Facility: **CPNPP Units 1 and 2** Date of Examination: **June 2015**

Examination Level: RO ☒ SRO ☐ Operating Test Number: **NRC**

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations (RA1)	M,R	2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (4.3). JPM: Perform Power Change Worksheet Calculation. (RO1302A)
Conduct of Operations (RA2)	N,R	2.1.4 Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, “no-solo” operation, maintenance of active license status, 10CFR55, etc. (3.3). JPM: Determine RO License Status.
Equipment Control (RA3)	D,R	2.2.12 Knowledge of surveillance procedures. (3.7). JPM: Perform Axial Flux Difference Surveillance. (RO1808)
Radiation Control (RA4)	M,R	2.3.11 Ability to control radiation releases. (3.8). JPM: Determine Maximum Allowable Venting Time. (RO7030)
Emergency Procedures/Plan	–	–

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

* Type Codes & Criteria:

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

(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)

(N)ew or (M)odified from bank (≥ 1)

(P)revious 2 exams (≤ 1; randomly selected)

RA1 The applicant will determine boron/dilution requirements to lower power from 100% to 50% equilibrium per IPO-003A, Power Operations, Attachment 3, Power Change Worksheet. The calculations include Power Defect, Rod Worth, Xenon Worth, change in Boron concentration and boration/dilution quantity. The critical steps are to determine the reactivity change for power defect, the rod position change, equilibrium xenon, and the total reactivity change for these parameters, the required change in boron concentration, and the amount of boration needed. This is a modified bank JPM.

RA2 The applicant will be presented with a detailed record (in table form) of watch standing and other activities performed by 3 individual Reactor Operators over a period of 4 to 6 weeks. The applicant will be required to analyze the work records of these three operators, and apply the guidance of ODA-315, Licensed Operator Maintenance Tracking, to evaluate and determine if the RO license status is active or inactive for each of the three operators. The critical steps are to determine that the RO licenses for two of the three operators are NOT active. This is a new JPM.

RA3 The applicant will be presented with Power Range Nuclear Instrument Axial Flux Difference data and will perform a manual Axial Flux Difference calculation using OPT-403, Axial Flux Difference. The critical steps are to determine whether at least 3 of 4 PR Δ FLUX channels are within the Acceptable Operation region of NUC-204-6, Axial Flux Difference as a Function of Rated Thermal Power. This is a direct from bank JPM.

RA4 The applicant will determine the maximum allowable venting time for venting the reactor vessel using FRI-0.3A, Response to Voids in Reactor Vessel, Attachment 5. Critical steps include various stages of the calculation, including the final determination of allowable venting time. This is a modified bank JPM.

Facility: **CPNPP Units 1 and 2** Date of Examination: **June 2015**

Examination Level: RO ☐ SRO ☒ Operating Test Number: **NRC**

Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations (SA1)	D,R	2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (4.2). JPM: Loss of RHR Time / Tech Specs. (SO1101)
Conduct of Operations (SA2)	N,R	2.1.4 Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, “no-solo” operation, maintenance of active license status, 10CFR55, etc. (3.8). JPM: Determine SRO License Status.
Equipment Control (SA3)	D,R	2.2.23 Ability to track Technical Specification limiting conditions for operations. (4.6). JPM: Complete LCOAR for TDAFW Pump Steam Admission Valve. (SO1024D)
Radiation Control (SA4)	D,R	2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions. (3.7). JPM: Select Volunteer for Emergency Exposure. (SO1142A)
Emergency Procedures/Plan (SA5)	M,P,R	2.4.44 Knowledge of emergency plan protective action recommendations. (4.4). JPM: Determine Protective Action Recommendations. (SO1140A)

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

* Type Codes & Criteria:
- (C)ontrol room, (S)imulator, or Class(R)oom
- (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
- (N)ew or (M)odified from bank (≥ 1)
- (P)revious 2 exams (≤ 1; randomly selected)

Task Summary

SA1 The applicant is presented with Loss of RHR conditions and then uses ABN-104, Residual Heat Removal System Malfunction, Attachment 5, Time to Saturation for Loss of All RHR with the RCS at Reduced Inventory and Attachment 19, Available Time for Containment Closure to determine Time to Saturation, Time to Core Uncovery, and Containment Closure Time. The critical steps are to determine Time to Saturation, Time to Core Uncovery, Containment Closure Time, and identify any Technical Specification required actions associated with the loss of the standby RHR pump. This is a direct from bank JPM.

SA2 The applicant is presented with a detailed record (in table form) of watch standing and other activities performed by 3 individual Senior Reactor Operators over a period of 4 to 6 weeks. The applicant will be required to analyze the work records of these three operators, and apply the guidance of ODA-315, Licensed Operator Maintenance Tracking, to evaluate and determine if the SRO license status is active or inactive for each of the three operators. The critical steps are to determine that the SRO licenses for two of the three operators are NOT active. This is a new JPM.

SA3 The applicant will be presented with conditions involving a TDAFW Pump Steam Admission Valve that has not been returned to service within the Completion Time and will use ODA-308, LCO Tracking Program, and Technical Specification 3.7.5 Auxiliary Feedwater System, to manually complete a Tracking LCOAR. The critical steps consist of various determinations on the LCOAR form, including correct information in required fields to pass the JPM. This is a direct from bank JPM.

SA4 The applicant is given accident conditions involving the need for a volunteer to attempt a lifesaving activity. Using the guidance in EPP-305, Emergency Exposure Guidelines and Personnel Dosimetry, the applicant will evaluate a series of potential volunteers and select the preferred volunteer from this list. The critical steps are evaluation and elimination of volunteers who do not meet the criteria required for the activity, and then final selection of the preferred volunteer. This is a direct from bank JPM.

Task Summary

SA5 The applicant will determine the appropriate Protective Action Recommendations for an emergency. This JPM is designated as a "P" because a form of it was used on the 2013 NRC exam. This JPM will be modified to include different conditions, including severity and meteorological parameters. The "random selection" aspect was performed due to limited topics available for SRO A.4 category, the fact that this JPM meets the requirements of NUREG-1021, and to avoid overlap with the Audit Exam. The critical steps will include several determinations the SRO must make, such as release duration, core damage, and identification of affected sectors. This is a modified bank JPM.

Facility: CPNPP JPM # NRC RA1 Task #RO1302 K/A#2.1.23 4.3 / 4.4

Title: Perform Power Change Worksheet Calculation

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	X
Actual Performance:	X	Simulator:	______
Alternate Path:	______	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 has been operating at 100% power for several weeks.
- A power ramp to 80% is planned during the next 1 hour.
- Current RCS boron concentration is 925 ppm.
- Current rod height is Control Bank D at 215 steps.
- Cycle 18 Core Burnup is 10000 MWD/MTU.
- Boric Acid Batch Tank X-01 and X-02 are both at 7450 ppm.
- Current Date/Time is 5/1/15 at 1200.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- DETERMINE boron / dilution required and the target CBD position using IPO-003A, Power Operations, Attachment 3, Power Change Worksheet.
- Xenon worth and AFD control strategies may be ignored.

Task Standard: CALCULATED the Volume of Boron required and the CBD approximate final position per IPO-003A, Attachment 3.

Required Materials: IPO-003A, Power Operations, Rev. 29-2.

TDM-201A, CVCS Calculations/Blended Flow, Rev. 6.

The Nuclear Design and Core Physics Characteristics of the Comanche Peak Nuclear Power Plant Unit 1 Cycle 18, Rev. October 2014.

Validation Time: 40 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________ Date: __________

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **IPO-003A, Power Operations.**
    - **Attachment 3, Power Change Worksheet.**
- **TDM-201A, CVCS Calculations/Blended Flow**
- **The Nuclear Design and Core Physics Characteristics of the Comanche Peak Nuclear Power Plant Unit 1 Cycle 18**

√ - Check Mark Denotes Critical Step

START TIME:	

Perform Step: 1	Complete Calculation Heading Information
Standard:	ENTERED information provided in Initial Conditions at top of each page. • Unit **1** • Cycle **18** • Date **5/1/15** • Time **1200**
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 2	Obtain Current Plant Conditions.
Standard:	RECORDED Current Plant Conditions: • A.1 RCS Boron **925** ppm • A.2 Power Level **100**% RTP • A.3 CBD Position **215** steps • A.4 Core Burnup **10000** MWD/MTU • A.5 Burnup Range **CHECKED MOL**
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 3	Estimate Target CBD Position. • Target Power Level
Standard:	RECORDED Target Power Level • B.1 **80**% RTP
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 4√	Estimate Target CBD Position. • IF planning a Power DECREASE (B.1 < A.2), THEN B.2 =
Standard:	CALCULATED • A.3 + [B.1 – A.2] x [A.4 + 8000] / 12000 • 215 + [80 – 100] x [10000 + 8000] / 12000 • B.2 Target CBD Position = **185** steps
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 5√	Power Defect Reactivity Change. • Determine change in Reactivity due to Power Defect, based on current RCS Boron, using: NDR Table 5.2 for MOL
Standard:	CALCULATED • C.1 Absolute Value of Power Defect at Current Power Level [A.2] = **1728** pcm. • C.2 Absolute Value of Power Defect at Target Power Level [B.1] = **1418** pcm. • C.3 Δ Power Defect = [C.1] – [C.2] = 1728 – 1418 = **310** pcm
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 6	Control Rod Motion Reactivity Change. • Determine change in Reactivity due to Control Rod Motion, using: NDR Figure 5.17 for MOL
Standard:	CALCULATED • D.1 Absolute Value of CBD Integral Worth at Current CBD Position [A.3] = **10 ± 5** pcm. • D.2 Absolute Value of CBD Integral Worth at Target CBD Position [B.2] = **90 ± 5** pcm. • D.3 Δ Control Rod Worth = [D.1] – [D.2] = 10 – 90 = -**80 ± 10** pcm
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 7	Determine Reactivity Worth Required from Boron Adjustment.
Standard:	CALCULATED • E.1 Δ Boron Worth = [D.3 + C.3] x [-1] = -80 + 310 = **-230 ± 10** pcm
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 8	Determine Integral Boron Worth at Current Conditions. For this section, utilize the following NRDR table. NDR Table 5.11 for MOL.
Standard:	DETERMINED • F.1 Integral Boron Worth at [A.1] pmm = -**8176.5** ppm
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 9√	Determine Target RCS Boron Value.
Standard:	CALCULATED • G.1 Target Integral Boron Worth = [F.1] + [E.1] = -8176.5 + -230 = -**8406.5 ± 10** pcm • G.2 Target RCS Boron Value = **952 ± 5** ppm
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 10√	Determine RCS Boration / Dilution Volume • Check appropriate method for RCS Boron Change
Standard:	H.1 CHECKED Boration Volume
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 11√	Determine RCS Boration / Dilution Volume • Volume Required
Standard:	CALCULATED Volume Required • H.2 Volume = 65804 [ln(7450 - 925) / (7450 – 952)] • H.2 Volume = **273 ± 50 gal.**
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 12√	Summary of Results • Volume Required
Standard:	COMPLETED the Summary of Results • I To change power immediately from [A.2] to [B.1], it is estimated that [H.2] gallons of [H.1] will be required, and CBD final position will be approximately [B.2] steps. • I To change power immediately from **100** to **80**, it is estimated that **273 ± 50** gallons of **BOR** will be required, and CBD final position will be approximately **185** steps.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

Initial Conditions:

Given the following conditions:

- **Unit 1 has been operating at 100% power for several weeks.**
- **A power ramp to 80% is planned during the next 1 hour.**
- **Current RCS boron concentration is 925 ppm.**
- **Current rod height is Control Bank D at 215 steps.**
- **Cycle 18 Core Burnup is 10000 MWD/MTU.**
- **Boric Acid Batch Tank X-01 and X-02 are both at 7450 ppm.**
- **Current Date/Time is 5/1/15 at 1200.**

Initiating Cue:

The Unit Supervisor directs you to PERFORM the following:

- **DETERMINE boron / dilution required and the target CBD position using IPO-003A, Power Operations, Attachment 3, Power Change Worksheet.**
- **Xenon worth and AFD control strategies may be ignored.**

Facility: CPNPP JPM # NRC RA2 Task # RO5001 K/A # 2.1.4 3.3 / 3.8

Title: Determine Licensed Operator License Status

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	X
Actual Performance:	X	Simulator:	______
Alternate Path:	______	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Today is April 6, 2015.
- Three Licensed Reactor Operators are available to be assigned as the Unit 1, Reactor Operator for the oncoming shift.
- Given the first quarter shifts worked as recorded in the Unit and Station Logs.
- Both Units maintained 100% RTP during the first quarter.

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- DETERMINE which Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)
  - o RO A Active Inactive
  - o RO B Active Inactive
  - o RO C Active Inactive

Task Standard: DETERMINED license status of each RO.

Required Materials: ODA-315, Licensed Operator Maintenance Tracking, Rev. 7-0.
ODA-315-1, Active License Status Form, Rev. 8.

Validation Time: 5 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **ODA-315, Licensed Operator Maintenance Tracking.**
- **ODA-315-1, Active License Status Form**
- **Work History Log Handout**

√ - Check Mark Denotes Critical Step

START TIME:	

Perform Step: 1√	DETERMINE which Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)
Standard:	DETERMINED RO A has only stood four 12-hour watches which qualify as the 3/31/15 watch was not completed in the previous quarter and does not count. **CIRCLED Inactive for RO A**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√	DETERMINE which Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)
Standard:	DETERMINED RO B has stood five 12-hour watches which qualify as the RO or BOP. **CIRCLED Active for RO B**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	DETERMINE which Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)
Standard:	DETERMINED RO C has only stood four 12-hour watches which qualify as the 3/13/15 watch was only 8-hours and does not count. **CIRCLED Inactive for RO C**.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

Initial Conditions: **Given the following conditions:**

- **Today is April 6, 2015.**
- **Three Licensed Reactor Operators are available to be assigned as the Unit 1, Reactor Operator for the oncoming shift.**
- **Given the first quarter shifts worked as recorded in the Unit and Station Logs.**
- **Both Units maintained 100% RTP during the first quarter.**

Initiating Cue: **The Shift Manager directs you to PERFORM the following:**

- **DETERMINE which Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)**
  - **RO A** **Active** **Inactive**
  - **RO B** **Active** **Inactive**
  - **RO C** **Active** **Inactive**

Facility: CPNPP JPM # NRC RA3 Task # RO1808 K/A # 2.2.12 3.7 / 4.1

Title: Perform Axial Flux Difference Surveillance

Examinee (Print): ________________________________

Testing Method:

Simulated Performance: ______ Classroom: X

Actual Performance: X Simulator: ______

Alternate Path: ______ Plant: ______

Time Critical: ______

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Today is 3/15/15.
- Unit 1 is at 80% power.
- The Axial Flux Difference (AFD) alarm was declared INOPERABLE over 24 hours ago.
- Power Range Nuclear Instrument AFD data was collected for several hours last shift.

TIME	1-NI-41C	1-NI-42C	1-NI-43C	1-NI-44C	% RTP
0800	14%	16%	17%	16%	80%
0830	14%	17%	17%	16%	80%
0900	15%	17%	17%	16%	80%
0930	15%	17%	17%	16%	80%
1000	16%	19%	19%	17%	80%

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- PERFORM OPT-403, Axial Flux Difference.
- ENTER the Power Range Nuclear Instrument AFD data onto OPT-403-1, AFD Data Sheet.
- RECORD findings in the Discrepancies/Comments Section of OPT-403-1.
- The NDR Verification has been performed for the NUC-204-6 Form.

Task Standard: Utilizing OPT-403, performed Axial Flux Difference surveillance and recorded findings on Form OPT-403-1.

Required Materials: OPT-403, Axial Flux Difference, Rev. 12.

OPT-403-1, AFD Data Sheet, Rev. 11.

NUC-204-6, Axial Flux Difference As a Function of Rated Thermal Power, Unit 1 Cycle 18, 3/02/15.

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ____ Date: ________________

CLASSROOM SETUP

EXAMINER:
PROVIDE the examinee with a copy of:

- **OPT-403, Axial Flux Difference.**
- **OPT-403-1, AFD Data Sheet.**
- **NUC-204-6, Axial Flux Difference As a Function of Rated Thermal Power.**

√ - Check Mark Denotes Critical Step

START TIME:	

Perform Step: 1 8.1 & 8.1.1	Record the following data for the affected unit: • Unit 1 or 2 as applicable
Standard:	CIRCLED Unit 1 on OPT-403-1.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 2 8.1 & 8.1.2	Record the following data for the affected unit: • Date
Standard:	ENTERED Date on OPT-403-1.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 3 8.2 & 8.2.1	Record the following data: • Time
Standard:	ENTERED Time on OPT-403-1.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 4 8.2 & 8.2.2	Record the following data: • PR Δ FLUX for each operable excore detector
Standard:	RECORDED PR Δ FLUX for each operable excore detector on OPT-403-1 from JPM Cue Sheet.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 5 8.2 & 8.2.3	Record the following data: • Percent Rated Thermal Power (RTP)
Standard:	RECORDED Percent Rated Thermal Power on OPT-403-1.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 6√ 8.3 & 8.3.A	Perform the following to determine PR Δ FLUX status and record: • Verify at least 3 of 4 PR Δ FLUX channels are within the Acceptable Operation region (Doghouse Region) of NUC-204-6 “Axial Flux Difference as a Function of Rated Thermal Power.”
Standard:	DETERMINED PR Δ FLUX status and RECORDED and INITIALED on OPT-403-1. Status is **ACCEPTABLE OPERATION for Times 0800 to 0930 and CIRCLED YES, NOT ACCEPTABLE OPERATION for Time 1000 and CIRCLED NO.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7√ 8.3 & 8.3.B	Perform the following to determine PR Δ FLUX status and record: • Repeat Steps 8.2 and 8.3 at least once per thirty (30) minutes.
Standard:	REPEATED Steps 8.2 and 8.3 at least once per thirty (30) minutes on OPT-403-1. DETERMINED PR Δ FLUX status and RECORDED and INITIALED on OPT-403-1. Status is **ACCEPTABLE OPERATION for Times 0800 to 0930 and CIRCLED YES, NOT ACCEPTABLE OPERATION for Time 1000 and CIRCLED NO.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8	Record findings in the Discrepancies/Comments Section of OPT-403-1.
Standard:	RECORDED findings in the Discrepancies / Comments Section of OPT-403-1.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

Initial Conditions: **Given the following conditions:**

- **Today is 3/15/15.**
- **Unit 1 is at 80% power.**
- **The Axial Flux Difference (AFD) alarm was declared INOPERABLE over 24 hours ago.**
- **Power Range Nuclear Instrument AFD data was collected for several hours last shift.**

TIME	1-NI-41C	1-NI-42C	1-NI-43C	1-NI-44C	% RTP
0800	14%	16%	17%	16%	80%
0830	14%	17%	17%	16%	80%
0900	15%	17%	17%	16%	80%
0930	15%	17%	17%	16%	80%
1000	16%	19%	19%	17%	80%

Initiating Cue: **The Unit Supervisor directs you to PERFORM the following:**

- **PERFORM OPT-403, Axial Flux Difference.**
- **ENTER the Power Range Nuclear Instrument AFD data onto OPT-403-1, AFD Data Sheet.**
- **RECORD findings in the Discrepancies/Comments Section of OPT-403-1.**
- **The NDR Verification has been performed for the NUC-204-6 Form.**

Facility: CPNPP JPM # NRC RA4 Task #RO7030 K/A# 2.3.11 3.8 / 4.3

Title: Respond to Voids in Reactor Vessel

Examinee (Print): ____________________

Testing Method:

Simulated Performance:	______	Classroom:	X
Actual Performance:	X	Simulator:	______
Alternate Path:	______	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 has experienced a SBLOCA.
- FRI-0.3A, Response to Voids in Reactor Vessel is in progress.
- RCS pressure is 950 psig.
- Containment pressure is 10.3 psig.
- Containment temperature is 135 °F.
- Containment H_2 concentration is 2% in Dry Air..

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Calculate the maximum venting time in accordance with FRI-0.3A, Attachment 5, Instructions for Determining Venting Time.

Task Standard: CALCULATED the Maximum Venting Time per FRI-0.3A, Attachment 5.

Required Materials: FRI-0.3A, Response to Voids in Reactor Vessel, Rev. 8-4.

Validation Time: 12 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **FRI-0.3A, Response to Voids in Reactor Vessel.**
    - **Attachment 5, Instructions for Determining Venting Time.**

√ - Check Mark Denotes Critical Step

START TIME:	

Perform Step: 1	Determine Containment Volume at STP = A • A = (2,985,000 ft^3) x [(Containment Pressure in PSIG + 14.7) / 14.7 psia] x [492 °R / (Containment temperature in °F + 460)]
Standard:	CALCULATED Containment Volume at STP • A = (2,985,000 ft^3) x [(10.3 + 14.7) / 14.7 psia] x [492 °R / (135 + 460)] • A = **4197736** ft^3
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 2	Determine Maximum Hydrogen volume that can be vented = B.
Standard:	CALCULATED Maximum Hydrogen Volume • B= (3.0% - Containment Hydrogen Concentration) x A / 100% • B = (3.0 – 2.0) x 4197736 / 100 • B = **41977** ft^3
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 3	Determine Hydrogen flow rate as a function of RCS pressure = C. • a. Check RCS pressure. • B. Using the Hydrogen Flow Rate As a Function of Pressure Curve, read hydrogen flow rate.
Standard:	DETERMINED using RCS pressure of 950 psig and Hydrogen Flow Rate As a Function of Pressure Curve • C = **3000 scfm**
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 4√	Calculate maximum vent time: • Maximum venting time = B / C minutes
Standard:	CALCULATED • 41977 / 3000 • **14 ± 0.5 minutes**
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

Initial Conditions:	**Given the following conditions:** • **Unit 1 has experienced a SBLOCA.** • **FRI-0.3A, Response to Voids in Reactor Vessel is in progress.** • **RCS pressure is 950 psig.** • **Containment pressure is 10.3 psig.** • **Containment temperature is 135 °F.** • **Containment H_2 concentration is 2% in Dry Air..**
Initiating Cue:	**The Unit Supervisor directs you to PERFORM the following:** • **Calculate the maximum venting time in accordance with FRI-0.3A, Attachment 5, Instructions for Determining Venting Time.**

Facility: CPNPP JPM # NRC SA1 Task # SO1101 K/A # 2.1.25 3.9 / 4.2

Title: Determine Loss of RHR Time Limitations and Evaluate Technical Specifications

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	X
Actual Performance:	X	Simulator:	______
Alternate Path:	______	Plant:	
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: JPM Cue Sheet #1

Given the following conditions:

- Unit 2 is in MODE 5 with water level in the Reactor Vessel at 49” above the Core Plate.
- All Pressurizer Safety Valves have been removed.
- Reactor Coolant System temperature is 140ºF.
- The Reactor was shutdown on April 1st at 0000 after operating at 100% power for the last 550 days.
- Today is April 7th and the Unit experienced a Loss of Residual Heat Removal cooling at 0600 hours.

Initiating Cue: JPM Cue Sheet #1

The Shift Manager directs you to PERFORM the following:

- CALCULATE the following times per ABN-104, Residual Heat Removal System Malfunction, Attachment 5, Time to Saturation for Loss of All RHR with the RCS at Reduced Inventory and Attachment 19, Available Time for Containment Closure:
  - DETERMINE Time to Saturation ________
  - DETERMINE Time to Core Uncovery ________
  - DETERMINE Both Containment Closure Times:
    - Thermal Environment Limiting ________
    - Radiological Environment Limiting ________

Initial Conditions:
JPM Cue Sheet #2

Given the following conditions:

- Unit 2 is in MODE 5 with water level in the Reactor Vessel at 49" above the Core Plate.
- All Pressurizer Safety Valves have been removed.
- Both Residual Heat Removal Pumps cannot be started.

Initiating Cue:
JPM Cue Sheet #2

The Shift Manager directs you to PERFORM the following:

- IDENTIFY any Technical Specification CONDITIONS and REQUIRED ACTION associated with the loss of both Residual Heat Removal Pumps.

CONDITION	REQUIRED ACTION
LCO & CONDITION	REQUIRED ACTION # & Action
________	________
	________
	________
	________
________	________
	________
	________
	________
	________
________	________
	________
	________
	________
	________

Task Standard: DETERMINED Time to Saturation, Time to Core Uncovery, And Containment Closure Time following a Loss of Residual Heat Removal System per ABN-104 and IDENTIFIED any Limiting Conditions for Operations associated with a loss of the standby Residual Heat Removal Pump per Technical Specifications.

Required Materials: ABN-104, Residual Heat Removal System Malfunction, Rev. 9-1.
CPNPP Technical Specifications Units 1 and 2, Amendment 162.

Validation Time: 20 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with JPM Cue Sheet #1 and a copy of:

- **ABN-104, Residual Heat Removal Malfunction.**
  - **Attachment 5, Time to Saturation for Loss of All RHR with the RCS at Reduced Inventory.**
  - **Attachment 19, Available Time for Containment Closure.**

When JPM Cue Sheet #1 is completed, PROVIDE JPM Cue Sheet #2 and a copy of:

- **CPNPP Technical Specifications - Units 1 and 2.**

√ - Check Mark Denotes Critical Step

START TIME:	

Perform Step: 1	Determine Time to Saturation: • Calculate **Time After Shutdown**.
Standard:	DETERMINED number of hours between 0000 on April 1st and 0600 on April 7th and CALCULATED **Time After Shutdown** = **150 hours**.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 2√	Determine **Time to Saturation**: • Find **Time to Saturation** from Attachment 5, Page 1.
Standard:	REFERRED to Page 1 of Attachment 5 and PLOTTED the intersection of **Time After Shutdown** (150 hours) and **Initial Temp** (140ºF) and DETERMINED: TIME TO SATURATION = **9 ± 1 minutes**.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 3√	Determine **Time To Core Uncovery**: • Find **Time To Core Uncovery** from Attachment 5, Page 2
Standard:	REFERRED to Page 2 of Attachment 5 and PLOTTED the intersection of **Time After Shutdown** (10 days or 150 hours) and **Initial RCS Level** (49 inches above the core plate) and DETERMINED: **Time To Core Uncovery** = **1.4 ± 0.1 hours**.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 4√	Determine Containment Closure time: • Find Containment Closure Time from Attachment 19: • Thermal Environment Limiting Curve.
Standard:	REFERRED to Attachment 19 and PLOTTED the intersection of **Time After Shutdown** and **Thermal Environment Limiting Curve** and DETERMINED: **Containment Closure Time** = **43 ± 2 minutes**.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 5√	Determine Containment Closure time: • Find Containment Closure Time from Attachment 19: • Radiological Environment Limiting Curve.
Standard:	REFERRED to Attachment 19 and PLOTTED the intersection of **Time After Shutdown** and **Radiological Environment Limiting Curve** and DETERMINED: **Containment Closure Time** = **45 ± 2 minutes**.
Comment:	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**Provide the examinee with copy of JPM Cue Sheet #2 and Technical Specifications.** **This Step is not critical as Required Action B.2 encompasses this Required Action and may be omitted which would be an administrative error.**
Perform Step: 6	Identify any Technical Specification REQUIRED ACTION associated with the loss of the standby Residual Heat Removal Pump.
Standard:	DETERMINED Technical Specification LCO 3.4.8.A is applicable: • CONDITION - One RHR loop inoperable • Immediately initiate action to restore RHR loop to OPERABLE status
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 6√	Identify any Technical Specification REQUIRED ACTION associated with the loss of the standby Residual Heat Removal Pump.

Standard:	DETERMINED Technical Specification LCO 3.4.8.B is applicable:
	• CONDITION - No RHR loop in operation.
	  • Immediately suspend operations that would cause introduction of coolant into the RCS with boron concentration less than required to meet SDM of LCO 3.1.1 (REQUIRED ACTION and COMPLETION TIME of LCO 3.4.8.B.1).
	  • Immediately initiate action to restore one RHR loop to OPERABLE status and operation (REQUIRED ACTION and COMPLETION TIME of LCO 3.4.8.B.2).

Terminating Cue:	**This JPM is complete.**
Comment:	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

Initial Conditions: JPM Cue Sheet #1

Given the following conditions:

- **Unit 2 is in MODE 5 with water level in the Reactor Vessel at 49" above the Core Plate.**
- **All Pressurizer Safety Valves have been removed.**
- **Reactor Coolant System temperature is 140ºF.**
- **The Reactor was shutdown on April 1st at 0000 after operating at 100% power for the last 550 days.**
- **Today is April 7th and the Unit experienced a Loss of Residual Heat Removal cooling at 0600 hours.**

Initiating Cue: JPM Cue Sheet #1

The Shift Manager directs you to PERFORM the following:

- **CALCULATE the following times per ABN-104, Residual Heat Removal System Malfunction, Attachment 5, Time to Saturation for Loss of All RHR with the RCS at Reduced Inventory and Attachment 19, Available Time for Containment Closure:**
  - **DETERMINE Time to Saturation** ________
  - **DETERMINE Time to Core Uncovery** ________
  - **DETERMINE Both Containment Closure Times:**
    - **Thermal Environment Limiting** ________
    - **Radiological Environment Limiting** ________

Initial Conditions: JPM Cue Sheet #2

Given the following conditions:

- **Unit 2 is in MODE 5 with water level in the Reactor Vessel at 49" above the Core Plate.**
- **All Pressurizer Safety Valves have been removed.**
- **Both Residual Heat Removal Pumps cannot be started.**

Initiating Cue: JPM Cue Sheet #2

The Shift Manager directs you to PERFORM the following:

- **IDENTIFY any Technical Specification CONDITIONS and REQUIRED ACTION associated with the loss of both Residual Heat Removal Pumps.**

CONDITION	**REQUIRED ACTION**
LCO & CONDITION	**REQUIRED ACTION # & Action**
______________	______________________________
	______________________________
	______________________________
	______________________________
______________	______________________________
	______________________________
	______________________________
	______________________________
	______________________________
______________	______________________________
	______________________________
	______________________________
	______________________________
	______________________________

Facility: CPNPP JPM # NRC SA2 Task # SO1004 K/A # 2.1.4 3.3 / 3.8

Title: Determine Licensed Operator License Status

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	X
Actual Performance:	X	Simulator:	______
Alternate Path:	______	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Today is April 6, 2015.
- Three Staff Senior Reactor Operators are available to be assigned as the Unit 1, Unit Supervisor for the oncoming shift.
- Given the first quarter shifts worked as recorded in the Unit and Station Logs.
- Both Units maintained 100% RTP during the first quarter.

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- DETERMINE which Senior Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)
  - o SRO A Active Inactive
  - o SRO B Active Inactive
  - o SRO C Active Inactive
- DETERMINE which Senior Reactor Operator(s) satisfy the requirements to fill the Unit 1, Unit Supervisor position for the oncoming shift.
  - o SRO ______, ______, ______ can be assigned as the Unit Supervisor.

Task Standard: DETERMINED license status of each SRO and DETERMINED the only SRO qualified to stand the watch as the Unit 1, Unit Supervisor for the oncoming shift.

Required Materials: ODA-315, Licensed Operator Maintenance Tracking, Rev. 7-0.
ODA-315-1, Active License Status Form, Rev. 8.

Validation Time: 10 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ____ Date: ______________

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **ODA-315, Licensed Operator Maintenance Tracking.**
- **ODA-315-1, Active License Status Form**
- **Work History Log Handout**

√ - Check Mark Denotes Critical Step

START TIME:	

Perform Step: 1√	DETERMINE which Senior Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)
Standard:	DETERMINED SRO A has only stood four 12-hour watches which qualify as the STA watches do not count and the 3/31/15 watch was not completed in the previous quarter and does not count. **CIRCLED Inactive for SRO A**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√	DETERMINE which Senior Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)
Standard:	DETERMINED SRO B has stood five 12-hour watches which qualify as the SM or US. **CIRCLED Active for SRO B**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	DETERMINE which Senior Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)
Standard:	DETERMINED SRO C has only stood four 12-hour watches which qualify as the STA watches do not count and the 3/13/15 watch was only 8-hours and does not count. **CIRCLED Inactive for SRO C**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√	DETERMINE which Senior Reactor Operator(s) satisfy the requirements to fill the Unit 1, Unit Supervisor position for the oncoming shift.
Standard:	DETERMINED SRO **B** can be assigned as the Unit Supervisor.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

Initial Conditions: **Given the following conditions:**

- **Today is April 6, 2015.**
- **Three Staff Senior Reactor Operators are available to be assigned as the Unit 1, Unit Supervisor for the oncoming shift.**
- **Given the first quarter shifts worked as recorded in the Unit and Station Logs.**
- **Both Units maintained 100% RTP during the first quarter.**

Initiating Cue: **The Shift Manager directs you to PERFORM the following:**

- **DETERMINE which Senior Reactor Operators are current on maintaining proficiency of an Active License. (Circle Correct Status)**
    - **SRO A** **Active** **Inactive**
    - **SRO B** **Active** **Inactive**
    - **SRO C** **Active** **Inactive**

- **DETERMINE which Senior Reactor Operator(s) satisfy the requirements to fill the Unit 1, Unit Supervisor position for the oncoming shift.**
    - **SRO ______, ______, ______ can be assigned as the Unit Supervisor.**

Facility: CPNPP JPM # NRC SA3 Task # SO1024 K/A # 2.2.23 3.1 / 4.6

Title: Initiate a Manual LCOAR

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	X
Actual Performance:	X	Simulator:	______
Alternate Path:	______	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 and Unit 2 are at 100% power.
- Motor Driven Auxiliary Feed Water Pump 1-02 (CP1-AFAPMD-02) was declared INOPERABLE for motor bearing replacement at 1200 on 3/2/15.
- The electronic LCOAR program is out of service and there are no other Limiting Conditions for Operation in affect.

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- COMPLETE the Manual Standard LCOAR Index per ODA-308, LCO Tracking Program.
- COMPLETE the Manual Standard LCOAR up to the second SRO review. This is the first Manual LCOAR initiated this year.
- Work Order and SmartForm Numbers may be marked as N/A.
- PERFORM a Safety Function Determination (SFDP), DOCUMENT results of SFDP in Comments area of LCOAR.

Task Standard: COMPLETED Manual LCOAR per ODA-308 and IDENTIFIED the Limiting Condition of Operations requirements for this failure. DETERMINED that a Loss of Safety Function does not exist.

Required Materials: ODA-308, LCO Tracking Program, Rev. 15-3

ODA-308-3.7.5, Standard LCOAR for 3.7.5 Auxiliary Feedwater (AFW) System, Rev. 3

ODA-308-48, Manual Standard LCOAR Index, Rev. 0

Comanche Peak Unit 1 and 2 Technical Specifications, Amendment 164

Validation Time: 30 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________ Date: ____________

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **ODA-308, LCO Tracking Program.**
- **ODA-308-3.7.5, Standard LCOAR for 3.7.5 Auxiliary Feedwater (AFW) System.**
- **ODA-308-48, Manual Standard LCOAR Index.**
- **Comanche Peak Unit 1 and 2 Technical Specifications.**

√ - Check Mark Denotes Critical Step

START TIME:	

Perform Step: 1	Assign a Manual LCOAR Tracking Number in the Manual LCOAR Index.
Standard:	ASSIGNEED tracking number **A1-3/2/15-01** on ODA-308-48, Manual Standard LCOAR Tracking Index.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 2	Enter the LCOAR initiation Date/Time in the Manual LCOAR Index.
Standard:	ENTERED **3-2-15/1200** on ODA-308-48, Manual Standard LCOAR Tracking Index.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 3	Enter the LCOs Affected in the Manual LCOAR Index.
Standard:	ENTERED **LCO 3.7.5** on ODA-308-48, Manual Standard LCOAR Tracking Index.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 4	Enter the Required Termination Date/Time in the Manual LCOAR Index.
Standard:	ENTERED **3-5-15/1200** on ODA-308-48, Manual Standard LCOAR Tracking Index.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 5	Circle U on the Manual LCOAR Index for unplanned.
Standard:	CIRCLED **P** on ODA-308-48, Manual Standard LCOAR Tracking Index.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 6	Enter Equipment Tag No.
Standard:	ENTERED **CP1-MDAPMD-02** on ODA-308-48, Manual Standard LCOAR Tracking Index.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 7 √	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Train A B.
Standard:	CIRCLED Train **B**.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 8	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Record tracking number.
Standard:	RECORD LCOAR number on ODA-308-3.7.5.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 9 √	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Enter Condition B Entry Date/Time.
Standard:	ENTERED **3-2-15/1200** on Condition B Entry Date/Time
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 10 √	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Enter Condition B.1 Required Date/Time.
Standard:	ENTERED **3-5-15/1200** on Condition B.1 Required Date/Time
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 11	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Enter Reason for Entry. • Enter Mode When Entered. • Check Unit 1. • Enter Affected Equipment/Equipment Number • Enter Work Order Number • Enter SmartForm Numbers
Standard:	• ENTERED motor bearing replacement. • ENTERED 1 for Mode. • CHECKED Unit 1. • ENTERED CP1-AFAPMD-02. • ENTERED N/A for Work Order and SmartForm Numbers.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 12	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Refer to ODA-308, Figure 7.1 Flowchart and determine if a SFDP is required by answering: • Is the LCO condition being entered for Technical Specifications?
Standard:	ANSWERED YES based on Technical Specification entry required.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 13	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Refer to ODA-308, Figure 7.1 Flowchart and determine if a SFDP is required by answering: • Is the LCO condition being entered for SSC other than an instrument channel?
Standard:	ANSWERED YES as this not an instrument failure.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 14	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Refer to ODA-308, Figure 7.1 Flowchart and determine if a SFDP is required by answering: • Is the LCO being entered for a TS support system or supported system?
Standard:	ANSWERED YES as Tech Spec LCO 3.7.5, Auxiliary Feedwater System on page 2 of Figure 7.1.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 15	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Refer to ODA-308, Figure 7.1 Flowchart and determine if a SFDP is required by answering: • Are existing TS LCO(s) presently in effect on components powered from the opposite Safeguards electrical train?
Standard:	ANSWERED NO as there are no other LCOs currently in affect. • Loss of Safety Function does NOT exist. • An SFDP Evaluation is NOT required.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 16 √	Complete the Manual Standard LCOAR Form, ODA-308-3.7.5: • Checked SFDP Complete and Documented Results in Comments
Standard:	CHECKED SFDP Complete and ENTERED a Loss of Safety Function does **NOT** exist in the comments.
Comment:	**SAT** ☐ **UNSAT** ☐

EXAMINER NOTE	**Candidate may check notifications LCOAR Initiation. These details are not included as the classroom environment does not allow for proper performance and is therefore not part of the JPM.**
Perform Step: 18	Enter the LCOAR initiation Date/Time on the Manual Standard LCOAR Form, ODA-308-3.7.5:
Standard:	ENTERED **3-2-15/1200** on ODA-308-48, Manual Standard LCOAR Form, ODA-308-3.7.5.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

Initial Conditions: **Given the following conditions:**

- **Unit 1 and Unit 2 are at 100% power.**
- **Motor Driven Auxiliary Feed Water Pump 1-02 (CP1-AFAPMD-02) was declared INOPERABLE for motor bearing replacement at 1200 on 3/2/15.**
- **The electronic LCOAR program is out of service and there are no other Limiting Conditions for Operation in affect.**

Initiating Cue: **The Shift Manager directs you to PERFORM the following:**

- **COMPLETE the Manual Standard LCOAR Index per ODA-308, LCO Tracking Program.**
- **COMPLETE the Manual Standard LCOAR up to the second SRO review. This is the first Manual LCOAR initiated this year.**
- **Work Order and SmartForm Numbers may be marked as N/A.**
- **PERFORM a Safety Function Determination (SFDP), DOCUMENT results of SFDP in Comments area of LCOAR.**

Facility: CPNPP JPM # NRC SA4 Task #SO1142 K/A #2.3.4 3.2 / 3.7

Title: Choose a Volunteer for Emergency Radiation Exposure

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	X	Classroom:	X
Actual Performance:		Simulator:	
Alternate Path:		Plant:	
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- A Large Break Loss of Coolant Accident has occurred.
- Cold Leg recirculation operations have been established.
- An operator venting Residual Heat Removal Pump 1-02 was injured and needs assistance to exit the Radiological Controlled Area.
- The Emergency Coordinator has authorized one volunteer to attempt a lifesaving activity.
- Health Physics predicts a dose between 15 and 20 REM given the general radiation levels in the area of the injured person.

Initiating Cue: The Emergency Coordinator directs you to PERFORM the following:

- EVALUATE and SELECT the preferred volunteer from the list of available candidates per EPP-305, Emergency Exposure Guidelines and Personnel Dosimetry, Steps 4.3.2 and 4.3.4.

Volunteer	Selected (Circle one)	Why or Why NOT selected
A	YES / NO	
B	YES / NO	
C	YES / NO	
D	YES / NO	
E	YES / NO	
F	YES / NO	
G	YES / NO	

Task Standard: EVALUATED and SELECTED the preferred volunteer to perform lifesaving activities during an emergency per EPP-305.

Required Materials: EPP-305, Emergency Exposure Guidelines and Personnel Dosimetry, Rev. 12.

List of Available Volunteers.

