related Unusual Event or Alert has been declared.

   B. Accountability shall be initiated expeditiously, but only after evaluating the need for offsite assembly and appropriate evacuation route based on radiological release and meteorological conditions.

   C. Once initiated, accountability is required to be completed (i.e., the names of any missing persons identified by security and the number of missing provided to the Station Emergency Director) within 30 minutes of initial PA announcement for site evacuation.

2. A **Site Evacuation** may be delayed if the health and safety of the plant personnel may be in jeopardy, such as severe weather or due to a security-related Unusual Event or Alert.

3. **Non-essential personnel evacuating the site**, contractors and visitors, shall report to a Remote (Off-Site) Assembly Area, if designated, for radiological monitoring and decontamination as warranted.

4. **Protected Area access** is halted during personnel accountability, except for the following:
   - ERO responders requiring access to staff the Operations Support Center (OSC) and/or Technical Support Center (TSC).
   - Direct approval from the TSC Security Coordinator or Shift Manager for others.

5. **Accountability**, once achieved, will be maintained by restricting Protected Area access and controlling/tracking the movement of on-shift personnel or ERO personnel on site in or out of their respective emergency response facility.

4.1.2. Determination of Actions

NOTE: Site Evacuation of non-essential personnel shall be conducted immediately after a Site Area or General Emergency has been declared. An exception may be made for events that could require the pre-planned evacuation to be rerouted or delayed such as:

- Severe weather, radiological or other hazardous conditions threaten safe movement of personnel.
- A security threat is occurring which could have an adverse impact on security response or personnel while leaving the site.

1. **IF** a Site Area Emergency has been declared **THEN** immediately perform protective measure steps per the appropriate Checklist:

   A. Mid-Atlantic Stations shall use EP-AA-113-F-04, Mid Atlantic Site Assembly, Accountability and Evacuation Checklist.

   B. Mid-West Stations shall use EP-AA-113-F-07, Mid West Site Assembly, Accountability and Evacuation Checklist.

NOTE: Site Assembly and/or Site Evacuation of non-essential personnel should be considered when a security related Unusual Event or Alert has been declared.

2. **IF** a Site Area Emergency has not been declared, **THEN** evaluate the need for and ability to conduct a Site Assembly and/or Site Evacuation.

   A. **CONDUCT** a Site Assembly whenever it has been determined that:

      1. Excess dose or other dangers exist to the onsite personnel.

      2. Positive control of location and movement of all onsite personnel is necessary for support of response efforts.

   B. **CONDUCT** a Site Evacuation whenever it has been determined that:

      1. Hazardous conditions exist that necessitate the removal of all non-essential personnel from the site.

      2. Positive control of location and movement of essential personnel is necessary for support of response efforts.

4.2. Habitability

4.2.1. **DETERMINE** if radiological controls are required to protect onsite personnel. The need for radioactive controls shall be based on monitored radioactive releases, exposure levels, and plant status information. Standard Radiation Protection policies and procedures shall form the basis of the decision-making for the administration of radiological controls.

NOTE: The decision to utilize radiological controls that differ from standard Radiation Protection practices shall be documented in position logs.

4.2.2. Radiological controls for continuously occupied areas for emergency workers are to be evaluated using EP-AA-113-F-01, On-Site Habitability Checklist.

4.2.3. Onsite radiological controls shall be used to the extent practical based on the emergency condition. They include but are not limited to the following:

1. Radiological Access Control for Rad/High Rad Areas - Access Control is used to limit the personnel who may be exposed to the radiological condition.

2. Use of Radiological Protective Clothing - Protective clothing shall be used to limit the spread of radiological contamination and to protect the emergency worker from becoming radiologically contaminated.

3. Use of Radiological Respiratory Protective Equipment - Respiratory protective equipment shall be used to limit the inhalation and ingestion of radioactive materials during the course of the emergency event. The need for respirators shall be based on air samples, plant monitoring systems, and plant conditions.

4. Use of Contamination Control Techniques - Contamination control techniques such as Step-off Pads, Posting, Contamination surveys, and whole body frisking shall be used to the extent practical based on the emergency condition.

4.3. Emergency Exposure Limits

NOTE: This section implements the requirements of RP-AA-203 and should **not** be revised without first reviewing the requirements of the current revision of the procedure.

Emergency Exposure Determination	**REFER** to Section 4.3.1
Briefing Personnel (greater than 5 Rem TEDE)	**REFER** to Section 4.3.2
Authorization (greater than 5 Rem TEDE)	**REFER** to Section 4.3.3
Tracking and Recording of Exposures	**REFER** to Section 4.3.4

4.3.1. Emergency Exposure Determination

NOTE: In certain onsite emergency situations, extremely high dose rates may be encountered (more than 500 Rem/hr). Before a rescue team is committed to life-saving emergency dose limits, weigh the probability of success against the probable cost of the commitment. Specifically there must be reasonable assurance that the victim is in the area and that they are alive or likely to survive.

1. **ASSURE** that the emergency exposure is for a bona fide emergency involving risk of life or limb, or the destruction of valuable property.

   A. **PLAN** emergency operations prior to entry.

   B. **WEAR** respiratory protection and protective clothing to reduce contamination where possible.

2. **DETERMINE** if emergency exposure limits in excess of 5 Rem TEDE (EPA-400 lower limits) are required for Exelon emergency workers.

3. **If** emergency exposure is less than 5 Rem TEDE (EPA-400 lower limits), **then OBTAIN** approval as appropriate:

   - TSC Radiation Protection Manager for onsite Exelon personnel
   - EOF Radiation Protection Manager for Exelon field team personnel

4.3.2. Briefing Personnel (greater than 5 Rem TEDE)

1. For exposures at or above 5 Rem TEDE (EPA-400 lower limits), **COMPLETE** an Authorization for Emergency Exposure (EP-AA-113-F-02).

2. **INFORM** emergency personnel (volunteers) before the fact of possible health effects at the anticipated exposure level using Attachment 1, Emergency Worker Exposure Limits and Associated Risks.

3. **OBTAIN** emergency worker's acknowledge that they have volunteered and understand the associated risks. Acknowledgement should be in writing on Authorization for Emergency Exposure Form if possible **OR** verbally for teams in the field,

4. **FORWARD** to the completed form to the Station Emergency Director for approval.

4.3.3. Authorization greater than 5 Rem TEDE (EPA-400 lower limits):

CAUTION

Emergency exposure limits greater than 5 Rem TEDE may be applicable for stopping a release, life saving actions, and protection of major equipment and large populations. Emergency exposure greater than 5 Rem TEDE should be voluntary.

All emergency exposures in excess of 25 Rem TEDE **shall** be voluntary and **shall** be limited to once in a lifetime. Persons who may receive exposures greater than 25 Rem TEDE **shall be fully aware of the risks involved**.

1. **OBTAIN** and **DOCUMENT** Station Emergency Director approval, by signature, for the use of the emergency dose limits above 5 Rem TEDE (EPA-400 lower limits) on the Authorization for Emergency Exposure form.

NOTE: The decision to authorize personnel exposure per EPA-400 limits is the responsibility of the Station Emergency Director and may **not** be delegated.

2. **NOTIFY** Occupational Health (Medical) Services Department promptly if any EPA-400 dose limit is exceeded.

4.3.4. Tracking and Recording

1. **ESTIMATE** and **RECORD** personnel dose equivalents resulting from any emergency situation.

2. **REPORT** final emergency exposures greater than 5 Rem TEDE (EPA-400 lower limits) to the NRC.

4.4. KI Assessment

Determination	**REFER** to Section 4.4.1
Authorization and Issuing KI	**REFER** to Section 4.4.2
Briefing Personnel	**REFER** to Section 4.4.3

4.4.1. Determination

1. **ASSESS** the potential of high thyroid exposure to emergency workers in, or projected to be sent into, areas where the possibility exists of exposure to radioactive iodine as follows:

A. For Field Monitoring Teams or other Exelon emergency workers working offsite, determine if **EITHER** of the following conditions exist:

Condition 1

- There is an Offsite Release in Progress.

And

- There has been a loss or potential loss of the Fuel Clad Barrier.

OR

Condition 2

- Dose Assessments project iodine thyroid exposure for emergency workers will be ≥ 50 Rem Committed Dose Equivalent (CDE).

B. For OSC Emergency Teams and other onsite workers, determine if **EITHER** of the following conditions exist:

Condition 1

- Workers will be entering an unknown radiological atmosphere that is suspected to have a high iodine concentration. Loss of the Fuel Clad barrier is a good indication of possible high iodine concentrations.

OR

Condition 2

- The calculated iodine thyroid exposure (actual or projected) for emergency workers, base on station Radiation Protection procedures or use of the dose assessment program, will be ≥ 50 Rem Committed Dose Equivalent (CDE).

2. **If** the condition A and/or B listed above are met **then**, **RECOMMEND** the issuance of one (1) 130 mg KI tablet to each emergency worker affected per day for 10 consecutive days

4.4.2. Authorization

NOTE: The Radiation Protection Manager and OSC Director should avoid the use of individuals known to have possible adverse reactions to KI for tasks where exposure to iodine may occur. A list of individuals who indicated possible allergies is available.

1. **DOCUMENT** the decision to issue KI using Thyroid Blocking Agent Authorization Form (EP-AA-113-F-03).
   - The Station Emergency Director must authorize issuance of KI to Exelon emergency workers.

2. **NOTIFY** Occupational Health (Medical) Services Department promptly if KI is to be issued to Exelon Nuclear personnel or contractors.

4.4.3. Briefing Personnel and Issuing KI

NOTE: The effectiveness of potassium iodide as a thyroid blocking agent decreases as a function of time. The effectiveness of potassium iodide is as follows:

- 90% effective if taken immediately prior to or concurrent with exposure to radioactive iodine.
- 50% effective if taken within 3 to 4 hours following exposure.
- Ineffective if taken more than 12 hours following exposure.

NOTE: The FDA KI Package insert provided with the KI product identifies the side effects and risks involved with KI usage. It is general use guidance intended for members of the public. It states approval from state and public health authorities is needed prior to use, this applies to members of the public. Exelon has the authority and responsibility to direct use of KI by Exelon Emergency Workers.

NOTE: Persons with a known allergy to iodine should not be considered for work requiring the use of potassium iodide blocking agents.

CAUTION
KI dosage in excess of that recommended by this procedure could lead to possible effects including: rash, swelling of salivary glands, soreness in the teeth and gums, upset stomach and diarrhea.

1. **REVIEW** Thyroid Blocking Agent Authorization Form (EP-AA-113-F-03) to ensure all individuals being issued KI are listed and form is complete.

2. **READ**, or instruct the Emergency Worker(s) to read, "Information on use of Thyroid Blocking Agent" on authorization form or the FDA KI package insert prior to taking or administering KI.

NOTE: Potassium Iodide (KI) has a limited effective shelf life, which may be extended by the manufacturer. Potassium iodide must be stored in sealed containers that are protected from light and are in areas that meet all manufacturers' limitations on temperature variances.

3. **VERIFY** the expiration date of the KI to ensure it is within its acceptable shelf life period prior to being used.

4. **ISSUE** of one (1) 130 mg KI tablet to each emergency worker affected per day for 10 consecutive days.

4.5. The following forms will be used by various members of the ERO to perform their duties related to personnel protective actions outlined in this procedure:

- EP-AA-113-F-01, On-Site Habitability Checklist
- EP-AA-113-F-02, Authorization of Emergency Exposure
- EP-AA-113-F-03, Thyroid Blocking Agent Authorization Form
- EP-AA-113-F-04, MA Emergency Director – Site Assembly, Accountability and Evacuation Checklist
- EP-AA-113-F-05, Vehicle and Evacuee Control Group Leader Checklist
- EP-AA-113-F-06, Vehicle and Evacuee Control Group Member Checklist
- EP-AA-113-F-07, MW Emergency Director – Site Assembly, Accountability and Evacuation Checklist
- EP-AA-113-F-08, PBAPS Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-09, LGS Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-10, TMI Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-11, Remote Assembly Area Muster List
- EP-AA-113-F-12, Vehicle Survey and Decontamination Report
- EP-AA-113-F-13, Facility Accountability List (Within Protected Area)
- EP-AA-113-F-14, Rock River Division Headquarters Vehicle Traffic Flowpath
- EP-AA-113-F-15, Rock River Division Headquarters Frisking Area and Personnel Flowpath
- EP-AA-113-F-17, Braidwood Assembly, Accountability and Evacuation Guidelines

- EP-AA-113-F-18, Byron Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-19, Dresden Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-20, LaSalle Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-21, Quad Cities Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-22, Clinton Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-23, Assembly Area Roster
- EP-AA-113-F-24, Relocation Center Operations Checklist
- EP-AA-113-F-25, Relocation Center Accountability Log
- EP-AA-113-F-26, Relocation Center Monitoring Log
- EP-AA-113-F-29, Oyster Creek Assembly, Accountability and Evacuation Guidelines

5. DOCUMENTATION

5.1. The following forms, when completed during a declared event document implementation of this procedure:

- EP-AA-113-F-01, On-Site Habitability Checklist
- EP-AA-113-F-02, Authorization of Emergency Exposure
- EP-AA-113-F-03, Thyroid Blocking Agent Authorization Form
- EP-AA-113-F-04, MA Emergency Director – Site Assembly, Accountability and Evacuation Checklist
- EP-AA-113-F-05, Vehicle and Evacuee Control Group Leader Checklist
- EP-AA-113-F-06, Vehicle and Evacuee Control Group Member Checklist
- EP-AA-113-F-07, MW Emergency Director – Site Assembly, Accountability and Evacuation Checklist
- EP-AA-113-F-08, PBAPS Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-09, LGS Assembly, Accountability and Evacuation Guidelines

- EP-AA-113-F-10, TMI Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-11, Remote Assembly Area Muster List
- EP-AA-113-F-12, Vehicle Survey and Decontamination Report
- EP-AA-113-F-13, Facility Accountability List (Within Protected Area)
- EP-AA-113-F-14, Rock River Division Headquarters Vehicle Traffic Flowpath
- EP-AA-113-F-15, Rock River Division Headquarters Frisking Area and Personnel Flowpath
- EP-AA-113-F-16, River Bend Middle School Vehicle Traffic and Relocation Center Layout
- EP-AA-113-F-17, Braidwood Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-18, Byron Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-19, Dresden Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-20, LaSalle Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-21, Quad Cities Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-22, Clinton Assembly, Accountability and Evacuation Guidelines
- EP-AA-113-F-23, Assembly Area Roster
- EP-AA-113-F-24, Relocation Center Operations Checklist
- EP-AA-113-F-25, Relocation Center Accountability Log
- EP-AA-113-F-26, Relocation Center Monitoring Log
- EP-AA-113-F-29, Oyster Creek Assembly, Accountability and Evacuation Guidelines

5.2. The Standard Records Retention ID for the above documents per the Standards Records Retention Schedule is 5B.100.

6. **REFERENCES**

6.1. Development References

6.1.1. Nuclear Operations Directive NOD-RP.14, "ALARA, Exposure Management, Work Controls and Radiological Monitoring," current revision.

6.1.2. EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents," October 1991.

6.1.3. "Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion, "Federal Guidance Report No. 11, Office of Radiation Programs, U.S. EPA, EPA-520/1-88-020, September 1988.

6.1.4. "Potassium Iodide as a Thyroid Blocking Agent in Radiation Emergency: Final Recommendations on use," Federal Register, Vol. 47, No. 125, June 29, 1982.

6.1.5. "Protection of Thyroid Gland in the Event of Releases of Radioiodine," NCRP Report No. 55, 1977.

6.1.6. Commonwealth Edison Quality Verification Audit Finding, Audit No. CE-92-04, CAR# CE-92-029 (Nov. 18, 1992)

6.1.7. Commonwealth Edison Medical Dept. Procedure and Practice Guideline, "Exposure Evaluation: Ionizing Radiation" (10/5/93).

6.1.8. RP-AA-203, "Exposure Control and Authorization

6.2. User References

None

7. ATTACHMENTS

7.1. Attachment 1 - Emergency Worker Exposure Limits and Associated Risks

ATTACHMENT 1

EMERGENCY WORKER EXPOSURE LIMITS AND ASSOCIATED RISKS

Page 1 of 1

EMERGENCY WORKER EXPOSURE LIMITS

The dose-limiting recommendations for emergency situations are as follows:

Dose Limit (Rem TEDE)*	Activity	Condition
5	All	Personnel should be kept within normal 10CFR20 limits during emergencies, except as authorized for activities as indicated below
10	Protecting Valuable Property	When a lower dose is not practical
25	Life Saving or Protection of Large Populations	When a lower dose is not practical
>25	Life Saving or Protection of Large Population	Only on a voluntary basis to persons fully aware of the risks involved

* Dose Equivalent Limit (TEDE in Rem). Workers performing services during emergencies should limit dose to the lens of the eye (LDE) to three times each listed value and doses to any other organ (including skin and body extremities) to ten times each listed value.

EMERGENCY EXPOSURE RISKS

Health effects associated with whole body absorbed doses received within a few hours[a]

Dose in rad (≈ Rem DDE)	Percent of population affected by prodromal[b] effects (e.g. reddening of skin, loss of appetite, nausea, fatigue, diarrhea)	Dose in rad (≈ Rem DDE)	Early fatalities[c] (percent affected)
50 rad	2 %	140 rad	5 %
100 rad	15 %	200 rad	15 %
150 rad	50 %	300 rad	50 %
200 rad	85 %	400 rad	85 %
250 rad	98 %	460 rad	95 %

Approximate cancer risk to average individuals from 25 Rem TEDE received promptly

Age at exposure (years)	Risk of premature death (deaths per 1000 persons exposed)	Average years of life lost if premature death occurs (years)
20 to 30	9.1	24
30 to 40	7.2	19
40 to 50	5.3	15
50 to 60	3.5	11

a Risks will be lower for extended exposure periods.

b Forewarning symptoms of more serious health effects associated with large doses of radiation.

c Supportive medical treatment may increase the dose at which these frequencies occur by approximately 50 percent.

Exelon Nuclear

AUTHORIZATION FOR EMERGENCY EXPOSURE

Name: ______________________________ Date / Time: ____/____/____ ____:____

Employee ID Number: ________________ Current Annual Exposure: __________ mRem

Reason For Request:

____

____

____

REQUESTING AUTHORIZATION TO EXCEED:

- ☐ 5 Rem TEDE (Authorized to receive greater than 5 Rem TEDE but less than 10 Rem TEDE)
- ☐ 10 Rem TEDE (Authorized to receive greater than 10 Rem TEDE but less than 25 Rem TEDE)
- ☐ 25 Rem TEDE (Authorized to receive greater than 25 Rem TEDE)

____ ______________

* Emergency Worker Signature Date / Time

* Emergency Worker Exposure Limits and Associated Risks (EP-AA-113 Attachment 1) have been reviewed and the potential health affects are understood.

____ ______________

Rad. Protection Management (Review) Date / Time

____ ______________

Station Emergency Director (Authorization) Date / Time

The Shift Manager (Shift Emergency Director) may approve prior to transferring Command and Control to the Station Emergency Director.

AUTHORIZATION FOR EMERGENCY EXPOSURE

Name: ______________________________ Date / Time: ____/____/____ ____:____

Employee ID Number: __________________ Current Annual Exposure: __________ mRem

Reason For Request:

____

____

____

REQUESTING AUTHORIZATION TO EXCEED:

- ☐ 5 Rem TEDE (Authorized to receive greater than 5 Rem TEDE but less than 10 Rem TEDE)
- ☐ 10 Rem TEDE (Authorized to receive greater than 10 Rem TEDE but less than 25 Rem TEDE)
- ☐ 25 Rem TEDE (Authorized to receive greater than 25 Rem TEDE)

____ _______________

* Emergency Worker Signature Date / Time

* Emergency Worker Exposure Limits and Associated Risks (EP-AA-113 Attachment 1) have been reviewed and the potential health affects are understood.

____ _______________

Rad. Protection Management (Review) Date / Time

____ _______________

Station Emergency Director (Authorization) Date / Time

The Shift Manager (Shift Emergency Director) may approve prior to transferring Command and Control to the Station Emergency Director.

Performance Information

Facility: Oyster Creek　　Task No.: 2000502401

Task Title: Security Event – Airborne Probable Attack Response

Job Performance Measure No.: SRO NRC Admin JPM 5

K/A Reference: 2.4.41 (4.6)

Examinee: ______　　Examiner: ______

Facility Evaluator: ______　　Date: ______

Method of Testing:

Simulated Performance ______　　Actual Performance X

Classroom X　　Simulator ______　　Plant ______

Read to the Examinee:

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

Initial Conditions:

- The plant is operating at 100% power.
- No refueling activities are in progress
- The Control Room has just been informed through security of a credible threat that a hijacked commercial UPS 737 airliner has been hijacked and that Oyster Creek Nuclear Generating Station is in the flight path of a track of interest.
- The hijacked airliner has made a heading change that aligns to the site with a 20 minute estimated time to the site.

Task Standard:

RO/SRO: Station announcement for AIRBORNE PROBABLE Threat is made in accordance with ABN-41

SRO ONLY: Completed the State and Local Notification Form for Emergency Director's Approval for minimum classification for the conditions.

Required Materials: None

General References:

1. ABN-41 Revision 36

Performance Information

Initiating Cue:

RO/SRO:

- The Shift Manager has directed you as the Reactor Operator to evaluate ABN-41, SECURITY EVENT, and take the required actions for validating this information and making station announcements, if appropriate.

SRO ONLY: State the minimum classification for these conditions (This is a time critical JPM)

- Complete the State and Local Notification Form for Emergency Director's Approval.

Time Critical Task: RO/SRO portion: NO SRO only portion: YES

Validation Time: 15 Minutes

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Obtains a copy of the reference procedure and reviews/utilizes the correct section

Standard: Current revision of ABN-41 is obtained

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 3

Procedure Step: 4.1

Using ABN-41, Step 4.1, determines based on given initial conditions that the attack type

Standard: Determines the ATTACK TYPE is Airborne Probable

Comment:

SAT/UNSAT

✓ Performance Step: 4

Procedure Step: 4.1.2
Per ABN-41 Step 4.1.2, notifies the NRC using Attachment ABN-41-1, Security Event Notification Worksheet Step1.0, Expedited NRC ENS Notification

CUE: Provide candidate with the following Authentication Code: 1234

Standard: On Attachment ABN-41-1, Candidate fills Authentication CODE, and crosses out HOSTILE ATTACK, IMMINENT, REPELLED, SURFACE ATTACK and BOMB IN (OCA)(PA) and then simulates calling the NRC on the ENS phone

Comment:

SAT/UNSAT

Performance Information

NOTE: ABN-41 Steps 4.2, 4.3 and 4.4 are N/A

✓ Performance Step: 5

Procedure Step: 4.5
Determine to Perform Attachment ABN-41-3 for Airborne Probable Attack

Determines Per Attachment ABN-41-3, Step 1.3, makes Airborne Probable Page announcement in Attachment ABN-41-1, 2.0 Plant Page Announcements

- Sounds Station Emergency Alarm for approximately 5 seconds
- Performs the appropriate announcement for AIRBORNE PROBABLE
- Sounds Station Emergency Alarm for approximately 5 seconds
- Repeats announcement

CUE: As Shift Manager, direct take immediate cover on the ground level, inside the nearest building and AWAIT FURTHER INSTRUCTIONS

- Repeats Announcement

Standard:

The following announcement is made:
Attention all personnel, attention all personnel. A Security Emergency has been declared. Personnel are directed to evacuate the Reactor and turbine Buildings. Fire Brigade is directed to don protective gear at the Technical support Center and wait for instructions. All other personnel are to ***await further instructions.*** *Impact projected in* ***20*** *minutes.* Take immediate cover on the ground level, inside the nearest building and Await further instructions. (This announcement is then repeated)

Comment:

SAT/UNSAT

Performance Information

Performance Step: 6

Performs Attachment ABN-41-3, Step 1.4

Standard: Evacuates all on-shift personnel in excess of SM, US, and URO to the TSC

Comment:

SAT/UNSAT

Terminating Cue: Station announcement for AIRBORNE PROBABLE Threat is completed

JPM Stop Time: ___________

Performance Information

Additional SRO Only Cue:

Provide SRO candidates the additional SRO only cue sheet and direct them to determine:

- State the minimum classification for these conditions (This is a time critical JPM)
- Complete the State and Local Notification Form for Emergency Director's Approval.

Performance Step: 7

Obtain controlled copy of procedure

Standard: Obtains controlled copy of procedure EP-AA-1010 and EP-MA-114-100-F03

Comment:

SAT/UNSAT

✓ Performance Step: 8

Determine Emergency Classification and associated EAL.

Standard: Declares "Alert" - Cat. HA1.

Time Critical Portion of JPM complete
Time Complete ________ (<15 minutes)

Comment:

SAT/UNSAT

Performance Step: 9

Procedure Step: EP-MA-114-100-F-03 block 1
Complete Status block

Standard: Fill in the block with:

Check the line that states "This is a Drill"

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 10

Procedure Step: EP-MA-114-100-F-03 block 3

Complete Emergency Classification block

Standard:

Fill in the block with:

Check the line that states "ALERT"

Comment:

SAT/UNSAT

Performance Step: 11

Procedure Step: EP-MA-114-100-F-03 block 3
Complete Declaration block

Standard:

Fill in the block with:

An "ALERT" was declared at "current time" on "current date". The EAL is "HA1"

Comment:

SAT/UNSAT

Performance Step: 12

Procedure Step: EP-MA-114-100-F-03 block 3
Complete Represents A/AN block

Standard:

Fill in the block with:

Check the line that states "Initial declaration"

Comment:

SAT/UNSAT

Performance Information

Performance Step: 13

Procedure Step: EP-MA-114-100-F-03 block 4
Complete EAL number and Event Description block

Standard:

Fill in the block with:

The EAL is "HA1"

Description similar to; "Hostile action within the owner controlled area or airborne attack threat. A validated notification from the NRC of an airliner attack threat <30 minutes from the site. Or Notification by the security force that a hostile action is occurring or has occurred within the owner controlled area."

Comment:

SAT/UNSAT

✓

Performance Step: 14

Procedure Step: EP-MA-114-100-F-03 block
Complete Non-Routine Radioactive Release Status block

Standard:

Fill in the block with:

Check the line that states that "There is a non-routine radiological release in progress"

Comment:

SAT/UNSAT

✓

Performance Step: 15

Procedure Step: EP-MA-114-100-F-03 block 6
Complete Meteorological Condition block

Standard:

Fill in the block with:

From the Weather screen record; Wind direction is from "218° " degrees and wind speed is "8 " miles per hour (use 380' elevation data)

Comment:

SAT/UNSAT

Performance Information

Performance Step: 16

Procedure Step: EP-MA-114-100-F-03 block 7
Complete Conclusion block

Standard:

Fill in the block with:

Check the line that states "This is a Drill" and Documents time

Comment:

SAT/UNSAT

Terminating Cue: HA1 EAL Declaration made and MA-114-100-F03 completed

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC RO Admin JPM 4

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ______________________ ______________________

JPM Setup

1. Provide a copy of ABN-41

Have SRO ONLY references available:
1. EP-AA-1010
2. EP-MA-114-100-F03

STUDENT HANDOUT

Initial Conditions:

- The plant is operating at 100% power.
- No refueling activities are in progress
- The Control Room has just been informed through security of a credible threat that a hijacked commercial UPS 737 airliner has been hijacked and that Oyster Creek Nuclear Generating Station is in the flight path of a track of interest.
- The hijacked airliner has made a heading change that aligns to the site with a 20 minute estimated time to the site.

Task Cue:

The Shift Manager has directed you as the Reactor Operator to evaluate ABN-41, SECURITY EVENT, and take the required actions for validating this information and making station announcements, if appropriate.

SRO ADDITIONAL STUDENT HANDOUT

Determine the following:

- Classify the highest EAL classification for this event
- Complete State and Local EAL notification form

Exelon Generation	OYSTER CREEK GENERATING STATION PROCEDURE	Number **ABN-41**	
Title **SECURITY EVENT**		Usage Level **1**	Revision No. 36

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

Prior Revision _35_ incorporated the following Temporary Changes:

N/A

This Revision _36_ incorporates the following Temporary Changes:

N/A

HARD CARDS APPLY

List of Pages

1.0 to 11.0
E1-1 to E1-5
E2-1 to E2-7
E3-1 to E3-7
E4-1 to E4-3
E5-1 to E5-2
E6-1 to E6-2
E7-1 to E7-9
E8-1
E9-1 to E9-3
E10-1 to E10-3
E11-1 to E11-5
E12-1
E13-1 to E13-3
E14-1
E15-1

CAUTION

This document is associated with the implementation of the Site Emergency Plan. Revision of this document requires performance of a 10 CFR 50.54(q) in accordance withEP-AA-120-1001, 50.54(q) Program Evaluation and Effectiveness Review.

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

PROCEDURE HISTORY

REV	DATE	ORIGINATOR	SUMMARY OF CHANGE
33	03/13	A. Decker	Incorporated PCRA 01469971-03. Added Step 1.21 to Attachment ABN-14-3 for visual discrimination reduction. Renumbered subsequent steps.
34	08/13	S Serpe	PCRA 682746-15 updates for TI-186 PCRA 682746-16 add caution EP-AA-120-1001, 50.54(q) Program Evaluation and Effectiveness Review required to change this procedure.
35	08/13	A. Decker	Incorporated PCRA 00682746-17. Added Step 1.6 from Attachment ABN-41-2 to Attachment ABN-41-3 Step 1.10. Renumbered subsequent steps. Incorporated PCRA 00682746-18. Added Step 1.4 for OP-AA-111-101-1004. Added Step 4.2 for notification. Revised Note in Attachment ABN-41-2. Revised Step 1.8 added Isolation Condenser vent valves in Attachment ABN-41-2. Added Steps 1.10 Stack Lights and 1.11 reduce visual discrimination in Attachment ABN-41-2. Corrected wording in Step 2.6 in Attachment ABN-41-2. Added Step 2.12 to Attachment ABN-41-2 for communications reestablishment. Added Steps 1.12, 1.13 and 1.27 in Attachment ABN-41-3 to Open breakers for lighting, reduce visual discrimination and reestablish communication. Added breaker closure to Step 1.7 in Attachment ABN-41-10. Added Step 1.8 Lighting Restoration in Attachment ABN-41-10. Added New Attachment ABN-41-15, Oyster Creek Security Protected Area Light Map. (50.54q) Eval No. 13-112.
36	10/14	S Serpe	Incorporated PCRA 00682746-19 The breaker listed in revision 35 step 1.21 of attachment 3 is also listed as part of step 1.12 of attachment 3 this will delete the redundant step and renumber remaining steps of attachment 3

1.0 APPLICABILITY

1.1 This procedure is applicable when notification has been made of a potential or actual attack via land-based, water-based, or air-based.

1.2 Actions detailed within this procedure are intended to protect plant equipment and personnel against a credible threat or hostile action.

Credible Threat: Threat that poses a risk to safe operation of the plant or to personnel and public safety.

Hostile Action: Act toward the Nuclear Power Plant or its personnel that includes the use of violent force to destroy equipment, take hostages, and/or intimidate the licensee to achieve an end. This includes attack by air, land, or water using guns, explosives, projectiles, vehicles or other devices used to deliver destructive force. Other acts that satisfy the overall intent may be included.

A hostile action should **not** be construed to include acts of civil disobedience or felonious acts that are **not** part of a concerted attack on the Nuclear Power Plant. Non-terrorism-based EAL's should be used to address such activities, (e.g., violent acts between individuals in the owner controlled area).

1.3 The Nuclear Regulatory Commission (NRC) will normally provide the notification and / or verification of attack information. Security may provide information obtained from Local Law Enforcement Agencies or Federal Agencies.

1.4 OP-AA-111-101-1004 Use of NRC Authentication Codes is the procedure for authenticating a phone call from the NRC, and is included in the binder for the Authentication Codes by the ENS phone.

1.5 NOTE

The NRC will issue a rapid notification through the Headquarters Operations Officers (HOO) by means of a "Blast Dial", if a licensed facility is under a physical attack. All licensees in each region will be notified, starting with the affected plant's region. Oyster Creek will use its site specific procedures and processes to immediately initiate appropriate actions consistent with information in Regulatory Issue Summary (RIS) 2002-12A, Power Reactors NRC Threat Advisory and Protective Measures System and RIS 2002-12E, Category I Fuel Facilities NRC Threat Advisory and Protective Measures System. Nothing contained in these documents should be interpreted as NRC direction to rapidly shut down Oyster Creek.

This ABN is **not** immediately applicable for NRC Rapid Notification of a licensed facility under physical attack. If Oyster Creek is notified that another licensed facility is under physical attack, then ensure the Shift Manager contacts the Security Shift Commander to refer to site specific procedures for Oyster Creek response (which may include entry into this ABN).

2.0 INDICATIONS

ATTACK TYPE	DEFINITION
Airborne Imminent:	Notification and/or verification by NRC that the site is in the flight path of a track of interest, AND An estimated time to site of **5** minutes or less, AND Altitude or heading changes align the aircraft with the site.
Airborne Probable:	Notification and / or verification by NRC that the site is in the flight path of a track of interest, AND Estimated time to site between **5** minutes and **30** minutes, AND Altitude or heading changes align the aircraft with the site.
Surface Imminent:	A hostile force (i.e. shots fired, explosions, military-style assault, etc.) has penetrated the Protected Area boundary in a land or water based attack, OR There are other indications that a loss of plant control is imminent, OR Security Code Red, OR Security Code Blue.

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<u>ATTACK TYPE</u>	<u>DEFINITION</u>
Surface Probable:	Security or Nuclear Duty Officer (NDO) notification that contingency actions for an escalated security event are required based on a probable site land or water based attack.
Informational:	Notification by NRC or another recognized authority that the site is in the flight path of a track of interest, <u>AND</u> Estimated time to site of more than **30** minutes, <u>OR</u> Bomb discovered in Protected Area, <u>OR</u> Security or NDO notification of a potential security threat.

3.0 IMMEDIATE OPERATOR ACTIONS

None

4.0 SUBSEQUENT OPERATOR ACTIONS

Execution of this procedure, especially during Imminent conditions, requires the Shift Manager to take notification / communication actions and the Unit Supervisor to take control of all plant related actions. The US should assign operators to implement subsequent portions of the attachments after completing the more urgent actions such as scram and isolations.

Steps 4.4 and 4.5 should be performed concurrently and with steps 4.1 and 4.2. Normally the US will perform the plant related actions of the attachments and the SM will perform initial notifications and assessments

NOTE

If the NRC is **not** the original source of information, then an EXPEDITED NRC NOTIFICATION is required. This should be made as soon as possible after being informed of a Credible Threat or Hostile Action and should **not** be delayed for assessment of the event. (< 15-minutes) This notification does **not** replace NRC notification required under the Emergency Plan and other procedures.

NOTE

For Airborne Probable Attacks maintain continuous communication with the original threat notification source until in contact with the NRC Operations Center.

If in contact with multiple sources of threat information, maintain constant communication with the NRC Operations Center and discontinue communications with other threat notification sources.

4.1 IF threat notification has been received from OTHER than the NRC,
THEN **PERFORM** the following:

1. **EVALUATE** attack type per Section 2.0, Indications. [ ]

2. **NOTIFY** the NRC using Attachment ABN-41-1, Security Event Notification Worksheet (Expedited). The current Authentication Code must be used.

   AND

   MAINTAIN Continuous Communications with the NRC operations center [ ]

4.2 IF notification has been received from OTHER than Site Security,
THEN notify Site Security of the threat. [ ]

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4.3

NOTE

Radio use should be minimized during security events.

4.3.1 IF an Airborne Imminent or Surface Imminent condition exists,

THEN **PERFORM** the following:

1. IF time permits,

THEN Immediately **EVACUATE** the 2nd CRO to the 480 volt room Remote Shutdown Panel to await further instructions for activation, [ ]

AND

EVACUATE all other on-shift personnel in excess of Shift Manager, Unit Supervisor, and Unit Reactor Operator to a specified location, (TSC, OSC, 480 volt room/RSP, Warehouse, OCAB Cafeteria or other location ________), **(CM-10)** [ ]

AND

INFORM Security of Control Room partial evacuation via telephone, (x4957 or x4951) [ ]

AND

IDENTIFY the need for Security to support movement of personnel from the muster area if required. [ ]

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2. IF Shift Manager is **not** in the Control Room,

   THEN Shift Manager shall **TAKE COVER** until conditions permit Shift Manager's return. **(CM-10)** [ ]

3. The Field Supervisor shall **TAKE COVER** and shall **not** enter the Control Room until conditions permit. **(CM-10)** [ ]

4.4 IF a Probable Attack attachment is being performed,

AND

An Imminent Attack is seen as likely to occur,

THEN **EXIT** probable attack attachment, [ ]

AND

ENTER imminent attack attachment. [ ]

4.5 **PERFORM** actions per the appropriate Attachment:

- Attachment ABN-41-2 for an **Airborne Imminent Attack** [ ]
- Attachment ABN-41-3 for an **Airborne Probable Attack** [ ]
- Attachment ABN-41-4 for a **Surface Imminent Attack** [ ]
- Attachment ABN-41-5 for a **Surface Probable Attack** [ ]
- Attachment ABN-41-6 for an **Informational Attack** (Airborne/Surface/Bomb in OCA) [ ]

4.6 **REFER** to Attachment ABN-41-7, Operation Contingency Action Guidelines, OCAG, for additional support options including implementation of the EDMGs and Support Procedures. **(CM-1)** [ ]

4.7 WHEN conditions permit,

THEN **PERFORM** Attachment ABN-41-10, Restoration Activities. [ ]

5.0 ATTACHMENTS

5.1 Attachment ABN-41-1, Security Event Notification Worksheet

5.2 Attachment ABN-41-2, Airborne Imminent Attack Response

5.3 Attachment ABN-41-3, Airborne Probable Attack Response

5.4 Attachment ABN-41-4, Surface Imminent Attack Response

5.5 Attachment ABN-41-5, Surface Probable Attack Response

5.6 Attachment ABN-41-6, Informational Attack Response

5.7 Attachment ABN-41-7, Operation Contingency Action Guidelines (OCAG)

5.8 Attachment ABN-41-8, Relocated to EDMG-SPX9

5.9 Attachment ABN-41-9, Containing Potentially Contaminated Washdown Water (**CM-12**)

5.10 Attachment ABN-41-10, Restoration Activities

5.11 Attachment ABN-41-11, References

5.12 Attachment ABN-41-12, Deleted

5.13 Attachment ABN-41-13, Isolation Condenser Makeup Using Core Spray

5.14 Attachment ABN-41-14, Security/Operations Interface

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ATTACHMENT ABN-41-1

SECURITY EVENT NOTIFICATION WORKSHEET

1.0 **Expedited NRC ENS Notification**: (Cross out text not used)

> NOTE
>
> Authentication Code should be obtained prior to contacting the NRC Operations Center. The Authentication Code can be obtained from the Authentication Code logbook located by the ENS phone. If an Authentication Code is **not** provided, the NRC will call back to verify the authenticity of the call. Do **not** delay the call if the Authentication Code cannot be readily located. The call is expected to be completed with in 15-minutes.

"This is the Oyster Creek Generating Station.

The Authentication Code is __________________.

A [hostile attack] [credible threat] is [imminent] [in progress] [repelled]

at Oyster Creek Generating Station.

I repeat, a [hostile attack] [credible threat] is [imminent] [in progress]

[repelled]

at Oyster Creek Generating Station.

The event is an [airborne attack] [surface attack] [bomb in (OCA) (PA)].

"End of Message." [ ]

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ATTACHMENT ABN-41-1
(continued)

SECURITY EVENT NOTIFICATION WORKSHEET

2.0 **Plant Page Announcements**:

> NOTE
>
> The Shift Manager and Security Coordinator should choose the appropriate action / announcement from the choices below

2.1 **SOUND** Station Emergency Alarm for approximately 5 seconds. [ ]

2.2 **PERFORM** the appropriate announcement below: (**CM-6**) [ ]

2.3 **SOUND** Station Emergency Alarm for approximately 5 seconds. [ ]

Airborne Imminent

"Attention all personnel, attention all personnel. A Security Emergency has been declared. Personnel are directed to evacuate the Reactor and Turbine Buildings. Fire Brigade is directed to don protective gear at the Technical Support Center and wait for instructions. All other personnel (as directed by SM/US):

Impact projected in ______________ minutes.

- Take immediate cover on the ground level, inside the nearest building [ ]

  OR

- Assemble at the (Circle one): [TSC], [OSC], [480 volt room/RSP], [Warehouse], [OCAB Cafeteria], or other location ____________ [ ]

  AND

  Await further instructions [ ]

  OR

- Evacuate the site [ ]

(REPEAT ANNOUNCEMENT)

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ATTACHMENT ABN-41-1
(continued)

SECURITY EVENT NOTIFICATION WORKSHEET

Airborne Probable

"Attention all personnel, attention all personnel. A Security Emergency has been declared. Personnel are directed to evacuate the Reactor and Turbine Buildings. Fire Brigade is directed to don protective gear at the Technical Support Center and wait for instructions. All other personnel (as directed by SM/US):

Impact projected in ______________ minutes.

- Take immediate cover on the ground level, inside the nearest building [ ]

  OR
- Assemble at the (Circle one): [TSC], [OSC], [480 volt room/RSP], [Warehouse], [OCAB Cafeteria], or other location ____________ [ ]

  AND
- Await further instructions [ ]

  OR
- Evacuate the site [ ]

(REPEAT ANNOUNCEMENT)

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ATTACHMENT ABN-41-1
(continued)

SECURITY EVENT NOTIFICATION WORKSHEET

Surface Imminent

"Attention all personnel, attention all personnel. A Security Emergency has been declared. Report all suspicious persons or activities to the Security Department at extension 4954 or 4957. All other personnel (as directed by SM/US):

- Take immediate cover, inside the nearest building [ ]

  OR

- Assemble at the (Circle one): [TSC], [OSC], [480 volt room/RSP], [Warehouse], [OCAB Cafeteria], or other location ____________ [ ]

  AND

- Await further instructions [ ]

(REPEAT ANNOUNCEMENT)

Surface Probable

"Attention all personnel, attention all personnel. A Security Emergency has been declared. Report all suspicious persons or activities to the Security Department at extension 4954 or 4957. All personnel (as directed by SM/US):

- Take immediate cover, inside the nearest building [ ]

  OR

- Assemble at the (Circle one): [TSC], [OSC], [480 volt room/RSP], [Warehouse], [OCAB Cafeteria], or other location ___________ [ ]

  AND

- Await further instructions [ ]

(REPEAT ANNOUNCEMENT)

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ATTACHMENT ABN-41-1
(continued)

SECURITY EVENT NOTIFICATION WORKSHEET

Bomb In OCA

"Attention all personnel, attention all personnel. A Security Emergency has been declared.

All personnel shall evacuate the ____________________
(event area)

All other personnel (as directed by SM/US):

- Take immediate cover, inside the nearest building [ ]

  OR
- Assemble at the (Circle one): [TSC], [OSC], [480 volt room/RSP], [Warehouse], [OCAB Cafeteria], or other location ___________ [ ]

  AND
- Await further instructions [ ]

Radio and cell phone use is suspended until further notice."

(REPEAT ANNOUNCEMENT)

Informational

"Attention all personnel, attention all personnel. A Security Emergency has been declared. Fire Brigade is to don protective gear at the Technical Support Center and wait for instructions. All ERO members exit the Oyster Creek site and report to the off-site staging area, the EOF. All non-essential personnel exit the Oyster Creek site, go home, and await further instructions." [ ]

(REPEAT ANNOUNCEMENT)

Restoration

"Attention all personnel, attention all personnel. The Security Emergency has cleared. All personnel are directed to report to their work group office for supervisor instructions. Obey security force instructions and report any noted abnormal condition to your supervisor." [ ]

(REPEAT ANNOUNCEMENT)

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ATTACHMENT ABN-41-2

AIRBORNE IMMINENT ATTACK RESPONSE

1.0 **PERFORM** the following concurrently, or in any order that the SM / US deems appropriate.

1.1

NOTE

An Authentication Code should be obtained prior to contacting the NRC Operations Center. Authentication Code can be obtained from the Authentication Code logbook located by the ENS phone.

Continuous communications with the NRC Operations Center may be terminated if all of the following are met:

1) Onsite personnel are notified of the imminent attack condition (Step 1.3)

2) External response organizations have been contacted as applicable:

- Fire Department
- Ambulance / EMT Service
- Law Enforcement Organizations

3) Reactor is Shutdown (Step 1.2)

4) Reactor Water Cleanup is isolated (Step 1.5)

5) Isolation Condensers are isolated (Step 1.6)

6) The NRC Operations Center has been notified that the above conditions are met and that communications will be terminated.

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ATTACHMENT ABN-41-2
(continued)

AIRBORNE IMMINENT ATTACK RESPONSE

VERIFY the authenticity of the notification call unless the NRC provided the correct Authentication Code:

- NRC Operations Center (ENS or 301-816-5100) [ ]
- NEADS (NORAD) at (315-334-6300) or (315-334-6304) [ ]

1.2 WHEN airborne threat has been verified,

THEN **SCRAM** the Reactor per ABN-1, Reactor Scram, [ ]

AND

COMMENCE a reactor cooldown in accordance with procedures. (203, 203.4, ABN-36, ABN-37 or EOPs) [ ]

1.3 IF the Airborne Probable Page announcement was **not** previously made,

THEN **MAKE** the Airborne Imminent page announcement in Attachment ABN-41-1, Security Event Notification Worksheet. [ ]

1.4. **EVACUATE** all on-shift personnel in excess of Shift Manager (SM), Unit Supervisor (US), and Unit Reactor Operator (URO) to the Technical Support Center (TSC) **(CM-10)** [ ]

IF Shift Manager is **not** in the Control Room,

THEN Shift Manager shall **TAKE COVER** until conditions permit Shift Manager's return. **(CM-10)** [ ]

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

ATTACHMENT ABN-41-2
(continued)

AIRBORNE IMMINENT ATTACK RESPONSE

1.5 **INFORM** Security of Control Room partial evacuation to the TSC via telephone. (x4957 or x4951) [ ]

1.6 The Field Supervisor (FS) shall **TAKE COVER** and shall **not ENTER** the Control Room until conditions permit. **(CM-10)** [ ]

1.7

> CAUTION
>
> The following step will eliminate the normal letdown path. Special care will be needed to control Reactor Water Level.