Validation Time: 15 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **EPP-305, Emergency Exposure Guidelines and Personnel Dosimetry.**
- **LIST of Available Volunteers.**

Denotes a Critical Step

START TIME:	

Perform Step: 1	Selection of individuals authorized to receive an emergency exposure for the purpose of conducting lifesaving activities or activities required to protect large numbers of people, shall be based on the following criteria: • The individual should be a volunteer or a professional rescue person. • The individual should be familiar with the consequences of exposure to radiation. • The individual shall not be a female capable of reproduction. • If more than one volunteer is being considered, preference should be given to individuals who have reached age 45 years or older.
Standard:	REFERED to EPP-305, Emergency Exposure Guidelines and Personnel Dosimetry, Step 4.3.2.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 2	The individual should be a volunteer or a professional rescue person.
Standard:	DETERMINED that all individuals have volunteered for Emergency Exposure.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 3√	The individual should be familiar with the consequences of exposure to radiation.
Standard:	DETERMINED that one individual is NOT familiar with the consequences of exposure to radiation and ELIMINATE **Volunteer A**.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 4√	The individual shall not be a female capable of reproduction.
Standard:	DETERMINED that one female volunteer has declared that she is pregnant and the other is capable of reproduction and ELIMINATE **Volunteers B & E**.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 5√	If more than one volunteer is being considered, preference should be given to individuals who have reached age 45 years or older.
Standard:	DETERMINED that several individuals have NOT reached the age of 45 years or older and ELIMINATE **Volunteers C & F. (Volunteer F** may also be eliminated due to possible Iodine allergy.)
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 6	Once selection of individuals has been completed, the following criteria shall be considered, prior to dispatching these individuals:: • Dose to the individual should not be planned to exceed the guidelines given in Attachment 1. • In accordance with the policy of minimizing total dose equivalent, respiratory protection equipment may be used to minimize internal exposure and protective clothing may be used to minimize skin contamination. • Limit exposures received under these conditions to once in a lifetime.
Standard:	REFERED to EPP-305, Emergency Exposure Guidelines and Personnel Dosimetry, Step 4.3.4.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 7	Dose to the individual should not be planned to exceed the guidelines given in Attachment 1.
Standard:	DETERMINED dose to the individual between 15 and 20 REM meets the guidelines given in Attachment 1.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 8√	Limit exposures received under these conditions to once in a lifetime.
Standard:	DETERMINED that one individual has already received an exposure for Protecting Valuable Property and ELIMINATE **Volunteer D**.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 9√	Select the individual.
Standard:	SELECTED **Volunteer G** as the most appropriate candidate for Emergency Exposure.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

Initial Conditions: **Given the following conditions:**

- **A Large Break Loss of Coolant Accident has occurred.**
- **Cold Leg recirculation operations have been established.**
- **An operator venting Residual Heat Removal Pump 1-02 was injured and needs assistance to exit the Radiological Controlled Area.**
- **The Emergency Coordinator has authorized one volunteer to attempt a lifesaving activity.**
- **Health Physics predicts a dose between 15 and 20 REM given the general radiation levels in the area of the injured person.**

Initiating Cue: **The Emergency Coordinator directs you to PERFORM the following:**

- **EVALUATE and SELECT the preferred volunteer from the list of available candidates per EPP-305, Emergency Exposure Guidelines and Personnel Dosimetry, Steps 4.3.2 and 4.3.4.**

Volunteer	Selected (Circle one)	Why or Why NOT selected
A	YES / NO	
B	YES / NO	
C	YES / NO	
D	YES / NO	
E	YES / NO	
F	YES / NO	
G	YES / NO	

Facility: CPNPP JPM # NRC SA5 Task # SO1140 K/A # 2.4.44 2.4 / 4.4

Title: Determine Protective Action Recommendations

Examinee (Print): ______________________

Testing Method:

Simulated Performance:	______	Classroom:	X
Actual Performance:	X	Simulator:	______
Alternate Path:	______	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Comanche Peak Unit 2 has experienced a Large Break Loss of Coolant Accident with multiple failures of Safeguards equipment and a breach of Containment.
- The Site is in a GENERAL EMERGENCY, a radiological release is in progress, and the following information is provided:
  - Core Exit Thermocouple highest reading is 1300ºF.
  - Containment pressure is 2 psig.
  - Meteorological Tower Data:
    - Wind Speed 5 mph.
    - Wind Direction from 180º.
  - Pasquill Stability Class is D.
  - Field Dose results are:
    - TEDE 1200 mrem at 5 miles and 400 mrem at 10 miles.
    - CDE Thyroid is 6250 mrem at 5 miles and 1500 mrem at 10 miles.
- Weather conditions include freezing rain and a temperature of 30°F throughout Somervell and Hood counties.
- The Initial Protective Action Recommendation was made at 0800.
- The current time is 0900.
- The duration of the release cannot be determined at this time.

Initiating Cue: The Shift Manager directs you to PERFORM the following:

- DETERMINE PAR per EPP-304, Protective Action Recommendations.
- HIGHLIGHT the Decision Path on Attachment 1.
- COMPLETE Attachment 2, Minimum Affected Area - Three (3) Sectors **or** Attachment 2A, Minimum Affected Area - Five (5) Sectors, as appropriate.

Task Standard: Utilizing EPP-304, DETERMINED Protective Action Recommendations during an accident.

Required Materials: EPP-304, Protective Action Recommendations, Rev. 21.

Validation Time: 10 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

CLASSROOM SETUP

EXAMINER:

PROVIDE the examinee with a copy of:

- **EPP-304, Protective Action Recommendations.**
- **Highlight pen.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from EPP-304, Attachment 1.**
Perform Step: 1√	Enter Attachment 1 at GENERAL EMERGENCY declared: • Is this the Initial PAR?
Standard:	ENTERED Attachment 1 at GENERAL EMERGENCY declared and DETERMINED that this is NOT the Initial PAR and CHOSE “**NO**” path.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√	• TEDE ≥ 1 Rem at 1 mile OR • CDE Thyroid ≥ 5 Rem at 1 mile
Standard:	DETERMINED Both TEDE and CDE Thyroid exceed 1 mile limits and CHOSE "**YES**" path.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√	• TEDE ≥ 1 Rem at 5 miles OR • CDE Thyroid ≥ 5 Rem at 5 miles
Standard:	DETERMINED Both TEDE and CDE Thyroid exceed 5 miles limits and CHOSE "**YES**" path.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√	• TEDE ≥ 1 Rem at 10 miles OR • CDE Thyroid ≥ 5 Rem at 10 miles
Standard:	DETERMINED Both TEDE and CDE Thyroid do NOT exceed 10 miles limits and CHOSE "**NO**" path.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Reference Inset Table[1] on Attachment 1.**
Perform Step: 5	**[1]SHELTER OR EVACUATE?**
Standard:	REFERRED to Inset Table[1].
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6√	Has there been severe core damage AND is a Rad release in progress?
Standard:	DETERMINED severe core damage exists due to Core Exit Thermocouple temperature with a radiation release in progress and CHOSE "**YES**" path.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7√	Can release duration be accurately determined AND will the release be of short duration?
Standard:	DETERMINED release duration can NOT be accurately determined and will NOT be of short duration based on breach of Containment and CHOSE "**NO**" path.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8√	**Impediments?** (ice, roads, hostile threat)
Standard:	DETERMINED impediments exist from the Initial Conditions due to weather conditions and CHOSE "**YES**" path to **SHELTER**.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 9√	[1]**SHELTER OR EVACUATE?**
Standard:	CHOSE **SHELTER** path to Box **D** and SHELTERED 2 mile radius and Downwind Sectors to 10 miles **AND** ADVISED remainder of EPZ to go indoors and LISTEN to EAS.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from EPP-304, Attachment 2.**
Examiner Note:	**The first sequence of steps on either Attachment is used to determine if Attachment 2 or 2A is appropriate.**
Perform Step: 10 Step 1	To identify Minimum Affected Area, use instruction below to determine appropriate Attachment (Attachment 2 or Attachment 2A).
Standard:	REFERRED to Attachment 2 or 2A.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 11 Step 1	<u>IF conditions are</u>: • ON-SITE Pasquill Stability Class C, D, E, F, or G and ON-SITE Wind Direction (From) is available <u>THEN</u> use Attachment 2
Standard:	DETERMINED that Stability Class D allows Attachment 2 use.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 12 Step 2	Circle ON-SITE Pasquill Stability Class C D E F G
Standard:	CIRCLED Pasquill Stability Class D.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 13 Step 3	Enter Wind Direction (From): ___________ degrees
Standard:	ENTERED Wind Direction from 180 degrees.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 14√ Step 4	Circle applicable Centerline Sector in the Table below
Standard:	CIRCLED Centerline Sector A.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 15√ Step 5	Knowing Centerline Sector, GO TO applicable subsequent page to identify affected sectors and Emergency Response Zones (ERZ).
Standard:	Knowing Centerline Sector is A, CIRCLED or HIGHLIGHTED the following: • AFFECTED SECTORS are RAB. • EMERGENCY RESPONSE ZONES from 0 to < 5 miles are 2A, 4B, 4C, 4A, 1B. • EMERGENCY RESPONSE ZONES from > 5 to < 10 miles are 1D, 4E, 4F, 1C.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

Initial Conditions: **Given the following conditions:**

- **Comanche Peak Unit 2 has experienced a Large Break Loss of Coolant Accident with multiple failures of Safeguards equipment and a breach of Containment.**
- **The Site is in a GENERAL EMERGENCY, a radiological release is in progress, and the following information is provided:**
  - **Core Exit Thermocouple highest reading is 1300ºF.**
  - **Containment pressure is 2 psig.**
  - **Meteorological Tower Data:**
    - **Wind Speed 5 mph.**
    - **Wind Direction from 180º.**
  - **Pasquill Stability Class is D.**
  - **Field Dose results are:**
    - **TEDE 1200 mrem at 5 miles and 400 mrem at 10 miles.**
    - **CDE Thyroid is 6250 mrem at 5 miles and 1500 mrem at 10 miles.**
- **Weather conditions include freezing rain and a temperature of 30°F throughout Somervell and Hood counties.**
- **The Initial Protective Action Recommendation was made at 0800.**
- **The current time is 0900.**
- **The duration of the release cannot be determined at this time.**

Initiating Cue: **The Shift Manager directs you to PERFORM the following:**

- **DETERMINE PAR per EPP-304, Protective Action Recommendations.**
- **HIGHLIGHT the Decision Path on Attachment 1.**
- **COMPLETE Attachment 2, Minimum Affected Area - Three (3) Sectors or Attachment 2A, Minimum Affected Area - Five (5) Sectors, as appropriate.**

Facility: **CPNPP Units 1 and 2**	Date of Examination: **June 2015**
Exam Level: RO SRO(I) **SRO (U)**	Operating Test Number: **NRC**

Control Room Systems (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

	System / JPM Title	Type Code*	Safety Function
S-1	001 –Control Rod Drive System (RO1030) Respond to Control Rods Below Insertion Limit	A,D,S	1
S-2	**006 –Emergency Core Cooling System (RO1506D)** **Transfer ECCS to Cold Leg Recirculation**	**A,EN,L,M,S**	**2**
S-3	006 –Emergency Core Cooling System (RO1511) Isolate SI Accumulators Following a LOCA	A,EN,L,N,S	3
S-4	**005 –Residual Heat Removal System (RO1402)** **Alternate Residual Heat Removal Trains**	**L,N,S**	**4P**
S-5	045 –Main Turbine Generator System (RO3149) Roll Main Turbine to 1800 RPM (RO Only)	L,N,S	4S
S-6	**022 –Containment Cooling System (RO2101A)** **Alternate Containment Recirculation Units(CACRS)**	**A,N,S**	**5**
S-7	064 –Emergency Diesel Generator System (RO4302D) Load Emergency Diesel Generator	A,D,S	6
S-8	008 –Component Cooling Water System (RO3603C) Rotate Component Cooling Water Pumps	M,S	8

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

P-1	**007 –Reactor Trip (AO6439B)** **Trip the Reactor and Stop MG Sets**	**D,E,R**	**1**
P-2	068 –Control Room Evacuation (AO6415A) Place MDAFW Pump on Alternate Suction Source	D,E,L,R	8
P-3	**062 –AC Electrical Distribution System (AO4204D)** **Transfer Inverter IVuPC1 from Bypass to Normal**	**N,E**	**6**

@	All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.
*Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥ 1(control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

NRC JPM Examination
Summary Description

S-1 Following a turbine runback, due to a trip of a Heater Drain Pump from 100% power, the applicant will determine that control rods are below the required rod insertion limit by using ABN-302, Feedwater, Condensate, Heater Drain System Malfunction, Section 4.0, Heater Drain Pump Trip. This is an Alternate Path JPM, requiring the applicant to manually determine the required boration using the Reactivity Briefing Sheet. The critical steps include determination of how much boration is needed, and the various control board manipulations needed to perform the boration. This is a direct from bank JPM under Control Rod Drive System – Reactivity Control Safety Function. (K/A 001.A4.05 - IR 3.7 / 3.7)

S-2 The applicant will be required to use EOS-1.3A, Transfer to Cold Leg Recirculation following a Large Break LOCA. This is an Alternate Path JPM because one of the RHR pump suction valves will NOT open, and the applicant will need to perform alternate steps for system realignment, including shutting off one pump and ensuring the other RHR pump is running. The critical steps include recognition of one RHR pump suction valve failing to open, and various control board manipulations needed for realignment in order to achieve cold leg recirculation. This is a PRA significant action. This is a modified from bank JPM under the Emergency Core Cooling System – Reactor System Inventory Control Safety Function. (K/A 006.A4.05 - IR 3.7 / 3.6)

S-3 Using EOS-1.2A, Post LOCA Cooldown and Depressurization, the applicant will be required to continue with Step 26 for determining if SI accumulators should be isolated and to isolate the accumulators. This is an Alternate Path JPM and requires the applicant to determine that one of the accumulator injection valves will NOT close. This will require the applicant to vent off this accumulator to minimize the consequences of undesired injection, since the accumulator cannot be isolated. The critical steps include restoring power to the injection valves, operation of the accumulator injection valves, and venting of the accumulator that cannot be isolated. This is a new JPM under the Emergency Core Cooling System – Reactor Pressure Control Safety Function. (K/A 006.A4.02 - IR 4.0 / 3.8)

S-4 The applicant will use SOP-102A, Residual Heat Removal System, Section 5.6 Alternating RHR Trains in MODE 5, 6, or Defueled to perform the task. The critical steps will include various control board manipulations required for making the swap such as starting and stopping RHR pumps, operation of control valves, and requirements for temperature control. This is a new JPM under the Residual Heat Removal System – Primary System Heat Removal from Reactor Core Safety Function. (K/A 005.A4.01 - IR 3.6 / 3.4)

S-5 The applicant will use IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator, beginning at Step 5.1.18 and completing Step 5.1.21. This involves setting up the turbine control for rolling the turbine to 1800 RPM. The Overspeed Trip test will NOT be required. The critical steps include setting up the turbine control panel to open the HP and LP stop valves, an interim step of holding at 500 RPM, placing of bearing lift oil pumps to AUTO, and then continuing to 1800 RPM where the JPM will terminate. This is a new JPM under the Main Turbine Generator System – Secondary System Heat Removal from Reactor Core Safety Function. RO Only. (K/A 045.A4.02 – IR 2.7 / 2.6)

S-6 With a Containment Vent in progress, the applicant is directed to alternate Containment Recirculation Units using SOP-801A, Containment Ventilation System, Section 5.1.3. During the swap Containment Air Gaseous radiation monitor goes into Alert. This is an alternate path JPM requiring action to manually initiate isolation of the Containment Vent. The critical steps include starting the desired cooling unit and manual operation of several valves for isolation of the Containment Vent evolution. This is a new JPM under the Containment Cooling System – Containment Integrity Safety Function. (K/A 022.A4.01 - IR 3.6 / 3.6)

S-7 With OPT-214A, Diesel Generator Operability Test in progress and following a fast start of Diesel Generator 1-01, the applicant is to continue with the surveillance. This involves beginning to load the diesel generator. This is an Alternate Path JPM. When loading is raised to approximately 2.2 MW, the Station Service Water Pump 1-01 will trip. This will result in the diesel generator running loaded with no cooling water. The applicant is required to shut down the diesel generator. The critical steps are proper loading of the diesel generator and shutting down the diesel generator to prevent equipment damage. This is a direct from bank JPM under the Emergency Diesel Generator System – Electrical Safety Function. (K/A 064.A4.06 - IR 3.9 / 3.9)

S-8 The applicant is directed to swap Component Cooling Water Pumps from Train A to Train B, using SOP-502A, Component Cooling Water System. The critical steps include establishing required system flow prior to and after the swap, control board manipulations required for the swap, starting the idle pump, and shutting down the pump to be idled. This is a modified from bank JPM under the Component Cooling Water System – Plant Service Systems Safety Function.
(K/A 008.A4.01 - IR 3.3 / 3.1)

P-1 With an Anticipated Transient Without Trip in progress on Unit 1, the applicant is required to locally trip the Unit 1 reactor, and to stop both Rod Drive Motor Generator Sets, in accordance with FRS-0.1A, Response to Nuclear Power Generator/ATWT, Step 6a RNO. Through a series of simulated operations and examiner cues, the applicant will open RTA and RTB trip breakers as critical steps. The bypass breakers will not be considered critical steps. When that is complete, the applicant will de-energize both MG Sets by opening associated breakers, each of which is a critical step. This is a PRA significant action. This is a direct from bank JPM under the Reactor Trip System – Reactivity Control Safety Function.
(K/A 007.EA2.02 - IR 4.3 / 4.6)

P-2 During a Control Room evacuation due a fire, the applicant is required to supply an alternate suction source to Motor Driven Auxiliary Feedwater Pump 1-01, which has tripped due to loss of suction pressure. Actions will be performed using ABN-803A/B, Response to a Fire in the Control Room or Cable Spreading Room, Attachment 9, Alternate AFW Supply. The critical steps include operation of breakers and manual operation of valves required for supplying the alternate suction source (which will be from Station Service Water). This is a PRA significant action. This is a direct from bank JPM under the Control Room Evacuation System – Plant Service Systems Safety Function.
(K/A 068.AA1.26 - IR 3.6 / 3.8)

P-3 The applicant will be directed to perform SOP-607A/B, 118 VAC Distribution System and Inverters, Section 5.5.9 Transferring Inverter IVuPC1 from Bypass to Normal Operation. The critical steps will include operating the Static Transfer Switch to make the swap, and placing of several other controls to complete the operation. This is a new JPM under the AC Electrical Distribution System – Electrical Safety Function. (K/A 062.A4.04 - IR 2.6 / 2.7)

Facility: CPNPP JPM # NRC S-1 Task # RO1030 K/A # 001.A4.05 3.7 / 3.7 SF-1

Title: Respond to Control Rods Below Insertion Limit

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	______
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 has experienced a trip of Heater Drain Pump 1-01 from 100% MOL conditions.
- All automatic control systems responded as expected.
- ABN-302, Feedwater, Condensate, Heater Drain System Malfunction, Section 4.0 Heater Drain Pump Trip is in progress.
- The automatic turbine runback was completed, per ABN-302, Section 4.3, Step 1.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Complete ABN-302, Section 4.0 beginning at Step 4.3.7.

Task Standard: Determined that control rods were not above the rod insertion limit and initiated a boration of a minimum of 175 gallons in accordance with the Reactivity Briefing Sheet.

Required Materials:

- MOL Reactivity Briefing Sheet.
- ABN-302, Feedwater, Condensate, Heater Drain System Malfunction, Rev. 14 PCN 18.
- SOP-104A, Reactor Make-Up and Chemical Control System, Rev. 15 PCN 2.

Validation Time: 8 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

SIMULATOR SETUP

SIMULATOR OPERATOR:

INITIALIZE to IC-46 and ENSURE the corrected boron concentration is accurately displayed on the CB-06 Operator Aid.

OR

INITIALIZE to IC-18 and INSERT the following:

- **FW14A, Heater Drain Pump 1 Trip**

Allow the plant to stabilize with the Control Rods below the RIL, and FREEZE.

EXAMINER:

PROVIDE the examinee with a copy of:

- **ABN-302, Section 4.0.**
- **MOL Reactivity Briefing Sheet when requested.**
- **SOP-104A, Section 5.1.2 when requested.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from ABN-302, Section 4.3.**
Perform Step: 1 4.3.7.a	Verify the following: Rods - ABOVE ROD INSERTION LIMIT
Standard:	DETERMINED that the Control Rods are below the Rod Insertion Limit.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps represent the Alternate Path of this JPM.**
Perform Step: 2 4.3.7a RNO	Verify SDM or initiate boration to restore SDM within 1 hour and restore Rods above insertion limits within 2 hours per TS 3.1.6.
Examiner Cue:	**If examinee informs examiner that they would contact Core Performance for a SDM calculation, state that Core Performance will not be available for minimum of 2 hours.**
Standard:	DETERMINED that boration is required.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Provide examinee a copy of the Reactivity Briefing Sheet when requested.**
Perform Step: 3 Reactivity Briefing Sheet A	Using Reactivity Briefing Sheet for Runback to 800 MWe, determines that a boration of 175 gallons should be initiated.
Standard:	Determined that a boration of 175 gallons should be initiated.
Examiner Cue:	**If examinee informs examiner that a boration is required per the Reactivity Briefing Sheet, state that the Unit Supervisor directs you to perform the required boration.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SOP-104A, Section 5.1.2.**

CAUTION: Initial RCS makeup boron concentration will be the concentration added from the previous RCS makeup evolution.

NOTE:
- This procedure does NOT assume prior automatic operation, but rather, sends Operator to setup for Automatic operation when section is complete or to a Manual Blend section. Step D, below, supports direct section entry by ensuring Makeup System FCVs are in a normal alignment prior to commencing the boration.
- TDM-201A and TDM-203A contain information to aid in obtaining correct values for setting pots and counters.
- Attachment 2, BOL Boration for Long Term Use provides instructions for periodic borations while keeping the Makeup System in Borate Mode.
- Prior to initiating borations, operator experience has shown the need to check the demand signal on 1-FK-110 and if a large disparity exists between actual and demanded then consider the use of manual control to get the controller closer to where it should be.

Perform Step: 4 5.1.2.A	Ensure the prerequisites of Section 2.1 and 2.2 are met.
Standard:	DETERMINED that the prerequisites of Section 2.1 are met and 2.2 are N/A for this evolution.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5 5..1.2.B	If at BOL and desire to periodically Borate for long term THEN Use Attachment 2, BOL Boration for Long Term Use.
Standard:	DETERMINED step is N/A.
Comment:	**SAT ☐ UNSAT ☐ N/A ☐**

Perform Step: 6√ 5.1.2.C	ENSURE 1/1-MU, RCS MU MAN ACT is in STOP.
Standard:	PLACED 1/1-MU, RCS MU MAN ACT in STOP.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7 5.1.2.D	ENSURE the following handswitches are in AUTO, <u>AND</u> the valves are CLOSED: • 1/1-FCV-111A, RMUW BLNDR FLO CTRL VLV • 1/1-FCV-111B, RCS MU TO VCT ISOL VLV • 1/1-FCV-110A, BA BLNDR FLO CTRL VLV • 1/1-FCV-110B, RCS MU TO CHRG PUMP SUCT ISOL VLV
Standard:	VERIFIED all valves are in AUTO and CLOSED.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 8√ 5.1.2.E	PLACE 43/1-MU, RCS MU MODE SELECT in BORATE.
Standard:	PLACED 43/1-MU, RCS MU MODE SELECT in BORATE.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 9 5.1.2.F	SET 1-FK-110, BA BLNDR FLO CTRL to obtain the desire flowrate (Pot setting = flowrate/4).
Standard:	LEFT 1-FK-110, BA BLNDR FLO CTRL at as found setting or ADJUSTED to desired flow setting..
Comment:	**SAT** ☐ **UNSAT** ☐

<u>Examiner Note</u>: The counter has to be set to 1750 to obtain 175.0 gallons. The final digit is the tenths of gallons on the counter.	
Perform Step: 10√ 5.1.2.G	SET 1-FY-110B, BA BATCH FLO counter to obtain the desired number of gallons.
Standard:	SET 1-FY-110B, BA BATCH FLO counter at any setting <u>></u> 175.0.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 11√ 5.1.2.H	START boration by placing 1/1-MU, RCS MU MAN ACT in START.
Standard:	PLACED 1/1-MU, RCS MU MAN ACT in START.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 12 5.1.2.I	VERIFY a BA XFER PMP - STARTS.
Standard:	VERIFIED 1/1-APBA1, BA XFER PMP 1 RED light LIT, GREEN light DARK.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 13 5.1.2.J	VERIFY the following: • 1/1-FCV-110A, BA BLNDR FLO CTRL VLV - THROTTLES to preset flow rate. • 1/1-FCV-110B, RCS MU TO CHRG PMP SUCT ISOL VLV - OPENS.
Standard:	VERIFIED 1/1-FCV-110A throttles to corresponding position and 1/1-FCV-110B OPENS.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 14 5.1.2.K	VERIFY the following are operating properly: • 1-FY-110B, BA BATCH FLO counter • 1-FR-110, R: BA FLO TO BLNDR/G: RCS MU FLO Flow Recorder
Standard:	VERIFIED 1-FY-110B and 1-FR-110 operating properly.
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 1 has experienced a trip of Heater Drain Pump 1-01 from 100% MOL conditions.**
- **All automatic control systems responded as expected.**
- **ABN-302, Feedwater, Condensate, Heater Drain System Malfunction, Section 4.0 Heater Drain Pump Trip is in progress.**
- **The automatic turbine runback was completed, per ABN-302, Section 4.3, Step 1.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **Complete ABN-302, Section 4.0 beginning at Step 4.3.7.**

Facility: CPNPP JPM # NRC S-2 Task #RO1506D K/A 006.A4.05 3.7 / 3.6 SF-2

Title: Transfer the ECCS System from the Injection Phase to the Cold Leg Recirculation Phase

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	______
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- A Large Break Loss of Coolant Accident has occurred.
- Refueling Water Storage Tank LO-LO level alarm has been reached.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- ALIGN the Emergency Core Cooling System for Cold Leg Recirculation per EOS-1.3A, Transfer to Cold Leg Recirculation.

Task Standard: Transferred both trains of ECCS to Cold Leg Recirculation.

Required Materials: EOS-1.3A, Transfer to Cold Leg Recirculation, Rev. 8 PCN 5.

Validation Time: 8 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

SIMULATOR SETUP

SIMULATOR OPERATOR:

INITIALIZE to IC-41

OR

INITIALIZE to any at power Initial Condition and PERFORM the following:

a. **INSERT malfunction RC08D2, Large Break LOCA.**
b. **INSERT malfunction SS03F2, Defeats AUTO Swapover for Train B RHR.**
c. **PLACE Simulator in RUN.**
d. **REDUCE AFW flow to all Steam Generators.**
e. **RESET the following:**
    1. **Safety Injection.**
    2. **Safety Injection Sequencers.**
    3. **Phase A & B Containment Isolation.**

- **STOP both Emergency Diesel Generators.**
- **STOP all Reactor Coolant Pumps.**
- **ENSURE CCW Flow established to RHR and Containment Spray Heat Exchangers.**

When the RWST reaches the LO-LO level setpoint of 33%, FREEZE the Simulator.

EXAMINER:

PROVIDE the examinee with a copy of EOS-1.3A, Transfer to Cold Leg Recirculation.

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from EOS-1.3A.**
CAUTION: Steps 1 through 3 should be performed without delay. FRGs should not be implemented prior to completion of these steps.	
Perform Step: 1 1	Reset SI.
Standard:	• DEPRESSED 1/1-SIRA and 1/1-SIRB OR • DETERMINED from PCIP that SI was already Reset.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2 2	Verify CCW Flow As Required: • From RHR heat exchangers • From Containment Spray heat exchangers
Standard:	VERIFIED FLOW on 1-FI-4556, 1-FI-4560, 1-FI-4558 and 1-FI-4562
Comment:	**SAT ☐ UNSAT ☐**

CAUTION: Any ECCS pump taking suction from RWST should be stopped at RWST EMPTY. Any Containment Spray pump taking suction from RWST should be stopped when RWST level reaches 0%.

CAUTION: Any ECCS or Containment Spray pump that loses suction or shows indication of cavitation should be stopped. The CCP and SI pump should be stopped before stopping the RHR pump.

CAUTION: SI pumps should be stopped if RCS pressure is greater than their shutoff head pressure.

Perform Step: 3 3a	Align ECCS For Cold Leg Recirculation: a. Check open CNTMT SMP TO RHRP 1 AND RHRP 2 SUCT ISOL VLVS: • 1/1-8811A
Standard:	DETERMINED 1/1-8811A OPEN, red light LIT, green light DARK
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 4 3a	Align ECCS For Cold Leg Recirculation: a. Check open CNTMT SMP TO RHRP 1 AND RHRP 2 SUCT ISOL VLVS: • 1/1-8811B
Standard:	DETERMINED 1/1-8811B CLOSED, red light DARK, green Light LIT
Comment:	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**The following step represents the alternate path of this JPM.**
Perform Step: 5√ 3a RNO	IF ONE RHR sump suction valve failed to open, THEN stop RHR pump with valve closed AND go to Step 3b to align operating RHR pump. • Stop RHR pump 1(2).
Standard:	PLACED 1/1-APRH2 in STOP. (PULL OUT is also acceptable).
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 6√ 3b	b. CLOSE RWST TO RHRP 1 AND RHRP 2 SUCT VLVS: • 1/1-8812A
Standard:	PERFORMED the following: • PLACED 1/1-8812A, in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**not-critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**1/1-8812B will be closed in step 5 g. The step is only critical when the valve is closed, if verified in Step 5 g. the step is not critical. The examinee may choose to not close 1/1-8812B at this time and that is also acceptable.**
Perform Step: 7√ 3b	b. CLOSE RWST TO RHRP 1 AND RHRP 2 SUCT VLVS: • 1/1-8812B
Standard:	PERFORMED the following: • PLACED 1/1-8812B in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**not-critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The critical step is to either:** **Close 1/1-8814A <u>AND</u> 1/1-8814B** **<u>OR</u>** **Close 1/1-8813**
Perform Step: 8√ 3c	c. Close SIP 1 AND SIP 2 MINIFLO VLVS: • 1/1-8814A
Standard:	PERFORMED the following: • PLACED 1/1-8814A in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**not-critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 9√ 3c	Close SIP 1 AND SIP 2 MINIFLO VLVS: • 1/1-8814B
Standard:	PERFORMED the following: • PLACED 1/1-8814B in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**not-critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 10√ 3c	Close SIP 1 AND SIP 2 MINIFLO VLVS: • 1/1-8813
Standard:	INSERTED key and TURNED Key switch to ON. PLACED 1/1-8813 in CLOSE.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**It is critical that either 1/1-8716A <u>OR</u> 1/1-8716B is CLOSED.**
Perform Step: 11√ 3d	Close RHRP 1 AND RHRP 2 XTIE VLVS: • 1/1-8716A
Standard:	PERFORMED the following: • PLACED 1/1-8716A in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**not-critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 12√ 3d	Close RHRP 1 AND RHRP 2 XTIE VLVS: • 1/1-8716B
Standard:	PERFORMED the following: • PLACED 1/1-8716B in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**not-critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**It is critical that either 1/1-8511A <u>OR</u> 1/1-8512B is CLOSED.**
Perform Step: 13√ 3e	Close the CCP ALT MINIFLO ISOL VLVS: • 1/1-8511A
Standard:	PERFORMED the following: • PLACED 1/1-8511A in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 14√ 3e	Close the CCP ALT MINIFLO ISOL VLVS: • 1/1-8512B
Standard:	PERFORMED the following: • PLACED 1/1-8512B in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**It is critical that either 1/1-8511B <u>OR</u> 1/1-8512A is CLOSED.**
Perform Step: 15√ 3e	Close the CCP ALT MINIFLO ISOL VLVS: • 1/1-8511B
Standard:	PERFORMED the following: • PLACED 1/1-8511B in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 16√ 3e	Close the CCP ALT MINIFLO ISOL VLVS: • 1/1-8512A
Standard:	PERFORMED the following: • PLACED 1/1-8512A in CLOSE (**critical**). • OBSERVED green CLOSE light LIT, red OPEN light DARK (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**It is critical that either 1/1-8807A <u>OR</u> 1/1-8807B is OPENED.**
Perform Step: 17√ 3f	Open SI CHRG SUCT HDR XTIE VLVS: • 1/1-8807A
Standard:	PERFORMED the following: • PLACED 1/1-8807A in OPEN (**critical**). • OBSERVED green CLOSE light DARK, red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 18√ 3f	Open SI CHRG SUCT HDR XTIE VLVS: • 1/1-8807B
Standard:	PERFORMED the following: • PLACED 1/1-8807B in OPEN (**critical**). • OBSERVED green CLOSE light DARK, red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 19√ 3g	Open RHRPs TO CCP/SIP SUCT VLVs: • 1/1-8804A
Standard:	PERFORMED the following: • PLACED 1/1-8804A in OPEN (**critical**). • OBSERVED green CLOSE light DARK, red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 20√ 3g	Open RHRPs TO CCP/SIP SUCT VLVs: • 1/1-8804B
Standard:	PERFORMED the following: • PLACED 1/1-8804B in OPEN (**critical**). • OBSERVED green CLOSE light DARK, red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 21 4	Align Containment Spray System for recirculation.
Examiner Cue:	**Another Operator will perform Attachment 1H of EOS-1.3A.**
Comment:	**SAT ☐ UNSAT ☐**

CAUTION: ECCS recirculation flow to RCS must be maintained at all times.

CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment (CCP will be running with no suction).

Perform Step: 22 5 a.	Perform the following to complete Recirculation Alignment: a. Check ECCS aligned for cold leg recirculation.
Standard	VERIFIED Train A RHR is supplying ECCS pump suctions via 1/1-8804A.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 23 5 b.	b. Verify closed CCP MINIFLO VLVS: • 1/1-8110 • 1/1-8111
Standard:	VERIFIED CCP MINIFLO VLVS Closed: • 1/1-8110 – green CLOSED light LIT, red OPEN light OFF. • 1/1-8111 – green CLOSED light LIT, red OPEN light OFF.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 24√ 5 c.	c. Close RWST TO CHRG PMP SUCT VLVS: • 1/1-LCV-112D • 1/1-LCV-112E
Standard:	CLOSED RWST TO CHRG PMP SUCT VLVS: • 1/1-LCV-112D, green CLOSED light LIT, red OPEN light OFF. • 1/1-LCV-112E, green CLOSED light LIT, red OPEN light OFF.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 26 5 d.	Verify CCP injection flow.
Standard:	VERIFIED flow on 1-FI-917, CCP SI FLO (CB04).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 27√ 5 e.	Close RWST TO SIP SUCT VLV: • 1/1-8806
Standard:	CLOSED 1/1-8806, green closed light LIT, red open light OFF (CB02).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 28 5 f.	Verify SIP discharge flow(s).
Standard:	VERIFIED flow on 1-FI-918, SIP 1 DISCH FLO and/or 1-FI-922, SIP 2 DISCH FLO (CB02).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 29 5 g.	Check RHR Status: 1) Both RHR Trains running in cold leg recirculation.
Standard:	DETERMINED train B RHR pump is not running (CB04).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**If 1/1-8812B was closed in step 3 b. (Performance Step 7), then this is NOT a critical step.**
Perform Step: 30 √ 5 g. 1) RNO A)	Perform the following: IF RHR pump is stopped because CNTMT SMP TO RHRP 1 or RHRP 2 SUCT ISOL VLV (1/1-8811A or 1/1-8811B) failed to automatically open, THEN perform the following: A) Close RWST to RHR Pump Suction Valve (1/1-8812A or 1/1-8812B) for the affected pump.
Standard:	• DETERMINED train B RHR pump is not running (**non-critical**) • CLOSED 1/1-8812B, green closed light LIT, red open light OFF (CB04). (**critical**)
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Applicants may use Plant Computer to verify valve position.**
Perform Step: 31 5 g. 1) RNO B)	Perform the following: IF RHR pump is stopped because CNTMT SMP TO RHRP 1 or RHRP 2 SUCT ISOL VLV (1/1-8811A or 1/1-8811B) failed to automatically open, THEN perform the following: B) Close RCS RHR Pump Suction Valve (1/1-8701A(B) OR 1/1-8702A(B) for the affected pump.
Standard:	• VERIFIED Closed 1/1-8701A and 1/1-8702B based on job aid on hand switches and green closed light OFF, red open light OFF (CB04).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 32 √ 5 g. 1) RNO C)	Perform the following: IF RHR pump is stopped because CNTMT SMP TO RHRP 1 or RHRP 2 SUCT ISOL VLV (1/1-8811A or 1/1-8811B) failed to automatically open, THEN perform the following: C) Open CNTMT Sump to RHR Pump Suction Valve (1/1-8811A OR 1/1-8811B) for the affected pump.
Standard:	• OPENED 1/1-8811B, green closed light OFF, red open light LIT (CB04).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 33 √ 5 g. 1) RNO D)	Start affected RHR pump.
Standard:	PLACED 1/1-APRH2 in START. (CB04)
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **A Large Break Loss of Coolant Accident has occurred.**
- **Refueling Water Storage Tank LO-LO level alarm has been reached.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **ALIGN the Emergency Core Cooling System for Cold Leg Recirculation per EOS-1.3A, Transfer to Cold Leg Recirculation.**

Facility: CPNPP JPM # NRC S-3 Task # RO1511 K/A # 006.A4.02 4.0 / 3.8 SF-3

Title: Isolate SI Accumulators Following a LOCA

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	______
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- A LOCA has occurred.
- The reactor has been tripped and safety injection initiated.
- Appropriate actions of EOP-0.0A, Reactor Trip or Safety Injection and EOP-1.0A, Loss of Reactor or Secondary Coolant have been completed.
- Actions of EOS-1.2A, Post LOCA Cooldown and Depressurization, have been completed through step 25.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Continue actions of EOS-1.2A, Post LOCA Cooldown and Depressurization.
- Start at EOS-1.2A, step 26.

Task Standard: Isolated SI accumulators 1-01, 1-02, and 1-03. Vented pressure from SI Accumulator 1-04 after determining the isolation valve would not close from the Control Room.

Required Materials: EOS-1.2A, Post LOCA Cooldown and Depressurization, Rev. 8-5.
Keys for 69/1-8808A – 8808D POWER switches.

Validation Time: 5 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

SIMULATOR SETUP

SIMULATOR OPERATOR:

INITIALIZE to IC-36

OR

PERFORM the following:
Load a 100% Power IC

EXECUTE the following:

- **Insert override OPEN ACCUM 4 INJ VLV, 1/1-8808D.**
- **Insert Malfunction RC17A, SBLOCA approximately 750 GPM then reduce to 300 gpm as required to stabilize the Unit with the following conditions:**
  Pressurizer Level approximately 60%.
  RCS Temperature approximately 490 °F.
  RCS Pressure is above Accumulator injection pressure, approximately 1300 psig.

Perform appropriate actions of EOP-0.0A, Reactor Trip or Safety Injection, transition to and perform appropriate actions of EOP-1.0A, Loss of Reactor or Secondary Coolant, then perform appropriate actions of EOS-1.2A, Post LOCA Cooldown and Depressurization through step 25.

Prepare the following Scenario File to energize the SI accumulator Valves:

IRF SIR03 f:1 k:1
IRF SIR04 f:1 k:1
IRF SIR05 f:1 k:1
IRF SIR06 f:1 k:1

Place Simulator in Freeze.

When directed by the Examiner, place Simulator in run when examinee is ready to begin.

EXAMINER:

PROVIDE the examinee with a copy of EOS-1.2A, Post LOCA Cooldown and Depressurization. Ensure all steps, as applicable are COMPLETE and PLACE KEPT through Step 25.