ISOLATE the Reactor Water Cleanup System by confirming all the following Isolation Valves CLOSED: **(CM-2) (CM-3)**

- V-16-1 [ ]
- V-16-2 [ ]
- V-16-14 [ ]
- V-16-61 [ ]

1.8 **ISOLATE** and **DEFEAT** both Isolation Condensers by placing all valve control switches in CLOSE. **(CM-4 & CM-5)**

A IC		B IC	
• V-14-30	[ ]	V-14-33	[ ]
• V-14-31	[ ]	V-14-32	[ ]
• V-14-34	[ ]	V-14-35	[ ]
• V-14-36	[ ]	V-14-37	[ ]
• V-14-5 / 20	[ ]	V-14-1 /19	[ ]

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390.

ATTACHMENT ABN-41-2
(continued)

AIRBORNE IMMINENT ATTACK RESPONSE

1.9 Place the Main Control Room ventilation in the FULL RECIRC MODE by **PLACING** control switch in FULL RECIRC. [ ]

1.10 **OPEN** Breaker 1E15 C2R to de-energize the Stack Aviation Lights. [ ]

1.11 Direct Security to take measures to reduce visual discrimination of the site relative to its surroundings or individual buildings within the Protected Area as follows:

- All BRE's turn off outside lighting [ ]
- All BRE's turn off inside lighting [ ]

1.12 **REVIEW** EP-AA-1010, Exelon Nuclear Radiological Emergency Plan Annex for Oyster Creek Station, for potential EAL's and mobilize the ERO as required. **(CM-10)** [ ]

1.13 **ENTER** the Extensive Damage Mitigation Procedure and execute their support procedures as necessary to augment the Abnormal, EOP and SAMG procedures. [ ]

1.14 WHEN conditions permit,

THEN **COORDINATE** with Security to move on-site ERO members to the TSC and Operations Support Center (OSC). **(CM-10)** [ ]

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

ATTACHMENT ABN-41-2
(continued)

AIRBORNE IMMINENT ATTACK RESPONSE

2.0 Follow up actions to be taken when conditions permit.

2.1 **MAXIMIZE** Reactor water makeup source availability. [ ]

2.2 Start a Diesel Fire Pump by **PLACING** control switch in MANUAL. [ ]

2.3 IF Refueling Floor operations are in progress,
THEN **PLACE** suspended loads in a safe condition. [ ]

2.4

CAUTION
The following step will intentionally secure Shutdown Cooling if in service.

IF the Shutdown Cooling system is in service,
AND
Time to boil is greater that 1 hour,
THEN **ISOLATE** the Shutdown Cooling system by confirming CLOSED:

- V-17-19 [ ]
- V-17-54 [ ]

2.5 **START** the Standby Gas Treatment system when time permits by performing the following:

2.5.1 **DEPRESS** Trip Check button on a Reactor Building Vent Manifold. [ ]

2.5.2 **ROTATE** Trip Check Adjust pot clockwise to the upscale trip point. [ ]

2.5.3 **CONFIRM** SGTS initiation. [ ]

2.5.4 **CONFIRM** isolation of Reactor Building Ventilation. [ ]

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EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

ATTACHMENT ABN-41-2
(continued)

AIRBORNE IMMINENT ATTACK RESPONSE

2.6 **SECURE** all Turbine Building supply and exhaust fans. [ ]

2.7 **CONFIRM** closed Control Room doors. [ ]

2.8 **CONFIRM** closed Reactor Building Railroad Airlock Doors. [ ]

2.9 **OPEN** Breaker 1E15 C2R to de-energize the Stack Aviation Lights. [ ]

2.10 **CONFIRM** closed the following Containment ventilation and purge valves:

Panel 11F		Panel 12XR	
V-27-1	[ ]	V-23-21	[ ]
V-27-2	[ ]	V-23-22	[ ]
V-27-3	[ ]	V-23-13	[ ]
V-27-4	[ ]	V-23-14	[ ]
V-28-17	[ ]	V-23-15	[ ]
V-28-18	[ ]	V-23-16	[ ]
V-28-47	[ ]	V-23-17	[ ]
		V-23-18	[ ]
		V-23-19	[ ]
		V-23-20	[ ]

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EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

ATTACHMENT ABN-41-2
(continued)

AIRBORNE IMMINENT ATTACK RESPONSE

2.11 WHEN time permits,

THEN **PROVIDE** periodic updates of the status of the threat via plant page. [ ]

2.12 Reestablish communication with the NRC Operations Center as soon as practical after an onsite aircraft impact or within 5 minutes of anticipated impact if no impact occurs. [ ]

2.13 WHEN conditions permit,

THEN **PERFORM** Attachment ABN-41-10, Restoration Activities. [ ]

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

ATTACHMENT ABN-41-3

AIRBORNE PROBABLE ATTACK RESPONSE

1.0 Perform the following steps concurrently and in any order the SM/US deems appropriate.

> NOTE
>
> An Authentication Code should be obtained prior to contacting the NRC Operations Center. Authentication Code can be obtained from the Authentication Code logbook located by the ENS phone.
>
> Maintain continuous communication with original threat notification source or NRC Operations Center as appropriate.

1.1 **VERIFY** the authenticity of the notification call unless the NRC provided the correct Authentication Code:

- NRC Operations Center (ENS or 301-816-5100) [ ]
- NEADS (NORAD) at (315-334-6300) or (315-334-6304) [ ]

1.2 IF Refueling Floor operations are in progress,

THEN **PLACE** suspended loads in a safe condition. [ ]

1.3 **MAKE** the Airborne Probable page announcement in Attachment ABN-41-1, Security Event Notification Worksheet. [ ]

1.4 **EVACUATE** all on-shift personnel in excess of SM, US, and URO to the TSC. **(CM-10)** [ ]

ATTACHMENT ABN-41-3
(continued)

AIRBORNE PROBABLE ATTACK RESPONSE

1.5 Rapidly **REDUCE** Reactor Recirculation flow to 8.5 x 10^4 gpm. [ ]

1.6 **INSERT** the CRAM array per the CRAM Rod Move Sheet of the approved Control Rod Sequence Package to further reduce power. [ ]

1.7 **REFER** to procedure 202.1, Power Operation for core limits and monitoring requirements. [ ]

1.8 IF during the rapid power reduction, controlling plant parameters **cannot** be maintained,

THEN **SCRAM** the reactor in accordance with ABN-1, Reactor Scram. [ ]

1.9

CAUTION

The following step will eliminate the normal letdown path. Special care will be needed to control Reactor Water Level.

ISOLATE the Reactor Water Cleanup System by confirming all the following Isolation Valves Closed: **(CM-2) (CM-3)**

- V-16-1 [ ]
- V-16-2 [ ]
- V-16-14 [ ]
- V-16-61 [ ]

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ATTACHMENT ABN-41-3
(continued)

AIRBORNE PROBABLE ATTACK RESPONSE

1.10 **ISOLATE** and **DEFEAT** both Isolation Condensers by placing all valve control switches in CLOSE. **(CM-4 & CM-5)**

A IC		**B IC**	
• V-14-30	[ ]	V-14-33	[ ]
• V-14-31	[ ]	V-14-32	[ ]
• V-14-34	[ ]	V-14-35	[ ]
• V-14-36	[ ]	V-14-37	[ ]
• V-14-5 / 20	[ ]	V-14-1 /19	[ ]

1.11 **PLACE** the Main Control Room ventilation in Full Recirculation mode by placing control switch in FULL RECIRC position. [ ]

1.12 **TURN** Off the following breakers:

- Breaker 1E15 C2R to de-energize the Stack Aviation Lights [ ]
- Breaker 1A24 A2R for outside lights [ ]
- Breaker 1B24 C1L for outside lights [ ]
- Breaker 1A22 C3R for outside lights [ ]
- Breaker 1B22 A3L for outside lights [ ]

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

ATTACHMENT ABN-41-3
(continued)

AIRBORNE PROBABLE ATTACK RESPONSE

1.13 **DIRECT** Security to take measures to reduce visual discrimination of the site relative to its surroundings or individual buildings within the Protected Area as follows:

- All BRE's turn off outside lighting [ ]
- All BRE's turn off inside lighting [ ]
- All Checkpoint lights turn off lighting [ ]
- Protected Area Lighting in accordance with Attachment ABN-41-15, Oyster Creek Security Protected Area Light Map as follows:
  - ➢ Breaker 1A31 C3R Intake Structure [ ]
  - ➢ Breaker SEB LP3 / 5 SEB Room 108 [ ]
  - ➢ Breaker SEB LP3 / 6 SEB Room 108 [ ]
  - ➢ Breaker SEB LP3 / 8 SEB Room 108 [ ]
  - ➢ Breaker SEB LP3 / 10 SEB Room 108 [ ]
  - ➢ Breaker SEB LP3 / 11 SEB Room 108 [ ]
  - ➢ Breaker SEB LP3 / 12 SEB Room 108 [ ]
  - ➢ Breaker DP-3T11 / 5 Auxiliary Office Building East Wall [ ]

1.14 **MAXIMIZE** Reactor water makeup source availability. [ ]

1.15 **START** a Diesel Fire Pump by placing control switch in MANUAL position. [ ]

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390.

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

ATTACHMENT ABN-41-3

AIRBORNE PROBABLE ATTACK RESPONSE

(continued)

1.16 **CAUTION**

The following step will secure Shutdown Cooling if it is in service.

IF the Shutdown Cooling system is in service,

AND time to boil is greater that 1 hour,

THEN **ISOLATE** the Shutdown Cooling system by confirming Closed the following valves:

- V-17-19 [ ]
- V-17-54 [ ]

1.17 **START** the Standby Gas Treatment system when time permits by performing the following:

1.17.1 **DEPRESS** Trip Check button on a Reactor Building Vent Manifold. [ ]

1.17.2 **ROTATE** Trip Check Adjust pot clockwise to the upscale trip point. [ ]

1.17.3 **CONFIRM** SGTS initiation. [ ]

1.17.4 **CONFIRM** isolation of Reactor Building Ventilation. [ ]

1.18 **SECURE** all possible Turbine Building supply and exhaust fans. [ ]

1.19 **CONFIRM** closed Control Room doors. [ ]

1.20 **CONFIRM** closed Reactor Building Railroad Airlock Doors. [ ]

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390

ATTACHMENT ABN-41-3
(continued)

AIRBORNE PROBABLE ATTACK RESPONSE

1.21 CONFIRM closed the following Containment ventilation and purge valves:

Panel 11F		Panel 12XR	
V-27-1	[ ]	V-23-21	[ ]
V-27-2	[ ]	V-23-22	[ ]
V-27-3	[ ]	V-23-13	[ ]
V-27-4	[ ]	V-23-14	[ ]
V-28-17	[ ]	V-23-15	[ ]
V-28-18	[ ]	V-23-16	[ ]
V-28-47	[ ]	V-23-17	[ ]
		V-23-18	[ ]
		V-23-19	[ ]
		V-23-20	[ ]

1.22 WHEN conditions permit,

THEN **STATION** the Field Supervisor (or an extra SRO) and the second RO (or additional RO-qualified individual) at the Remote Shutdown Panel. **(CM-10)** [ ]

EXEMPT FROM PUBLIC DISCLOSURE IN ACCORDANCE WITH 10CFR 2.390.

ATTACHMENT ABN-41-3
(continued)

AIRBORNE PROBABLE ATTACK RESPONSE

1.23 **REVIEW** EP-AA-1010, Exelon Nuclear Radiological Emergency Plan Annex for Oyster Creek Station, for potential EALs and mobilize the ERO as required. **(CM-10)** [ ]

1.24 WHEN conditions permit,

THEN **COORDINATE** with Security to move on-site ERO members to the TSC and OSC. **(CM-10)** [ ]

1.25 WHEN time permits,

THEN **PROVIDE** periodic updates of the status of the threat via plant page. [ ]

1.26 Reestablish communication with the NRC Operations Center as soon as practical after an onsite aircraft impact or within 5 minutes of anticipated impact if no impact occurs. [ ]

1.27 WHEN conditions permit,

THEN **PERFORM** Attachment ABN-41-10, Restoration Activities. [ ]

Table OCGS 2-1: Emergency Action Level (EAL) Matrix

	GENERAL EMERGENCY	SITE AREA EMERGENCY	ALERT	UNUSUAL EVENT
Hazards and Other Conditions Affecting Plant Safety				
Security	**HG1** HOSTILE ACTION resulting in loss of physical control of the facility. 1 2 3 4 D **EAL Threshold Values:** 1. A HOSTILE ACTION has occurred such that plant personnel are unable to operate equipment required to maintain ANY safety function (Table H1). **OR** 2. A HOSTILE ACTION has: • Caused failure of Spent Fuel Pool Cooling Systems **AND** • IMMINENT fuel damage is likely for freshly offloaded reactor fuel in the pool (e.g., within 120 days).	**HS1** HOSTILE ACTION within the PROTECTED AREA. 1 2 3 4 D **EAL Threshold Values:** A notification from the Security Force that a HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA.	**HA1** HOSTILE ACTION within the OWNER CONTROLLED AREA or airborne attack threat. 1 2 3 4 D **EAL Threshold Values:** 1. A validated notification from NRC of an airliner attack threat **< 30 minutes** from the site. **OR** 2. Notification by the Security Force that a HOSTILE ACTION is occurring or has occurred within the OWNER CONTROLLED AREA.	**HU1** Confirmed SECURITY CONDITION or threat, which indicates a potential degradation in the level of safety of the plant. 1 2 3 4 D **EAL Threshold Values:** 1. A credible site-specific security threat notification as determined per SY-AA-101-132, Security Assessment and Response to Unusual Activities. **OR** 2. A validated notification from NRC providing information of an aircraft threat. **OR** 3. Notification by the Security Force of a SECURITY CONDITION that does not involve a HOSTILE ACTION.
C. R. Evacuation	**Table H1 - Safety Functions** • Reactivity Control (ability to shut down the reactor and keep it shutdown) • RCS Inventory (ability to cool the core) • Decay Heat Removal (ability to maintain heat sink)	**HS2** Control Room evacuation has been initiated and plant control cannot be established. 1 2 3 4 D **EAL Threshold Values:** Note: The Emergency Director should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. Control Room evacuation has been initiated. **AND** 2. Control of the plant cannot be established per ABN-30 in **< 15 minutes**.	**HA2** Control Room evacuation has been initiated. 1 2 3 4 D **EAL Threshold Values:** Entry into ABN-30 for Control Room evacuation.	
Fire / Explosion		**Table H2 – Vital Areas** • Reactor Bldg • 4160V Switchgear Rooms (1C & 1D) • Control Room Complex (MOB, Upper and Lower Cable Spreading Rooms) • Main Transformer/Condensate Transfer Pad • Intake Structure • #1 EDG Vault • #2 EDG Vault • EDG Fuel Oil Storage Tank	**HA3** FIRE or EXPLOSION affecting the operability of plant safety systems required to establish or maintain safe shutdown. 1 2 3 4 D **EAL Threshold Values:** FIRE or EXPLOSION resulting in any of the following: • VISIBLE DAMAGE to a Table H2 permanent structure. **OR** • VISIBLE DAMAGE to safety system equipment contained within a Table H2 area. **OR** • Control Room indication of degraded safety system equipment performance contained within a Table H2 area.	**HU3** FIRE within the PROTECTED AREA not extinguished within 15 minutes of detection or EXPLOSION within the PROTECTED AREA. 1 2 3 4 D **EAL Threshold Values:** Note: The Emergency Director should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 1. FIRE in any Table H2 area not extinguished in **< 15 minutes** of Control Room notification or verification of a Control Room FIRE alarm. **OR** 2. EXPLOSION within PROTECTED AREA boundary affecting a Table H2 area.

Modes: 1 – Power Operation, 2 – Hot Shutdown, 3 – Cold Shutdown, 4 – Refueling, D – Defueled

STATE / LOCAL NOTIFICATION FORM

(Or Electronic Facsimile)

MESSAGE NO. ____________

VERIFIED WITH:________________ **EMERGENCY DIRECTOR APPROVAL:**______________________

1. CALL STATUS is: [ ] This is a DRILL. [ ] This is an ACTUAL EVENT	2. This is*______________________ at Oyster Creek Generating Station. My phone number is*__________________ The current time is*________ *Completed by Communicator at time notification is performed: use PPC time in 24-hour clock.

3. EMERGENCY CLASSIFICATION: [ ] UNUSUAL EVENT [ ] ALERT [ ] SITE AREA EMERGENCY [ ] GENERAL EMERGENCY [ ] RECOVERY [ ] TERMINATION	DECLARED AT: TIME: ________________ (use PPC time in 24-hr clock) DATE: _______/_______/________	THIS REPRESENTS A/AN: [ ] INITIAL DECLARATION [ ] ESCALATION [ ] NO CHANGE [ ] REDUCTION IN CLASSIFICATION STATUS

4. EMERGENCY ACTION LEVEL (EAL) NUMBER IS: ____________
BRIEF NON-TECHNICAL DESCRIPTION:

5. NON-ROUTINE RADIOLOGICAL RELEASE* STATUS:
- [ ] **NO** non-routine radiological release in progress
- [ ] **AIRBORNE** non-routine radiological release in progress
- [ ] **LIQUID** non-routine radiological release in progress
- [ ] Non-routine radiological release **TERMINATED**

6. METEOROLOGY:
Wind Direction is *FROM*:________________________________ (degrees)
Wind Speed is:________________ (miles per hour)

7. CONCLUSION [ ] This is a DRILL. [ ] This is an ACTUAL EVENT.
The time is _______:_______ (24 hour clock).

- **PERFORM** final roll call (**General Emergency Only**)
- **ASK** if there is any questions about the information provided and **PROVIDE** clarification as needed.
- **READ:** "This concludes the notification message"

STATE / LOCAL NOTIFICATION FORM

MESSAGE NO. ___________

"15 Minute Notifications UNUSUAL EVENT, ALERT or SITE AREA EMERGENCY (Time Contacted: 24-hour clock) **NJSP Office of Emergency Management** 609-963-6951 **or** 609-963-6952 Time: ____________ **VERIFICATION CALL RECEIVED** **NJSP Office of Emergency Management**: Time: ____________ Person Contacted: _________________ **FOLLOW-UP NOTIFICATIONS** **NRC Resident Inspector** 610-547-2603 **or 215-498-4087** Time: ____________ Person Contacted: ______________	**"15 Minute Notifications GENERAL EMERGENCY** (Time Contacted: 24-hour clock) **Initial Roll Call** **Final Roll Call** (Time) (√) _____ **NJSP Office of Emergency Management** ☐ 609-963-6951 **or** 609-963-6952 _____ **Ocean County** ☐ 732-349-9100 _____ **Lacey Township** ☐ 609-693-6636 **or** 609-693-6637 _____ **Ocean Township** ☐ 609-693-4007 **or** 609-693-4008 _____ **Initial Roll Call Completed** **VERIFICATION CALL RECEIVED** **NJSP Office of Emergency Management**: Time: ____________ Person Contacted: _________________ **Ocean County**: Time: ____________ Person Contacted: _________________ **FOLLOW-UP NOTIFICATIONS** NRC Resident Inspector 610-547-2603 **or 215-498-4087** Time: ____________ Person Contacted: _________________

RPPC-A | ACTIVE | PLANT MODE | RUN | ALM | Health

Meteorological Monitoring

MET_MONITOR

INTEG | RX/PWR | CTMT | HT REM | RAD

Recorder A Status: UP

Recorder B Status: UP

Stability Classifications

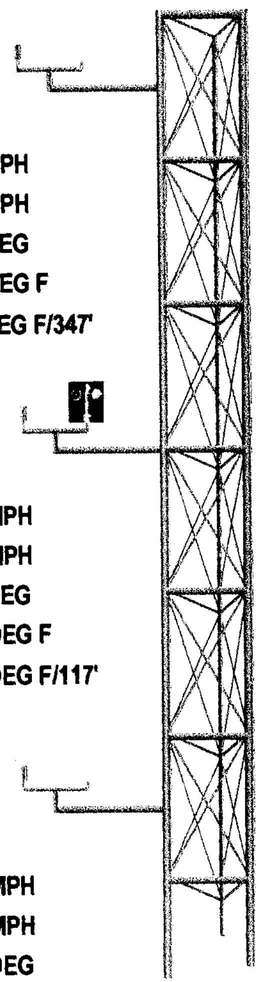
15 Minute Averages

Intake	68.3 DEG F
Discharge	87.5 DEG F
Circ Water Delta T	19.2 DEG F
Rx S Bridge Temp	77.3 DEG F
Circ Water Heat Discharge	4352.3 MBTU/HR

Other Values

Rx S Bridge Sensor A	77.3 DEG F
Rx S Bridge Sensor B	77.3 DEG F
	26.1 MR/HR
	24.1 MR/HR
	127.4 DEG F
	96.1 %
	96.6 PERCENT
Main Generator Megawatts	647.4 MWE

Meteorological Tower



380 Feet - A (Alpha)

15 Minute Average

Wind Gust Max	11.8 MPH
Wind Speed	8.0 MPH
Wind Direction	218.0 DEG
Air Temperature	67.2 DEG F
ΔT (380' - 33')	-1.7 DEG F/347'

380 Feet - B (Bravo)

15 Minute Average

Wind Gust Max	11.8 MPH
Wind Speed	8.0 MPH
Wind Direction	218.0 DEG
Air Temperature	67.2 DEG F
ΔT (380' - 33')	-1.7 DEG F/347'

150 Feet - A (Alpha)

15 Minute Average

Wind Gust Max	13.2 MPH
Wind Speed	10.0 MPH
Wind Direction	215.0 DEG
Air Temperature	68.0 DEG F
ΔT (150' - 33')	-0.9 DEG F/117'

150 Feet - B (Bravo)

15 Minute Average

Wind Gust Max	13.2 MPH
Wind Speed	10.0 MPH
Wind Direction	215.0 DEG
Air Temperature	68.0 DEG F
ΔT (150' - 33')	-0.9 DEG F/117'

33 Feet - A (Alpha)

15 Minute Average

Wind Gust Max	10.2 MPH
Wind Speed	8.6 MPH
Wind Direction	220.0 DEG
Air Temperature	68.9 DEG F

33 Feet - B (Bravo)

15 Minute Average

Wind Gust Max	10.2 MPH
Wind Speed	8.6 MPH
Wind Direction	220.0 DEG
Air Temperature	68.9 DEG F

Performance Information

Facility: Oyster Creek   Task No.: 2010101009

Task Title: Perform Control Rod Exercising Test – uncoupled Rod (Alternate Path)

Job Performance Measure No.: NRC Control Room JPM 1

K/A Reference: 201003 A2.02 (3.7/3.8)

Examinee: ____________   Examiner: ____________

Facility Evaluator: ____________   Date: ____________

Method of Testing:

Simulated Performance ________   Actual Performance ___X___

Classroom ________   Simulator ___X___   Plant ________

Read to the Examinee:

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

Initial Conditions:

- The plant is at rated power
- Control Rod Exercising Procedure 617.4.002 is in progress

Task Standard: Perform CRD exercise and perform actions for an uncoupled Rod

Required Materials: None

General References:

1. 617.4.002 Control Rod Exercise Procedure Rev 69
2. ABN-6 Control Rod Malfunctions Rev 14
3. RAP-H5a Rod Overtravel Rev 2

Initiating Cue:

Continue with procedure 617.4.002, Control Rod Exercising at step 6.4 for Control Rod 02-35

Time Critical Task: NO

Validation Time: 11 Minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Obtain a copy of the reference procedure and continue with Control Rod exercising of control rod 02-35

Standard: Obtains procedure 617.4.002 and continues with control rod exercising of control rod 02-35

Comment:

SAT/UNSAT

✓ Performance Step: 3

Procedure Step: 6.4 – 6.4.7.6

Insert Control Rod 02-35 from position 48 to position 46

Standard: Monitors CRD position indicators for any mispositioned control rod. Turns on Rod Power, On the Rod select matrix selects control rod 02-35, records initial position on attachment 3 and inserts control rod 1 notch from position 48 to position 46 by placing ROD Control Switch to Rod IN position for approximately one-second. Verifies Control Rod moves into position 46. Inserts a check mark on 617-4-002-3 in the insert column.

BOOTH: uncouple rod 02-35

Insert MAL-CRD. 008_0235

Performance Information

Comment:

SAT/UNSAT

✓ Performance Step: 4

Procedure steps: 6.4.8 – 6.4.8.3

Withdraw Control Rod 02-35 from position 46 to 48

Standard: Places Rod Control switch to ROD OUT NOTCH for approximately one-second. Verifies Control rod moves to position 48 and latches. Records checkmark in the withdrawal column of 617-4-002-3

Comment:

SAT/UNSAT

Alternate Path

✓ Performance Step: 5

Procedure Step: 6.4.15 – 6.4.15.3

Perform a coupling check and determines Rod is uncoupled

Standard: Holds ROD CONTROL switch in ROD OUT NOTCH and simultaneously places the NOTCH OVERRIDE switch in NOTCH OVERRIDE.

Comment:

SAT/UNSAT

✓ Performance Step: 6

Recognize rod 02-35 is uncouples and make an update

Standard: Recognizes alarm H5a (Rod overtravel) has come in and makes update. Then enters RAP-H5a and enters ABN-6

Comment:

Performance Information

SAT/UNSAT

✓ Performance Step: 7

Procedure Step: 7.3 – 7.3.1.3

Apply continuous insert signal for rod 02-35 until a response of nuclear instruments is notice

Standard: Confirms Rod power switch is On, Rod 02-35 is selected, applies Continuous insert signal until a response is observed on the nuclear instruments

BOOTH: re-couple rod 02-35

Delete MAL-CRD. 008_0235

Comment:

SAT/UNSAT

Performance Step: 8

Procedure Step: 7.3.2.1
Notify Reactor engineering of uncoupled rod

Standard: Notifies Reactor engineering that rod 02-35 was uncoupled

Comment:

SAT/UNSAT

✓ Performance Step: 9

Procedure step: 7.3.2.2 – 7.3.2.3

Verify rod 02-35 is recoupled

Performance Information

Standard: Withdraws rod to position 48. Applies a continuous withdraw signal at position 48 an verifies Rod overtravel alarm is not alarming an control rod position display indicates position 48.

Comment:

SAT/UNSAT

Performance Step: 10

Make update that rod is re-coupled

Standard: Makes update that Rod 02-35 is re-coupled.

Comment:

SAT/UNSAT

Terminating Cue: Control Rod has been withdrawn to position 48 and Re-coupling check is complete

JPM Stop Time: __________

Validation of Completion

JPM Number: NRC Control Room JPM 1

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ________________ ________________

JPM Setup

SIMULATOR SETUP INSTRUCTIONS

1. Reset to a full power IC (115 or other), but this JPM can be run at any power level.

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

STUDENT HANDOUT

Initial Conditions:

- The plant is at rated power
- Control Rod Exercising Procedure is in progress

Task Cue:

- Continue with procedure 617.4.002, Control Rod Exercising at step 6.4 for Control Rod 02-35

Exelon Generation	OYSTER CREEK GENERATING STATION PROCEDURE	Number **617.4.002**	
Title **CRD Exercise and Flow Test / IST Cooling Water Header Check Valve**		Usage Level **1**	Revision No. 69

Prior Revision _68_ incorporated the following Temporary Changes:

N/A

This Revision _69_ incorporates the following Temporary Changes:

N/A

List of Pages

PROCEDURE HISTORY

REV	DATE	ORIGINATOR	SUMMARY OF CHANGE
61	04/12	A. Decker	Incorporated TPC 04-08-12-01. Added rows for 38 rods.
62	09/12	A. Decker	Incorporated PCRA 00525245-15. Revised Numbering for Step 6.4.6 Note.
63	04/13	A. Decker	Incorporated PCRA 00525245-16. Removed reference to Emergency In from Step 4.6, 6.4.8.5, 7.2.4 and Attachment 617.4.002-3. Corrected Step 2.1 and 4.4 to reference WC-AA-111.
64	06/13	A. Decker	Incorporated PCRA 00525245-17. Corrected formatting of Perform / Verify.
65	10/13	S Serpe	PCRA 1447483-15 Enhance note at step 6.4.6 to clarify rods at 00 are not required to be exercised unless requested by the RE or System manager.
66	04/14	A. Decker	Incorporated PCRA 01636591-01. Updated document from LS-AA-125 to PI-AA-125.
67	12/14	A. Decker	Incorporated PCRA 00525245-18. Enhanced Steps 6.4.14.3 and 6.4.15.2 with reference to actual signature Steps 6.4.18.2 and 6.4.19.2.
68	06/15	A. Decker	Incorporated PCRA 00525245-21. Corrected Attachment 617.4.002-3, Step 6.4.14.3 and 6.4.18.2 to reference Step 6.4.18.2 and 6.4.19.2.
69	09/01	A. Decker	Incorporated PCRA 00525245-22. Corrected Step 3.5 reference. Removed 302.2 Attachment 6 reference and added OP-AB-300-1001 reference.

TABLE OF CONTENTS

1.0 PURPOSE

1.1 To verify the operability of CRDs by exercising each partially or fully withdrawn control rod per Technical Specification 4.2.D.

1.2 To measure withdraw stall flows of fully withdrawn CRD's.

1.3 To measure insert stall flows of selected CRDs during power reductions or other designated evolutions.

1.4 To satisfy the Oyster Creek Nuclear Generating Station IST Program requirements for the valves listed in Attachment 617.4.002-4.

1.5 To verify the integrity of the ROD SELECT pushbutton circuitry.

1.6 To check for NOTCH OVERRIDE Switch 4S3, mechanical wear that may prevent the Emergency Rod In function.

1.7 To verify CRD coupling in support of plant shutdown using an Improved BPWS sequence.

2.0 REFERENCES

2.1 Procedures:

- WC-AA-111, Surveillance Program requirements
- 235, Determination and Correction of Control Rod Drive System Problems
- 1001.22, Core Monitoring and Operation
- ER-AA-321, Inservice Testing Program Implementing Procedure
- PI-AA-125, Corrective Action Program (CAP) Procedure
- HU-AA-1211, Briefings – Pre-Job, Heightened Level Of Awareness, Infrequent Plant Activity And Post-Job Briefings
- OP-AB-300-1001, BWR Control Rod Movement Requirements

2.2 Drawings:

- GE197E871, Scram Discharge Volume System Control Rod Drive (CRD) Hydraulic System & Nitrogen Charging System Flow Diagram
- GE237E912, Elementary Diagram Reactor Manual Control System

2.3 Technical Specifications:

- Section 3.2.B.4
- Section 4.2.D
- Section 4.3.C

2.4 Other References:

- SOER 84-02, Mispositioned Control Rod
- General Electric Services Information Letter (SIL) 538, CRD Cooling Water Orifices
- General Electric NEDO-33091, Improved BPWS Control Rod Insertion Process
- A/R A2137675, Eval 01, Technical Evaluation to Evaluate Control Rod Motion for Tech Spec Surveillance 4.2.D

Perform / Verify

3.0 PREREQUISITES

3.1 Conduct briefing in accordance with (I.A.W). HU-AA-1211, Briefings - Pre-Job, Heightened Level of Awareness, Infrequent Plant Activity and Post-Job Briefings. BB / CC

_______ / Today / Then
US Date Time

3.2 US has given permission to commence testing. BB / CC

_______ / Today / Then
US Date Time

3.3 CRD System is in operation with no rod blocks present and the drive water pressure is 250 ± 10 psid. BB / CC

3.4 The REACTOR MODE SELECTOR Switch is in RUN. BB / CC

3.5 Perform planned control rod movements in accordance with the following attachments. The attachments shall be available at Panel 4F.

- OP-AB-300-1001, BWR Control Rod Movement requirements BB / CC
- 302.2 Attachment 7, Rod Movement Communications Examples BB / CC

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Control rod manipulations shall be made in accordance with Procedure OP-AA-300, Reactivity Management.

4.2 Nuclear Instrumentation shall be continuously monitored during CRD movement.

4.3 CRD position indicators shall be monitored during all periods of rod movement for indication of abnormal rod motion.

4.4 The performance of this surveillance and its review shall be conducted in accordance with both Procedures WC-AA-111 and ER-AA-321.

4.5 Mispositioned Control Rod:

1. A correctly selected control rod was moved more than one notch beyond its intended position. (SOER 84-02)
2. A correctly selected control rod was moved one notch beyond its intended position and unknowingly left in this position.
(I.e. next rod selected, control rod evolution completed, etc.)
3. An incorrectly selected control rod was moved.
4. Moving a control rod in a direction contrary to the intended direction.

4.6 If a control rod is inadvertently moved one notch beyond the intended position (e.g. double notching), record the event on Attachment 3 and follow the requirements of PI-AA-125.

4.7 Steps to perform control rod coupling checks shall be performed during the scheduled control rod exercise. This will satisfy the requirement for performing coupling checks prior to reactor shutdowns utilizing the Improved BPWS Control Rod Insertion Process.

4.8 To avoid the possibility of receiving a control rod Block signal, if any accumulator low-pressure alarm is received during the performance of this surveillance, the alarm should be clear before continuing with this surveillance. The US may direct continuation of the surveillance with an accumulator low pressure alarm. However, an accumulator low pressure alarm could cause a control rod to notch in one notch.

4.9 If Position Indicating Probe (PIP) reed switch becomes stuck, preventing completion of this surveillance, contact Reactor Engineering for allowed control rod movements to free the stuck reed switch.

4.10 A specific sequence for CRD exercise may be designated by the US.

4.11 Changes in drive water differential pressure affect CRD cooling. Therefore, drive water pressure adjustments should be minimized when possible.

4.12 Unless otherwise specified, drive water differential pressure shall be returned to 250 ± 10 psid prior to the first insert or withdraw attempt on each control rod.

4.13 Control rod insert and withdrawal speed shall be monitored during control rod movement. Control rods which appear to notch either faster or slower than normal (based on operator experience or data obtained by the CRD System Manager) shall be single notch timed per Procedure 235, Attachment 13 following the performance of this test unless appropriate speed adjustments are **<u>not</u>** possible given known HCU directional control valve position.
(e.g., full closed for fast rods or full open for slow rods)

4.14 During Control Rod exercise of rods at intermediate positions (i.e. **<u>not</u>** fully inserted or fully withdrawn) the Unit Supervisor should position themselves in proximity to the Reactor Operator. For rods that are fully inserted or fully withdrawn, the reactivity change is minimal and the Unit Supervisor may adequately supervise control rod exercising from any location in the “at the controls” area.

4.15 Perform planned control rod movements in accordance with 302.2, Attachment 6 and Attachment 7.

Perform / Verify

5.0 MATERIAL & TEST EQUIPMENT

None

6.0 PROCEDURE

6.1 **VERIFY** all Section 3.0 prerequisites met. BB / CC

6.2 **VERIFY** Operating Stabilizing Valve flows in acceptable range by performing the following:

6.2.1 IF Stabilizing Valves NC-19A / NC-19B are in service,

THEN **PERFORM** Attachment 617.4.002-1. n/a /

6.2.2 IF Stabilizing Valves NC-19E / NC-19F are in service,

THEN **PERFORM** Attachment 617.4.002-2. BB / CC

6.2.3 **RECORD** stabilizing valve flow from Attachment 617.4.002-1 or Attachment 617.4.002-2 on Data Sheet, Attachment 617.4.002-3 BB / CC

Perform / Verify

~~6.3~~ STALL FLOW MEASUREMENT OF CRDS

~~6.3.1~~

> NOTE
>
> Stall flows can be taken concurrently while performing coupling checks on all rods at 48.

PERFORM the following for fully withdrawn CRDs:

~~6.3.1.1~~ **TURN** ROD POWER Switch to ON. BB / CC

~~6.3.1.2~~ **SELECT** a CRD at position 48. BB / CC

~~6.3.1.3~~ **HOLD** NOTCH OVERRIDE Switch in NOTCH OVERRIDE position. BB / CC

~~6.3.1.4~~ **HOLD** ROD CONTROL Switch to ROD OUT NOTCH position. BB / CC

~~6.3.1.5~~ WHEN CRD returns to position 48,

AND Drive pressure stabilizes,

THEN **RECORD** the withdraw stall flow as indicated on FT-RD10, Drive Water Flow on Data Sheet, Attachment 617.4.002-6. (Panel 4F) BB / CC

~~6.3.1.6~~ **RELEASE** ROD CONTROL Switch. BB / CC

~~6.3.1.7~~ **RELEASE NOTCH** OVERRIDE Switch. BB / CC

Perform / Verify

6.3.1.8 **PERFORM** the following for withdraw stall flows > 5 gpm:

1. **IDENTIFY** each CRD with a withdraw stall flow > 5 gpm in Comments section on the Data Sheet, Attachment 617.4.002-6. ______/

2. **CONVERT** stall flows > 5 gpm from differential pressure on DPI-234, Drive Water Flow Element Diff Pressure Indicator to gallons per minute using Attachment 617.4.002-5. (DPI-234 behind CRD Filters) ______/

6.3.1.9 **PERFORM** the following for each remaining CRD at position 48:

1. **REPEAT** Steps 6.3.1.2 through 6.3.1.7. ______/

2. **PERFORM** Step 6.3.1.8 for stall flows > 5 gpm. ______/

3. **RECORD** stall flows. ______/

6.3.1.10 **RETURN** the ROD POWER Switch to OFF. ______/

6.3.2 **PERFORM** the following for operable CRD's at position 00.

6.3.2.1 **TURN** ROD POWER Switch to ON. ______/

6.3.2.2 **SELECT** a CRD at position 00. ______/

6.3.2.3 **APPLY** a continuous insert signal by holding the ROD CONTROL Switch in ROD IN. ______/

Perform / Verify

6.3.2.4 WHEN drive pressure stabilizes,

THEN **RECORD** the insert stall flow, followed by an "I", as indicated on FT-RD10, Drive Water Flow on the Data Sheet, Attachment 617.4.002-6. (Panel 4F) ______/

6.3.2.5 **RELEASE** the ROD CONTROL Switch. ______/

6.3.2.6 **RECORD** each CRD with insert stall flow > 3.5 gpm in the Comments section of Data Sheet, Attachment 617.4.002-6. ______/

6.3.2.7 **PERFORM** the following for insert stall flows > 5 gpm:

1. **CONVERT** stall flows > 5.0 gpm from differential pressure on DPI-234, Drive Water Flow Element Diff Pressure Indicator to gallons per minute using Attachment 617.4.002-5. (DPI-234-Reactor Building 23' elevation along SE wall of the Drywell) ______/

6.3.2.8 **PERFORM** Steps 6.3.2.2 through 6.3.2.7 for each remaining operable CRD at position 00. ______/

6.3.2.9 **RETURN** ROD POWER Switch to OFF. ______/

Perform / Verify

6.4 CRD EXERCISE

6.4.1

> NOTE
>
> The Operator and the verifier perform Step 6.4.1.

MONITOR CRD position indicators for any mispositioned control rod. ______/______ PC

6.4.2 IF a control rod is mispositioned,

THEN **ENTER** ABN-6, Control Rod Malfunctions. ______/

6.4.3 **TURN** ROD POWER Switch to ON. ______/

6.4.4 **SELECT** the CRD to be exercised from Attachment 617.4.002-3. ______/

6.4.1 **RECORD** the CRD's INITIAL POSITION on Attachment 617.4.002-3. ______

6.4.5 **SELECT** CRD to be exercised on Control Rod Select Panel. ______/

6.4.6

> NOTE
>
> Exercise Control Rods at position '00' only when requested by R.E. or the system manager
>
> For operable CRD's which are fully inserted, steps shall be performed in the following order: 6.4.5, 6.4.6, 6.4.8, 6.4.7, 6.4.9, 6.4.10.

IF control rod to be exercised has been identified to repeatedly double notch is known to have high notch speeds or as directed by US,

THEN **PERFORM** the following:

6.4.6.1 **ADJUST** drive pressure to 210 ± 10 psid. ______/

Perform / Verify

6.4.6.2 **RECORD** adjusted pressure on Data Sheet, Attachment 617.4.002-3. ______/

6.4.7 Control Rod In Movement

6.4.7.1

> NOTE
>
> Normal drive pressure is 250 ± 10 psid.

PLACE ROD CONTROL Switch to ROD IN position for approximately one-second. ______/

6.4.7.2

> NOTE
>
> Successful completion of Step 6.4.6.2 verifies Cooling Water Header Check Valve V-138 has fully closed. Data entered on Data Sheet; Attachment 617.4.002-3 will act as acceptance check-off for each control rod / valve.

VERIFY the following:

- Control rod moves into the next even numbered position or into position 00 for fully inserted rods. /______
- Control rod latches. /______

6.4.7.3 IF control rod operated correctly,

THEN **PLACE** a check mark in the INSERT column of Data Sheet, Attachment 617.4.002-3. ______/

Perform / Verify

6.4.7.4 IF control rod double notches at normal drive pressure,

THEN **RECORD** DN in the INSERT column of Data Sheet Attachment 617.4.002-3, ______/

AND **PERFORM** Single Notch Timing in accordance with Procedure 235 immediately following the double notch. ______/

6.4.7.5

> NOTE
>
> Single Notch Timing is performed in case the cause of high pressure to move is rod speed related and to reduce the possibility of a double notch rod resulting from operation at increased drive pressure.

IF all of the following are met:

1. The control rod does **not** notch with normal drive pressure,
2. Single Notch Timing per Procedure 235, Attachment 13 has **not** already been attempted during this performance of this surveillance,
3. Appropriate speed improvements are possible given known HCU directional control valve position (e.g., **not** full closed for fast rods or full open for slow rods), and CRDM condition, (per System Manager Direction)

Perform / Verify

THEN **PERFORM** the following:

1. **PERFORM** Single Notch Timing in accordance with Procedure 235, Attachment 13 in both the Insert and Withdrawal directions. ______/

2. **VERIFY** control rod is at its Pre-Step 6.4.6 position. /______

3. **RETURN** to Step 6.4.6.1. ______/

6.4.7.6 IF the control rod does **not** notch with normal drive pressure,

THEN **PERFORM** Attachment 617.4.002-7. ______/

6.4.8 Control Rod Out Movement

6.4.8.1

NOTE
Normal drive pressure is 250 ± 10 psid.

PLACE ROD CONTROL Switch to ROD OUT NOTCH for approximately one-second. ______/

6.4.8.2 **VERIFY** the following:

- Control rod moves out to the original position, /______

  OR

- For fully inserted control rods into the next even numbered position, /______

  AND

- Control rod latches. /______

Perform / Verify

6.4.8.3 IF operation is correct,

THEN **RECORD** a checkmark in the WITHDRAW column on the Data Sheet, Attachment 617.4.002-3. ______/

6.4.8.4

NOTE

Single notch speed adjustments for double notching control rods are made in accordance with Procedure 235 as directed by Shift Management.

IF control rod double notches at normal drive pressure,

THEN **RECORD** DN in the WITHDRAW column of Data Sheet, Attachment 617.4.002-3. ______/

AND **PERFORM** Single Notch Timing IAW Procedure 235 immediately following the double notch. ______/

Perform / Verify

6.4.8.5

NOTE
Single Notch Timing is performed in case the cause of the high pressure to move is rod speed related and to reduce the possibility of a double notch rod resulting from operation at increased drive pressure.

IF all of the following are met:

1. The control rod does **not** notch with normal drive pressure,
2. Single Notch Timing per Procedure 235, Attachment 13 has **not** already been attempted during this performance of this surveillance,
3. Appropriate speed improvements are possible given known HCU directional control valve position (e.g., **not** full closed for fast rods or full open for slow rods), and CRDM condition, (per System Manager Direction)

THEN **PERFORM** the following:

1. **PERFORM** Single Notch Timing in accordance with Procedure 235, Attachment 13 in both the Insert and Withdrawal directions. _______/
2. **VERIFY** control rod is at its Pre-Step 6.4.7 position. /_______
3. **RETURN** to Step 6.4.7.1. _______/

Perform / Verify

6.4.8.6 IF control rod does **not** notch with normal drive pressure,

THEN **PERFORM** Attachment 617.4.002-8. ______/

6.4.9 IF CRD required > 300 psid drive pressure to insert or withdraw,

THEN **EXERCISE** the CRD five times in an attempt to lower drive pressure to < 300 psid. ______/

6.4.10 IF after five exercise attempts the drive pressure required is still > 300 psid,

THEN **PERFORM** the following:

- **IDENTIFY** CRD ______/
- **RECORD** drive pressure in Comments section ______/
- **SUBMIT** an IR ______/

6.4.11 **VERIFY** the selected control rod has been returned to its programmed original position. /______

6.4.12 **RECORD** initials in the OPER column on Data Sheet Attachment 617-4-002-3. ______/

6.4.13 Concurrently **VERIFY** the selected control rod has been returned to its programmed original position. /______

6.4.14 **RECORD** initials in the CV column on Data Sheet, Attachment 617.4.002-3. /______

Perform / Verify

6.4.15

NOTE

Steps to perform control rod coupling checks are required for all control rods that are returned to position 48. This will satisfy the requirement to perform coupling checks prior to reactor shutdowns utilizing the Improved BPWS sequence.

Stall flows (Section 6.3) can be taken concurrently while performing coupling checks on all rods at 48.