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from EOS-1.2A.**
Perform Step: 1 26.a	Check If Accumulators Should Be Isolated: • RCS subcooling – GREATER THAN 25°F (55°F FOR ADVERSE CONTAINMENT)
Standard:	DETERMINED subcooling greater than 55°F.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 2 26.b	PRZR level – GREATER THAN 13% (34% FOR ADVERSE CONTAINMENT)
Standard:	DETERMINED that Pressurizer Level is approximately 60%.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 3 26.c	Check power to injection valves - AVAILABLE
Standard:	DETERMINED Accumulator Power Switches are OFF and all Accumulator Injection Valve indications are DARK, indicating that the valves do NOT have power.
Comment:	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**Accumulator Injection Valves may be isolated in any order.**
Examiner Note:	**Once examinee indicates that a key is required to energize the Accumulator Injection Valves, the examiner shall provide the required keys.**
Examiner Note:	**When the Examinee requests the NEO energize the SI accumulator injection valves, have the SIMULATOR OPERATOR actuate key 1 to energize the valves. All four valves will energize at the same time.**
SIMULATOR OPERATOR NOTE:	**Actuate key 1 to energize all four accumulator valves when directed by the Examiner to insert the following remote functions to energize the SI accumulator valves:** • **IRF SIR03 f:1** • **IRF SIR04 f:1** • **IRF SIR05 f:1** • **IRF SIR06 f:1**
Perform Step: 5 26.c RNO	Restore power to injection valve(s)
Standard:	Contacted NEO to turn on the breakers for all four SI accumulator injection valves.
Examiner Cue:	**Report as the NEO that the SI accumulator injection valve breakers are ON.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Critical portion of step is to CLOSE 1, 2 and 3 Accumulator Injection Valves. 69/1-8808A through C, POWER, switches must be placed in ON using the Key in order to close the valves.** **Accumulator injection valve 4 will not close and is therefore not critical.**
Examiner Note:	**The Alternate Path portion of this JPM begins below with the failure of 1/1-8808D, ACCUM 4 INJ VLV to close.**
Perform Step: 5 √ 26.d	Close all accumulator injection valves.
Standard:	OBTAINED keys and PLACED the selected accumulator lockout switches in ON and the associated accumulator valve Handswitch to CLOSE: • 69/1-8808A, POWER- ON (**CRITICAL**) • 1/1-8808A, ACCUM 1 INJ VLV - CLOSE (**CRITICAL**) • 69/1-8808B, POWER- ON (**CRITICAL**) • 1/1-8808B, ACCUM 2 INJ VLV (**CRITICAL**) • 69/1-8808C, POWER- ON (**CRITICAL**) • 1/1-8808C, ACCUM 3 INJ VLV (**CRITICAL**) • 69/1-8808D, POWER- ON (**NON-CRITICAL**) • 1/1-8808D, ACCUM 4 INJ VLV - Accumulator 4 Accumulator Injection Valve NOT CLOSED. (**NOT-CRITICAL**)
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6 √ RNO step 26.d.1)	Vent any unisolated accumulator: 1) Close SI/PORV ACCUM N_2 ISOL VLV. 1/1-8880.
Standard:	Determined 1-04 Accumulator is NOT isolated. PLACED SI/PORV ACCUM N_2 ISOL VLV. 1/1-8880, in CLOSE. (CB04)
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7 √ RNO step 26.d.2)	Open the unisolated accumulator(s) nitrogen vent valve. 2) 1/1-8875D, ACCUM 4 N2 SPLY/VENT VLV
Standard:	PLACED 1/1-8875D, ACCUM 4 N2 SPLY/VENT VLV, in OPEN. (CB04)
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**1-HC-943 is required to open sufficiently so that Accumulator 4 pressure lowers. This does not require fully opening, rather opening enough to lower pressure will satisfy the standard.**
Perform Step: 8 √ RNO step 26.d.3)	3) Open ACCUM 1•4 VENT CTRL 1-HC-943
Standard:	At CB-04, ADJUSTS Control Knob for ACCUM 1•4 VENT CTRL 1-HC-943 CLOCKWISE until valve position indicates >0% and Accumulator 4 Pressure begins to lower.
Examiner Note:	**Terminate the JPM once SI Accumulator 1-04 indicated pressure begins to lower.**
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **A LOCA has occurred.**
- **The reactor has been tripped and safety injection initiated.**
- **Appropriate actions of EOP-0.0A, Reactor Trip or Safety Injection and EOP-1.0A, Loss of Reactor or Secondary Coolant have been completed.**
- **Actions of EOS-1.2A, Post LOCA Cooldown and Depressurization, have been completed through step 25.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **Continue actions of EOS-1.2A, Post LOCA Cooldown and Depressurization.**
- **Start at EOS-1.2A, step 26.**

Facility: CPNPP JPM # NRC S-4 Task # RO1335 K/A # 005.A4.01 3.6 / 3.4 SF-4P

Title: Swap RHR Trains

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	______
Actual Performance:	X	Simulator:	X
Alternate Path:	______	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 5.
- Train A RHR is in service.
- Train B RHR has been filled, vented, and properly aligned per the appropriate portion of section 5.12 of SOP-102A.
- Flushing of Train B is NOT required.
- The RCS is NOT in reduced inventory.
- The RCS is NOT in solid plant operations.

Initiating Cue: The Unit Supervisor directs you to swap RHR trains to place Train B in service and secure Train A RHR pump in accordance with SOP-102A, Section 5.6, Alternating RHR Trains in MODE 5, 6, or Defueled.

Task Standard: Swapped RHR trains to place Train B in service and secured Train A, utilizing SOP-102A, Section 5.6,.

Required Materials: SOP-102A, Section 5.6, Rev. 19 PCN 7

Validation Time: 20 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

SIMULATOR SETUP

SIMULATOR OPERATOR:

LOAD IC35

OR

INITIALIZE to a MODE 5 IC with RHR Train A in service.

Ensure the following:

- **RCS temperature is < 200°F.**
- **Ensure the RCS Inventory / RHR screen selected on Plant Computer screens.**
- **Ensure RCS not at reduced inventory or solid.**

Enter the following remote functions and associated keys to ensure the RHR to CVCS valves can be operated from Keys 1 and 2.

IRF RHR01 f:0 k:2

IRF RHR02 f:100 k:1

Place the following Danger tags:

1/1-8702A, RHRP 1 HL RECIRC ISOL VLV

1/1-8701B, RHRP 2 HL RECIRC ISOL VLV

EXAMINER:

PROVIDE the examinee with a copy of SOP-102A, Section 5.6, Alternating RHR Trains in MODE 5, 6, or Defueled

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from SOP-102A, Section 5.6.**
This section describes steps to alternate the in service RHR trains. CAUTION: [C] • A second RHR Pump shall NOT be aligned in the Shutdown Cooling Mode (HL suction valves OPEN) with RCS temperature ≥ 200°F. This limitation ensures operating temperature is within the value prescribed for operation of RHR to meet ECCS design functions (REFERENCE EV-CR-2010-006268-2), AND RHR is in a readied state to deal with accident assumptions of the SSC in MODE 4 AND above. • RCS temperature shall remain < 200 °F until the off-going RHR Train has been removed from service. • This procedure section should NOT be used to shutdown the last RHR Train. • This procedure section does NOT flush the on-coming RHR Train. IF the on-coming RHR Train has been drained AND refilled, THEN alignment to the Reactor Cavity without flushing may cause water clarity issues AND DELAY Refueling Operations (CR-2011-004654). IF flushing is desired, THEN STARTUP of the on-coming train should be performed per section 5.4.	
Perform Step: 1 5.6 A	VERIFY the following: • Section 5.3, RHR Initial Startup Preparation for Shutdown Cooling Mode has been performed for the selected RHR train. -OR- • Selected RHR train has been filled AND vented per the appropriate portion of section 5.12.
Standard:	DETERMINED that Train B RHR has been filled and vented from Initial Conditions.
Comment:	**SAT ☐ UNSAT ☐**
Perform Step: 2 5.6 A	Verify the following: • RCS temperature < 200°F. • Selected RHR Train pressure is approximately the same as RCS pressure. • Flushing of the on-coming RHR Train is NOT desired. (IF flushing is desired, THEN GO to section 5.4. SEE Caution above).
Standard:	DETERMINED the following: • RCS temperature is < 200°F. • Train B RHR pressure is approximately the same as RCS pressure. • Flushing of Train B RHR is NOT desired (from Initial Conditions).
Comment:	**SAT ☐ UNSAT ☐**

CAUTION:	• RHR HX CCW RET FLO LO annunciators on 1-ALB-3B alarm when CCW flow to the RHR Heat Exchanger is ≤ 2500 gpm with the RHR HX CCW RET VLV OPEN. • RHR HX CCW return temperature must be monitored AND maintained ≤ 165°F to prevent exceeding maximum analyzed temperature of CCW piping AND preclude saturated conditions in the CCW System.
EXAMINER NOTE:	**Examinee may choose to throttle less than 2500 gpm. If so, then, the Examinee should ensure RHR HX CCW return temperature has remained less than or equal to 165 °F.**
Perform Step: 3√ 5.6 B. 1)	ENSURE CCW flow established to the RHR heat exchanger on the oncoming train by performing the following: 1) THROTTLE OPEN the CCW return valve: • 1-HS-4572, RHR HX 1 CCW RET VLV • 1-HS-4573, RHR HX 2 CCW RET VLV
Standard:	THROTTLED OPEN 1-HS-4573, RHR HX 2 CCW RET VLV.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4 5.6 B. 2)	ENSURE the selected RHRP SEAL CLR CCW RET FLO LO alarm is clear: • 1-ALB-3B, 3.7, RHRP1 SEAL CLR CCW RET FLO LO • 1-ALB-3B, 4.7, RHRP2 SEAL CLR CCW RET FLO LO
Standard:	DETERMINED 1-ALB-3B, 4.7, RHRP2 SEAL CLR CCW RET FLO LO alarm is clear.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5 5.6 C 1)	ENSURE proper valve alignment AND VENT the RHR pump by performing the following:
Standard:	SELECTED 1/1-APRH2, RHRP2 in PULL OUT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 6 5.6 C 2)	ENSURE the following valves are CLOSED for the oncoming train: TRAIN B • 1/1-8811B, CNTMT SMP TO RHRP 2 SUCT ISOL VLV • 1/1-8804B, RHRP 2 TO SIP SUCT VLV • 1/1-8716B, RHRP 2 XTIE VLV • 1/1-8840, RHR TO HL 2 & 3 INJ ISOL VLV • 1/1-8812B, RWST TO RHRP 2 SUCT VLV
Standard:	ENSURED the following valves are CLOSED for Train B: • 1/1-8811B, CNTMT SMP TO RHRP 2 SUCT ISOL VLV • 1/1-8804B, RHRP 2 TO SIP SUCT VLV • 1/1-8716B, RHRP 2 XTIE VLV • 1/1-8840, RHR TO HL 2 & 3 INJ ISOL VLV • 1/1-8812B, RWST TO RHRP 2 SUCT VLV
Comment:	**SAT ☐ UNSAT ☐**

NOTE: The following alignment conditions apply to the RHR Pump hot leg recirculation isolation valves:

	TRAIN A RHR	TRAIN B RHR
MODE 5 - 6:	1-8702A OPEN with power OFF AND TAGGED. 1-8701A no restrictions (normally OPEN with power ON in Shutdown Cooling Mode).	1-8701B OPEN with power OFF AND TAGGED. 1-8702B no restrictions (normally OPEN with power ON in Shutdown Cooling Mode)

Perform Step: 7 5.6 C. 3)	ENSURE that the hot leg recirculation isolation valves for the oncoming train are OPEN: TRAIN B • 1/1-8701B, RHRP 2 HL RECIRC ISOL VLV • 1/1-8702B, RHRP 2 HL RECIRC ISOL VLV
Standard:	DETERMINED hot leg recirculation isolation valves for TRAIN B OPEN: • 1/1-8701B, RHRP 2 HL RECIRC ISOL VLV – Open danger tagged OFF. • 1/1-8702B, RHRP 2 HL RECIRC ISOL VLV – OPEN power ON.
Comment:	**SAT ☐ UNSAT ☐**

NOTE:
- Venting of the seal cooler may be omitted for ALARA OR other considerations as directed by the Shift Manager/Unit Supervisor under the following circumstances:
  - If an RHR pump is being started in response to ABN-104 for purposes other than "Erratic RHR Pump Parameters"
  - If the pump has been operated in the previous six hours AND the flow path has NOT changed.
    REFERENCE SMF-2008-001280 AND EVAL-2005-001267-01.
- Steps C. 5), 6), AND 7) may be performed in parallel with step C. 4).

Examiner Note:	**This step requires Independent Verification for closure of 1RH-0022. Since it is a local action, examinee should not ask for IV.**
Perform Step: 8 5.6 C. 4)	VENT the selected RHR pump cooler AND VERIFY oil level by performing the following: a. OPEN the selected RHRP seal cooler vent valve for a minimum of 60 seconds to ensure all air is expelled: • 1RH-0022, RHR PMP 1-02 SEAL CLR VNT VLV b. CLOSE the selected RHRP seal cooler vent valve: • 1RH-0022, RHR PMP 1-02 SEAL CLR VNT VLV c. VERIFY oil level for the motor bearings is at the proper level on the sight glass. (REFER to Attachment 4, RHR Pump Motor Oil Level Indication)
Standard:	DISPATCHED an NEO to perform Steps 5.6 C.4) a, b, and c.
Examiner Cue:	**The NEO reports RHR Pump 1-02 seal cooler has been vented and motor oil levels are acceptable.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The valve below is normally open in all modes of plant operation except for ECCS Hot Leg Injection Mode.**
Perform Step: 9 5.6 C.5)	IF selected valve is NOT OPEN with it's breaker deenergized per IPO-010A, THEN OPEN the cold leg injection valve for the oncoming train: • 1/1-8809AB, RHR TO CL 1 & 2 INJ ISOL VLV • 1/1-8809B, RHR TO CL 3 & 4 INJ ISOL VLV
Standard:	DETERMINED step is N/A, OR may verify the following valve is OPEN: • 1/1-8809B, RHR TO CL 3 & 4 INJ ISOL VLV
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 10 5.6 C.6)	ENSURE the selected train heat exchanger flow control valve is CLOSED: • 1-HC-606, RHR HX 1 FLO CTRL • 1-HC-607, RHR HX 2 FLO CTRL
Standard:	ENSURED 1-HC-607, RHR HX 2 FLO CTRL controller set to 0% (CLOSE).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 11 5.6 C.7)	ENSURE the selected train heat exchanger bypass flow control valve is CLOSED: • 1-FK-618, RHR HX 1 BYP FLO CTRL • 1-FK-619, RHR HX 2 BYP FLO CTRL
Standard:	ENSURED the following on 1-FK-619, RHR HX 2 BYP FLO CTRL: • Amber MAN light ON. • Output indicating 0%.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 12 5.6 D	<u>IF</u> the RCS level is less than 56 inches above the core plate (827’8”), <u>THEN</u> ENSURE IPO-010A Attachment 12 has been performed on the oncoming train.
Standard:	DETERMINED step is not applicable from Initial Conditions.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 13 5.6 E	<u>IF</u> the RCS is water solid, <u>THEN</u> PLACE 1-PK-131, LTDN HX OUT PRESS CTRL in MANUAL, <u>AND</u> CONTROL RCS pressure manually to maintain stable pressure while continuing with this procedure.
Standard:	DETERMINED step is not applicable from Initial Conditions.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 14√ 5.6 F	START the oncoming RHR pump. • 1/1-APRH1, RHRP 1 • 1/1-APRH2, RHRP 2
Standard:	PERFORMED the following: • PLACED 1/1-APRH2, RHRP 2 to START (**critical**). • OBSERVED red PUMP light LIT, green PUMP light DARK (**NOT critical**). • OBSERVED RHRP 2 MOT CURRENT indication rising and then stabilizing. (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

CAUTION: A flow rate of at least 500 gpm through the RHR pump is required for minimum flow protection.	
Perform Step: 15 5.6 G	VERIFY that the selected train miniflow OPENS. • 1/1-FCV-610, RHRP 1 MINIFLO VLV • 1/1-FCV-611, RHRP 2 MINIFLO VLV
Standard:	PERFORMED the following: • VERIFIED 1/1-FCV-611, RHRP 2 MINIFLO VLV green light DARK, red light LIT. • OBSERVED 1-FI-619, RHR TO CL 3 & 4 indicating greater than or equal to 500 gpm.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 16√ 5.6 H	Slowly (over a period of 5 - 10 min) ESTABLISH flow from the oncoming train while CLOSING the off-going train flow control valves as necessary to maintain desired temperature: Train B Oncoming OPEN 1-FK-619, RHR HX 2 BYP FLO CTRL OR 1-HC-607, RHR HX 2 FLO CTRL OR both as desired while CLOSING the following: • 1-HC-606, RHR HX 1 FLO CTRL AND • 1-FK-618, RHR HX 1 BYP FLO CTRL
Standard:	• ESTABLISHED flow from the Train B RHR pump through the RHR heat exchanger AND • STOPPED flow through Train A RHR heat exchanger.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 17√ 5.6 I	ESTABLISH the desired flow rate, as indicated on the associate flow instruments. • 1-FI-619, RHR TO CL 3 & 4 INJ FLO
Standard:	ESTABLISHED flow rate as indicated on 1-FI-619, RHR TO CL 3 & 4 INJ FLO such that flow is not less than 500 gpm and that RCS temperature is maintained at < 200°F.
Comment:	**SAT ☐ UNSAT ☐**

NOTE: WHEN the heat exchanger bypass flow controller is placed in AUTO, THEN the bypass valve will OPEN to give a flow rate of approximately 3950 gpm.	
EXAMINER NOTE:	**Examinee may choose to maintain the bypass flow controller in manual.**
Perform Step: 18 5.6 J	IF desired, THEN PLACE the selected train controller in AUTO. • 1-FK-619, RHR HX 2 BYP FLO CTRL
Standard:	PERFORMED the following: • DEPRESSED AUTO pushbutton on 1-FK-619. • OBSERVED amber MAN light DARK, white AUTO light LIT. • OBSERVED 1-FI-619, RHR TO CL 3 & 4 INJ FLO trending to approximately 3950 gpm.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 19 5.6 K 1)	IF letdown flow to the CVCS is established, THEN PERFORM the following: ENSURE 1-PK-131, LTDN HX OUT PRESS CTRL is in Manual AND ADJUST as necessary to maintain stable letdown flow rate while performing the following steps:
Standard:	ENSURED 1-PK-131, LTDN HX OUT PRESS CTRL in Manual.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 20 5.6 K 2)	OPEN the RHR to CVCS letdown isolation valve for the oncoming train: • 1RH-8734B-RO, RHR HX 1-02 TO CVCS LTDN ISOL VLV RMT OPER
Standard:	DISPATCHED an NEO to OPEN 1RH-8734B-RO, RHR HX 1-02 TO CVCS LTDN ISOL VLV RMT OPER.
Simulator Operator:	**When called as NEO, use Remote Function RHR02 to OPEN 1RH-8734B-RO. Report back to Control Room that 1RH-8734B-RO is OPEN when completed. (Key 2)**
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 21 5.6 K 3)	CLOSE the RHR to CVCS letdown isolation valve for the off-going train: • 1RH-8734A-RO, RHR HX 1-01 TO CVCS LTDN ISOL VLV RMT OPER
Standard:	DISPATCHED an NEO to CLOSE 1RH-8734A-RO, RHR HX 1-01 TO CVCS LTDN ISOL VLV RMT OPER.
Booth Operator:	**When called as NEO, use Remote Function RHR01 to CLOSE 1RH-8734A-RO. Report back to Control Room that 1RH-8734A-RO is CLOSED when completed. (Key 1)**
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 22√ 5.6 K 4)	OPERATE charging pumps AND charging flow as required for RCS level control per SOP-103A.
Standard:	MAINTAINED RCS level control by controlling charging flow.
Comment:	**SAT** ☐ **UNSAT** ☐

CAUTION: [C] • Prior to RHR Pump shutdown, RCS temperature shall be < 200°F. This limitation ensures operating temperature is within the value prescribed for operation of RHR to meet ECCS design functions (REFERENCE EV-CR-2010-006268-2) AND RHR is in a readied state to deal with accident assumptions of the SSC in MODE 4 AND above. • IF RCS temperature is ≥ 200°F, THEN RCS should be cooled to < 200°F prior to RHR Pump shutdown.	
Perform Step: 23 5.6 L	VERIFY on-coming RHR Train is in service maintaining RCS temperature < 200°F.
Standard:	VERIFIED RHR Train B in service and RCS temperature < 200°F.
Comment:	**SAT ☐ UNSAT ☐**

CAUTION: • STARTING OR STOPPING an RHR pump when the RCS is water solid will cause a pressure excursion in the RCS. Pressure should be controlled by using 1-PK-131 in "MANUAL." • A flow rate of at least 500 gpm through the RHR pump is required for minimum flow protection.	
NOTE: IF shutting down an RHR Train in preparation for MODE 3 entry, THEN steps 5.6 M. through P. 3) should be performed in a timely manner.	
Perform Step: 24 5.6.3 M	ENSURE off-going RHR Train heat exchanger outlet valve AND RHR heat exchanger bypass valve are CLOSED: RHRP 1-01 • 1-HC-606, RHR HX 1 FLO CTRL • 1-FK-618, RHR HX 1 BYP FLO CTRL
Standard:	PERFORMED the following: • OBSERVED 1-HC-606, RHR HX 1 FLO CTRL indicates 0% on scale (CLOSE). • OBSERVED 1-FK-618, RHR HX 1 BYP FLO CTRL amber Manual light LIT, white AUTO light DARK, and output scale indicating 0%.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**IPO-010A is for Reduced Inventory Operations. Applicant will determine that this step does apply.**
Perform Step: 25√ 5.6 N 1)	IF the cold leg injection valves are NOT THROTTLED OPEN per IPO-010A, THEN PERFORM the following: 1) CLOSE the cold leg injection valve for the train being shut down: • 1/1-8809A, RHR TO CL 1 & 2 INJ ISOL VLV
Standard:	PERFORMED the following: • ENSURE key INSERTED in 69/1-8809A POWER, and turn to ON (**critical**). • OPERATE 1/1-8809A to OPEN position (**critical**). • OBSERVE 1/1-8809A green CLOSE light LIT, red OPEN light DARK (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 26 5.6 N 2)	VERIFY that the miniflow valve for the selected RHR pump OPENS: • 1/1-FCV-610, RHRP 1 MINIFLOW VLV
Standard:	OBSERVED 1/1-fcv-610, RHRP 1 MINIFLOW VLV green light DARK, red light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 27√ 5.6 O	STOP the selected RHR pump: • 1/1-APRH1, RHRP 1
Standard:	PERFORMED the following: • PLACED 1/1-APRH1, RHRP 1 to STOP (**critical**). • OBSERVED green PUMP light LIT, red PUMP light DARK (**NOT critical**).
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

<u>INITIAL</u> <u>CONDITIONS</u>: **Given the following conditions:**

- **Unit 1 is in MODE 5.**
- **Train A RHR is in service.**
- **Train B RHR has been filled, vented, and properly aligned per the appropriate portion of section 5.12 of SOP-102A.**
- **Flushing of Train B is NOT required.**
- **The RCS is NOT in reduced inventory.**
- **The RCS is NOT in solid plant operations.**

<u>INITIATING</u> <u>CUE</u>: **The Unit Supervisor directs you to swap RHR trains to place Train B in service and secure Train A RHR pump in accordance with SOP-102A, Section 5.6, Alternating RHR Trains in MODE 5, 6, or Defueled.**

Facility: CPNPP JPM # NRC S-5 Task # RO3149 K/A # 045.A4.02 2.7 / 2.6 SF-4S

Title: Roll the Main Turbine to 1800 RPM

Examinee (Print): ______________________

Testing Method:

Simulated Performance:	____	Classroom:	____
Actual Performance:	X	Simulator:	X
Alternate Path:	____	Plant:	____
Time Critical:	____		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- The Unit is in MODE 1.
- IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator is in progress, and has been completed up to and including Step 5.1.17 C.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Continue IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator, beginning at Step 5.1.18 and to the completion of Step 5.1.21.
- The Overspeed Trip test is NOT required.

Task Standard: Utilizing IPO-003A, the examinee rolled the Main Turbine to 1800 RPM, in accordance with Steps 5.1.18 through 5.1.21.

Required Materials: IPO-003A, Power Operations, Rev. 29 PCN 2

Validation Time: 40 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

SIMULATOR SETUP

SIMULATOR OPERATOR:

INITIALIZE to IC- 39

OR

INITIALIZE to IC-17.

Perform Step 5.1.17 of IPO-003A.

Set Remote function MSR04 to CLOSED.

THEN

Ensure TG Control screen is up on the left OT.

FREEZE the simulator.

WHEN examinee is ready, THEN place the simulator in RUN.

EXAMINER:

PROVIDE the examinee with a copy of:

IPO-003A, Power Operations, with Steps 5.1.1 through and including Step 5.1.17 appropriately marked/initialed as completed.

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from IPO-003A, Section 5.1.**
	NOTE: If at any time the HP Stop valves fail to open during the latching program, they may be opened manually per SOP-401A Section 5.3.3, Opening HP Stop Valves manually.
Perform Step: 1√ 5.1.18.A	CLOSE 1-HS-2417, HP CTRL VLV 1.4 BEF SEAT DRN VLV (1-CB-10).
Standard:	PLACED 1-HS-2417, HP CTRL VLV 1.4 BEF SEAT DRN VLV in CLOSE.
Comment:	**SAT** ☐ **UNSAT** ☐
Perform Step: 2 5.1.18.B	**“EHC Detail” Display** VERIFY HP and LP Control Valves are CLOSED (0%) HP • CV 1 • CV 2 • CV 3 • CV 4 LP1 • CV 1 • CV 2 LP2 • CV 1 • CV 2
Standard:	On “EHC Detail” Display OBSERVED the following indications: HP • CV 1 – 0% (CLOSED) • CV 2 – 0% (CLOSED) • CV 3 – 0% (CLOSED) • CV 4 – 0% (CLOSED) LP1 • CV 1 – 0% (CLOSED) • CV 2 – 0% (CLOSED) LP2 • CV 1 – 0% (CLOSED) • CV 2 – 0% (CLOSED)
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 3√ 5.1.18.C	On the "TG Control" Display in the "Start-Up" Section, turn on the "Open Stop Valves" Subloop Controller.
Standard:	PERFORMED the following: • On "TG Control" Display 1ZA60H101, PLACED "Open Stop Valves" Subloop Controller in the ON condition. (**critical**). • OBSERVED "Open Stop Valves" status light change from green to red. (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4 5.1.18.D	On the TG Overview Display, verify HP and LP Stop Valves are OPEN: • LPT 1 LP STOP VLV 1 • LPT 2 LP STOP VLV 1 • LPT 1 LP STOP VLV 2 • LPT 2 LP STOP VLV 2 • HPT STOP VLV 1 (SV1) • HPT STOP VLV 3 (SV3) • HPT STOP VLV 2 (SV2) • HPT STOP VLV 4 (SV4)
Standard:	On TG Overview Display OBSERVED the following indications: • LPT 1 LP STOP VLV 1 - OPEN • LPT 2 LP STOP VLV 1 - OPEN • LPT 1 LP STOP VLV 2 - OPEN • LPT 2 LP STOP VLV 2 - OPEN • HPT STOP VLV 1 (SV1) - OPEN • HPT STOP VLV 3 (SV3) - OPEN • HPT STOP VLV 2 (SV2) - OPEN • HPT STOP VLV 4 (SV4) - OPEN
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5√ 5.1.18.E	OPEN 1-HS-2417, HP CTRL VLV 1.4 BEF SEAT DRN VLV (1-CB-10)
Standard:	PLACED 1-HS-2417, HP CTRL VLV 1.4 BEF SEAT DRN VLV in OPEN.
Comment:	**SAT ☐ UNSAT ☐**

> NOTE: Steam Dumps should be used when practical to maintain power. Increasing Reactor power to provide additional steam flow capability should not be performed until just prior to synchronization. Operation of the SG Atmospherics should NOT routinely be used to compensate for Steam Dump operation.

Perform Step: 6 5.1.19.A	IF temperature difference between MSR 1A (MSRL) and 1B (MSRR) tubesheets is >25°F, THEN perform the following:
Standard:	DETERMINED step is N/A.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7 5.1.19.B	Maintain Reactor power at approximately 6% - 8% and Tavg approximately 557°F, while rolling the Main Turbine to 1800 rpm.
Standard:	Maintained Reactor power at approximately 6% - 8% and Tavg approximately 557°F during Main Turbine roll up to 1800 rpm.
Examiner Cue:	**Another operator will maintain reactor power.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8 5.1.19.C	Dispatch a Plant Equipment Operator to locally inspect the Main Turbine during roll up for any unusual noises, rubbing, etc.
Standard:	DISPATCHED a Plant Equipment Operator to monitor Main Turbine roll up.
Examiner Cue:	**A Nuclear Equipment Operator (NEO) is standing by at the Main Turbine to monitor for unusual noises, rubbing, etc.**
Comment:	**SAT ☐ UNSAT ☐**

> NOTE: The Main Turbine will begin rolling at a preset rate as soon as the "Speed Target" setpoint is above actual Turbine Speed.

Perform Step: 9√ 5.1.19.D	On the "TG Control" Display in the "Speed Control" Section, roll the Main Turbine to approximately 500 RPM by raising the "Speed Target" Controller to 500 RPM.
Standard:	SET "Speed Target" Controller to 500 RPM.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 10 5.1.19.E	On the "Lube Oil" Display, verify "Turning Gear Valve #1" closes at a Main Turbine speed of approximately 260 RPM.
Standard:	ACCESSED "TG Lube Oil" display and OBSERVED "Valve #1 1-HV-6554A" display indicating green and 0%.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 11 5.1.19.F	Verify no unexpected or sudden increase is indicated: • Turbine Display or Turbine Vibration Display • Generator Display or Generator Vibration Display • Alarm Summary Display (Asd)
Standard:	VERIFIED no unexpected or sudden increase indicated on • Turbine Display or Turbine Vibration Display • Generator Display or Generator Vibration Display • Alarm Summary Display (Asd)
Comment:	**SAT** ☐ **UNSAT** ☐

NOTE:

- Thermal stress of the turbine shaft is calculated based on the differential temperature between the shaft surface and the internal shaft core temperature. Since the shaft is rotating, the use of an embedded thermocouple is impossible; therefore, a thermocouple measures the steam temperature entering the HP casing and this temperature is the shaft surface temperature. The shaft core temperature is then calculated from the inlet steam temperature by the TSE system.
- From these temperatures, the TSE system computes the upper and lower permissible temperature (Turbine) and Turbine Load Margins on the "TSE Margin" Display.
- The TSE, within the digital turbine control system, is constantly measuring temperatures at critical sections of the turbine and will limit the ramp up/ramp down as deemed necessary by internal stress calculations performed by TSE. If TSE determines that the allowable temperature margin is being approached or exceeded, alarm annunciation will occur and the ramp up/ ramp down will be limited. The following alarms may be received:

  TSE Lower Temp Margin <0
  TSE Lower Temp Margin <20
  TSE Upper Temp Margin <0
  TSE Upper Temp Margin <60
  TSE Lower Margin HP Shaft <0
  TSE Lower Margin HP Shaft <60
  TSE Upper Margin HP Shaft <0
  TSE Upper Margin HP Shaft <60
- While TSE Influence is off, any INCREASE in Turbine load is limited to 5 MW/min
- While TSE Influence is off, with a TSE fault present, the following limits apply:
  - Turbine speed should be held at warm-up speed (500 RPM) for a minimum of 20 minutes, prior to commencing ramp to 1800 RPM
  - Following initial synchronization, turbine load increases should be limited to a load rate of 2.27 MW/min while ≤ 400 MWe, THEN limited to 5 MW/min while greater than 400 MWe

Perform Step: 12 5.1.19.G	On the "TSE Margin" Display, IF the Simulated Shaft Temperature is less than 120°F, THEN wait at least 20 minutes before increasing speed to 1800 rpm.
Standard:	WAITED at least 20 minutes before increasing speed to 1800 rpm.
Examiner Cue:	**20 minutes have passed.**
Comment:	**SAT ☐ UNSAT ☐**

NOTE:
- The "Admission Temperature" Section on the "TSE Margin" Display shows the #1 Stop Valve which has a duplex thermocouple mounted in the valve that measures inner wall temperature (100%/steam side) and midwall temperature (50%).
- From these temperatures, the TSE calculates the permissible upper and lower temperature margins for the valves (Admission). To ensure the turbine startup rate does not exceed the thermal stress limits on the valves, the upper margin shall limit the speed controller's ramp rate.
- The TSE Margin Display has 2 Bar Graphs which have a positive and a negative temperature scale that represents Upper and Lower TSE Margins.

Perform Step: 13 5.1.19.H 1st bullet	Determine the upper TSE margin temperature limitations by monitoring the "TSE Margin" Display: • IF the Admission Upper Margin is increasing or stable, THEN proceed to Next Step.
Standard:	OBSERVED "TSE Margin" Display (1ZA60H213) and DETERMINED Admission Upper Margin is increasing or stable on "TSE Margin" Display" AND PROCEEDED to the next step.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 14 5.1.20	IF an Overspeed Trip test is required (Prerequisite 2.20), THEN perform the test per Attachment 4.
Standard:	DETERMINED that Overspeed Trip test is not required, per Initiating Cue instructions.
Comment:	**SAT** ☐ **UNSAT** ☐

NOTE: 1-ALB-10A, 2.11, GEN CORE MONITOR ALARM may illuminate during Main Turbine speed increase to 1800 RPM. The annunciator should clear after the Generator Core Monitors are placed in service by the subsequent steps.

Perform Step: 15 5.1.21.A	Perform the following steps to increase Main Turbine speed to 1800 RPM: Verify no abnormal indications on the following Displays: • Turbine Display • Generator Display
Standard:	VERIFIED no abnormal indications on: • Turbine Display • Generator Display
Comment:	**SAT** ☐ **UNSAT** ☐

NOTE: The TSE Margin Display has 2 Bar Graphs. Each of the 2 Bar Graphs has a positive and a negative temperature scale which represent Upper and Lower TSE Margins. At this point the upper bar graphs should be green and above 60°F.

Perform Step: 16 5.1.21.B	Verify upper TSE Margin is above 60°F and Upper Admission Bar is green on the "TSE Margin" Display.
Standard:	DETERMINED upper TSE Margin is above 60°F and Upper Admission Bar is green on the "TSE Margin" Display.
Comment:	**SAT** ☐ **UNSAT** ☐

NOTE:
- Hold Setpoint Function on the "TG" Display may be used at anytime during the Turbine Roll-up if problems occur.
- Initiating the Hold Setpoint Function will automatically reduce (ramp down) the turbine speed to 500 rpm. The turbine then remains at warm-up speed until the Operator resumes startup.

CAUTION: If the Upper TSE Margin stops the Main Turbine rollup prior to attaining at least 1765 RPM, Main Turbine speed should immediately be reduced to approximately 500 RPM to allow the Main Turbine to continue soaking.

Perform Step: 17√ 5.1.21.C	In the "Speed Control" Section, roll the Main Turbine to 1800 RPM by raising the "Speed Target" Controller to 1800 RPM.
Standard:	RAISED "Speed Target" Controller to 1800 RPM.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 18 5.1.21.D	Verify Lube Oil Temperature is maintained at approximately 113°F as indicated on the TURB BRG TEMP RCDR 1 recorder (1-SB10T010.G01 recorder point 12 on 1-CB-10) while Main Turbine speed is increased.
Standard:	VERIFIED Lube Oil Temperature maintained at approximately 113°F while Main Turbine speed is increased.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 19 5.1.21.E 1st bullet	Perform the following: • Verify 1-HS-6579, TURB SHAFT LIFT OIL PMP automatically stops at a Main Turbine speed of approximately 540 RPM.
Standard:	When Main Turbine speed reached approximately 540 RPM, then OBSERVED green light LIT and red light DARK for 1-HS-6579, TURB SHAFT LIFT OIL PMP on 1-CB-10.
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 20√ 5.1.21.E 2nd bullet	Perform the following: • Place 1-HS-6579 in AUTO AFTER STOP
Standard:	PLACED 1-HS-6579 in AUTO AFTER STOP.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 21 5.1.21.F	WHEN turbine speed is approximately 1400 rpm, THEN ensure the EXCITER AIR DRIER and EXCITER HEATER in OFF at the Unit 1 GENERATOR AUXILIARIES CABINET JC91 (TB 778, U1 GAC).
Standard:	DISPATCHED a Nuclear Equipment Operator to ensure EXCITER AIR DRIER and EXCITER HEATER in OFF for Unit 1.
Examiner Cue:	**An NEO was dispatched to the Unit 1 GENERATOR AUXILIARIES CABINET and reported that the EXCITER AIR DRIER and EXCITER HEATER are in OFF.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 22 5.1.21.G	Verify 1-PI-6558, TURB L/O PMP DISCH PRESS is between 155 and 175 psig.
Standard:	OBSERVED 1-PI-6558 (on 1-CB10-A) and DETERMINED indication was between 155 and 175 psig.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 23 5.1.21.H	WHEN Main Turbine speed increases above 1765 RPM, THEN stop ALL running Auxiliary Oil Pumps and place in AUTO.
Standard:	When Main Turbine speed increased above 1765 rpm, ENSURED that the following Auxiliary Oil Pumps are OFF with control switches in AUTO: • 1-HS-3287, TURB AUX L\O PMP A • 1-HS-3288, TURB AUX L\O PMP B • 1-HS-3292, TURB DC EMER L\O PMP
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 24 5.1.21.I	Verify no unexpected or sudden increase in vibration is indicated: • Turbine Display or Turbine Vibration Display • Generator Display or Generator Vibration Display • Alarm Summary Display (Asd)
Standard:	DETERMINED no unexpected or sudden increase in vibration indicated on: • Turbine Display or Turbine Vibration Display • Generator Display or Generator Vibration Display • Alarm Summary Display (Asd)
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

<u>INITIAL</u> <u>CONDITIONS</u>: **Given the following conditions:**

- **The Unit is in MODE 1.**
- **IP-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator is in progress, and has been completed up to and including Step 5.1.17C.**

<u>INITIATING</u> <u>CUE</u>: **The Unit Supervisor directs you to PERFORM the following:**

- **Continue IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator, beginning at Step 5.1.18 and to the completion of Step 5.1.21.**
- **The Overspeed Trip test is NOT required.**

Facility: CPNPP JPM # NRC S-6 Task # RO2101 K/A # 022.A4.01 3.6 / 3.6 SF-5

Title: Alternate Containment Recirculation Units (CACRS)

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	______
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is at 100% power.
- A Containment Vent is in progress per SOP-801A, Containment Ventilation System, Section 5.6.5, Containment Pressure Relief System Operation.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Alternate Containment Recirculation Units in accordance with SOP-801A, Containment Ventilation System, Section 5.1.3, by starting CACRS #1, and stopping CACRS #3.
- The Containment Vent is to remain in progress during the swap.

Task Standard: Utilizing SOP-801A:

- STARTED CACRS #1.
- STOPPED CACRS #3.
- When radiation alarm (Alert) comes in for Containment Air, manually SECURED Containment Vent.

Required Materials: SOP-801A, .Containment Ventilation System, Rev. 14 PCN 1

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

SIMULATOR SETUP

SIMULATOR OPERATOR:

LOAD IC37

OR

INITIALIZE to a 100% power IC:

ENSURE CACR #1 is OFF, and CACR #3 is RUNNING.

Enter the following conditional command:

{DICHHS5413A.Value=1} IMF RM197 f:2E-5

Raise Containment pressure to approximately 1.2 psig as follows:

Set the following remote functions as indicated:

CHR12A - ON

CHR12 - 1.2

When Containment pressure indicates 1.2 psig, then set CHR12A to OFF.

ENSURE the CONTAINMENT VENT IN PROGRESS job aid is on CB03

EXAMINER:

PROVIDE the examinee with a copy of:

- **SOP-801A, Containment Ventilation System, including markup of in-progress Section 5.6.6 with Steps A through E checked off as completed. There will be a CIRCLE around the box and the letter “F” next to Step F to indicate the procedure step is in progress.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from SOP-801A, Section 5.1.3.**
CAUTION: • Alternating these cooling units may change indicated radiation levels inside containment due to mixing of noble gases from stagnant areas of air. Radiation levels reaching High Alarm on Containment Air Gaseous (1-RE-5503) OR Particulate Monitors (1-RE-5502) will cause a Containment Ventilation Isolation (CVI). • IF CACRS Fans are reduced to only two in service, THEN CACRS Fans 1 and 2 should remain in service together OR Fans 3 and 4 should remain in service. This is to ensure BOTH of the CACRS Fans associated with at least one Condensate Measuring Tank are in service (reference ODA-308-3.4.15)	
5.1.3 This section describes the steps to alternate running Containment Air Cooling AND recirculation units.	
Perform Step: 1 5.1.3 A	VERIFY the Hydrogen Purge Supply AND Exhaust System is NOT in service.
Standard:	VERIFIED Hydrogen Purge Supply and Exhaust not in service.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2 5.1.3 B	IF a Containment Purge OR Vent is in progress, THEN PERFORM on of the following:
Standard:	DETERMINED that Step 5.1.3 B. Second bullet is the only applicable step: CLOSELY MONITOR the Containment Air Gaseous (1-RE-5503) AND Particulate Monitors (1-RE-5502) to verify they remain below their Alert Alarm Limit. IF radiation levels on one of these monitors increases to the Alert Alarm Limit, THEN Step 5.1.3H will direct the increase. This step is applicable.
Comment:	**SAT ☐ UNSAT ☐**

NOTE:	Normal operation of the CACRS is with three of the four Containment Fan Coolers in operation. Operating four Containment Fan Coolers is permitted for off-normal conditions (e.g., containment temperature alarm, condition requiring additional containment cooling) that are tracked in a Condition Report (Reference EV-CR-2009-003258-00-3).

Perform Step: 3√ 5.1.3 C	START the desired cooling unit(s) AND VERIFY the associated discharge damper opens. • 1-HS-5405A, CNTMT FN CLR FN 1 (1-HV-5405D)
Standard:	PERFORMED the following: • PLACED 1-HS-5405A, CNTMT FN CLR FN 1 (1-HV-5405D) to START (**critical**). • OBSERVED DMPR green CLOSE light DARK, red OPEN light LIT (**NOT critical**). • OBSERVED FAN green OFF light DARK, red ON light LIT (**NOT critical**).
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 4 5.1.3 D	VERIFY the chill water return valve(s) from the selected cooling unit(s) automatically opens as indicated by the position lights on the valve handswitch located on CV-01. • 1-HS-6074, CNTMT FN CLR 1 CH WTR RET VLV
Standard:	OBSERVED 1-HS-6074 green CLOSE light DARK, red OPEN light LIT.
Comment:	**SAT** ☐ **UNSAT** ☐

Examiner Note:	**When applicant places 1-HS-5413A to STOP, the Alternate Path of this JPM begins. An Alert alarm (Yellow on PC-11) will initiate for 1-RE-5503 CAG-197, Containment Air Gaseous.**
Perform Step: 5√ 5.1.3 E 1)	SHUTDOWN the desire cooling unit(s) by performing the following steps: 1) STOP the cooling unit(s) to be shutdown <u>AND</u> VERIFY the associated discharge damper(s) closes. • 1-HS-5413A, CNTMT FN CLR FN 3 (1-HV-5413D)
Standard:	PERFORMED the following: • PLACED 1-HS-5413A, CNTMT FN CLR FN 3 (1-HV-5413D) to STOP (**critical**). • OBSERVED DMPR red OPEN light DARK, green CLOSED light LIT (**NOT critical**). • OBSERVED FAN red ON light OFF, green OFF light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Steps 5.1.3.E 2) through 5.1.3.G are omitted as the applicant will respond to the Rad alarm.**
Examiner Note:	**The following steps are the Alternate Path for this JPM.**
Examiner Note:	**The following steps are from SOP-801A, Section 5.6.5**
Perform Step: 6√ 5.6.5 G	CLOSE 1-HS-5548, CNTMT PRESS RLF ISOL VLV.
Standard:	PERFORMED the following: • PLACED 1-HS-5548, CNTMT PRESS RLF ISOL VLV to CLOSE (**critical**). • OBSERVED 1-HS-5548 red OPEN light DARK, green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7√ 5.6.5 H	CLOSE 1-HS-5549, CNTMT PRESS RLF ISOL VLV.
Standard:	PERFORMED the following: • PLACED 1-HS-5549, CNTMT PRESS RLF ISOL VLV to CLOSE (**critical**). • OBSERVED 1-HS-5549 red OPEN light DARK, green CLOSE light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 8√ 5.6.5 I	CLOSE 1-HS-5574, AIR PRG EXH DMPR <u>OR</u>, <u>IF</u> this section was performed in preparation for purging the containment, <u>THEN</u> N/A this step.
Standard:	PERFORMED the following: • PLACED 1-HS-5574, AIR PRG EXH DMPR to CLOSE (**critical**). • OBSERVED 1-HS-5574 red OPEN light DARK, green CLOSE light LIT (**NOT critical**).
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

Initial Conditions: **Given the following conditions:**

- **Unit 1 is at 100% power.**
- **A Containment Vent is in progress per SOP-801A, Containment Ventilation System, Section 5.6.5, Containment Pressure Relief System Operation.**

Initiating Cue: **The Unit Supervisor directs you to PERFORM the following:**

- **Alternate Containment Recirculation Units in accordance with SOP-801A, Containment Ventilation System, Section 5.1.3, by starting CACRS #1, and stopping CACRS #3.**
- **The Containment Vent is to remain in progress during the swap.**

Facility: CPNPP JPM # NRC S-7 Task # RO4302D K/A # 064.A4.06 3.9 / 3.9 SF-6

Title: Load Diesel Generator

Examinee (Print): ________________________________

Testing Method:

Simulated Performance:	______	Classroom:	______
Actual Performance:	X	Simulator:	X
Alternate Path:	X	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- OPT-214A, Diesel Generator Operability Test is in progress.
- Diesel Generator 1-01 has been fast started in accordance with OPT-214A, Section 8.1.
- All Diesel Generator parameters are normal and steady.
- The NEO stationed locally at the Diesel Generator reports no abnormalities in the start or running state of the Diesel Generator.

Initiating Cue: The Unit Supervisor directs you to complete Section 8.1 of OPT-214A for Diesel Generator 1-01, beginning with Step 8.1.Q.

Task Standard: SYNCHRONIZED and LOADED Diesel Generator 1-01 to a minimum of 2.2 MW and then PLACED the Diesel Generator Emergency STOP/START switch in PULLOUT when Station Service Water Pump 1-01 tripped.

Required Materials: OPT-214A, Diesel Generator Operability Test, Rev. 22 PCN 14.

Validation Time: 10 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ________________________________ Date: ______________

SIMULATOR SETUP

SIMULATOR OPERATOR:

INITIALIZE to IC-38

- **ENSURE that NO PCS screens on DAD.**
- **ENSURE synch scope handle is NOT in SS1-EG1.**

OR

PERFORM the following:

Initialize to IC-18

ENTER the SSW Pump 1-01 Trip malfunction on key 1, IMF SW01A f:1 k:1

Start EDG 1-01 by performing a fast start in accordance with OPT-214A, Section 8.1.A

ANR 20 DG-1 TRBL to NORM if required to clear the local EDG trouble alarm.

EXAMINER:

PROVIDE the examinee with copies of the following:

- **OPT-214A, Diesel Generator Operability Test, including, Attachment 10.7, TS 3.8.1 Administrative Controls and Test Termination Criteria - Section II**
- **OPT-214A-1, Train A Diesel Generator Operability Data Sheet appropriately marked through 8.1.P.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from OPT-214A.**
Perform Step: 1√ 8.1.Q	Turn SS-1EG1, BKR 1EG1 SYNCHROSCOPE to ON.
Standard:	• INSERTED Synchroscope handle in SS-1EG1 AND • PLACED in ON.
Comment:	**SAT ☐ UNSAT ☐**

NOTE: Use of V-IN AND V-RUN to adjust voltage prior to synchronization is the preferred method. This method adjusts DG voltage approximately 50 to 100 volts greater than 1EA1 voltage. The following equipment metering is available as an alternate method.

DG Voltage		SFGD Bus Voltage
V-1EG1, DG 1 VOLT (CB-11) OR V6710A, DG 1 VOLT (Computer Pt.)	TO	V-1EA1-1, BUS 1EA1 VOLT (CB-11) OR V6101A, BUS 1EA1 VOLT (Computer Pt.)

NOTE: DG VOLT should be maintained less than 7150V per Technical Specifications. WITH the AVR TRIP light ON (on at 7185V), the DG is to be considered INOPERABLE until the AVR TRIP light is reset. REFERENCE Attachment 5 of SOP-609A for reset of the AVR TRIP signal.

Perform Step: 2 8.1.R	Using 90-1EG1, DG 1 VOLT CTRL, gradually ADJUST V-IN on the synchroscope 1 to 2 volts higher than V-RUN on the synchroscope.
Standard:	COMPARED V-IN to V-RUN and ADJUSTED as deemed necessary.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3 8.1.S	Using 65-1EG1, DG 1 SPD CTRL, ADJUST speed so the synchroscope is moving 2 to 4 RPM in the fast direction.
Standard:	ADJUSTED speed such that the synchroscope is moving 2 to 4 RPM in the fast direction.
Comment:	**SAT ☐ UNSAT ☐**

	NOTE: "Continuous Action Step" This step is a compensatory action for the possibility of excessive loading on the DG due to Offsite Power degradation. The termination criteria of Attachment 10.7, Section II apply to the following step.
Perform Step: 4 8.1.T	IF the termination criteria of Attachment 10.7, Section II are met while the DG is synchronized with the offsite power source, THEN PERFORM the following: • OPEN CS-1EG1, DG1 BKR 1EG1. • Slowly ADJUST DG voltage to 6900 V (6831 V to 6969 V). • Slowly ADJUST DG frequency to 60.0 (59.7 to 60.3) Hz.
Standard:	PLACE KEPT Continuous Action Step.
Comment:	**SAT ☐ UNSAT ☐**

	CAUTION: Following DG Output Breaker closure, load should be raised promptly to prevent Reverse Power Trip. The DG will trip if the Generator is motorized with >34.5 KW IN for greater than 8 seconds.
Perform Step: 5√ 8.1.U 1)	To synchronize the Diesel Generator to the bus, PERFORM the following: • CLOSE CS-1EG1, DG 1 BKR 1EG1 when the synchroscope is slightly before the 12 o'clock position AND moving slowly in the fast direction.
Standard:	CLOSED CS-1EG1.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	• **Ensure the Simulator Operator activates key 1 to insert Station Service Water Pump 1-01 trip once DG 1 load is increased to greater than or equal to 2.2 MW.** • **Responding to the SSW Pump trip will constitute the Alternate Path of this JPM.**
SIMULATOR OPERATOR NOTE:	**When directed by the Examiner, activate key 1 (IMF SW01A f:1 k:1)**
Perform Step: 6√ 8.1.U 2)	To synchronize the Diesel Generator to the bus, PERFORM the following: • Immediately LOAD the DG to 2.2 - 2.5 MW for stability by moving 65-1EG1, DG 1 SPD CTRL in the RAISE direction.
Standard:	RAISED DG load to at least 2.2 MW.
Comment:	**SAT ☐ UNSAT ☐**

Examiner: Note:	**The following step represents the Alternate Path of this JPM.**
Examiner Note:	**The following step is an Initial Operator Action from ABN-501, Section 2.3, which is to be performed from memory.**
NOTE: • The diesel generator can be operated, with load, for approximately one minute without SSW flow and not affect diesel performance. • When a fault exists on the 6.9KV safeguard bus, the SSW pump will not be available to supply cooling water to the DG. • Diamond step 1 denotes Initial Operator Actions.	
Perform Step 7	Examinee determines Unit 1 Train A Station Service Water Pump has tripped.
Standard:	DETERMINED SSW Pump 1-01 has tripped due to 1-ALB-1 Window 1.8 SSWP 1/2 OVERLOAD/TRIP alarm, SSW Flow on Train A is zero.
Perform Step: 8√ 2.3.1	Place affected train diesel generator handswitch, CS-uDGuE (emergency stop/start) in PULLOUT.
Comment:	**SAT ☐ UNSAT ☐**

Standard:	PLACED CS-1DG1E handswitch in PULLOUT within 1 minute of Station Service Water Pump 1-01 trip.
Comment:	**SAT ☐ UNSAT ☐**
Terminating Cue:	**This JPM is complete.**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **OPT-214A, Diesel Generator Operability Test is in progress.**
- **Diesel Generator 1-01 has been fast started in accordance with OPT-214A, Section 8.1.**
- **All Diesel Generator parameters are normal and steady.**
- **The NEO stationed locally at the Diesel Generator reports no abnormalities in the start or running state of the Diesel Generator.**

INITIATING CUE: **The Unit Supervisor directs you to complete Section 8.1 of OPT-214A for Diesel Generator 1-01, beginning with Step 8.1.Q.**

Facility: CPNPP JPM # NRC S-8 Task # RO3603C K/A # 008.A4.01 3.3 / 3.1 SF-8

Title: Rotate Component Cooling Water Pumps

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	______	Classroom:	______
Actual Performance:	X	Simulator:	X
Alternate Path:	______	Plant:	______
Time Critical:	______		

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 is in MODE 1.
- A CCW pump swap is required to support a maintenance activity in Train A CCW Pump Room.
- A Nuclear Equipment Operator (NEO) is standing by for pump start.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- START Train B Component Cooling Water (CCW) Pump and STOP Train A CCW Pump per SOP-502A, Component Cooling Water System.
- If needed to initiate flow through the Containment Spray or RHR Heat exchangers, do NOT exceed 1500 gpm flow per heat exchanger.
- START at Step 5.2.1.1, Starting a Standby CCW Pump During Normal Operation, to place the Train B CCW Pump in service.
- CONTINUE with Step 5.2.1.2, Placing a CCW Pump in Standby from Dual Pump Operation, to secure the Train A CCW Pump.

Task Standard: Utilized SOP-502A, Component Cooling Water System, STARTED Train B CCW Pump and Stopped Train A CCW Pump.

Required Materials: SOP-502A, Component Cooling Water System, Rev. 19 PCN 4.

Validation Time: 10 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

SIMULATOR SETUP

SIMULATOR OPERATOR:
INITIALIZE to IC-39 (Can also use IC18)

SET UP Plant Computer screen to monitor CCW Pump 1-02 temperatures. GD_CCWP2

EXAMINER:
PROVIDE the examinee with a copy of:

SOP-502A, Component Cooling Water System.

- **Step 5.2.1.1, Starting a Standby CCW Pump During Normal Operation.**
- **Step 5.2.1.2, Placing a CCW Pump in Standby from Dual Pump Operation.**

√ - Check Mark Denotes Critical Step

START TIME:	

NOTE: Starting a CCW Pump will automatically start the following equipment, if their control switches are in AUTO:

- Associated CCW Pump room fan cooler
- Associated SSW Pump
- Associated Safety Chilled Water Recirc Pump

Perform Step: 1 5.2.1.1.A	Ensure the Station Service Water Pump, associated with the CCW Pump to be started is operating. • SSWP 2
Standard:	DETERMINED SSWP 2, Station Service Water Pump is running and OBSERVED red PUMP light LIT.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2 5.2.1.1.B	Ensure the oil level in the bearing housings are normal. • CCWP 2
Standard:	DISPATCHED NEO to verify oil levels for CCWP 2.
Examiner Cue:	**The NEO reports that bearing housing oil levels are normal.**
Comment:	**SAT ☐ UNSAT ☐**

NOTE: • Experience has shown that starting a second CCW Pump can result in lifting of CCW system relief valves if running CCW Pump discharge pressure is high (~ 140 psig). The following step may be required to limit CCW System pressure AND prevent relief valve operation when two CCW Pumps are running. • Low flow alarms are provided for both CT & RHR Heat Exchanger flow. These alarms may OR may not occur as flow is started AND stopped, dependent on time spent at OR near the flow setpoint. This is a normal occurrence. • CCWP RECIRC VLVs (1-HS-4536/1-HS-4537), open on low flow of approximately 8,200 gpm on CCW HX outlet flow with the CCW Pump breaker closed.	
Examiner Note:	**Examinee may establish flow through either Train A or Train B heat exchangers at this time. Critical action is to establish sufficient flow to lower CCW Pump discharge pressure during two pump operation.**
Perform Step: 3√ 5.2.1.1.C	IF CCW heat load is low, THEN additional CCW flow should be established through the CS HX or RHR HX prior to starting the second pump. TRAIN A • 1-HS-4574, CS HX 1 CCW RET VLV • 1-HS-4572, RHR HX 1 CCW RET VLV TRAIN B • 1-HS-4575, CS HX 2 CCW RET VLV • 1-HS-4573, RHR HX 2 CCW RET VLV
Standard:	PERFORMED the following: • PLACED 1-HS-4574, CS HX 1 CCW RET VLV in OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**). **and/or** • PLACED 1-HS-4572, RHR HX 1 CCW RET VLV in OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**). **and/or** • PLACED 1-HS-4575, CS HX 2 CCW RET VLV in OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**). **and/or** • PLACED 1-HS-4573, RHR HX 2 CCW RET VLV in OPEN (**critical**). • OBSERVED red OPEN light LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

NOTE: The following indications are available on the Plant computer.

			ALARM
T2740A	CCWP 1 INBD RDL BRG TEMP		185°F
T2741A	CCWP 1 OUTBD RDL BRG TEMP		185°F
T2742A	CCWP 1 ACTIVE FACE THR BRG TEMP		185°F
T2744A	CCWP 1 MOT INBD BRG TEMP		185°F
T2745A	CCWP 1 MOT OUTBD BRG TEMP		185°F
T2746A	CCWP 1 MOT STAT PHASE A TEMP	236°F	
T2747A	CCWP 1 MOT STAT PHASE B TEMP	236°F	
T2748A	CCWP 1 MOT STAT PHASE C TEMP		236°F
T2760A	CCWP 2 INBD RDL BRG TEMP		185°F
T2761A	CCWP 2 OUTBD RDL BRG TEMP		185°F
T2762A	CCWP 2 ACTIVE FACE THR BRG TEMP		185°F
T2764A	CCWP 2 MOT INBD BRG TEMP		185°F
T2765A	CCWP 2 MOT OUTBD BRG TEMP		185°F
T2766A	CCWP 2 MOT STAT PHASE A TEMP	236°F	
T2767A	CCWP 2 MOT STAT PHASE B TEMP	236°F	
T2768A	CCWP 2 MOT STAT PHASE C TEMP		236°F

Perform Step:4√ 5.2.1.1.D	Start the idle CCW Pump. • 1-HS-4519A, CCWP 2
Standard:	PERFORMED the following: • PLACED 1-HS-4519A, CCWP 2 to START (**critical**). • OBSERVED red FAN and PUMP lights LIT (**NOT critical**). • OBSERVED 1-PI-4521, CCWP2 DISCH PRESS rising (**NOT critical**). • OBSERVE 1-FI-4537A, CCW HX 2 OUT FLO rising (**NOT critical**).
Comment:	**SAT** ☐ **UNSAT** ☐

> NOTE: Low flow alarms are provided for both CT & RHR Heat Exchanger flow. These alarms may or may not occur as flow is started and stopped, dependent on time spent at or near the flow setpoint. This is a normal occurrence.

Examiner Note:	• Examinee **may establish flow through either Train A or Train B heat exchangers at this time. Expected action is to momentarily establish flow through all four heat exchangers during the transfer. Flow may have previously been established through any/all of these heat exchangers.** • Examinee **could bring in 1-ALB-3B, Window 3.11, ANY RCP THBR CLR CCW RET FLO LO while adjusting flows, starting the second pump and completing the SOP steps will clear the alarm.** • **If** this **alarm annunciates, then cue the examinee to continue with the task.**
Perform Step: 5 5.2.1.1.E	IF the CCW PUMPS are being alternated for their bi-weekly rotation per OWI-409 "EQUIPMENT ROTATION PROGRAM", THEN momentarily initiate flow through each RHR and CS heat exchanger while BOTH pumps are in service. TRAIN A • 1-HS-4574, CS HX 1 CCW RET VLV • 1-HS-4572, RHR HX 1 CCW RET VLV TRAIN B • 1-HS-4575, CS HX 2 CCW RET VLV • 1-HS-4573, RHR HX 2 CCW RET VLV
Standard:	DETERMINED step is N/A per Initial Conditions.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**The following steps are from SOP-502A, Step 5.2.1.2.**
Perform Step: 6 5.2.1.2.A & B	IF the safeguards loops are not cross-connected, THEN ensure the following equipment for the pump to be stopped has been removed from service:
Standard:	DETERMINED the Safeguards Loops ARE cross-connected and N/A.
Comment:	**SAT ☐ UNSAT ☐**

NOTE: Low flow alarms are provided for both CT & RHR Heat Exchanger flow. These alarms may or may not occur as flow is started and stopped, dependent on time spent at or near the flow setpoint. This is a normal occurrence.

Perform Step: 7 5.2.1.2.C.1)	IF additional flow was established for two pump operation AND is not required, THEN throttle the following valve(s) as necessary such that CCWP DISCHARGE PRESSURE is approximately 140 to 150 psig as indicated on 1 PI-4520 and 1-PI-4521. (MCB) TRAIN A • 1-HS-4574, CS HX 1 CCW RET VLV • 1-HS-4572, RHR HX 1 CCW RET VLV TRAIN B • 1-HS-4575, CS HX 2 CCW RET VLV • 1-HS-4573, RHR HX 2 CCW RET VLV
Standard:	PERFORMED the following: • OBSERVED 1-PI-4520, CCWP1 DISCH PRESS approximately 140 to 150 PSIG. • OBSERVED 1-PI-4521, CCWP2 DISCH PRESS approximately 140 to 150 PSIG.
Comment:	**SAT ☐ UNSAT ☐**

CAUTION: Holding the CCW Pump handswitch in STOP, while CCW flow and pressure stabilize, will minimize the likelihood of receiving an automatic restart. (ref. SMF-2000-1848)

Perform Step: 8√ 5.2.1.2.C.2)	Stop the desired CCW Pump AND hold the handswitch in STOP. • 1-HS-4518A, CCWP 1
Standard:	PERFORMED the following: • PLACED and HELD 1-HS-4518A, CCWP 1 in STOP (**critical**). • OBSERVED green PUMP and red FAN lights LIT (**NOT critical**).
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 9√ 5.2.1.2.C.3)	WHEN CCW flow and pressure stabilize, THEN release the CCW Pump handswitch.
Standard:	RELEASED 1-HS-4518A, CCWP 1 handswitch when CCW flow and pressure stabilized.
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Examinee may request an independent verification of the following step.**
Perform Step: 10 5.2.1.2.D	Ensure BOTH CCW Pump handswitches are in AUTO: • 1-HS-4518A, CCWP 1 • 1-HS-4519A, CCWP 2
Standard:	VERIFIED 1-HS-4518A, CCWP 1 **AND** 1-HS-4519A, CCWP 2 handswitches are in AUTO.
Comment:	**SAT ☐ UNSAT ☐**
Terminating Cue:	**This JPM is complete.**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 1 is in MODE 1.**
- **A CCW pump swap is required to support a maintenance activity in Train A CCW Pump Room.**
- **A Nuclear Equipment Operator (NEO) is standing by for pump start.**

INITIATING CUE: **The Unit Supervisor directs you to PERFORM the following:**

- **START Train B Component Cooling Water Pump and STOP Train A Component Cooling Water Pump per SOP-502A, Component Cooling Water System.**
- **If needed to initiate flow through the Containment Spray or RHR Heat exchangers, do NOT exceed 1500 gpm flow per heat exchanger.**
- **START at Step 5.2.1.1, Starting a Standby CCW Pump During Normal Operation, to place the Train B CCW Pump in service.**
- **CONTINUE with Step 5.2.1.2, Placing a CCW Pump in Standby from Dual Pump Operation, to secure the Train A CCW Pump.**

Facility: CPNPP JPM # NRC P-1 Unit 1 Task #AO6439 K/A #007.EA2.02 4.3 / 4.6 SF-1

Title: Locally Trip the Reactor and Stop MG Sets

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	X	Classroom:	
Actual Performance:		Simulator:	
Alternate Path:		Plant:	X
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions with Unit 1 at 100% power:

- An Anticipated Transient Without Trip (ATWT) is in progress.
- Solid State Protection System Testing is NOT in progress.
- The Reactor Operator is currently inserting rods at ≥ 48 steps per minute.

Initiating Cue: The Unit Supervisor DIRECTS you to perform the following actions:

- Locally OPEN the Unit 1 Reactor Trip Breakers.
- Locally STOP both of the Unit 1 Control Rod Drive Motor Generator sets.

Task Standard: Locally OPENED the Unit 1 Reactor Trip Breakers and Locally STOPPED both of the Unit 1 Control Rod Drive Motor Generator sets.

Required Materials: None.

Validation Time: 6 minutes Time Critical: N/A Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

EXAMINER:

The Steps of the JPM may be performed in any order.

IF ROD CONTROL SYSTEM IS IN SERVICE, DO NOT OPEN REACTOR TRIP SWITCHGEAR BREAKER DOORS.

All operations for this JPM will be in Unit 1 Safeguards Building, 832' elevation on TBX-ESPDTS-01, Reactor Trip Switchgear 1-01.

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**Initial condition of Reactor Trip Breaker A is CLOSED.**
Perform Step: 1√	OPEN UNIT 1 TRAIN A REACTOR TRIP BREAKER RTA.
Standard:	DEPRESSED red TRIP pushbutton on the breaker door OR DEPRESSED red TRIP pushbutton inside door on front of breaker.
Examiner Cue:	**The breaker makes clunking sound. Control Room reports RTA indicates OPEN.**
Examiner Note:	**If applicant checks position on the breaker, report Breaker Open green flag is visible on the breaker (located inside cubicle door).**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Based on the cue, the applicant may determine this step is unnecessary as there is no SSPS testing in progress, and mark the step N/A.** **Initial condition of Reactor Trip Bypass Breaker A is OPEN and racked out to DISCONNECT.**
Perform Step: 2	Open Reactor Trip Bypass Breaker A.
Standard:	VERIFIED red close and green open lights on front of cubicle are OFF. OR OBSERVED Breaker Open green flag visible with breaker racked to DISCONNECT position.
Examiner Cue:	**Red close and green open lights are off.** **OR** **Open green flag is visible with breaker racked to DISCONNECT position.**
Comment:	**SAT ☐ UNSAT ☐ N/A ☐**

Examiner Note:	**Initial condition of Reactor Trip Breaker B is CLOSED.**
Perform Step: 3√	OPEN UNIT 1 TRAIN B REACTOR TRIP BREAKER RTB.
Standard:	DEPRESSED red TRIP pushbutton on the breaker door. OR DEPRESSED red TRIP pushbutton inside door on front of breaker.
Examiner Cue:	**The breaker makes clunking sound. Control Room reports RTB indicates OPEN.**
Examiner Note:	**If applicant checks position on the breaker, report Breaker Open green flag is visible on the breaker (located inside cubicle door).**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**Based on the cue, the applicant may determine this step is unnecessary as there is no SSPS testing in progress, and mark the step N/A.** **Initial condition of Reactor Trip Bypass Breaker B is OPEN and racked out to DISCONNECT.**
Perform Step: 4	Open Reactor Trip Bypass Breaker B.
Standard:	VERIFIED red close and green open lights on front of cubicle are OFF. OR OBSERVED Breaker Open green flag visible with breaker racked to DISCONNECT position.
Examiner Cue:	**Red close and green open lights are off.** **OR** **Open green flag is visible with breaker racked to DISCONNECT position.**
Comment:	**SAT ☐ UNSAT ☐ N/A ☐**

Perform Step: 5√	Stop Control Rod Drive Motor Generator Set 1-01.
Standard:	PLACED 1/1-ELPS1, MOTOR 1-01 STARTING BREAKER to TRIP OR PULL LAMP CUT OUT.
Examiner Cue:	**Breaker makes clunking sound. Motor Generator begins to slow (if placed in TRIP, green light LIT, red light OFF.)**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**If the applicant opened the Motor Breaker first, the Generator Breaker will trip OPEN.**
Perform Step: 6	Stop Rod Drive Motor Generator Set 1-01.
Standard:	PLACED 1/1-MGPS1, MG SET 1-01 GENERATOR CKT BKR CONTROL SWITCH to TRIP. OR PULL OUT.
Examiner Cue:	**INDICATE the Generator Breaker is OPEN (lights are OFF in PULL OUT).**
Comment:	**SAT ☐ UNSAT ☐ N/A ☐**

Perform Step: 7√	Stop Rod Drive Motor Generator Set 1-02.
Standard:	PLACED 1/1-ELPS2, MOTOR 1-02 STARTING BREAKER to TRIP OR PULL LAMP CUT OUT.
Examiner Cue:	**Breaker makes clunking sound. Motor Generator begins to slow (if placed in TRIP, green light LIT, red light OFF).**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**If the applicant opened the Motor Breaker first, the Generator Breaker will trip OPEN.**
Perform Step: 8	Stop Rod Drive Motor Generator Set 1-02.
Standard:	PLACED 1/1-MGPS2, MG SET 1-02 GENERATOR CKT BKR CONTROL SWITCH to TRIP OR PULL OUT.
Examiner Cue:	**INDICATE the Generator Breaker is OPEN (lights are OFF in PULL OUT).**
Comment:	**SAT ☐ UNSAT ☐ N/A ☐**

Perform Step: 9	Notify the Unit 1 Control Room that Reactor Trip and Bypass Breakers are OPEN and both Control Rod Drive Motor Generator Sets are STOPPED.
Standard:	NOTIFIED the Unit 1 Control Room that Reactor Trip and Bypass Breakers are OPEN and both Control Rod Drive Motor Generator Sets are STOPPED.
Terminating Cue:	**The Control Room reports DRPI indication shows all Rod Bottom lights ON. This JPM is complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions with Unit 1 at 100% power:**

- **An Anticipated Transient Without Trip (ATWT) is in progress.**
- **Solid State Protection System Testing is NOT in progress.**
- **The Reactor Operator is currently inserting rods at ≥ 48 steps per minute.**

INITIATING CUE: **The Unit Supervisor DIRECTS you to perform the following actions:**

- **Locally OPEN the Unit 1 Reactor Trip Breakers.**
- **Locally STOP both of the Unit 1 Control Rod Drive Motor Generator sets.**

Facility: CPNPP JPM # NRC P-2 Task # AO6413 K/A # 068.AA1.22 4.0 / 4.3

Title: Response to Fire in the Control Room or Cable Spreading Room, NEO #2 Actions

Examinee (Print): ____________________

Testing Method:

Simulated Performance:	X	Classroom:	
Actual Performance:		Simulator:	
Alternate Path:	X	Plant:	X
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 1 has entered ABN-803A, Response to Fire in the Control Room or Cable Spreading Room.
- Attachment 4, Nuclear Equipment Operator No. 2 Actions to Achieve Hot Shutdown are in progress.

Initiating Cue: The Unit Supervisor directs you to PERFORM the following:

- Continue with ABN-803A, Response to Fire in the Control Room or Cable Spreading Room Attachment 4, (Nuclear Equipment Operator No. 2 Actions to Achieve Hot Shutdown) at Step "l".
- The RO at the RSP has just informed you that CCW pump 1-01 is running.

Task Standard: PERFORMED Steps l through n ABN-803A, Response to Fire in the Control Room or Cable Spreading Room, of Attachment 4 including starting Safety Chiller 1-05.

Required Materials:

- ABN-803A, Response to Fire in the Control Room or Cable Spreading Room, Attachment 4 (Nuclear Equipment Operator No. 2 Actions to Achieve Hot Shutdown).

Validation Time: 10 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ______________

EXAMINER:

PROVIDE the examinee with the following:

- **ABN-**803A**, Attachment 4 marked through performance of Step k.**

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from ABN-803A, Attachment 4**
Examiner Note:	**The following represents the Alternate Path of this JPM.**
Examiner Note:	**ECB 778 Unit 1 Safety Chiller Equipment Room (Rm 1-115A)**
Examiner Cue:	**The RO at the RSP informs you that CCW pump 1-01 is running.**
Examiner Cue:	**When the examinee arrives at the Unit 1 Train A Safety Chiller:** • **Power ON and System Run lights are DARK**
Perform Step: 1 step I & I 1)	WHEN CCW pump is running, THEN ensure Safety Chiller 1-05 – RUNNING IF Safety Chiller NOT running, THEN perform the following: Verify Recirculation Pump running.
Standard:	CHECKED Recirculation Pump 1-05 running.
Examiner Cue:	**The Recirculation Pump is running.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2√ step I 2)	WHEN CCW pump is running, THEN ensure Safety Chiller 1-05 – RUNNING IF Safety Chiller NOT running, THEN perform the following: Place STOP/RESET-START switch (1-HS-6710A) in STOP/RESET.
Standard:	PLACED 1-HS-6710A in STOP/RESET.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√ step I 3)	WHEN CCW pump is running, THEN ensure Safety Chiller 1-05 – RUNNING IF Safety Chiller NOT running, THEN perform the following: Place STOP/RESET-START switch in START.
Standard:	PLACED 1-HS-6710A in START.
Examiner Cue:	**Power ON and System Run lights are LIT. The Safety Chiller is running.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**SFGD 790, Corridor Outside CS Chem Add Tk Room, (RM 1-070)**
Examiner Cue:	**The Position Indicator is at the Top in line with the OPEN indication.**
Perform Step: 4√ step m 1st Bullet	Ensure the following valves – CLOSED. 1-8812A, RWST 1-01 TO RHR PMP 1-01 SUCT VLV
Standard:	• DEPRESSED Declutch lever. • ROTATED Handwheel in the Clockwise direction.
Examiner Cue:	**The Handwheel has stopped turning and Position Indicator is at the Bottom in line with the CLOSED indication.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Cue:	**The Position Indicator is at the Top in line with the OPEN indication.**
Perform Step: 5√ step m 2nd Bullet	Ensure the following valves – CLOSED. 1-8812B, RWST 1-01 TO RHR PMP 1-02 SUCT VLV
Standard:	• DEPRESSED Declutch lever. • ROTATED Handwheel in the Clockwise direction.
Examiner Cue:	**The Handwheel has stopped turning and Position Indicator is at the Bottom in line with the CLOSED indication.**
Comment:	**SAT ☐ UNSAT ☐**

Examiner Note:	**For each Steam Generator either an upstream or downstream isolation valve may be used for throttling.** **The valves are normally "Locked Open", the examinee will need to indicate that he has cut the seal before the valve can be moved.**
Examiner Cue:	**Once examinee arrives at throttle valves provide the following cue:** **The RO reports the Initial Flow Rates are as follows:** • **Steam Generator # 1 is 300 gpm.** • **Steam Generator # 2 is 300 gpm.** • **Total Flow from MDAFW Pump 1-01 is 650 gpm.** **The RO desires 150 gpm from each Steam Generator and total flow from MDAFW Pump 1-01 of 400 gpm.**
Perform Step: 6 √ step n	Train A MD AFW PMP Room (SG 790' 1-072) As directed by the RO, locally control auxiliary feedwater flow to Steam Generators 1 and 2: SG 1-01 • 1AF-0074, MD AFW PMP 1-01 DISCH TO SG 1-01 UPSTRM ISOL VLV OR • 1AF-0121, MD AFW PMP 1-01 DISCH TO SG 1-01 DNSTRM ISOL VLV
Standard:	UNLOCKED and THROTTLED CLOSED 1AF-0074 or 1AF-0121 by ROTATING handwheel in CLOCKWISE direction.
Examiner Cue:	**Once examinee has demonstrated throttling the valve closed, provide examinee with the modified flow rates:** **Steam Generator # 1 is 100 gpm.** **Steam Generator # 2 is 350 gpm.** **Total Flow from MDAFW Pump 1-01 is 525 gpm.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 7 √ step n	Train A MD AFW PMP Room (SG 790' 1-072) As directed by the RO, locally control auxiliary feedwater flow to Steam Generators 1 and 2: <u>SG 1-02</u> • 1AF-0082, MD AFW PMP 1-01 DISCH TO SG 1-02 UPSTRM ISOL VLV OR • 1AF-0123, MD AFW PMP 1-01 DISCH TO SG 1-02 DNSTRM ISOL VLV
Standard:	UNLOCKED and THROTTLED CLOSED 1AF-0082 or 1AF-0123 by ROTATING handwheel in CLOCKWISE direction.
Examiner Cue:	**Once examinee has demonstrated throttling the valve closed, provide examinee with the modified flow rates:** **Steam Generator # 1 is 150 gpm.** **Steam Generator # 2 is 150 gpm.** **Total Flow from MDAFW Pump 1-01 is 400 gpm.**
Examiner Cue:	**This JPM is Complete.**
Comment:	**SAT ☐ UNSAT ☐**

STOP TIME:	

Initial Conditions: **Given the following conditions:**

- **Unit 1 has entered ABN-803A, Response to Fire in the Control Room or Cable Spreading Room.**
- **Attachment 4, Nuclear Equipment Operator No. 2 Actions to Achieve Hot Shutdown are in progress.**

Initiating Cue: **The Unit Supervisor directs you to PERFORM the following:**

- **Continue with ABN-803A, Response to Fire in the Control Room or Cable Spreading Room Attachment 4, (Nuclear Equipment Operator No. 2 Actions to Achieve Hot Shutdown) at Step “l”.**
- **The RO at the RSP has just informed you that CCW pump 1-01 is running.**

This JPM is NOT Time Critical

Facility: CPNPP JPM # NRC P-3 Task # AO4204D K/A # 062.A4.04 2.6 / 2.7 SF-6

Title: Transfer Inverter IV2PC1 from Bypass to Normal

Examinee (Print): ______________________________

Testing Method:

Simulated Performance:	X	Classroom:	
Actual Performance:		Simulator:	
Alternate Path:		Plant:	X
Time Critical:			

READ TO THE EXAMINEE

I will explain the Initial Conditions, which steps to simulate or discuss, and provide an Initiating Cue. When you complete the task successfully, the objective for this JPM will be satisfied.

Initial Conditions: Given the following conditions:

- Unit 2 is at 100% power.
- Inverter IV2PC1 is currently energized and on Bypass Power.
- Appropriate repairs have been completed.

Initiating Cue: The Unit Supervisor directs you to Transfer Inverter IV2PC1 from Bypass to Normal Operation, in accordance with SOP-607B, 118 VAC Distribution System and Inverters, Section 5.5.9.

Task Standard: Utilizing SOP-607B, 118 VAC Distribution System and Inverters, Section 5.5.9, Transferring Inverter IV2PC1 from Bypass to Normal Operation.

Required Materials: SOP-607B, 118 VAC Distribution System and Inverters, Rev. 16, PCN 2.

Validation Time: 15 minutes Completion Time: ________ minutes

Comments:

Result: SAT ☐ UNSAT ☐

Examiner (Print / Sign): ______________________________ Date: ____________

<u>EXAMINER</u>:

PROVIDE the examinee with a copy of SOP-607B, 118 VAC Distribution System and Inverters, Section 5.5.9, Transferring Inverter IV2PC1 from Bypass to Normal Operation

√ - Check Mark Denotes Critical Step

START TIME:	

Examiner Note:	**The following steps are from SOP-607B, Section 5.5.9.**
CAUTION: Operable vital bus electrical power distribution subsystems require the associated buses to be energized to their proper voltage from either the associated inverter (or swing inverter) via inverted DC voltage OR the alternate bypass power supply via Class 1E transformers per TS 3.8.9 and 3.8.10.	
Perform Step: 1 step A.	IF Inverter IV2PC1 is deenergized, THEN ENERGIZE IV2PC1 per section 5.5.1.
Standard:	DETERMINED that step is N/A, per Initial Conditions.
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 2 step B 1)	IF Inverter IV2PC1 is energized, THEN PERFORM the following to PLACE IV2PC1 in INVERTER SUPPLYING LOAD: 1) VERIFY IN SYNC light is LIT.
Standard:	VERIFIED IN SYNC light LIT.
Examiner Cue:	**Simulate IN SYNC light LIT.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 3√ step B 2)	2) DEPRESS BYPASS SOURCE TO LOAD pushbutton (Static Transfer Switch) AND VERIFY BYPASS SOURCE SUPPLYING LOAD red light is LIT.
Standard:	• DEPRESSED BYPASS SOURCE TO LOAD pushbutton (Static Transfer Switch) (**critical**). AND • VERIFIED BYPASS SOURCE SUPPLYING LOAD red light LIT (**NOT critical**).
Examiner Cue:	**Once pushbutton depressed, BYPASS SOURCE SUPPLYING LOAD red light LIT.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 4√ step B 3)	3) PLACE TRS1-IV2PC1, BYP SW S1 in NORMAL SOURCE.
Standard:	PLACED TRS1-IV2PC1, BYP SW S1 in NORMAL SOURCE.
Examiner Cue:	**Simulate Switch TRS1-IV2PC1, BYP SW S1 in NORMAL SOURCE.**
Comment:	**SAT ☐ UNSAT ☐**

Perform Step: 5 step B 4)	4) VERIFY IV2PC1 alarm lamps are OFF.
Standard:	VERIFIED IV2PC1 Red alarm lamps OFF.
Examiner Cue:	**Red alarm lamps are OFF.**
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 6 step B 5)	5) VERIFY Inverter AC OUTPUT voltage is 118 to 128 VAC.
Standard:	VERIFIED Inverter AC OUTPUT voltage between 118 to 128 VAC.
Examiner Cue:	**INDICATE on meter Inverter AC OUTPUT voltage is 125 VAC.**
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 7√ step B 6)	6) DEPRESS INVERTER TO LOAD pushbutton (Static Transfer Switch) AND VERIFY INVERTER SUPPLYING LOAD yellow light is LIT.
Standard:	• DEPRESSED INVERTER TO LOAD pushbutton (Static Transfer Switch) (**critical**). • VERIFIED INVERTER SUPPLYING LOAD yellow light is LIT (**NOT critical**).
Examiner Cue:	**Once pushbutton is depressed, INVERTER SUPPLYING LOAD yellow light is LIT.**
Comment:	**SAT** ☐ **UNSAT** ☐

Perform Step: 8 step B 7)	VERIFY Inverter AC OUTPUT voltage is 118 to 128 VAC.
Standard:	VERIFIED Inverter AC OUTPUT voltage is 118 to 128 VAC.
Examiner Cue:	**INDICATE on meter Inverter AC OUTPUT voltage is 125 VAC.**
Terminating Cue:	**This JPM is complete.**
Comment:	**SAT** ☐ **UNSAT** ☐

STOP TIME:	

INITIAL CONDITIONS: **Given the following conditions:**

- **Unit 2 is at 100% power.**
- **Inverter IV2PC1 is currently energized and on Bypass Power.**
- **Appropriate repairs have been completed.**

INITIATING CUE: **The Unit Supervisor directs you to Transfer Inverter IV2PC1 from Bypass to Normal Operation, in accordance with SOP-607B, 118 VAC Distribution System and Inverters, Section 5.5.9.**

Scenario Event Description
NRC Scenario 1

Facility:	CPNPP 1 & 2	Scenario No.:	1	Op Test No.:	June 2015 NRC
Examiners:	____________		Operators:	____________	
	____________			____________	
	____________			____________	

Initial Conditions: 100% power MOL – RCS Boron is 924 ppm (by sample).