IF the selected rod is at position 48,

THEN **PERFORM** a coupling check as follows:

6.4.15.1 **HOLD** the ROD CONTROL switch in ROD OUT NOTCH and simultaneously **PLACE** the NOTCH OVERRIDE Switch in NOTCH OVERRIDE. ______/

6.4.15.2 WHEN the red WITHDRAW light is illuminated,

AND The rod position display indicates a continuous digital readout of "48" with red backlighting,

THEN **RELEASE** the ROD CONTROL switch and the NOTCH OVERRIDE Switch. ______/

6.4.15.3 **RECORD** initials in the COUPLING CHECK column on Data Sheet, Attachment 617.4.002-3. ______/

6.4.16 **RECORD** the CRD's FINAL POSITION on Attachment 617.4.002-3. ______/

Perform / Verify

6.4.17 **PERFORM** Steps 6.4.4 through 6.4.16 for the remaining CRD's. ______/

6.4.18 WHEN control rod coupling checks have been completed,

THEN **PERFORM** the following:

6.4.18.1 **MARK** "N/A" on Attachment 617.4.002-3 for rods **not** at position 48. ______/

6.4.18.2 Independently **VERIFY** all control rods at position 48 have a signed coupling check. /______ IV

6.4.18.3 **RECORD** Independent Verification on Attachment 617.4.002-3. ______/

6.4.19 WHEN all operable control rods have been exercised,

THEN **PERFORM** the following:

6.4.19.1 Independently **VERIFY** all control rods are returned to their original positions. /______ IV

6.4.19.2 **RECORD** Independent verification of rod positions on Data Sheet, Attachment 617.4.002-3. ______/

6.4.20 WHEN exercising is complete,

THEN **PLACE** the Rod Power Switch to OFF. ______/

Group Heading CONTROL RODS/DRIVES ROD CNTRL	H-5-a

ROD OVERTRAVEL	

CONFIRMATORY ACTIONS:

- ❑ **VERIFY** blank position indication for affected Control Rod. (Panel 4F) [ ]

AUTOMATIC ACTIONS:

NONE

MANUAL CORRECTIVE ACTIONS:

- ❑ **REFER** to ABN-6, Control Rod Drive System for uncoupled rod. [ ]

CAUSES:	SETPOINTS:	ACTUATING DEVICES:
Any of the Control Rod Drives indicating travel beyond full out. This indicates Control Rod is uncoupled from the Control Rod Drive.	Any CRD 2" beyond full out	AR1-1, AR1-2, AR1-3, AR1-4
		Reference Drawings: GE 148F481 GU 3E-611-17-010

TABLE OF CONTENTS

7.0 UNCOUPLED ROD

7.1 INDICATIONS

1. Annunciators:

Engraving	Location	Setpoint
ROD OVERTRAVEL	H-5-a	Any CRD 2" beyond full out

2. Plant Parameters:

Parameter	Location	Change
Timer malfunction rod block	Rod Block Matrix	Blue light lit
Reactor Power	4F	Not changing as expected
RWM rod block	4F	RWM display
Changing rod position	4F	Full core display

7.2 IF a control rod is uncoupled and reactor power is < 10%,

THEN **PERFORM** the following:

7.2.1 **IMMEDIATE OPERATOR ACTIONS**

1. **CONFIRM** Rod Power Switch is ON. [ ]
2. **SELECT** the rod. [ ]
3. **APPLY** a continuous INSERT signal to the rod until the rod indicates position "00". [ ]

7.2.2 **SUBSEQUENT OPERATOR ACTIONS**

1. IF the rod **cannot** be inserted to position "00",

   THEN **SCRAM** the affected rod from Panel 6XR in accordance with Attachment ABN-6-1, Operation of the Single Rod Scram Test Panel. [ ]

2. IF the rod can **not** be scrammed,

   THEN **SCRAM** the Reactor and **ENTER** ABN-1, Reactor Scram. [ ]

3. **NOTIFY** Reactor Engineering of the event. [ ]

4. **INFORM** US to consult Technical Specifications, Section 3.2. [ ]

7.2.3 IF the control rod is re-coupled,

THEN **COORDINATE** with Reactor Engineering and **RETURN** the rod to its programmed position. [ ]

7.2.4 IF the affected control rod **cannot** be re-coupled,

THEN **INSERT** the rod to position "00" and ISOLATE the affected HCU in accordance with Procedure 302.1, Control Rod Drive Hydraulic System. [ ]

7.2.5 IF the affected rod **cannot** be moved with control rod drive pressure or **cannot** be re-coupled,

THEN **INFORM** US to consult Technical Specifications, Section 3.2. [ ]

7.2.6 **REFER** to Procedure 235, Determination and Correction of control Rod Drive System Problems. [ ]

7.3 IF a control rod is uncoupled and reactor power > 10%,

THEN **PERFORM** the following:

7.3.1 **IMMEDIATE OPERATOR ACTIONS**

1. **CONFIRM** Rod Power Switch is ON. [ ]
2. **SELECT** the rod. [ ]
3. **APPLY** a continuous INSERT signal until one of the following occurs:
   - A response is observed on the Nuclear Instruments [ ]

     OR

   - The rod is **CONFIRMED** fully inserted [ ]

7.3.2 **SUBSEQUENT OPERATOR ACTIONS**

1. NOTE

   If the programmed position for the affected rod is **not** position "48", then Reactor Engineering guidance will be required to move the rod to Position "48" for a coupling check.

   NOTIFY Reactor Engineering prior to proceeding to next step. [ ]

2. NOTE

   If a response is **not** indicated on the Nuclear Instruments, the control rod blade may be uncoupled and stuck.

   MONITOR nuclear instrumentation response while withdrawing the affected control rod to position "48". [ ]

3. **APPLY** a continuous WITHDRAW signal at position "48" and **VERIFY** the following:

   - ROD OVERTRAVEL (H-5-a) is **<u>not</u>** alarming [ ]
   - Control rod position display indicates position "48" [ ]

7.3.3 <u>IF</u> the control rod is re-coupled,

<u>THEN</u> **COORDINATE** with Reactor Engineering and **RETURN** the rod to its programmed position. [ ]

7.3.4 <u>IF</u> the affected control rod **<u>cannot</u>** be re-coupled,

<u>THEN</u> **INSERT** the rod to position "00" and ISOLATE the affected HCU in accordance with Procedure 302.1, Control Rod Drive Hydraulic System. [ ]

7.3.5 <u>IF</u> the affected rod **<u>cannot</u>** be moved with control rod drive pressure or **<u>cannot</u>** be re-coupled,

<u>THEN</u> **INFORM** US to consult Technical Specifications, Section 3.2. [ ]

7.3.6 **REFER** to Procedure 235, Determination and Correction of control Rod Drive System Problems. [ ]

ATTACHMENT 617.4.002-2

Stabilizing Valve Checks — Initial

1.0 IF Stabilizing Valves NC19E (V-15-125) and NC19F (V-15-126) are in service,

THEN **PERFORM** the following to measure their flows and place NC19A (V-15-123) and NC19B (V-15-124) into service:

1.1 **VERIFY** Stabilizing Valve Isolation valve V-15-34 open. BB /

1.2 **VERIFY** Stabilizing Valve Isolation valve V-15-39 open. BB /

1.3 **CLOSE** Stabilizing Valve NC19F (V-15-126) by removing its amphenol connector. BB /

1.4 **RECORD** flow on FI-RD44, STABILIZING FLOW INDICATOR.

NC19E: 4.1 gpm BB /

1.5 IF flow on FI-RD44, STABILIZING FLOW INDICATOR is **not** 4 gpm, (3.2 - 4.8 gpm)

THEN **ADJUST** the metering valve on Stabilizing Valve NC19E to obtain this flow. N/A /

1.6 **RECONNECT** amphenol to NC19F. (V-15-126) BB /

1.7 **CLOSE** Stabilizing Valve NC19E (V-15-125) by removing its amphenol connector. BB /

1.8 **RECORD** flow on FI-RD44

NC19F: 2.2 gpm BB /

1.9 IF flow is **not** 2 gpm, (1.6 - 2.4 gpm)

THEN **ADJUST** the metering valve on Stabilizing Valve NC19F to obtain this flow. N/A /

1.10 **RECONNECT** amphenol to NC19E. (V-15-125) BB /

ATTACHMENT 617.4.002-2

Stabilizing Valve Checks
(Continued)

Step	Action	Initial
1.11	**VERIFY** flow is approximately 6 gpm as shown on FI-RD44. FI-RD44 flow 6 gpm	BB /
1.12	**ESTABLISH** communications between the Control Room and the CRD valve area.	BB /
1.13	**OPEN** Stabilizing Inlet Valve NC19A and NC19B Isolation Valve, V-15-35.	BB /
1.14	**OPEN** Stabilizing Outlet Valve NC19A and NC19B Isolation Valve, V-15-37.	BB /
1.15	**PLACE** the Stabilizer Valves Selector Switch to A - B on panel 4F.	BB /
1.16	**NOTE** that the selected valve white indicator lamp illuminates.	BB /
1.17	**CLOSE** Stabilizing Inlet Valve NC19E and NC19F Isolation Valve, V-15-34.	BB /
1.18	**CLOSE** Stabilizing Outlet Valve NC19E and NC19F Isolation Valve, V-15-39.	BB /
1.19	**CLOSE** Stabilizing Valve NC19B (V-15-124) by removing its amphenol connector.	BB /
1.20	**RECORD** flow on FI-RD44, STABILIZING FLOW INDICATOR. NC19A: 4.2 gpm	BB /
1.21	IF flow is **not** 4 gpm, (3.2 - 4.8 gpm) THEN **ADJUST** the metering valve on stabilizing valve NC19A to obtain this flow.	N/A /
1.22	**RECONNECT** amphenol to NC19B. (V-15-124)	BB /
1.23	**CLOSE** Stabilizing Valve NC19A (V-15-123) by removing its amphenol connector.	BB /

ATTACHMENT 617.4.002-2

Stabilizing Valve Checks (Continued) — Initial

1.24 **RECORD** flow on FI-RD44.

NC19B: 2.1 gpm — BB /

1.25 IF flow is **not** 2 gpm, (1.6 - 2.4 gpm)

THEN **ADJUST** the metering valve on Stabilizing Valve NC19B to obtain this flow. — N/A /

1.26 **RECONNECT** amphenol to NC19A. (V-15-123) — BB /

1.27 **VERIFY** flow is approximately 6 gpm as shown on FI-RD44.

FI-RD44 flow 6 gpm — BB /

1.28 **TRANSFER** NC 19 A, B, E and F flow data recorded above onto Data Sheet, Attachment 617.4.002-3. — BB /

ATTACHMENT 617.4.002-3
Control Rod Exercise Data Sheet Date: ____Today_____

6.2 Stabilizing Valve flows:

NC19A: 4.2 gpm NC19B: 2.1 gpm

NC19E: 4.1 gpm NC19F: 2.2 gpm

Stabilizing Valves Initially in service:

A/B E/F (Circle One)

6.4 CRD Exercise

CRD	INITIAL POSITION	INSERT	WITH DRAW	OPER	CV	COUPLING CHECK	FINAL POSITION
02-35							
02-31							
02-27							
02-23							
02-19							
06-43							
06-39							
06-35							
06-31							
06-27							
06-23							
06-19							
06-15							
06-11							
10-47							
10-43							
10-39							
10-35							
10-31							

CONT Indicates continuous insert (or withdraw) signal required to move control rod.
DN Indicates control rod double notched out or in.
CV Independent Verification

Performance Information

Facility: Oyster Creek Task No.: 2760101005

Task Title: Sequential Loss of Service Water (Alternate Path)

Job Performance Measure No.: NRC Control Room JPM 2

K/A Reference: 400000 K1.01 (3.2/3.3)

Examinee: ________ Examiner: ________

Facility Evaluator: ________ Date: ________

Method of Testing:

Simulated Performance ________ Actual Performance X

Classroom ________ Simulator X Plant ________

Read to the Examinee:

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

Initial Conditions:

- The plant is at rated power

Task Standard: Perform actions for a total loss of Service Water flow per ABN-18

Required Materials: None

General References:

1. ABN-18 Service Water Failure Response Rev 7

Initiating Cue: You are the Reactor Operator; respond to plant annunciators and take any actions, if required

Time Critical Task: NO

Validation Time: 10 Minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provide repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

BOOTH OPERATOR:
When directed by the evaluator, insert the following malfunction to trip an operating Service Water Pump
INSERT: MAL-SWS001A

Performance Step: 2

Responds to a trip of the operating Service Water Pump

Standard: Acknowledges annunciator K-1-f SVC WATER PUMP TRIP

Comment:

SAT/UNSAT

Performance Step: 3

Obtains copy of ABN-18

Standard: Obtains copy of ABN-18 and implements procedure

Comment:

Performance Information

SAT/UNSAT

Performance Step: 4

Procedure Step: 3.2
IF Loss of one pump with initially two in service, Then **Go to** Step 4.6.

Standard: Determines that one service water pump has tripped and proceeds to Step 4.6

Comment:

SAT/UNSAT

✓ Performance Step: 5

Procedure Step: 4.6 – 4.6.1
IF Service Water loss has reduced RBCCW or TBCCW cooling Capacity, THEN **PERFORM** the following steps concurrently:

- 4.6.1 **LOWER** Reactor Water Cleanup Flow as directed by U.S.

Standard: Lowers cleanup flow as directed

Cue: Inform applicant RBCCW cooling has been reduced and as US direct: lower RWCU flow to 350 gpm.

Comment:

SAT/UNSAT

BOOTH OPERATOR:
After RWCU flow has been reduced, insert the following malfunction to trip the second operating Service Water Pump:

1. **INSERT: MAL-SWS001B**

Performance Information

Alternate Path

Performance Step: 6

Procedure Step: 4.6.2
EXECUTE ABN-19, RBCCW Failure Response concurrently with this procedure

Standard: Attempts to implement ABN-19, RBCCW Failure Response

NOTE: This step may not be reached depending on when the second Service Water Pump is tripped.

Cue: Another operator will perform ABN-19

Comment:

SAT/UNSAT

Performance Step: 7

Recognize trip of second Service Water Pump

Standard: Recognizes trip of second Service Water Pump. Re-enters ABN-18 and responds per section 4.4 for a complete loss of service water

Comment:

SAT/UNSAT

✓ Performance Step: 8

Procedure Step: 4.4 – 4.4.1
If a complete loss of service water has occurred, **perform** a rapid power reduction as directed by the US

Standard: Performs rapid power reduction by lowering master recirc flow

Cue: If requested, direct lowering power with recirc flow.

Comment:

SAT/UNSAT

Performance Information

✓ **Performance Step: 9**

Procedure Step: 4.4.2
SCRAM the reactor and **ENTER** ABN-1 Reactor Scram concurrently with this procedure

Standard: Scrams the reactor by pushing the manual scram pushbuttons and taking the mode switch to shutdown.

Cue: After the reactor is scrammed, inform the applicant another operator will perform the remaining actions of ABN-1

Comment:

SAT/UNSAT

Performance Step: 10

Procedure Step: 4.4.3
ENTER ABN-19, RBCCW Failure Response concurrently with this procedure

Standard: Attempts to implement ABN-19, RBCCW Failure Response

Cue: Another operator will perform ABN-19

Comment:

SAT/UNSAT

Performance Step: 11

Procedure Step: 4.4.4
CONFIRM the main turbine is tripped if TBCCW is on Service Water

Standard: Observes the main turbine is tripped

CUE: If asked report TBCCW is on Service Water

Comment:

SAT/UNSAT

Performance Information

Performance Step: 12

Procedure Step: 4.4.6

ISOLATE the Service Water system as directed by the US

Standard: Attempts to isolate the SW system

CUE: Another operator will isolate the Service Water system

Comment:

SAT/UNSAT

✓ Performance Step: 13

Procedure Step: 4.4.7

START one ESW pump in each system in order to keep system piping full of water.

Standard: Starts an ESW pump in system I and II.

CUE: Your task is complete.

Comment:

SAT/UNSAT

Terminating Cue: ESW pumps are running

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC Sim JPM 2

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ________________ ________________

JPM Setup

SIMULATOR SETUP INSTRUCTIONS

1. Reset to a full power IC (115 or other), but this JPM can be run at any power level.

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

2. Ensure TBCCW is on Service Water
3. 1-1 and 1-2 service water pumps running

STUDENT HANDOUT

Initial Conditions:

- The plant is at rated power

Task Cue: You are the Reactor Operator; respond to plant annunciators and take any actions, if required

1.0 APPLICABILITY

This procedure is applicable following a total or partial loss of Service Water System flow or cooling capability.

Event	Section
Loss of 1 of 2 available Service water pumps	3.1
Recovery of pumps with LOOP LOCA	4.1
Major Service water leak	4.3
Complete Loss of Service Water	4.4
Reduced Cooling due to intake blockage	4.5
Service Water has reduced RBCCW or TBCCW cooling capacity	4.6

2.0 INDICATIONS

2.1 Annunciators

Engraving	Location	Setpoint
SVC WATER PUMP TRIP	K-1-f	Breaker trip
INTAKE SCRN Dp HI	K-5-e	5 in. H_2O

2.2 Plant parameters

Parameter	Location	Change
Service Water Header Press	5F/6F	Lowering to less than 41 psig.
RBCCW System Temperatures	See Attachment 1	Rising
TBCCW System Temperatures	See Attachment 2	Rising

2.3 Other indications

1. SERVICE WATER PUMP ON light extinguished.
2. Visual indication of pipe break.
3. Flow indicator FI-531-1033 (Service water flow to RBCCW HX's in Reactor Building) indicates low or **no** flow.

3.0 IMMEDIATE OPERATOR ACTIONS

3.1 IF **no** Service Water pump is running,

Then **START** any available Service Water Pump. [ ]

3.2 IF Loss of one pump with initially two in service,

Then **Go to** Step 4.6. [ ]

4.0 SUBSEQUENT OPERATOR ACTIONS

4.1 IF plant conditions are Loss of Off Site Power concurrent with a Loss of Coolant Accident, (LOOP LOCA)

AND plant electrical loading conditions permit,

THEN **BYPASS** the trip logic on the respective switchgear, USS 1A3 (1B3) if required for starting on a diesel generator. [ ]

4.1.1 **START** any available Service Water Pump. [ ]

4.2 IF a Service Water pump was started in Section 3.0 or 4.1,

THEN **DISPATCH** an Operator to perform running checks on the Service Water pump. [ ]

4.3 IF a major Service Water System pipe break has occurred,

THEN **PERFORM** the following:

1. **ATTEMPT** to identify and isolate the break. [ ]

2. IF the break affects only one Service Water Pump, (upstream of the pump discharge valve)

   THEN **CONFIRM** the unaffected Service Water Pump is running. [ ]

3. IF the break **cannot** be isolated with the system in operation,

   THEN **ENTER** ABN-19, RBCCW Failure Response concurrently with this procedure, [ ]

4. **SWAP** RBCCW HX cooling from Service Water to ESW System I IAW Section 13 of Procedure 322 Service Water System at the direction of the US if all prerequisites are met. [ ]

4.4 IF a complete loss of service water has occurred or is imminent,

THEN **PERFORM** the following:

4.4.1 **PERFORM** a Rapid power Reduction as directed by the US. [ ]

4.4.2 **SCRAM** the Reactor and **ENTER** ABN-1 Reactor Scram concurrently with this procedure. [ ]

4.4.3 **ENTER** ABN-19, RBCCW Failure Response concurrently with this procedure. [ ]

4.4.4 IF TBCCW is being cooled by Service Water,

THEN **CONFIRM** Main Turbine is tripped. [ ]

4.4.5 **STOP** all operating Service Water pumps. [ ]

4.4.6 **ISOLATE** the Service Water System as directed by the Unit Supervisor. [ ]

4.4.7 **START** one ESW pump in each system in order to keep system piping full of water.

- System I [ ]
- System II [ ]

4.4.8 IF The plant configuration will allow, based on piping or equipment lost,

THEN **SWAP** RBCCW HX cooling from Service Water to ESW System I IAW Section 13 of Procedure 322 Service Water System at the direction of the US if all prerequisites are met [ ]

4.5 IF Service Water loss is due to blocked Trash Racks or Intake Screens,

THEN **EXECUTE** ABN-32, Abnormal Intake Level concurrently with this procedure and continue at Step 4.6. [ ]

4.6 IF Service Water loss has reduced RBCCW or TBCCW cooling capacity. [ ]

THEN **PERFORM** the following steps concurrently:

4.6.1 **LOWER** Reactor Water Cleanup Flow as directed by U.S. [ ]

4.6.2 **EXECUTE** ABN-19, RBCCW Failure Response concurrently with this procedure. [ ]

4.6.3 IF Two Service water pumps were in operation,

THEN **Dispatch** an operator / electrician to investigate cause of trip and recover pump if conditions permit. [ ]

4.6.4 IF TBCCW is being cooled by Service Water,

THEN **PERFORM** the following concurrently:

1. IF time permits:

   THEN **PLACE** TBCCW on Circ Water in accordance with Procedure 322, Service Water System. [ ]

2. **EXECUTE** ABN-20, TBCCW Failure Response concurrently with this procedure. [ ]

4.6.5 **COMMENCE** Plant shutdown in accordance with Procedure 203, Plant Shutdown, when directed by U.S. [ ]

4.6.6 IF limits on Attachment ABN-18-1 **cannot** be maintained for any of the following parameters:

- Drywell pressure
- Drywell bulk temperature
- Reactor Recirculation Pump Seal temperatures
- Reactor Recirculation Pump Motor temperatures

AND response to alarm actions cannot be implemented effectively,

THEN **SCRAM** the Reactor IAW ABN-1, Reactor Scram. [ ]

4.7 **MONITOR** all equipment in accordance with Attachment ABN-18-1, RBCCW Loads. [ ]

4.8 **MONITOR** all equipment in accordance with Attachment ABN-18-2, TBCCW Loads. [ ]

4.9 **SHUT DOWN** the Chlorination System in accordance with Procedure 326, Chlorination System when directed by U.S. [ ]

Performance Information

Facility: Oyster Creek   Task No.: 2040101412

Task Title: Place the Second RWCU Pump In Service

Job Performance Measure No.: NRC Control Room JPM 3 (RO ONLY)

K/A Reference: 204000 A4.01 (3.1/3.0)

Examinee: ____________________   Examiner: ____________________

Facility Evaluator: ____________________   Date: ____________________

Method of Testing:

Simulated Performance ________   Actual Performance X

Classroom ________   Simulator X   Plant ________

Read to the Examinee:

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

Initial Conditions:

- The plant is at rated power, with elevated reactor water conductivity.
- All prerequisites for starting the standby RWCU Pump have been verified.
- An Equipment Operator is locally stationed and is standing by.
- The plant announcement for the pump start has been made.
- RBCCW and Service Water Systems have been aligned for two RWCU pump operation; RBCCW and Service Water temperatures have been adjusted to low in their normal bands.

Task Standard:

Flow is established through the second RWCU Pump

Required Materials: None

General References:

1. 303, Reactor Cleanup Demineralizer System rev 147

Initiating Cue:

- Place the standby RWCU Pump in service IAW procedure 303, Reactor Cleanup Demineralizer System, starting at step 22.3.6.
- Adjust flow to 650 gpm when both RWCU pumps are in service

Time Critical Task: NO

Performance Information

Validation Time: 15 Minutes

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Obtain a copy of the reference procedure and reviews/utilizes the correct section

Standard: Current revision of 303 is obtained

Comment:

SAT/UNSAT

✓ ### Performance Step: 3

Procedure Step: 22.3.6

START the second pump being placed in service

Standard: Starts RWCU Pump B by placing the RECIRC PUMP ND02B switch CW to START. (red light ON, green light OFF)

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 4

Procedure Step: 22.3.7

Slowly **OPEN** the second pump discharge valve by momentarily cycling its discharge valve control switch between OPEN and mid position until a small increase in pump discharge pressure is noted.

- V-16-49, RECIRC PUMP A DISCHARGE

  OR

- V-16-50, RECIRC PUMP B DISCHARGE

Standard: Slowly opens the RWCU Pump B discharge valve by momentarily cycling the RECIRC PUMP B DISCHARGE V-16-50 control switch between OPEN and mid position until a small increase in RECIRC PUMP DISCHARGE PRESS is noted. (Red light ON, green light ON; small increase in RECIRC PUMP DISCHARGE PRESS)

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 5

Procedure Step: 22.3.8

PERFORM either or both of the following to reduce pump discharge pressure to approximately the original valve.

- Slowly **OPEN** FCV-ND16
- Slowly **OPEN** V-16-54, FCV Bypass

Standard: Slowly opens SYSTEM FLOW CONTROLLER FCV-ND16 by rotating the manual knob CW to reduce RECIRC PUMP DISCHARGE PRESS to approximately the original valve. (SYSTEM FLOW CONTROLLER FCV-ND16 indicates further open; RECIRC PUMP DISCHARGE PRESS lowers)

Comment:

SAT/UNSAT

Performance Step: 6

Procedure Step: 22.3.9

ADJUST PCV-ND11 as needed to maintain system pressure at approximately 90 psig

Standard: Verifies system pressure is approximately 90 psig.

Comment:

SAT/UNSAT

Performance Information

Performance Step: 7

Procedure Step: 22.3.10

MONITOR demineralizer and filter (if in service) dP at RK05.

Standard: Directs an EO to monitor demineralizer and filter dP at RK05.

CUE: Repeat back the request to monitor demineralizer and filter dP at RK05.
(Note:No dP limits will be exceeded during this JPM.)

Comment:

SAT/UNSAT

Performance Step: 8

Procedure Step: 22.3.11

IF any of the following dP alarm setpoints are approached:

- Demineralizer strainer dP (IJ22B) - 10 psid
- Demineralizer dP (IJ22A) - 15 psid
- Filter dP (IJ18) - 30 psid

THEN **STOP** the flow increase.

Standard: Directs the EO to monitor/report any of the following:

- Demineralizer strainer dP (IJ22B) - 10 psid
- Demineralizer dP (IJ22A) - 15 psid
- Filter dP (IJ18) - 30 psid

CUE: Repeat back the request to monitor demineralizer and filter dP at RK05.
(Note:No dP limits will be exceeded during this JPM.)

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 9

Procedure Step: 22.3.12

WHEN system flow exceeds 500 gpm, THEN **CLOSE** the Minimum Flow Valves with the local toggle switches:

- V-16-37, Minimum Flow Valve Pump "B"
- V-16-36, Minimum Flow Valve Pump "A"

Standard: WHEN system flow exceeds 500 gpm, THEN directs the EO to close the Minimum Flow Valves with the local toggle switches:

- V-16-37, Minimum Flow Valve Pump "B"
- V-16-36, Minimum Flow Valve Pump "A"

BOOTH Close both RWCU minimum flow valves by inserting the following remotes:

a) LOA-RCU022 to 0 (RWCU Pump A V-16-36)

b) LOA-RCU023 to 0 (RWCU Pump B V-16-37)

CUE: When RWCU min flow valves are closed, report: V-16-36 and V-16-37 are closed

Comment:

SAT/UNSAT

✓ Performance Step: 10

Procedure Step: 22.3.13

Continue to open the discharge valve by momentarily cycling the respective discharge valve control switch between OPEN and mid position while adjusting pressure and flow, until the valve is fully open

Standard: Continues to open the discharge valve by momentarily cycling the RECIRC PUMP B DISCHARGE V-16-5 control switch between OPEN and mid position while adjusting pressure and flow, until the valve is fully open. Slowly opens SYSTEM FLOW CONTROLLER FCV-ND16 by rotating the manual knob CW to reduce RECIRC PUMP DISCHARGE PRESS. (Red light ON, green light OFF)

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 11

Procedure Step: 22.3.14
PERFORM either or both of the following to continue to raise flow:

- Throttle **OPEN** FCV-ND16
- Throttle **OPEN** V-16-54, FCV Bypass.

Standard: Throttles either valve but does not exceed 760 gpm

CUE: Another operator is updating main condenser performance monitoring, Confirming Noble metals monitoring system flow, and adjusting PPC heat balance input for RWCU flow

Comment:

SAT/UNSAT

Performance Step: 12

Procedure Step: 22.3.18
CONFIRM that the RWCU System differential temperature is ≤ 80°F.

- RWCU Inlet Temp _____deg. F
  (TE-IJ31A or Average Recirc Temp. minus 5°F)
- RWCU Outlet Temp _____deg. F (TE-IJ31C)
- RWCU Differential Temp _____deg. F

  [(Step 22.3.18.1) – (Step 22.3.18.2)]

Standard: Obtains values and determines RWCU System differential temperature is ≤ 80°F.

Comment:

SAT/UNSAT

Terminating Cue:

Second RWCU pump in service with flow < 760 gpm and differential temperature < 80°F

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC Sim JPM 3 (RO ONLY)

Examinee's Name: ____________________

Examiner's Name: ____________________

Date Performed: ____________________

Facility Evaluator: ____________________

Number of Attempts: ____________________

Time to Complete: ____________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ____________________ ____________________

JPM Setup

SIMULATOR SETUP INSTRUCTIONS

1. Reset to a full power IC (115 or other), but this JPM can be run at any power level.

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

2. Verify RWCU Pump A is in service, with an RWCU filter in-service and system flow between 380 – 420 GPM.
3. Open both RWCU minimum flow valves by inserting the following remotes:
   c) LOA-RCU022 to 1 (RWCU Pump A V-16-36)
   d) LOA-RCU023 to 1 (RWCU Pump B V-16-37)
4. Place the heat balance screen up on the PPC screen
5. Input RWCU flow to 760 gpm
6. Verify both RBCCW Pumps running
7. Verify both Service Water Pumps running
8. Insert LOA-RBC009 to 0.6 (this opens V-5-122 to 60%; RBCCW outlet of the NRHX outlet)
9. Insert BKR-RCU001 to FAIL AUT TRIP
10. Insert BKR-RCU002 to FAIL AUT TRIP
    a. This will prevent any automatic trips of the RWCU Pumps
11. Place placards for two RWCU pump operation at 3F and on the Letdown Flow Controller

STUDENT HANDOUT

Initial Conditions:

- The plant is at rated power, with elevated reactor water conductivity.
- All prerequisites for starting the standby RWCU Pump have been verified.
- An Equipment Operator is locally stationed and is standing by.
- The plant announcement for the pump start has been made.
- RBCCW and Service Water Systems have been aligned for two RWCU pump operation; RBCCW and Service Water temperatures have been adjusted to low in their normal bands.

Task Cue:

- Place the standby RWCU Pump in service IAW procedure 303, Reactor Cleanup Demineralizer System, starting at step 22.3.6
- Adjust flow to 650 gpm when both RWCU pumps are in service

22.0 SYSTEM OPERATION WITH TWO CLEANUP RECIRCULATION PUMPS RUNNING

22.1 Prerequisites

22.1.1 The Cleanup System is in operation with one recirculation pump running and flow at approximately 380 to 420 gpm. **[BB]**

22.1.2 A cleanup filter shall be in service. **[BB]**

22.1.3 Communication has been established between the Control Room and instrument rack RK05, when initially establishing high system flow. **[BB]**

22.2 Precautions and Limitations

22.2.1 The Plant Process Computer heat balance calculation shall be adjusted to include the higher RWCU system flow associated with operation of the second cleanup recirculation pump.

22.2.2 Maximum cleanup flowrate shall be limited as follows:

22.2.2.1 Maximum system flow is 760 gpm, the design flowrate of the filters and demineralizer.

22.2.2.2 Demineralizer and filter dP alarm setpoints are **not** exceeded, as read at instrument rack RK05.

22.2.3 Cleanup Surge Tank level shall be maintained within its normal operating range (1.5 ft - 2.0 ft as read on LI-IJ77 at RK05) in accordance with Section 27.0 of this procedure.

22.2.4 A slight power reduction may be necessary when placing a second Cleanup Recirculation Pump in operation and increasing system flow, at or near full power.

22.2.5 Adjustments to the RBCCW System should be made in accordance with Procedure 309.2.

22.2.6 The number of clean-up pumps in operation is important when determining the efficiency of the plant. If ignored, a misleading 0.3% efficiency drop (2 Mwe) will be incurred with the second pump in operation. Main condenser performance is evaluated using the "MEGABW.XLS", and shall be updated to reflect the number of operating clean-up pumps IAW Procedure 323.1.

22.2.7 Evolutions performed in this section will cause changes in Noble Metals Monitoring System (NMMS) flow. NMMS flow shall be maintained in accordance with Procedure 303.1.

22.2.8 If V-16-54, FCV Bypass, is opened to allow flow beyond the capability of FCV-ND16, then an EST tag shall be placed on Panel 3F reflecting this configuration.

22.3 Procedure for Two Pump Operation

22.3.1

NOTE
A slight power reduction may be necessary when placing a second Cleanup Recirculation Pump in operation, and increasing system flow, at or near full power. PPC indicated Core Thermal Power will increase based on the higher RWCU system flow associated with 2 pump operation.

ADJUST the Plant Process Computer heat balance calculation input for RWCU Flow to 760 GPM to bound the operation of the second Cleanup Recirculation Pump. [BB]]

22.3.2 **PLACE** placards at the following locations:

- Panel 3F reflecting the heat balance adjustment [BB]]
- On Letdown Flow Controller warning Operators **not** to exceed 760 gpm in the Cleanup System [BB]

22.3.3 **CONFIRM** closed the pump discharge valve for the pump to be started:

- V-16-49, RECIRC PUMP A DISCHARGE [BB]

OR

- V-16-50, RECIRC PUMP B DISCHARGE [BB]

22.3.4 **CONFIRM** no trip flags are present at selected Cleanup Pump 4160V breaker cubicle. [BB]

22.3.5

> **CAUTION**
>
> Non-Regenerative heat exchanger temperature should be maintained less than or equal to 120°F. Cation resin decomposition occurs as temperature rises. The decomposition of the resin in the CU Demin causes sulfates to release which causes Reactor Water Sulfate concentration to rise.

OPEN the Minimum Flow Valves for both pumps using the local toggle switches:

- V-16-36, Minimum Flow Valve Pump "A" [BB]
- V-16-37, Minimum Flow Valve Pump "B" [BB]

22.3.6 **START** the second pump being placed in service. [ ]

22.3.7

CAUTION

High System flow may cause a demineralizer and/or filter high ΔP condition. Allow time for pressure and flow to stabilize after each performance of the following steps.

Slowly **OPEN** the second pump discharge valve by momentarily cycling its discharge valve control switch between OPEN and mid position until a small increase in pump discharge pressure is noted.
(Panel 3F)

- V-16-49, RECIRC PUMP A DISCHARGE [ ]

  OR

- V-16-50, RECIRC PUMP B DISCHARGE [ ]

22.3.8 **PERFORM** either or both of the following to reduce pump discharge pressure to approximately the original valve. [ ]

22.3.8.1 Slowly **OPEN** FCV-ND16. [ ]

22.3.8.2 Slowly **OPEN** V-16-54, FCV Bypass. [ ]

22.3.9 **ADJUST** PCV-ND11 as needed to maintain system pressure at approximately 90 psig. [ ]

22.3.10 **MONITOR** demineralizer and filter (if in service) DP at RK05. [ ]

22.3.11 IF any of the following DP alarm setpoints are approached:

- Demineralizer strainer dP (IJ22B) - 10 psid
- Demineralizer dP (IJ22A) - 15 psid
- Filter dP (IJ18) - 30 psid

THEN **STOP** the flow increase. [ ]

22.3.12 WHEN system flow exceeds 500 gpm,

THEN **CLOSE** the Minimum Flow Valves with the local toggle switches:

- V-16-37, Minimum Flow Valve Pump "B" [ ]
- V-16-36, Minimum Flow Valve Pump "A" [ ]

22.3.13 **CONTINUE** to open the discharge valve by momentarily cycling the respective discharge valve control switch between OPEN and mid position while adjusting pressure and flow, until the valve is fully open. [ ]

22.3.14

NOTE
The maximum system flow is 760 gpm, the design flowrate of the filters and demineralizer.

PERFORM either or both of the following to continue to raise flow:

22.3.14.1 Throttle **OPEN** FCV-ND16. [ ]

22.3.14.2 Throttle **OPEN** V-16-54, FCV Bypass. [ ]

22.3.15 **UPDATE** the Main Condenser Performance Monitoring using the "MEGABW.XLS" IAW Procedure 323.1. [ ]

22.3.16 **CONFIRM** Noble Metals Monitoring System (NMMS) flow is in the required range per Procedure 303.1. [ ]

22.3.17 **ADJUST** the PPC heat balance input for RWCU Flow to the value indicated on the 3F Recorder. (IJ13) [ ]

22.3.18 **CONFIRM** that the RWCU System differential temperature is ≤ 80°F.

22.3.18.1 RWCU Inlet Temp _____deg. F (TE-IJ31A or Average Recirc Temp. minus 5°F) [ ]

22.3.18.2 RWCU Outlet Temp _____deg. F (TE-IJ31C) [ ]

22.3.18.3 RWCU Differential Temp _____deg. F [(Step 22.3.18.1) – (Step 22.3.18.2)] [ ]

22.3.19 IF a flow decrease is intended from steady state two RWCU pump operation,

THEN **PERFORM** either or both of the following to achieve intended RWCU flow while adjusting PCV-ND11 as needed to maintain system pressure at approximately 90 psig.

22.3.19.1 Throttle **CLOSE** FCV-ND16. [ ]

22.3.19.2 Throttle **CLOSE** V-16-54, FCV Bypass. [ ]

22.3.20 IF system flow decreases to 500 gpm,

THEN **OPEN** both Minimum Flow Valves with the local toggle switches:

- V-16-37, Minimum Flow Valve Pump "B" [ ]
- V-16-36, Minimum Flow Valve Pump "A" [ ]

22.3.21 **ADJUST** PCV-ND11 to maintain system pressure at approximately 90 psig. [ ]

22.3.22 WHEN intended flow rate has been established,

THEN **PERFORM** the following:

22.3.22.1 **CONFIRM** Noble Metals Monitoring System (NMMS) flow is in the required range per Procedure 303.1. [ ]

22.3.22.2 **ADJUST** the PPC heat balance input for RWCU Flow to the value indicated on the 3F Recorder. (IJ13) [ ]

22.3.23

NOTE

The maximum system flow is 760 gpm, the design flowrate of the filters and demineralizer.

CAUTION

Non-Regenerative heat exchanger temperature should be maintained less than or equal to 120°F. Cation resin decomposition occurs as temperature rises. The decomposition of the resin in the CU Demin causes sulfates to release which causes Reactor Water Sulfate concentration to rise.

High System flow may cause a demineralizer and/or filter high ΔP condition. Allow time for pressure and flow to stabilize after each performance of the following steps.

IF a flow increase is intended from steady state two RWCU pump operation,

THEN **ADJUST** the Plant Process Computer heat balance calculation input for RWCU Flow to 760 GPM, [ ]

AND **PERFORM** either or both of the following to achieve intended RWCU flow while adjusting PCV-ND11 as need to maintain system pressure at approximately 90 psig:

22.3.23.1 Throttle **OPEN** FCV-ND16. [ ]

22.3.23.2 Throttle **OPEN** V-16-54, FCV Bypass. [ ]

22.3.24 IF Initial flow was ≤ 500 gpm,

WHEN system flow exceeds 500 gpm,

THEN **CLOSE** both Minimum Flow Valves with the local toggle switches:

- V-16-37, Minimum Flow Valve Pump "B" [ ]
- V-16-36, Minimum Flow Valve Pump "A" [ ]

22.3.25 **ADJUST** PCV-ND11 as needed to maintain system pressure at approximately 90 psig. [ ]

22.3.26 **MONITOR** demineralizer and filter (if in service) DP at RK05. [ ]

22.3.27 IF any of the following DP alarm setpoints are approached:

- Demineralizer strainer DP (IJ22B) - 10 psid
- Demineralizer DP (IJ22A) - 15 psid
- Filter DP (IJ18) - 30 psid

THEN **STOP** the flow increase. [ ]

22.3.28 WHEN intended flow rate has been established,

THEN **PERFORM** the following:

22.3.28.1 **CONFIRM** Noble Metals Monitoring System (NMMS) flow is in the required range per Procedure 303.1. [ ]

22.3.28.2 **ADJUST** the PPC heat balance input for RWCU Flow to the value indicated on the 3F Recorder. (IJ13) [ ]

22.3.28.3 **CONFIRM** that the RWCU System differential temperature is ≤ 80°F.

1. RWCU Inlet Temp _____deg. F
(TE-IJ31A or Average Recirc Temp. minus 5°F) [ ]

2. RWCU Outlet Temp _____deg. F
(TE-IJ31C) [ ]

3. RWCU Differential Temp _____deg. F
[(Step 1) – (Step 2)] [ ]

22.4 Procedure for Returning to One Pump Operation

22.4.1 **OPEN** the Minimum Flow Valves for both pumps using the local toggle switches:

- V-16-36, Minimum Flow Valve Pump "A" [ ]
- V-16-37, Minimum Flow Valve Pump "B" [ ]

22.4.2

> NOTE
>
> System pressure and flow should be monitored while making the following adjustments, allowing time for these system parameters to stabilize after each performance of the following steps.

Slowly **CLOSE** the discharge valve for the pump being removed from service by momentarily cycling the discharge valve control switch between CLOSE and mid position until a small decrease in pressure is seen: (Panel 3F)

- V-16-49, RECIRC PUMP A DISCHARGE [ ]
- V-16-50, RECIRC PUMP B DISCHARGE [ ]

Performance Information

Facility: Oyster Creek | Task No.: 2390201009

Task Title: Partial MSIV Stroke Test (Alternate Path)

Job Performance Measure No.: NRC Control Room JPM 4

K/A Reference: 239001 A4.01 (4.2/4.0)

Examinee: ____________ Examiner: ____________

Facility Evaluator: ____________ Date: ____________

Method of Testing:

Simulated Performance ________ Actual Performance ___X___

Classroom ________ Simulator ___X___ Plant ________

Read to the Examinee:

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

Initial Conditions:

- The plant is operating at 100% power.
- You are directed to perform Main Steam Isolation Valve 10% Closure Test 602.4.004 for V-1-0008 / NS03B and V-1-10 / NS04B.
- All steps of Section 3.0 PREREQUISITES are met and the Unit Supervisor has granted permission to perform the surveillance Test.

Task Standard: Reactor is scrammed and the mode switch is shutdown.

Required Materials: Digital Stopwatch

General References:

1. 602.4.004 Main Steam Isolation Valve 10% Closure Test Rev 25

Initiating Cue: Perform Main Steam Isolation Valve 10% Closure Test 602.4.004 Sections 6.1 through 6.4

Time Critical Task: NO

Validation Time: 10 Minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ___________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Obtain a copy of the reference procedure and reviews/utilizes the correct section

Standard: Current revision of 602.4.004 is obtained

Comment:

SAT/UNSAT

Performance Information

Performance Step: 3

Review Precautions and Limitations and obtains a digital Stop Watch

Standard: Precautions and Limitations reviewed; stop watch obtained

Comment:

SAT/UNSAT

Performance Step: 4

Procedure Step: 6.1

VERIFY Section 3.0 Prerequisites are satisfied.

RECORD Digital Stopwatch Number

Standard: Section 3.0 Prerequisites are satisfied, as given in Initial Conditions.

Records Digital Stopwatch Number

Comment:

SAT/UNSAT

Performance Information

Performance Step: 5

Procedure Step: 6.3.1
CONFIRM nitrogen receiver T-23-001 pressure > 95 psig

Standard: Directs Equipment Operator to report nitrogen pressure locally and determines nitrogen is in band.

CUE: Report as Equipment Operator that PI-23-523 indicates 100 psig

Comment:

SAT/UNSAT

Performance Step: 6

Procedure Step: 6.3.2

Reads Step 6.3.2 IF/Then step concerning increasing steam flow in lines not being tested

Standard: Reads and places keeps step

Comment:

SAT/UNSAT

Performance Information

Performance Step: 7

Procedure Step: 6.3.3

Station personnel as required to observe indications

Standard: Ensures Station personnel at the following:

- Relay 2K17
- Relay 2K18
- PPC point SOE47
- PPC point SOE48

CUE: Personnel are stationed

Comment:

SAT/UNSAT

✓ Performance Step: 8

Procedure Step: 6.3.4

Simultaneously **PERFORM** the following two steps:

- **DEPRESS** and **HOLD** TEST button for ValveV-1-0008 / NS03B. (Panel 11F)
- **START** the stopwatch
- **OBSERVE** the Red Open indicating light Extinguishes for NS03B.

Standard: **DEPRESSES** and **HOLDS** TEST button for ValveV-1-0008 / NS03B. (Panel 11F), **STARTS** the stopwatch and **OBSERVE** the Red Open indicating light Extinguishes for NS03B

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 9

Procedure Step: 6.3.6
WHEN a half scram signal is received, AND both 2K17 and 2K18 have de-energized, simultaneously **PERFORM** the following two steps:

- **RELEASE** the TEST button
- **STOP** the stopwatch

Record stroke time for NS03B.

Standard: Releases Test button and stops the stopwatch. Records Stroke time for NS03B

CUE: (at time of ½ scram): Relays 2K17 and 2K18 are de-energized

Comment:

SAT/UNSAT

Performance Step: 10

Procedure Step: 6.3.7 – 6.3.9
Performs the following:

- **VERIFY** relays 2K17 and 2K18 de-energized and all contacts opened. (Panel 7R)
- **VERIFY** Plant Process Computer, PID: SOE47, tripped; MSIV CLOSURE SCRAM. (2K17)
- **VERIFY** Plant Process Computer, PID: SOE48, tripped; MSIV CLOSURE SCRAM. (2K18)

Standard: Verifies relays are tripped and the appropriate Plant Process computer points are received

CUE: Relays 2K17 and 2K19 are de-energized and all contacts opened (paper models in simulator)

Comment:

SAT/UNSAT

Performance Information

Performance Step: 11

Procedure Step: 6.3.10
VERIFY that the MSIV returns to the fully open position by the Red Open light illuminating

Standard: Verifies MSIV is FULLY OPEN (red light ON; green light OFF)

Comment:

SAT/UNSAT

Performance Step: 12

Procedure Step: 6.3.11 – 6.3.12
VERIFY SCRAM SOLENOIDS lights extinguished. (Panel 7R)
VERIFY SCRAM CONTACTOR OPEN alarm (G-1-c) is received.

Standard: Verifies SCRAM SOLENOIDS lights extinguished. (Panel 7R) and SCRAM CONTACTOR OPEN alarm is received on panel G

Comment:

SAT/UNSAT

Performance Step: 13

Procedure Step: 6.3.13 – 6.3.14
VERIFY MSIV CLOSED II alarm (J-2-a) annunciated
VERIFY MN STM VLVS OFF NORMAL alarm (J-8-b) annunciated.

Standard: Verifies J-2-a and J-8-b annunciators are in alarm

Comment:

SAT/UNSAT

Performance Information

Performance Step: 14

Procedure Step: 6.3.15
VERIFY relays 2K51A and 2K52A are de-energized. (Panel 7R)

Standard: **VERIFIES** relays 2K51A and 2K52A are de-energized. (Panel 7R)

CUE: Relays 2K51A and 2K52A are de-energized (paper models in simulator)

Comment:

SAT/UNSAT

✓ Performance Step: 15

Procedure Step: 6.3.16 – 6.3.20
RESET the half scram
CONFIRM Plant Process Computer PIDs returned to normal state
CONFIRM Alarms returned to normal state
VERIFY all SCRAM SOLENOID lights lit. (4F/7R)
VERIFY SCRAM CONTACTOR OPEN alarm (G-1-c) clear

Standard: Resets the half scram RPS signal by pushing scram reset pushbutton on 4F.

- **CONFIRMS** Plant Process Computer PIDs returned to normal state
- **CONFIRMS** Alarms returned to normal state
- **VERIFIES** all SCRAM SOLENOID lights lit. (4F/7R)
- **VERIFIES** SCRAM CONTACTOR OPEN alarm (G-1-c) is clear

Comment:

SAT/UNSAT

Performance Information

Performance Step: 16

Procedure Step: 6.3.21 – 6.3.26
VERIFY MSIV CLOSED II alarm (J-2-a) clear
VERIFY MN STM VLVS OFF NORMAL alarm (J-8-b) clear.
VERIFY relays 2K17 and 2K18 energized. (Panel 7R)
VERIFY relays 2K51A and 2K52A energized. (Panel 7R)
VERIFY Plant Process Computer PIDs SOE47 and SOE48 are normal.

Standard: Verifies the following:

- MSIV CLOSED II alarm (J-2-a) clear
- MN STM VLVS OFF NORMAL alarm (J-8-b) clear.
- Relays 2K17 and 2K18 are energized. (Panel 7R)
- Relays 2K51A and 2K52A are energized. (Panel 7R)
- Plant Process Computer PIDs SOE47 and SOE48 are normal.