Turnover: Begin a 30 minute ramp to 50% power for removing Main Feedwater Pump 1-01 from service to repair an oil leak.

Critical Tasks:
- Initiate Train A and/or Train B Safety Injection due to Failure to Automatically Actuate prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection.
- Trip Reactor Coolant Pumps within 5 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection or EOP-1.0A, Loss of Reactor or Secondary Coolant, Foldout Pages.
- Initiate Cooldown of Reactor Coolant System Prior to Exiting EOS-1.2A, Post LOCA Cooldown and Depressurization.

Event No.	Malf. No.	Event Type*	Event Description
1	----	R - RO N - BOP N - SRO	Begin power reduction for removing MFP 1-01 from service.
2	CC02A CC03A	C - BOP TS - SRO	CCW Pump 1-01 trips. Standby fails to auto start.
3	CH10	C - BOP C - SRO	CRDM Vent Fan trips. Requires manual start of alternate.
4	RP05A	I - RO TS - SRO	NR Cold Leg TI (TE-411B) fails high.
5	RC03C	C - RO C - BOP C - SRO	RCP 1-03 vibration (Ramps to 20 mils over 5 min.)
6	RC19C	M - ALL	SBLOCA.
7	RP07A RP07B	I - RO	Both trains SI fail to auto actuate.
8	ED05E CV01F	C - RO	Loss of 1EA1 Safeguards Bus (86-2 actuation). CCP 1-01 fails to sequence on. Requires manual start.

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

Actual	Target Quantitative Attributes
7	Total malfunctions (5-8)
3	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
1	Major transients (1-2)
2	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
3	Critical tasks (2-3)

SCENARIO 1 SUMMARY

Event 1
Due to an oil leak on Main Feedwater Pump 1-01, the crew begins a 30 minute ramp to 50% power for removing MFP 1-01 from service.

Event 2
The next event is a trip of Component Cooling Water (CCW) Pump 1-01, with a failure of the standby pump (CCW Pump 1-02) to automatically start The crew will enter ABN-502, Section 2.0, CCW Pump Trip, and manually start CCW Pump 1-02, per Step 1 RNO. The SRO will refer to Technical Specifications for this malfunction.

Event 3
The operating CRDM vent fan trips. The crew will refer to 1-ALB-3A, Window 1.6, CRDM SHROUD EXH TEMP HI, and ensure that at least one CRDM vent fan is in service, and manually start an alternate vent fan, per SOP-801A. They will use either Section 5.3.1, Control Rod Drive Mechanism Ventilation System Startup, or Section 5.3.3, Alternating Control Rod Drive Mechanism Ventilation Fans, for this evolution.

Event 4
The next event is a failure of Cold Leg Loop 1 NR Temperature Transmitter (TE-411B). It will fail high (630°F). The Reactor Operator will take action per ABN-704, Tc/N-16 Instrumentation Malfunction. This event requires taking manual control of rods, since the Tc failure results in a higher Tave and rods will be inserting in automatic. The SRO will refer to Technical Specifications for this malfunction.

Event 5
The next event is the precursor to the major event and involves high shaft vibration of Reactor Coolant Pump 1-03. This malfunction ramps in over a period of 5 minutes, allowing the crew time to evaluate and enter ABN-101, Section 6.0, Excessive Reactor Coolant Pump Vibration. Alarm 1-ALB-5B, Window 3.5, RCP 3 VIBR HI will come in (setpoint is 15 mils shaft vibration). Bearing temperatures and amps will continue to rise as the condition worsens. As the event progresses, the crew will recognize that RCP trip criteria have been exceeded. The crew then trips the reactor and enters to EOP-0.0A.

Event 6
When the reactor is tripped, a SBLOCA occurs inside containment on RCS Loop 3 at 1500 gpm. The crew will progress through EOP-0.0A, and then transition to EOP-1.0A, Loss of Reactor or Secondary Coolant. Adverse Containment Conditions will apply at some point as containment pressure rises due to the LOCA.

Event 7
This scenario is complicated by the automatic failure of both trains of Safety Injection to actuate. Manual actuation of both trains will be successful.

Event 8
Once SI has been reset, a Safeguard Bus 1EA1 lockout (86-2) occurs. The bus will reenergize from the Emergency Diesel Generator and all loads will properly sequence on with the exception of Centrifugal Charging Pump (CCP) 1-01. Manual start of CCP 1-01 will be successful. The crew will transition to EOS-1.2A, Post LOCA Cooldown and Depressurization, and begin the required cooldown. The scenario will be terminated approximately 5 minutes after the cooldown is commenced.

Risk Significance:

• Failure of risk important system prior to trip:	Loss of CCW (Pump trip) RCP high vibration
• Risk significant core damage sequence:	RCP high vibration, then Small Break LOCA
• Risk significant operator actions:	Manually Initiate Safety Injection

Critical Task Determination

Critical Task	Safety Significance	Cueing	Measurable Performance Indicators	Performance Feedback
Initiate Train A and/or Train B Safety Injection due to Failure to Automatically Actuate prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection.	Recognize a failure or an incorrect automatic actuation of an ESF system or component.	Procedural direction at EOP-0.0A Step 4 to determine if a Safety Injection is required and annunciators indicating that an SI should have occurred yet did not occur.	The operator will manually actuate Safety Injection using either the handswitch on CB-07 or CB-02.	PCIP Window 1.8 annunciates indicating both trains of SI have actuated. Numerous equipment changes of state.
Trip Reactor Coolant Pumps within 5 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection or EOP-1.0A, Loss of Reactor or Secondary Coolant, Foldout Pages.	Take one or more actions that would prevent a challenge to plant safety. FSAR II.K.3.5; WCAP-9584; WOG ERG Generic Issue for RCP Trip / Restart	Procedurally driven from EOP-0.0A and EOP-1.0A Foldout pages. Availability of Subcooling indication both on meters and computer.	The operator will secure ALL RCPs using the handswitches on CB-05.	Indication of pump stop including light indication, flow and motor current.
Initiate Cooldown of Reactor Coolant System Prior to Exiting EOS-1.2A, Post LOCA Cooldown and Depressurization.	Take one or more actions that would prevent a challenge to plant safety.	Procedurally driven from EOS-1.2A to commence cooldown to reduce the overall temperature of the RCS.	The operator will increase dumping steam from the SGs via the ARVs or Steam Dumps to reduce RCS temperature.	Lowering SG pressures and lowering RCS temperatures beginning with the cold leg temperatures.

	SIMULATOR OPERATOR INSTRUCTIONS for SIMULATOR SETUP				
Initialize to IC18 and LOAD NRC Scenario 1.					
EVENT	**TYPE**	**MALF #**	**DESCRIPTION**	**DEMAND VALUE**	**INITIATING PARAMETER**
7		RP07A	Train ‘A’ SI fails to auto actuate.	f:1	K0
		RP07B	Train ‘B’ SI fails to auto actuate.	f:1	K0
2		CC03A	CCW Pump 1-02 fails to auto start.	f:1	K0
8		CV01F	CCP 1-01 fails to sequence on Blackout.	f:1	K0
2		CC02A	CCW Pump 1-01 trips.	f:1	K2
		CC03A	CCW Pump 1-02 fails to auto start.	f:1	K0
3		CH10	CRDM Vent Fan #1 trips.	f:1	K3
4		RP05A	NR Cold Leg TI (TE-411B) fails high.	f:630	K4
5		RC03C	RCP1-03 vibration, ramps to 20 mils over 300 seconds.	f:20	K5
6		RC19C	Small Break LOCA Loop 3.	f:1500	(1)
7		RP07A	Train ‘A’ SI fails to auto actuate.	f:1	K0
		RP07B	Train ‘B’ SI fails to auto actuate.	f:1	K0
8		ED05E	Loss of 1EA1 Safeguard Bus (86-2)	f:1	(2)
		CV01F	CCP 1-01 fails to sequence on Blackout.	f:1	K0
(1) {DIRPRTC.Value=1} IMF RC19C f:1500 - Insert Small Break LOCA at 1500 gpm upon taking the RX trip switch to the TRIP position.					
(2) {DICSHSRWSTB.Value=1} IMF ED05E f:1 - Insert 86-2 Lockout on Safeguard Bus 1EA1 when the Train B RHR Auto Swap Over Reset pushbutton is DEPRESSED.					

Simulator Operator:	**INITIALIZE to IC18 and LOAD NRC Scenario 1.** **ENSURE all Simulator Annunciator Alarms are ACTIVE.** **ENSURE all Control Board Tags are removed.** **ENSURE Operator Aid Tags reflect current boron conditions.** **ENSURE Rod Bank Update (RBU) is performed.** **ENSURE Turbine Load Rate set at 10 MWe/minute.** **ENSURE 60/90 buttons DEPRESSED on ASD.** **ENSURE ASD speakers are ON at half volume.** **ENSURE Reactivity Briefing Sheet printout provided with Turnover.** **ENSURE procedures in progress are on SRO desk:** **- COPY of IPO-003A, Power Operations, Section 5.6, Reducing Turbine Power from 100% to Mode 3.** **ENSURE Control Rods are in AUTO with Bank D at 215 steps.**

Control Room Annunciators in Alarm:

PCIP-1.1 – SR TRN A RX TRIP BLK
PCIP-1.2 – IR TRN A RX TRIP BLK
PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9
PCIP-1.6 – RX ≥ 10% PWR P-10
PCIP-2.1 – SR TRN B RX TRIP BLK
PCIP-2.2 – IR TRN B RX TRIP BLK
PCIP-2.5 – SR RX TRIP BLK PERM P-6
PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK
PCIP-4.2 – PR TRN B LO SETPT RX TRIP BLK

Operating Test :	NRC	Scenario #	1	Event #	1	Page	6	of	37
Event Description:	30 minute down power to remove Main Feed Pump from service								

Time	Position	Applicant's Actions or Behavior
Examiner Note:		**The following steps are from IPO-003A, Power Operations, Section 5.6, Reducing Turbine Power from 100% to Mode 3.**
	US	Direct power reduction to 50% to remove MFP 1-01 from service using IPO-003A Power Operations, Section 5.6, Reducing Turbine Power from 100% to MODE 3.
		NOTE: Chemistry will specify Demineralizers to be placed in service based on RCS conditions. BTRS or CVCS demineralizers may be used.
		NOTE: For power reductions to approximately 700 MWE, Attachment 6A may be used.
	US	CONTACT Chemistry AND PLACE the specified demineralizers in service per SOP-103A or SOP-106A prior to starting the power reduction. [5.6.1]
	US	Notify QSE Generation Controller prior to reducing load. [5.6.2]

NOTE: For power changes greater than 5%, a reactivity plan should be developed using one of the sources below. (Listed in order of preference)

- IF time and resources support generation of a BEACON projection (for a pre-planned power maneuver), THEN contact Core Performance Engineering for support, and utilize the approved results as the reactivity plan.
- During operation at BOL with a zero or small negative moderator temperature coefficient, very little reactivity feedback will result from changes in RCS temperature. During a shutdown, significant rod movement can occur when relatively small changes in RCS temperature occurs. This could result in large transients in Pressurizer level and RCS pressure. Care should be taken to ensure changes in steam flow and SG level control are done gradually to minimize RCS transients.
- IF the power change closely matches one of the down-power scenarios available in the Reactivity Briefing Sheets (printed from CHORE), THEN utilize the appropriate reactivity plan (interpolation between values on the Boration Matrix is allowed).
- IF the above two options are not available or do not fit the current scenario, THEN perform a NDR based reactivity calculation per Attachment 3 or equivalent CHORE output.

Operating Test :	NRC	Scenario #	1	Event #	1	Page	7	of	37
Event Description:	30 minute down power to remove Main Feed Pump from service								

Time	Position	Applicant's Actions or Behavior
	US	IF Reactor power will be decreased by ≥15% within a one hour period, THEN notify Chemistry and Radiation Protection. (TS SR 3.4.16.2, ODCM 4.11.2.1.1.2, 4.11.2.1.1.3) [5.6.3]

<u>NOTE</u>:

- During the initial reduction in power, a combination of control rod insertion and boration should be used to compensate for changes in reactivity due to power defect. This will allow the control rods to be available to compensate for the reactivity due to Xenon following the power reduction.
- Primary plant should lead secondary plant during Main Turbine load changes.
- During a down power, operators should adjust the pots (1-SK-0509B and 1-SK-0509C) to maintain the difference between the FWPT speeds within the desirable range.
- FWPT speed deviation from commanded speed during a normal shutdown may be an indication of binding in a FWPT control valve, guidance for this event is located in ABN-302 Sect. 9.0, FEEDWATER PUMP CONTROL SYSTEM MALFUNCTION.
- The TSE, within the digital turbine control system, is constantly measuring temperatures at critical sections of the turbine and will limit the ramp up/ramp down as deemed necessary by internal stress calculations performed by TSE. If TSE determines that the allowable temperature margin is being approached or exceeded, alarm annunciation will occur and the ramp up/ ramp down will be limited. The following alarms may be received:

  TSE Lower Temp Margin <0
  TSE Lower Temp Margin <20
  TSE Upper Temp Margin <0
  TSE Upper Temp Margin <60
  TSE Lower Margin HP Shaft <0
  TSE Lower Margin HP Shaft <60
  TSE Upper Margin HP Shaft <0
  TSE Upper Margin HP Shaft <60

- While TSE Influence is off, with a TSE fault present, the following limits apply:
  - Turbine load decreases (excluding runbacks) should be limited to a load rate of 10 MW/min while > 400 MWe, THEN limited to 5MW/min while ≤ 400 MWe (during rapid cooldown, a 2-hour HOLD at 400 MWe is required for temperature equalization)
  - Automatic TSE influence to the EHC should not be switched from OFF to ON if any TSE related faults are active.

	US	PERFORM the following steps to reduce Turbine load to approximately 200 MW (16%) or the desired intermediate load: [5.6.4]

Operating Test : NRC	Scenario # 1	Event # 1	Page 8 of 37
Event Description: 30 minute down power to remove Main Feed Pump from service			

Time	Position	Applicant's Actions or Behavior
	RO	IF desired, THEN DETERMINE the amount of boration required to reduce Reactor power to approximately 200 MW or the desired intermediate load using the appropriate currently approved Reactivity Projection. [5.6.4.A]
	RO	IF desired, THEN DETERMINE the rate of boration required to allow slow control rod inward motion as the turbine load decreases, using the appropriate currently approved Reactivity Projection. [5.6.4.B]
	RO	REFER to Attachment 2 for guidance in controlling AFD during power ramps. [5.6.4.C]
	RO	INITIATE RCS boration/dilution using SOP-104A. [5.6.4.D]
	BOP	WHEN the following are met: 1) No TSE alarms are active 2) ENSURE turbine load/speed is matched with target load/speed THEN TURN ON TSE Influence. [5.6.4.E]
	BOP	In the "Load Control" Section, SET in the desired unloading rate using the Load Rate Setpoint Controller. [5.6.4.F]
NOTE: The load will immediately begin decreasing to the setpoint value at the rate set on the Load Rate Setpoint Controller. The LOAD RATE may be readjusted as necessary.		
	BOP	In the "Load Control" Section, LOWER the Load Target Setpoint Controller as necessary to obtain 200 MW or the desired intermediate load to control turbine load. [5.6.4.G]

Operating Test :	NRC	Scenario #	1	Event #	1	Page	9	of	37
Event Description:	30 minute down power to remove Main Feed Pump from service								

Time	Position	Applicant's Actions or Behavior

Examiner Note: The following steps are from SOP-104A, Reactor Make-up and Chemical Control System, Section 5.1.2, Borate Mode.

CAUTION: Initial RCS makeup boron concentration will be the concentration added from the previous RCS makeup evolution.

NOTE:
- This procedure assumes prior automatic operation.
- TDM-201A and TDM-203A contain information to aid in obtaining correct values for setting pots and counters.
- Attachment 2, BOL Boration for Long Term Use provides instructions for periodic borations while keeping the Makeup System in Borate Mode.

Time	Position	Applicant's Actions or Behavior
	RO	PERFORM the following to COMMENCE RCS boration:
		• ENSURE Prerequisites of Section 2.1 and 2.2 are met. [Step 5.1.2.A]
		• ENSURE 1/1-MU, RCS MU MAN ACT is in STOP. [Step 5.1.2.B]
		• PLACE 43/1-MU, RCS MU MODE SELECT in BORATE. [Step 5.1.2.C]
		• SET 1-FK-110, BA BLNDR FLO CTRL to ~4.68 pot setting for ~18.7 GPM. [Step 5.1.2.D]
		• SET 1-FY-110B, BA BATCH FLO counter for 561 gallons. [Step 5.1.2.E]

NOTE: 1/1-FCV-110A may be in CLOSE if RCS Boron Concentration is < 250 ppm to prevent inadvertent boration of RCS..

Time	Position	Applicant's Actions or Behavior
		• ENSURE 1/1-FCV-110A, BA BLNDR FLO CTRL VLV in AUTO. [Step 5.1.2.F]
		• PLACE 1/1-MU, RCS MU MAN ACT in START. [Step 5.1.2.G]
		• VERIFY 1/1-APBA1, BA XFR PMP 1 STARTS. [Step 5.1.2.H]
		• VERIFY 1/1-FCV-110A, BA BLNDR FLO CTRL VLV throttles to ~18.7 GPM. [Step 5.1.2.I]
		• VERIFY 1/1-FCV-110B, RCS MU TO CHG PMP SUCT ISOL VLV OPEN. [Step 5.1.2.I]
		• VERIFY 1-FY-110B, BA BATCH FLO counter operating properly. [Step 5.1.2.J]
		• VERIFY 1-FR-110, BA BATCH FLO TO BLNDR red pen operating properly. [Step 5.1.2.J]

Operating Test :	NRC	Scenario #	1	Event #	1	Page	10	of	37
Event Description:	30 minute down power to remove Main Feed Pump from service								

Time	Position	Applicant's Actions or Behavior
		NOTE: The following step is intended to reduce the severity of VCT pressure and level transients which can significantly impact RCS Hydrogen concentration. The applicability of this step is dependent on the expected magnitude of the makeup.
		• OPERATE 1/1-LCV-112A, VCT LVL CTRL VLV as necessary to maintain proper VCT level. [Step 5.1.2.K]
		• When desired amount of boric acid is added, PLACE 1/1-MU, RCS MU MAN ACT in STOP. [Step 5.1.2.L]
		Examiner Note: The following steps continue from IPO-003A, Power Operations, Section 5.6, Reducing Turbine Power from 100% to Mode 3.
	BOP	SET Turbine Load Rate Setpoint Controller to ~22 MWe/min. [Step 5.6.4.E]
		• OPEN "Load Rate Setpoint" OSD.
		• SELECT blue bar and ENTER 22 MWe/min.
		• CLOSE "Load Rate Setpoint" OSD.
		NOTE: The load will immediately begin decreasing to the setpoint value at the rate set on the Load Rate Setpoint Controller. The LOAD RATE may be readjusted as necessary.
	BOP	SET Turbine Load Target to ~600 MWe. [Step 5.6.4.F]
		• OPEN "Load Target" OSD.
		• SELECT blue bar and ENTER 600 MWe.
		• DEPRESS "Accept" then VERIFY value in blue bar is desired "Load Target" (magnitude and direction).
		• DEPRESS "Execute" then VERIFY "Load Target" changes to desired load.
		• CLOSE "Load Target" OSD.
	CREW	MONITOR load change.
		When crew has demonstrated ability to reduce power in a controlled manner, or at Lead Examiner discretion, PROCEED to Event 2.

Operating Test : NRC	Scenario # 1	Event # 2	Page 11 of 37
Event Description: Train A Component Cooling Water (CCW) Pump Trip / Train B CCW Pump Start Failure			

Time	Position	Applicant's Actions or Behavior
Simulator Operator: **When directed, EXECUTE Event 2 (Key 2).** **- CC02A, Train A CCW Pump (1-01) trip.** **- CC03A, Train B CCW Pump (1-02) start failure.**		
Indications Available: **3C-2.3 – CCWP 1 / 2 OVLD TRIP** **3C-3.3 – CCW TRAIN B SFGD LOOP PRESS LO** **Multiple CCW low flow alarms**		
	BOP	RESPOND to Annunciator Alarm Procedures.
Examiner Note: **The operator may recognize that an automatic start has not occurred and immediately start CCW Pump 1-02 which is permissible.**		
	BOP	RECOGNIZE Train A CCW Pump trip with failure of Train B CCW Pump to start.
	US	DIRECT implementation of ABN-502, Component Cooling Water System Malfunctions, Section 2.0.
Examiner Note: **The following steps are from ABN-502, Component Cooling Water System Malfunctions, Section 2.0, CCW Pump Trip.**		
	BOP	VERIFY Train B CCW Pump – Not RUNNING. [Step 1]
		• Manually START Train B CCW Pump 1-02.
	BOP	VERIFY Train B Station Service Water Pump – RUNNING. [Step 2]
	RO/BOP	VERIFY Train B Safety Chiller Recirc Pump 1-06 – RUNNING. [Step 3]
Simulator Operator Note: **When dispatched to locally inspect Train A CCW Pump and Breaker, report a 50/51 relay is tripped at the breaker on Phases 'A' and 'B' and there is an acrid odor, no fire.**		

Operating Test : NRC	Scenario # 1	Event # 2	Page 12 of 37
Event Description:	Train A Component Cooling Water (CCW) Pump Trip / Train B CCW Pump Start Failure		

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY CCW Heat Exchanger outlet flow – LESS THAN 17,500 GPM PER HEAT EXCHANGER. [Step 4]
		• 1-FI-4536A, CCW HX 1 OUT FLO
		• 1-FI-4537A, CCW HX 2 OUT FLO
	BOP	VERIFY required Train B equipment for existing plant conditions – IN OPERATION. [Step 5]
		• Control Room Air Conditioning Units
		• Containment Spray System
		• UPS HVAC Unit
		• Excess Letdown
		• RHR System
<u>Examiner Note</u>: Common equipment may be turned over to Unit 2.		
	BOP	STOP Train A equipment – AS NECESSARY. [Step 6]
		• Control Room Air Conditioning Units
		• Containment Spray System
		• UPS HVAC Unit
		• RHR System
		• Safety Chiller Recirculation Pump
	BOP	VERIFY CCW Heat Exchanger outlet temperature did NOT exceed 122ºF with pump running.
	US	INITIATE a Work Request per STA-606.

Operating Test : NRC	Scenario # 1	Event # 2	Page 13 of 37
Event Description: Train A Component Cooling Water (CCW) Pump Trip / Train B CCW Pump Start Failure			

Time	Position	Applicant's Actions or Behavior
	US	EVALUATE Technical Specifications.
		• LCO 3.7.7.A, Component Cooling Water System.
		• CONDITION A - One CCW train inoperable. • ACTION A.1 - Restore CCW train to OPERABLE status within 72 hours.
	US	REFER to EPP-201.

When the crew has completed the actions of ABN-502, or at Lead Examiner discretion, PROCEED to Event 3.

Operating Test : NRC	Scenario # 1	Event # 3	Page 14 of 37
Event Description: CRDM Vent Fan trips. Requires manual start of alternate fan.			

Time	Position	Applicant's Actions or Behavior

Simulator Operator: **When directed, EXECUTE Event 3 (Key 3).**
- CH10, Control Rod Drive Mechanism Fan (1-01) trips.

Indications Available:
3A-2.1 – CNTMT FN MASTER TRIP
3A-1.3 – CRDM VENT FN 1 ∆P LO
3A-1.6 – CRDM SHROUD EXH TEMP HI
3B-4.2 – CRDM ANY VENT FAN DISCH TEMP HI (30 seconds later)
1-HS-5421, CRDM VENT FN amber MISMATCH, white TRIP, and green STOP lights LIT

Time	Position	Applicant's Actions or Behavior
	BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE CRDM Vent Fan 1-01 tripped.
	US	DIRECT performance of ALM-0031A, 1-ALB-3A, Window 1.6 - CRDM SHROUD EXH TEMP HI.

Examiner Note: **The following steps are from ALM-0031A, 1-ALB-3A, Window 1.6 - CRDM SHROUD EXH TEMP HI.**

Simulator Operator Note: **When dispatched to locally inspect CRDM Vent Fan breaker, report the breaker tripped on overload.**

NOTE: The CRDM Cooling Unit Ventilation Chilled Water is supplied from the Containment fan Cooler Ventilation Chilled Water return header. Any adjustments on Containment Fan Cooler flow will also affect flow to CRDM cooling units. Normal Chilled Water supply flow is provided when three containment fan coolers are in service.

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY at least one CRDM Vent Fan in service. [Step 1]
	BOP	• If NO fans are in service, START one CRDM Vent Fan per SOP-801A, Containment Ventilation System. [Step 1.a]

Operating Test :	NRC	Scenario #	1	Event #	3	Page	15	of	37
Event Description:	CRDM Vent Fan trips. Requires manual start of alternate fan.								

Time	Position	Applicant's Actions or Behavior
Examiner Note: The following two steps are from SOP-801A, Containment Ventilation System.		
	BOP	PLACE 1-HS-5423, CRDM VENT FN 2 handswitch in START. [Step G]
	BOP	MONITOR Containment Radiation levels until they stabilize. [Step I]
Examiner Note: The next steps continue with ALM-0031A, 1-ALB-3A, Window 1.6 - CRDM SHROUD EXH TEMP HI.		
	BOP	MONITOR 1-TI-5400A, CNTMT AVE TEMP. [Step 2]
CAUTION: Chilled Water temperature should not be allowed to increase to 100°F. Recirculation through chiller units may actuate the rupture discs.		
	BOP	VERIFY X-TI-6071, CH WTR SPLY HDR TEMP is 45ºF to 55ºF at X-CV-01. [Step 3]
	BOP	ENSURE 1-FI-6081, CNTMT FN CLR CH WTR RET FLO is between 912 and 1008 GPM with any combination of 3 of 4 units in service. [Step 4]
	BOP	MONITOR CRDM Shroud exhaust temperature. [Step 5]
		• 1-TI-5455, CRDM VENT FN 2 DISCH TEMP.
	US	REFER to Technical Specifications LCO 3.6.5, Containment Air Temperature. [Step 6]
	US	CORRECT the condition or INITIATE a work request per STA-606. [Step 7]
When CRDM cooling is restored, or at Lead Examiner discretion, PROCEED to Event 4.		

Operating Test :	NRC	Scenario #	1	Event #	4	Page	16	of	37
Event Description:	NR Cold Leg TI (TE-411B) Fails High.								

Time	Position	Applicant's Actions or Behavior
Simulator Operator:		**When directed, EXECUTE Event 4 (Key 4).** **- NR Cold Leg TI (TE-411B) fails high.**
Indications Available: **6D-1.10 – AVE T_{AVE} T_{REF} DEV** **6D-2.10 – AVE T_{AVE} HI** **6D-3.14 – 1 OF 4 OT N16 ROD STOP & TURB RUNBACK** **1-TI-411A, CL 1 TEMP (NR) CHAN I indication failed high** **1-TI-412, RC LOOP 1 T_{AVE} CHAN I indication failed high**		
	RO	RESPOND to Annunciator Alarm Procedures.
	RO	RECOGNIZE Control Rods inserting due to T_{COLD} failed high.
	US	DIRECT performance of ABN-704, Tc / N-16 Instrumentation Malfunction, Section 2.0.
NOTE:		• If the failed channel was reading lower than the substituted channel, then AVE Tave will increase when the failed channel is defeated due to another channel being substituted for the failed signal to maintain accurate averaging. • Rod Control should remain in MANUAL until all channels are operable. This does not preclude placing rods in AUTO during rapidly changing transient conditions such as runbacks, etc. as long as rod control is returned to MANUAL when the plant is stabilized.
	RO	PLACE 1/1-RBSS, CONTROL ROD BANK SELECT Switch in MANUAL. [Step 2.3.1]
	RO	SELECT LOOP 1 on 1-TS-412T, T_{AVE} Channel Defeat. [Step 2.3.2]
	RO/BOP	VERIFY Steam Dump System is NOT actuated and NOT armed. [Step 2.3.3]

Operating Test : NRC	Scenario # 1	Event # 4	Page 17 of 37
Event Description: NR Cold Leg TI (TE-411B) Fails High.			

Time	Position	Applicant's Actions or Behavior
Examiner Note: **Crew should Hold Setpoint on Turbine Ramp and stop boration on this failure (may have been previously performed).**		
	RO/BOP	SELECT LOOP 1 on 1/1-JS-411E, N16 Power Channel Defeat. [Step 2.3.5]
	RO	ENSURE a valid N16 channel supplying recorder on 1/1-TS-411E, 1 TR 411 CHAN SELECT. [Step 2.3.6]
	RO/BOP	VERIFY PCIP, Window 3.4 – TURB LOAD REJ STM DMP ARMED C-7, not ARMED (DARK). [Step 2.3.7]
	US/BOP	VERIFY Steam Dumps were NOT blocked. [Step 2.3.8]
	US	EVALUATE Technical Specifications. [Step 2.3.11]
		• LCO 3.3.1.E, Reactor Trip System Instrumentation (Functions 6 & 7).
		• CONDITION E - One channel inoperable. • ACTION E.1 - Place channel in trip within 72 hours, <u>OR</u> • ACTION E.2 - Be in MODE 3 within 78 hours.
	US	INITIATE a work request per STA-606. [Step 2.3.12]
	US	INITIATE a Condition Report per STA-421. [Step 2.3.13]
When Technical Specifications are addressed, or at Lead Examiner discretion, proceed to Events 5.		

Operating Test :	NRC	Scenario #	1	Event #	5	Page	18	of	37
Event Description:	RCP 1-03 High Vibration.								

Time	Position	Applicant's Actions or Behavior
Simulator Operator:		**When directed, EXECUTE Events 5 (Key 5).** **- RCP 1-03 High Vibration (Ramps to 20 mils over 300 seconds)**
Indications Available: **1-ALB-5B, Window 3.5, RCP 3 VIBR HI** **Rising vibration observed on RCP Vibration Monitors**		
	RO	RESPOND to Annunciator Alarm Procedures.
	BOP	REPORT RCP 1-03 shaft vibration greater than 15 mils.
	US	DIRECT implementation of ABN-101, Reactor Coolant Pump Trip/Malfunction, Section 6.0, Excessive Reactor Coolant Pump Vibration.
Examiner Note:		**The following steps are from ABN-101, Reactor Coolant Pump Trip/Malfunction, Section 6.0, Excessive Reactor Coolant Pump Vibration.**
NOTE:		Amplitude trip rate of 1 mil/hr is based on operation at 100% power. IF not in Mode 1, THEN the amplitude rate of change may be ignored. IF DAS connected to the vibration monitoring panel, THEN filtered data should be used to determine trip criteria. (EVAL-2000-002454-01)
	RO/BOP	CHECK RCP Vibration – WITHIN LIMITS: [Step 6.3.1]
		• RCP shaft vibration: [Step 6.3.1.a]
		• BETWEEN 15 mils and 20 mils and amplitude INCREASING less than 1 mil per hour. [Step 6.3.1.a]
	RO/BOP	• TRIP Reactor and GO to EOP-0.0A while other operators continue this procedure. [Step 6.3.1.1) RNO]
	RO	• STOP affected RCP 1-03 after Reactor trip. [Step 6.3.1.2) RNO]
When the REACTOR is tripped, a SBLOCA will occur on RCS Loop 3 at 1500 gpm (automatically triggered on the Reactor Trip Switch), PROCEED to Events 6, 7, and 8.		

Operating Test : NRC	Scenario # 1	Event # 6, 7, 8	Page 19 of 37
Event Description: Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure			

Time	Position	Applicant's Actions or Behavior
Simulator Operator:		**Event 6 (Automatically inserts on the REACTOR Trip Switch)** **-RC19C, SBLOCA RCS Loop 3 (1500 gpm)** **-Both Trains of SI fail to actuate** **-Loss of 1EA1 Safeguards Bus (86-2 Lockout)** **-CCP1-01 fails to sequence on**
Indications Available: **2A-2.8 – ANY CNTMT SMP PMP RUN** **2B-4.12 – CNTMT FN CLR 1 & 2 CNDS FILL RATE HI** **2B-3.12 – CNTMT FN CLR 3 & 4 CNDS FILL RATE HI** **5B-3.4 – PRZR 1 OF 4 PRESS LO** **5B-4.4 – PRZR 1 OF 4 SI PRESS LO** **5B-3.6 – PRZR LVL LO** **5C-1.2 – PRZR LVL DEV LO** **5C-3.3 – PRZR PRESS LO BACKUP HTRS ON** **6A-3.4 – CHRG FLO HI / LO**		
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
Examiner Note: **The following steps are from EOP-0.0A, Reactor Trip or Safety Injection.**		
	RO	VERIFY Reactor Trip: [1]
		• VERIFY Reactor Trip Breakers – OPEN. [1.a]
		• VERIFY Neutron flux – DECREASING. [1.a]
		• VERIFY all Control Rod Position Rod Bottom Lights – ON. [1.b]
	BOP	VERIFY Turbine Trip: [2]
		• VERIFY all HP Turbine Stop Valves – CLOSED. [2]
	BOP	VERIFY Power to AC Safeguards Buses: [3]
		• VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [3.a]
		• VERIFY both AC Safeguards Buses – ENERGIZED. [3.b]

Operating Test : NRC	Scenario # 1	Event # 6, 7, 8	Page 20 of 37
Event Description: Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure			

Time	Position	Applicant's Actions or Behavior
	RO	CHECK SI status: [4]
		• VERIFY SI Actuated – FIRST OUT ANNUNCIATOR LIT [4.a]
Examiner Note: **SI fails to actuate automatically. Requires MANUAL actuation (Event 7).**		
CRITICAL TASK STATEMENT		**Initiate Train A and/or Train B Safety Injection due to Failure to Automatically Actuate prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection.**
	RO	Check if SI is required. [4.a.RNO]
		• Steam Line Pressure less than 610 psig.
		• Pressurizer Pressure less than 1820 psig.
		• Containment Pressure greater than 3.0 psig.
	RO	IF SI is required, THEN manually actuate SI from either handswitch. [4.a.RNO]
		VERIFY Both Trains SI Actuated: [4.b]
		• SI Actuated blue status light – ON NOT FLASHING [4.b]
CRITICAL TASK	RO	Manually Actuate SI. [4.b.RNO]
Examiner Note: **RO will trip RCP 1-03 after completion of EOP-0.0A, Immediate Actions due to High Vibrations.**		
	RO	Secure RCP 1-03 Upon completion of EOP-0.0A Immediate Actions.
Examiner Note: **The RO may adjust seal injection and the BOP may adjust AFW Flow in accordance with guidance on the EOP-0.0A Foldout Page.**		

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8	Page	21	of	37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure								

Time	Position	Applicant's Actions or Behavior
		CAUTION: A Safety Injection actuation will affect normal egress from the Containment Building. Attachment 9 of this procedure provides instructions to evacuate personnel from the Containment during a Safety Injection actuation.
		NOTE: Attachment 2 is required to be completed before FRGs are implemented.
		Examiner Note: EOP-0.0A, Attachment 2 steps performed by BOP begin on Page 32 of the scenario guide.
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2.
	RO	VERIFY AFW Alignment:
		• VERIFY both MDAFW Pumps – RUNNING.
		• PLACE TDAFW Pump in PULLOUT per Foldout Page.
		• VERIFY AFW total flow – GREATER THAN 460 GPM.
		• VERIFY AFW valve alignment - PROPER ALIGNMENT.
	RO	VERIFY Containment Spray NOT Required:
		• VERIFY 1-ALB-2B, Window 1-8, CS ACT – NOT ILLUMINATED.
		• VERIFY 1-ALB-2B, Window 4-11, CNTMT ISOL PHASE B ACT – NOT ILLUMINATED.
		• VERIFY Containment pressure – LESS THAN 18.0 psig.
		• VERIFY Containment Spray Heat Exchanger Outlet Valves – CLOSED.
		• VERIFY Containment Spray Pumps – RUNNING.

Operating Test : NRC	Scenario # 1	Event # 6, 7, 8	Page 22 of 37
Event Description: Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure			

Time	Position	Applicant's Actions or Behavior
	RO	CHECK if Main Steam lines should be ISOLATED:
		• VERIFY Containment pressure – LESS THAN 6.0 psig.
		• VERIFY Steam Line pressure – GREATER THAN 610 psig.
Examiner Note:		**T_{COLD} is used to determine RCS temperature trend as this indication will be accurate independent of the condition of the RCPs.**
	RO	CHECK RCS Temperature:
		• VERIFY RCS Average Temperature – STABLE AT OR TRENDING TO 557°F.
		• If temperature less than 557°F, PERFORM the following:
		• STOP dumping steam.
		• If cooldown continues, MINIMIZE AFW flow as required.
		• If cooldown continues, CLOSE MSIVs.
	RO	CHECK PRZR Valve Status:
		• VERIFY PRZR Safeties – CLOSED.
		• VERIFY Normal PRZR Spray Valves – CLOSED.
		• VERIFY PORVs – CLOSED.
		• VERIFY Power to at least 1 Block Valve – AVAILABLE.
		• VERIFY Block Valves – AT LEAST ONE OPEN.
CRITICAL TASK STATEMENT		**Trip Reactor Coolant Pumps within 5 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection, or EOP-1.0A, Loss of Reactor or Secondary Coolant.**
	RO	VERIFY RCS subcooling less than 25ºF (55ºF FOR ADVERSE CONTAINMENT) and STOP all RCPs.
		• VERIFY RCS subcooling – LESS THAN 25°F.
		• VERIFY ECCS Pumps (CCP or SI) – AT LEAST ONE RUNNING.
CRITICAL TASK		• STOP all RCPs.

Operating Test : NRC	Scenario # 1	Event # 6, 7, 8	Page 23 of 37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure		

Time	Position	Applicant's Actions or Behavior
	RO/BOP	CHECK if Any Steam Generator Is Faulted:
		• VERIFY NO Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER.
		• VERIFY NO Steam Generator pressure – COMPLETELY DEPRESSURIZED.
	RO/BOP	CHECK if Steam Generator Tubes Are NOT Ruptured:
		• VERIFY Condenser Off Gas radiation – NORMAL.
		• VERIFY Main Steam Line radiation – NORMAL.
		• VERIFY SG Blowdown Sample Radiation Monitor – NORMAL.
		• VERIFY levels in all Steam Generators – NORMAL.
	RO/BOP	CHECK if RCS is Intact:
		• VERIFY Containment pressure – GREATER THAN 1.3 psig.
		• VERIFY Containment recirculation sump levels – NOT NORMAL.
		• VERIFY Containment radiation levels – NOT NORMAL.
		• GO to EOP-1.0A, Loss of Reactor or Secondary, Step 1.
	US	TRANSITION to EOP-1.0A, Loss of Reactor or Secondary Coolant, Step 1.

Examiner Note: **EOP-1.0A, Loss of Reactor or Secondary Coolant steps begin here.**

CAUTION: Following a high energy line rupture inside containment, the operator should not rely upon steam generator water level indications in any depressurized steam generators.

NOTE: As PRZR Temperature decreases the error on indicated PRZR level will increase. Attachment 2 may be used to determine actual PRZR level.

Operating Test : NRC	Scenario # 1	Event # 6, 7, 8	Page 24 of 37
Event Description: Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure			

Time	Position	Applicant's Actions or Behavior
	US	CHECK If RCPs Should Be Stopped:
		• VERIFY RCS subcooling less than 25ºF (55ºF FOR ADVERSE CONTAINMENT).
		• VERIFY ECCS Pumps (CCP or SI) – AT LEAST ONE RUNNING.
CRITICAL TASK STATEMENT		**Trip Reactor Coolant Pumps within 5 minutes upon a Loss of Subcooling per EOP-0.0A, Reactor Trip or Safety Injection, or EOP-1.0A, Loss of Reactor or Secondary Coolant.**
	RO	VERIFY RCS subcooling less than 25ºF (55ºF FOR ADVERSE CONTAINMENT) and STOP all RCPs.
CRITICAL TASK		• STOP all RCPs.
	RO/BOP	CHECK if Any Steam Generator Is Faulted:
		• VERIFY NO Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER.
		• VERIFY NO Steam Generator pressure – COMPLETELY DEPRESSURIZED.
	US	CHECK Intact Steam Generator Levels:
		• VERIFY Narrow range level – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT).
		• MAINTAIN total AFW flow greater than 460 GPM until narrow range level GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT).
	US	CHECK Secondary Radiation NORMAL:
		• VERIFY Condenser off gas radiation – NORMAL.
		• VERIFY Main Steam Line radiation – NORMAL.
		• VERIFY SG Blowdown Sample Radiation Monitor – NORMAL.
		• VERIFY levels in all Steam Generators – NORMAL.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8	Page	25	of	37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure								

Time	Position	Applicant's Actions or Behavior
		CAUTION: If any PRZR PORV opens because of high PRZR pressure, Step 5b should be repeated after pressure decreases to less than the PORV setpoint.
	US	CHECK PRZR PORVs and Block Valves:
		• VERIFY power to Block Valves – AVAILABLE.
		• VERIFY PORVs – CLOSED.
		• VERIFY Block Valves – AT LEAST ONE OPEN.
	US/RO	CHECK if ECCS Flow Should Be Reduced:
		• VERIFY Secondary heat sink conditions – SATISFIED.
		• VERIFY total AFW flow to Intact SGs – GREATER THAN 460 GPM.
		• VERIFY intact SG NR level – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT).
		• VERIFY RCS subcooling – NOT GREATER THAN 25°F (55°F FOR ADVERSE CONTAINMENT).
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
		CAUTION: When time permits, Attachment 9 of EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION should be performed to realign equipment after an SI signal has been reset.
	RO/BOP	RESET ESF Actuation Signals.
	RO/BOP	PLACE both EDG EMERG STOP/START handswitches in START.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8	Page	26	of 37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure							

Time	Position	Applicant's Actions or Behavior
	RO/BOP	RESET SI.
		• DEPRESS 1/1-SIRA, TRAIN A SI RESET pushbutton.
		• DEPRESS 1/1-SIRB, TRAIN A SI RESET pushbutton.
	RO/BOP	RESET SI Sequencers.
		• At SI Sequencer Train A Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.
		• At SI Sequencer Train B Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• After ~ 2 seconds, PLACE ON/RESET toggle switch in ON.
	RO/BOP	RESET Containment Isolation Phase A and Phase B.
		• DEPRESS 1/1-C1PARA, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PARB, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PBRA, CNTMT ISOL – PHASE B RESET pushbutton.
		• DEPRESS 1/1-C1PBRB, CNTMT ISOL – PHASE B RESET pushbutton.
	RO/BOP	RESET Containment Spray Signal.
		• DEPRESS 1/1-CSRA, TRAIN A CS RESET pushbutton.
		• DEPRESS 1/1-CSRB, TRAIN B CS RESET pushbutton.