CUE: US has Verified plant parameters required to continue to next are satisfied

Comment:

SAT/UNSAT

Performance Step: 17

Continues on with surveillance testing of Test of V-1-10 / NS04B.

Reads Step 6.4.1

Standard: Place keeping identifies candidate has read step 6.4.1

Comment:

SAT/UNSAT

Performance Information

Performance Step: 18

Procedure Step: 6.4.2

Station personnel as required to observe indications

Standard: Ensures Station personnel at the following:

- Relay 2K17
- Relay 2K18
- PPC point SOE47
- PPC point SOE48

CUE: Personnel are stationed

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 19

Procedure Step: 6.4.3 – 6.4.4

Simultaneously **PERFORM** the following two steps:

- **DEPRESS** and **HOLD** TEST button for ValveV-1-0010 / NS04B. (Panel 11F)
- **START** the stopwatch
- **OBSERVE** the Red Open indicating light Extinguishes for NS04B.

Standard: **DEPRESSES** and **HOLDS** TEST button for ValveV-1-0010 / NS04B. (Panel 11F), **STARTS** the stopwatch and **OBSERVE** the Red Open indicating light Extinguishes for NS04B

BOOTH: INSERT MAL-NSS013D to severity to 0 over 1000 seconds

Comment:

SAT/UNSAT

Alternate Path

✓ Performance Step: 20

6.4.6 when half scram signal received and both 2K17 and 2K18 have de-energized or there is a noticeable increase in reactor pressure or decrease in steam flow,

- **RELEASE** the TEST button
- **STOP** the stopwatch
- **RECORD** stroke time for NS04B

Standard: Releases Test button and stops the stopwatch. Records Stroke time for NS04B and notices Steam line pressure is still rising and the Red open light is not illuminated

CUE: (at time of ½ scram): Relays 2K17 and 2K18 are de-energized

Comment:

SAT/UNSAT

Performance Information

Performance Step: 21

Step 6.4.5

Remove fuse 11F-6F6 and verifies NS04B open

Standard: Removes fuse 11F-6F6 and notices NS04B not fully open and steam pressure still rising

CUE: fuse is removed

(note: not modeled in simulator)

Comment:

SAT/UNSAT

✓ Performance Step: 22

Prior to auto scram operator Scrams reactor, Pushes scram pushbuttons and takes mode switch to shutdown

Standard: Pushes Scram pushbuttons and takes mode switch to shutdown

CUE: (after mode with to shutdown)

report: another operator will perform further actions.

Comment:

SAT/UNSAT

Terminating Cue:
Reactor is scrammed and the mode switch is shutdown.

JPM Stop Time: ___________

Performance Information

Validation of Completion

JPM Number: NRC Control Room JPM 4

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ______________________ ______________________

Performance Information

JPM Setup

1. Rest to a full power IC (115 or other)

Note: It is okay to use a similar IC to the IC listed above, provided the IC actually used is verified to be compatible with this and other JPM's that are scheduled to be run concurrntly

Performance Information

STUDENT HANDOUT

Initial Conditions:

- The plant is operating at 100% power.
- You are directed to perform Main Steam Isolation Valve 10% Closure Test 602.4.004 for V-1-0008 / NS03B and V-1-10 / NS04B.
- All steps of Section 3.0 PREREQUISITES are met and the Unit Supervisor has granted permission to perform the surveillance Test.

Task Cue:

Perform Main Steam Isolation Valve 10% Closure Test 602.4.004 Sections 6.1 through 6.4

Exelon Generation	OYSTER CREEK GENERATING STATION PROCEDURE	Number **602.4.004**	
Title **Main Steam Isolation Valve 10% Closure Test**		Usage Level **1**	Revision No. 26

Prior Revision _25_ incorporated the following Temporary Changes:

N/A

This Revision _26_ incorporates the following Temporary Changes:

N/A

List of Pages

1.0 to 22.0

Exelon Generation	OYSTER CREEK GENERATING STATION PROCEDURE	Number **602.4.004**
Title **Main Steam Isolation Valve 10% Closure Test**		Revision No. 26

PROCEDURE HISTORY

REV.	DATE	ORIGINATOR	SUMMARY OF CHANGE
18	01/10	W. Behrle	Incorporated 524897-04 to verify both MSIV Closure relays de-energize during test performance.
19	11/11	S Serpe	524897-05 Added a precaution and enhanced steps 6.3.2, 6.4.1, 6.5.2, & 6.6.1 to clarify 180 meters FT-ID-33-A / B to be monitored
20	12/11	A. Decker	Incorporated ECR OC 11-00600. Added Precautions and limitations Step 4.0.Added NOTE at Step 6.5.4 and Step 6.6.3.
21	04/05	A. Decker	Incorporated PCRA 00524897-06. Deleted IV's during step performance. Added Critical Step to verify parameters after each valve manipulation. Corrected Typo Section 7.0 Acceptance Criteria to reflect Panel 7R for 2K relays.
22	12/12	A. Decker	Incorporated PCRA 01133197-20. 5% TCCP has been removed. Reflect 90% Limit Switch restoration.
23	01/14	S Serpe	Incorporated ACIT 1601814-03 add prerequisite to ensure fuses are available. Replace references to procedure 116 with WC-AA-111
24	04/14	S Serpe	Incorporated 1636591-01 Replace LS-AA-120 with PI-AA-120
25	02/15	S Serpe	Incorporated PCRA 524897-08 Add Prerequisite to Check LED's for air supply to the SDIV valves.
26	11/15	J. Jimenez	Incorporated PCRA 524897-10 Added steps to remove fuses 11F-6F5 or 11F-6F6 in the case that an MSIV continues to go close due to a test pushbutton failure.

Exelon Generation	OYSTER CREEK GENERATING STATION PROCEDURE	Number **602.4.004**
Title **Main Steam Isolation Valve 10% Closure Test**		Revision No. 26

1.0 PURPOSE

To test and determine the operability of the MSIV Closure Scram.

2.0 REFERENCES

2.1 Procedures

- WC-AA-111 Surveillance Program Requirements
- 301.1, Main Steam Supply System (Inside Drywell)
- ER-AA-321, Administrative Requirements For Inservice Testing
- PI-AA-120, Issue Identification and Screening Process

2.2 Technical Specifications

- Table 4.1.1

2.3 Other

- IR# 00344792 and DOC ID# DG00-001177 for use of digital or electronic stop watches.

3.0 PREREQUISITES

3.1 SCRAM SOLENOID lights are illuminated (Panels 6R and 7R), and **no** other testing is in progress which could cause a half scram. **[BB]**

3.2 QA Fuses (BAF-5) to replace 1F7 / 2F7 are available in the shift managers office if required (Stock Code 204 40260) **[BB]**

3.3 V-6-450 red LED Illuminated (Inside panel 6R) **[BB]**

3.4 V-6-451 red LED Illuminated (Inside panel 7R) **[BB]**

3.5 Steps 6.3.6, 6.4.5, 6.5.6, and 6.6.5 are mitigating actions to be performed if a MSIV Test Pushbutton doesn't de-energize. These steps are required to be pre-briefed and Fuses 11F-6F5 and 11F-6F6 pre-identified before surveillance commencement. **[BB]**

3.5 The Unit Supervisor (US) has granted permission to perform the surveillance Test.

US	Today / Then Date/Time

4.0 PRECAUTIONS AND LIMITATIONS

4.1 The performance of this surveillance and its review shall be conducted in accordance with Procedure ER-AA-321 and Procedure WC-AA-111.

4.2 If the push button is **not** released when the MSIV closure scram signal is received and both MSIV limit switch relays have de-energized, the valve will continue to go shut and a scram could occur due to Reactor High Pressure or High Steam Line flow.

4.3 Monitor Steam Flow on the 180 meters panel 5F / 6F (FT-ID-33A / B) PPC should not be used as it is not calibrated.

5.0 MATERIAL AND TEST EQUIPMENT

5.1 Digital Stopwatch(s)

6.0 PROCEDURE Initial / Verify

6.1 **VERIFY** Section 3.0 prerequisites are satisfied.

________________________ ________/_________

Signature Date /Time

6.2 **RECORD** Digital Stopwatch Number: __________ _____/

6.3 Test of V-1-0008 / NS03B

6.3.1 IF inboard MSIVs are being supplied with nitrogen (drywell inerted),

THEN **CONFIRM** nitrogen receiver T-23-001 pressure is greater that 95 psig by performing the following:

6.3.1.1 **OBSERVE** PI-23-523 indicates between 95 psig and 100 psig. _____/

6.3.1.2 IF PI-23-523 does **not** indicates between 95 psig and 100 psig during test performance,

THEN **PERFORM** the following:

1. **START** a Nitrogen Compressor by placing a selected Nitrogen Compressor control switch to HAND. _____/

Initial / Verify

2. WHEN PI-23-523 indicates 100 psig,

   THEN **PLACE** selected Nitrogen Compressor control switch to AUTO. _____/

3. **REPEAT** steps 6.3.1.2 (1) through 6.3.1.2 (2) as required maintaining T-23-001 pressure between 95 psig and 100 psig. _____/

6.3.2 IF during the performance of this test, Main Steam Flow in the line **not** being tested as indicated on the 180 meters FT-ID-33A / B starts to increase before the half scram signal is received,

THEN **PERFORM** the following:

6.3.2.1 **RELEASE** the TEST pushbutton. _____/

6.3.2.2 **VERIFY** the valve opens. _____/

6.3.2.3 **VERIFY** Plant conditions return to normal. _____/

Initial / Verify

6.3.3

NOTE

Relays 2K17 and 2K18 and Plant Process Computer (PPC) Points SOE47 and SOE48 change state quickly and automatically reset/re-energize when the MSIV opens. There may be a slight delay between the two relays and the TEST button may have to be held down a little longer after the alarm annunciates in order to verify both have de-energize during test performance.

The PPC Alarm Display should be used to observe the SOE points. .

STATION personnel, as required to observe the following:

- Relay 2K17 _____/
- Relay 2K18 _____/
- PPC point SOE47 _____/
- PPC point SOE48 _____/

6.3.4 Simultaneously **PERFORM** the following two steps:

6.3.4.1 **DEPRESS** and **HOLD** TEST button for Valve V-1-0008 / NS03B. (Panel 11F) _____/

6.3.4.2 **START** the stopwatch. _____/

6.3.5 **OBSERVE** the Red Open indicating light Extinguishes for NS03B. _____/

6.3.6 IF NS03B continues to CLOSE following the release of the TEST button,

THEN **REMOVE** fuse 11F-6F5,

AND **VERIFY** NS03B Opens. _____/

Initial / Verify

6.3.7 WHEN a half scram signal is received,

AND both 2K17 and 2K18 have de-energized,

OR there is a noticeable increase in reactor pressure or decrease in steam flow,

THEN simultaneously **PERFORM** the following two steps:

6.3.7.1 **RELEASE** the TEST button. _____/

6.3.7.2 **STOP** the stopwatch. _____/

- **RECORD** stroke time for NS03B.

______________ _____/

6.3.8 **VERIFY** relays 2K17 and 2K18 de-energized and all contacts opened. (Panel 7R) _____/

6.3.9 **VERIFY** Plant Process Computer, PID: SOE47, tripped; MSIV CLOSURE SCRAM. (2K17) _____/

6.3.10 **VERIFY** Plant Process Computer, PID: SOE48, tripped; MSIV CLOSURE SCRAM. (2K18) _____/

6.3.11 **VERIFY** that the MSIV returns to the fully open position by the Red Open light illuminating. _____/

6.3.12 **VERIFY** SCRAM SOLENOIDS lights extinguished. (Panel 7R) _____/

6.3.13 **VERIFY** SCRAM CONTACTOR OPEN alarm (G-1-c) is received. _____/

6.3.14 **VERIFY** MSIV CLOSED II alarm (J-2-a) annunciated. _____/

Initial / Verify

6.3.15 **VERIFY** MN STM VLVS OFF NORMAL alarm (J-8-b) annunciated. _____/

6.3.16 **VERIFY** relays 2K51A and 2K52A are de-energized. (Panel 7R) _____/

6.3.17 **RESET** the half scram. _____/

6.3.18 **CONFIRM** Plant Process Computer PIDs returned to normal state. _____/

6.3.19 **CONFIRM** Alarms returned to normal state. _____/

6.3.20 **VERIFY** all SCRAM SOLENOID lights lit. (4F/7R) _____/

6.3.21 **VERIFY** SCRAM CONTACTOR OPEN alarm (G-1-c) clear. _____/

6.3.22 **VERIFY** MSIV CLOSED II alarm (J-2-a) clear. _____/

6.3.23 **VERIFY** MN STM VLVS OFF NORMAL alarm (J-8-b) clear. _____/

6.3.24 **VERIFY** relays 2K17 and 2K18 energized. (Panel 7R) _____/

6.3.25 **VERIFY** relays 2K51A and 2K52A energized. (Panel 7R) _____/

6.3.26 **VERIFY** Plant Process Computer PIDs SOE47 and SOE48 are normal. _____/

6.3.27 **CRITICAL STEP:**

US VERIFY plant parameters required to continue to next are satisfied. _____/

Initial / Verify

6.4

> NOTE
>
> Outboard MSIVs might stroke much slower then inboard MSIVs.

Test of V-1-10 / NS04B

6.4.1 IF during the performance of this test, Main Steam Flow in the line **not** being tested as indicated on the 180 meters FT-ID-33A / B starts to increase before the half scram signal is received,

THEN **PERFORM** the following:

6.4.1.1 **RELEASE** the TEST pushbutton. _____/

6.4.1.2 **VERIFY** the valve opens. _____/

6.4.1.3 **VERIFY** plant conditions return to normal. _____/

6.4.2

> NOTE
>
> Relays 2K17 and 2K18 and PPC Points SOE47 and SOE48, change state quickly and automatically reset/re-energize when the MSIV opens. There may be a slight delay between the two relays and the TEST button may have to be held down a little longer after the alarm annunciates in order to verify both have de-energize during test performance.
>
> The PPC Alarm Display should be used to observe the SOE points.

STATION personnel, as required to observe the following:

- Relay 2K17 _____/
- Relay 2K18 _____/
- PPC point SOE47 _____/
- PPC point SOE48 _____/

Initial / Verify

6.4.3 Simultaneously **PERFORM** the following two steps:

6.4.3.1 **DEPRESS** and **HOLD** TEST button for Valve V-1-0010 / NS04B. (Panel 11F) _____/

6.4.3.2 **START** the stopwatch. _____/

6.4.4 **OBSERVE** the Red Open indicating light extinguishes for NS04B. _____/

6.4.5 IF NS04B continues to CLOSE following the release of the TEST button,

THEN **REMOVE** fuse 11F-6F6,

AND **VERIFY** NS04B Opens. _____/

6.4.6 WHEN half scram signal is received,

AND both 2K17 and 2K18 have de-energized,

OR there is a noticeable increase in reactor pressure or decrease in steam flow,

THEN simultaneously **PERFORM** the following two steps:

6.4.6.1 **RELEASE** the TEST button. _____/

6.4.6.2 **STOP** the stopwatch. _____/

- **RECORD** stroke time for NS04B.

______________ _____/

6.4.7 **VERIFY** relays 2K17 and 2K18 de-energized and all contacts opened. (Panel 7R) _____/

6.4.8 **VERIFY** Plant Process Computer, PID: SOE47, tripped, MSIV CLOSURE SCRAM. (2K17) _____/

6.4.9 **VERIFY** Plant Process Computer, PID: SOE48, tripped, MSIV CLOSURE SCRAM. (2K18) _____/

6.4.10 **VERIFY** that the MSIV returns to the fully OPEN position by the Red Open light illuminating. _____/

Initial / Verify

6.4.11 **VERIFY** relays 2K51A and 2K52A are de-energized. (Panel 7R) _____/

6.4.12 **VERIFY** SCRAM SOLENOIDS lights extinguish. (Panel 7R) _____/

6.4.13 **VERIFY** SCRAM CONTACTOR OPEN alarm (G-1-c) annunciates. _____/

6.4.14 **VERIFY** MSIV CLOSED II alarm (J-2-a) annunciated. _____/

6.4.15 **VERIFY** MN STM VLVS OFF NORMAL alarm (J-8-b) annunciated. _____/

6.4.16 **RESET** the half scram. _____/

6.4.17 **CONFIRM** Plant Process Computer PIDs returned to normal state. _____/

6.4.18 **CONFIRM** Alarms returned to normal state. _____/

6.4.19 **VERIFY** all SCRAM SOLENOID lights lit. (4F/7R) _____/

6.4.20 **VERIFY** SCRAM CONTACTOR OPEN alarm (G-1-c) clear. _____/

6.4.21 **VERIFY** MSIV CLOSED II alarm (J-2-a) clear. _____/

6.4.22 **VERIFY** MN STM VLVS OFF NORMAL alarm (J-8-b) clear. _____/

6.4.23 **VERIFY** relays 2K17 and 2K18 energized. (Panel 7R) _____/

6.4.24 **VERIFY** relays 2K51A and 2K52A energized. (Panel 7R) _____/

6.4.25 **VERIFY** Plant Process Computer PIDs SOE47 and SOE48 are normal. _____/

6.4.26 **CRITICAL STEP:**

US VERIFY plant parameters required to continue to next are satisfied. _____/

Initial / Verify

6.5 Test of V-1-7 / NS03A

6.5.1 IF inboard MSIVs are being supplied with nitrogen, (drywell inerted)

THEN **CONFIRM** nitrogen receiver T-23-001 pressure is greater that 95 psig by performing the following:

6.5.1.1 **OBSERVE** PI-23-523 indicates between 95 psig and 100 psig. _____/

6.5.1.2 IF PI-23-523 does **not** indicates between 95 psig and 100 psig during test performance,

THEN **PERFORM** the following:

1. **START** a Nitrogen Compressor by placing a selected Nitrogen Compressor control switch to HAND. _____/
2. WHEN PI-23-523 indicates 100 psig,

   THEN **PLACE** selected Nitrogen Compressor control switch to AUTO. _____/
3. **REPEAT** steps 6.5.1.2 (1) through 6.5.1.2 (2) as required to maintain T-23-001 pressure between 95 psig and 100 psig. _____/

Initial / Verify

6.5.2 IF during the performance of this test, Main Steam Flow in the line **not** being tested as indicated on the 180 meters FT-ID-33A / B starts to increase before the half scram signal is received,

THEN **PERFORM** the following:

6.5.2.1 **RELEASE** the TEST pushbutton. _____/

6.5.2.2 **VERIFY** the valve opens. _____/

6.5.2.3 **VERIFY** plant conditions return to normal. _____/

6.5.3

> NOTE
>
> Relays 1K17 and 1K18 and PPC Points SOE17 and SOE18, change state quickly and automatically reset/re-energize when the MSIV opens. There may be a slight delay between the two relays and the TEST button may have to be held down a little longer after the alarm annunciates in order to verify both have de-energize during test performance.
>
> The PPC Alarm Display should be used to observe the SOE points.

STATION personnel, as required to observe the following:

- Relay 1K17 _____/
- Relay 1K18 _____/
- PPC point SOE17 _____/
- PPC point SOE18 _____/

Initial / Verify

6.5.4 Simultaneously **PERFORM** the following two steps:

6.5.4.1 **DEPRESS** and **HOLD** TEST button for Valve V-1-0007 / NS03A. (Panel 11F) _____/

6.5.4.2 **START** the stopwatch. _____/

6.5.5 **OBSERVE** the Red Open indicating light extinguishes for NS03A. _____/

6.5.6 IF NS03A continues to CLOSE following the release of the TEST button,

THEN **REMOVE** fuse 11F-6F5,

AND **VERIFY** NS03A Opens. _____/

6.5.7 WHEN half scram signal is received,

AND both 1K17 and 1K18 have de-energized,

OR there is a noticeable increase in reactor pressure or decrease in steam flow',

THEN simultaneously **PERFORM** the following two steps:

6.5.7.1 **RELEASE** the TEST button. _____/

6.5.7.2 **STOP** the stopwatch. _____/

- **RECORD** stroke time for NS03A.

______________ _____/

6.5.8 **VERIFY** relays 1K17 and 1K18 de-energized and all contacts opened. (Panel 6R) _____/

6.5.9 **VERIFY** Plant Process Computer, PID: SOE17, tripped; MSIV CLOSURE SCRAM. (1K17) _____/

6.5.10 **VERIFY** Plant Process Computer, PID: SOE18, tripped; MSIV CLOSURE SCRAM. (1K18) _____/

Initial / Verify

6.5.11 **VERIFY** that the MSIV returns to the fully open position by the Red Open light illuminating. _____/

6.5.12 **VERIFY** relays 1K51A and 1K52A are de-energized. (Panel 6R) _____/

6.5.13 **VERIFY** SCRAM SOLENOIDS lights extinguish. (Panel 6R) _____/

6.5.14 **VERIFY** SCRAM CONTACTOR OPEN alarm (G-1-c) annunciates. _____/

6.5.15 **VERIFY** MSIV CLOSED I alarm (J-1-a) annunciated. _____/

6.5.16 **VERIFY** MN STM VLVS OFF NORMAL alarm (J-8-b) annunciated. _____/

6.5.17 **RESET** the half scram. _____/

6.5.18 **CONFIRM** Plant Process Computer PIDs returned to normal state. _____/

6.5.19 **CONFIRM** Alarms returned to normal state. _____/

6.5.20 **VERIFY** all SCRAM SOLENOID lights lit. (4F/6R) _____/

6.5.21 **VERIFY** SCRAM CONTACTOR OPEN alarm (G-1-c) clear. _____/

6.5.22 **VERIFY** MSIV CLOSED I alarm (J-1-a) clear. _____

6.5.23 **VERIFY** MN STM VLVS OFF NORMAL alarm (J-8-b) clear. _____/

6.5.24 **VERIFY** relays 1K17 and 1K18 energized. (Panel 6R) _____/

6.5.25 **VERIFY** relays 1K51A and 1K52A energized. (Panel 6R) _____/

6.5.26 **VERIFY** Plant Process Computer PIDs SOE17 and SOE18 are normal. _____/

6.5.27 **CRITICAL STEP:**

US VERIFY plant parameters required to continue to next are satisfied. _____/

Initial / Verify

6.6

> NOTE
>
> Outboard MSIVs might stroke much slower then inboard MSIVs.

Test of V-1-0009 / NS04A

6.6.1 IF during the performance of this test, Main Steam Flow in the line **not** being tested as indicated on the 180 meters FT-ID-33A / B starts to increase before the half scram signal is received,

THEN **PERFORM** the following:

6.6.1.1 **RELEASE** the TEST pushbutton. _____/

6.6.1.2 **VERIFY** the valve opens. _____/

6.6.1.3 **VERIFY** Plant conditions return to normal. _____/

6.6.2

> NOTE
>
> Relays 1K17 and 1K18 and PPC Points SOE17 and SOE18, change state quickly and automatically reset/re-energize when the MSIV opens. There may be a slight delay between the two relays and the TEST button may have to be held down a little longer after the alarm annunciates in order to verify both have de-energize during test performance.
>
> The PPC Alarm Display should be used to observe the SOE points.

STATION personnel, as required to observe the following:

- Relay 1K17 _____/
- Relay 1K18 _____/
- PPC point SOE17 _____/
- PPC point SOE18 _____/

18.0

Initial / Verify

6.6.3 Simultaneously **PERFORM** the following two steps:

6.6.3.1 **DEPRESS** and **HOLD** TEST button for Valve V-1-0009 / NS04A. (Panel 11F) _____/

6.6.3.2 **START** the stopwatch. _____/

6.6.4 **OBSERVE** the Red Open indicating light extinguishes for NS04A. _____/

6.6.5 IF NS04A continues to CLOSE following the release of the TEST button,

THEN **REMOVE** fuse 11F-6F6,

AND **VERIFY** NS04A Opens. _____/

6.6.6 WHEN half scram signal is received,

AND both 1K17 and 1K18 have de-energized,

OR there is a noticeable increase in reactor pressure or decrease in steam flow,

THEN simultaneously **PERFORM** the following two steps:

6.6.6.1 **RELEASE** the TEST button. _____/

6.6.6.2 **STOP** the stopwatch. _____/

- **RECORD** stroke time for NS04A.

______________ _____/

6.6.7 **VERIFY** relays 1K17 and 1K18 de-energized and all contacts opened. (Panel 6R) _____/

6.6.8 **VERIFY** Plant Process Computer, PID: SOE17, tripped, MSIV CLOSURE SCRAM. (1K17) _____/

6.6.9 **VERIFY** Plant Process Computer, PID: SOE18, tripped, MSIV CLOSURE SCRAM. (1K18) _____/

Initial / Verify

6.6.10 **VERIFY** that the MSIV returns to the fully OPEN position by the Red Open light illuminating. _____/

6.6.11 **VERIFY** relays 1K51A and 1K52A are de-energized. (Panel 6R) _____/

6.6.12 **VERIFY** SCRAM SOLENOIDS lights extinguish. (Panel 6R) _____/

6.6.13 **VERIFY** SCRAM CONTACTOR OPEN alarm (G-1-c) annunciates. _____/

6.6.14 **VERIFY** MSIV CLOSED I alarm (J-1-a) annunciates. _____/

6.6.15 **VERIFY** MN STM VLVS OFF NORMAL alarm (J-8-b) annunciated. _____/

6.6.16 **RESET** the half scram. _____/

6.6.17 **CONFIRM** Plant Process Computer PIDs returned to normal state. _____/

6.6.18 **CONFIRM** Alarms returned to normal state. _____/

6.6.19 **VERIFY** all SCRAM SOLENOID lights lit. (4F/6R) _____/

6.6.20 **VERIFY** SCRAM CONTACTOR OPEN alarm (G-1-c) clear. _____/

6.6.21 **VERIFY** MSIV CLOSED I alarm (J-1-a) clear. _____/

6.6.22 **VERIFY** MN STM VLVS OFF NORMAL alarm (J-8-b) clear. _____/

6.6.23 **VERIFY** relays 1K17 and 1K18 energized. (Panel 6R) _____/

6.6.24 **VERIFY** relays 1K51A and 1K52A energized. (Panel 6R) _____/

6.6.25 **VERIFY** Plant Process Computer PIDs SOE17 and SOE18 are normal. _____/

Initial / Verify

6.7 IF Fuse 11F-6F5 was removed

AND Repairs have been completed for NS03A or NS03B

THEN **PERFORM** the following:

6.7.1 **REINSTALL** Fuse 11F-6F5 _____/_____

6.7.2 **DEPRESS** the MAIN STEAM ISOLATION RESET. (Panel 4F) _____/

6.7.3 **TAKE** NS03A Switch to OPEN. (Panel 11F) _____/

6.7.4 **TAKE** NS03B Switch to OPEN. (Panel 11F) _____/

6.8 IF Fuse 11F-6F6 was removed

AND Repairs have been completed for NS04A or NS04B

THEN **PERFORM** the following:

6.8.1 **REINSTALL** Fuse 11F-6F6 _____/_____

6.8.2 **DEPRESS** the MAIN STEAM ISOLATION RESET. (Panel 4F) _____/

6.8.3 **TAKE** NS04A Switch to OPEN. (Panel 11F) _____/

6.8.4 **TAKE** NS04B Switch to OPEN. (Panel 11F) _____/

6.9 **RECORD** any comments / discrepancies. _____/

____

____

____

____

____

____

7.0 ACCEPTANCE CRITERIA

7.1 Components tested by this procedure meet Technical Specifications and In-Service Test Program requirements for operability if the following criteria are met:

- Relays 1K17, 1K18, 1K51A, 1K52A and SCRAM SOLENOIDS lights (Panel 6R) de-energize at appropriate steps.
- Relays 2K17, 2K18, 2K51A, 2K52A and SCRAM SOLENOIDS lights (Panel 7R) de-energize at appropriate steps.
- Valve stroke times are recorded for trending purposes only.

7.2 If any requirements are **not** met, then declare the affected components inoperable and follow the requirements of Tech Spec. Table 3.1.1, (Item A.10); Section 3.5.A.3; and Procedure PI-AA-120.

7.3 If any of the following criteria are **not** met or if any other deviation from proper operation is noted, follow the requirements of Procedure PI-AA-120.

- Plant Process Computer PIDs change state as required in instructions, if **not** observed, document in comments, IR is **not** required.
- All alarms and lights operate as specified.

8.0 ATTACHMENTS

None

Facility: Oyster Creek　　Task No.: 2000501401

Task Title: Cool down the RPV using the Isolation Condenser tube side vents IAW SP-15, Alternate Pressure Control Systems – IC Tube Side Vents (Alternate Path)

Job Performance Measure No.: NRC Control Room JPM 5

K/A Reference: 295021 AA1.04 (RO/SRO 3.7/3.7)

Examinee: ____________　　Examiner: ____________

Facility Evaluator: ____________　　Date: ____________

Method of Testing:

Simulated Performance ________　　Actual Performance X

Classroom ________　　Simulator X　　Plant ________

Read to the Examinee:

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

Initial Conditions:

- The plant is shutdown and cooling down to COLD SHUTDOWN IAW RPV Control – no ATWS.
- Isolation Condensers are not required to be isolated.
- The Main Condenser is intact.
- The Offsite radioactivity release rate is below that required for an Unusual Event.
- Shutdown Cooling interlocks cannot be cleared.
- All modes of pressure control for cooldown are unavailable except the Isolation Condenser Tube Side Vents.
- The Isolation Condenser DC valves are isolated due to previous RPV level being > 180". RPV water level is currently 155 in and steady.

Task Standard:

RPV is being cooled down using Isolation Condenser B Tube Side Vents.

Required Materials: EMG-SP15

General References:

1. Support Procedure 15, Alternate Pressure Control Systems – IC Tube Side Vents, Revision 1.

Initiating Cue:

As the Unit Supervisor, I am directing you to establish a 10°F/hr cooldown rate IAW SP-15, Alternate Pressure Control Systems – IC Tube Side Vents. 'A' Isolation Condenser is the preferred system.

Time Critical Task: NO

Validation Time: 11 minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Procedure Step: 2.1.1

Verify Isolation Condensers are **not** required to be isolated.

Standard: Verifies Isolation Condensers are **not** required to be isolated.

Note: Initial Conditions state that Isolation Condensers are **not** required to be isolated.

Comment:

SAT/UNSAT

Performance Step: 3

Procedure Step: 2.1.2

Verify Main Condenser is intact.

Standard: Verifies Main Condenser is intact.

Note: Initial Conditions state the Main Condenser is intact.

Comment:

SAT/UNSAT

Performance Information

Performance Step: 4

Procedure Step: 2.1.3

Verify Offsite radioactivity release rate is expected to remain below the release rate, which requires an Unusual Event.

Standard: Verifies Offsite radioactivity release rate is expected to remain below the release rate, which requires an Unusual Event.

Note: Initial Conditions state that Offsite radioactivity release rate is expected to remain below the release rate, which requires an Unusual Event.

Comment:

SAT/UNSAT

Performance Step: 5

Procedure Step: 2.2

Open the EOP BYPASS PLUGS panel inside of Panel 10XF.

Standard: Opens the EOP BYPASS PLUGS panel inside of Panel 10XF.

Comment:

SAT/UNSAT

✓ Performance Step: 6

Procedure Step: 2.2.1

Remove the bypass plug from position BP2.

Standard: Removes the bypass plug from position BP2.

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 7

Procedure Step: 2.2.2

Insert a bypass plug into position BP1.

Standard: Inserts a bypass plug into position BP1.

Comment:

SAT/UNSAT

✓ Performance Step: 8

Procedure Step: 2.2.3

Remove the bypass plug from position BP4.

Standard: Removes the bypass plug from position BP4.

Comment:

SAT/UNSAT

✓ Performance Step: 9

Procedure Step: 2.2.4

Insert a bypass plug into position BP3.

Standard: Inserts a bypass plug into position BP3.

Comment:

SAT/UNSAT

Performance Information

Performance Step: 10

Procedure Step: 3.1

Verify that RPV Water Level is below 180 in.

Standard: Verifies that RPV Water Level is below 180 in.

CUE: If RPV water level has risen to > 180 in following the JPM setup, inform the applicant RPV water level is < 155 in and steady.

Comment:

SAT/UNSAT

✓ Performance Step: 11

Procedure Step: 3.2

Confirm open the following Isolation Condenser Steam Inlet Valves for the Isolation Condenser A: (Panel 1F/2F)

- V-14-30
- V-14-31

Standard: Confirms open the following Isolation Condenser Steam Inlet Valves for the Isolation Condenser A: (Panel 1F/2F)

- V-14-30
- V-14-31

Note: Places the CLOSE-AUTO-OPEN switch for the valves to the OPEN position. Waits for valve indications to show red OPEN light lit and green CLOSED light extinguished.

Comment:

SAT/UNSAT

Performance Information

NOTE: In the next step Isolation Condenser A vents will NOT open.

Alternate Path.

✓ Performance Step: 12

Procedure Step: 3.3

Open the following Isolation Condenser Vents for the Isolation Condensers to be used: (Panel 11F)

- V-14-5 / V-14-20

Standard: Opens the following Isolation Condenser Vents for the Isolation Condensers to be used: (Panel 11F)

V-14-5 / V-14-20

Note: Isolation Condenser A vent valves V-14-5 and V-14-20 will not open. The applicant will re-perform SP-15 starting at step 3.2 for Isolation Condenser B.

CUE: The applicant may inform the US that Isolation Condenser A vent valves will not open. Direct the applicant to continue with Support Procedure 15. (It is acceptable if the applicant establishes a cooldown using the Isolation Condenser B vents without first consulting the US.)

Comment:

SAT/UNSAT

✓ Performance Step: 13

Procedure Step: 3.2

Confirm open the following Isolation Condenser Steam Inlet Valves for the Isolation Condenser B: (Panel 1F/2F)

- V-14-32 and V-14-33

Standard: Confirms open the following Isolation Condenser Steam Inlet Valves for the Isolation Condenser B: (Panel 1F/2F)

- V-14-32 and V-14-33

Note: Places the CLOSE-AUTO-OPEN switch for the valves to the OPEN position. Waits for valve indications to show red OPEN light lit and green CLOSED light extinguished.

Comment:

Performance Information

SAT/UNSAT

✓ Performance Step: 14

Procedure Step: 3.3

Open the following Isolation Condenser Vents for the Isolation Condensers to be used: (Panel 11F)

- V-14-1 / V-14-19

Standard: Opens the following Isolation Condenser Vents for the Isolation Condensers to be used: (Panel 11F)

- V-14-1 / V-14-19

Note: Waits for valve indications to show red OPEN light lit and green CLOSED light extinguished.

CUE: Another operator will continue with and control the cooldown that is already established.

Comment: ______________________________

____

____

SAT/UNSAT

Terminating Cue: RPV cooldown is in progress using Isolation Condenser 'B' tube side vents.

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC Control Room JPM 5

Examinee's Name: ______________

Examiner's Name: ______________

Date Performed: ______________

Facility Evaluator: ______________

Number of Attempts: ______________

Time to Complete: ______________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ______________ ______________

Simulator Setup

1. Reset to IC-115 or any shutdown IC where the Primary Containment is NOT isolated
2. Insert a manual scram
3. Stabilize RPV pressure around 500 psig
4. Stabilize RPV level below 180 in
5. Shut the IC A & B vents
6. Insert VLV-ICS002 to CLOSE
    - Keeps IC A vent valve V-14-5 closed
7. Insert VLV-ICS004 to CLOSE
    - Keeps IC A vent valve V-14-20 closed
8. Have a copy of SP-15 for the applicant

STUDENT HANDOUT

Initial Conditions:

- The plant is shutdown and cooling down to COLD SHUTDOWN IAW RPV Control – no ATWS.
- Isolation Condensers are not required to be isolated.
- The Main Condenser is intact.
- The Offsite radioactivity release rate is below that required for an Unusual Event.
- Shutdown Cooling interlocks cannot be cleared.
- All modes of pressure control for cooldown are unavailable except the Isolation Condenser Tube Side Vents.
- The Isolation Condenser DC valves are isolated due to previous RPV level being > 180". RPV water level is currently 155 in and steady.

Initiating Cue:

As the US, I am directing you to establish a 10°F/hr cooldown rate IAW SP-15, Alternate Pressure Control Systems – IC Tube Side Vents. 'A' Isolation Condenser is the preferred system.

Exelon Nuclear	OYSTER CREEK GENERATING STATION PROCEDURE	Number **EMG-SP15**
Title	**SUPPORT PROCEDURE 15** **ALTERNATE PRESSURE CONTROL SYSTEMS IC TUBE SIDE VENTS**	Revision No. 1

1.0 PREREQUISITES

None

2.0 PREPARATION

PERFORM the following using the IC Tube Side Vents for RPV pressure control.

2.1 **VERIFY**:

2.1.1 Isolation Condensers are **not** required to be isolated. [ ]

2.1.2 Main Condenser is intact. [ ]

2.1.3. Offsite radioactivity release rate is expected to remain below the release rate, which requires an Unusual Event. [ ]

2.2 **OPEN** the 10XF IC Vent Valves/V-28-17 Bypass Plugs Panel inside of Panel 10XF. [ ]

2.2.1 **REMOVE** the bypass plug from position BP2. [ ]

2.2.2 **INSERT** a bypass plug into position BP1. [ ]

2.2.3 **REMOVE** the bypass plug from position BP4. [ ]

2.2.4 **INSERT** a bypass plug into position BP3. [ ]

OVER

3.0 PROCEDURE

3.1 **VERIFY** that RPV Water Level is below **180 in.** [ ]

3.2 **CONFIRM** open the following Isolation Condenser Steam Inlet Valves for the Isolation Condensers to be used: (Panel 1F/2F)

Isolation Condenser A

- V-14-30 [ ]
- V-14-31 [ ]

Isolation Condenser B

- V-14-32 [ ]
- V-14-33 [ ]

3.3 **OPEN** the following Isolation Condenser Vents for the Isolation Condensers to be used: (Panel 11F)

Isolation Condenser A

- V-14-5 / V-14-20 [ ]

Isolation Condenser B

- V-14-1 / V-14-19 [ ]

3.4 **CONTROL** Reactor pressure as directed by the Unit Supervisor by cycling the tube side vents designated in Step 3.3. [ ]

Performance Information

Facility: Oyster Creek | Task No.: 2000501416

Task Title: Place the H2/02 Monitoring System in service

Job Performance Measure No.: NRC Control Room JPM 6 (RO/SRO)

K/A Reference: 500000 EA1.01 (RO/SRO 3.4/3.3)

Examinee: ______ | Examiner: ______

Facility Evaluator: ______ | Date: ______

Method of Testing:

Simulated Performance ______ | Actual Performance X

Classroom ______ | Simulator X | Plant ______

Read to the Examinee:

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

Initial Conditions:

- A LOCA is in progress
- The Primary Containment Control EOP has been entered.

Task Standard:

Channel A H2/02 Monitoring System is in service.

Required Materials: None.

General References:

1. Support Procedure 39, Placing the H2O2 Monitoring System in Service, Revision 1.

Initiating Cue:

As the US, I am directing you to place the H2/02 monitoring system in service IAW Support Procedure 39.

Time Critical Task: NO

Validation Time: 7 minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Procedure Step: 3.1.1

(For Channel A) Verify the Power switch is in the ON position

Standard: Verifies the Power switch is in the ON position for Channel A

Comment:

SAT/UNSAT

✓ Performance Step: 3

Procedure Step: 3.1.2

Place switch for H2 Sample Supply V-38-37 to OPEN

Standard: Places switch for H2 Sample Supply V-38-37 to OPEN

Note: Verifies that the red OPEN light is lit and the green CLOSE light is extinguished.

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 4

Procedure Step: 3.1.3

Place switch tor H2 Sample Supply V-38-38 to OPEN

Standard: Places switch tor H2 Sample Supply V-38-38 to OPEN

Note: Verifies that the red OPEN light is lit and the green CLOSE light is extinguished.

Comment:

SAT/UNSAT

✓ Performance Step: 5

Procedure Step: 3.1.4

Place switch for H2 Sample Supply V-38-39 to OPEN

Standard: Places switch for H2 Sample Supply V-38-39 to OPEN

Note: Verifies that the red OPEN light is lit and the green CLOSE light is extinguished.

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 6

Procedure Step: 3.1.5

Place switch for H2 Sample Supply V-38-40 to OPEN

Standard: Places switch for H2 Sample Supply V-38-40 to OPEN

Note: Verifies that the red OPEN light is lit and the green CLOSE light is extinguished.

Comment:

SAT/UNSAT

✓ Performance Step: 7

Procedure Step: 3.1.6

Place switch for PUMP (P-38-5) in ENABLE position

Standard: Places switch for PUMP (P-38-5) in ENABLE position

Comment:

SAT/UNSAT

✓ Performance Step: 8

Procedure Step: 3.1.7

Depress Channel A ANALYZE PB to place Analyzer IT-1A in Analyze mode.

Standard: Depresses Channel A ANALYZE PB to place Analyzer IT-1A in Analyze mode.

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 9

Procedure Step: 3.1.8

Touch CRT Screen and VERIFY:

- GAS MONITORING SYSTEM screen ILLUMINATES
- GAS MONITORING SYSTEM screen does not indicate Stand-By mode.

Standard: Touches CRT Screen and VERIFY:

- GAS MONITORING SYSTEM screen ILLUMINATES
- GAS MONITORING SYSTEM screen does not indicate Stand-By mode

Comment:

SAT/UNSAT

Performance Step: 10

Procedure Step: 3.1.9

Verify H2/02 Recorder AR-0002 begins recording

Standard: Verifies H2/02 Recorder AR-0002 begins recording

Cue: Inform the applicant Channel A has begun recording and another operator will continue with the support procedure

Comment:

SAT/UNSAT

Terminating Cue: Channel A of the H2/02 monitoring system has been placed in service IAW SP-39.

JPM Stop Time: __________

Validation of Completion

JPM Number: ILT 14-1 NRC Control Room JPM 6

Examinee's Name: ____________________

Examiner's Name: ____________________

Date Performed: ____________________

Facility Evaluator: ____________________

Number of Attempts: ____________________

Time to Complete: ____________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ____________________ ____________________

Simulator Setup

1. Reset to IC 115 (or similar IC)
2. Have a copy of SP-39 for the applicant

STUDENT HANDOUT

Initial Conditions:

- The Primary Containment Control EOP has been entered.

Task Cue:

As the US, I am directing you to place the H2/02 monitoring system in service IAW Support Procedure 39.

Exelon Nuclear	OYSTER CREEK GENERATING STATION PROCEDURE	Number **EMG-SP39**	
SUPPORT PROCEDURE 39 Title **PLACING THE H2 / O2 MONITORING SYSTEM IN SERVICE**		Usage Level **1**	Revision No. 1

REVISIONS TO THIS SUPPORT PROCEDURE SHALL BE MADE IN ACCORDANCE WITH AD-OC-103.

Prior Revision 0 incorporated the following Temporary Changes:

N/A

This Revision 1 incorporates the following Temporary Changes:

N/A

HARD CARDS APPLY

List of Pages
1.0 to 4.0

Exelon Nuclear	OYSTER CREEK GENERATING STATION PROCEDURE	Number **EMG-SP39**
SUPPORT PROCEDURE 39 Title **PLACING THE H2 / O2 MONITORING SYSTEM IN SERVICE**		Revision No. 1

PROCEDURE HISTORY

REV	DATE	ORIGINATOR	SUMMARY OF CHANGE
0	09/06	H. Tritt	Update format. Removed from Procedure EMG-3200.02.
1	08/10	G. Collins	Incorporated PCRA 686519-01 to correct formatting and change Recorder in Step 3.1.9 from 002 to 001. Deleted Prerequisite that entry has been directed by EOP's. Changed logo to Exelon.

Exelon Nuclear	OYSTER CREEK GENERATING STATION PROCEDURE	Number **EMG-SP39**
Title	**SUPPORT PROCEDURE 39** **PLACING THE H2 / O2 MONITORING SYSTEM IN SERVICE**	Revision No. 1

1.0 PREREQUISITES

None

2.0 PREPARATION

None

3.0 PROCEDURE

3.1 Placing Channel A in service (Panel 16R):

3.1.1 **VERIFY** Power switch is in ON position [ ]

3.1.2 **PLACE** switch for H_2 Sample Supply V-38-37 to OPEN [ ]

3.1.3 **PLACE** switch for H_2 Sample Supply V-38-38 to OPEN [ ]

3.1.4 **PLACE** switch for H_2 Sample Return V-38-39 to OPEN [ ]

3.1.5 **PLACE** switch for H_2 Sample Return V-38-40 to OPEN [ ]

3.1.6 **PLACE** switch for PUMP (P-38-5) in ENABLE position [ ]

3.1.7 **DEPRESS** Channel A ANALYZE PB to place Analyzer IT-1A in Analyze mode. [ ]

3.1.8 **TOUCH** CRT Screen and **VERIFY** the following:

- GAS MONITORING SYSTEM screen **ILLUMINATES** [ ]
- GAS MONITORING SYSTEM screen does **not** indicate Stand-By mode. [ ]

3.1.9 VERIFY H_2/O_2 Recorder AR-0001 begins recording. [ ]

OVER

3.2 Placing Channel B in service (Panel 16R):

3.2.1 **VERIFY** Power switch is in ON position [ ]

3.2.2 **PLACE** switch for H_2 Sample Supply V-38-41 to OPEN [ ]

3.2.3 **PLACE** switch for H_2 Sample Supply V-38-43 to OPEN [ ]

3.2.4 **PLACE** switch for H_2 Sample Return V-38-44 to OPEN [ ]

3.2.5 **PLACE** switch for H_2 Sample Return V-38-46 to OPEN [ ]

3.2.6 **PLACE** switch for PUMP (P-38-6) in ENABLE position [ ]

3.2.7 **DEPRESS** Channel B ANALYZE PB to place Analyzer IT-1B in Analyze mode. [ ]

3.2.8 **TOUCH** CRT Screen and **VERIFY** the following:

- GAS MONITORING SYSTEM screen **ILLUMINATES** [ ]
- GAS MONITORING SYSTEM screen does **not** indicate Stand-By mode. [ ]

3.2.9 VERIFY H_2/O_2 Recorder AR-0002 begins recording [ ]

3.3 **RECORD** time.

__________ [ ]
Time

3.4

NOTE
A five (5) minute stabilization period is required after switching an analyzer from STANDBY to ANALYZE.

WHEN a minimum of 5 minutes has elapsed since placing the H_2/O_2 monitors in ANALYZE,

THEN **OBSERVE** H_2 and O_2 concentrations and inform the Unit Supervisor. [ ]

4.0

Facility: Oyster Creek   Task No.: 2880101404

Task Title: Startup of the Turbine Building Ventilation System (Alternate Path)

Job Performance Measure No.: NRC Control Room JPM 7

K/A Reference: 288000 A4.01 (3.1/2.9)

Examinee: ______________ Examiner: ______________

Facility Evaluator: ______________ Date: ______________

Method of Testing:

Simulated Performance ________ Actual Performance ___X___

Classroom ________ Simulator ___X___ Plant ________

Read to the Examinee:

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

Initial Conditions:

- The plant is shutdown
- The Turbine Building Ventilation System has been secured
- All prerequisites to start the Turbine Building Ventilation System have been verified
- Attachments 328-1, 328-2, 328-3 have been completed

Task Standard:

The Turbine Ventilation System has been started utilizing Exhaust Fan 1-6

Required Materials: None.

General References:

1. Procedure 328, Turbine Building Heating And Ventilation System, Revision 61

Initiating Cue:

Start the Turbine Building Ventilation System IAW Procedure 328, Turbine Building Heating And Ventilation System, starting at Step 5.1.2

Time Critical Task: NO

Validation Time: 13 minutes

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Reviews Precautions and Limitations.

Standard: Reviews Precautions and Limitations.

Comment:

SAT/UNSAT

Note: Exhaust Fan 1-7 will not start and initiates the Alternate Path. Exhaust Fan 1-7 will not be re-started on the second attempt.

Alternate Path

✓ Performance Step: 3

Procedure Step: 5.1.2

Start EF-1-7 by placing EF-1-7 control switch to START.

Reports the fan does not start.

Standard: Starts EF-1-7 by placing EF-1-7 control switch to START.

Reports the fan will not start. (red light OFF; green light ON)

May contact EO to inspect the Fan.

Cue: As the SRO, acknowledge the fan will not start.

As the EO, report that you see no obvious abnormalities with the fan.

Comment:

SAT/UNSAT

Note: The step below may occur any time during the JPM.

Performance Step: 4

Procedure Step: 5.1.2.1.1

Notify Radiation Protection anytime operating EF-1-6.

Standard: Notifies Radiation Protection anytime operating EF-1-6.

Cue: RP has been notified

Comment:

SAT/UNSAT

Performance Step: 5

Procedure Step: 5.1.2.1.1

Confirm closed Dampers DM-28-8, DM-28-3 and their associated limit switches are made up

Standard: Directs the EO to confirm closed Dampers DM-28-8, DM-28-3 and their associated limit switches are made up

Cue: Dampers DM-28-8, DM-28-3 are closed and their associated limit switches are made up

Comment:

SAT/UNSAT

Performance Step: 6

Procedure Step: 5.1.2.1.4

Confirm open DM-28-4 and associated limit switches are made up.

Standard: Directs the EO to confirm open DM-28-4 and associated limit switches are made up.

Cue: Damper DM-28-4 is open and associated limit switches are made up.

Comment:

SAT/UNSAT

✓ Performance Step: 7

Procedure Step: 5.1.2.1.3

Start EF-1-7 by placing EF-1-7 control switch to START

Standard: Starts EF-1-7 by placing EF-1-7 control switch to START and recognizes the fan will not start (red light OFF; green light ON)

Comment:

SAT/UNSAT

✓ Performance Step: 8

Procedure Step: 5.1.2.1.4a

If EF-1-7 fails to start on the second attempt, then place EF-1-6 in service as follows:

Open V-28-71 to drain any standing water from EF-1-6

Standard: Directs EO to Open V-28-71 to drain any standing water from EF-1-6

Cue: V-28-71 is open and a little water has drained out.

Comment:

SAT/UNSAT

✓ Performance Step: 9

Procedure Step: 5.1.2.1.4a

When water has stopped draining, then close V-28-71

Standard: Directs EO to close V-28-71 when water has stopped draining

Cue: Water has stopped draining and V-28-71 is closed

Comment:

SAT/UNSAT

Performance Step: 10

Procedure Step: 5.1.2.1.4c

Confirm closed DM-28-8

Standard: Directs EO to confirm closed DM-28-8

Cue: DM-28-8 is closed

Comment:

SAT/UNSAT

✓ Performance Step: 11

Procedure Step: 5.1.2.1.4d

Close DM-28-4.

Standard: Directs EO to close DM-28-4

Cue: DM-28-4 is closed

Comment:

SAT/UNSAT

✓ Performance Step: 12

Procedure Step: 5.1.2.1.4e

Open DM-28-3

Standard: Directs the EO to open DM-28-3

Cue: DM-28-3 is open

Comment:

SAT/UNSAT

✓ Performance Step: 13

Procedure Step: 5.1.2.1.4f

Start Exhaust Fan EF-1-6 by placing EF-1-6 control switch to ON

Standard: Starts Exhaust Fan EF-1-6 by placing EF-1-6 control switch to START (red light ON; green light OFF)

Comment:

SAT/UNSAT

✓ Performance Step: 14

Procedure Step: 5.1.3

Start Supply Fan SF-1-1 or SF-1-2 by placing Control Switch to ON

Standard: Starts Supply Fan SF-1-1 or SF-1-2 by placing Control Switch to ON (red light ON; green light OFF) on panel 11R

Comment:

SAT/UNSAT

✓ Performance Step: 15

Procedure Step: 5.1.4

Start Supply Fan SF-1-3 or SF-1-4 by placing Control Switch to ON.

Standard: Starts Supply Fan SF-1-3 or SF-1-4 by placing Control Switch to ON. (red light ON; green light OFF) on panel 11R

Comment:

SAT/UNSAT

✓ Performance Step: 16

Procedure Step: 5.1.5

Start EF-1-33 by placing EF-1-33 control switch to ON.

Standard: Starts EF-1-33 by placing EF-1-33 control switch to ON. (red light ON; green light OFF) on panel 11R

Comment:

SAT/UNSAT

✓ Performance Step: 17

Procedure Step: 5.1.6

Start SF-1-5 or SF-1-6 by placing the control switch to ON.

Standard: Starts SF-1-5 or SF-1-6 by placing the control switch to ON. (red light ON; green light OFF) on panel 11R

Comment:

SAT/UNSAT

Performance Step: 18

Procedure Step: 5.1.7

Verify that EF-1-4 has started by observing the red indicating light Lit

Standard: Verifies that EF-1-4 has started by observing the red indicating light Lit on panel 11R

Comment:

SAT/UNSAT

✓ Performance Step: 19

Procedure Step: 5.1.8

Starts Feedwater Pump Room Supply Fan, SF-1-7, and Exhaust Fan, EF-1-1, by placing SF-1-7 and EF-1-1 control switch to ON

Standard: Start Feedwater Pump Room Supply Fan, SF-1-7, and Exhaust Fan, EF-1-1, by placing SF-1-7 and EF-1-1 control switch to ON (red lights ON; green lights OFF)

Cue: Another Operator will continue with the procedure

Comment:

SAT/UNSAT

Terminating Cue: The Turbine Ventilation System has been started utilizing Exhaust Fan 1-6

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC Control Room JPM 7

Examinee's Name: ____________________

Examiner's Name: ____________________

Date Performed: ____________________

Facility Evaluator: ____________________

Number of Attempts: ____________________

Time to Complete: ____________________

Question:

Response:

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ____________________ ____________________

Simulator Setup

1. IC-115. (but can be any IC)
2. Shutdown the TB Vent System IAW procedure 328, section 5.4
3. Insert the following:
    a. LOA-TBS030 to OPEN
    b. SWI-TBS017A to ON
    c. These two malfunctions open the breaker to Exhaust Fan 1-7 but keeps the green light on
4. Insert ANN-L-2E to OFF
    a. This keeps EF 7 TRIP annunciator off
5. Insert LOA-TBS011 to CLOSE (this closes DM-28-4)
6. Insert LOA-TBS012 to OPEN (this opens DM-28-3)
7. Insert LOA-TBS013 to OFF (stops SF 1-22)
8. Ensure the TURB BLDG VENT ISOLATION pushbutton on Panel 11R is depressed/reset before beginning JPM
9. Have a copy of 328, completed up to step 5.1.1 (for only section 5)

STUDENT HANDOUT

Initial Conditions:

- The plant is shutdown
- The Turbine Building Ventilation System has been secured
- All prerequisites to start the Turbine Building Ventilation System have been verified
- Attachments 328-1, 328-2, 328-3 have been completed

Task Cue:

Start the Turbine Building Ventilation System IAW Procedure 328, Turbine Building Heating and Ventilation System, starting at Step 5.1.2

1.0 PURPOSE

To provide detailed instructions for the operation of the Turbine Building Heating and Ventilation System.

2.0 REFERENCES/DEFINITIONS

2.1 Procedures:

- OP-AA-201-006, Control of Temporary Heat Sources

2.2 Drawings:

- BR 2009, Turbine Building H&V - Flow Diagram
- DWG GU 3E-871-21-1000, Sheets 1, Domestic Water and Pretreatment System

2.3 Other

- AR A2063866, Eval 01, 04, & 05 Technical Evaluations to Support Installation of Supplemental Cooling Equipment.
- Tech Eval A2273194-02, TCC Attachment 321-10, for Temporary Domestic Water feed to west roof air-washers.
- Tech Eval 1069881-02 Technical Evaluations to Support Temporary Installation of Heaters for the Feed Pump Room and Temporary exhaust fans for the 4160V Room.
- Tech Eval 1248105 02 support of flex ducting for Attachment 9

2.4 Definitions:

- Turbine Building Ventilation Envelope - an area of the Turbine Building consisting of the Condenser Bay, Heater By, Hi/Lo Conductivity room, Demineralizer room, Demineralizer Regen room, Steam Jet Air Ejector room and the Mechanical Vacuum Pump room.

3.0 PREREQUISITES

3.1 480 Volt Electrical System is in operation in accordance with Operating Procedure 338. **[BB]**

3.2 Well-Domestic Water System should be in operation in accordance with Operating Procedure 321. **[BB]**

3.3 Instrument and Service Air System should be in operation in accordance with Operating Procedure 334. **[BB]**

3.4 125 Volt DC System is in operation in accordance with Operating Procedures 340.1 and 370.3. **[BB]**

3.5 Plant Heating Boiler should be in service in accordance with Operating Procedure 327 when outside air temperature is less than 40°F. **[BB]**

3.6 Area Radiation Monitoring System is in operation in accordance with Operating Procedure 407.2. **[BB]**

3.7 Stack RAGEMS is in operation in accordance with applicable sections of Procedures 406.8. **[BB]**

3.8 Turbine Building RAGEMS system is in operation in accordance with applicable sections of Procedures 406.9. **[BB]**

3.9 All air filters are installed and should be clean. **[BB]**

4.0 Precautions and Limitations

4.1 The Turbine Building should be maintained at a negative pressure as indicated by:

4.1.1 Turbine Building operating floor DP indicator DPI-51-0389 next to Panel ER-74.

4.1.2 Turbine Building Ventilation Envelope DP indicator DPI-821-0001 (Panel 11R in control room) or backup indicator DPI-821-0003. (In ATC-P-17 panel at stack pad)

4.2 Operate the Turbine Building Operating Floor Exhaust Fan (EF-1-33) and Lube Oil Equipment Area Fan EF-1-4 in accordance with the following guidelines:

4.2.1 EF-1-33 and EF-1-4 should normally be operated simultaneously to facilitate optimum effluent monitoring accuracy.

4.2.2 If not already running, EF-1-33 should be started prior to the Turbine Building roof temperature reaching 130°F. (Alarm L-7-e, Roof Temp Hi, setpoint)

4.3 The Turbine Building Operating Floor Exhaust Fan (EF-1-33) shall be shut down in the event of a turbine floor high radiation alarm.

4.4 EF-1-33 control switch must be "ON" to allow for proper operation of SF-1-4 inlet damper. If EF-1-33 is placed in "OFF" with SF-1-4 running, the inlet damper for SF-1-4 will close.

4.5 The Turbine Building Heating and Ventilation System should be operated to maintain a minimum temperature of 50°F in all areas of the Turbine Building.

4.6 During plant operation, a minimum of one reactor or one turbine building ventilation exhaust fan will be operated to provide for dilution of hydrogen in the off gases to the stack.

4.7 The Turbine Building RAGEMS has the capability to continuously monitor the following exhausts:

• Turbine Operating Floor	EF-1-33
• Lube Oil Area	EF-1-4
• Feedpump Room	EF-1-1

4.8 Whenever the Turbine Building RAGEMS Ventilation Flow measuring device is out of service, effluent flow must be estimated using fan capacities. During this period chemistry must be notified when any turbine building exhaust fans are started or shutdown. Chemistry will notify the Control Room when any of the vent flow measuring devices are inoperable.

4.9 In the event of a fire or discharge of the CO_2 Fire Suppression Systems in the Turbine Generator Exciter, Turbine Bearing No. 10, or the 4160 V Switchgear Room refer to Procedure 333, Plant Fire Protection System for purging instructions.

4.10 IF the Heating Boiler is not in service,

THEN the heating coils for the Turbine Building Ventilation System shall be drained and isolated.

4.11

NOTE

A Condenser/Heater Bay negative pressure is airflow direction at any operating floor penetration moving from the Turbine Building Operating Floor down into the Condenser / Heater Bay.

During a refueling outage the Condenser/Heater Bay does **not** have to be maintained at a negative pressure.

4.12 The purpose of the EF-1-1 / SF-1-7 Key Interlock SW-821-1 at MCC1B13 is to allow operations of EF-1-1 with a fault, maintenance or loss of power to SF-1-7. With SW-821-1, EF-1-1 interlock key switch in the BYPASS position, the ability to secure EF-1-1 in the Control Room at Panel 11R is lost. In this configuration, in order to secure EF-1-1, SW-821-1 must be position to the interlock position or the breaker for EF-1-1 at MCC1B13 must be placed in the OPEN position.

4.13 The Feedwater Pump motors supplemental cooling Movincools should be staged in the Feed Pump Room by May 15th of each year and may be removed after September 30th.

5.0 OPERATION OF THE TURBINE BUILDING HEATING AND VENTILATION SYSTEM

5.1 Startup

5.1.1 **VERIFY** Turbine Building Heating and Ventilation System is lined up in accordance with Check Off Lists:

- Attachment 328-1 [BB]
- Attachment 328-2 [BB]
- Attachment 328-3. [BB]

5.1.2

> CAUTION
>
> Step 5.1.3 should be performed immediately after starting exhaust fan EF-1-7, or EF-1-6.

START EF-1-7 by placing EF-1-7 control switch to START. (Panel 11R) [ ]

5.1.2.1 IF EF-1-7 fails to start,

THEN **PERFORM** Steps 1 through 4. [ ]

1.

> NOTE
>
> DM-28-3 and DM-28-4 position indication is located on the west side of the dampers.

> CAUTION
>
> Notify Radiation Protection anytime operating EF-1-6.

CONFIRM Closed Dampers DM-28-8, DM-28-3 and their associated limit switches are made up. [ ]

2. **CONFIRM** Open DM-28-4 and associated limit switches are made up. [ ]

3. **START** EF-1-7 by placing EF-1-7 control switch to START. (Panel 11R in Control Room) [ ]

4. IF EF-1-7 fails to start on the second attempt,

   THEN **PLACE** EF-1-6 in service as follows:

   a. NOTE

      Water drained from EF-1-6 shall be treated as potentially contaminated.

      OPEN V-28-71 to drain any standing water from EF-1-6. [ ]

   b. WHEN water has stopped draining,

      THEN **CLOSE** V-28-71. [ ]

   c. **CONFIRM** closed DM-28-8. [ ]

   d. **CLOSE** DM-28-4. [ ]

   e. **OPEN** DM-28-3. [ ]

   f. **START** Exhaust Fan EF-1-6 by placing EF-1-6 control switch to START. (Panel 11R) [ ]

5.1.3 **START** Supply Fan SF-1-1 or SF-1-2 by placing Control Switch to ON. (Panel 11R)

- Supply Fan SF-1-1 [ ]

  OR

- Supply Fan SF-1-2 [ ]

5.1.4 **START** Supply Fan SF-1-3 or SF-1-4 by placing Control Switch to ON. (Panel 11R)

- Supply Fan SF-1-3 [ ]

  OR

- Supply Fan SF-1-4 [ ]

5.1.5

NOTE

The inlet vortex damper of the operating supply fan (SF-1-3 or SF-1-4) will automatically reposition to the full open position upon starting exhaust fan EF-1-33.

CAUTION

The Turbine Building operating floor exhaust fan shall be shut down in the event of a turbine floor high radiation alarm.

START EF-1-33 by placing EF-1-33 control switch to ON. (Panel 11R) [ ]

5.1.6

NOTE

Exhaust fan EF-1-4 is automatically started.

START SF-1-5 or SF-1-6 by placing the control switch to ON. (Panel 11R)

- Supply Fan SF-1-5 [ ]

  OR

- Supply Fan SF-1-6 [ ]

5.1.7 **VERIFY** that EF-1-4 has started by observing the red indicating light Lit. (Panel 11R) [ ]

5.1.8

NOTE
Exhaust and return Air Modulating Dampers will be automatically controlled to maintain the air temperature leaving the Feedpump Room.

START Feedwater Pump Room Supply Fan, SF-1-7, and Exhaust Fan, EF-1-1, by placing SF-1-7 and EF-1-1 control switch to ON. (Panel 11R) [ ]

5.1.9 **START** "C" 4160V Switchgear Vault exhaust fan FN-59-8 by pressing the FN-59-8 "HIGH" start button, on local panel located outside the east entrance for the "C" 4160V Switchgear Vault. [ ]

5.1.10 **VERIFY** that FN-59-8 has started by observing the red "HIGH" indicating light lit, on local panel located outside the east entrance for the "C" 4160V Switchgear Vault. [ ]

5.1.11 **START** "D" 4160V Switchgear Vault exhaust fan FN-59-19 by pressing the FN-59-19 start button on local panel located outside the east entrance for the "C" 4160V Switchgear Vault. [ ]

5.1.12 **VERIFY** that FN-59-19 has started by observing the red "HIGH" indicating light lit, on local panel located outside the east entrance for the "C" 4160V Switchgear Vault. [ ]

5.1.13 **START** SF-1-22, Machine Shop and Store Room Supply Fan by pressing the local start switch. [ ]

5.1.13.1 **OBSERVE** indicating lights. (Panel 11R) [ ]

5.1.14 **ADJUST** local thermostats in the Turbine Building Machine Shop and Store Room to maintain temperature. [ ]

5.1.15 IF outside temperature is above 44°F,

THEN **PLACE** Air Washers in service by performing the following:

5.1.15.1 **CONFIRM** TCC temporary domestic water supply to air-washers 1, 2, and 3 installed in accordance with Procedure 328-10, E10-1 [ ]

5.1.15.2 **CONFIRM** Domestic Water Supplying Air-washers via the TCC by performing the following:

1. **CONFIRM** CLOSE V-10-361
(TCC supply to AW-1-1)
AIR WASHER 1-1 SUPPLY LINE DRN VALVE. [ ]

2. **CONFIRM** CLOSE V-10-63
AIR WASHER 1-1 ISOLATION VALVE.
(TBOF West Roof Area,
East side of AW M-59-001) [ ]

3. **CONFIRM** CLOSE V-10-362
(TCC supply to AW-1-2)
AIR-WASHER 1-2 SUPPLY LINE DRN VALVE. [ ]

4. **CONFIRM** CLOSE V-10-64
AIRWASHER AW-1-2 ISOLATION VALVE. [ ]

5 **CONFIRM** CLOSE V-10-359
(TCC supply to AW-1-3)
AIR-WASHER 1-3 SUPPLY LINE DRN VALVE. [ ]

6. **CONFIRM** CLOSE V-10-65
AIR-WASHER AW-1-3 ISOLATION VALVE. [ ]

7. **CONFIRM** CLOSE V-10-2T TCC Drain Valve. [ ]

8. **CONFIRM** CLOSE V-10-1T TCC Supply Valve. [ ]

9. **OPEN** V-10-48
DOMESTIC WATER SYSTEM DRAIN VALVE. [ ]

10. **SLOWLY** OPEN V-10-1T TCC Supply Valve. [ ]

5.1.15.3 Air Washer M-59-001

1. **CLOSE** V-10-213, Bypass Valve for V-10-212. [ ]
2. **CONFIRM** CLOSE V-10-63, Domestic Water Shutoff Valve. (TBOF West Roof Area, East side of Air Washer M-59-001) [ ]
3. **CLOSE** V-10-286, Air Washer Drain Valves. [ ]
4. **OPEN** V-10-361, Air Washer Drain Valves. (TTC supply to AW-1-1) [ ]
5. **CONFIRM** that the air washer water tank has been filled via the local fill valve before proceeding to the next step. [ ]
6. **START** Air Washer P-59-001 Spray Pump by closing Breaker MCC 1B11 (C04). [ ]
7. **CONFIRM** #1Air Washer Lo ΔP Alarm Bypass switch behind Panel 4F in OFF. [ ]

5.1.15.4 Air Washer M-59-002

1. **CLOSE** V-10-228, Bypass Valve for V-10-227. [ ]
2. **CONFIRM** CLOSE V-10-64, Domestic Water Shutoff Valve. [ ]
3. **CLOSE** V-10-287, Air Washer Drain Valve. [ ]
4. **OPEN** V-10-362, Air Washer Drain Valve. (TTC supply to AW-1-2) [ ]
5. **CONFIRM** that the air washer water tank has been filled via the local fill valve before proceeding to the next step. [ ]
6. **START** Air Washer P-59-002 Spray Pump by closing Breaker MCC 1A12 (E02). [ ]
7. **CONFIRM** #2 Air Washer Lo ΔP Alarm Bypass switch behind Panel 4F in OFF. [ ]

5.1.15.5 Air Washer M-59-003

1. **CLOSE** V-10-251, Bypass Valve for V-10-250. [ ]
2. **CONFIRM** CLOSE V-10-65, Domestic Water Shutoff Valve. [ ]
3. **CLOSE** V-10-288, Air Washer Drain Valve. [ ]
4. **OPEN** V-10-359, Air Washer Drain Valve. (TTC supply to AW-1-3) [ ]
5 **CONFIRM** that the air washer water tank has been filled via the local fill valve before proceeding to the next step. [ ]
6. **START** Air Washer P-59-003 Spray Pump by closing Breaker MCC 1B12 (E04). [ ]
7. **CONFIRM** #3 Air Washer Lo ΔP Alarm Bypass switch behind Panel 4F in OFF. [ ]

5.1.15.6 **MONITOR** Air Washer(s) for correct operation. [ ]

5.1.16

NOTE

Single Air Washers can be removed from service by performing individual Sections. 5.1.16.2, 5.1.16.3, 5.1.16.4.

If draining for temperature or TCC removal all of 5.1.16 must be performed.

REMOVE Air Washers from service by performing the following:

5.1.16.1 IF outside temperature is below 44°F,

THEN **CONFIRM** that the air washer water tank has been drained via the local drain valves by performing the following:

5.1.16.2 Air Washer M-59-001

1. **STOP** Air Washer P-59-001 Spray Pump by opening Breaker MCC 1B11 (C04). [ ]
2. **CLOSE** V-10-361, (TCC supply to AW-1-1) AIR-WASHER 1-1 SUPPLY LINE DRAIN VALVE. [ ]
3. **OPEN** V-10-286, Air Washer Drain Valve. [ ]
4. **PLACE** #1 Air Washer Lo ΔP Alarm switch behind 4F in BYPASS. [ ]

5.1.16.3 Air Washer M-59-002

1. **STOP** Air Washer P-59-002 Spray Pump by opening breaker MCC 1A12 (E02). [ ]
2. **CLOSE** V-10-362, (TCC supply to AW-1-2) AIR-WASHER 1-2 SUPPLY LINE DRAIN VALVE. [ ]
3. **OPEN** V-10-287, Air Washer Drain Valve. [ ]
4. **PLACE** #2 Air Washer Lo ΔP Alarm switch behind 4F in BYPASS. [ ]

5.1.16.4 Air Washer M-59-003

1. **STOP** Air Washer P-59-003 Spray Pump by opening breaker MCC 1B12 (E04). [ ]
2. **CLOSE** V-10-359, (TCC supply to AW-1-3) AIR-WASHER 1-3 SUPPLY LINE DRAIN VALVE. [ ]
3. **OPEN** V-10-288, Air Washer Drain Valve. [ ]
4. **PLACE** #3 Air Washer Lo ΔP Alarm Bypass Switch in BYPASS. [ ]

5.1.16.5 Air washer removal for temperature or TCC removal

1. **CONFIRM** Sections 5.1.16.2, 5.1.16.3, 5.1.16.4 Complete. [ ]

2. **CLOSE** V-10-48 DOMESTIC WATER SYSTEM DRAIN VALVE [ ]

3. **CLOSE** V-10-1T TCC Supply Valve. [ ]

4. **OPEN** V-10-2T TCC Drain Valve. [ ]

5. **OPEN** V-10-361 (TCC supply to AW-1-1) AIR WASHER 1-1 SUPPLY LINE DRN VALVE [ ]

6 **OPEN** V-10-213, bypass valve for V-10-212. [ ]

7. **OPEN** V-10-362 (TCC supply to AW-1-2) AIR-WASHER 1-2 SUPPLY LINE DRN VALVE. [ ]

8. **OPEN** V-10-228, bypass valve for V-10-227. [ ]

9. **OPEN** V-10-359 (TCC supply to AW-1-3) AIR-WASHER 1-3 SUPPLY LINE DRN VALVE. [ ]

10. **OPEN** V-10-251, bypass valve for V-10-250. [ ]

5.1.17 IF the TCC is to be removed for Winterization,

THEN **COMPLETE** 328-10 for TCC Removal. [ ]

5.1.18 IF the associated fans for an Air Washer have been shutdown,

THEN **PLACE** associated Air Washer Lo ΔP Alarm Bypass switch in BYPASS. [ ]

5.1.19

> NOTE
>
> Pressure switches on the Turbine Operating Floor are set to trip at a positive pressure of 1.0" W.G., which will isolate the Turbine Building supply and exhaust fans. This is to prevent over pressurizing of the Turbine Building. A red light on Panel 11R will give proof that the fan trip was caused by these switches. A reset button provided just below this red light must be depressed to reset this trip signal. A green indication will indicate a reset condition. At this time the affected fans may be restarted.

CHECK that negative pressure is maintained in the Turbine Building as indicated by:

- T.B. Operating Floor: DP indicator DPI-51-0389 next to Panel ER-74 [ ]
- Turbine Building Ventilation Envelope [ ]
- DP Indicator DPI-821-0001 (Panel 11R in Control Room) [ ]

  OR

- Backup indicator DPI-821-0003 (In ATC-P-17 panel at stack pad) [ ]

5.1.20 **PLACE** heating coils in operation by performing the following:

5.1.20.1 **CONFIRM** Air washers are secured in accordance with Section 5.1.12 of this procedure:

- Air Washer M-59-001 [ ]
- Air Washer M-59-002 [ ]
- Air Washer M-59-003 [ ]

5.1.20.2 **CONFIRM** Plant Heating Boiler in service in accordance with Procedure 327. [ ]

5.1.20.3 **CONFIRM** Open V-13-474, HC 1-1 Header Isolation Valve. [ ]

5.1.20.4 **LINE UP** HC 1-1, Heating Coil I in accordance with Attachment 328-7A. [ ]

5.1.20.5 **CONFIRM** Open V-13-155, HC 1-2 Header Isolation Valve. [ ]

5.1.20.6 **CONFIRM** Open V-13-157, HC 1-2 Header Isolation Valve. [ ]

5.1.20.7 **LINE UP** HC 1-2, Heating Coil in accordance with Attachment 328-7B. [ ]

5.1.20.8 **CONFIRM** Open V-13-173, HC 1-3 Header Isolation Valve. [ ]

5.1.20.9 **LINE UP** HC 1-3, Heating Coil in accordance with Attachment 328-7C. [ ]

5.1.20.10 **CONFIRM** Trap Y-13-45 inservice by performing the following:

1. **OPEN** V-13-137. [ ]
2. **OPEN** V-13-140. [ ]

5.1.20.11 **SHUT** V-13-138. [ ]

ATTACHMENT 328-1

Turbine Building Heating and ventilation System Check Off List

Valve Check Off List

VALVE NUMBER	TYPE OPER	FUNCTION	POSITION	CONTROL LOCATION	INITIAL CHECK/VERIFY
V-28-71	M	EF-1-6 Drain	C	Bottom of Fan Housing	cc / bb
V-13-283	M	Condensate Return Valve to T-13-002	C	MS23-6	cc / bb
V-13-362	M	Steam Supply to H-13-003, 4 & 5	C	MS23-6	cc / bb

M-59-001 AIR WASHER VALVE CHECK LIST

VALVE NUMBER	TYPE OPER	FUNCTION	POSITION	CONTROL LOCATION	INITIAL CHECK/VERIFY
V-10-63	M	TBOF West Roof Area East side of Air Washer M-59-001	C	4160V Swgr. Rm.	cc / bb
V-10-212	AO	D.W. Auto Makeup	C	Roof	cc / bb
V-10-213	M	Bypass Valve for V-10-212	O	Roof	cc / bb
V-10-211	M	D.W. Makeup Valve	O	Roof	cc / bb
V-10-360	AO	Air Washer Auto Drain	C	Roof	cc / bb
V-10-286	M	Air Washer Drain	O	Roof	cc / bb

M-59-002 AIR WASHER VALVE CHECK LIST

VALVE NUMBER	TYPE OPER	FUNCTION	POSITION	CONTROL LOCATION	INITIAL CHECK/VERIFY
V-10-64	M	Domestic Water Makeup Shut Off	C	Roof	cc / bb
V-10-227	AO	D.W. Auto Makeup	C Manual	Roof	cc / bb
V-10-228	M	Bypass Valve for V-10-227	O	Roof	cc / bb
V-10-226	M	D.W. Makeup Valve	O	Roof	cc / bb
V-10-375	AO	Air Washer Auto Drain	C	Roof	cc / bb
V-10-287	M	Air Washer Drain	O	Roof	cc / bb

ATTACHMENT 328-1
(Continued)

Turbine Building Heating and ventilation System Check Off List

Valve Check Off List

VALVE NUMBER	TYPE OPER	FUNCTION	POSITION	CONTROL LOCATION	INITIAL CHECK/VERIFY
		M-59-003 AIR WASHER VALVE CHECK LIST			
V-10-65	M	Domestic Water Makeup Shut Off	C	Roof	cc / bb
V-10-250	AO	D.W. Auto Makeup	C	Roof	cc / bb
V-10-251	M	Bypass Valve for V-10-250	O	Roof	cc / bb
V-10-248	M	D.W. Makeup Valve	O	Roof	cc / bb
V-10-289	AO	Air Washer Auto Drain	C	Roof	cc / bb
V-10-288	M	Air Washer Drain	O	Roof	cc / bb

Checked By: ____________ Date: Today Time: then

Verified By: ____________ Date: Today Time: then

Reviewed and Approved By: ____________ Date: Today Time: then

US

Remarks: ____________

ATTACHMENT 328-2

Electrical Check Off List

ITEM	SUPPLY	LOCATION	POSITION	INITIAL CHECK/VERIFY
Supply Fans				
SF-1-1	MCC1A11	Turb. Bldg Base	C	cc / bb
SF-1-2	MCC1B13	Turb. Bldg Base	C	cc / bb
SF-1-3	MCC1A12	Turb. Bldg North	C	cc / bb
SF-1-4	MCC1B12	Turb. Bldg North	C	cc / bb
SF-1-5	MCC1A12	Turb. Bldg North	C	cc / bb
SF-1-6	MCC1B11	Turb. Bldg North	C	cc / bb
SF-1-7	MCC1B11	Turb. Bldg Base	C	cc / bb
SF-1-22	MCC1A11	Turb. Bldg South	C	cc / bb
Exhaust Fans				cc / bb
EF-1-1	MCC1B13	Turb. Bldg Base	C	cc / bb
EF-1-2	MCC1A12	Turb. Bldg North	C	cc / bb
EF-1-3	MCC1B12	Turb. Bldg North	C	cc / bb
EF-1-4	MCC1B12	Turb. Bldg North	C	cc / bb
EF-1-6	US1B2	460V S.G. Room	C	cc / bb
EF-1-7	MCC1B24	Boiler House	C	cc / bb
EF-1-23	UF-2 (SW#10)	Machine Shop	*	cc / bb
EF-1-33	MCC1A12	Turb. Bldg North	C	cc / bb
T-13-1 Pumps				
P-13-1A	MCC1A11A	Turb. Bldg Base	O	cc / bb
P-13-1B	MCC1B11	Turb. Bldg Base	O	cc / bb
P-13-1A	TB22-976	Control Switch	OFF	cc / bb
P-13-B	TB22-976	Control Switch	OFF	cc / bb

ATTACHMENT 328-2 (continued)

Electrical Check Off List

ITEM	SUPPLY	LOCATION	POSITION	INITIAL CHECK/VERIFY
4160 V Switchgear Vault Exhaust Roof Ventilators				
FN-59-008	SP-1D Bkr 18	Turb. Bldg. Mezzanine	C	cc / bb
FN-59-019	SP-1D Bkr 18	Turb. Bldg. Mezzanine	C	cc / bb
FN-59-027	DP-B1 Bkr 6	Turbine Bldg Bsmt South	C	cc / bb
Interlock Switch				
SW-821-1	MCC1B13	Turb. Bldg. Basement	INTERLOCK	cc / bb

Checked By: ______________ Date: today Time: then

Verified By: ______________ Date: today Time: then

Reviewed and Approved By: ______________ US Date: Today Time: then

Remarks: ______________

- Position based on ventilation needs.
- T-13-1 is retired in place.

ATTACHMENT 328-3

Damper Line-Up for Turbine Building Heating and Ventilation System

DAMPER I.D. NUMBER	TYPE OF OPERATOR	FUNCTION	CONTROL LOCATION	POSITION	INITIAL CHECK/VERIFY
DM-59-020	M	SF-1-1 Inlet	West Roof	Open	cc / bb
DM-59-021	M	SF-1-2 Inlet	West Roof	Open	cc / bb
DM-59-022	A	SF-1-1 Outlet	West Roof	*	cc / bb
DM-59-023	A	SF-1-2 Outlet	West Roof	*	cc / bb
DM-59-080	A	SF-1-3 Outlet	West Roof	*	cc / bb
DM-59-081	A	SF-1-4 Outlet	West Roof	*	cc / bb
DM-59-040	A	SF-1-3 Vortex	West Roof	**	cc / bb
DM-59-050	A	SF-1-4 Vortex	West Roof	**	cc / bb
DM-59-029	A	SF-1-5 Outlet	N.W. Roof	*	cc / bb
DM-59-030	A	SF-1-6 Outlet	N.W. Roof	*	cc / bb
DM-59-027	M	SF-1-5 Inlet	N.W. Roof	Open	cc / bb
DM-59-028	M	SF-1-6 Inlet	N.W. Roof	Open	cc / bb
DM-59-037	A	SF-1-7 Inlet Damper	East Roof	*	cc / bb
DM-59-041	A	F.P. Rm. Exhaust Damper	East Roof	***	cc / bb
DM-59-049	M	SF-1-7 Vortex	East Roof	O	cc / bb
DM-59-043	M	EF-1-1 Vortex	East Roof	O	cc / bb
DM-59-042	A	SF-1-7 Recirc	East Roof	C	cc / bb
DM-59-038	A	EF-1-1 Recirc Damper	East Roof	***	cc / bb
DM-59-048	A	EF-1-33 Vortex	West Roof	**	cc / bb

ATTACHMENT 328-3
(Continued)

Damper Line-Up for Turbine Building Heating and Ventilation System

DAMPER I.D. NUMBER	TYPE OF OPERATOR	FUNCTION	CONTROL LOCATION	POSITION	INITIAL CHECK/VERIFY
DM-28-004	M	EF-1-7 Inlet	Stack Pad	O	cc / bb
DM-28-003	M	EF-1-6 Inlet	Stack Pad	C	cc / bb
DM-28-005	M	EF-1-7 Vortex	Stack Pad	O	cc / bb
DM-28-008	M	EF-1-6 Inlet	Stack Pad	O	cc / bb
DM-28-009	M	EF-1-6 Vortex	Stack Pad	O	cc / bb

NOTES: Vortex dampers DM-28-005 and DM-28-009 for EF-1-7 and EF-1-6 respectively, shall be manually operated.

* - Dampers open automatically upon fan start and close upon fan trip.

** - Vortex damper for SF-1-3 or SF-1-4 will automatically reposition to a throttled position when EF-1-33 is shutdown, and will open fully when EF-1-33 is started. Vortex damper for EF-1-33 will modulate automatically to maintain the Turbine Building operating floor at approximately (-) 0.1" W.G. as read on DP indicator located in Panel ER 74.

*** - Feedpump room ventilation exhaust damper and recirc damper will modulate automatically and are dependant on return air temperature from the feedpump room.

During the summer season recirc damper DN-59-038 located above the inlet air filter shall be verified closed and the exhaust damper DM-59-041 shall be verified to be 75% open as a minimum.

Facility: Oyster Creek　　Task No.: 2150201401

Task Title: Perform an APRM Gain Adjustment

Job Performance Measure No.: NRC Control Room JPM 8

K/A Reference: 215005 A4.03 (RO 3.2/SRO 3.3)

Examinee: ____________　　Examiner: ____________

Facility Evaluator: ____________　　Date: ____________

Method of Testing:

Simulated Performance ________　　Actual Performance X

Classroom ________　　Simulator X　　Plant ________

Read to the Examinee:

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

Initial Conditions:

- Reactor Recirculation flow was just adjusted to attain 100% reactor power a short while ago.
- Reactor power has been steady for the last 5 minutes.
- Procedure 403 allows bypassing APRM 8.
- The procedure revision, prerequisites and precautions and limitations have been verified by the Unit Supervisor.
- APRM 8 is the ONLY APRM that requires an adjustment.

Task Standard:

APRM 8 should indicate 100% ± 1% of Core Thermal Power (by meter on Panel 5R) and APRM 8 has been UNBYPASSED on Panel 4F.

Required Materials: None.

General References:

1. 202.1-9, APRM Gain Adjustment From Heat Balance (Hard Card), revision 148

Initiating Cue:

Perform an APRM Gain Adjustment on APRM 8 IAW Attachment 202.1-9 starting at step 2.

Time Critical Task: NO

Validation Time: 5 minutes

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Reviews Procedure revision, Prerequisites, and Precautions and Limitations.

Standard: Acknowledges the Initial Conditions state that the procedure revision, prerequisites and precautions and limitations have been verified with the US.

CUE: This was given in the Initial Conditions and the student may initial the step in section 1.0 as completed.

Comment:

SAT/UNSAT

Performance Step: 3

Procedure Step: 2.1

Allow reactor power to stabilize for at least 2 minutes.

Standard: The student verifies from the Initial Conditions that reactor power has been stabilized for at least 2 minutes.

CUE: The Initial Conditions state that reactor power has been stable for 5 minutes.

Comment:

SAT/UNSAT

✓ Performance Step: 4

Procedure Step: 2.2

If allowed by 403, bypass APRM 8.

Standard: Verifies from the Initial Conditions that Bypassing APRM 8 is allowed by Procedure 403.

Bypasses APRM 8 on Panel 4F by placing the APRM BYPASS joystick in the CH 8 position.

CUE: If the applicant begins reviewing Procedure 403, inform them (as stated in the Initial Conditions) 403 has already been reviewed and Bypassing APRM 8 is allowed.

Comment:

SAT/UNSAT

Performance Step: 5

Procedure Step: 2.3

Pull out the APRM 8 drawer.

Standard: Pulls out APRM Drawer 8 on Panel 5R to allow access to the R10 screw (Gain adjustment screw).

Comment:

SAT/UNSAT

✓ Performance Step: 6

Procedure Step: 2.4

Turn the gain adjustment pot with a small screwdriver (R10 on calibration and feedback unit) clockwise to raise gain or counterclockwise to lower gain while monitoring APRM output on the APRM 8 drawer.

Standard: Inserts small screwdriver and turns CCW or CW to change APRM power indication.

Comment:

SAT/UNSAT

✓ Performance Step: 7

Procedure Step: 2.5

When output on APRM 8 drawer matches required APRM setting within 1%, then stop gain adjustment.

Standard: When output on APRM 8 drawer matches required APRM (on PPC Heat Balance) setting within 1%, then stops gain adjustment. With reactor power at 100%, APRM 8 should indicate 100% $\pm$ 1% of Core Thermal Power by meter indication on Panel 5R.

Comment:

SAT/UNSAT

Performance Step: 8

Procedure Step: 2.6

Verify the following:

- FCTR Card Status light is GREEN
- FCTR Active LEDs are GREEN
- FCTR Curve Select Display is Zero

Standard: Completes verification of FCTR card status light as green, FCTR active LED's are green, FCTR curve select display as zero

CUE: FCTR Card status light and Active LEDs are GREEN

FCTR Curve select display is Zero

Comment:

SAT/UNSAT

Performance Step: 9

Procedure Step: 2.7

Push in Selected drawer since FCTR card indications are indicating correctly

Standard: APRM drawer pushed back into panel

Comment:

SAT/UNSAT

✓ Performance Step: 10

Procedure Step: 2.8

Un-bypasses APRM 8.

Standard: Places the APRM 8 BYPASS joystick to the center position.

Comment:

SAT/UNSAT

Performance Step: 11

Procedure Step: 2.9

If another APRM channel in the same drawer requires adjustment, then perform the APRM adjustment IAW steps 2.2 through 2.6.

Standard: Determines that no other APRM adjustments are required from the Initial Conditions.

CUE: Student will inform evaluator that APRM 8 Gain has been adjusted.

Comment:

SAT/UNSAT

Terminating Cue:
APRM 8 should indicate 100% $\pm$ 1% of Core Thermal Power (by meter on Panel 5R) and APRM 8 has been UNBYPASSED on Panel 4F.

JPM Stop Time: __________

Validation of Completion

JPM Number: NRC Control Room JPM 8

Examinee's Name: ____________________

Examiner's Name: ____________________

Date Performed: ____________________

Facility Evaluator: ____________________

Number of Attempts: ____________________

Time to Complete: ____________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ____________________ ____________________

Simulator Setup

1. Reset the simulator to IC-115 or other rated power IC.
2. Change APRM 8 gain so that the APRM reads > 104%.
3. Have a blank copy of Attachment 202.1-9 rev 146, APRM Gain Adjustment From Heat Balance (Hard Card).
4. Ensure Heat Balance is displayed on PPC between Panel 3R and 4R.
5. Ensure APRMs 1 through 7 indicate 100%.
6. Ensure all APRM drawers are fully pushed in and latched.
7. Have a copy of procedure 403 for the students to Bypass APRM 8.
8. Have a copy of Attachment 403-2 which shows APRM bypass is allowed.

STUDENT HANDOUT

Initial Conditions:

- Reactor Recirculation flow was just adjusted to attain 100% reactor power a short while ago.
- Reactor power has been steady for the last 5 minutes.
- Procedure 403 allows bypassing APRM 8.
- The procedure revision, prerequisites and precautions and limitations have been verified by the Unit Supervisor.
- APRM 8 is the ONLY APRM that requires an adjustment.

Initiating Cue:

Perform an APRM Gain Adjustment on APRM 8 in accordance with Attachment 202.1-9 starting at step 2.

ATTACHMENT 202.1-9

APRM GAIN ADJUSTMENT FROM HEAT BALANCE (HARD CARD)

(202.1, Section 4.15.2.1)

1.0 **VERIFY** with the Unit Supervisor that the following support use of the Hard Card:

- Procedure revision [BB]
- Prerequisites [BB]
- Precautions and Limitations [BB]

2.0 APRM GAIN ADJUSTMENT

2.1 **ALLOW** reactor to stabilize for at least 2 minutes. [ ]

2.2 IF allowed by Procedure 403,
THEN **BYPASS** the APRM channel. [ ]

2.3 **PULL** out selected APRM drawer. [ ]

2.4 **TURN** the gain adjustment pot with a small screwdriver (R10 on calibration and feedback unit) clockwise to raise gain or counterclockwise to lower gain while monitoring APRM output on the selected drawer. [ ]

2.5 WHEN output on the selected drawer matches required APRM setting within 1%,
THEN **STOP** gain adjustment. [ ]

2.6 **VERIFY** the following:

- FCTR Card Status Light is Green [ ]
- FCTR Active LED's are green [ ]
- FCTR Curve Select Display is Zero (0) [ ]

2.7 IF any FCTR Card indications are not indicating correctly,
THEN **STOP** and NOTIFY the US, [ ]
OTHERWISE **PUSH** in selected drawer. [ ]

2.8 IF the APRM channel was bypassed,
THEN **UNBYPASS** the APRM channel. [ ]

2.9 IF another APRM channel in the same drawer requires adjustment,
THEN **PERFORM** the APRM channel adjustment IAW Steps 2.2 through 2.8 above. [ ]

3.0 **REFER** to Procedure 202.1 if problems are encountered. [ ]

Performance Information

Facility: Oyster Creek   Task No.: 2000501441

Task Title: Vent the Scram Air Header

Job Performance Measure No.: NRC In-Plant JPM 1

K/A Reference: 295037 EA1.05 (3.9/4.0)

Examinee: ______   Examiner: ______

Facility Evaluator: ______   Date: ______

Method of Testing:

Simulated Performance X   Actual Performance ______

Classroom ______   Simulator ______   Plant X

Read to the Examinee:

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

Initial Conditions:

- The plant was at rated power when a valid RPS scram signal occurred.
- RPS failed to de-energize and insert control rods.

Task Standard:

The scram air header has been vented and then restored to normal

Required Materials: None.

General References:

1. EMG-SP21, Alternate Insertion of Control Rods, revision 1

Initiating Cue: Vent the scram air header IAW EMG-SP21, section 4.3

Time Critical Task: NO

Validation Time: 2 minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

✓ Performance Step: 2

Procedure Step: 4.3.1

Close Scram Air Header isolation valve V-6-175 (RB 23 SE)

Standard: Closes Scram Air Header isolation valve V-6-175 (RB 23 SE) by rotating the valve operator CW until motion stops

Cue: Scram Air Header isolation valve V-6-175 is closed

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 3

Procedure Step: 4.3.2

Open Scram Air Header drain valve V-6-409 (RB 23 SE)

Standard: Opens Scram Air Header drain valve V-6-409 (RB 23 SE) by rotating the valve operator CCW until motion stops

Cue:
- Scram Air Header drain valve V-6-409 is open and air is heard rushing out the vent
- The Control Room notifies you that all control rods indicate full-in

Comment:

SAT/UNSAT

✓ Performance Step: 4

Procedure Step: 4.3.3.1

When control rods are no longer moving in, then perform the following:

1. Close Scram Air Header drain valve V-6-409 (RB 23 SE)

Standard: Closes Scram Air Header drain valve V-6-409 (RB 23 SE) by rotating the valve operator CW until motion stops

Cue: Scram Air Header drain valve V-6-409 is closed

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 5

Procedure Step: 4.3.3.2

When control rods are no longer moving in, then perform the following:

2. Open Scram Air Header isolation valve V-6-175 (RB 23 SE)

Standard: Opens Scram Air Header isolation valve V-6-175 (RB 23 SE) by rotating the valve operator CCW until motion stops

Cue: Scram Air Header isolation valve V-6-175 is open

Comment: ______________________________

____

SAT/UNSAT ______________________________

Terminating Cue: The scram air header has been vented and then restored to normal

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC In-Plant JPM 1

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ________________ ________________

JPM Setup

1. Have a copy of EMG-SP21 for the applicant.

STUDENT HANDOUT

Initial Conditions:

- The plant was at rated power when a valid RPS scram signal occurred.
- RPS failed to de-energize and insert control rods occurred.