<u>**CAUTION:**</u> RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT) the RHR pumps must be manually restarted to supply water to the RCS.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8	Page	27	of	37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure								

Time	Position	Applicant's Actions or Behavior
	US	CHECK If RHR Pumps Should Be Stopped:
	RO/BOP	• VERIFY RCS pressure – GREATER THAN 325 psig (425 psig FOR ADVERSE CONTAINMENT).
	RO/BOP	• VERIFY RCS pressure – STABLE OR INCREASING.
	RO/BOP	• VERIFY RHR Pumps – RUNNING WITH SUCTION ALIGNED TO RWST.
	RO/BOP	• STOP RHR Pumps and PLACE in standby.
	RO/BOP	• RESET RHR Auto Switchover.
Examiner Note:		**A Loss of Safeguards Bus 1EA1 (86-2) will occur upon RESET of RHR Auto Swapover. The Train 'A' EDG will start and energize the bus. Centrifugal Charging Pump (CCP) 1-01 will then fail to sequence on to the bus. This will result in the need to Restart CCP 1-01 (Event 8).**
	US	CHECK RCS and SG Pressures:
	RO/BOP	• VERIFY RCS pressure – STABLE OR DECREASING.
	RO/BOP	• VERIFY all SG pressures – STABLE OR INCREASING.
	US	CHECK If Diesel Generators Should Be Stopped:
	RO/BOP	• VERIFY AC Safeguards Buses ENERGIZED by Diesel Generators.
	RO/BOP	Restart Centrifugal Charging Pump (CCP) 1-01.
		NOTE: Verification of at least one flowpath from a RHR pump to the RCS via a SI pump or CCP is sufficient to verify cold leg recirculation capability.

Operating Test : NRC	Scenario # 1	Event # 6, 7, 8	Page 28 of 37
Event Description: Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure			

Time	Position	Applicant's Actions or Behavior
	US	INITIATE Evaluation of Plant Status.
	RO/BOP	• VERIFY Cold Leg Recirculation capability:
		• VERIFY Train A RHR Pump – AVAILABLE.
		• VERIFY CCW to Train A RHR Pump – AVAILABLE.
		• VERIFY 1/1-8811A, CNTMT SMP TO RHRP 1 SUCT ISOL VLV – AVAILABLE.
		• VERIFY Train B RHR Pump – AVAILABLE.
		• VERIFY CCW to Train B RHR Pump – AVAILABLE.
		• VERIFY 1/1-8811B, CNTMT SMP TO RHRP 2 SUCT ISOL VLV – AVAILABLE.
		• VERIFY 1/1-8804A, RHRP 1 TO CCP SUCT VLV – AVAILABLE.
		• VERIFY 1/1-8804B, RHRP 2 TO SIP SUCT VLV – AVAILABLE.
	RO/BOP	• CHECK Auxiliary Building and Safeguards Building radiation – NORMAL:
		• CHECK PC-11 monitors – NORMAL OR Notify Radiation Protection to take local Radiation Surveys.
	US	• NOTIFY Chemistry to obtain RCS samples to assist in determining extent of the accident.
	US	• CONTACT Plant Staff to EVALUATE plant equipment.
	US	CHECK if RCS Cooldown and Depressurization Is Required:
	RO/BOP	• VERIFY RCS pressure – GREATER THAN 325 psig (425 psig FOR ADVERSE CONTAINMENT).
	US	• GO to EOS-1.2A, Post LOCA Cooldown and Depressurization, Step 1.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8	Page	29	of	37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure								

Time	Position	Applicant's Actions or Behavior
Examiner Note:		**EOS-1.2A, Post LOCA Cooldown and Depressurization, steps begin here. Steps in [brackets] are from the associated EOS-1.2A Attachments.**
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
		CAUTION: When time permits Attachment 9 of EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION should be performed to realign equipment after an SI signal has been reset.
	RO/BOP	[1.D] VERIFY Diesel Generators – RUNNING.
	RO/BOP	[1.D] VERIFY SI – RESET.
	RO/BOP	[1.D] VERIFY SI Sequencers – RESET.
	RO/BOP	[1.D] VERIFY Containment Isolation Phase A and Phase B – RESET.
	RO/BOP	[1.D] VERIFY Containment Spray Signal – RESET.
Simulator Operator Note:		**If requested, EXECUTE remote functions EDR73, 1EB3/11D BKR to CLOSE and EDR74, 1EB4/11D BKR to CLOSE to RESET Instrument Air Compressors 1-01 & 1-02.**

Operating Test : NRC	Scenario # 1	Event # 6, 7, 8	Page 30 of 37
Event Description: Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure			

Time	Position	Applicant's Actions or Behavior
	RO/BOP	[1.D] ESTABLISH Instrument Air and Nitrogen to Containment.
		• ESTABLISH Instrument Air:
		• VERIFY Air Compressor – RUNNING.
		• ESTABLISH Instrument Air to Containment:
		• ESTABLISH Nitrogen:
		• VERIFY ACCUM 1●4 VENT CTRL, 1-HC-943 – CLOSED.
		• OPEN SI/PORV ACCCUM N2 ISOL VLV 1/1-8880.
	BOP	VERIFY all AC Buses – ENERGIZED BY OFFSITE POWER.
CAUTION: PRZR heaters should not be energized until PRZR water level indicates greater than minimum level recommended by Plant Staff to ensure heaters are covered.		
	RO	DEENERGIZE PRZR Heaters:
		• PLACE all PRZR heater switches in OFF position.
		• CONSULT Plant Staff for a recommended minimum indicated PRZR water level that will ensure heaters are covered.
CAUTION: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT), the RHR pumps must be manually restarted to supply water to the RCS.		
	US	CHECK If RHR Pumps Should Be Stopped.
		• VERIFY RHR Pumps – NOT RUNNING.

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8	Page	31	of	37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure								

Time	Position	Applicant's Actions or Behavior
	US	CHECK Intact SG Levels:
		• VERIFY narrow range level – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT):
		• CONTROL AFW flow to maintain narrow range level between 43% (50% FOR ADVERSE CONTAINMENT) and 60%.
NOTE: Shutdown margin should be monitored during RCS cooldown.		
NOTE: After the low steamline pressure SI signal is blocked, main steamline isolation will occur if the high steam pressure rate setpoint is exceeded.		
CRITICAL TASK STATEMENT		**Initiate Cooldown of Reactor Coolant System Prior to Exiting EOS-1.2A, Post LOCA Cooldown and Depressurization.**
	US	INITIATE RCS Cooldown to Cold Shutdown:
		• MAINTAIN cooldown rate in RCS Cold Legs – LESS THAN 100°F/HR.
		• BLOCK Low Main Steam Pressure SI signal when Pressurizer pressure – LESS THAN 1960 psig.
CRITICAL TASK		• DUMP steam from intact Steam Generators via ARVs.
When an RCS Cooldown is initiated, TERMINATE the scenario.		

Operating Test : NRC	Scenario # 1	Event # 6, 7, 8	Page 32 of 37
Event Description: Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure			

Time	Position	Applicant's Actions or Behavior
Examiner Note: These steps are performed by the BOP per EOP-0.0A, Attachment 2.		
CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment.		
	BOP	VERIFY SSW Alignment:
		• VERIFY SSW Pumps – RUNNING.
		• VERIFY EDG Cooler SSW Return Flow.
	BOP	VERIFY Safety Injection Pumps – RUNNING.
	BOP	VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS).
	BOP	VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS).
	BOP	VERIFY CCW Pump 1-02 – RUNNING.
	BOP	VERIFY RHR Pumps – RUNNING.
	BOP	VERIFY Proper CVCS Alignment:
		• VERIFY CCPs – RUNNING.
		• VERIFY Letdown Relief Valve Isolation:
		• Letdown Orifice Isolation Valves – CLOSED.
		• Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED.

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY ECCS flow:
		• CCP SI flow indicator – CHECK FOR FLOW.
		• RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT).
		• SIP discharge flow indicator – CHECK FOR FLOW.
		• RCS pressure – LESS THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT).
		• GO to Step 9.
	BOP	VERIFY Feedwater Isolation Complete:
		• Feedwater Isolation Valves – CLOSED.
		• Feedwater Isolation Bypass Valves – CLOSED.
		• Feedwater Bypass Control Valves – CLOSED.
		• Feedwater Control Valves – CLOSED.
	BOP	VERIFY Diesel Generators – RUNNING.
	BOP	VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB10 – LIT.
NOTE: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication.		
	BOP	VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION.
	BOP	INITIATE periodic monitoring of Spent Fuel Cooling.
		• Spent Fuel Pool temperature (T2900A, T2901A).
		• Spent Fuel Pool level (L4800A, L4801A, L4802A, L4803A).

Operating Test : NRC	Scenario # 1	Event # 6, 7, 8	Page 34 of 37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure		

Time	Position	Applicant's Actions or Behavior

NOTE: Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

NOTE: When the SI sequencer has timed out,the Reactor Makeup Water Pump with its handswitch in Auto will restart.

Time	Position	Applicant's Actions or Behavior			
	BOP	VERIFY Components on Table 1 are Properly Aligned.			
		Location	Equipment	Description	Condition
		CB-03	X-HS-5534	H2 PRG SPLY FN 4	STOPPED
		CB-03	X-HS-5532	H2 PRG SPLY FN 3	STOPPED
		CB-04	1/1-8716A	RHRP 1 XTIE VLV	OPEN
		CB-04	1/1-8716B	RHRP 2 XTIE VLV	OPEN
		CB-06	1/1-8153	XS LTDN ISOL VLV	CLOSED
		CB-06	1/1-8154	XS LTDN ISOL VLV	CLOSED
		CB-07	1/1-RTBAL	RX TRIP BKR	OPEN
		CB-07	1/1-RTBBL	RX TRIP BKR	OPEN
		CB-07	1/1-BBAL	RX TRIP BYP BKR	OPEN/DEENERGIZED
		CB-07	1/1-BBBL	RX TRIP BYP BKR	OPEN/DEENERGIZED
		CB-08	1-HS-2397A	SG 1 BLDN HELB ISOL VLV	CLOSED
		CB-08	1-HS-2398A	SG 2 BLDN HELB ISOL VLV	CLOSED
		CB-08	1-HS-2399A	SG 3 BLDN HELB ISOL VLV	CLOSED
		CB-08	1-HS-2400A	SG 4 BLDN HELB ISOL VLV	CLOSED
		CB-08	1-HS-2111C	FWPT A TRIP	TRIPPED
		CB-08	1-HS-2112C	FWPT B TRIP	TRIPPED
		CB-09	1-HS-2490	CNDS XFER PUMP	STOPPED (MCC deenergized on SI)
		CV-01	X-HS-6181	PRI PLT SPLY FN 17 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-6188	PRI PLT SPLY FN 18 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-6195	PRI PLT SPLY FN 19 & INTK DMPR	STOPPED/DEENERGIZED

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8	Page	35	of	37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure								

Time	Position	Applicant's Actions or Behavior

	CV-01	X-HS-6202	PRI PLT SPLY FN 20 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6209	PRI PLT SPLY FN 21 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6216	PRI PLT SPLY FN 22 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6223	PRI PLT SPLY FN 23 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6230	PRI PLT SPLY FN 24 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-3631	UPS & DISTR RM A/C FN 1 & BSTR FN 42	STARTED
	CV-01	X-HS-3632	UPS & DISTR RM A/C FN 2 & BSTR FN 43	STARTED
	CV-01	1-HS-5600	ELEC AREA EXH FN 1	STOPPED/DEENERGIZED
	CV-01	1-HS-5601	ELEC AREA EXH FN 2	STOPPED/DEENERGIZED
	CV-01	1-HS-5602	MS & FW PIPE AREA EXH FN 3 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5603	MS & FW PIPE AREA EXH FN 4 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5618	MS & FW PIPE AREA SPLY FN 17	STOPPED/DEENERGIZED
	CV-01	1-HS-5620	MS & FW PIPE AREA SPLY FN 18	STOPPED/DEENERGIZED
	CV-03	X-HS-5855	CR EXH FN 1	STOPPED/DEENERGIZED
	CV-03	X-HS-5856	CR EXH FN 2	STOPPED/DEENERGIZED
	CV-03	X-HS-5731	SFP EXH FN 33	STOPPED/DEENERGIZED
	CV-03	X-HS-5733	SFP EXH FN 34	STOPPED/DEENERGIZED
	CV-03	X-HS-5727	SFP EXH FN 35	STOPPED/DEENERGIZED
	CV-03	X-HS-5729	SFP EXH FN 36	STOPPED/DEENERGIZED

Operating Test :	NRC	Scenario #	1	Event #	6, 7, 8	Page	36	of	37
Event Description:	Rx Trip, SBLOCA, SI Fails to Actuate, 1EA1 (86-2 Lockout), CCP 1-01 Start Failure								

Time	Position	Applicant's Actions or Behavior

Examiner Note: The next four (4) steps would be performed on Unit 2.

	CB-03	2-HS-5538	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5539	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5537	AIR PRG SPLY ISOL DMPR	CLOSED
	CB-03	2-HS-5536	AIR PRG SPLY ISOL DMPR	CLOSED

Time	Position	Applicant's Actions or Behavior
	BOP	NOTIFY Unit Supervisor attachment instructions complete AND to IMPLEMENT FRGs as required.

EOP-0.0A, Attachment 2 steps are now complete.

;CPNPP 2015 NRC Initial Scenario 1
;Load IC18

;INITIAL SETUP

;Both Trains SI Fail to Actuate (Event 7)
IMF RP07A f:1
IMF RP07B f:1

;Train A pressure switch fails to start B CCWP (Event 2)
IMF CC03A f:1

;CCP 1-01 Fails to sequence on BO (Event 8)
IMF CV01F f:1

;MALFUNCTIONS

;CCW Pump 1-01 Trip (Event 2)
IMF CC02A f:1 k:2

;CRDM Vent fan 1 Phase Overcurrent (Event 3)
IMF CH10 f:1 k:3

;Cold Leg Loop 1 NR Fail High (TE-411B) (Event 4)
IMF RP05A f:630 k:4

;RCP 3 Vibration 20 mils (Event 5)
IMF RC03C f:20 r:300 k:5

;SBLOCA Loop 3 1500 gpm (Event 6)
{DIRPRTC.Value=1} IMF RC19C f:1500

;86-2 on bus 1EA1 insert on Train B SI (Event 8)
{DICSHSRWSTB.Value=1} IMF ED05E f:1

June 2015 NRC Exam

Facility: CPNPP 1 & 2 Scenario No.: 2 Op Test No.: June 2015

Examiners: ______________________ Operators: ______________________

______________________ ______________________

______________________ ______________________

Initial Conditions: 1 x 10^{-8} amps following a refueling outage. MDAFWPs are maintaining Steam Generator Water Levels 60-75%. Steam dumps are in Steam Pressure mode. Boron is 1669 ppm (by sample).

Turnover: Raise power to 100%.

Critical Tasks:
- Isolate Reactor Coolant System Leakage Paths in accordance with ECA-0.0A, Loss of All AC Power, prior to initiation of Steam Generator depressurization.
- Restore Power to Bus 1EA2 in accordance with ECA-0.0A, Loss of All AC Power, prior to initiation of Steam Generator depressurization.
- Identify and isolate the Faulted Steam Generator Prior to Exiting EOP-2.0A, Faulted Steam Generator Isolation.
- Terminate Safety Injection prior to exiting from EOS-1.1A, Safety Injection Termination.

Event No.	Malf. No.	Event Type*	Event Description
1	---	R - RO N - BOP N - SRO	Begin raising power to 2% to 3%.
2	CV01B	C - RO TS - SRO	Centrifugal Charging Pump (CCP) 1-01 trip.
3	RX08A	I - RO TS - SRO	PT-455 PZR pressure fails high.
4	FW24B	C - BOP TS - SRO	AFW Pump 1-02 trips. Manual start of TDAFW Pump required.
5	RD03B12 RD03D2 RD03M14 RD03P4	C - RO C - SRO	Shutdown Bank A (4 rods) drops.
6	ED01 EG06A EG15B	M - ALL	Loss of Offsite Power. DG 1-01 will not start in auto or manual. DG 1-02 requires manual start.
7	MS01B	M - ALL	Main Steam Line Break on SG 1-02 inside containment.
8	RP09B	C - BOP	Auto Containment Isolation Phase A Actuation Failure on Train B

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

Actual	Target Quantitative Attributes
7	Total malfunctions (5-8)
3	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
2	Major transients (1-2)
3	EOPs entered/requiring substantive actions (1-2)
1	EOP contingencies requiring substantive actions (0-2)
4	Critical tasks (2-3)

SCENARIO 2 SUMMARY

Event 1
In accordance with turnover instructions, the crew begins raising power to 2% to 3%, per IPO-002A, Plant Startup From Hot Standby, Section 5.4, Increasing Reactor Power to Approximately 2% Following Reactor Startup and Establishing Main Feedwater Flow to the SGs.

Event 2
The next event is a Centrifugal Charging Pump (CCP) 1-01 trip. The crew will enter ABN-105, Section 3.0, Charging Pump Trip; and as an Initial Operator Action, the operator will manually start CCP 1-02. The SRO will refer to Technical Specifications.

Event 3
The next event is a failure of Pressurizer Pressure Channel PT-455 high. The crew will enter ABN-705, Pressurizer Pressure Malfunction, Section 2.0, Pressurizer Pressure Instrument Malfunction. The associated PORV will open and the operator will close the PORV, its associated Block Valve, and place 1-PK-455A, Master Pressurizer Pressure Controller in manual and control PZR pressure. The SRO will refer to Technical Specifications.

Event 4
Upon Pressurizer pressure control restoration to automatic, Motor Driven Auxiliary Feedwater Pump (MDAFWP) 1-02 will trip. The crew will enter ABN-305, Auxiliary Feedwater System Malfunction, Section 3.0, Motor Driven Auxiliary Feedwater Pump Malfunction. The crew will manually start the Turbine Driven Auxiliary Feedwater Pump (TDAFWP) and feed Steam Generators 1-03 and 1-04 with the TDAFWP. The SRO will refer to Technical Specifications.

Event 5
When the Unit is stable, Shutdown Bank A Control Rods will drop fully into the core. The reactor will be manually tripped. The crew will enter EOP-0.0A, Reactor Trip or Safety Injection, and transition to EOS-0.1A, Reactor Trip Response.

Event 6
After the crew has transitioned to EOS-0.1A, Reactor Trip Response, a Loss of Offsite Power occurs. In conjunction with the Loss of Offsite Power, Emergency Diesel Generator (EDG) 1-01 will fail to start and EDG 1-02 will fail to automatically start. The crew will transition to ECA-0.0A, Loss of All AC Power. Letdown will be isolated as a Critical Task for isolating leakage paths. Power is restored in ECA-0.0A, via manual start of EDG 1-02.

Event 7
After transitioning back to EOS-0.1A, Reactor Trip Response, a Main Steamline Break occurs on SG 1-02 inside containment. The crew will transition back to EOP-0.0A, Reactor Trip or Safety Injection and then transition to EOP-2.0A, Faulted Steam Generator isolation. Upon completion of EOP-2.0A actions, the crew will terminate Safety Injection in accordance with EOS-1.1A, Safety Injection Termination. The scenario will be terminated upon completion of SI termination.

Event 8
When the crew transitions to EOP-0.0A, Reactor Trip or Safety Injection, the Unit Supervisor will direct the Balance-of-Plant (BOP) Operator to perform Attachment 2, Safety Injection Actuation Alignment, and during performance, the BOP Operator will discover that Auto Containment Isolation Phase A has failed on the B Train. This will require the operator to manually initiate Phase A on Train B and verify that a proper containment isolation has occurred.

Risk Significance:

- Failure of risk important system prior to trip: Charging Pump trips
4 dropped rods
AFW pump trips
- Risk significant core damage sequence: Loss of Offsite Power
DG failures to start
Main Steam Line Break
- Risk significant operator actions: Manually start TDAFW pump
Manually start DG 1-02
Identify and isolate faulted SG
Manually initiate Phase A, Train B

Critical Task Determination

Critical Task	Safety Significance	Cueing	Measurable Performance Indicators	Performance Feedback
Isolate Reactor Coolant System Leakage Paths in accordance with ECA-0.0A, Loss of All AC Power, prior to initiation of Steam Generator depressurization.	Take one or more actions that would prevent a challenge to plant safety.	Procedural direction at ECA-0.0A Step 3 to minimize RCS inventory loss. Valve position indication and letdown flow.	The operator will manually close the Letdown Isolation Valves.	Valve position will change and letdown flow will lower to zero.
Restore Power to Bus 1EA2 in accordance with ECA-0.0A, Loss of All AC Power, prior to initiation of Steam Generator depressurization.	Recognize a failure or an incorrect automatic actuation of an ESF system or component resulting in degraded ECCS capacity.	Procedural direction at ECA-0.0A Step 5 to restore power via EDG 1-02 to 1EA2. Bus voltage indication and EDG parameters.	The operator will manually start EDG 1-02 using the handswitch on CB-11.	Indication of DG running and loading via bus voltage and frequency.
Identify and isolate the Faulted Steam Generator Prior to Exiting EOP-2.0A, Faulted Steam Generator Isolation.	Take one or more actions that would prevent a challenge to plant safety.	Procedurally driven from EOP-2.0A to isolate the faulted SG to prevent further RCS cooldown and mass addition to containment.	The operator will close the AFW flow control valve to SG 1-02.	Valve position will change and AFW flow to SG 1-02 will reduce to zero.
Terminate Safety Injection prior to exiting from EOS-1.1A, Safety Injection Termination.	Take one or more actions that would prevent a challenge to plant safety.	Procedurally driven from EOS-1.1A to terminate Safety Injection and preclude filling the pressurizer.	The operator will stop pumps and close valves which will terminate flow to the RCS via the SI injection flow paths.	Valve position, pump running indication and discharge pressures and flow to the RCS.

SIMULATOR OPERATOR INSTRUCTIONS for SIMULATOR SETUP

INITIALIZE to IC08 and LOAD NRC Scenario 2.

EVENT	REM. FUNC.	MALF.	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
6		EG06A	Diesel Generator (1-01) Air Start Failure	f:1	K0
		EG15B	Diesel Generator (1-02) Fail to Auto Start		
8		RP09B	Auto Containment Isolation Phase A Failure (Train B)	f:1	K0
2		CV01B	CCP 1-01 trips.	f:1	K2
3		RX08A	PT-455 PZR Pressure Fails High.	f:2500	K3
4		FW24B	AFW Pump 1-02 trips.	f:1	K4
5		RD03B12 RD03D2 RD03M14 RD03P4	Shutdown Bank A, Group 1 rods drop (4 rods).	f:1	K5
6		ED01	Loss of Offsite Power	f:1	K6
		EG06A	DG 1-01 Air Start Failure.		K0
		EG15B	DG 1-02 Fail to Auto Start.		K0
7		MS01B	Main Steam Line Break on SG 1-02 Inside Containment	f:2	K7
8		RP09B	Auto Containment Isolation Phase A Failure (Train B)	f:1	K0

<u>Simulator Operator</u>:	**INITIALIZE to IC08 and LOAD NRC Scenario 2.** **ENSURE all Simulator Annunciator Alarms are ACTIVE.** **ENSURE all Control Board Tags are removed.** **ENSURE Operator Aid reflects current boron conditions (1669 ppm BOL).** **ENSURE Rod Bank Update (RBU) is performed (C at 214 / D at 99).** **ENSURE Turbine Load Rate set at 10 MWe/minute.** **ENSURE 60/90 buttons DEPRESSED on ASD.** **ENSURE ASD speakers are ON to half volume.** **ENSURE Reactivity Briefing Sheet printout provided with Turnover (BOL).** **ENSURE procedures in progress are on SRO desk:** **- COPY of IPO-002A, Plant Startup From Hot Standby, Section 5.4, Increasing Reactor Power to Approximately 2% Following Reactor Startup and Establishing Main Feedwater Flow to the SGs <u>AND</u> Bubble Chart Page 5 provided.** **ENSURE Control Rods are in MANUAL with Bank C at 214 steps and Bank D at 99 steps.** **ENSURE PCS TT06 is set to "GTGC MODE2" and on proper scale.**

<u>Control Room Annunciators in Alarm</u>:
1-ALB-6D-1.1 – SR HI VOLT FAIL
1-ALB-6D-3.1 – SR SHTDN FLUX ALM BLK
PCIP-1.1 – SR TRN A RX TRIP BLK
PCIP-1.3 – AMSAC BLK TURB < 40% PWR C-20
PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9
PCIP-2.1 – SR TRN B RX TRIP BLK
PCIP-2.4 – LO TURB PWR ROD WITHDRWL BLK C-5
PCIP-2.5 – SR RX TRIP BLK PERM P-6
PCIP-3.5 – RX & TURB ≤ 10% PWR P-7
PCIP-4.5 – RX ≤ 48% PWR 3-LOOP FLO PERM P-8
PCIP-4.6 – TURB ≤ 10% PWR P-13
1-ALB-7B-1.6 – FW FLUSH VLV NOT CLOSE HV-2166
1-ALB-8A-1.10 – 1 OF 4 TURB STOP VLV CLOSE
1-ALB-10A-3.12 – GEN PRI WTR SYS TRBL
1-ALB-9A – Various Heater Drain and Extraction Steam Alarms

Operating Test : NRC	Scenario # 2	Event # 1	Page 6 of 39
Event Description: Raise Reactor Power to 2% to 3%			

Time	Position	Applicant's Actions or Behavior

Examiner Note: The following steps are from IPO-002A, Plant Startup From Hot Standby, Section 5.4, Increasing Reactor Power to Approximately 2% Following Reactor Startup and Establishing Main Feedwater Flow to the SGs.

CAUTION:

- The preferred methods to maintain Reactor Power and temperature prior to Turbine Generator synchronization are use of Steam Dumps and SG Blowdown Flow. Steam Dump operation and Main Steam Line Drain flow affect LP Turbine casing ΔT, which should be monitored prior to synchronization.
- If LP Turbine casing ΔT approaches limits prior to synchronization, a reduction in Steam Dump operation may be required, and Main Steam Line drain flow should also be limited.
- The preferred method, to reduce Steam Dump Operation and Main Steam Line drain flow, is maintaining maximum SG Blowdown flow.
- SG Atmospherics should not be routinely used to minimize Steam Dump operation.

NOTE:

- The verification of Power Range response and reaching the point of adding heat can be used to ensure proper Nuclear Instrumentation response.
- Intermediate Range should be monitored and/or trended to provide alternate indication of how power is trending. At low power, Power Range Instruments may not give an accurate trend of actual power.

Time	Position	Applicant's Actions or Behavior
	RO	Withdraw control rods to establish a 0.5 dpm startup rate.
	RO	Reduce startup rate to 0.2 dpm at approximately 3 x 10^{-6} amps.
	RO	Verify Power Range channels begin to respond.
	RO	VERIFY Steam Dumps are maintaining temperature.
	RO	VERIFY 1-PCIP, 3.6 TAVE LO LO P-12 is OFF.
	RO	Maintain Reactor Power between 2% and 3%.

When the crew has demonstrated that they can maintain power stable between 2% and 3%, or at Lead Examiner discretion, PROCEED to Event 2.

Operating Test :	NRC	Scenario #	2	Event #	2	Page	7	of	39
Event Description:	Centrifugal Charging Pump (CCP) 1-01 trips.								

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 2 (Key 2). - CV01B, Centrifugal Charging Pump (CCP) 1-01 trip.		
Indications Available: **5A-1.6 – ANY RCP SEAL WTR INJ FLO LO** **6A-1.7 – ANY CHG PMP OVRLOAD / TRIP** **6A-3.4 – CHG FLO HI / LO** **1-FI-121A, CHRG FLO lowers to zero (0) GPM** **1/1-APCH1, CCP 1, amber MISMATCH and white TRIP lights LIT**		
	RO	RESPOND to Annunciator Alarm Procedures.
	RO	RECOGNIZE Charging Pump 1-01 trip.
	US	DIRECT performance of ABN-105, Chemical and Volume Control System Malfunction, Section 3.0.
Examiner Note: The following steps are from ABN-105, Chemical and Volume Control System Malfunction, Section 3.0, Charging Pump Trip. The Diamond steps (◊) are Initial Operator Actions.		

CAUTION: With NO Seal Injection flow AND NO Thermal Barrier cooling the affected RCP must be secured within ONE minute.

Consideration should be given to ensure gas binding not a factor before starting a charging pump. Indications of potential gas binding are:

- PDP SUCT STAB LVL HI-HI (6A-1.8)
- CHRG FLO HI/LO (6A-3.4)
- VCT LVL LO-LO (6A-4.5)
- Fluctuating charging header pressure/flow prior to pump trip.

Section 7.0 provides for recovery from gas binding of a charging pump.

NOTE: Diamond steps 1 denotes Initial Operator Action. Step 1 RNO actions may be performed concurrently.

Operating Test :	NRC	Scenario #	2	Event #	2	Page	8	of	39
Event Description:	Centrifugal Charging Pump (CCP) 1-01 trips.								

Time	Position	Applicant's Actions or Behavior
	◊ RO ◊	START Centrifugal Charging Pump 1-02. [Step 3.3.1]
	RO	VERIFY at least one Charging Pump - RUNNING. [Step 3.3.2]
	RO	VERIFY Seal Injection Flow to each RCP – BETWEEN 6 GPM AND 13 GPM. [Step 3.3.3]
	RO	VERIFY RCP parameters in – NORMAL OPERATING RANGE. [Step 3.3.4]

Examiner Note: **The crew will use the Plant Computer on screen "GD RCP1(2,3,4)" to monitor RCP parameters.**

PARAMETER	RCP 1	RCP 2	RCP 3	RCP 4
LOW SEAL WTR BEARING TEMP (Pump Radial)	T0417A	T0437A	T0457A	T0477A
SEAL WTR IN TEMP	T0181A	T0182A	T0183A	T0184A
SEAL LKOFF FLO	u-FR-157	u-FR-156	u-FR-155	u-FR-154

Time	Position	Applicant's Actions or Behavior
	RO	VERIFY PRZR level – GREATER THAN 17% AND INCREASING. [Step 3.3.5]

Simulator Operator: **When contacted about status of Centrifugal Charging Pump 1-01, REPORT Phase 'B' 50/51 overcurrent relays are tripped at the breaker and an acrid odor is present at the CCP.**

Simulator Operator: **When contacted, EXECUTE remote functions CVR05 and CVR06 for the Centrifugal Charging Pump (1-01 & 1-02) Auxiliary Lube Oil Pumps.**

Operating Test : NRC	Scenario # 2	Event # 2	Page 9 of 39
Event Description: Centrifugal Charging Pump (CCP) 1-01 trips.			

Time	Position	Applicant's Actions or Behavior
Examiner Note: In the event that Letdown was isolated in ABN-105, Step 1, the following steps will re-establish Letdown.		
	RO	IF isolated in Step1, THEN establish normal Letdown: [Step 3.3.6]
		• OPEN Letdown Isolation Valves: [Step 3.3.6.a] • 1/1-LCV-460, LTDN ISOL VLV • 1/1-LCV-459, LTDN ISOL VLV • 1/1-8152, LTDN CNTM ISOL VLV ORC • 1/1-8160, LTDN CNTMT ISOL VLV IRC
		• Manually OPEN 1-PK-131, LTDN HX OUT PRESS CTRL to 30% demand (50% if restoring two orifice valves). [Step 3.3.6.b]
		• Manually OPEN 1-TK-130, LTDN HX OUT TEMP CTRL to 50%demand. [Step 3.3.6.c]
		• ADJUST charging to desired flow and MAINTAIN seal injection flow between 6 and 14 gpm. [Step 3.3.6.d] ~100 gpm
		• OPEN selected Letdown Orifice Isolation Valves(s). [Step 3.3.6.e]
		• 1/1-8149A, LTDWN ORIFICE ISOL VLV (45 gpm) • 1/1-8149B, LTDWN ORIFICE ISOL VLV (75 gpm) • 1/1-8149C, LTDWN ORIFICE ISOL VLV (75 gpm)
		• ADJUST 1-PK-131, LTDN HX OUT PRESS CTRL to ~310 psig on 1-PI-131, LTDN HX OUT PRESS then PLACE in AUTO. [Step 3.3.6.f]
		• ADJUST 1-TK-130, LTDN HX OUT TEMP CTRL to obtain ~95ºF on 1-TI-130, LTDN HX OUT TEMP, then PLACE in AUTO. [Step 3.3.6.g]
	RO	VERIFY RCS leakage – NORMAL: [Step 3.3.7]
		• VERIFY PRZR level stable at or trending to program. [Step 3.3.7.a]
		• VERIFY Charging flow less than 15 gpm above Letdown flow. [Step 3.3.7.b]
	US	EVALUATE Technical Specifications. [Step 3.3.8]
		• LCO 3.5.2, ECCS - Operating.
		• CONDITION A - One train inoperable because of the inoperability of a centrifugal charging pump. • ACTION A.1 - Restore pump to OPERABLE status within 7 days.

Operating Test : NRC	Scenario # 2	Event # 2	Page 10 of 39
Event Description: Centrifugal Charging Pump (CCP) 1-01 trips.			

Time	Position	Applicant's Actions or Behavior
	US	EVALUATE Technical Requirements Manual. [Step 3.3.8]
		• LCO 13.1.31, Two boration injection subsystems shall be OPERABLE.
		• CONDITION B - One charging pump inoperable. • ACTION B.1 - Restore charging pump to OPERABLE status within 7 days.
	US	INITIATE a work request per STA-606. [Step 3.3.9]
	US	INITIATE a SMART Form per STA-421. [Step 3.3.10]
When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 3.		

Operating Test : NRC	Scenario # 2	Event # 3	Page 11 of 39
Event Description: PT-455 PRZR Pressure fails high.			

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 3 (Key 3). - RX08A, Pressurizer Pressure Channel (PT-455) fails high.		
Indications Available: **5C-1.4 - PORV 455A/456 NOT CLOSE** **5C-3.1 - PRZR 1 OF 4 PRESS HI** **5C-4.3 - PRZR PRESS DEV HI** **PRZR variable heaters turn OFF.** **Both PRZR spray valves OPEN.** **PORV OPENs and then closes once pressure reduces to 2185 psig.**		
	RO	RESPOND to Annunciator Alarm Procedures.
	RO	RECOGNIZE PRZR pressure channel PT-455A has failed high.
	US	DIRECT performance of ABN-705, Pressurizer Pressure Malfunction, Section 2.0.
Examiner Note: The following steps are from ABN-705, Pressurizer Pressure Malfunction, Section 2.0, Pressurizer Pressure Instrument Malfunction. The Diamond steps (◊) are Initial Operator Actions.		
NOTE: • Diamond steps denote initial action. • A PORV is not considered INOPERABLE when its actuation instrumentation is not functioning. • Power should NOT be removed from a block valve closed in accordance with this procedure section.		
	◊ RO ◊	VERIFY PORV – CLOSED. [Step 2.3.1] • Place PRZR PORV, 1/1-PCV-455A to CLOSE • Place PRZR PORV BLK VLV, 1/1-8000A to CLOSE
	◊ RO ◊	PLACE 1-PK-455A, PRZR MASTER PRESS CTRL in MANUAL. [Step 2.3.2]
	◊ RO ◊	ADJUST 1-PK-455A for current RCS pressure. [Step 2.3.3]

Operating Test :	NRC	Scenario #	2	Event #	3	Page	12	of	39
Event Description:	PT-455 PRZR Pressure fails high.								

Time	Position	Applicant's Actions or Behavior
	RO	TRANSFER 1/1-PS-455F, PRZR PRESS CTRL CHAN SELECT to an Alternate Controlling Channel. [Step 2.3.4]
	RO	PLACE 1-PK-455A, PRZR MASTER PRESS CTRL in AUTO. [Step 2.3.5]
	RO	VERIFY automatic control restoring Pressurizer pressure to 2235 psig. [Step 2.3.6]
	RO	ENSURE valid channel selected on recorder 1/1-PS-455G, 1-PR-455 PRZR PRESS SELECT. [Step 2.3.7]
	US/RO	IF necessary, return PORV closed in Step 1 RNO to AUTO and ENSURE it remains closed. [Step 2.3.8]
	US/RO	IF necessary, OPEN block valve closed in Step 1 RNO. [Step 2.3.9]
	US/RO	Within one hour, VERIFY PCIP Window 2.6 - PRZR PRESS SI BLK PERM P-11 – DARK. [Step 2.3.10]
	US/RO	VERIFY other instruments on common instrument line - NORMAL. [Step 2.3.11]

NOTE:

- If the failed channel temperature was reading lower than the substituted channel, then AVE Tave will increase when the channel is defeated due to another channel being substituted for the defeated signal to maintain accurate averaging.
- Rod Control is not required to be placed in MANUAL until a Tave loop is defeated using u-TS-412T. As long as a Tave loop is defeated, Rod Control should remain in MANUAL. This does not preclude placing rods in AUTO during rapidly changing transient conditions such as runbacks, etc. as long as rod control is returned to MANUAL when the plant is stabilized. The affected Tave loop does not need to be defeated until just prior to tripping bistables (tripping bistables will cause the N16 and Tave loop to fail low).

Operating Test : NRC	Scenario # 2	Event # 3	Page 13 of 39
Event Description: PT-455 PRZR Pressure fails high.			

Time	Position	Applicant's Actions or Behavior
	US	EVALUATE Technical Specifications. [Step 2.3.14]
		• LCO 3.3.1, Reactor Trip System Instrumentation (Function 6, Overtemperature N-16 & 8.b, Pressurizer Pressure High).
		• CONDITION E - One channel inoperable. • ACTION E.1 - Place channel in trip within 72 hours, OR • ACTION E.2 - Be in MODE 3 within 78 hours.
Examiner Note: Technical Specification 3.3.1, Reactor Trip System (RTS) Instrumentation, Function 8.a, "Pressurizer Pressure LOW" does not apply in current plant conditions. Must be in MODE 1 and above the P-7 (At Power Permissive) interlock for this Function to apply.		
		• LCO 3.3.2, ESFAS Instrumentation (Function 1.d, Safety Injection, Pressurizer Pressure - Low).
		• CONDITION D - One channel inoperable. • ACTION D.1 - Place channel in trip within 72 hours, OR • ACTION D.2.1 - Be in MODE 3 within 78 hours, AND • ACTION D.2.2 - Be in MODE 4 within 84 hours.
		• LCO 3.3.2, ESFAS Instrumentation (Function 8.b, ESFAS Interlocks, Pressurizer Pressure - P-11).
		• CONDITION L - One or more required channel(s) inoperable. • ACTION L.1 - Verify interlock is in required state for existing unit condition within one hour, OR • ACTION L.2.1 - Be in MODE 3 within 7 hours, AND • ACTION L.2.2 - Be in MODE 4 within 13 hours.
	US	INITIATE a Condition Report per STA-421, as applicable.
When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 4.		

Operating Test : NRC	Scenario # 2	Event # 4	Page 14 of 39
Event Description: AFW Pump 1-02 trips. Turbine Driven AFW Pump manual start.			