Task Cue:

Vent the scram air header IAW EMG-SP21, section 4.3

There will be no manipulations of plant components.

All mainuplations are to be simulated.

4.0 ELECTRICAL ATWS

4.1 **PERFORM** the following methods of control rod insertion for electrical ATWS in any order or concurrently. [ ]

4.2 Manual Rod Insertion

4.2.1 **CONFIRM** all available CRD pumps are running. (Panel 4F) [ ]

4.2.2 IF no CRD pump is in service,

THEN **INSERT** Control rods using other methods [ ]

4.2.3 **PLACE** Reactor Mode Switch in REFUEL. (Panel 4F) [ ]

4.2.4 **PLACE** the ROD WORTH MINIMIZER keylock in BYPASS (Panel 4F). [ ]

4.2.5 **CLOSE** CRD DRIVE WATER PRESSURE CONTROL NC18 to maximize CRD drive water differential pressure. (Panel 4F) [ ]

4.2.6 IF CRD Bypass valve V-15-30 is open for RPV injection,

THEN **CLOSE** CRD Bypass valve V-15-30. (RB 23 SE) [ ]

4.2.7 **INSERT** Cram Array Control Rods. [ ]

4.2.8 **INSERT** remaining Control Rods as directed by the US. [ ]

4.3 Vent the Scram Air Header

4.3.1 **CLOSE** Scram Air Header isolation valve V-6-175. (RB 23 SE) [ ]

4.3.2 **OPEN** Scram Air Header vent valve V-6-409. (RB 23 SE) [ ]

4.3.3 WHEN control rods are no longer moving in,

THEN **PERFORM** the following:

1. **CLOSE** Scram Air Header vent valve V-6-409. (RB 23 SE) [ ]

2. **OPEN** Scram Air Header isolation valve V-6-175 (RB 23 SE) [ ]

4.4 De-energize the Scram Solenoids

4.4.1 IF MSIVs are OPEN,

THEN **PERFORM** the following:

1. **PLACE** the following Sub channel Test Keylocks in the TRIP position. (Panels 6R/7R)

   - RPS Sub Channel 1A Keylock (Panel 6R) [ ]
   - RPS Sub Channel 1B Keylock (Panel 6R) [ ]
   - RPS Sub Channel 2A Keylock (Panel 7R) [ ]
   - RPS Sub Channel 2B Keylock (Panel 7R) [ ]

2. WHEN the control rods are no longer moving in,

   THEN **PLACE** the RPS Channel I and II Sub channel Test Keylocks in the NORMAL position. [ ]

OVER

Facility: Oyster Creek   Task No.: 2640101401

Task Title: Start Diesel Generator 1 for Peaking Operations

Job Performance Measure No.: NRC In-Plant JPM 2

K/A Reference: 264000 K4.07 (3.3/3.4)

Examinee: ____________ Examiner: ____________

Facility Evaluator: ____________ Date: ____________

Method of Testing:

Simulated Performance X   Actual Performance ______

Classroom ______ Simulator ______ Plant X

Read to the Examinee:

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

Initial Conditions:

- The plant is at rated power.
- The electrical grid is stable.
- All prerequisites for starting EDG 1 have been verified.

Task Standard:

EDG 1 is started and loaded to within limits.

Required Materials: None.

General References:

1. Procedure 341, Emergency Diesel Generator Operation, Revision 110

Initiating Cue:

Start EDG 1 for Peaking Operations IAW Procedure 341, Emergency Diesel Generator Operation, starting at Step 7.3.1.3.

Time Critical Task: NO

Validation Time: 20 minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Reviews Precautions and Limitations.

Standard: Reviews Precautions and Limitations

Comment:

SAT/UNSAT

✓ Performance Step: 3

Procedure Step: 7.3.1.3

Place EDG-1 MODE SELECTOR SWITCH in the IDLE position

Standard: Places EDG-1 MODE SELECTOR SWITCH in the IDLE position

Cue: The EDG-1 MODE SELECTOR SWITCH in the IDLE position

Comment:

SAT/UNSAT

Performance Information

✓ **Performance Step: 4**

Procedure Step: 7.3.1.4

Start EDG-1 by placing the STOP/START SWITCH in the START position

Standard: Starts EDG-1 by placing the STOP/START SWITCH in the START position (EDG speed rises)

Cue: The STOP/START SWITCH in the START position. The EDG has started. The EDG is running at idle speed

Comment:

SAT/UNSAT

✓ **Performance Step: 5**

Procedure Step: 7.3.1.5

Place EDG-1 MODE SELECTOR SWITCH in the RUN position

Standard: Places EDG-1 MODE SELECTOR SWITCH in the RUN position after about 90 seconds

Cue: The EDG-1 MODE SELECTOR SWITCH in the RUN position and the EDG noise has risen.

Note: 90 seconds is not critical

Comment:

SAT/UNSAT

Performance Information

Performance Step: 6

Procedure Step: 7.3.1.6

Verify engine speed increases

Standard: Verifies engine speed increases

Cue: The EDG speed and noise has increased.

Comment:

SAT/UNSAT

✓ Performance Step: 7

Procedure Step: 7.3.1.7

Place EDG-1 MODE SELECTOR SWITCH in the EXC position

Standard: Places EDG-1 MODE SELECTOR SWITCH in the EXC position

Cue: The EDG-1 MODE SELECTOR SWITCH in the EXC position

Comment:

SAT/UNSAT

Performance Step: 8

Procedure Step: 7.3.1.8

Compare EDG-1 output voltage with line voltage using the KILOVOLT METER selecting any GEN or BUS position on the VOLTAGE/FREQUENCY SELECTOR SWITCH

Standard: Compares EDG-1 output voltage with line voltage using the KILOVOLT METER selecting any GEN or BUS position on the VOLTAGE/FREQUENCY SELECTOR SWITCH

Cue: GEN volts is 3900 volts; BUS volts is 4160 volts

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 9

Procedure Step: 7.3.1.9

Adjust EDG-1 output voltage to be slightly higher than line voltage using the VOLTAGE CONTROL SWITCH

Standard: Adjusts EDG-1 output voltage to be slightly higher than line voltage using the VOLTAGE CONTROL SWITCH in the RAISE position

Cue: GEN volts is 4200 volts; BUS volts is 4160 volts

Comment:

SAT/UNSAT

✓ Performance Step: 10

Procedure Step: 7.3.1.10.1

Place EDG-1 SYNCHROSCOPE ON/OFF SWITCH in the ON position with the synchroscope key

Standard: Places EDG-1 SYNCHROSCOPE ON/OFF SWITCH in the ON position with the synchroscope key. The synchroscope is rotating slowly in the fast direction.

Cue: The EDG-1 SYNCHROSCOPE ON/OFF SWITCH in the ON position and the synchroscope is rotating slowly in the fast direction

Comment:

SAT/UNSAT

Performance Information

Performance Step: 11

Procedure Step: 7.3.1.10.2

Operate EDG-1 GOVERNOR CONTROL SWITCH so that the synchroscope hand is moving slowly in the fast direction, and the synchronizing lights are pulsing slowly in unison

Standard: Confirms the synchroscope is rotating slowly in the fast direction and the synchronizing lights are pulsing slowly in unison

Cue: The synchroscope is rotating slowly in the fast direction and the synchronizing lights are pulsing slowly in unison

Comment:

SAT/UNSAT

Performance Step: 12

Procedure Step: 7.3.1.10.3

Verify EDG-1 output voltage is slightly higher than line voltage

Standard: Verifies EDG-1 output voltage is slightly higher than line voltage

Cue: GEN volts is 4200 volts; BUS volts is 4160 volts

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 13

Procedure Step: 7.3.1.10.4

Place EDG-1 VOLTAGE/FREQUENCY SELECTOR SWITCH in one of the following positions; GEN 1-2, GEN 2-3, or GEN 3-1

Standard: Places EDG-1 VOLTAGE/FREQUENCY SELECTOR SWITCH in one of the following positions; GEN 1-2, GEN 2-3, or GEN 3-1

Cue: The EDG-1 VOLTAGE/FREQUENCY SELECTOR SWITCH in one of the following positions; GEN 1-2, GEN 2-3, or GEN 3-1

Comment:

SAT/UNSAT

Performance Step: 14

Procedure Step: 7.3.1.10.5

Confirm the synchroscope hand is moving slowly in the fast direction

Standard: Confirms the synchroscope hand is moving slowly in the fast direction

Cue: The synchroscope hand is moving slowly in the fast direction

Comment:

SAT/UNSAT

✓ Performance Step: 15

Procedure Step: 7.3.1.10.6

When EDG-1 synchroscope hand reaches the eleven o'clock position, then place EDG-1 BREAKER CONTROL SWITCH in the CLOSED position

Standard: When EDG-1 synchroscope hand reaches the eleven o'clock position, then places EDG-1 BREAKER CONTROL SWITCH in the CLOSED position (red light ON; green light OFF; synchroscope remains stable)

Cue: The EDG-1 BREAKER indicates closed

Comment:

SAT/UNSAT

Performance Information

Note: Minimum reactive load is +200 KVARS (lagging). Several repetitive pauses in raising load to switch between KWATTS and KVARS on the KILOWATT/KILOVAR Selector Switch may be required to achieve desired load without dropping below minimum KVARS. The Candidate may check VARS as KW load is rising.

✓ Performance Step: 16

Procedure Step: 7.3.1.10.7

Raise load on EDG-1 to a minimum of 2500 KW by operating the GOVERNOR CONTROL SWITCH in RAISE position

Standard: Positions the Ammeter Selector Switch to position 1 or 3 and positions the KILOWATT/KILOVAR Selector Switch to WATTS position to monitor KW

Raises load on EDG-1 to a minimum of 2500 KW by operating the GOVERNOR CONTROL SWITCH in RAISE position (KW loading rises)

Position the Ammeter Selector Switch to position 1 or 3 and positions the KILOWATT/KILOVAR Selector Switch to VARS LAG position to monitor VARs

Cue: The Ammeter Selector Switch is in position 1 or 3 and the KILOWATT/KILOVAR Selector Switch is in the WATTS position and KW Loading indicates 2700 KW after adjustment

The Ammeter Selector Switch is in position 1 or 3 and the KILOWATT/KILOVAR Selector Switch is in VARS LAG position and VARs indicates >300 VAR **as KW load is rising**. **When 2700 KW is obtained**, state that VARS indicates 190 VARS.

Comment:

SAT/UNSAT

Performance Information

Note: Step 7.3.1.10.8 and 7.3.1.10.9 are NA

✓ Performance Step: 17

Procedure Step: 7.3.1.10.10

If Auxiliary Transformer is supplying 4160V Bus 1C, then adjust EDG-1 VOLTAGE CONTROL SWITCH to control EDG KVAR loading to approximately +1000 KVAR (lagging) with an acceptable range of +200 to +2000 KVAR (lagging).

Standard: Adjusts EDG-1 VOLTAGE CONTROL SWITCH to control EDG KVAR loading to approximately +1000 KVAR (lagging) with an acceptable range of +200 to +2000 KVAR (lagging) by placing the switch to RAISE.

Cue: The KVAR loading is +1000 KVAR (lagging) after adjustment

Note: This was adjusted in a prior step.

Comment:

SAT/UNSAT

Performance Step: 18

Procedure Step: 7.3.1.10.11

Place EDG-1 SYNCHROSCOPE ON/OFF SWITCH in OFF position

Standard: Places EDG-1 SYNCHROSCOPE ON/OFF SWITCH in OFF position

Cue: The EDG-1 SYNCHROSCOPE ON/OFF SWITCH is in the OFF position

Comment:

SAT/UNSAT

Performance Information

Performance Step: 19

Procedure Step: 7.3.1.10.12

Place EDG-1 VOLTAGE/FREQUENCY SELECTOR SWITCH in OFF position

Standard: Places EDG-1 VOLTAGE/FREQUENCY SELECTOR SWITCH in OFF position

Cue: The EDG-1 VOLTAGE/FREQUENCY SELECTOR SWITCH is in the OFF position

Comment:

SAT/UNSAT

Performance Step: 20

Procedure Step: 7.3.1.11

Monitor EDG-1 performance IAW Section 9.0

Standard: Monitors EDG-1 performance IAW Section 9.0

Cue: Another Operator will monitor EDG-1 performance IAW Section 9.0

Comment:

SAT/UNSAT

Terminating Cue: EDG 1 is started and loaded to within limits

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC In-Plant JPM 2

Examinee's Name: ______________________

Examiner's Name: ______________________

Date Performed: ______________________

Facility Evaluator: ______________________

Number of Attempts: ______________________

Time to Complete: ______________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ____________________ ____________________

Setup

1. Have a copy of procedure 341, completed Section 7 up to step 7.3.1.3.

STUDENT HANDOUT

Initial Conditions:

- The plant is at rated power.
- The electrical grid is stable.
- All prerequisites for starting EDG 1 have been verified.

Task Cue:

Start EDG 1 for Peaking Operations IAW Procedure 341, Emergency Diesel Generator Operation, starting at Step 7.3.1.3

NO plant manipulations or changes in plant configuration will be made. All actions will be simulated.

7.0 MANUAL STARTING AND SYNCHRONIZING FOR PEAKING OPERATION FROM THE DIESEL GENERATOR SWITCHGEAR

7.1 Prerequisites

7.1.1 The Diesel Generator is lined up for automatic operation IAW Section 3.0. **[BB]**

7.2 Precautions and Limitations

7.2.1 The operation of the emergency diesel generators in parallel with an unstable grid can compromise the ability of the diesel generators to function as an emergency power source due to voltage surge. These surges can cause damage to circuitry, thereby affecting diesel generator operability. If unstable grid conditions exist, or are anticipated, the diesel generators should **not** be operated in parallel with the grid.

7.2.2 When VOLTAGE/FREQUENCY SELECTOR SWITCH is **not** being used in an evolution, it shall be in the OFF position. This is to prevent inadvertently placing a 4160V potential on the EDG when it is shutdown due to inadvertent shutting of the EDG output breaker.

7.2.3 The minimum load on the Diesel Generators for normal operation is restricted to 500 KW to prevent "souping" (carryover of engine oil into the EDG intake and exhaust systems). The restriction does **not** apply to maintenance, tests, or adjustments requiring other load levels.

7.2.4 Diesel Generator loading shall be restricted to 2750 ± 50 KW.

7.2.5 All control panels and enclosure doors shall be secured to prevent relay vibration. (except as required for maintenance and test)

7.2.6 When raising Diesel Generator load, **do not** let reactive load drop below + 200 KVARS.

7.3 Manual Starting and Synchronizing for Peaking Operation

7.3.1 IF performing a manual start EDG-1,

THEN **PERFORM** the following:

7.3.1.1

> NOTE
>
> The air quality forecast for New Jersey is available at the New Jersey Department of Environmental Protection air quality website at http:www.state.nj.us/dep/aqpp/aqforecast, "Air Quality Conditions and Forecasts.

CONFIRM" NJ DEP website **does not** show air quality anywhere in New Jersey to be "unhealthy for sensitive groups," "unhealthy," or "very unhealthy" or "hazardous". Air quality should show as "green – Good" or "yellow – Moderate". **[BB]**

1. IF Air quality **does not** show as "green – Good" or "yellow – Moderate",

THEN **NOTIFY** Director Operations or SOS to get their concurrence prior to proceeding: **[n/a]**

7.3.1.2

> NOTE
>
> The sync check relay monitors voltage during manual synchronization. The EDG load breaker will close with the Breaker Control Switch only when the proper phase angle and voltage exist.

IF the plant is off line and startup transformer S1A is supplying power to 4160V Buss 1C,

THEN **COMPLETE** the following prior to synchronizing EDG-1 to the system:

1. **DIRECT** a qualified Operator to Bank 5 Induction Regulator, in the Substation. **[n/a]**

2. NOTE

The three single phase Induction Regulator units of Bank 5 will typically be found on different taps when in automatic with the plant off line. If regulators must be adjusted to maintain voltage, then each single phase regulator should be moved by the same increment (from the existing position) as the others one step at a time until the appropriate voltage range is obtained.

IF voltage on the 4160V 1C bus is greater than 4250 volts,

THEN **PERFORM** the following:

a. **PLACE** the Bank 5 Induction Regulators in MANUAL. [N/A]

b. **STEP DOWN** all three single phase voltage regulators until voltage is between 4160 volts and 4250 volts IAW Procedure 337. [N/A]

3. **NOTIFY** the System Operator that Bank 5 regulators are in Manual. [N/A]

4. **RECORD** in Control Room Log Bank 5 regulators are in Manual. [N/A]

7.3.1.3

NOTE

All controls are located in the Diesel Generator Switchgear unless otherwise noted.

PLACE EDG-1 MODE SELECTOR SWITCH in the IDLE position. [ ]

7.3.1.4 **START** EDG-1 by placing the STOP/START SWITCH in the START position. [ ]

7.3.1.5

> NOTE
>
> After the engine has idled for 90 seconds from initial start, placing its MODE SELECTOR SWITCH in RUN will then increase engine speed to 900 RPM.

PLACE EDG-1 MODE SELECTOR SWITCH in the RUN position. [ ]

7.3.1.6 **VERIFY** engine speed increases. [ ]

7.3.1.7 **PLACE** EDG-1 MODE SELECTOR SWITCH in the EXC position. [ ]

7.3.1.8 **COMPARE** EDG-1 output voltage with line voltage using the KILOVOLT METER selecting any GEN or BUS position on the VOLTAGE/FREQUENCY SELECTOR SWITCH. [ ]

7.3.1.9

> NOTE
>
> EDG output voltage should be slightly higher than line voltage so that the machine will have lagging VARS when it is parallel with the system.

ADJUST EDG-1 output voltage to be slightly higher than line voltage using the VOLTAGE CONTROL SWITCH. [ ]

7.3.1.10 **SYNCHRONIZE** EDG-1 with the bus as follows:

1. **PLACE** EDG-1 SYNCHROSCOPE ON/OFF SWITCH in the ON position with the Synchroscope key. [ ]

2. **OPERATE** EDG-1 GOVERNOR CONTROL SWITCH so that the Synchroscope hand is moving slowly in the fast direction, and the synchronizing lights are pulsing slowly in unison. [ ]

3. **VERIFY** EDG-1 output voltage is slightly higher than line voltage. [ ]

4. **PLACE** EDG-1 VOLTAGE/FREQUENCY SELECTOR SWITCH in one of the following positions; GEN 1-2, GEN 2-3, or GEN 3-1. [ ]

5. NOTE

   The generator is synchronized to the system when the synchroscope hand is at the twelve o'clock position. Synchronizing lights should be out at this position.

   CONFIRM the Synchroscope hand is moving slowly in the fast direction. [ ]

6. WHEN EDG-1 Synchroscope hand reaches the eleven o'clock position, [ ]

   THEN **PLACE** EDG-1 BREAKER CONTROL SWITCH in the CLOSED position. [ ]

7

> NOTE
>
> To monitor KW loading of the Diesel Generator, position the Ammeter Selector Switch to position 1 or 3 and position the KILOWATT/KILOVAR Selector Switch to WATTS position.
>
> To monitor reactive loading of the Diesel Generator, position the Ammeter Selector Switch to position 1 or 3 and position the KILOWATT/KILOVAR Selector Switch to VARS LAG position.
>
> Minimum reactive load is + 200 KVARS (lagging). Several repetitive pauses in raising load to switch between KWATTS and KVARS on the KILOWATT/KILOVAR Selector Switch may be required to achieve load without dropping below minimum KVARS.

RAISE load on EDG-1 to a minimum of 2500 KW by operating the GOVERNOR CONTROL SWITCH in RAISE position. [ ]

8. IF while raising EDG-1 load, reactive load lowers to near + 200 KVAR, (lagging)

THEN **PERFORM** the following:

a. **STOP** raising EDG load. [ ]

b. IF Startup Transformer Bank 5 is supplying 4160V Bus 1C,

THEN **ADJUST** EDG-1 VOLTAGE CONTROL SWITCH to obtain a bus voltage of **no** more than 4300 volts with a minimum of + 200 KVAR. (Lagging) [ ]

c. IF Auxiliary Transformer is supplying 4160V Bus 1C,

THEN **ADJUST** EDG-1 VOLTAGE CONTROL SWITCH to control EDG KVAR loading to approximately + 1000 KVAR (lagging) with an acceptable range of + 200 to + 2000 KVAR. (Lagging) [ ]

d. **CONTINUE** to raise EDG load. [ ]

9. IF Startup Transformer Bank 5 is supplying 4160V Bus 1C,

THEN **ADJUST** EDG-1 VOLTAGE CONTROL SWITCH to obtain a bus voltage of no more than 4300 volts with a minimum of + 200 KVAR. (Lagging) [ ]

10. IF Auxiliary Transformer is supplying 4160V Bus 1C,

THEN **ADJUST** EDG-1 VOLTAGE CONTROL SWITCH to control EDG KVAR loading to approximately + 1000 KVAR (lagging) with an acceptable range of + 200 to + 2000 KVAR. (Lagging) [ ]

11. **PLACE** EDG-1 SYNCHROSCOPE ON/OFF SWITCH in OFF position. [ ]

12. **PLACE** EDG-1 VOLTAGE/FREQUENCY SELECTOR SWITCH in OFF position. [ ]

7.3.1.11 **MONITOR** EDG-1 performance IAW Section 9.0. [ ]

7.3.2 IF performing a manual start EDG-2,

THEN **PERFORM** the following:

7.3.2.1

> NOTE
>
> The sync check relay monitors voltage during manual synchronization. The EDG load breaker will close with the Breaker Control Switch only when the proper phase angle and voltage exist.

IF the Main Generator is off line and Startup Transformer S1B is supplying power to 4160V Bus 1D,

THEN **COMPLETE** the following prior to synchronizing EDG-2 to the system:

1. **DIRECT** a qualified Operator to Bank 6 Induction Regulator, in the substation. [ ]

2.

> NOTE
>
> The three single phase Induction Regulator units of Bank 6 will typically be found on different taps when in automatic with the plant off line. If regulators must be adjusted to maintain voltage, then each single phase regulator should be moved by the same increment (from the existing position) as the others one step at a time until the appropriate voltage range is obtained.

IF voltage on the 4160V 1D bus is greater than 4250 volts,

THEN **PERFORM** the following:

a. **PLACE** the Bank 6 Induction Regulators to MANUAL. [ ]

b. **STEP** down all three single phase voltage regulators until voltage is between 4160 volts and 4250 volts IAW Procedure 337. [ ]

3. **NOTIFY** the System Operator that Bank 6 regulators are in Manual. [ ]

4. **RECORD** in Control Room Log Bank 6 regulators are in Manual. [ ]

7.3.2.2

NOTE

All controls are located in the Diesel Generator Switchgear unless otherwise noted.

PLACE EDG-2 MODE SELECTOR SWITCH in the IDLE position. [ ]

7.3.2.3 **START** EDG-2 by placing the STOP/START SWITCH in the START position. [ ]

7.3.2.4

NOTE

After the engine has idled for 90 seconds from initial start, placing its MODE SELECTOR SWITCH in RUN will then increase engine speed to 900 RPM.

PLACE EDG-2 MODE SELECTOR SWITCH in RUN position. [ ]

7.3.2.5 **VERIFY** engine speed increases. [ ]

7.3.2.6 **PLACE** EDG-2 MODE SELECTOR SWITCH in EXC position. [ ]

7.3.2.7 **COMPARE** EDG-2 output voltage with line voltage using the KILOVOLT METER selecting any GEN or BUS position on VOLTAGE/FREQUENCY SELECTOR SWITCH. [ ]

7.3.2.8

> NOTE
>
> EDG output voltage should be slightly higher than line voltage so that the machine will have lagging VARS when it is parallel with the system.

ADJUST EDG-2 output voltage to be slightly higher than line voltage using VOLTAGE CONTROL SWITCH. [ ]

7.3.2.9 **SYNCHRONIZE** EDG-2 with line as follows:

1. **PLACE** EDG-2 SYNCHROSCOPE ON/OFF SWITCH in ON position with Synchroscope key. [ ]
2. **OPERATE** EDG-2 GOVERNOR CONTROL SWITCH so that Synchroscope hand is moving slowly in the fast direction, and synchronizing lights are pulsing slowly in unison. [ ]
3. **VERIFY** EDG-2 output voltage is slightly higher than line voltage. [ ]
4. **PLACE** EDG-2 VOLTAGE/FREQUENCY SELECTOR SWITCH in one of the following positions; GEN 1-2, GEN 2-3, or GEN 3-1. [ ]
5. > NOTE
   >
   > The generator is synchronized to the system when the synchroscope hand is at the twelve o'clock position. Synchronizing lights should be out at this position.

   CONFIRM the Synchroscope hand is moving slowly in the fast direction. [ ]

6. WHEN EDG-2 Synchroscope hand reaches eleven o'clock position,

   THEN **PLACE** EDG-2 BREAKER CONTROL SWITCH in CLOSED position. [ ]

7. NOTE

   To monitor KW loading of the Diesel Generator, position Ammeter Selector Switch to position 1 or 3 and position KILOWATT/KILOVAR Selector Switch to WATTS position.

   To monitor reactive loading of Diesel Generator, position Ammeter Selector Switch to position 1 or 3 and position KILOWATT/KILOVAR Selector Switch to VARS LAG position.

   Minimum reactive load is + 200 KVARS (lagging). Several repetitive pauses in raising load to switch between KWATTS and KVARS on the KILOWATT/KILOVAR Selector Switch may be required to achieve load without dropping below minimum KVARS.

   RAISE load on EDG-2 to a minimum of 2500 KW by operating GOVERNOR CONTROL SWITCH in RAISE position. [ ]

8. IF while raising EDG-2 load, reactive load lowers to near +200 KVAR, (lagging)

   THEN **PERFORM** the following:

   a. **STOP** raising EDG load. [ ]

   b. IF Startup Transformer Bank 6 is supplying 4160V Bus 1D,

      THEN **ADJUST** EDG-2 VOLTAGE CONTROL SWITCH to obtain a bus voltage of no more than 4300 volts with a minimum of + 200 KVAR. (Lagging) [ ]

   c. IF Auxiliary Transformer is supplying 4160V Bus 1D,

      THEN **ADJUST** EDG-2 VOLTAGE CONTROL SWITCH to control EDG KVAR loading to approximately + 1000 KVAR (lagging) with an acceptable range of + 200 to + 2000 KVAR. (Lagging) [ ]

   d. **CONTINUE** to raise EDG load. [ ]

9. IF Startup Transformer Bank 6 is supplying 4160V Bus 1D,

   THEN **ADJUST** EDG-2 VOLTAGE CONTROL SWITCH to obtain a bus voltage of no more than 4300 volts with a minimum of + 200 KVAR. (Lagging) [ ]

10. IF Auxiliary Transformer is supplying 4160V Bus 1D,

    THEN **ADJUST** EDG-2 VOLTAGE CONTROL SWITCH to control EDG KVAR loading to approximately + 1000 KVAR (lagging) with an acceptable range of + 200 to + 2000 KVAR. (Lagging) [ ]

11. **PLACE** EDG-2 SYNCHROSCOPE ON/OFF SWITCH in OFF position. [ ]

12. **PLACE** EDG-2 VOLTAGE/FREQUENCY SELECTOR SWITCH in OFF position. [ ]

7.3.2.10 **MONITOR** EDG-2 performance IAW Section 9.0. [ ]

Facility: Oyster Creek   Task No.: 2010101001

Task Title: Line Up to Vent the TORUS through the Hardened Vent

Job Performance Measure No.: NRC In-Plant JPM 3

K/A Reference: 295024 EA1.14 (3.4/3.5)

Examinee: ____________   Examiner: ____________

Facility Evaluator: ____________   Date: ____________

Method of Testing:

Simulated Performance X   Actual Performance ____

Classroom ____   Simulator ____   Plant X

Read to the Examinee:

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

Initial Conditions:

- TORUS water level is 173".
- Drywell pressure is 53 psig.
- Hydrogen concentration less than 1.5 %.
- CHRRMS indicates 1 x 10^3 R/Hr.
- Exhaust fans 1-5 and 1-7 are operating.

Initiating Cue:

You are being dispatched from the OSC. Radiation Protection is on hand to support. The US directs you to prepare the Torus to be vented through the hardened vent per EMG-SP35 section 2. You have a set of EO Building Keys.

Required Materials: None

General References:

1. EMG-SP35, Venting the TORUS via the Hardened Vent, Revision 2

Task Standard: The Torus is lined up to be vented via the Hardened Vent.

Time Critical Task: NO

Validation Time: 10 minutes

Performance Information

Denote critical steps with a check mark ✓

Performance Step: 1

Provides repeat back of initiating cue.

JPM Start Time: ____________

Standard: Provides repeat back of initiating cue. *Evaluator acknowledges the repeat back.*

Comment:

SAT/UNSAT

Performance Step: 2

Procedure Step: 2.1

OBTAIN a MB-1 key.

Standard: Obtained a MB-1 key.

CUE: The Initiating Cue states the applicant already has a set of building keys (which includes a MB-1 key)

Comment:

SAT/UNSAT

Performance Information

Performance Step: 3

Procedure Step: 2.2

VERIFY TORUS level is less than **348 in.**

Standard: Verified TORUS level is less than **348 in.** (Initial Condition)

CUE: If Control Room Contacted – TORUS Level is 173"

Comment:

SAT/UNSAT

Performance Step: 4

Procedure Step: 2.3

VERIFY Primary Containment H2 concentration is below minimum detectable (**1.5%** on H2/O2 Monitor)

Standard: Verified Primary Containment H2 concentration is below minimum detectable (**1.5%** on H2/O2 Monitor)
(Initial Condition)

CUE: If Control Room Contacted – H2 Concentration < 1.5%

Comment:

SAT/UNSAT

Performance Information

Performance Step: 5

Procedure Step: 2.4

VERIFY CHRRMS Channels 1 and 2 are reading below **2 x 10^4 R/HR**

Standard: **VERIFY** CHRRMS Channels 1 and 2 are reading below **2 x 10^4 R/HR** (Initial Condition)

CUE: If Control Room Contacted – CHRRMS Indicates $1X10^3$ R/Hr

Comment:

SAT/UNSAT

Performance Step: 6

Procedure Step: 2.5

EVACUATE personnel from the Reactor Building

SOUND the Reactor Building Evacuation alarm

CONTACT Control Room to make evacuation announcement

IAW EMG-SP35

Standard: Contacted Control Room to make evacuation announcement

Evacuated personnel from the Reactor Building

Sounded the Reactor Building Evacuation alarm

IAW EMG-SP35

CUE: Reactor Bldg is evacuated

Comment:

SAT/UNSAT

Performance Information

Performance Step: 7

Procedure Step: 2.6

CONFIRM at least one Reactor Bldg. or Turbine Bldg. Exhaust Fan is running

Standard: Confirmed at least one Reactor Bldg. or Turbine Bldg. Exhaust Fan is running (Initial Condition)

CUE: If Control Room Contacted – Exh Fans 1-5/1-7 are operating

Comment:

SAT/UNSAT

Performance Step: 8

Procedure Step: 2.7

CONFIRM N2 Purge Isolation Valve V-23-195 closed

(Outside Rx Bldg, NE Corner)

Standard: Confirmed N2 Purge Isolation Valve V-23-195 closed

(Outside Rx Bldg, NE Corner)

CUE: **V-23-195 is CLOSED**

Comment:

SAT/UNSAT

Performance Information

✓ Performance Step: 9

Procedure Step: 2.8

UNLOCK and CLOSE Nitrogen System Nitrogen Purge Header Isolation Valve V-23-357

(Outside Rx Bldg, NE Corner)

Standard: Unlocked and Closed Nitrogen System Nitrogen Purge Header Isolation Valve V-23-357

(Outside Rx Bldg, NE Corner)

CUE: **V-23-357 is CLOSED**

Comment:

SAT/UNSAT

✓ Performance Step: 10

Procedure Step: 2.9

UNLOCK and OPEN the Nitrogen System Stack Isolation Valve V-23-358

(Outside Rx Bldg, NE Corner)

Standard: Unlocked and Opened the Nitrogen System Stack Isolation Valve V-23-358

(Outside Rx Bldg, NE Corner)

CUE: V-23-358 is OPEN

Comment:

SAT/UNSAT

Performance Information

Performance Step: 11

Procedure Step: 2.10

INFORM the US that the Torus is ready to be vented via the Hardened Vent

Standard: Informed the US that the Torus is ready to be vented via the Hardened Vent

Comment:

SAT/UNSAT

Terminating Cue: The Torus is ready to be vented via the Hardened Vent.

JPM Stop Time: ___________

Validation of Completion

JPM Number: NRC In-Plant JPM 3

Examinee's Name: ____________________

Examiner's Name: ____________________

Date Performed: ____________________

Facility Evaluator: ____________________

Number of Attempts: ____________________

Time to Complete: ____________________

Question:

____

____

____

Response:

____

____

____

Result: Satisfactory/Unsatisfactory

Examiner's Signature and Date: ____________________ ____________________

JPM Setup

1. Provide a copy of EMG-SP35, Venting the TORUS via the Hardened Vent, Revision 2

INITIAL CONDITIONS

- TORUS level is 173".
- Drywell pressure is 53 psig.
- Hydrogen concentration less than 1.5 %.
- CHRRMS indicates 1 x 10^3 R/Hr.
- Exhaust fans 1-5 and 1-7 are operating.

INITIATING CUE

You are being dispatched from the OSC. Radiation Protection is on hand to support. The US directs you to prepare the Torus to be vented through the hardened vent per EMG-SP35 section 2. You have a set of EO Building Keys.

There will be NO manipulation or change of plant components.

Exelon Generation	OYSTER CREEK GENERATING STATION PROCEDURE	Number **EMG-SP35**
Title	**SUPPORT PROCEDURE 35** **VENTING THE TORUS VIA THE HARDENED VENT**	Revision No. 2

1.0 PREREQUISITES

None

2.0 PREPARATION

2.1 **OBTAIN** an MB-1 key. [ ]

2.2 **VERIFY** Torus level is less than **348 in.** (Panel 1F/2F) [ ]

2.3 **VERIFY** Primary Containment H_2 concentration is below minimum detectable (**1.5%** on H_2/O_2 Monitor). (Panel 16R) [ ]

2.4 **VERIFY** CNTMT HI RANGE RAD MONITOR Channels 1 and 2 are reading below **2 x 10^4 R/HR**. (Panel 2R) [ ]

2.5 **EVACUATE** personnel from the Reactor Building by performing the following:

2.5.1 **SOUND** the Reactor Building Evacuation alarm.

__________ [ ]
Time

2.5.2 **MAKE** the following announcement:

"PRIMARY CONTAINMENT VENTING VIA THE HARDENED VENT WILL COMMENCE IN APPROXIMATELY FIVE MINUTES. ALL PERSONNEL EVACUATE THE REACTOR BUILDING. STAND CLEAR OF THE RX. BLDG. FAN PAD, THE STACK AND THE RCA YARD, NORTH AND EAST OF THE RX. BLDG." [ ]

OVER

2.6 **CONFIRM** at least one Reactor Bldg. or Turbine Bldg. Exhaust Fan is Running: (Panel 11R)

- 1-5 [ ]
- 1-6 [ ]
- 1-7 [ ]

2.7 **CONFIRM** V-23-195, N2 System Drywell/Torus Purge Isolation Valve closed.
(Outside Rx. Bldg., NE Corner) [ ]

2.8 **UNLOCK** and **CLOSE** Nitrogen System Nitrogen Purge Header Isolation Valve V-23-357. (Outside Rx. Bldg. NE Corner) [ ]

2.9 **UNLOCK** and **OPEN** the Nitrogen System Stack Isolation Valve V-23-358. (Outside Rx. Bldg., NE Corner) [ ]

2.10 **INFORM** the Unit Supervisor that the Torus is ready to be vented via the Hardened Vent. [ ]

3.0 PROCEDURE

3.1 WHEN directed by the Unit Supervisor,

THEN **PERFORM** the following:

3.1.1

NOTE

The containment isolation function of the following valves is defeated when the CNTMT VENT AND PURGE ISOLATION BYPASS keylock is in the BYPASS position:

- Drywell Ventilation Vent Valves (V-27-1 and 2)
- Drywell Ventilation Purge Valves (V-27-3 and 4)
- Drywell Nitrogen Purge Inlet Valves (V-23-13 & V-23-14).
- Torus Nitrogen Purge Inlet Valves (V-23-15 & V-23-16).

PLACE the CNTMT VENT AND PURGE ISOLATION BYPASS keylock in BYPASS using a T112 key. (Panel 12XR) [ ]

3.1.2 <u>WHEN</u> at least five minutes has passed since sounding the Reactor Building Alarm,

<u>THEN</u> **PERFORM** the following:

1. **INFORM** the Unit Supervisor. [ ]

2. **OPEN** the following Torus Nitrogen Purge Inlet valves (Torus Hardened Vent Valves): (Panel 12XR)

   - Torus N_2 Purge Press Control Valve, V-23-15 [ ]

   - Torus N_2 Purge Shutoff Valve, V-23-16 [ ]

3.1.3 **INFORM** the Unit Supervisor that Torus venting via the Hardened Vent has commenced. [ ]

3.1.4 **CONTROL** Torus pressure as directed by the Unit Supervisor by cycling either of the following Valves: (Panel 12XR)

- Torus N_2 Purge Shutoff Valve, V-23-16 [ ]

- Torus N_2 Purge Press Control Valve, V-23-15 [ ]

Exelon Generation

NRC 2016 Scenario 1 (**New**)

Scenario Outline

Facility: Oyster Creek **Scenario No.:** 1 **Op Test No.:** NRC 2016

Examiners: ______________________ **Operators:** ______________________

______________________ ______________________

______________________ ______________________

Initial Conditions:

- 100% power
- Containment Spray system 1 Tagged out of service for Maintenance
- Containment Spray system 2 protected
- Risk is Yellow

Turnover:

- Lower power to 95% using recirculation flow IAW 1001.22-3, Core Maneuvering Daily Instruction Sheet.
- Following the power reduction Backwash A North Condenser IAW procedure 323.6

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	R	ATC SRO	Lower power with Recirc flow
2	N/A	N	BOP SRO	Backwash 'A' North Condenser
3	MAL-CRD002	C TS	ATC SRO	'A' CRD pump trips
4	MAL-ICS002A	C TS	BOP SRO	Isolable Isolation Condenser 'A' tube leak
5	MAL-NSS012E	C TS	ATC SRO	Respond to a reference leg leak in the A & C GEMAC RPV level indicators ID13A and ID13C
6	MAL-TCS010	C	BOP SRO	EPR failure low
7	MAL-CRD001 MAL-CRD010_1851 MAL-CRD010_2251	C	ATC/ All	Respond to 'B' CRD pump to trip and Responds to an HCU accumulator failure

8	SRV-NSS001C MAL-NSS013C MAL-NSS013D	M	All	MSIV's close and Safety Valve Lifts after Scram
9	BKR-CNS008	C	BOP SRO	Trip of Containment Spray Pump

*** (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor Transient, (TS) Tech Specs**

NRC 2016 Scenario 1 (**New**)

Simulator Summary

Event	**Event Summary**
1	The ATC will lower reactor power to approximately 95% with recirculation flow using the Master Recirc Speed Controller. (**ATC: Reactivity Manipulation**)
2	The BOP will backwash condenser 'A' North IAW procedure 323.6, Backwashing Condensers. This will require several switch manipulations by the BOP and observe condenser parameters. (**BOP: Normal Evolution**)
3	The ATC will respond to a trip of CRD Pump A IAW RAP H-1-c. The ATC will start CRD Pump B. The SRO will review and apply Tech Spec 3.4.D.2. (**ATC: Component Malfunction; SRO: Tech Specs**)
4	Then 'A' Isolation Condenser develops a tube leak **(MAL ICS002A)**. Crew enters Rad Release Control and requires manually isolating the 'A' IC **(BOP: Component Malfunction; SRO: Tech Specs)**.
5	The ATC will diagnose a rising RPV water level. Indications of actual RPV water level will rise on Panel 4F and Panel 5F/6F Yarway indications. The ATC will perform actions to stabilize RPV water level IAW ABN-17, Feedwater System Abnormal Conditions. The ATC will take manual control of RPV water level and swap Feedwater Level Control to the alternate water level instrument ID13B. The increased Primary Containment leakage will result in a rise in unidentified leak rate and the SRO will review and apply Tech Spec 3.3.D.2. (**ATC: Instrument Malfunction; SRO: Tech Specs**)
6	Rx pressure begins to drop and the crew recognizes that the EPR is failing low. The crew enters ABN-9 and transfers pressure control over to the MPR. (**BOP: Component Malfunction)**
7	Once Rx pressure is restored Following the EPR failure the 'B' CRD pump will trip and there is no standby pump to start. The Crew will enter ABN-1 and attempt to scram the reactor when two accumulators come in. (**ATC/Crew: Component**)
8	Upon scramming the US enters RPV control no ATWS. When the Reactor is scrammed a Safety to fail open (**SRV-NSS001C)** which drives DW temp and Pressure up. The US then enters Primary Containment control (**CREW: Major**)

9	When required the crew attempts to lineup containment spray system two in preparation for reducing containment pressure or temperature and recognizes that containment pump #1 started then tripped and must start the second containment pump in system two to reduce drywell parameters. **(BOP: Component Malfunction)**
Critical Task 1	Given an isolable leak outside the Reactor Building , the crew must isolate the leak, in accordance with Rad Release control.
Critical Task 2	Given a loss of all CRD, the crew must insert a manual reactor scram in accordance with ABN-1.
Critical Task 3	The must initiate containment spray to restore and maintain <281°f or when containment pressure exceeds 12 psig IAW Primary Containment Control.