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 4 (Key 4). **- FW24BA, Motor Driven Auxiliary Feedwater Pump (MDAFWP) 1-02 trip.**		
Indications Available: **8B-4.3 - MD AFWP 1/2 OVRLOAD/TRIP** **1-HS-2451A, MD AFWP 2, amber MISMATCH and green PUMP lights LIT** **SGs 1-03 & 1-04 AFW FLO Indicators indicating (0) GPM (1-FI-2465A/C and 1-FI-2466A/C)** **MD AFWP 2 CURRENT indicating (0) AMPS (1-II-2451)** **MD AFWP 2 DISCH PRESS indicating (0) PSIG (1-PI-2454A)** **MD AFWP 2 DISCH FLO indicating (0) GPM (1-FI-2457A)** **SGs 1-03 & 1-04 LVL (NR) decreasing (1-LI-553/554 SGs 1-03/4 Controlling NR Channels)**		
	RO/BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE trip of Motor Driven Auxiliary Feedwater Pump 1-02.
	US	DIRECT performance of ABN-305, Auxiliary Feedwater System Malfunction, Section 3.0, Motor Driven Auxiliary Feedwater Pump Malfunction.
Examiner Note: The following steps are from ABN-305, Auxiliary Feedwater System Malfunction, Section 3.0, Motor Driven Auxiliary Feedwater Pump Malfunction.		
CAUTION: Placing the pump handswitch in STOP OR PULL-OUT with the pump tripped (white TRIP light) will reset the 86M relay (white TRIP light) and may result in an automatic restart if the handswitch is returned to AUTO.		
	US/BOP	Verify MD AFW Pump 1-02 has tripped. [Step 3.3.1]
CAUTION: Do not exceed 800 gpm total flow on one Motor Driven Auxiliary Feedwater Pump.		
	BOP	VERIFY MD AFW Pump 1-01 is running. [Step 3.3.2]

Operating Test :	NRC	Scenario #	2	Event #	4	Page	15	of	39
Event Description:	AFW Pump 1-02 trips. Turbine Driven AFW Pump manual start.								

Time	Position	Applicant's Actions or Behavior
CAUTION: Do NOT operate both Motor-Driven Auxiliary Feedwater Pumps at the same time with the trains cross-connected.		
	BOP	Verify Steam Generator levels - NORMAL. [Step 3.3.3 RNO]
		• Start the Turbine Driven AFW Pump and feed Steam Generator 1-03 and 1-04.
Simulator Operator: When contacted, REPORT the breaker for MD AFW Pump 1-02 tripped on overcurrent.		
	US	Dispatch an NEO to check breaker status of MD AFW Pump 1-02. (Step 3.3.4]
		• 1EA2/13/BKR, 1APMD2, AUXILIARY FEEDWATER PUMP 1-02 BKR (SFGD 852 Rm 1-103)
	BOP	Verify MD AFW Pump 1-01 suction pressure greater than or equal to 10 psig. [Step 3.3.5]
Simulator Operator: When contacted, REPORT that the motor casing for MD AFW Pump 1-02 is hot to the touch.		
	US	Dispatch an NEO to MD AFW Pump 1-02 Room to inspect pump condition. [Step 3.3.6]
		• Pump casing and discharge piping at ambient temperature • Pump and pump motor - NO APPARENT DAMAGE • No excessive leakage

Operating Test :	NRC	Scenario #	2	Event #	4	Page	16	of	39
Event Description:	AFW Pump 1-02 trips. Turbine Driven AFW Pump manual start.								

Time	Position	Applicant's Actions or Behavior
	US	If damage to motor or pump is apparent, or excessive leakage is found, then refer to Technical Specification 3.7.5 for LCO. [Step 3.3.6 RNO step b for pump casing temperature]
		• LCO 3.7.5, Auxiliary Feedwater (AFW) System • CONDITION B - One AFW train inoperable for reasons other than Condition A. • ACTION A.1 - Restore AFW train to OPERABLE status within 72 hours.

When Steam Generator Levels are being maintained between 60% and 75%, Technical Specifications have been addressed, or at Lead Examiner discretion, PROCEED to Event 5.

Operating Test : NRC	Scenario # 2	Event # 5	Page 17 of 39
Event Description: Shutdown Bank A (4 rods) drop.			

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 5 (Key 5). **- RD03B12** **- RD03D2** **- RD03M14** **- RD03P4** **Shutdown Bank A (4 rods) drops.**		
Indications Available: **6D-3.5, - DRPI ROD DEV** **6D-3.7 - ANY ROD AT BOT** **6D-4.7 - $\geq$ 2 ROD AT BOT**		
	RO	RECOGNIZE two or more rods dropped.
Examiner Note: Crew may recognize two or more rods dropped, manually trip the reactor and immediately enter EOP-0.0A, Reactor Trip or Safety Injection.		
	US	DIRECT performance of ABN-712, Rod Control System Malfunction, Section 3.3, Dropped or Misaligned Rod in MODE 1 or 2.
Examiner Note: The following step is from ABN-712, Rod Control System Malfunction, Section 3.3, Dropped or Misaligned Rod in MODE 1 or 2.		
	RO	Verify number of rods misaligned from step counter by > 12 steps is $\leq$ ONE. [Step 3.3.1 RNO]
		• Trip Reactor and GO TO EOP-0.0A.

Operating Test :	NRC	Scenario #	2	Event #	5	Page	18	of	39
Event Description:	Shutdown Bank A (4 rods) drop.								

Time	Position	Applicant's Actions or Behavior
Examiner Note: EOP-0.0A, Reactor Trip or Safety Injection steps begin here.		
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
	RO	VERIFY Reactor Trip: [Step 1]
		• VERIFY Reactor Trip Breakers - OPEN. [Step 1.a]
		• VERIFY Neutron flux - DECREASING. [Step 1.a]
		• VERIFY all Control Rod Position Rod Bottom Lights - ON. [Step 1.b]
	BOP	VERIFY Turbine Trip: [Step 2]
		• VERIFY all HP Turbine Stop Valves - CLOSED. [Step 2]
	BOP	VERIFY Power to AC Safeguards Busses: [Step 3]
		• VERIFY AC safeguards busses - AT LEAST ONE ENERGIZED [Step 3.a] • AC safeguards bus voltage - 6900 Volts (6500 - 7100 Volts)
		• VERIFY AC safeguards busses - BOTH ENERGIZED
	RO	CHECK SI status: [Step 4]
		• CHECK is SI is actuated. [Step 4.a RNO]
		• CHECK if SI is required: • Steam Line Pressure less 610 psig. • Pressurizer Pressure less than 1820 psig. • Containment Pressure greater than 3.0 psig.
	US	• IF SI is NOT required, THEN go to EOS-0.1A, REACTOR TRIP RESPONSE, Step 1.

Operating Test :	NRC	Scenario #	2	Event #	5	Page	19	of	39
Event Description:	Shutdown Bank A (4 rods) drop.								

Time	Position	Applicant's Actions or Behavior
<u>Examiner Note</u>: The crew will transition to EOS-0.1A, Reactor Trip Response.		
<u>CAUTION</u>: If SI actuation occurs during this procedure, EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION, shall be performed.		
	RO	CHECK RCS Temperature - [Step 1
		• Check RCPs - ANY RUNNING [Step 1.a]
		• RCS temperature stable at or trending to 557°F [Step 1.b]
	BOP	Check FW Status: [Step 2]
		• VERIFY reactor trip breakers - OPEN [Step 2.a]
		• Check RCS average temperatures - LESS than 564°F. (Step 2.b]
		• VERIFY Feedwater Isolation - ISOLATION COMPLETE. [Step 2.c]
		• VERIFY total AFW flow to SGs - GREATER THAN 460 GPM. [Step 2.d]
Upon completion of EOS-0.1A, Step 2.d, or at Lead Examiner's discretion, PROCEED to Event 6.		

Operating Test :	NRC	Scenario #	2	Event #	6	Page	20	of	39
Event Description:	Loss of Offsite Power; DG 1-01 start failure; DG 1-02 requires manual start.								

Time	Position	Applicant's Actions or Behavior

Simulator Operator: When directed, EXECUTE Event 6 (Key 6).
- ED01, Loss of Offsite Power.
- EG06A, DG 1-01 Air Start Failure.
- EG15B, DG 1-02 Fails to Auto or Emergency Start.

Indications Available:

10B-2.4 - 6.9KV ANY NON-1E BUS VOLTLOSS

10B-2.6 - 6.9KV BUS 1EA1/1EA2 VOLTLOSS

Numerous Loss of Offsite Power Alarms.

	RO/BOP	RECOGNIZE Loss of Offsite Power conditions.

Examiner Note: The crew will enter ECA-0.0A, Loss of All AC Power.

	US	DIRECT performance of ECA-0.0A, Loss of All AC Power.

Examiner Note: The following steps are from ECA-0.0A, Loss of All AC Power.

NOTE: CSF Status Trees should be monitored for information only. FRGs should not be implemented.

	RO	VERIFY Reactor Trip: [Step 1]
		• VERIFY Reactor Trip Breakers - AT LEAST ONE OPEN. [Step 1]
		• VERIFY Neutron flux - DECREASING. [Step 1]
	BOP	VERIFY Turbine Trip: [Step 2]
		• VERIFY all HP Turbine Stop Valves - CLOSED. [Step 2]

Operating Test :	NRC	Scenario #	2	Event #	6	Page	21	of	39
Event Description:	Loss of Offsite Power; DG 1-01 start failure; DG 1-02 requires manual start.								

Time	Position	Applicant's Actions or Behavior
CRITICAL TASK STATEMENT		**Isolate Reactor Coolant System Leakage Paths in accordance with ECA-0.0A, Loss of All AC Power prior to initiation of Steam Generator depressurization.**
	RO	CHECK If RCS Is Isolated: [Step 3]
		• CHECK Letdown Isolation Valves - CLOSED. [Step 3.a]
		• 1/1-LCV-459 and 1/1-LCV-460
Examiner Note:		**The Letdown Isolation Valves are interlocked with the Letdown Orifice Isolation Valves. The Letdown Isolation Valves cannot be closed until the Letdown Orifice Isolation Valves are closed.**
CRITICAL TASK	RO	• CLOSE Letdown Isolation Valves. [Step 3.a RNO]
		• PLACE 1/1-LCV-459 AND 1/1-LCV-460, Letdown Isolation Valves in CLOSE. [Step 3.a RNO]
	RO	• CHECK Pressurizer Power Operated Relief Valves - CLOSED. [Step 3.b]
	RO	• CHECK Excess Letdown Isolation Valves - CLOSED. [Step 3.c]
		• 1/1-8153 and 1/1-8154
	RO	• CHECK Primary Sample System Isolation Valves - CLOSED. [Step 3.d]
		• 1/1-4165A and 1/1-4167A
		• CLOSE Primary Sample System Isolation Valves. [Step 3.d RNO]
		• PLACE 1-HS-4165A, Primary Sample System Isolation Valves in CLOSE. [Step 3.d RNO]
	RO/BOP	VERIFY AFW Flow - GREATER THAN 460 GPM: [Step 4]

Operating Test : NRC	Scenario # 2	Event # 6	Page 22 of 39
Event Description: Loss of Offsite Power; DG 1-01 start failure; DG 1-02 requires manual start.			

Time	Position	Applicant's Actions or Behavior
CRITICAL TASK STATEMENT		**Restore Power to Bus 1EA2 in accordance with ECA-0.0A, Loss of All AC Power, prior to initiation of Steam Generator depressurization.**
	BOP	RESTORE Power to Any AC Safeguards Bus: [Step 5]
		• ENERGIZE selected AC Safeguards Bus with Diesel Generator [Step 5.a]
		• VERIFY selected Diesel Generator - RUNNING [Step 5.a.1]
		• Start selected diesel generator as follows: [Step 5.a.1 RNO]
		• Perform an Emergency Start. [Step 5.a.1 RNO Step A]
<u>Examiner Note</u>:		**The crew may select Diesel Generator 1-01 to start first; it will not start either normally or with an emergency start. The crew will then proceed to Diesel Generator 1-02; it will not start with an emergency start, however, it will start normally. The crew may also select Diesel Generator 1-02 to be started first.**
CRITICAL TASK	BOP	• If the diesel generator is NOT running, THEN perform a Normal Start. [Step 5.a.1 RNO Step B]
<u>Examiner Note</u>:		**When Diesel Generator 1-02 is started, the supply breaker will automatically CLOSE when the Diesel Generator is ready to accept load (~10 seconds).**
	BOP	• Check selected diesel generator AC safeguards bus 1EA2 supply breaker closed. [Step 5.a.2]
		• Check AC safeguards busses - AT LEAST ONE ENERGIZED [Step 5.c]
<u>Examiner Note</u>:		**With Safeguards Bus 1EA2 now energized, crew will transition back to procedure and step in effect; EOS-0.1A, Reactor Trip Response, Step 3.**
	RO	Check PRZR Level Control: [Step 3]
		• Level - GREATER THAN 17% [Step 3.a]
		• VERIFY charging - IN SERVICE [Step 3.b]
		• VERIFY letdown - IN SERVICE [Step 3.c RNO]
<u>Examiner Note</u>:		**Crew may discuss whether restoration of letdown is needed. Proceed to next event prior to any substantive action taken in Step 3.c of EOS-0.1A.**

Operating Test : NRC	Scenario # 2	Event # 7	Page 23 of 39
Event Description: Main Steam Line Break on SG 1-02 inside containment.			

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 7 (Key 7). Main Steam Line Break on SG 1-02 inside containment.		
Indications Available: 7A-1.12 - MSIV 1 NOT OPEN 7A-2.12 - MSIV 2 NOT OPEN 7A-3.12 - MSIV 3 NOT OPEN 7A-4.12 - MSIV 4 NOT OPEN 2B-1.10 - CNTMT 1 OF 3 PRESS HI-1 2B-2.10 - CNTMT 1 0F 3 PRESS HI-2 Numerous alarms associated with Main Steam Line Break inside containment		
	RO/BOP	RECOGNIZE lowering RCS temperature and pressure and rising containment pressure.
Examiner Note: Crew will transition from EOS-0.1A to EOP-0.0A, Reactor Trip or Safety Injection.		
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
Examiner Note: The following steps are from EOP-0.0A, Reactor Trip or Safety Injection.		
	RO	VERIFY Reactor Trip: [Step 1]
		• VERIFY Reactor Trip Breakers - OPEN. [Step 1.a]
		• VERIFY Neutron flux - DECREASING. [Step 1.a]
		• VERIFY all Control Rod Position Rod Bottom Lights - ON. [Step 1.b]
	BOP	VERIFY Turbine Trip: [Step 2]
		• VERIFY all HP Turbine Stop Valves - CLOSED. [Step 2]
	BOP	VERIFY Power to AC Safeguards Buses: [Step 3]
		• VERIFY AC Safeguards Buses - AT LEAST ONE ENERGIZED. [Step 3.a]
		• VERIFY both AC Safeguards Buses - ENERGIZED. [Step 3.b]
		• Restore power to 1EA1 as time permits. [Step 3.b RNO]

Operating Test :	NRC	Scenario #	2	Event #	7	Page	24	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
	RO	CHECK SI status: [Step 4]
		• CHECK if SI is actuated. [Step 4.a]
		• SI actuation indicated on First Out Annunciator 1-ALB-6C
		• SI Actuated blue status light - ON
	RO	VERIFY Both Trains SI Actuated: [Step 4.b]
		• SI Actuated blue status light - ON <u>NOT</u> FLASHING

<u>**Examiner Note**</u>: **EOP-0.0A, Attachment 2 steps performed by the BOP are identified on Page 34 of the scenario guide.**

> <u>**CAUTION**</u>: A Safety Injection actuation will affect normal egress from the Containment Building. Attachment 9 of this procedure provides instructions to evacuate personnel from the Containment during a Safety Injection actuation.

> <u>**NOTE**</u>: Attachment 2 is required to be completed before FRGs are implemented.

Time	Position	Applicant's Actions or Behavior
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2 [Step 5]
	RO	VERIFY AFW Alignment: [Step 6]
		• VERIFY MDAFW Pumps - RUNNING [Step 6.a]
		• VERIFY Turbine Driven AFW Pump running. [Step 6.b]
		• VERIFY AFW total flow – GREATER THAN 460 gpm. [Step 6.c]
		• VERIFY AFW proper valve alignment [Step 6.d]

Operating Test : NRC	Scenario # 2	Event # 7	Page 25 of 39
Event Description: Main Steam Line Break on SG 1-02 inside containment.			

Time	Position	Applicant's Actions or Behavior
	RO	VERIFY Containment Spray NOT Required: [Step 7]
		• VERIFY 1-ALB-2B, Window 1-8, CS ACT – NOT ILLUMINATED. [Step 7.a]
		• VERIFY 1-ALB-2B, Window 4-11, CNTMT ISOL PHASE B ACT – NOT ILLUMINATED. [Step 7.a]
		• VERIFY Containment pressure – LESS THAN 18.0 psig. [Step 7.a]
		• VERIFY Containment Spray Heat Exchanger Outlet Valves – CLOSED. [Step 7.b]
		• VERIFY Containment Spray Pumps – RUNNING. [Step 7.c]
	RO	CHECK If Main Steamlines Should Be Isolated: [Step 8]
		• VERIFY Containment pressure - GREATER THAN 6.0 PSIG [Step 8.a]
		• VERIFY main steam isolation complete: [Step 8.b]
		• VERIFY Main Steam isolation valves CLOSED. [Step 8.b]
		• VERIFY Before MSIV drippot isolation valves CLOSED. [Step 8.b]
	RO	CHECK RCS Temperature: [Step 9]
		• RCS AVERAGE TEMPERATURE STABLE AT OR TRENDING TO 557°F [Step 9 RNO]
	RO	STOP dumping steam. [Step 9 RNO Step a]
	RO	REDUCE total AFW flow to minimize the cooldown: [Step 9 RNO Step b]
		• MAINTAIN a minimum of 460 gpm UNTIL narrow range level greater than 50%

Operating Test :	NRC	Scenario #	2	Event #	7	Page	26	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
	RO	CHECK PRZR Valve Status: [Step 10]
		• VERIFY PRZR Safeties - CLOSED. [Step 10.a]
		• VERIFY normal PRZR spray valves - CLOSED. [Step 10.b]
		• VERIFY PORVs - CLOSED. [Step 10.c]
		• VERIFY power to at least one block valve - AVAILABLE. [Step 10.d]
		• VERIFY block valves - AT LEAST ONE OPEN. [Step 10.e]
	RO	CHECK If RCPs Should Be Stopped: [Step 11]
		• RCS subcooling - LESS THAN 55°F FOR ADVERSE CONTAINMENT [Step 11.a RNO]
	RO/BOP	CHECK If Any SG Is Faulted: [Step 12]
		• DETERMINE SG 1-02 is completely DEPRESSURIZED. [Step 12.a]
	US	TRANSITION to EOP-2.0A, Faulted Steam Generator Isolation, Step 1.

Examiner Note: **The following steps are from EOP-2.0A, Faulted Steam Generator isolation.**

CAUTION: At least one SG must be maintained available for RCS cooldown.

CAUTION: Any faulted SG or secondary break should remain isolated during subsequent recovery actions unless needed for RCS cooldown.

Time	Position	Applicant's Actions or Behavior
	RO	CHECK Main Steamline Isolation Valves - CLOSED. [Step 1]
	RO	CHECK At Least One SG Pressure - STABLE OR INCREASING. [Step 2]

Operating Test :	NRC	Scenario #	2	Event #	7	Page	27	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
CRITICAL TASK STATEMENT		**Identify and isolate the Faulted Steam Generator Prior to Exiting EOP-2.0A, Faulted Steam Generator isolation.**
CRITICAL TASK	RO/BOP	IDENTIFY SG 1-02 as the Faulted Steam Generator. [Step 3]
		CAUTION: If the turbine-driven AFW pump is the only available source of feed flow, steam supply to the turbine-driven AFW pump must be maintained from at least one SG.
Simulator Operator Note:		**Crew may contact to locally close 1-HV-2492A, AFWIV 2. If contacted acknowledge report, wait 5 minutes and EXECUTE remote function – IRF FWR125 f:0 – then report the valve is closed.**
	RO/BOP	ISOLATE Faulted Steam Generator 1-02. [Step 4]
		• ISOLATE main feedline to SG 1-02.
CRITICAL TASK		• ISOLATE AFW flow to SG 1-02.
		• IF SG 1 or 4 faulted, THEN place TDAFW Pump steam supply valve(s) in pull-out.
		• ISOLATE blowdown and sample lines to SG 1-02.
		• ENSURE SG 1-02 atmospheric - CLOSED.
		• ENSURE main steamline drippot isolation valve - CLOSED.
	RO	CHECK CST Level - GREATER THAN 10%. [Step 5]
	US/BOP	VERIFY Faulted SG 1-02 Break Inside Containment. [Step 6]
	US/RO	CHECK Secondary Radiation: [Step 7]
		• REQUEST periodic activity samples of all Steam Generators. [Step 7.a]
		• CHECK available secondary radiation monitors - NORMAL. [Step 7.b]

Operating Test :	NRC	Scenario #	2	Event #	7	Page	28	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
	US/RO	CHECK If ECCS Flow Should Be Reduced: [Step 8]
		• VERIFY secondary heat sink: [Step 8.a]
		• Total AFW flow to intact SGs - GREATER THAN 460 GPM OR • Narrow range level in at least one intact SG - GREATER THAN 50%.
		• VERIFY RCS subcooling - GREATER THAN 55°F. [Step 8.b]
		• VERIFY RCS pressure - STABLE OR INCREASING. [Step 8.c]
		• VERIFY PRZR level - GREATER THAN 34%. [Step 8.d]
	US	• Go to EOS-1.1A, SAFETY INJECTION TERMINATION, Step 1 [Step 8.e]
		• Go to Step 9. [Step 8 RNO]

Examiner Note: **It is possible that Step 8.b, c, and d will be AER and that the crew will transition to EOS-1.1A, Safety Injection Termination, depending on the timing, sequence of operator actions, and plant response. If the conditions to transition to EOS-1.1A are not met, the crew will transition to EOP-1.0A, Loss of Reactor or Secondary Coolant and eventually transition to EOS-1.1A when the conditions are met.**

Time	Position	Applicant's Actions or Behavior
	US	Go To EOP-1.0A, LOSS OF REACTOR OR SECONDARY COOLANT, Step 1 [Step 9]

Operating Test :	NRC	Scenario #	2	Event #	7	Page	29	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
<u>Examiner Note</u>:		**The following steps are from EOP-1.0A, Loss of Reactor or Secondary Coolant. These steps will only be performed if the crew does not meet the conditions to transfer to EOS-1.1A directly from EOP-2.0A.**
		<u>CAUTION</u>: Following a high energy line rupture inside containment, the operator should not rely upon steam generator water level indications in any depressurized steam generators.
		<u>NOTE</u>: As PRZR Temperature decreases the error on indicated PRZR level will increase. Attachment 2 may be used to determine actual PRZR level.
<u>Examiner Note</u>:		**Depending on the timing, sequence of operator actions, and plant response, it may be necessary for the crew to secure RCPs due to loss of subcooling.**
	US/RO	Check if RCPs should be stopped: [Step 1]
		• RCS subcooling – LESS THAN 25°F (55°F FOR ADVERSE CONTAINMENT). [Step 1.a]
		• ECCS pumps – AT LEAST ONE RUNNING
		• CCP -OR- SI Pump [Step 1.b]
		• Stop all RCPs. [Step 1.c]
	RO/BOP	CHECK if Any Steam Generator Is Faulted: [Step2]
		• Check Pressure in all SGs. [Step 2.a]
		• VERIFY any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. [Step 2.a]
		• VERIFY any Steam Generator pressure – COMPLETELY DEPRESSURIZED. [Step 2.a]
		• DETRMINE SG 1-02 was Faulted and has been isolated: [Step 2.b]

Operating Test :	NRC	Scenario #	2	Event #	7	Page	30	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
	US	CHECK Intact Steam Generator Levels: [Step 3]
		• DETERMINE Narrow range levels – GREATER THAN 50%. [Step 3.a]
		• CONTROL AFW flow to maintain NR level between 50% and 60%. [Step 3.b]
	US	CHECK Secondary Radiation NORMAL: [Step 4]
		• VERIFY Condenser off gas radiation – NORMAL.
		• VERIFY Main Steam Line radiation – NORMAL.
		• VERIFY SG Blowdown Sample Radiation Monitor – NORMAL.
		• VERIFY levels in all Steam Generators – NORMAL.
		CAUTION: If any PRZR PORV opens because of high PRZR pressure, Step 5b should be repeated after pressure decreases to less than the PORV setpoint.
	US	CHECK PRZR PORVs and Block Valves: [Step 5]
		• VERIFY power to Block Valves – AVAILABLE. [Step 5.a]
		• VERIFY PORVs – CLOSED. [Step 5.b]
		• VERIFY Block Valves – AT LEAST ONE OPEN. [Step 5.c]

Operating Test : NRC	Scenario # 2	Event # 7	Page 31 of 39
Event Description: Main Steam Line Break on SG 1-02 inside containment.			

Time	Position	Applicant's Actions or Behavior
Examiner Note:		**EOP-1.0A, Step 6 is a continuous action step. When the crew meets the requirements they will transition to EOS-1.1A, Safety Injection Termination.**
	US/RO	Check if ECCS Flow Should Be Reduced: [Step 6]
		• VERIFY Secondary heat sink: [Step 6.a]
		• DETERMINE total AFW flow to intact SGs > 460 GPM.
		• DETERMINE Narrow range level in all SGs > 50%.
		• DETERMINE RCS subcooling > 25°F (55°F for Adverse Containment) [Step 6.b]
		• DETERMINE RCS pressure Stable or Increasing [Step 6.c]
		• DETERMINE PRZR level > 13% (34% for Adverse Containment) [Step 6.d]
		• Go To EOS-1.1A, SAFETY INJECTION TERMINATION, Step 1 [Step 6.e]
Examiner Note:		**EOS-1.1A, Safety Injection Termination steps begin here.**
Examiner Note:		**The following six steps are performed per EOS-1.1A, Attachment 1.D.**
CAUTION:		If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
	BOP	[1.D] PLACE both Diesel EMER START/STOP handswitches in START. [Step 1]
	BOP	[1.D] RESET SI. [Step 2]
	BOP	[1.D] RESET SI Sequencers. [Step 3]
	BOP	[1.D] RESET Containment Isolation Phase A and B. [Step 4]
	BOP	[1.D] RESET Containment Spray Signal. [Step 5]

Operating Test :	NRC	Scenario #	2	Event #	7	Page	32	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
Simulator Operator Note:		**To restore power to IA Compressor 1-02 after SI has been reset EXECUTE the following:** **Shunt Trip Breakers Reset – IOR EDR11 f:0** **1EB4/11D FDR BRKR [IAC 1-02] – Closed – IRF EDR74 f:2 d:10**
	RO/BOP	[1.D] ESTABLISH Instrument Air and Nitrogen to Containment. [Step 6]
		• ESTABLISH instrument air. [Step 6.a]
		• VERIFY air compressor running. [Step 6.a.1)]
		• OPEN 1-HS-3487, Containment Instrument Air Isolation Valve. [Step 6.a.2)]
		• ESTABLISH Nitrogen: [Step 6.b]
		• VERIFY 1-HC-3943, ACCUM 1●4 VENT CTRL Valve – CLOSED. [Step 6.b.1)]
		• OPEN 1/1-8880, SI/PORV ACCUM N_2 ISOL VLV. [Step 6.b.2)]
	RO	VERIFY one CCP running. [Step 7]
	US/RO	CHECK RCS Pressure – STABLE OR INCREASING. [Step 8]
Examiner Note:		**The following two steps are performed per EOS-1.1A, Attachment 1.J.**
CRITICAL TASK STATEMENT		**Terminate Safety Injection prior to exiting from EOS-1.1A, Safety Injection Termination.**
	RO	[1.J] ISOLATE CCP Injection Line Flow Path: [Step 9]
		• VERIFY CCP – SUCTION ALIGNED TO RWST. [Step 9.a]
		• ALIGN CCP Miniflow Valves: [Step 9.b]
		• OPEN 1/1-8110 and 1/1-8111, CCP Miniflow Valves.
		• CLOSE the CCP Injection Line Isolation Valves: [Step 9.c]
CRITICAL TASK		• CLOSE 1/1-8801A and 1/1-8801B, CCP Injection Line Isolation Valves.

Operating Test :	NRC	Scenario #	2	Event #	7	Page	33	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
	RO	[1.J] ESTABLISH Charging Flow Path: [Step 10]
		• OPEN 1/1-8105 and 1/1-8106, Charging Line Isolation Valves. [Step 10.a]
		• ADJUST Charging Flow Control Valve to establish Charging flow. [Step 10.b]
		• ADJUST RCP seal flow to maintain between 6 gpm and 13 gpm. [Step 10.c]
		• CLOSE CCP Alternate Miniflow Isolation Valves 1/1-8511A and 1/1-8511B. [Step 10.d]
When EOS-1.1A, Safety Injection Termination, Attachment 1.J is complete, TERMINATE the scenario.		

Operating Test : NRC	Scenario # 2	Event # 7	Page 34 of 39
Event Description: Main Steam Line Break on SG 1-02 inside containment.			

Time	Position	Applicant's Actions or Behavior
		Examiner Note: These steps are performed by the BOP per EOP-0.0, Reactor Trip or Safety Injection, Attachment 2
		CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment.
		Examiner Note: Train A Safeguards Bus, 1EA1, is de-energized. Train 'A' equipment will not be running.
	BOP	VERIFY SSW Alignment: [Step 1]
		• VERIFY SSW Pump 1-02 – RUNNING. [Step 1.a]
		• VERIFY EDG Cooler SSW return flow. [Step 1.b]
	BOP	VERIFY Safety Injection Pump 1-02 – RUNNING. [Step 2]
		Examiner Note: Event 8, Auto Containment Isolation Phase 'A' Actuation Failure on Train B, should be diagnosed at the next step of Attachment 2. Manual initiation of Phase 'A' on the B Train will be required.
	BOP	VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS). [Step 3] • Manually Initiate Phase A, Train B
	BOP	VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS). [Step 4]
	BOP	VERIFY CCW Pump 1-02 – RUNNING. [Step 5]
	BOP	VERIFY RHR Pump 1-02 – RUNNING. [Step 6]

Operating Test :	NRC	Scenario #	2	Event #	7	Page	35	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY Proper CVCS Alignment: [Step 7]
		• VERIFY CCP 1-02 – RUNNING. [Step 7.a]
		• VERIFY Letdown Relief Valve Isolation: [Step 7.b]
		• Letdown Orifice Isolation Valves – CLOSED. [Step 7.b.1)]
		• Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [Step 7.b.2)]
	BOP	VERIFY ECCS flow: [Step 8]
		• CCP SI flow indicator – CHECK FOR FLOW. [Step 8.a]
		• RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT). [Step 8.b]
		• SIP discharge flow indicator – CHECK FOR FLOW. [Step 8.c]
		• RCS pressure – LESS THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.d]
		• GO to Step 9. [Step 8.d RNO]
	BOP	VERIFY Feedwater Isolation Complete: [Step 9]
		• Feedwater Isolation Valves – CLOSED.
		• Feedwater Isolation Bypass Valves – CLOSED.
		• Feedwater Bypass Control Valves – CLOSED.
		• Feedwater Control Valves – CLOSED.
	BOP	VERIFY Diesel Generator 1-02 – RUNNING. [Step 10]
	BOP	VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB-10 – LIT. [Step 11]

NOTE: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication.

Operating Test : NRC	Scenario # 2	Event # 7	Page 36 of 39
Event Description: Main Steam Line Break on SG 1-02 inside containment.			

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION. [Step 12]
	BOP	INITIATE periodic monitoring of Spent Fuel Cooling. [Step 13]
		• Spent Fuel Pool temperature (T2900A, T2901A).
		• Spent Fuel Pool level (L4800A, L4801A, L4802A, L4803A).

NOTE: Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

NOTE: When the SI sequencer has timed out, the Reactor Makeup Water Pump with its handswitch in Auto will restart.

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY Components on Table 1 are Properly Aligned. [Step 14]

Location	Equipment	Description	Condition
CB-03	X-HS-5534	H2 PRG SPLY FN 4	STOPPED
CB-03	X-HS-5532	H2 PRG SPLY FN 3	STOPPED
CB-04	1/1-8716A	RHRP 1 XTIE VLV	OPEN
CB-04	1/1-8716B	RHRP 2 XTIE VLV	OPEN
CB-06	1/1-8153	XS LTDN ISOL VLV	CLOSED/H.S. IN CLOSED
CB-06	1/1-8154	XS LTDN ISOL VLV	CLOSED/H.S. IN CLOSED
CB-07	1/1-RTBAL	RX TRIP BKR	OPEN
CB-07	1/1-RTBBL	RX TRIP BKR	OPEN
CB-07	1/1-BBAL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-07	1/1-BBBL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-08	1-HS-2397A	SG 1 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2398A	SG 2 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2399A	SG 3 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2400A	SG 4 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2111C	FWPT A TRIP	TRIPPED
CB-08	1-HS-2112C	FWPT B TRIP	TRIPPED

Operating Test :	NRC	Scenario #	2	Event #	7	Page	37	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior			
		CB-09	1-HS-2490	CNDS XFER PUMP	STOPPED (MCC deenergized on SI)
		CV-01	X-HS-6181	PRI PLT SPLY FN 17 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-6188	PRI PLT SPLY FN 18 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-6195	PRI PLT SPLY FN 19 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-6202	PRI PLT SPLY FN 20 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-6209	PRI PLT SPLY FN 21 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-6216	PRI PLT SPLY FN 22 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-6223	PRI PLT SPLY FN 23 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-6230	PRI PLT SPLY FN 24 & INTK DMPR	STOPPED/DEENERGIZED
		CV-01	X-HS-3631	UPS & DISTR RM A/C FN 1 & BSTR FN 42	STARTED
		CV-01	X-HS-3632	UPS & DISTR RM A/C FN 2 & BSTR FN 43	STARTED
		CV-01	1-HS-5600	ELEC AREA EXH FN 1	STOPPED/DEENERGIZED
		CV-01	1-HS-5601	ELEC AREA EXH FN 2	STOPPED/DEENERGIZED
		CV-01	1-HS-5602	MS & FW PIPE AREA EXH FN 3 & EXH DMPR	STOPPED/DEENERGIZED
		CV-01	1-HS-5603	MS & FW PIPE AREA EXH FN 4 & EXH DMPR	STOPPED/DEENERGIZED
		CV-01	1-HS-5618	MS & FW PIPE AREA SPLY FN 17	STOPPED/DEENERGIZED
		CV-01	1-HS-5620	MS & FW PIPE AREA SPLY FN 18	STOPPED/DEENERGIZED
		CV-03	X-HS-5855	CR EXH FN 1	STOPPED/DEENERGIZED
		CV-03	X-HS-5856	CR EXH FN 2	STOPPED/DEENERGIZED
		CV-03	X-HS-5731	SFP EXH FN 33	STOPPED/DEENERGIZED
		CV-03	X-HS-5733	SFP EXH FN 34	STOPPED/DEENERGIZED
		CV-03	X-HS-5727	SFP EXH FN 35	STOPPED/DEENERGIZED
		CV-03	X-HS-5729	SFP EXH FN 36	STOPPED/DEENERGIZED

Operating Test :	NRC	Scenario #	2	Event #	7	Page	38	of	39
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior

Examiner Note: The next four (4) steps would be performed on Unit 2.

	CB-03	2-HS-5538	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5539	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5537	AIR PRG SPLY ISOL DMPR	CLOSED
	CB-03	2-HS-5536	AIR PRG SPLY ISOL DMPR	CLOSED

	BOP	NOTIFY Unit Supervisor attachment instructions complete AND to IMPLEMENT FRGs as required. [Step 14]

EOP-0.0A, Attachment 2 steps are now complete.

```
;CPNPP 2015 NRC Initial Scenario 2
;Load IC08

;INITIAL SETUP

;DG A fail to start auto or manual (Event 6)
IMF EG06A f:1

;DG B fail to auto start (Event 6)
IMF EG15B f:1

;Phase A Auto Isol Fail, Train B (Event 8)
IMF RP09B f:1

;MALFUNCTIONS

;CCP 1-01 Trip (Event 2)
IMF CV01B f:1 k:2

;PZR press PT-455 fails high (Event 3)
IMF RX08A f:2500 k:3

;AFW pump 1-02 trip (Event 4)
IMF FW24B f:1 k:4

;SD Bank A Group 1 Rods drop (Event 5)
IMF RD03B12 f:1 k:5
IMF RD03D2 f:1 k:5
IMF RD03M14 f:1 k:5
IMF RD03P4 f:1 k:5

;Loss Offsite Power (Event 6)
IMF ED01 f:1 k:6

;Main Steam Line break IRC SG 1-02 (Event 7)
IMF MS01B f:2 k:7
```

June 2015 NRC Exam

Facility: CPNPP 1 & 2   Scenario No.: 3   Op Test No.: June 2015

Examiners: ____________________   Operators: ____________________

____________________   ____________________

____________________   ____________________

Initial Conditions: 100% power, EOL. SI Pump 1-02 tagged out for inspection.

Turnover: SI Pump 1-02 returned to service in approx. 4 hours.

Critical Tasks:
- Place EHC Pumps in PULL OUT or Manually Close MSIVs Upon Failure of Main Turbine Trip Prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection.
- Manually Start Safety Injection Pump 1-01 Prior to completing Attachment 2 of EOP-0.0A, Reactor Trip or Safety Injection.
- Identify and isolate the Ruptured Steam Generator Prior to Commencing an Operator Induced Cooldown per EOP-3.0A.

Event No.	Malf. No.	Event Type*	Event Description
1	NI04E	I - RO TS - SRO	NI42 Power Range Channel fails high.
2	TP01	C - BOP C - SRO	TPCW leak. Auto makeup fails.
3	RX05B	I - RO TS - SRO	PZR LT-460 fails low. Letdown isolates.
4	FW16 FW17A	C - BOP C - SRO	CEV pump trips. Manually start alternate.
5	SG01B	R - RO N - BOP, TS - SRO	SG 1-02 tube leak. Down power per ABN-106.
6	SG02B	M - ALL	SG 1-02 tube rupture.
7	TC07C	C - BOP	Turbine fails to auto trip. Manual trip not successful. EHC pumps to Pull Out.
8	SI04C	C - BOP	SI Pump 1-01 fails to Auto start.

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

Actual	Target Quantitative Attributes
7	Total malfunctions (5-8)
2	Malfunctions after EOP entry (1-2)
5	Abnormal events (2-4)
1	Major transients (1-2)
1	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
3	Critical tasks (2-3)

SCENARIO 3 SUMMARY

Event 1
The first event is failure high of NI42 Power Range Channel. The crew will enter ABN-703, Power Range Instrumentation Malfunction. Since the failure is in the high direction, rods will be rapidly inserting. This will require the operator to place rod control to Manual, per Step 1.b of ABN-703. The SRO will refer to Technical Specifications.

Event 2
The next event is initiation of a leak in the Turbine Plant Cooling Water system at 15 gpm. The normal makeup valve (1-HS-3050 Makeup Valve) fails to auto open. Requires manual makeup, as directed by 1-ALB-9A, Window 2.10, TPCW HEAD TK LVL LO. This manual makeup operation will be successful, and alarm will clear as level restores.

Event 3
Once the TPCW Head Tank level is restored, the next event is a low failure of PZR LT-460. This failure causes letdown to isolate and a loss of the pressurizer heaters. The crew will enter ABN-706, Section 2.0, Pressurizer Level Instrument Malfunction, and per Step 1 and 2, manually control PZR level and reenergize PZR heaters. The SRO will refer to Technical Specifications.

Event 4
The operating Condenser Exhaust Vacuum (CEV) pump trips. The crew will observe megawatts lowering and condenser vacuum lowering. They will also receive an alarm (1-ALB-9A, Window 1.12, CNDSR ANY VAC PMP TRIP, for the actual trip of the vacuum pump. They will also enter ABN-304, Section 3.0, Main or Auxiliary Condenser vacuum Decreasing, and manually start the alternate CEV pump. The crew may slightly reduce turbine load.

Event 5
A tube leak (10 gpm) will develop on SG 1-02. The crew will enter ABN-106, Section 3.0, Steam Generator Tube Leakage Greater than or equal to 75 gpd (0.52 gpm). They will recognize per the procedure, that a reduction in power is required. This evolution is intended to satisfy the reactivity manipulation requirement and normal evolution for this scenario. The SRO will refer to Technical Specifications.

Event 6
As the power reduction progresses, the tube leak on SG 1-02 worsens to a tube rupture event. The crew will recognize the change in leakage and conclude that a manual reactor trip is warranted. The reactor will be manually tripped, but the turbine will fail to auto trip. The crew enters EOP-0.0A, Reactor Trip or Safety Injection.

Event 7
The Main Turbine fails to auto trip. The Manual trip is NOT successful. This will require the operator to place the EHC pumps to PULL OUT or manually close the MSIVs, per Immediate Action Step 2, RNO.

Event 8
When safety injection is actuated in response to the SG Tube Rupture SI Pump 1-01 will fail to auto start. The operator performing EOP-0.0A, Attachment 2 should start the pump. The crew will continue through EOP-0.0A, and transition EOP-3.0A, Steam Generator Tube Rupture. When the ruptured Steam Generator 1-02 is isolated, including stopping Auxiliary Feedwater flow, the scenario can be terminated.