	ES-301-4 Target Quantitative Attributes	**Actual Attributes**	**Event Number(s)**
2.	Malfunctions after EOP entry (**1-2**)	**2**	**8,9**
3.	Abnormal events (**2-4**)	**3**	**5,6,7**
4.	Major transients (**1-2**)	**1**	**8**
5.	EOPs entered/requiring substantive actions (**1-2**)	**2**	**Primary Containment RPV control No ATWS**
6.	EOP contingencies requiring substantive actions (**0-2**)	**0**	**N/A**
7.	EOP Critical tasks (**2-3**)	**2**	**4,7,9**

Op-Test No.: NRC 2016	Scenario No.: Scenario 1	Event No.: 1
Event Description: Lower reactor power to 95% using recirculation flow		
Initiation: Following shift turnover		
Cues: As directed by the SRO following shift turnover		

Time	Position	Applicant's Actions or Behavior
	SRO	• Approves the ReMA and provides to the ATC • Directs the ATC to lower power to 95% IAW the Core Maneuvering Daily Instruction Sheet • Acts as the reactivity Manager • Provides a reactivity brief • May notify the Power team when at 95% power
	ATC	• Lowers power IAW the Core Maneuvering Daily Instruction Sheet o May review 202.1, section 6.0, Power Reductions o Rotates the MASTER RECIRC SPEED CONTROLLER manual knob CW o Monitors power, level, pressure o Reports to SRO when rated power is reached
	BOP	o Provides second check for the reactivity manipulation
Terminus:	Reactor power is approximately 95%	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 1	Event No.: 2
Event Description: Continue backwashing Main Condenser Half A North		
Initiation: Reactor power is approximately 95%, or as directed by the Lead Examiner		
Cues: As directed by the SRO		

Time	Position	Applicant's Actions or Behavior
	SRO	Directs BOP to backwash 'A' North Condenser IAW procedure 323.6, starting at step 5.1.3.1.
	BOP	• Performs backwash of condenser half A North IAW procedure 323.6, starting at step 5.1.3.1 o Verifies the following: ▪ All condenser valves are in the normal position ▪ The inlet & outlet valves for each condenser half are open ▪ The backwash valves and the cross connect valves for each condenser are closed ▪ May verify the EO is aware of which valves will be operated [**ROLE PLAY**] o Places the COND A NORTH BACKWASH CONTROL switch to BACKWASH o After about 10 seconds, places the COND A NORTH CIRC WATER INLET & OUTLET switch to CLOSE o Verifies the following: ▪ V-3-12, COND A NORTH CIRC WATER INLET valve closed ▪ V-3-27, COND A NORTH CIRC WATER OUTLET valve closed ▪ V-3-18, COND A NORTH BACKWASH CONTROL valve open ▪ V-3-24, COND A NORTH CONNECT valve open ▪ V-3-28, COND A SOUTH CIRC WATER OUTLET valve closed

		▪ V-3-13, COND A SOUTH CIRC WATER INLET valve open ▪ V-3-19, COND A SOUTH BACKWASH CONTROL valve closed o Backwashes for about 3-5 minutes o Monitors the following during backwash: ▪ Condenser Hotwell Level ▪ Turbine Exhaust Hood Temperature ▪ Condenser Vacuum o Places the COND A NORTH CIRC WATER INLET & OUTLET switch to OPEN o After about 10 seconds, places the COND A NORTH BACKWASH CONTROL switch to CLOSE o Verifies the following: ▪ V-3-12, COND A NORTH CIRC WATER INLET valve open ▪ V-3-27, COND A NORTH CIRC WATER OUTLET valve open ▪ V-318, COND A NORTH BACKWASH CONTROL valve closed ▪ V-3-13, COND A SOUTH CIRC WATER INLET valve open ▪ V-3-28, COND A SOUTH CIRC WATER OUTLET valve open ▪ V-3-19, COND A SOUTH BACKWASH CONTROL valve closed ▪ V-3-24, COND A CROSS CONNECT valve closed • Reports 'A' North condenser backwash is complete
ROLE PLAY	When told as the EO which backwash valves will be operated, acknowledge the report	
Terminus:	Main condenser backwash is complete	

Notes/Comments

<table>
<tr><td colspan="3">Op-Test No.: NRC 2016 Scenario No.: Scenario 1 Event No.: 3
Event Description: CRD Pump A trips requiring Tech Spec LCO entry (Trigger 1)</td></tr>
<tr><td colspan="3">Initiation: Backwash of 'B' North Condenser is complete or as directed by the Lead Examiner.</td></tr>
<tr><td colspan="3">Cues: Annunciator H1c, PUMP A OL; H7c, CHARG WTR PRESS LO; COOLING WATER FLOW, CLG WTR/REACTOR ΔP, DRV WTR/REACTOR ΔP indicate downscale; CRD Pump A breaker open</td></tr>
<tr><td>Time</td><td>Position</td><td>Applicant's Actions or Behavior</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td>ATC</td><td>• Responds to annunciator H1c, PUMP A TRIP
o Reports CRD Pump A tripped
o Dispatches EO to investigate pump/breaker [ROLE PLAY]
o Starts CRD Pump B by placing CRD PUMP NC08B switch to START
o Ensures CRD parameters return to normal bands
o Reports CRD Pump B running with CRD indications return to normal</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td>SRO</td><td>• Declares CRD Pump A inoperable
• Notifies SM/WWM about the pump trip
• Reviews and applies Tech Spec 3.4.D.2
o If one CRD hydraulic pump becomes inoperable when the reactor water temperature is above 212 °F, the reactor may remain in operation for a period not to exceed 7 days provided the second CRD hydraulic pump is operating and is checked at least once every 8 hours. If this condition cannot be met, the reactor water temperature shall be reduced to less than 212 °F</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td colspan="3">ROLE PLAY As the EO investigating the CRD Pump A trip, wait 1 minute and report the pump tripped on overload.</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>Terminus:</td><td colspan="2">CRD Pump B is in service and the SRO has addressed Tech Specs</td></tr>
</table>

Notes/Comments

Op-Test No.: NRC 2016 Scenario No.: Scenario 1 Event No.: 4 Event Description: 'A' Isolation condenser Tube leak **(TRIGGER 3)**		
Initiation: Standby CRD pump running and T.S determination has been made or as directed by the Lead Examiner.		
Cues: Rising levels in 'A' shell level and temperature, RAP-10F-1-k, RAP-C6a		
Time	Position	Applicant's Actions or Behavior
	CREW	• Recognizes Area Rad Monitor C-3 is alarming. • Recognizes high level in A IC shell. • Recognizes high shell temperature • Makes update of Tube leak in 'A' IC
ROLE PLAY: 3 minute after inserting the leak or as directed by the lead evaluator: **Report** as EO from Boiler House that steam is coming out of A IC vents to the yard.		
	SRO	• Enters Secondary Containment Control • Enters Radioactivity Release Control • Directs isolating 'A' Isolation Condenser • Per Tech Spec 3.8, determines that the plant may continue operation for 7 days.
	BOP	• Reports Area Rad monitors levels • Isolates 'A' Isolation Condenser
CRITICAL TASK 1		
Terminus:	'A' IC is isolated and T.S declaration is made	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 1	Event No.: 5
Event Description: Responds to a leak in the common variable leg to RPV water level instruments ID13A and ID13C **(TRIGGER 5)**		
Initiation: Isolation condenser is isolated or as directed by the Lead Examiner		
Cues: ID13A and ID13C indication lowers; Other RPV water level indicators rising; Drywell pressure, temperature, unidentified leakage rising		

Time	Position	Applicant's Actions or Behavior

	ATC	• Reports Indicated RPV water level lowering on NR GEMACs ID13A and ID13C, with RPV water level rising on all other available RPV water level instruments
		• Reports small rise in Drywell pressure, temperature and Drywell unidentified leak rate
		• Performs ABN-17, Feedwater System Abnormal Conditions **OR** ABN-59, RPV Level Instrument Failures (same actions in both ABNs)
		  o Places the MASTER FEEDWATER LEVEL CONTROLLER in manual by pressing the AUTO/MAN pushbutton
		  o Confirms Feedwater flow is approximately equal to steam flow
		    ▪ Lowers feedwater flow by turning the manual knob on the MASTER FEEDWATER LEVEL CONTROLLER CCW to match TOTAL STEAM FLOW and TOTAL FEEDWATER FLOW
		  o Places the LEVEL TRANSMITTER SELECTOR to the B position
		    o Selects the S display on the MASTER FEEDWATER LEVEL CONTROLLER
		    o Matches the S display to the P display by turning the manual knob on the MASTER FEEDWATER LEVEL CONTROLLER
		    o When the deviation = 0 (S = P; Y = 0), then places the turning the manual knob on the MASTER FEEDWATER LEVEL CONTROLLER in AUTO
		  o Monitors RPV water level and Feedwater flow

		◦ Maintains RPV water level at 160" or as directed by the US Reports RPV water level transmitters swapped, Feedwater in auto and controlling.
	BOP	• May perform Drywell venting IAW attachment 312.11-10 or ABN-63, if directed ◦ Opens Torus vent valve V-28-47 ◦ Opens Torus vent valve V-28-18 ◦ Monitors DW pressure • May perform Drywell venting IAW attachment 312.11-12 or ABN-63, if directed ◦ Opens Drywell vent valve V-23-21 ◦ Opens Drywell vent valve V-23-22 • May maximize cooling and start 5th drywell fan IAW ABN-63 • Monitors DW pressure
	SRO	• Directs entry into ABN-17, Feedwater System Abnormal Conditions **OR** ABN-59, RPV Level Instrument Failures • Notifies SM/WWM for repair/investigation of RPV water level instruments ID13A and ID13C • May direct Drywell venting and maximizing cooling IAW 312.11-10 or 312.11-12 or ABN-63 • Enters Tech Spec 3.3.D.1 for 2 gpm increase in unidentified leakage in a 24 hour period • With the reactor coolant system leakage greater than the limits in 3.3.D.1.a or b above, reduce the leakage rate to within the acceptable limits within 8 hours, or place the reactor in the shutdown condition within the next 12 hours and be in the cold shutdown condition within the following 24 hours.
Terminus:	RPV water level transmitters have been swapped, Feedwater is in auto and is controlling, and the SRO has reviewed/applied the Tech Specs	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 1	Event No.: 6
Event Description: EPR fails low requiring transfer to MPR **(TRIGGER 7)**		

Initiation: Rx water level has been stabilized or as directed by the Lead Examiner

Cues: Rx pressure lowers

Time	Position	Applicant's Actions or Behavior
	CREW	• Recognizes lowering Rx pressure
	ATC	• Monitors critical parameters • Reports DW pressure to crew
	US	• Directs entry into ABN-9 • Refers to procedure 202.1 for limitations on power with one pressure regulator out of service

	BOP	• Makes update EPR failure
		• Performs ABN-9 actions
		  • Transfers RPV pressure control to MPR by
		    • Lowering MPR setpoint until MPR takes over
		  • Verifies EPR controlling light off
		  • Turns off EPR power switch to off
		  • Verifies alarm Q6a is recieved
		  • Slowly raises Rx pressure back to normal band with MPR as directed by US by
		  • Slowly raising MPR setpoint until pressure back in band

Terminus:	The MPR is placed in service and pressure band is back in band	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 1	Event No.: 7
Event Description: Trip of 'B' CRD pump and two accumulator alarms come in forcing Rx scram B **(TRIGGER 9)**		

Initiation: MPR is controlling pressure in band, or as directed by the Lead Examiner

Cues: RAP H-7-c, RAP H-8-c, RAP H-7-a, CRD hydraulic parameters drop to 0

Time	Position	Applicant's Actions or Behavior
	Crew	• Makes update and responds to TRIP of 'B' CRD IAW RAPs H7c, H8c
	ATC	• Refers to Raps • Determines 'B' CRD pump has tripped and will not restart. • Makes update that B CRD pump cannot be restarted. • Directs EO's to investigate pump and breakers for CRD pumps.
	SRO	• Sets scram criteria when 2 HCU alarms come in
Role play	BOOTH: If directed to investigate CRD pump as EO 3 minutes later • Report B CRD breaker tripped on Overload.	
CRITICAL TASK 2	ATC	• When 2 accumulator alarms come in scrams the reactor • DEPRESS both Manual Scram Pushbuttons • PLACE the Reactor Mode Switch in SHUTDOWN position. • VERIFY that all rods are fully inserted (at or beyond position 04). • VERIFY that reactor power is lowering. • UPDATES US that immediate scram actions are complete. • INSERT SRM and IRM detectors
	SRO	• ENTERS RPV CONTROL No-ATWS • DIRECT URO to maintain RPV water level 138" to 160" TAF using feed/condensate. Uses SP-2. • Directs pressure control to 'B' Isolation condenser and EMRV's per SP-11/12
	BOP	• When RPV level begins to rise Trips two feed pumps, places MFRV's to manual and closes them when • CONFIRMs main turbine tripped, GC1 and GD1 OPEN, generator field breaker OPEN, S1A and S1B closed • EXECUTE the following RPV Control – No ATWS steps when directed:

		• STABILIZE RPV pressure below 1045 psig with turbine bypass valves.
	URO	• MAINTAIN RPV level between 138 and 160 in. with SP-2.
Terminus:	Rx is scrammed and all rods in	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 1	Event No.: 8
Event Description: MSIV's close and Safety Valve Lifts after Scram **(TRIGGER 11)**		
Initiation: When Reactor is scrammed and scram pushbuttons are pressed		
Cues: MSIV position indication Drywell pressure and temperature rise, safety acoustic high		

Time	Position	Applicant's Actions or Behavior
	Crew	• Recognizes that outboard MSIV's close and Safety valve is stuck open
	SRO	• Enters Primary Containment Control when DW pressure exceeds 3.0 psig and directs the following operator actions: • Continues pressure control to 'B' Isolation condenser and EMRV's per SP-11/12 • When required directs maximizing drywell cooling per SP-27 • Directs primary containment isolation per SP-1 when RO available • Directs H_2/O_2 IAW SP-39 when applicable • Directs SP-28 when applicable
	RO	• Monitor bulk drywell temperature. • Maximize drywell cooling per SP-27 when directed • Confirm primary containment isolation per SP-1 when directed • Initiate H_2/O_2 IAW SP-39 when directed. • Evaluates the usability of RPV water level instrumentation per SP-28 when directed.
	BOP	• Maintains RPV pressure as directed per SP-11 using 'B' isolation and EMRV's as necessary with SP-12
	US	• Directs lineup of DW sprays before bulk drywell temperature reaches 281°F **or** DW or Torus pressure reaches 12 psig per SP-29.

	RO	• Performs SP-29 for lineup of DW spray
		  • Selects Containment Spray system to be used
		  • Confirms DW Fans and Recirc pumps are tripped
		  • Informs US that Containment Spray is lined up per SP-29

Terminus:	Pressure control is on isolation condensers and EMRV's as necessary.	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 1	Event No.: 9
Event Description: Trip of Containment Spray Pump **(TRIGGER 13 or 15)**		
Initiation: When containment spray pump is started to reduce Drywell parameters		
Cues: Pump Red light off, Containment spray flow drops to 0		

Time	Position	Applicant's Actions or Behavior
	US	• Directs spraying to the drywell IAW SP-29 when above 12 psig in the drywell
	RO	• Per SP-29, lines up containment spray for drywell spray • Once directed to spray the DW • Places system mode select to DW spray position • Verifies valves reposition • Starts ESW pump by turning switch • Starts containment spray pump by turning keylock and control switch • Maintains Primary containment pressure between 4 to 12 psig.
BOOTH	If 1-3 Containment Spray pump running • INSERT: Trigger 13 If 1-4 Containment Spray pump running • INSERT: Trigger 15	
CRITICAL TASK 3	RO	• Recognizes running containment spray trips • May start second ESW pump by turning switch • Starts second containment spray pump by turning keylock and control switch • Verifies system parameters • Maintains Primary containment pressure between 4 to 12 psig.
Terminus:	Drywell parameters are in band along with Rx pressure and Level.	
Final EAL Call	FA-1 – Any Loss or Potential Loss of either the Fuel Clad or RCS. Lost Reactor Coolant System Barrier.	

Procedures Used

Event	**Procedure**				
1	• 202.1 • 301.2				
2	• 323.6				
3	• Annunciator H1c • Annunciator H7c				
4	• RAP-10F1k • RAP-C6a • RAP-C6b				
5	• ABN-17 • ABN-59 • 312.11				
6	• ABN-9 • 202.1				
7	• Annunciator H7c • Annunciator H8c • Annunciator H7a • RPV Control No-ATWS • EMG-SP2				
8	• EMG-SP11 • EMG-SP12 • EMG-SP1 • EMG-SP39 • EMG-SP29 • EMG-SP27				
9	• EMG-SP29				

NRC 2016 Scenario 1 (**New**)

Simulator Setup

1. Reset to IC-40 (bwr-2)
2. Have a copy of 202.1 and 301.2 for the applicants
3. Have a Copy of 323.6 for applicants
4. Hang tags on Containment Spray system 1
5. Protect Containment Spray system 2
6. Risk is Yellow

Event	**Trigger**	**Malfunction**
Preset	n/a	Containment Spray System 1 Tag Out **LOA-CNS054**, rack out **LOA-CNS051**, rack out **VLV-CNS002**, close **BKR-CNS007,** fail control fuse **BKR-CNS005,** fail control fuse
1	NA	NA
2	N/A	N/A
3	**T1**	**BKR-CRD002 to TRIP** This trips CRD Pump A
4	**T3**	**MAL-ICS002A, 5%, ramp 120 seconds** 'A' IC tube leak occurs
5	**T5**	**MAL- NSS012E to 2% over a 900 Sec ramp** This places a leak in the common variable leg to NR GEMAC water level instruments ID13A and ID13C (this also inputs into FWLC).
6	**T7**	**MAL-TCS010, 900 psig, 60 sec ramp** Fails EPR setpoint to 900 psig
7	**T9**	**BKR-CRD001 , Trip** trips "B" CRD pump **MAL-CRD010_1851, 60 sec delay** HCU 1851 accumulator alarm **MAL-CRD010_2251, 100 sec delay** HCU 2251 accumulator alarm

8	**T11**	**MAL-NSS013C**, 0 Closes MSIV's **MAL-NSS013D**, 0 Closes MSIV's **SRV-NSS001C**, 25% , ramp 200 seconds Lifts Safety Valve 25% open,
9	**T13**	If 1-3 containment spray pump running **BRK-CNS008, Trip** Trips 1-3 containment Spray pump
	T15	If 1-4 Containment Spray pump running **BKR-CNS006, Trip** Trips 1-3 containment Spray pump

Shift Turnover

Current plant conditions:

- 100% power
- Containment Spray system 1 Tagged out of service for Maintenance
- Containment Spray system 2 protected
- Risk is Yellow

Shift Activities

- Lower power to 95% using recirculation flow IAW 1001.22-3, Core Maneuvering Daily Instruction Sheet.
- Following the power reduction Backwash A North Condenser IAW procedure 323.6

NRC 2016 Scenario 2 (**New**)

Scenario Outline

Facility: Oyster Creek **Scenario No.:** 2 **Op Test No.:** NRC 2016

Examiners: ____________________ **Operators:** ____________________

____________________ ____________________

____________________ ____________________

Initial Conditions:

- 100% power
- Air Compressor #3 is tagged OOS
- EDG #2 Out of service

Turnover:

- Diesel Generator #2 has been out of service for 2 days due to failure to start during the load test. It is scheduled to be returned to service the next day. The diesel load test for #1 diesel is due next shift.
- Air Compressor #3 is OOS for troubleshooting due to failure to start.
- Swap RBCCW pumps IAW 309.2

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	N	BOP, SRO	Swap RBCCW pumps
2	MAL-RCU013	C TS	BOP, SRO	RWCU isolable leak (failure of one isolation valve) EMG-3200.11, Secondary Containment Control T.S. 3.5
3	MAL-EDS004 B	C TS	ALL T.S.-SRO	Loss of VMCC 1B2 ABN-51, Loss of VMCC 1B2 T.S. 3.7
4	MAL-CRD001 A	C	ATC, SRO	CRD Flow Control Failure ABN-6, Control Rod Malfunctions
5	MAL-OGS003 MAL-CFW017	C R	ALL	OFF-Gas Deflagration/ with condenser vacuum leak ABN-25, OFF-Gas Deflagration ABN-14, Loss of Condenser Vacuum
6	MAL-GEA005 A MAL-GEA005	C	ALL	Loss of Stator Cooling ABN-11 Loss of Generator Stator Cooling EMG-3200.01A RPV control No-ATWS

	B			
7	CAEP ATWS.C AE	M	ALL	Electric ATWS EMG-3200.01B RPV control-With ATWS
8	MAL-TCS006 D Through TCS006I	C	BOP, SRO	Failure of Turbine Bypass Fails EMG-3200.01B, RPV control w/atws

* **(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor Transient, (TS) Tech Specs**

NRC 2016 Scenario 2 (**New**)

Simulator Summary

Event	Event Summary
1	The BOP will swap RBCCW pumps IAW 309.2, Reactor Building Closed Cooling Water System, Section 15. (**BOP: Normal Evolution**)
2	A RWCU system break will occur with failure of cleanup to automatically isolate. The crew will enter secondary containment control and investigate radiation levels and temperatures in Rx Building. The RWCU HELB alarms will come in and the crew will manually attempt to isolate cleanup but will be unable to close cleanup isolation valves V-16-1. The US will determine T.S applicability IAW section 3.5. (**BOP: Component Malfunction; SRO: Tech Specs**)
3	The crew will respond to the trip of VMCC 1B2 and enter ABN-51, Loss of VMCC 1B2. The BOP will restore power to PSP-2 and the ATC will reset the ½ scram. The SRO will review TS 3.7 and enter a cold shutdown LCO. (**BOP: Component Malfunction; SRO: Tech Specs**)
4	The ATC will respond to in-service CRD Flow Control Valve failing closed. The ATC will swap Flow Control Valves IAW procedure 302.1, Control Rod Drive System. (**ATC: Component Malfunction**)
5	This is followed by an Off-Gas deflagration the isolates off-gas. Once the Off-Gas alarms clear the crew confirms no damage to plant and reset Off-Gas system. Once the Off-Gas system is reset a small vacuum leak occurs forcing the crew to reduce power until vacuum recovers (**ATC: Component Malfunction, BOP: Component Malfunction**)
6	The running Stator Water Cooling Pump will trip and ABN-11 will be entered. The standby Stator Water Cooling Pump is not available since it was powered from Bus 1B1 and therefore all stator water cooling is lost and a turbine runback will occur. IAW the ABN, when the runback occurs, the ATC will insert a manual scram. (**ATC: Component**)
7	The Crew will diagnose an electric ATWS and the SRO will direct entry into RPV Control – with ATWS EOP. The ATC will perform actions to insert control rods and the BOP will perform actions to control Torus water temperature and RPV water level. (**Major Evolution**) (**PRA**)

8 While the crew Terminates and Prevents injection IAW SP-17, the bypass valves will go closed forcing the crew to augment Rx pressure control with Isolation Condensers and EMRV's for pressure control (**Component Failure After EOP**)

Critical Task 1 Given a failure to scram, the crew must terminate and prevent injection in accordance with EOP SP-17

Critical Task 2 Given a failure to scram, the crew must recommence injection to the reactor in accordance with EOP SP-19.

Critical Task 3 Given a failure to scram, the crew must vent the scram air header in accordance with EOP SP-21

Critical Task 4 Given an isolable leak from RWCU, the crew must isolate the RWCU system in accordance with secondary Containment Control

	ES-301-4 Target Quantitative Attributes	Actual Attributes	Event Number(s)
1.	Malfunctions after EOP entry (**1-2**)	**2**	**7,8**
2.	Abnormal events (**2-4**)	**4**	**3,4,5,6**
3.	Major transients (**1-2**)	**1**	**7**
4.	EOPs entered/requiring substantive actions (**1-2**)	**1**	**RPV control No-ATWS**
5.	EOP contingencies requiring substantive actions (**0-2**)	**1**	**RPV Control W/ATWS**
6.	EOP Critical tasks (**2-3**)	**4**	**2,7,8**

Op-Test No.: NRC 2016	Scenario No.: Scenario 2	Event No.: 1
Event Description: Swap RBCCW Pumps		
Initiation: Following shift turnover		
Cues: As directed by the SRO following shift turnover		

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs the BOP to swap RBCCW Pumps IAW 309.2
	BOP	• Swaps RBCCW Pumps IAW 309.2 • Directs the EO to open the RBCCW Pump 2 Casing Vent valve V-5-510 until a steady stream is established, then close the valve [**ROLE PLAY 1**] • Starts the RBCCW Pump 2 by placing its control switch to the START position [**ROLE PLAY 2**] • Verifies the RBCCW Pump 2 ON light lit • Verifies proper pump discharge pressure • Immediately stops RBCCW Pump 1 by placing its control switch to the STOP position • Reports RBCCW Pumps swapped
	ATC	• Monitors plant parameters
ROLE PLAY	**1**)When asked to open RBCCW Pump 2 vent valve V-5-510, state that you have opened the valve, established a steady stream, then closed the valve (**NO** Booth actions are required). **2**)WHEN RBCCW Pump 2 is started, report a good start on RBCCW Pump 2	
Terminus:	RBCCW Pumps have been swapped IAW 309.2	

Notes/Comments

Op-Test No.: NRC 2016 Scenario No.: Scenario 2 Event No.: 2 Event Description: Respond to isolable Leak in the RWCU System with a failure of one isolation valves **(TRIGGER 1)**		
Initiation: When RBCCW pumps are swapped or as directed by the Lead Examiner.		
Cues: Annunciators L6c, RB ΔP LOW; D1d, D2d, RWCU HELB I/II; D8d, CU ROOM TEMP HI; 10F1k, AREA MON HI; 10F3k, CU SYS AREA HI		
Time	Position	Applicant's Actions or Behavior

CRITICAL TASK 4	BOP	• Makes update that RB D/P alarm is in
		• Makes update on RB D/P pressure
		• Monitors Reactor building area temperatures and Radiation levels when directed
		• Responds to annunciators D1d/D2d, RWCU HELB I/II when Annunciates
		    • Reports that RWCU System should have isolated
		    • Attempts to close RWCU valves V-16-1, V-16-14, V-16-61 with their control switches
		    • Reports valves V-16-1 and V-16-61 did close
		    • Reports the valve V-1-6-14 will not close

Role Play	**BOOTH** – If directed to investigate for leak around Cleanup • Report – Steam is coming out of the cleanup cage	
	SRO	• Directs investigating cause of RB D/P alarm • Enters Secondary Containment Control • Directs attaining radiation levels and area temperatures in the Rx Building. • Directs isolating RWCU when determined system has developed a leak. • Refers to T.S. 3.5 for applicability and determines that V-16-14 and V-16-2 are closed and within 4 hours must be deactivated to met T.S 3.5.
	ATC	• Monitors 4F parameters and ensures 4F critical parameters stay in band • Lowers power with recirc if Rx power goes above license limit
Role Play	**BOOTH** – If directed to restore RBCCW temps back in band • Adjust RBCCW parameters to restore DW parameters back in band using RBCCW simulator PI&D.	
Terminus:	RWCU is isolated and the SRO has addressed Tech Specs	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 2	Event No.: 3
Event Description: Respond to trip of VMCC 1B2 **(TRIGGER 3)**		
Initiation: When RWCU leak is isolated or as directed by the Lead Examiner		
Cues: Annunciators G3c, RPS MG SET 2 TRIP; G1c, SCRAM CONTACTOR OPEN; 9XF4a, PROT SYS PNL 2 PWR LOST; 9XF5c, CIP-3 INV AC INP LOST		

Time	Position	Applicant's Actions or Behavior

	BOP	• Responds to annunciators
		• Recognizes and reports loss of VMCC 1B2
		• Performs ABN-51
		    • Confirms CIP-3 INV AC INP LOST (9XF-5-c) alarm received
		    • Verifies the Trans Output green Off light is lit on Panel 7R
		    • Restores power to PSP-2 by placing the Power Select switch in the TRANS position
		    • Resets the following:
		    • Half Scram signal (4F)
		    • Main Steam Isolation signal (4F)
		    • APRM lights (5R)
		    • APRM flow converters (3R, 5R)
		    • Main Steam Line Rad Monitor drawers
		    • Annunciators
		    • **NOTE**: The following are simulated photographs. The candidate can simulate and assume indications are as expected.
		        • Resets the INOP status LED on APRM FCTR cards
		        • Verifies status LED on FCTR card is GREEN
		        • Verifies Curve Select Display is "0"
		    • Resets/verifies reset annunciator 9XF-4-a, PROT SYS PNL PWR LOST
		    • Informs the US the following valves inoperable (1F/2F)

		IAW Tech Spec 3.7 and 3.5.A.3 (only if 'B' Battery is unavailable – it will begin discharging but will be available for several hours) • V-14-31, DC Steam Inlet Valve to 'A' Condenser • V-14-34, DC Condensate Return Valve from 'A' Condenser • V-16-2, Inlet Isolation Valve to Cleanup Auxiliary Pump • V-16-14, Clean-Up Inlet Isolation Valve • Informs the US the B Battery is INOPERABLE as soon as it begins discharging • Monitors 125 VDC B Bus Voltage • Reduces loads as directed by the US utilizing the B Battery Load List • Monitors 125 VDC A Bus Voltage • Verifies the following alarms are received: • MCC-1AB2 PWR XFER (9XF-2-c) • VACP-1 PWR XFER (9XF-3-c) • IP-4 PWR XFER (9XF-7-c) • Confirms one Fire Diesel Pump is operating in MANUAL mode and the other Fire Diesel Pump in AUTO mode • Directs the EO to investigate the loss of VMCC 1B2 • Informs US of Tech Specs section 3.7, Auxiliary Power • Notifies the Director of Operations and the WWM • Informs US to refer to EP-AA-1010 • Reports ABN-51 is complete
Roleplay	BOOTH: When directed to investigate loss of VMCC-1B2 • Report VMCC-1B2 breaker is open and has an acrid order with no smoke and no fire. FLOOR: When operator verifies LED on FCTR card is green • Cue: FCTR card is green FLOOR: When operator verifies Curve select display is "0" • Cue: Curve Select displays "0"	
	SRO	• Directs entry into ABN-51

		• Notifies SM/WWM about the loss of VMCC 1B2
		• Declares VMCC 1B2 inoperable
		• Declares B Battery inoperable as soon as it begins to discharge
		• Reviews/applies Tech Spec 3.7.B
		    • The reactor shall be PLACED IN the COLD SHUTDOWN CONDITION if the availability of power falls below that required by Specification A above
		• Declares the following valves inoperable (1F/2F) IAW Tech Spec 3.5.A.3 (only if 'B' Battery is fully discharged)
		    • V-14-31, DC Steam Inlet Valve to 'A' Condenser
		    • V-14-34, DC Condensate Return Valve from 'A' Condenser
		    • V-16-2, Inlet Isolation Valve to Cleanup Auxiliary Pump
		    • V-16-14, Clean-Up Inlet Isolation Valve

	ATC	• Makes plant announcement of entry into ABN-51
		• Reports ½ scram on RPS 2
		• Following restoration of RPS-2, resets the following:
		    • Half Scram signal
		    • Main Steam Isolation signal

BOOTH: <u>AFTER</u> the ATC resets the ½ scram, insert CAEP ATWS for Event 6		
Terminus:	ABN-51 actions are complete and the SRO has reviewed/applied Tech Specs 3.7.B and 3.5.A.3	

Notes/Comments

Op-Test No.: NRC 2016 Scenario No.: Scenario 2 Event No.: 4 Event Description: Respond to CRD Flow Control Valve failed closed **(TRIGGER 5)**		
Initiation: RWCU is isolated and T.S determination has been made or as directed by the Lead Examiner.		
Cues: Annunciator H5c, CRD HIGH TEMP; DRIVE WATER FLOW, COOLING WATER FLOW, CLG WTR/REACTOR ΔP, & DRIVE WTR/REACTOR ΔP go downscale		
Time	Position	Applicant's Actions or Behavior

	ATC	• Responds to annunciator H5c, CRD HIGH TEMP, and abnormal CRD indications.
		• Reports abnormal CRD indications.
		• Reports the CRD FCV (NC30A) indicates closed.
		• Directs the EO to investigate the failed CRD FCV [**ROLE PLAY 1**].
		• Enters ABN-6, Control Rod Malfunctions, section 13, Flow Control Valve NC-30A/B Fails Closed.
		• Places CRD FCV NC30B in service IAW procedure 302.1, section 6.3.3.
		    • Places the CRD FLOW CONTROLLER in MAN.
		    • Directs the EO to open the standby FCV inlet/outlet valves [**ROLE PLAY 2**].
		    • Directs the EO to place the 4-Way Valve in position to supply both controllers [**ROLE PLAY 3**].
		    • Places the CRD FLOW CONTROL VALVES switch to the B position.
		    • Directs the EO to place the 4-Way Valve in position to supply the in-service controller [**ROLE PLAY 4**].
		    • Verifies normal CRD indications.
		    • Places the CRD FLOW CONTROLLER in AUTO.
		    • Directs the EO to close the failed FCV inlet/outlet valves [**ROLE PLAY 5**].
		        • Reports the standby CRD FCV is in service and indications are normal.

	BOP	• Announces entry into ABN-6, Control Rod Malfunctions, due to CRD FCV NC30A failing closed. • May check CRD Temperatures on Panel 8R and report there are several control rods with high temperatures.

	SRO	• Directs entry into ABN-6, Control Rod Malfunctions, due to CRD FCV NC30A failing closed. • Directs swapping CRD FCVs IAW procedure 302.1, section 6.3.3. • Notifies the SM/WWM about the failed CRD FCV.
ROLE PLAY	1. When/if asked as the EO to investigate the in-service CRD FCV (NC30A), report that it is closed, was leaking air badly, and that you have isolated the air supply to the valve. 2. (Step 6.3.3.1.1.2.b) When/if asked as the EO to open the standby CRD FCV inlet/outlet valves, insert **TRIGGER 7** and report the valves OPEN (V-15-18, V-15-19). 3. (Step 6.3.3.1.1.3) When/if asked as the EO to place the 4-Way Valve in position to supply both controllers, state it is in the position to supply both controller (**NO** booth actions are required). 4. (Step 6.3.3.1.1.5) When/if asked as the EO to place the 4-Way Valve in position to supply the in-service controller state it is in the position to supply NC30B (**NO** booth actions are required). 5. (Step 6.3.3.1.1.8.a) When/if asked as the EO to close the failed FCV inlet/outlet valves, state the valves are closed (**Insert LOA-CRD009 and LOA-CRD010 to 0**) (closes V-15-16, V-15-17).	
Terminus:	CRD FCV NC30B is in service and CRD parameters indicate normal.	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 2	Event No.: 5
Event Description: OFF Gas Deflagration/ loss of vacuum **(TRIGGER 9)**		
Initiation: CRD flow controller swapped or as directed by the Lead Examiner **(booth Look ahead):** Delete malfunction once alarms come in		
Cues: RAP-10XF3d, 10F1a, 10F2a, RAP10F1b, 10F2b		

Time	Position	Applicant's Actions or Behavior
	BOP	Performs actions IAW ABN-25 • Confirms V-267-005 closed • Places Off-gas drain valves selector switch to close • Sends EO to investigate Off-Gas building per RAP-10XF3d • Verifies Off-Gas inlet isolation valves closed • Verifies V-7-31 open • Determines cause of system isolation • Checks for proper system purge • Places off-gas selector switch to isolate and bypass • Verifies off-gas press and temp alarms clear and resets Off-gas isolation • Confirms V-7-1 through 6 open and off-gas line flow is established Performs actions IAW ABN-14 • Makes update that vacuum is recovering after power reduction • Confirms Circ water pumps are operating • Confirms SJAE's are operating properly • Confirms Gland seal system operating properly • Confirms Vacuum breaker is closed • Confirms SJAE drain pumps operating properly
BOOTH	Once OFF-Gas isolation act 1 and 2 along with temp and pressure alarms come in **DELETE** • **DMF MAL-OGS003** (Explosion in off gas piping) **Role Play:** AS RBEO Report: I am out near the stack and just heard a loud bang. I don't see any visible damage	

	Role Play: If asked to investigate Off-Gas: Report: No visible damage to equipment or building and no sign of fire or smoke. Once OFF-Gas has been reset **INSERT** • **Trigger 11 (MAL-CFW017)** Once crew begins to lower power with Recirc • **Insert MAL-CFW017 to 0**	
	CREW	Makes update that vacuum is degrading after OFF-Gas reset
	ATC	Reduces power with the master recirc flow controller
	SRO	• Directs entry into ABN-25 • Directs entry into ABN-14
Terminus:	Rx power has been lowered to stop vacuum reduction	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 2	Event No.: 6
Event Description: Loss of all Stator Cooling Water requires manual scram		
Initiation: Rx power has been lowered to stop vacuum reduction or as directed by the Lead Examiner		
Cues: Annunciator R6c, STATOR CLG TROUBLE; Turbine runback with generator electric lowering and Turbine Bypass Valves opening		

Time	Position	Applicant's Actions or Behavior
	BOP	• Responds to annunciator R6c, STATOR CLG TROUBLE • Directs EO to investigate the alarm [**ROLE PLAY**] • Reports Turbine Bypass Valves are opening and MWe is lowering
	SRO	• Directs entry into ABN-11 • Directs the ATC to manually scram the reactor when the turbine runback is noticed, and to enter ABN-1 • Directs entry into RPV Control – With ATWS EOP
	ATC	• Manually scrams the reactor by pressing MANUAL SCRAM BUS 1 and BUS 2 pushbuttons and places REACTOR MODE SELECTOR switch in SHUTDOWN • Reports not all control rods inserted • Pushes ARI button • Bypasses ROPS • Reduces Recirc pumps to minimum
ROLE PLAY	When directed as the EO to investigate the stator cooling alarm, report that no stator cooling water pumps are running	
Terminus:	The reactor has been manually scrammed and the ATWS has been recognized	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 2	Event No.: 7/8
Event Description: : Respond to an ATWS with reactor power > 2%; Bypass valves shut		

Initiation: inserted a manual scram, and have recognized ATWS conditions or as directed by the Lead Examiner

Cues: The reactor has failed to scram and is in an electrical ATWS condition, all rods still out, power >50%

Time	Position	Applicant's Actions or Behavior

CRITICAL TASK 3	ATC/ Crew	• Reports reactor power
		• Determines the ATWS is electric
		• Trips all Recirculation Pumps when directed with the DRIVE MOTOR switches to STOP
		• Performs SP-21 to insert control rods
		  • May request to close V-15-52, Charging Header Isolation [**ROLE PLAY**]
		  • Determines electrical ATWS
		  • Vent the Scram Air header (Possible Success Path)
		    • Directs the EO to vent the scram air header [**ROLE PLAY**]
		• Manual Control Rod insertion
		  • Confirms all available CRD pumps are running
		  • Places Reactor Mode Switch in REFUEL
		  • Places the ROD WORTH MINIMIZER keylock in BYPASS
		  • Closes CRD DRIVE WATER PRESSURE CONTROL NC18 to maximize CRD drive water differential pressure

ROLE PLAY: If requested to close V-15-52, **INSERT LOA-CRD024 to 0**, and report V-15-52 is closed

ROLE PLAY: As the EO directed to vent the scram air header, acknowledge the request.
NOTE: The crew may de-energize RPS by opening the RPS 100amp breakers when the MSIVs go closed, or after the crew has directed an EO to vent the scram air header, the

Lead Examiner may direct the booth to vent the scram air header by inserting Trigger 7.		

	SRO	• Directs entry into RPV Control – With ATWS EOP
		  • Confirms ARI initiated
		  • Directs ROPS bypassed
		  • Directs all Recirculation Pumps tripped
		  • May direct initiation of SLC IAW SP-22, Initiating the Liquid Poison System
		  • Directs ATC to insert control rods IAW SP-21, Alternate Insertion of Control Rods
		  • Directs SP-1, Confirmation of Automatic Initiation and Isolations
		  • Directs ADS bypassed
		  • Directs SP-16, Bypassing MSIV Lo-Lo Level Isolation Interlocks and the RBCCW Interlocks
		  • Waits until MSIV isolations are bypassed, then directs terminate and prevent RPV injection IAW SP-17
		  • Directs augmenting pressure control with EMRV's when Bypass valves close.
		  • Directs RPV water level below -20" to 30" IAW SP-19, Feedwater/Condensate and CRD Operation
		• May enter Primary Containment Control EOP on Torus high water temperature (95 °F) if reached
		  • Directs Torus Cooling IAW Support Procedure 25
		• Enters RPV Control - No ATWS EOP when all control rods are inserted
		  • Directs RPV water level 138" – 175" using SP-2/3(FW)

BOOTH:	When Core Spray pumps are in pull to lock during SP-17 fault bypass valves INSERT: **TRIGGER 15**	

	BOP/
	Crew
		• Performs SP-1
		• Places ADS TIMERS to BYPASS
		• Performs SP-16
		  • Obtains four (4) bypass plugs
		  • Opens the EOP BYPASS PLUGS panel in the rear of Panel 6R

		• INSERT a bypass plug in position BP1
		• INSERT a bypass plug in position BP2
		• Opens the EOP BYPASS PLUGS panel in the rear of Panel 7R
		  • INSERT a bypass plug in position BP1
		  • INSERT a bypass plug in position BP2
		• Places the ISOL SIGNAL BYPASS V-6-395 switch in the BYPASS position
		• Informs the Unit Supervisor that the MSIV LO-LO Level Isolation Interlock has been bypassed
		• Verifies that the RBCCW System is not isolated due to high Drywell pressure/low RPV water level conditions
		• Opens the EOP BYPASS PLUGS panel in the rear of Panel 2R
		  • Removes the bypass plug from position BP1
		  • Removes the bypass plug from position BP2

CRITICAL TASK 1		• Performs SP-17
		  • Terminates and prevents the Core Spray System injection into the RPV by performing the following:
		    • Presses the OVERRIDE switches for all the sensors that are lit
		    • Presses all ACTUATED switches, whether lit or unlit
		    • Confirms Core Spray Parallel Isolation Valves closed
		    • Confirms Core Spray Booster Pumps tripped
		    • Confirms Core Spray Main Pumps that are not being used to provide makeup water to the torus per SP37 are in the PULL-TO-LOCK position
		• Makes update that EMRV's are open
		  • Takes manual control of EMRV's to control Rx Pressure
		  • Terminates and prevents Condensate and Feedwater injection by performing the following:
		    • Trips all operating Feedwater Pumps
		    • Confirms only one Condensate Pump running
		    • Places all individual FRV Controllers in MAN position
		    • Closes all Feedwater Regulating Valves
		    • Closes the Low Flow Valves

		• Reports RPV injection has been terminated and prevented
CRITICAL TASK 2		• Monitors RPV water level and controls Feedwater to maintain desired band -20" to 20" IAW SP-19 • Confirms only one Condensate Pump and only one Feedwater Pump operating • Controls RPV Water level using the following: • Feedwater Regulating Valves • Feed Regulating Valve Block Valves • Feedwater Low Flow Valves • Heater Bank Outlet Isolation Valves • Feedwater and Condensate Pumps • Reports RPV water level in band • May perform SP-25 if directed (Torus cooling) • Confirm the SYSTEM MODE SELECT switch is in the TORUS COOLING position • Start an ESW Pump • Place and hold the System Pump Start Permissive Keylock for the selected pump in the appropriate position • Start the selected Containment Spray Pump using its control switch
BOOTH	After level is being controlled by SP-19 or as directed Vent the SAH INSERT: **TRIGGER 17**	
Terminus:	Control rods have been fully inserted from venting the scram air header. RPV water level is rising towards the prescribed band as directed in the RPV Control – No ATWS EOP.	
Final EAL Call	MS-2 Automatic Scram Failure to shutdown the reactor and manual actions taken from the Rx control console are not successful in shutting down the reactor.	

Notes/Comments

Procedures Used

Event	Procedure				
1	• 309.2				
2	• Annunciator L6c • Annunciator D1d • Annunciator D2d • Annunciator D8d • Annunciator 10F1k • Annunciator 10F3k				
3	• Annunciator G3c, • Annunciator G1c, • Annunciator 9XF4a, • Annunciator RXF5c • ABN-51 • T.S – 3.7 • T.S. - 3.5				
4	• Annunciator H5c • 302.1				
5	• RAP-Q5d • ABN-14 • RAP-10XF3d& 4d • RAP-10XF5c • RAP-10F3b • ABN-25				
6	• Annunciator R6c • ABN-11 • EMG-3200.01b				
7/8	• EMG-SP21				

	• EMG-SP16 • EMG-SP17 • EMG-SP22 • EMG-SP1 • EMG-SP-19 • EMG-SP25 • EMG-3200.01b • EMG-SP2 • EMG-SP3				

NRC 2016 Scenario 2 (**New**)

Simulator Setup

1. Reset to IC-40 (bwr-2)
2. Confirm RBCCW pump 1 is running
3. Confirm B CRD pump running
4. Risk is Yellow
5. Tag EDG #2 NORMAL START and EMERG START control switches
6. Protect #1 EDG
7. Protect 'A' CRD pump
8. Protect system 1 Containment Spray
9. Protect system 1 Core spray pumps
10. Tag #3 Air Compressor

Event	**Trigger**	**Malfunction**
Preset	Preset	• IMF **MAL-RCU014** (RWCU fail to auto isolate) • IMF **VLV-RCU001** to "Mech seize" (opt 6) (V-16-01 mech seize) • **STL-DGN004** to fail off • **STL-DGN005A** to fail off • **ANN-T-4-f** to fail on • **LOA-DGN012** to "trip" • **LOA-DGN009** to "stop" (Places EDG#2 OOS) • **LOA-CAS031** to Rack out (Places #3 Air compresser OOS)
1	NA	NA
2	**1**	• **MAL-RCU013** to 10% over a 30-minute ramp (inserts a 10% RWCU leak in the RB over a 30-minute period)
3	**3**	• **MAL-EDS004B** (causes a fault on VMCC 1B2)
4	**5**	• **MAL-CRD001A** to 0

	7	(closes CRD FCV NC30A) • **LOA-CRD012** to 1 • **LOA-CRD011** to 1 (This opens the alternate FCV NC30B inlet/outlet valves)
5	**9**	**MAL-OGS003** (explosion in off-gas piping) **NOTE:** Once off gas alarms come in Delete MAL-OGS003
	11	Once Off-Gas reset insert • **MAL-CFW017**,1.5, 120 sec (Vacuum leak in condenser)
6	**13**	• **MAL-GEA005A** • **MAL-GEA005B** (trips A and B Stator water cooing pumps)
7	**Set after event #2**	Activate after event # 2 (Loss of VMCC 1B2) • Insert **ATWS.CAE** file NOTE: This ATWS.CAE is File Path: OPENSIM/CAEP/Training/ATWS.CAE
	Trigger 17	• **LOA-CAS022, 1** • **LOA-CAS021, 0** (Vents Scram Air Header)
8	**Trigger 15→**	• **MAL-TCS006D,** close, **5 seconds TD** • **MAL-TCS006E,** close, **5 seconds TD** • **MAL-TCS006F,** close, **5 seconds TD** • **MAL-TCS006G,** close, **5 seconds TD** • **MAL-TCS006H,** close, **5 seconds TD** • **MAL-TCS006I,** close, **5 seconds TD** This will close bypass valves 5 seconds after core spray pumps are in

		pull to lock is bypassed in SP-17 is complete in Event #7.

NRC 2016 Scenario 2 (**New**)

Shift Turnover

Current plant conditions:

- 100% power
-
- EDG #2 Out of service –
    - Diesel Generator #2 has been out of service for 2 days due to failure to start during the load test. It is scheduled to be returned to service the next day. The diesel load test for #1 diesel is due next shift. Fire diesel #1 is out of service until next shift for quarterly PMs.
- Air Compressor #3 is OOS for troubleshooting due to failure to start.

Shift Activities

- Swap RBCCW pumps IAW 309.2

Exelon Generation.

NRC 2016 Scenario 3 (**New**)

Scenario Outline

Facility: **Oyster Creek** **Scenario No.:** **3** **Op Test No.:** **NRC 2016**

Examiners: ____________ **Operators:** ____________

____________ ____________

____________ ____________

Initial Conditions:

- 100% power
- Main Generator voltage control is in Manual
- Containment Spray system 1 OOS and is in day 2 of a 7 day LCO for heat exchanger cleaning.
- Containment Spray system 2 is protected
- Risk is Yellow

Turnover:

- Place the AVR from manual voltage regulation to automatic voltage regulation IAW 336.1, section 8, starting at Step 8.2

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	N	BOP SRO	Return the AVR to service. 336.1 24 KV main generator electric system
2	MAL-NSS025E	R TS	ALL	EMRV Spuriously opens ABN-40, Stuck open EMRV T.S 4.5.L
3	MAL-CRD013_3403	C	ATC SRO	CRD high temperature alarm RAP- H5c, CRD High temp
4	MAL-EDS003C	C TS	BOP, SRO	Trip of 1A3 ABN-46, Loss of 1A3 T.S -3.7
5	MAL-RBC001A MAL-RBC001	C	ALL	RBCCW Pump Trip Leads to Reactor Scram ABN-19 RBCCW failure response

	B			
6	MAL-NSS017A	M	ALL	LOCA in Primary Containment EMG-3200.02 Primary Containment Control
7	VLV-CNS005	C	BOP, SRO	Containment Spray Fails to Swap to Spray Mode EMG-SP29 Initiation of the containment Spray system for Drywell Sprays
8	RUNFLD.CAE NOLEVEL.CAE	M	ALL	RPV level flashing EMG-3200.08A RPV flooding-No ATWS

* **(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor Transient, (TS) Tech Specs**

NRC 2016 Scenario 3 (**New**)

Simulator Summary

Event	Event Summary
1	The BOP will return the AVR to automatic service IAW 336.1. The BOP will place the AVR MODE Switch to the AUTO position and confirm indications voltage regulation is in automatic. (**BOP: Normal Evolution**)
2	The BOP will respond to a leaking EMRV IAW ABN-40, Stuck Open EMRV. The valve will stop leaking when the control switch is placed in OFF. The ATC will manipulate the Master FW Controller, and the SRO will apply TS 3.4 (**R: Reactivity Manipulation, SRO: Tech Specs)**
3	The ATC will respond to a control rod high temperature alarm (RAP-H5c). The ATC will apply stall flow IAW 617.4.002 (CRD Exercise and Flow Test/IST Cooling Water Header Check Valve), which will clear the alarm. (**ATC: Component Malfunction**)
4	The BOP will respond to a loss of USS 1A3 and execute ABN-46, Loss of USS 1A3. The BOP will start Service Water Pump 1-2, restore power to ER-42, and confirm HP Screen Wash Pump 1-2 and LP Screen Wash Pump 1-4 are running. The SRO will review and apply Tech Spec 3.7. **(BOP: Component Malfunction; SRO: Tech Specs)**
5	The in-service RBCCW pump will trip and the crew will enter ABN-19. The BOP will diagnose a tripped pump and will attempt to the start the standby RBCCW pump. The Standby RBCCW pump will be mechanically seized resulting in a loss of all RBCCW flow. The ATC will manually scram the reactor and secure all running Recirculation Pumps. **(All: Component Malfunction)**
6/7	The Crew will respond to a primary coolant leak in the Primary Containment. The SRO will direct Drywell Sprays but sprays will not operate. The SRO will direct Emergency Depressurization when it has been determined that Torus pressure cannot be maintained below the Primary System Pressure (PSP) Curve. **[Major Event; Component Failure after EOP]**
8	Following emergency depressurization level instrument reference legs will flash resulting in a loss of RPV level indication. The crew will enter RPV Flooding and commence flooding the vessel using the condensate and feedwater system IAW SP 58 and/or Core spray IAW SP 60 to ensure core submergence. **[Major Event]**

NRC 2016 Scenario 3 (**New**)

Critical Task 1	Given a failed open EMRV, the crew will need to take action to close the EMRV in accordance with ABN-40, Stuck open EMRV.
Critical Task 3	Given a LOCA in Primary Containment with challenges to RPV level control, the crew must implement EOP SP-58, Feed and Condensate System and/or EOP SP-60, Core Spray operation, to restore RPV water level.
Critical Task 2	Given a LOCA in Primary Containment with Drywell parameters degrading beyond the capacity of the Containment Spray system, the crew will perform an Emergency Depressurization of the Reactor.

	ES-301-4 Target Quantitative Attributes	**Actual Attributes**	**Event Number(s)**
1.	Malfunctions after EOP entry (**1-2**)	**2**	**7,8**
2.	Abnormal events (**2-4**)	**3**	**2,4,5**
3.	Major transients (**1-2**)	**2**	**6,8**
4.	EOPs entered/requiring substantive actions (**1-2**)	**2**	**RPV Control No-ATWS Primary Containment**
5.	EOP contingencies requiring substantive actions (**0-2**)	**2**	**ED-No ATWS RPV Flooding-No ATWS**
6.	EOP Critical tasks (**2-3**)	**2**	**6/7,8**

Op-Test No.: NRC 2016	Scenario No.: Scenario 3	Event No.: 1
Event Description: Return the AVR to service IAW 336.1.		
Initiation: Following shift turnover		
Cues: As directed by the SRO following shift turnover		

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs the BOP to shift from manual to automatic voltage regulation IAW 336.1, section 8, starting at Step 8.2
	BOP	• Shifts from manual to automatic voltage regulation IAW 336.1, section 8, step 8.2. • Verifies the EX2100e TRANSFER VOLTMETER (8F/9F) is reading Zero (± 1%) • Places the AVR MODE Switch (AVR\97CS Panel 8F/9F) to the AUTO position and allow switch to return to center. (Panel 8F/9F) • Confirms the AUTO light illuminated above AVR MODE Switch. (AVR\97CS Panel 8F/9F) • Confirms the PSS Status is Enabled locally at the HMI
ROLE PLAY: As the EO at the HMI, report that the PSS is active (336.1 step 8.5)		
	BOP	• Removes VOLTAGE CONTROL IN MANUAL operator aids installed per Section 7.0. • May verify Terminal Voltage or Excitation are within the requirements of 336.1, section 5.0, on the PJM website. [**FLOOR ROLE PLAY**] • May notify the Power team when in auto
FLOOR ROLE PLAY:	If the applicant requests (or attempts to verify on the PJM website) that Terminal Voltage or MG Excitation (VARS) are within the limits of section 5.0, inform them that the requirements of section 5.0 are satisfactory.	
Terminus:	The AVR is in automatic voltage control	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 3	Event No.: 2
Event Description: Leaking EMRV NR108A **[TRIGGER 1]**		
Initiation: AVR is in Auto or as directed by the Lead Examiner		
Cues: Annunciator B4g, SV/EMRV NOT CLOSED; EMRV NR108A indicates in the VALVE OPEN REGION; Elevated EMRV tailpipe temperatures		

Time	Position	Applicant's Actions or Behavior

	BOP	• Responds to annunciator B4g, SV/EMRV NOT CLOSED
		• Performs ABN-40 actions
		  • Checks the following:
		    • EMRV lights
		    • Acoustic monitoring indications
		    • EMRV Tailpipe temperatures [**ROLE PLAY**]
		  • Determines that EMRV NR108A is leaking

Role Play:	If asked as the EO to check EMRV tailpipe temperatures locally on RB 23, report that EMRV NR108A tailpipe temperature is about 335°F. All others indicate normal.	
	BOP	o Places EMRV NR108A AUTO DEPRESS switch to OFF o Reports EMRV not closed o Cycles EMRV NR108A AUTO DEPRESS switch between OFF to MAN to OFF [**Booth Action**] o Reports EMRV indicates closed o Resets the MASTER ALARM to silence the alarm o Plots EMRV Dowmcomer temperature IAW the ABN attachment o Refers the SRO to Tech Specs 4.5.F.5 and 4.5.L for surveillance requirementsSpec 3.5.A.3 (only if 'B' Battery is
CRITICAL TASK 1		
Booth Action	When the BOP cycles the EMRV NR108A switch to OFF, DELETE the EMRV leak MAL-NSS025A	
	SRO	• Directs entry into ABN-40, Stuck Open EMRV • Declares EMRV NR108A inoperable after closed in OFF • Applies Tech Spec 3.4.B.2 • 3.4.B.1: Five electromatic relief valves, which provide the

		automatic depressurization and pressure relief functions, shall be operable when the reactor water temperature is greater than 212°F and pressurized above 110 psig, except as specified in 3.4.B.2 and during Reactor Vessel Pressure Testing consistent with Specifications 1.39 and 3.3.A.(i).
		• 3.4.B.2: If at any time there are only four operable electromatic relief valves, the reactor may remain in operation for a period not to exceed 3 days provided the motor operated isolation and condensate makeup valves in both isolation condensers are verified daily to be operable.
		• 3.4.B.3 (IF IC A was declared INOP): If Specifications 3.4.B.1 and 3.4.B.2 are not met; reactor pressure shall be reduced to 110 psig or less, within 24 hours.
		• Reviews Tech Specs 4.5.F.5 and 4.5.L
		  • 4.5.F.5: Once every 3 months and following any release of energy which would tend to increase pressure to the suppression chamber, each OPERABLE suppression chamber - drywell vacuum breaker shall be exercised. Operation of position switches, indicators and alarms shall be verified every 3 months by operation of each OPERABLE vacuum breaker.
		  • 4.5.L.3: Whenever heat from relief valve operation is being added to the suppression pool, the pool temperature shall be continually monitored and also observed until the heat addition is terminated.
		  • Notifies SM/WWM about the EMRV failure and of the required LCO

	ATC	• Performs ABN-40 actions
		  • Reduces Recirc flow control 2 Hz
		  • Places the MASTER FEEDWATER CONTROLLER in MAN by pressing the AUTO/MAN button, and controls RPV water level 155" to 165" with the manual knob
		  • Places the MASTER FEEDWATER CONTROLLER in AUTO
		    • Selects the P display on the MASTER FEEDWATER CONTROLLER using the CHNG DISP button
		    • Selects the S display on the MASTER FEEDWATER

		CONTROLLER using the CHNG DISP button • Raises or lowers the S Display to match the P Display • When S and P are matched, Places the MASTER FEEDWATER CONTROLLER in AUTO by pressing the AUTO/MAN button • Verifies the green AUTO light is on • Adjusts the auto setpoint to 160", or as directed by the SRO • Reports Feedwater Level Control is in auto Monitors RPV water level and feedwater flow
Terminus:	The EMRV is closed and the SRO has reviewed/applied the Tech Specs	

Notes/Comments

Op-Test No.: NRC 2016 Scenario No.: Scenario 3 Event No.: 3 Event Description: CRD high temperature alarm **[TRIGGER 3]**		
Initiation: EMRV is closed or as directed by the Lead Examiner.		
Cues: Annunciator H5c, CRD TEMP HI		
Time	Position	Applicant's Actions or Behavior

	ATC	• Responds to annunciator H5c, CRD TEMP HI
		  • Confirms cooling water differential pressure and flow within limits in accordance with Procedure 302.1
		  • Directs EO to check for a leaking scram discharge valve on HCU 34-03 [**ROLE PLAY**]

ROLE PLAY: As the EO directed to check for a leaking scram discharge valve on HCU 34-03, report that there are no indications of a leaking scram discharge valve on HCU 34-03.		
	ATC	• Attempt to clear alarm by performing the following: Applies stall flow signal to the affected CRD IAW Procedure 302.2 section 11[**FLOOR**]
FLOOR: Provide copy of 302.2 section 11 to the applicants.		
	ATC	• Turns Rod power on • Selects control rod 34-03 • Holds NOTCH OVERRIDE Switch in NOTCH OVERRIDE position • Holds ROD CONTROL Switch to ROD OUT NOTCH position • Releases ROD CONTROL Switch and NOTCH OVERRIDE Switch [**BOOTH**] • Turns off ROD POWER switch
BOOTH: When the candidate applies stall flow the first time, then **DELETE MAL-CRD013_3403**. This will restore cooling water to the control rod and the high temperature alarm will clear shortly.		
	ATC	• Reports the CRD TEMP HI annunciator has cleared
	BOP	• Determines which CRD is bringing in the high temperature alarm at Panel 8R • Identifies control rod 34-03 and reports temperature/trend • Verifies CRD temp hi condition has cleared on 8R recorder

		TR-RD0046 • Resets recorder by pressing the alarm acknowledge button on 8R recorder TR-RD0046. This will clear annunciator H5c on Panel 5F/6F. • Trends 34-03 temperature following the annunciator clearing and reports temperature
	SRO	Oversees the control rod manipulation
Terminus:	The CRD TEMP HI annunciator H5c is clear	

Notes/Comments

Op-Test No.: NRC 2016 Scenario No.: Scenario 3 Event No.: 4 Event Description: Loss of 480 VAC Bus USS 1A3 **[TRIGGER 5]**		
Initiation: CRD hi temp clear or as directed by the Lead Examiner.		
Cues: Annunciators S8f, FDR TO 460V 1A3 TRIP, and U5a, 1A3 MN BRKR TRIP		
Time	Position	Applicant's Actions or Behavior
	BOP	Per RAPs S-8-f, FDR TO 460V 1A3 TRIP, and U-5-a, 1A3 MN BRKR TRIP **(NOTE: Applicant may directly enter and execute ABN-46 instead of RAP).** • Checks Breaker position and Bus amps • Has EO check at the local breaker cubicle for relay targets • Verifies trip of 4160V Breaker 1A3P • Refers to ABN-46 • Checks Bus loads have shed • Determines cause of Breaker trip **[BOOTH]** • Has Intake operator confirm control power switch inside panel ER-42 in position 2 and restores power to ER-42
BOOTH: When requested to investigate cause of USS 1A3 trip, report that the 1A3P breaker tripped on overload **BOOTH: Roleplay:** Roleplay when directed to to swap ER-42 and restore power to ER-42 insert **TRIGGER 7** and report.		
	BOP	• Makes update that lost USS-1A3 • Per ABN-46, LOSS OF USS 1A3: IMMEDIATE OPERATOR ACTIONS • Starts 1-2 Service Water pump SUBSEQUENT OPERATOR ACTIONS • Has an EO restore power to Panel ER-42 **[BOOTH]** • Has an EO confirm HP Screen Wash Pump 1-2 and LP Screen Wash Pump 1-4 are running **[BOOTH]**
ROLE PLAY	**BOOTH:** NOTE: Screen Wash Control Panel and Low Pressure Screen Wash pumps are **not** modeled. When requested to confirm HP Screen Wash Pump 1-2 and LP Screen Wash Pump 1-4 are running, report they are both running. May request EO to check intake dp.	
		• Monitors North intake DP, Circ Water pump amps and main

		condenser vacuum • Notifies Security of the loss of security lighting at the intake • Requests Work Week Manager to mobilize Electrical Maintenance for troubleshooting and repair • Reviews Attachment 1 Load list on USS 1A3, MCC 1A31 and lighting panel 1A31 for any additional loads lost. • Informs US to refer to T.S. 3.7
	ATC	• May assist in communications associated with execution of RAPs and ABN-46
	SRO	• Directs entry into ABN-46, Loss of USS 1A3 • Determines that USS 1A3 is inoperable per Tech Spec 3.7 and determines that the plant must be placed in the cold shutdown condition
Terminus:	ABN-46 has been performed and the SRO has addressed Tech Specs.	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 3	Event No.: 5
Event Description: The in-service RBCCW pump trips **[TRIGGER 9]**		
Initiation: ABN-46 actions complete or as directed by the Lead Examiner		
Cues: Annunciators C3c, RBCCW PUMP 1-1 TRIP; E7d, E7f, F7b, CCW FLOW LO for all Recirculation Pumps; RBCCW PUMP 1-1 indicates tripped		

Time	Position	Applicant's Actions or Behavior
	BOP	• Responds to annunciators C3c, RBCCW PUMP 1-1 TRIP; E7d, E7f, F7b, CCW FLOW LO for all Recirculation Pumps • Checks RBCCW HX OUTLET PRESS and RBCCW PUMP 1-1 indications and recognizes RBCCW Pump 1-1 has tripped • Enters and performs immediate actions of ABN-19. • Starts RBCCW Pump 1-2 by placing its control switch to START **(must be started within 1 minute)** • Reports RBCCW Pump 1-1 tripped and RBCCW Pump 1-2 did not start

	SRO	• Directs entry into ABN-19
		• Recognizes a loss of all RBCCW flow has occurred and enters ABN-19
		• Directs a manual scram IAW ABN-1
		• Directs tripping all Recirculation Pumps
		• Directs entry into RPV Control – No ATWS
		  • Directs the Crew to maintain RPV water level 138" – 175" (or 138" – 160") using SP2 (Cond/FW) and/or SP3 (CRD)
		  • If an RPV isolation did not occur, directs the Crew to maintain RPV pressure (approximately) 800 – 1000 psig using the Turbine Bypass Valves
		    • If an RPV isolation occurred (due to reaching RPV Lo-Lo Level post scram), directs the Crew to maintain RPV pressure (approximately) 800 – 1000 psig using the Isolation Condensers (SP-11) and/or EMRVs (SP-12)
		    • Directs SP-1 (Confirmation of Automatic Initiations and Isolations)

	ATC	• Scrams the reactor IAW ABN-1
		  • Depresses both Manual Scram Pushbuttons
		  • Places the Reactor Mode Selector switch in SHUTDOWN
		  • Verifies all control rods fully inserted
		  • Reports immediate scram actions complete
		• Trips all operating Recirculation Pumps IAW ABN-19
		• Maintains RPV pressure in band with Turbine bypass valves
		  • If Rx reaches Lo-Lo: Performs SP-11 (ICs) and/or SP-12 (EMRVs) to maintain RPV pressure as directed
		    • SP-11 (ICs)
		    • Trips Recirculation Pump A for use with IC-A (or Recirculation Pump E for use with IC-B)
		    • Verifies RPV water level < 160”
		    • Cycles Condensate Return Valve V-14-34 as necessary to maintain RPV Pressure with IC-A (or V-14-35 for IC-B)
		    • SP-12 (EMRVs)
		    • Verifies Torus water level is > 90”
		    • Places one or more EMRV control switch in the MAN position, then back to AUTO

	BOP	• Controls RPV water level as directed following the scram
		  o Reports entry into RPV Control – No ATWS on low RPV water level
		  o When RPV level begins to rise following the scram, then performs the following:
		  o Places all MFRVs in MANUAL, if in AUTO
		  o Closes all MFRVs, if OPEN
		  o Directs the EO to close CRD Supply Water Valve to Charging Water Header valve V-15-52 [**ROLE PLAY**]

Roleplay	As the EO directed to close CRD Supply Water Valve to Charging Water Header valve V-15-52, insert Trigger 15. Report when complete.	
		○ Enters SP-2 (Cond/FW) when directed ○ Controls RPV water level using the following as necessary: ○ Feedwater Regulating valves ○ Main Feed Regulating Valve (MFRV) Block valves ○ Feedwater Low Flow valves ○ Heater Bank Outlet Isolation valves ○ Feedwater and Condensate pumps • Performs SP-1 as directed • Makes plant announcement for reactor scram due to loss of all RBCCW flow
Terminus:	The reactor is scrammed, all Recirculation Pumps are tripped, and RPV water level and pressure are under control	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 3	Event No.: 6/7
Event Description: Leak in Primary Containment		
[TRIGGER 11, Nolevel.CAE, Run FLD.CAE]		

Initiation: level is recovering or as directed by the Lead Examiner

Cues: Drywell pressure and Temperature parameters are rising.

Time	Position	Applicant's Actions or Behavior

	RO	• Responds to annunciators for Primary Containment rising temperature and pressure
		• Reports Drywell temperature and pressure are rising
		• Reports Drywell pressure > 3 psig – EOP entry
		• Monitors Primary Containment indications
		• Performs Drywell Sprays IAW SP-29
		  • Confirms all Reactor Recirculation Pumps tripped
		  • Confirms all Drywell Recirc Fans tripped
		  • When directed, initiates Drywell Sprays
		    ▪ Places the SYSTEM MODE SELECT switch for the selected system in the DW SPRAY position
		    ▪ Verifies the Torus CLG Discharge valve closes
		  • Verifies the DW Spray Discharge valve opens
		  • Reports the DW Spray Discharge for System 2 (V-21-5) will not open and thus no Drywell Sprays are available
		  • Directs EO to open DW Spray Discharge for System 2 (V-21-5) [**Role Play**]

Role Play:	As the directed as the EO to open DW Spray Discharge for System 2 (V-21-5), report that the valve is stuck closed and you cannot open it.	

	RO	• Monitors Primary Containment conditions (temperature, pressure)
		  • Reports when PSP is being approached
		  • Reports when 281 °F Drywell bulk temperature is being approached

CRITICAL TASK 2		• Opens all EMRVs by placing the AUTO DEPRESS VALVE switches to MAN • Reports all EMRVs open

	SRO	• Directs entry into Primary Containment Control EOP • Directs SP-1, Confirmation of Automatic Initiations and Isolations • Directs line-up of Drywell Sprays IAW SP-29 • Directs initiation of Drywell Sprays when either: ▪ Drywell or Torus pressure exceeds 12 psig ▪ When Primary Containment conditions are within the Containment Spray Initiation Limit (CSIL) Curve • When determined that Torus pressure cannot be maintained < PSP, or when bulk Drywell temperature cannot be restored and maintained < 281 °F, directs entry into Emergency Depressurization – With AWS EOP • Directs RO to Bypass ROPS • Verifies Torus water level > 90" • Directs RO to open all EMRVs
Terminus:	The RPV has been emergency depressurized due to Primary Containment conditions	

Notes/Comments

Op-Test No.: NRC 2016 Scenario No.: Scenario 3 Event No.: 8 Event Description: RPV Level instruments fail		
Initiation: Reactor Scrammed or as directed by the Lead Examiner		
Cues: RPV level instruments indicating high out of sight		
Time	Position	Applicant's Actions or Behavior
	Crew	• Determines that all level indications have flashed and cannot determine water level.
	SRO	• Based on RPV Control No ATWS Override " level cannot be determined" entry into RPV Flooding is required and directs the following operator actions: • Confirms all EMRVs are open, Confirms that the MSIVs are closed and Closes isolation condenser isolation valves.
CRITICAL TASK 3	RO	Per SP-58, increases injection into the RPV with condensate/feedwater: • Confirms that the condensate and feedwater pumps are running. • Confirms the heater string outlets and FRV block valves are open. • Throttles open the FRVs to maintain the main steam lines flooded. • Monitors hotwell levels. Maximizes hotwell level make up. Per SP-60, increases injection into the RPV with Core Spray • Overrides actuating signals • Confirms 1 Main pump running and 1 booster pump running in system started • Opens Parallel Valves as required to flood RPV
Terminus:	When RPV Flooding is established.	
Final EAL call	FS-1 due to a loss of Reactor Coolant System barrier and a potential loss of Fuel Clad barrier	

Notes/Comments

Procedures Used

Event	Procedure				
1	• Copy of 336.1 handed out				
2	• RAP-B4g • ABN-40 • TS 3.4.B (ADS valves) • TS 4.5				
3	• RAP-H5c • 617.4.002 (Handout)				
4	• ABN-46 • RAP-S8f • RAP-U5a • T.S 3.7				
5	• ABN-19 • RAP-C3c				
6	• EMG-3200.01A • EMG-SP29 • EMG-3200.02 • EMG-SP2 • EMG-SP3 • EMG-SP11 • EMG-SP12				
7	• EMG-SP29 • EMG-3200.02 • EMG-3200				

8	• EMG-SP-58 • EMG-SP-60 • EMG-3200.08A				

NRC 2016 Scenario 3 (**New**)

Simulator Setup

1. Reset to IC-40 (bwr2)
2. Lower reactor power to 97% with recirc flow
3. Place the AVR in manual voltage control IAW 336.1, section 7
4. Confirm Transfer meter is at "0"
5. Have copy of 336.1 (complete procedure) for applicants; mark step 8.1.1 and 8.1.2 complete
6. Have copy of 202.2 section 11 for applicants
7. Ensure Service Water Pump 1-1 is running and Service Water Pump 1-2 is secured
8. Hang tags on containment spray/ESW 1 pumps
9. Protect containment spray/ESW 2 system
10. Protect EDG #2
11. Risk is Yellow

Event	**Trigger**	**Malfunction**
Preset	Preset	**VLV-CNS005, Mech Seize** (Containment Spray mechanical seizure) Containment Spray System 1 Tag Out **LOA-CNS054**, rack out **LOA-CNS051**, rack out **VLV-CNS002**, close **BKR-CNS007,** fail control fuse **BKR-CNS005,** fail control fuse
1	NA	NA
2	**1**	**MAL-NSS025A to 25%** (This inserts a 25% leak through EMRV NR108A)
3	**3**	**MAL-CRD013_3403** (This will plug the cooling water to control rod 34-03 and result in a high temperature) (This malfunction will be deleted within the scenario)
4	**5**	**MAL-EDS003C** (This will insert a loss of USS 1A3)

	7	LOA-CWS049 to B31 This will restore power to ER-42
5	**9**	**MAL-RBC001A** (Trips RBCCW Pump 1-1) **MAL-RBC001B** (Trips RBCCW Pump 1-2)
	15	**LOA-CRD024 to 0** (This closes CRD Supply Water Valve to Charging Water Header valve V-15-52)
6	**11**	**MAL-NSS017a, 6%, 300 seconds** (Steam leak inside drywell) **file: NOLEVEL.CAE** **file: RUN FLD.CAE** (RPV level flashing)
7	**Preset in Initial conditions**	**VLV-CNS005, Mech Seize** (Containment Spray mechanical seizure)
8	**Set in event 6**	**file:** NOLEVEL.CAE **file:** RUN FLD.CAE (RPV level flashing)

NRC 2016 Scenario 3 (**New**)

Shift Turnover

Current plant conditions:

- 100% power
- Main Generator voltage control is in Manual
- Containment Spray system 1 OOS and is in day 2 of 7 for heat exchanger cleaning.
- Containment Spray system 2 is protected
- Risk is Yellow

Shift Activities

- Place the AVR from manual voltage regulation to automatic voltage regulation IAW 336.1, section 8, starting at Step 8.2

Exelon Generation

NRC 2016 Scenario 4 (**New**)

Scenario Outline

Facility: Oyster Creek **Scenario No.:** 4 **Op Test No.:** 15-1 NRC

Examiners: ____________ **Operators:** ____________

Initial Conditions:
- <5% power
- Turbine warming is inprog

Turnover:
- Raise Reactor Power with Control rods

Event No.	Malf. No.	Event Type*		Event Description
1	N/A	N/R	ATC, SRO	Raise Reactor Power with Rods 302.1 Control Rod Drive System
2	MAL-CRD005_1431	C	ALL	Control Rod Drifts Out ABN-6 Control Rod Malfunctions
3	MAL-NIS020B	I	ATC, SRO TS-SRO	APRM Fails High 403 LPRM-APRM system operations T.S. 3.1.1
4	LOA-EDS137	C TS	BOP, SRO TS-SRO	Loss of VACP-1 ABN-58 Instrument Power Failures T.S. 3.7
5	ANN-L-4f	C TS	BOP SRO TS-SRO	Respond to trip of Control Room Vent Fan B 331.1, Control Room HVAC T.S. 3.17.B
6	MAL-EDS001a	C	All	Loss of Bus 1A Causes a Reactor Scram ABN-1 Reactor Scram

7	MAL-RPS006 MAL-RPS005	C	ALL	ATWS - Rods Insert With ARI which causes fuel failure EMG-3200.01B RPV control with ATWS
8	MAL-ICS 003A VLV-ICS005 VLV-ICS006	M	ALL	Steam Leak into Reactor Building From unisolable Isolation Condenser EMG-3200.02 Secondary Containment Control

* **(N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor Transient, (TS) Tech Specs**

NRC 2016 Scenario 4 (**New**)

Simulator Summary

Event	Event Summary
1	The ATC will withdraw control rods to raise reactor power IAW the pull sheet and 302.2. (**ATC: Reactivity Manipulation**) (**Normal evolulation)**
2	The ATC will respond to an outward drifting control rod (rod 14-31) after the second rod is pull to required position. The ATC will enter ABN-6 and attempt to drive the rod to its original position. The rod will continue to move out at which time the ATC will drive the rod to position 00. The BOP will manually scram the rod from panel 6XR. The Reactor Building Operator will Isolate the HCU for rod 14-31. The SRO will evaluate TS 3.2.B.4, Reactivity Control, for applicability and determine that it does not apply since there are not more than six control rods inoperable. (**ATC: Component Malfunction; BOP: Component Malfunction**)
3	The ATC will respond to an upscale failure of APRM 2 and resultant ½ scram on RPS 1. The ATC will bypass the APRM and reset the ½ scram and the SRO will review TS Table 3.1.1. [**Instrument Malfunction: ATC; Tech Spec: SRO**]
4	The crew responds to a loss of VACP-1. The crew enters ABN-58, starts Standby Gas treatment system and dispatches operator to investigate loss of VACP-1. US makes a Tech Spec determination that the plant must be in cold shutdown condition from TS section 3.7 unless VACP-1 is restored.**(BOP: Component Malfunction, Tech Spec: SRO)**
5	The Control Room HVAC Fan B will trip. The SRO will direct placing the CR HVAC System A in service IAW 331.1, Control Room and Old Cable Spreading Room Heating, Ventilation and Air Conditioning System. The SRO will apply TS 3.17.B. **(BOP: Component malfunction, Tech Spec: SRO)**
6/7	A loss of 4160V 1A then occurs forcing the crew to enter ABN-1 and scram the reactor on multiple Recirc pump trips. The crew determines that a manual scram did not insert the rods and takes immediate failure to scram actions with ARI working. The crew then recognizes fuel failure occurred during the Scram. (**CREW: Component Malfunction)**
8	A steam leak will occur in the Isolation Condenser System, which will be unisolable. The steam leak combined with the fuel failures will result

in exceeding the Max Safe radiation levels and/or temperature levels in two areas and the SRO will direct an Emergency Depressurization of the RPV. **[MAJOR, Component Failure after EOP]**

Critical Task 1 — Given a drifting control rod which fails to remain inserted with RMCS, the crew must scram the control rod in accordance with ABN-6

Critical Task 2 — Given an un-isolable steam leak into the Reactor Building, the crew must Anticipate Reactor Blowdown and/or Emergency Depressurize the Reactor when two maximum safe parameters are challenged.

Critical Task 3 — Given a Reactor Scram with rods failing to insert, the crew must manually initiate ARI to insert control rods, in accordance with EOP RPV-with ATWS.

	ES-301-4 Target Quantitative Attributes	**Actual Attributes**	**Event Number(s)**
1.	Malfunctions after EOP entry (**1-2**)	2	8,9
2.	Abnormal events (**2-4**)	2	2,4
3.	Major transients (**1-2**)	1	8
4.	EOPs entered/requiring substantive actions (**1-2**)	2	RPV Control No-ATWS Secondary Containment
5.	EOP contingencies requiring substantive actions (**0-2**)	1	ED-No ATWS
6.	EOP Critical tasks (**2-3**)	2	6/7,8

Op-Test No.: NRC 2016	Scenario No.: Scenario 4	Event No.: 1
Event Description: Withdraw Control Rods to raise reactor power		

Initiation: Following shift turnover

Cues: As directed by the SRO following shift turnover

Time	Position	Applicant's Actions or Behavior
	SRO	• Directs ATC to withdraw control rods IAW the pull sheet and 302.2 • Acts as the Reactivity Manager during the reactivity manipulation

	ATC	• Withdraws control rods IAW the pull sheet and 302.2
		  • **VERIFY** the PERMIT light is illuminated
		  • **CONFIRM** the ROD POWER Switch ON
		  • **SELECT** the control rod to be withdrawn by momentarily depressing the pushbutton on the CONTROL ROD SELECT pushbutton matrix
		    • Verifies the control rod light is lit
		    • Verifies no other control rods are selected
		  • **TURN** the ROD CONTROL Switch to ROD OUT NOTCH position and simultaneously **TURN** the NOTCH OVERRIDE
		  • **VERIFY** the WITHDRAW light remains illuminated for the duration of rod withdrawal and an increasing rod position display is presented
		  • **ALLOW** the rod to settle one notch before the desired position by simultaneously releasing the Rod Control Switch and the Notch Override Switch one digit before the desired notch position (one notch above the target notch) is reached, unless the control rod is being withdrawn to the full-out position
		  • **VERIFY** that the rod latches in an even-numbered position before the SETTLE light extinguishes

	BOP	• Provides peer check for control rod movements • Verifies the following during switch movement

		o Amber OVERRIDE light is illuminated o Green INSERT light is illuminated following switch movement and remains on for approximately 1 second o Rod position readout momentarily displays the next lower odd-numbered digit as the drive unlatches
Terminus:	2 Control Rods have been withdrawn to required position	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 4	Event No.: 2
Event Description: Respond to an outward drifting control rod **[TRIGGER 1]**		
Initiation: 2 Control Rods have been withdrawn to required position per pull sheet or as directed by the Lead Examiner		
Cues: Annunciator H6a, ROD DRIFT; Control rod position indication for control rod 18-11 is rising		

Time	Position	Applicant's Actions or Behavior

	ATC	• Responds to Annunciator H6a, ROD DRIFT
		  • Reports control rod 14-31 is drifting outward of the core
		  • Reports entry into ABN-6
		    • Confirms ROD POWER Switch to ON
		    • Selects control rod 14-31
		    • Applies an insert signal to the control rod
		    • When the control rod is returned to its programmed position, then removes the insert signal
		    • Reports that the control rod continues to drift outward
		    • Applies a continuous INSERT signal to the control rod using the ROD CONTROL switch
		    • Following the rod scram, removes the insert signal
		    • Reports that control rod 14-31 remains at position 00
		    • Directs the EO to isolate the associated HCU IAW with Procedure 302.1, Control Rod Hydraulic System [**ROLE PLAY**]
		    • Places ROD POWER switch to OFF
		    • Notifies Chemistry to sample Reactor Coolant for activity
		    • Monitors Off-gas activity, Reactor coolant activity, and Main steam line radiation
		    • Notifies Reactor Engineering
		    • Informs US to consult Tech Spec, Section 3.2.

Role Play:	As the EO directed to isolate HCU 14-31, report that HCU 14-31 is isolated (no booth actions required) **BOOTH:** When control rod 14-31 indicates in a scrammed condition, then **DELETE MAL-CRD005 1431.**	

	BOP	• Scrams the affected control rod from Panel 6XR IAW ABN-6 attachment 1
CRITICAL TASK 1	BOP	• Obtain Key #129 from the key locker located in the Shift Managers office for Panel 6XR • Unlocks Panel 6XR • Selects the control rod 14-31 and places the toggle switch to the open (scram) position (up position) • Verifies that the scram display illuminates for 18-11 rod position indicator (Panel 4F) **[BOOTH]** • May direct the EO to verify the following valves open at HCU 18-11: 101, 102, &108 **[ROLE PLAY]**
BOOTH: When directed as the EO to verify the 101, 102, and 108 valves open at HCU 14-31, report that the valves are open OR directs the EO to isolate HCU 14-31 with cooling water.		
	BOP	• When rod movement stops, removes the scram signal by placing the 14-31 toggle switch to the closed position (down position) • Verifies the scram signal is removed • Locks Panel 6XR • Returns the key to the key locker in SM office
	SRO	• Directs entry into ABN-6 • Notifies SM/WWM and Reactor Engineering about the drifting control rod • Declares control rod 14-31 inoperable Reviews/applies Tech Spec 3.2.B.4
Terminus:	Control Rod is scrammed and the SRO has reviewed/applied the Tech Specs	

Notes/Comments

Op-Test No.: NRC 2016 Scenario No.: Scenario 4 Event No.: 3		
Event Description: APRM Fails High **[TRIGGER 3]**		
Initiation: Control Rod is scrammed or as directed by the Lead Examiner.		
Cues: Annunciators G1c, SCRAM CONTACTOR OPEN; G1d, CHANNEL I; G1f, APRM HI-HI/INOP; G3f, APRM HI; ½ scram on RPS 1		
Time	Position	Applicant's Actions or Behavior

	ATC	• Reports ½ scram on RPS 1 from APRM failing high
		• Reports all APRMs normal
		• Reviews associated RAPs
		• Reports APRM 2 is upscale
		• Bypasses APRM 2 IAW 403 and resets ½ scram
		    • Directs SRO to Tech Spec 3.1
		    • Places APRM BYPASS joystick in the CH 2 position
		    • Presses SCRAM SYSTEM RESET pushbutton
		    • Verifies APRM indicates bypassed and ½ scram reset
		    • Updates Attachment 403-2 as determined by the SRO
		    • Reports APRM bypassed and ½ scram reset

	BOP	• Makes plant page regarding ½ scram • Checks APRM drawers • Reports upscale lights on APRM 2

	SRO	• Directs ATC to bypass APRM 2 IAW Procedure 403 and to reset ½ scram
		• Notifies Shift Manager/Work Week Manager (SM/WWM) for repair of APRM 2
		• Reviews Tech Spec 3.1
		    • With one required channel inoperable in one trip system, within 12 hours, restore the inoperable channel or place the inoperable channel and/or that trip system in a tripped condition.
		    • Determines that 1 bypassing APRM is allowed and RX startup can continue. May notify Reactor Engineering to update Attachment 403-2

BOOTH	After ½ scram is reset: Insert **CAE file: ATWS, ARI op**	

Terminus:	APRM 2 has been bypassed and ½ scram reset

Notes/Comments

Op-Test No.: NRC 2016 Scenario No.: Scenario 4 Event No.: 4 Event Description: Loss of VACP-1 **[TRIGGER 5]**		
Initiation: ½ scram is reset and APRM 2 is bypassed or as directed by the Lead Examiner.		
Cues: Annunciator 9xF3B, Instrument AIR supply pressure, MPR set point, MPR relay positions, and CST level indications fail downscale, Cleanup system trips		
Time	Position	Applicant's Actions or Behavior

	BOP	• Recognizes loss of VACP-1 and makes update that Annunciator BACP-1 PWR LOST alarmed
		Per ABN-58:
		• Starts SGTS;
		  • SECURES all painting, hot work and vehicle operations in the Reactor Building if applicable. (PA Announcement)
		  • CONFIRMS STANDBY GAS TREATMENT SYSTEM
		  • SELECT switch in the desired position
		  • STARTS selected SGTS exhaust fan by placing it's control switch to hand on panel 11R
		  • CLOSES SGTS Crosstie valve V-28-48 by placing the V-28-48 control switch to CLOSE position
		  • VERIFIES Rx bldg pressure is -0.25" H_2O
		  • Dispatches EO to check VACP-1 supply breakers
		  • Receives report that switch was bumped and did not auto transfer
		  • Verifies disconnect switch VACP-1 is closed
		  • Informs US to refer to T.S 3.7
		  • Refers to Procedure 202.1 for restrictions with MPR out of service

BOOTH	ROLEPLAY: As equipment operator if directed to investigate: 2 min later • VACP-1 tripped on overload and auto transfer switch is stuck	
	SRO	• Directs entry into ABN-58 • Could Enter SCC based on RB dP lo • Refers to Procedure 202.1 for restrictions with MPR out of service • Directs restoring DW parameters after cleanup trip • Refers to TS 3.7 • Determines the Rx must be placed in a cold

		shutdown.
BOOTH:	If directed to adjust RBCCW to restore DW parameters • Adjust RBCCW temps using RBCCW PI&D	
	ATC	• Monitor critical parameters • Directs EO to adjust RBCCW to restore DW parameters
Terminus:	ABN-58 actions are complete	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 4	Event No.: 5
Event Description: Trip of Control Room Vent System B **[TRIGGER 7]**		
Initiation: ABN-58 actions are complete or as directed by lead examiner		
Cues: Annunciator RAP-L4f		
Time	Position	Applicant's Actions or Behavior

	BOP	• Responds to annunciator L4f, CONTROL RM HVAC SYS B TROUBLE
		  • Reports that CR HVC B has shutdown
		  • Dispatches NLO to Panel ER-826-134 to determine cause of trip **[ROLE PLAY]**
		• Starts CR HVAC System A IAW procedure 331.1, section 5.0 (**Panel 11R**)
		  • Verifies HVAC System A is electrically lined-up
		  • Directs NLO to confirm System A compressor crank case on-contact temperature near 75 °F **[ROLE PLAY]**
		  • Momentarily places CONTROL ROOM HVAC A SYSTEM BYPASS in RESET (**Panel 11R**)
		  • Verifies CONTROL ROOM HVAC A SYSTEM MODE switch in NORM
		  • Start HVAC A Fan FN-826-008A by placing CONTROL ROOM HVAC A SYSTEM INITIATION switch in ON
		  • Verifies isolation dampers open:
		    • DM-826-042
		    • DM-826-043
		  • Verifies CR HVAC Fan A FN-826-008A is running
		  • Verifies System A operational mode is as selected by observing the NORM light lit
		  • Notifies NLO to close refrigeration compressor breakers on the side of air conditioning unit 1-826-001A as required (NCSR) **[ROLE PLAY]**
		  • Adjusts the local thermostat to maintain 75 $\pm$ 5 °F (**NOT MODELED**)
		  • Starts kitchen and Toilet Exhaust Fan in STOP (**NOT MODELED**)
		  • Reports CR HVAC System A is in service

	SRO	• Directs CR VHAC System A started IAW procedure 331.1
		• Reviews TS 3.17.B
		  • Declares CR HVAC System B inoperable
		  • States the partial recirc mode verified every 24 hours or place in partial recirc mode; and, 7-day LCO, or prepare a special report
		  • within 14 days
		• Notifies WWM/SM for repair/investigation
		• Briefs the Crew

ROLE PLAY	• As the NLO, when requested to check Panel ER-826-134, WAIT 2 minutes, then report that there are no abnormal indications. • As the NLO, when requested to confirm System A compressor crank case on-contact temperature near 75 °F, WAIT 2 minutes then report System A compressor crank case on-contact temperature is 76 °F • As the NLO, if requested to check breaker for CR HVAC Fan B FN-826-008B, state that is has tripped. • As the NLO, when requested to close refrigeration compressor breakers 1, 2, and 3, WAIT 2 minutes and report breakers are closed. • As the NLO report status of 'A' control room ventilation dampers as seen on	
Terminus:	CR HVAC System A is in service and the crew is briefed.	

Notes/Comments

Op-Test No.: NRC 2016	Scenario No.: Scenario 4	Event No.: 6/7
Event Description: Loss of Bus 1A **[TRIGGER 9]**		
Initiation: CR HVAC System A is in service or as directed by evaluator		
Cues: Multiple Feedwater and Recic pump trips,		

Time	Position	Applicant's Actions or Behavior
	CREW	Recognizes multiple RRP trips due to power loss
	SRO	• Directs scramming the Reactor
BOOTH	When Rods are in or as directed by lead evaluator • **INSERT TRIGGER 11**	
	ATC **CRITICAL TASK 3**	• Pushes scram pushbuttons • PLACE the Reactor Mode Switch in SHUTDOWN position. • Announces failure to scram and performs failure to scram actions • Presses ARI pushbutton • Bypasses ROPS • Takes recirc to minimum • VERIFY that all rods are fully inserted (at or beyond position 04). • VERIFY that reactor power is lowering. • UPDATES US that immediate scram actions are complete. INSERT SRM and IRM detectors
	SRO	• Enters RPV control W/ATWS • Enter RPV Control no ATWS once Rods are in • DIRECT URO to maintain RPV water level 138" to 175" TAF using feed/condensate. Uses SP-2/3. • DIRECT BOP to maintain RPV Pressure band below 1045 psig with turbine bypass valves
	BOP	• When RPV level begins to rise ensure one feed pump still running, places MFRV's to manual and closes them • EXECUTE the following RPV Control – No ATWS steps when directed:

		• STABILIZE RPV pressure below 1045 psig with turbine bypass valves.
	ATC	• MAINTAIN RPV level between 138 and 160 in. with SP-2/3.
Terminus:	Rx is scrammed and all rods in	

Notes/Comments

Op-Test No.: NRC 2016 Scenario No.: Scenario 4 Event No.: 8

Event Description: Responds to a steam leak in Isolation Condenser A steam line **[TRIGGER 9]**

Initiation: Reactor Scrammed or as directed by the Lead Examiner

Cues: Annunciator 10F1k, AREA MON HI; Isolation Condenser area temperatures rising; Annunciators 10F1m – 10F4m (refuel floor ARMs)

Time	Position	Applicant's Actions or Behavior

	RO	• Responds to annunciator 10F1k, AREA MON HI
		  • Reports ISOLATION COND AREA and LIQUID POISON SYSTEM AREA ARMs above the high setpoint and rising
		  • Reports EOP entry required
		• Attempts to Isolate the Isolation Condensers with their control switches
		  • Reports that Isolation Condenser System A steam valves will not close
		  • May dispatch EO to isolate Isolation Condenser A [**Role Play**]

Role Play:	If dispatched as the EO to isolate Isolation Condenser A, report a steam cloud inside the Rx building at the Isolation Condensers and you have left the area.	

	RO	• Monitors and records area temperature and radiation levels monitoring
		  • Reports Isolation Condenser System area temperatures rising
		  • Reports radiation levels rising on the refuel floor area and any other areas
		  • Reports radiation monitors for Isolation Condenser and Liquid Poison area (same EOP area) are at Max Safe 1000 mr/hr
		  • Reports that Refuel Floor ARMs at the Max Save level (different area)
		  • Reports Isolation Condenser area temperatures at MAX Safe level
		  • Reports RWCU area temperatures at Max Safe level
		• Performs Emergency Depressurization – No ATWS EOP

CRITICAL TASK 2		actions • Confirms ROPS in BYPASS • Opens all EMRVs with their control switch to MAN • Reports all EMRVs open

	SRO	• Directs entry into the Secondary Containment Control EOP from ARMs
		  • Directs isolating the Isolation Condensers
		  • Directs area temperature and radiation levels monitoring
		  • When area temperature levels (Area 1 at 225 °F and Area 4 at 212 °F) or radiation levels (Area 1 at 1000 mr/hr and Area 2 at 1000 mr/hr) in ≥ 2 areas exceed the Max Safe values, directs Emergency Depressurization
		• May direct lowering RPV pressure to reduce the driving head of the leak
		• Directs entry into the Emergency Depressurization – No ATWS EOP
		  • Directs ROPS bypassed
		  • Verifies Torus water level > 90"
		• Directs all EMRVs open

Terminus:	The RPV has been Emergency Depressurized when area radiation levels or area temperature levels in ≥ 2 areas exceed the Max Safe values	
Final EAL call	FS-1, loss of containment and loss of Reactor coolant system	

Notes/Comments

NRC 2016 Scenario 4 (**New**)

Procedures Used

Event	**Procedure**				
1	• 302.2 • Control Rod pull sheets				
2	• RAP-h6a • ABN-6 • TS 3.2.B.4 • 235				
3	• RAP-G1c • RAP-G1d • RAP-G1f • RAP-G3f • 403 to bypass APRM				
4	• RAP-9xF3B • ABN-58				
5	• RAP-L4f • 331.1				
6	• EMG-3200.01A • EMG-3200.01B • EMG-SP2 • EMG-SP3				
7	• EMG-3200.01A • EMG-3200.01B • EMG-SP2 • EMG-SP3				
8	• EMG-3200.11 • EMG-3200.04A				

NRC 2016 Scenario 4 (**New**)

Simulator Setup

1. Reset to IC-34 < 5 power
2. Have a copy of 302.2, 201, & 402.2 for the applicants
3. Have a copy of Scenario 1 pull-sheets (Sequence Step Numbers 9-11 completed through step 10 and rod 34-15 of step 10) in yellow. Place in binder in simulator in front of Step 8 (or hand to students as part of their pre-scenario brief).

Event	**Trigger**	**Malfunction**
Preset	Preset	**VLV-ICS005 MECH SZ** (V-14-30) **VLV-ICS006 to MECH SZ** (V-14-31) (This keeps Isolation Condenser A steam valves open and cannot be closed)
1	NA	n/a
2	**1**	**MAL-CRD005_1431** (Rod 1431 drifts out) This malfunction will be deleted within the scenario, following the individual scram of the control rod
3	**3**	**MAL-NIS020B to 150** (This places APRM 2 to 150% and gives RPS 1 ½ scram) Look ahead in scenario when ½ scram reset insert: • CAE: ATWS,ARI op (ATWS file where ARI works)
4	**5**	**LOA-EDS137** (trips VACP-1)

5	**7** **7**	**SWI-TBS027C to ON** (This trips the CR HVAC Fan B) **ANN-L-4f to ON** (This brings in CONTROL RM HVAC SYS B TROUBLE alarm)
6	**9**	**IMF MAL-EDS001a** (loss of 4160V 1A)
7	**11**	**MAL-RXS001 to 0.02 over a 500 sec ramp** (inserts Fuel Failure)
8	Preset	Inserted at setup: • VLV-ICS005 to MECH SZ (V-14-30) • VLV-ICS006 to MECH SZ (V-14-31) • This keeps Isolation Condenser A steam valves open and cannot be closed
	13	**MAL-ICS003A to 10% over a 900 sec ramp** (This inserts a steam line break in Isolation Condenser A after 15 minutes) NOTE: Raise as needed to ensure exceeds 2 areas max safe at 1%% over 60 seconds

Shift Turnover

Current plant conditions:

- <5 power
- Turbine warming is complete

Shift Activities

- Raise Reactor Power with Control rods