Risk Significance:

• Failure or risk important system prior to trip:	Steam Generator Tube Leak Main Turbine Fails to Trip
• Risk significant core damage sequence:	SG tube leak leads to tube rupture event Two stuck rods on reactor trip
• Risk significant operator actions:	Place Turbine EHC Pumps to PULL OUT Initiate Emergency Boration for stuck rods Identify and isolate ruptured Steam Generator

Critical Task Determination

Critical Task	Safety Significance	Cueing	Measurable Performance Indicators	Performance Feedback
Place EHC Pumps in PULL OUT or Manually Close MSIVs Upon Failure of Main Turbine Trip Prior to Exiting EOP-0.0A, Reactor Trip or Safety Injection.	Recognize a failure or an incorrect automatic actuation of an ESF system or component.	Procedural direction at EOP-0.0A Step 2 to determine if a turbine trip has occurred. Position indication of the HP Turbine Stop Valves as still open.	The operator will manually place all EHC pumps handswitch on CB-10 to pull out. Or Isolate Main Steam lines on CB07.	EHC fluid pressure lowering and position indication for HP Turbine Stop Valves indicating closed.
Manually Start Safety Injection Pump 1-01 Prior to completing Attachment 2 of EOP-0.0A, Reactor Trip or Safety Injection.	Recognize a failure or an incorrect automatic actuation of an ESF system or component.	Procedural direction per EOP-0.0A Attachment 2 to start SI Pump 1-01. Pump indication lights, flow and discharge pressure.	The operator will manually start SI Pump 1-01.	Indication of pump start including light indication, pressure and flow.
Identify and isolate the Ruptured Steam Generator Prior to Commencing an Operator Induced Cooldown per EOP-3.0A.	Take one or more actions that would prevent a challenge to plant safety.	Procedurally driven from EOP-3.0A, to identify and isolate a ruptured SG. Indications include MSL Radiation alarms and SG level.	The operator will close the MSIV and stop feeding the SG once sufficient level to cover the tubes is available.	SG pressure increasing, AFW flow reduced to zero and valve position indications.

SIMULATOR OPERATOR INSTRUCTIONS for SIMULATOR SETUP

INITIALIZE to IC #20 and LOAD NRC Scenario 3.

EVENT	REM. FUNC.	MALF.	DESCRIPTION	DEMAND VALUE	INITIATING PARAMETER
SETUP		TC07C	Main Turbine fails to auto trip. Also defeats manual turbine trip pushbutton.	f:1	K0
		SI04C	SI Pump 1-01 fails to auto start	f:1	K0
2	IOR	DITPHS 3050	TPCW Fill Handswitch auto override prevents auto make up to surge tank.	f:0	K0
7		SS02A1	SSPS TR A MASTER RELAY K504 FAILURE [OPEN, MSL ISO]	f:1	K0
7		SS02A2	SSPS TR B MASTER RELAY K504 FAILURE [OPEN, MSL ISO]	f:1	K0
1		NI04E	NI42 Power Range Channel fails high	f:200	K1
2		TP01	TPCW Leak (1)	f:15	K2
2	CMR5 1		Demin Wtr Trans Pmp 2, start when if required.	f:3	K10
3		RX05B	PZR LT-460 fails low.	f:0	K3
4		FW16	Main Condenser Air Inleakage	f:2	K4
4		FW17A	Main Condenser Vacuum Pump Trip	f:1	K4
5		SG01B	SG 1-02 tube leak	f:10	K5
6		SG02B	SG 1-02 tube rupture	f:1	K6
7		TC07C	Main Turbine fails to auto trip. Also defeats manual turbine trip pushbutton.	f:1	K0
7		SS02A1	SSPS TR A MASTER RELAY K504 FAILURE [OPEN, MSL ISO]	f:1	K0
7		SS02A2	SSPS TR B MASTER RELAY K504 FAILURE [OPEN, MSL ISO]	f:1	K0
8		SI04C	SI Pump 1-01 fails to auto start	f:1	K0

(1) Delete override and leak when RO fills using 1-HS-3050:
{DITPHS3050.Value=2} DOR DITPHS3050
{DITPHS3050.Value=2} DMF TP01

<u>Simulator Operator</u>:	**INITIALIZE to IC #20 and LOAD NRC Scenario 3.** **ENSURE all Simulator Annunciator Alarms are ACTIVE.** **ENSURE all Control Board Tags are removed.** **ENSURE Operator Aid Tags reflect current boron conditions.** **ENSURE Rod Bank Update (RBU) is performed.** **ENSURE Turbine Load Rate set at 10 MWe/minute.** **ENSURE 60/90 buttons DEPRESSED on ASD.** **ENSURE ASD speakers are ON to half volume.** **ENSURE Reactivity Briefing Sheet printout provided with Turnover.** **ENSURE procedures in progress are on SRO desk:** **COPY of IPO-003A, Power Operations, Section 5.5, Operating at Constant Turbine Load.** **ENSURE Control Rods are in AUTO with Bank D at 215 steps.** **ENSURE GEM Sign Posting Log for SIP 1-02 is provided with Turnover.** **PLACE SIP 1-02 handswitch in PULL OUT, affix a danger tag to the handswitch.** **ENSURE SIP 1-02 Breaker is racked out IRF SIR01 f:0.** **PLACE GEM Cover on train A SIP handswitch.** **CHANGE Delta I target to -4.9 using Delta Flux Option #5, change the target to -4.9, then depress ENTER, then save. Ensure the computer updated.** **When the scenario has been run for the last time, ENSURE the plant computer is updated for the MOL Delta I target of -3.10%.** **ENSURE the EOL AFD Job Aid on CB-07 is displayed.**
<u>Control Room Annunciators in Alarm</u>: **PCIP-1.1 – SR TRN A RX TRIP BLK** **PCIP-1.2 – IR TRN A RX TRIP BLK** **PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9** **PCIP-1.6 – RX ≥ 10% PWR P-10** **PCIP-2.1 – SR TRN B RX TRIP BLK** **PCIP-2.2 – IR TRN B RX TRIP BLK** **PCIP-2.5 – SR RX TRIP BLK PERM P-6** **PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK** **PCIP-4.2 – PR TRN B LO SETPT RX TRIP BLK** **SSII-TRN B-1.2 – ECCS**	

Operating Test : NRC	Scenario # 3	Event # 1	Page 6 of 41
Event Description: N42 Power Range Channel Fails High			

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 1 (Key 1). NI42 Power Range Channel fails high. IMF NI04E f:200 k:1		
Indications Available: 1 OF 4 OT N-16 HI (5C-2.5) 1 OF 4 HI SETPT PR FLUX HI (6D-1.3) 1 OF 4 LO SETPT PR FLUX HI (6D-2.3) 1 OF 4 PR FLUX RATE HI (6D-3.3) RX _50% PWR UP PR DET FLUX DEV HI (6D-1.4) PR CHAN DEV (6D-3.4) QUADRANT PWR TILT (6D-4.10) OP HI FLUX ROD STOP C-2 (6D-2.14)		
	RO	REFER to Annunciator Alarm Procedures.
	RO	RECOGNIZE Power Range Nuclear Instrument N-42 detector failure.
Examiner Note: If a Power Range Channel fails HIGH while the Rod Control System is in AUTO, Control Rods will be rapidly inserted.		
	US	DIRECT implementation of ABN-703, Power Range Instrumentation Malfunction, Section 2.0.
	RO	VERIFY rapid Control Rod insertion – NOT REQUIRED. [Step 2.3.1]
		• VERIFY Reactor and Turbine Power – MATCHED. [Step 2.3.1.a]
		• VERIFY T_{AVE} less than 3°F above $T_{REF.}$ [Step 2.3.1.a]
		• PLACE Rod Control in MANUAL. [Step 2.3.1.b]
	RO	VERIFY Reactor Power < 75% rated thermal power. [Step 2.3.2]
	US	• INITIATE actions to comply with Technical Specification SR 3.2.4.2. [Step 2.3.2 RNO]
		PERFORM at Channel N-42 Drawers: [Step 2.3.3]
	RO/BOP	• At Detector Current Comparator Drawer, SELECT Rod Stop Bypass Switch to N-42. [Step 2.3.3.a]

Operating Test :	NRC	Scenario #	3	Event #	1	Page	7	of	41
Event Description:	N42 Power Range Channel Fails High								

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• At Comparator and Rate Drawer, SELECT Comparator Channel Defeat Switch to N-42. [Step 2.3.3.b]
	RO/BOP	• At Detector Current Comparator Drawer, SELECT Upper Section Switch to N-42. [Step 2.3.3.c]
	RO/BOP	• At Detector Current Comparator Drawer, SELECT Lower Section Switch to N-42. [Step 2.3.3.d]
	RO/BOP	• At Detector Current Comparator Drawer, SELECT Power Mismatch Bypass Switch to N-42. [Step 2.3.3.e - YES]
	RO/BOP	• At the Power Range A Drawer, SELECT Rate Mode Switch momentarily to RESET for N-42. [Step 2.3.3.f]
	RO/BOP	• PLACE 1/1-JS-411E, N16 PWR CHAN DEFEAT Switch to LOOP 2. [Step 2.3.3.g]
	RO/BOP	• PLACE 1/1-TS-412T, T_{AVE} CHAN DEFEAT Switch to LOOP 2. [Step 2.3.3.g]
	RO/BOP	PLACE 1/1-TS-411E, 1-TR-411 Channel Select to an OPERABLE channel. [Step 2.3.4]
NOTE: Rod Control should remain in MANUAL until all channels are operable.This does not preclude placing rods in AUTO during rapidly changing transient conditions such as runbacks, etc. as long as rod control is returned to MANUAL when the plant is stabilized.		
	RO	RESTORE T_{AVE} to within 1ºF of $T_{REF.}$ [Step 2.3.5]

Operating Test : NRC	Scenario # 3	Event # 1	Page 8 of 41
Event Description: N42 Power Range Channel Fails High			

Time	Position	Applicant's Actions or Behavior
NOTE: P-10 permissive is interlocked with Source Range instruments. During a unit shutdown if P-10 permissive is in incorrect state, SR detectors cannot be re-energized. This affects SR RX Trip and SR Flux DBLG protection.		
	US/RO	Verify WITHIN 1 Hour, of Instrument Malfunction, Interlocks in - REQUIRED STATE: [Step 2.3.6]
		• RX & TURB ≤ 10% PWR P-7 (PCIP – 3.5) – DARK. [Step 2.3.6.a]
		• RX ≤ 48% PWR 3-LOOP FLO PERM P-8 (PCIP – 4.5) – DARK. [Step 2.3.6.a]
		• RX ≤ 50% PWR TURB TRIP PERM P-9 (PCIP – 1.7) – DARK. [Step 2.3.6.a]
		• RX ≥ 10% PWR P-10 (PCIP – 1.6) – LIT. [Step 2.3.6.a]
	US/RO	• RECORD verification in Unit Log. [Step 2.3.6.b]
CAUTION: QUADRANT POWER TILT alarms (u-ALB-6D, 4.10) should be considered inoperable when any Power range channel is inoperable.		
	US/RO	CHECK Quadrant Power Tilt Ratio within limits: [Step 2.3.7]
		• CHECK Power Range Channels– ONE OR MORE INOPERABLE [Step 2.3.7.a]
		• CHECK Reactor Power – GREATER THAN 50%. [Step 2.3.7.b]
		• REFER to TS 3.2.4, Table 3.3.1-1, Items 2, 3 (ACTIONS D and E) and TR 13.2.33. [Step 2.3.7.c]

Operating Test : NRC	Scenario # 3	Event # 1	Page 9 of 41
Event Description: N42 Power Range Channel Fails High			

Time	Position	Applicant's Actions or Behavior
		NOTE: The following step allows I&C to troubleshoot failed channel while energized, to locate problem area. If troubleshooting can NOT be completed within 72 hours, Attachment 4 will cover ALL bistables regardless of partial or complete failure.
	US	EVALUATE Technical Specifications. [Step 2.3.10]
		• LCO 3.3.1.D, Reactor Trip System Instrumentation (Function 2.a, Power Range Neutron Flux High)
		• CONDITION D - One Power Range Neutron Flux-High channel inoperable. • ACTION D.1.1 - Perform SR 3.2.4.2 within 12 hours from discovery of THERMAL POWER> 75% RTP, AND • ACTION D.1.2 - Place channel in trip within 72 hours, OR • ACTION D.2 - Be in MODE 3 within 78 hours.
		• LCO 3.3.1.E, Reactor Trip System Instrumentation (Function 3.a, Power Range Neutron Flux Rate High Positive Rate)
		• CONDITION E - One channel inoperable.
		• E.1 - Place Channel in Trip in 72 hours. OR • E.2 - Be in MODE 3 in 78 hours.
		• LCO 3.3.1.S, Reactor Trip System Instrumentation (Function 18.e, Power Range Neutron Flux, P-10)
		• CONDITION S - One or more required channel(s) inoperable. • ACTION S.1 - Verify interlock is in the required state for existing unit conditions within 1 hour, OR • ACTION S.2 - Be in MODE 3 within 7 hours.
		• LCO 3.3.1.T, Reactor Trip System Instrumentation. (Function 18.b, c, & d, Power Range Neutron Flux, P-7, P-8, & P-9)
		• CONDITION T - One or more required channel(s) inoperable. • ACTION T.1 - Verify interlock is in the required state for existing unit conditions within 1 hour. • ACTION T.2 - Be in MODE 2 within 7 hours.
	US	INITIATE a Condition Report per STA-421. [Step 2.3.11]
	US	INITIATE repairs per STA-606. [Step 2.3.12]
		When the Technical Specification actions are addressed, or at Lead Evaluator's discretion, PROCEED to Event 2.

Operating Test : NRC	Scenario # 3	Event # 2	Page 10 of 41
Event Description: TPCW Leak, Auto Fill Failure			

Time	Position	Applicant's Actions or Behavior
		<u>Simulator Operator</u>: When directed, EXECUTE Event 2 (Key 2). **- TP01, TPCW leak. Auto makeup fails.**
		<u>Indications Available</u>: **1-ALB-9A, Window 2.10, TPCW HEAD TK LVL LO** **1-LI-3051. TPCW HEAD TK LVL lowering.** **1-HS-3050, TPCW HEAD TK MAKEUP VLV – NOT open.**
	BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE failure to auto makeup (1-HS-3050).
	US	DIRECT performance of 1ALB-9A.
		<u>NOTE</u>: 1-HS-3050 fails closed on loss of instrument air or power. A blown control power fuse will result in a loss of all handswitch light indications.
		<u>NOTE</u>: A LO-LO head tank level will trip both TPCW pumps at approximately 6% level on 1-LS-3050C <u>AND</u> 1-LS-3050D.
		<u>NOTE</u>: Surge tank level indication scale is approximately 40 gallons per percent.
	BOP	ENSURE 1-HS-3050, TPCW HEAD TK MAKEUP VLV is open. [Step 1] A. IF all handswitch light indications are off, THEN DISPATCH an operator to 1-TC-21 FB1 Fuses 21 and 23 to check for a blown control power fuse.
		<u>NOTE</u>: When chemical addition is in progress, TPCW head tank level should be manually controlled until the chemical addition tank is full. Manually controlling TPCW head tank level will minimize the possibility of overflowing head tank when chemicals are added to the system.
	BOP	VERIFY at least one demineralized water transfer pump is in service.[Step 2.] • X-ZL-5327, DEMIN WTR XFER PMP 1 • X-ZL-5328, DEMIN WTR XFER PMP 2

Operating Test : NRC	Scenario # 3	Event # 2	Page 11 of 41
Event Description: TPCW Leak, Auto Fill Failure			

Time	Position	Applicant's Actions or Behavior
	BOP	MONITOR 1-LI-3051, TPCW HEAD TK LVL.[Step 3.] A. IF TPCW head tank level is ≤ 63%, THEN DISPATCH an operator to TB 830 to fill the head tank by opening 1TW-0203, TPCW HEAD TK 1-01 DWS IN LVL CTRL VLV 3050 BYP VLV. B. IF level continues to decrease, THEN GO to ABN-306 for Excessive TPCW System Leakage.

<u>**Simulator Operator Note**</u>: **When dispatched to find leakage, report, "1TW-0222, TPCW Pump 1-02 DISCH DRN VLV was partially open as it was bumped by personnel moving equipment around the 1-02 TPCW Pump. The valve has been closed"**

DELETE malfunction TP01.

<u>**Examiner Note**</u>: **If the US enters ABN-306, Turbine Plant Cooling Water System Malfunction, Section 2.0, Excessive TPCW System Leakage, the steps begin below.**

<u>NOTE</u>: Step 1 is a Continuous Action Step

Time	Position	Applicant's Actions or Behavior
	BOP	Verify TPCW Head Tank Level is Trending Higher. [Step 2.3.1 2nd Bullet]
	BOP	Verify TPCW Head Tank Level-Greater than or equal to <u>50%</u>. [Step 2.3.2]
	BOP	Check Main Generator – <u>NO</u> IN-LEAKAGE, locally check Main Generator Liquid Level detectors at seal oil rack (TB 803 Rm 1-008) – NO LIQUID [Step 3 a.]
	BOP	Verify "GEN GAS MOISTURE HI" alarm (10A-1.10) – <u>DARK</u>. [Step 2.3.3 b.]
	BOP	Ensure makeup aligned to the TPCW Head Tank, 1-HS-3050, TPCW HEAD TK MAKEUP VLV, - OPEN. [Step 2.3.4 a.]

Operating Test :	NRC	Scenario #	3	Event #	2	Page	12	of	41
Event Description:	TPCW Leak, Auto Fill Failure								

Time	Position	Applicant's Actions or Behavior
Simulator Operator Note:		**When dispatched to start the second demineralized water transfer pump, wait 3 minutes and then activate key 10 to insert the remote function to start demineralized water transfer pump X-02.** **IRF CMR51 f:3 k:10**
	BOP	BOTH Demineralized Water Transfer Pumps – Running [Step 2.3.4 b.]
	BOP	Dispatch Nuclear Equipment Operators to inspect TPCW System for leaks. [Step 2.3.5]
	BOP	Verify Chemical Addition to TPCW – SECURED. [Step 2.3.6]
	BOP	Verify TPCW Head Tank level – STABLE AT OR TRENDING TO NORMAL. [Step 7]
	BOP	Verify TPCW System aligned for normal operation per SOP-313A/B. [Step 2.3.8]
	US	Initiate repair per STA-606. [Step 2.3.9]
	US	Initiate a Condition Report per STA-421 as applicable. [Step2.3.10]
When the TPCW Head Tank level alarm is clear, or at Lead Examiner discretion, PROCEED to Event 3.		

Operating Test :	NRC	Scenario #	3	Event #	3	Page	13	of	41
Event Description:	PZR LT-460 fails low. Letdown isolates.								

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 3 (Key 3). - RX05B, Pressurizer Level Transmitter (LT-460) fails low.		
Indications Available: 1-ALB-5B, Window 1.4, PRZR HTR GRP C CTRL TRBL 1-ALB-5B, Window, 3.6, PRZR LVL LO 1-ALB-5C, Window 1.2, PRZR LVL DEV LO 1-ALB-6A, Window 3.8, CVCS HELB PT-5358A 1-ALB-6A, Window 4.8, CVCS HELB PT-5358 1-LI-460A, PRZR LVL CHAN II indication failed low		
	RO	RESPOND to Annunciator Alarm Procedures.
		RECOGNIZE PZR level lowering and REPORT Pressurizer Level Channel II (LT-460) failed low.
	US	DIRECT performance of ABN-706, Pressurizer Level Instrumentation Malfunction, Section 2.0.
CAUTION: To avoid thermal shock of the reactor coolant piping, the letdown flow should not be stopped without also stopping the charging flow when the reactor coolant temperature is greater than 350˚F. NOTE: Channels 459 and 460 are normally the controlling channels.		
	RO	Manually control u-LK-459, PRZR LVL CTRL OR u-FK-121, CCP CHRG FLO CTRL to maintain level at program. [Step 2.3.1]
	RO	Transfer 1/u-LS-459D, PRZR LVL CTRL CHAN SELECT to an operable alternate controlling channel. [Step 2.3.2]
	RO/BOP	TRANSFER 1/1-LS-459E, 1/1-LR-459 PZR Level Recorder Select to an OPERABLE channel. [Step 2.3.3]

Operating Test :	NRC	Scenario #	3	Event #	3	Page	14	of	41
Event Description:	PZR LT-460 fails low. Letdown isolates.								

Time	Position	Applicant's Actions or Behavior
<u>Examiner Note</u>: Letdown flow is re-established using ABN-706, Attachment 6, or the Letdown Restoration Job Aid.		
	RO	VERIFY Normal Letdown aligned. [Step 2.3.4]
		WHEN pressurizer level is greater than 17%, THEN restore letdown per Attachment 6.
		• OPEN or VERIFY OPEN Letdown Isolation Valves 1/1-LCV-460 & 1/1-LCV 459. [Step 1]
		• Manually OPEN 1-PK-131, LTDN HX OUT PRESS CTRL to 30% (75 GPM) or 50% (120 GPM) DEMAND. [Step 2]
		• Manually OPEN 1-TK-130, LTDN HX OUT TEMP CTRL to 50% DEMAND. [Step 3]
		• ADJUST Charging to desired flow and MAINTAIN Seal Injection flow between 6 and 13 GPM. [Step 4]
		• OPEN selected Orifice Isolation Valves. [Step 5]
		o 1/1-8149A, LTDN ORIFICE ISOL VLV (45 GPM) o 1/1-8149B, LTDN ORIFICE ISOL VLV (75 GPM) o 1/1-8149C, LTDN ORIFICE ISOL VLV (75 GPM)
		• ADJUST 1-PK-131, LTDN HX OUT PRESS CTRL to ~310 psig on 1-PI-131, LTDN HX OUT PRESS then PLACE in AUTO. [Step 6]
		• ADJUST 1-TK-130, LTDN HX OUT TEMP CTRL to obtain ~95ºF on 1-TI-130, LTDN HX OUT TEMP, then PLACE in AUTO. [Step 7]
	RO	If necessary, Reclose 1/u-PCPR, PRZR CTRL HTR GROUP C by placing the control switch in the "ON" position. [Step 2.3.5]
	RO	RESTORE PZR Level Control **or** Charging Flow Control to AUTO as desired. [Step 2.3.6]
	US/RO	VERIFY other instruments on common instrument line – NORMAL. [Step 2.3.7]
		• VERIFY Loop 2 Instrument PT-0456 and PT-0458 responding normally per Attachment 1.

Operating Test :	NRC	Scenario #	3	Event #	3	Page	15	of	41
Event Description:	PZR LT-460 fails low. Letdown isolates.								

Time	Position	Applicant's Actions or Behavior
	US	EVALUATE Technical Specifications. [Step 2.3.10]
		LCO 3.3.1.M, Reactor Trip System Instrumentation (Function 9 – Pressurizer Water Level - High). • CONDITION M – One channel inoperable.
	US	INITIATE repairs per STA-606. [Step 2.3.11]
	US	INITIATE a SMART Form per STA-421. [Step 2.3.12]

When Letdown flow has been restored and Technical Specifications have been addressed, or at Lead Examiner discretion, PROCEED to Event 4.

Operating Test :	NRC	Scenario #	3	Event #	4	Page	16	of	41
Event Description:	CEV 1-01 Trip.								

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 4 (Key 4). - FW16, FW17A CEV pump trips. Manually start alternate		
Indications Available: 1-ALB-9A, Window 1.12, CNDSR ANY VAC PMP TRIP Plant Computer Alarms: • P6600A – CNDSR A PRESS (VA) • P6601A – CNDSR B PRESS (VA) 1-PI-2042-1, CNDNSR A PRESS lowering 1-PI-2042-2, CNDNSR B PRESS lowering		
	BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE Main Condenser vacuum lowering slowly.
	US	DIRECT performance of ABN-304, Main Condenser and Circulating Water System Malfunction, Section 3.0.
	BOP	START all available Condenser Vacuum Pumps. [Step 3.3.1]
Simulator Operator: When dispatched to verify CEV seal water tank levels, after 3 minutes, report, "The seal tank on 1-01 CEV was empty and it has been filled." Delete the Air in-leakage malfunction, FW16.		
	BOP	DISPATCH an operator to VERIFY CEV seal water tank level indicated. [Step 3.3.2]
	BOP	VERIFY Main Condenser vacuum $\geq$ 21" Hg. [Step 2.3.3]

Operating Test : NRC	Scenario # 3	Event # 4	Page 17 of 41
Event Description: CEV 1-01 Trip.			

Time	Position	Applicant's Actions or Behavior
	BOP	DETERMINE Main Condenser vacuum > 26.5" Hg. [Step 2.3.4]
		On the Back Pressure Limit Display ensure turbine NOT operating for more than 5 minutes in the NOT PERMISSIBLE region [Step 2.3.4 RNO]
NOTE: Step 5 is a continuous action step.		
Examiner Note: The crew may perform at least one 50 MWe load if Rated Thermal power eexceeds 100%.		
	BOP	Verify Main Condenser Vacuum Being Maintained - GREATER THAN 24.5" HG AND STABLE [Step 2.3.5]
		AND Reactor Power - LESS THAN 100%
	BOP	Locally verify In-leakage paths - NORMAL [Step 2.3.6]
	US	DIRECT performance of ALM-0091A, CNDSR ANY VAC PMP TRIP
NOTE: If trip is due to overcurrent trip switch, the handswitch white light will be illuminated for affected vacuum pump. The OTS (white light) can be reset locally at breaker or by placing handswitch in OFF.		
NOTE: The standby condenser vacuum pump will automatically start when condenser vacuum is ≤24 inches Hg vacuum. The pressure switches used to start and operate vacuum pump and suction valve are located in seal pump control cabinet next to vacuum pump.		
	BOP	PLACE affected vacuum pump handswitch in OFF. [Step 1]
		• 1-HS-2956, CNDSR VAC PMP 1 • 1-HS-2957, CNDSR VAC PMP 2 • 1-HS-2958, CNDSR VAC PMP 3
		A. IF NO vacuum pumps are in service, THEN START an available pump per SOP-309A for Startup.
	BOP	VERIFY condenser vacuum is maintained above 24.5 inches Hg vacuum. [Step 2]
		A. IF vacuum can NOT be maintained, THEN GO to ABN-304 for Main or Auxiliary Condenser Vacuum Decreasing.

Operating Test :	NRC	Scenario #	3	Event #	4	Page	18	of	41
Event Description:	CEV 1-01 Trip.								

Time	Position	Applicant's Actions or Behavior
Simulator Operator:		**When dispatched to check CEV pump 1-01, after 3 minutes, report, "The 1-01 CEV motor is hot and there is an acrid odor, the breaker has tripped on overload".**
	BOP	DISPATCH an operator to TB 778' CEV AREA to check pump for signs of damage (i.e., smoke, acrid odor, overheating). [Step 3]
	BOP	CORRECT the condition or INITIATE a work request per STA-606.[Step 4]
At Lead Examiner discretion, PROCEED to Event 5.		

Operating Test :	NRC	Scenario #	3	Event #	5	Page	19	of	41
Event Description:	SG 1-02 10 GPM Tube Leak.								

Time	Position	Applicant's Actions or Behavior
Simulator Operator:		**When directed, EXECUTE Event 5 (Key 5). - SG02B, Steam Generator 1-02 Tube Leak at 10 GPM.**
Indications Available:		**PC-11 – MSL-179 (1-RE-2326) is RED PC-11 – N16-175 MSL #1 (1-RE-2326A) is RED PC-11 – COG-182 (1-RE-2959) is RED (Condenser Off Gas is delayed)**
	RO/BOP	RESPOND to PC-11, Digital Radiation Monitoring System alarms.
	RO/BOP	RECOGNIZE radiation monitor alarms associated with Steam Generator 1-02.
	US	DIRECT performance of ABN-106, High Secondary Activity, Section 3.0.
	RO/BOP	DETERMINE Main Steam Line 1-02 radiation alarm 1-RE-2326 is RED on PC-11.
	US	• REDUCE power to ≤ 50% in 1 hour AND be in MODE 3 in the next 2 hours.
	US	• GO to Step 5.b.
Examiner Note:		**Crew should implement Reactivity Briefing Sheet for a Rapid Plant Shutdown within one hour.**
NOTE:		Operation with charging flow exceeding combined Letdown and VCT Makeup flow may result in Charging Pump suction shifting to RWST.
	RO	VERIFY PRZR level – STABLE OR TRENDING TO NORMAL LEVEL.
Note:		Step 6 is a continuous action step.
	US	VERIFY Condenser off Gas Radiation Monitor OR Main Steam Line Leak Rate Radiation Monitor on Affected Steam Generator – OPERABLE.

Operating Test :	NRC	Scenario #	3	Event #	5	Page	20	of 41
Event Description:	SG 1-02 10 GPM Tube Leak.							

Time	Position	Applicant's Actions or Behavior
NOTE: • A preferred sampling sequence may be specified if one Steam Generator is suspected of leaking. • Sample isolation valves will have to be held open while sampling if isolated due to high radiation on u-RE-4200 (SGS-u64).		
	US	DIRECT Chemistry to implement CHM-113.
	BOP	ADJUST Steam Generator 1-02 Atmospheric Relief Controller setpoint to 1160 PSIG per TDM-501A.
	BOP	VERIFY Affected Steam Generator – SG 1-02.
	US	EVALUATE Technical Specifications.
		LCO 3.4.13, RCS Operational Leakage
		• CONDITION B - Primary to secondary LEAKAGE not within limits.
Examiner Note: The following steps are from IPO-003A, Power Operations, Section 5.6, Reducing Turbine Power from 100% to MODE 3.		
	US	DIRECT load reduction to 200 MWe per IPO-003A, Power Operations, Section 5.6, Reducing Turbine Power from 100% to MODE 3.
NOTE: Chemistry will specify Demineralizers to be placed in service based on RCS conditions. BTRS or CVCS demineralizers may be used.		
NOTE: For power reductions to approximately 700 MWE, Attachment 6A may be used.		
	RO	CONTACT Chemistry and place specified demineralizers in-service.
	RO	NOTIFY QSC Generation Controller prior to reducing load.

Operating Test : NRC	Scenario # 3	Event # 5	Page 21 of 41				
Event Description: SG 1-02 10 GPM Tube Leak.							

Time	Position	Applicant's Actions or Behavior
		NOTE: For power changes greater than 5%, a reactivity plan should be developed using one of the sources below. (Listed in order of preference) • IF time and resources support generation of a BEACON projection (for a pre-planned power maneuver), THEN contact Core Performance Engineering for support, and utilize the approved results as the reactivity plan. • IF the power change closely matches one of the down-power scenarios available in the Reactivity Briefing Sheets (printed from CHORE), THEN utilize the appropriate reactivity plan (interpolation between values on the Boration Matrix is allowed). • IF the above two options are not available or do not fit the current scenario, THEN perform a NDR based reactivity calculation per Attachment 3 or equivalent CHORE output.
	RO	NOTIFY Chemistry and Radiation Protection that power will be lowered ≥ 15% within a one hour period.

Operating Test :	NRC	Scenario #	3	Event #	5	Page	22	of	41
Event Description:	SG 1-02 10 GPM Tube Leak.								

Time	Position	Applicant's Actions or Behavior

NOTE:

- During the initial reduction in power, a combination of control rod insertion and boration should be used to compensate for changes in reactivity due to power defect. This will allow the control rods to be available to compensate for the reactivity due to Xenon following the power reduction.
- Primary plant should lead secondary plant during Main Turbine load changes.
- During a down power, operators should adjust the pots (1-SK-0509B and 1-SK-0509C) to maintain the difference between the FWPT speeds within the desirable range.
- FWPT speed deviation from commanded speed during a normal shutdown may be an indication of binding in a FWPT control valve, guidance for this event is located in ABN-302 Sect. 9.0, FEEDWATER PUMP CONTROL SYSTEM MALFUNCTION.
- The TSE, within the digital turbine control system, is constantly measuring temperatures at critical sections of the turbine and will limit the ramp up/ramp down as deemed necessary by internal stress calculations performed by TSE. If TSE determines that the allowable temperature margin is being approached or exceeded, alarm annunciation will occur and the ramp up/ ramp down will be limited. The following alarms may be received:

  TSE Lower Temp Margin <0
  TSE Lower Temp Margin <20
  TSE Upper Temp Margin <0
  TSE Upper Temp Margin <60
  TSE Lower Margin HP Shaft <0
  TSE Lower Margin HP Shaft <60
  TSE Upper Margin HP Shaft <0
  TSE Upper Margin HP Shaft <60

	RO	PERFORM the following to reduce Turbine Load to ~200MWe:
		DETERMINE the amount of Boration required to reduce Reactor Power to 200 MWe (~15% power).
	RO	If desired, DETERMINE the rate of Boration required to allow slow Control Rod inward motion as Turbine load lowers.
	RO	REFER to Attachment 2 for guidance in controlling AFD during power ramp.

Operating Test :	NRC	Scenario #	3	Event #	5	Page	23	of	41
Event Description:	SG 1-02 10 GPM Tube Leak.								

Time	Position	Applicant's Actions or Behavior
	RO	INITIATE RCS boration per SOP-104A, Reactor Make-up and Chemical Control System.

Examiner Note: The following steps are from SOP-104A, Reactor Make-up and Chemical Control System, Section 5.1.2, Borate Mode.

> CAUTION: Initial RCS makeup boron concentration will be the concentration added from the previous RCS makeup evolution.

> NOTE:
> - This procedure assumes prior automatic operation.
> - TDM-201A and TDM-203A contain information to aid in obtaining correct values for setting pots and counters.
> - Attachment 2, BOL Boration for Long Term Use provides instructions for periodic borations while keeping the Makeup System in Borate Mode.

Time	Position	Applicant's Actions or Behavior
	RO	PERFORM the following to COMMENCE RCS boration:
		• ENSURE Prerequisites of Section 2.1 and 2.2 are met. [Step 5.1.2.A]
		• ENSURE 1/1-MU, RCS MU MAN ACT is in STOP. [Step 5.1.2.B]
		• PLACE 43/1-MU, RCS MU MODE SELECT in BORATE. [Step 5.1.2.C]
		• SET 1-FK-110, BA BLNDR FLO CTRL to ~4.68 pot setting for ~18.7 GPM. [Step 5.1.2.D]
		• SET 1-FY-110B, BA BATCH FLO counter for 561 gallons. [Step 5.1.2.E]

> NOTE: 1/1-FCV-110A may be in CLOSE if RCS Boron Concentration is < 250 ppm to prevent inadvertent boration of RCS..

Time	Position	Applicant's Actions or Behavior
		• ENSURE 1/1-FCV-110A, BA BLNDR FLO CTRL VLV in AUTO. [Step 5.1.2.F]
		• PLACE 1/1-MU, RCS MU MAN ACT in START. [Step 5.1.2.G]
		• VERIFY 1/1-APBA1, BA XFR PMP 1 STARTS. [Step 5.1.2.H]
		• VERIFY 1/1-FCV-110A, BA BLNDR FLO CTRL VLV throttles to ~18.7 GPM. [Step 5.1.2.I]
		• VERIFY 1/1-FCV-110B, RCS MU TO CHG PMP SUCT ISOL VLV OPEN. [Step 5.1.2.I]
		• VERIFY 1-FY-110B, BA BATCH FLO counter operating properly. [Step 5.1.2.J]

Operating Test :	NRC	Scenario #	3	Event #	5	Page	24	of 41
Event Description:	SG 1-02 10 GPM Tube Leak.							

Time	Position	Applicant's Actions or Behavior
		• VERIFY 1-FR-110, BA BATCH FLO TO BLNDR red pen operating properly. [Step 5.1.2.J]
NOTE: The following step is intended to reduce the severity of VCT pressure and level transients which can significantly impact RCS Hydrogen concentration. The applicability of this step is dependent on the expected magnitude of the makeup.		
		• OPERATE 1/1-LCV-112A, VCT LVL CTRL VLV as necessary to maintain proper VCT level. [Step 5.1.2.K]
		• When desired amount of boric acid is added, PLACE 1/1-MU, RCS MU MAN ACT in STOP. [Step 5.1.2.L]
Examiner Note: The following steps continue from IPO-003A, Power Operations, Section 5.6, Reducing Turbine Power from 100% to Mode 3.		
	BOP	SET Turbine Load Rate Setpoint Controller to ~20 MWe/min.
		• OPEN "Load Rate Setpoint" OSD.
		• SELECT blue bar and ENTER 20 MWe/min.
		• CLOSE "Load Rate Setpoint" OSD.
	BOP	SET Turbine Load Target to 200 MWe.
		• OPEN "Load Target" OSD.
		• SELECT blue bar and ENTER 200 MWe.
		• DEPRESS "Accept" then VERIFY value in blue bar is desired "Load Target" (magnitude and direction).
		• DEPRESS "Execute" then VERIFY "Load Target" changes to desired load.
		• CLOSE "Load Target" OSD.
	CREW	MONITOR load change.
When the crew has demonstrated controlled load reduction, or as determined by the lead examiner, proceed to Event 6.		

Operating Test : NRC	Scenario # 3	Event # 6, 7, 8	Page 25 of 41
Event Description: SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start			

Time	Position	Applicant's Actions or Behavior
Examiner Note: Events 7 and 8 will occur as they were inserted on setup, and therefore this is the last active key for the scenario.		
Simulator Operator: When directed, EXECUTE Event 6 (Key 6). SG01A, SG 1-02 Tube Rupture, One Tube.		
Indications Available: **6A-3.4 – CHRG FLO HI / LO** **5C-1.2 – PRZR LVL DEV LO** **5C-3.3 – PRZR PRESS LO BACKUP HTRS ON** **PC-11 – MSL-178 (1-RE-2326) is RED** **Main Steam Line Radiation level rising** **Pressurizer pressure lowering**		
	RO/BOP	RECOGNIZE Pressurizer level and pressure LOWERING at a rising rate.
	RO/BOP	RECOGNIZE PRZR pressure decreasing with Steam Line Radiation Monitors in alarm and steam / feed mismatch.
	RO	Manually INITIATE a Reactor Trip.
		PLACE 1/1-RTC, RX TRIP BKR Switch in TRIP.
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
	RO	VERIFY Reactor Trip: [Step 1]
		• VERIFY Reactor Trip Breakers – OPEN. [Step 1.a]
		• VERIFY Neutron flux – DECREASING. [Step 1.a]
		• VERIFY all Control Rod Position Rod Bottom Lights – ON. [Step 1.b]

Examiner Note: Turbine will not trip which will require the operator to stop EHC pumps or close the Main steam isolation valves, either action satisfies the Critical Task.		
CRITICAL TASK		**Place EHC Pumps in PULL OUT or Manually Close MSIVs Upon Failure of Main Turbine Trip Prior to Exiting EOP 0.0A, Reactor Trip or Safety Injection.**
	BOP	VERIFY Turbine Trip: [Step 2]
		• All HP Turbine Stop Valves – CLOSED. [Step 2]
		Manually trip turbine. [Step 2 RNO]
CRITICAL TASK	BOP	<u>IF</u> the turbine will <u>NOT</u> trip, <u>THEN</u> pull-out all EHC fluid pumps. [Step 2 RNO] <u>IF</u> the turbine still <u>NOT</u> tripped, <u>THEN</u> close or verify closed main steamline isolation valves.
	BOP	VERIFY Power to AC Safeguards Buses: [Step 3]
		• VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a]
		• VERIFY both AC Safeguards Buses – ENERGIZED. [Step 3.b]
	RO	CHECK SI status: [Step 4]
		• CHECK if SI is actuated. [Step 4.a]
		• PLACE 1/1-SIA2, SI MAN ACT Switch to ACT position at CB-07 and DETERMINE SI has actuated.
		• VERIFY Both Trains SI Actuated: [Step 4.b]
		• SI Actuated blue status light – ON <u>NOT</u> FLASHING.
Examiner Note: Attachment 2 Steps begin on page 37 of the scenario.		
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2. [Step 5]

Time	Position	Applicant's Actions or Behavior
	RO	VERIFY AFW Alignment: [Step 6]
		• MDAFW Pumps – RUNNING. [Step 6.a]
		• Turbine Driven AFW Pump – RUNNING IF NECESSARY. [Step 6.b]
		• AFW total flow – GREATER THAN 460 GPM. [Step 6.c]
		• AFW valve alignment - PROPER ALIGNMENT. [Step 6.d]
	RO	DETERMINE Containment Spray NOT Required: [Step 7]
		• VERIFY 1-ALB-2B, Window 1-8, CS ACT – NOT ILLUMINATED. [Step 7.a]
		-AND-
		• VERIFY 1-ALB-2B, Window 4-11, CNTMT ISOL PHASE B ACT – NOT ILLUMINATED. [Step 7.a]
		-AND-
		• VERIFY Containment pressure – LESS THAN 18.0 PSIG. [Step 7.a]
	RO	VERIFY Containment Spray Heat Exchanger Outlet Valves – CLOSED. [Step 7.b]
	RO	VERIFY Containment Spray Pumps – RUNNING. [Step 7.c]

	RO/BOP	CHECK if Main Steam lines should be ISOLATED: [Step 8] a. Verify the following:
		• VERIFY Containment pressure – GREATER THAN 6.0 PSIG. [Step 8.a] -OR- • VERIFY Steam Line pressure – LESS THAN 610 PSIG. [Step 8.a]
	RO/BOP	Determine Main Steam lines should not be isolated and go to Step 9. [Step 8 a. RNO]
	RO/BOP	Check RCS Temperature - RCS AVERAGE TEMPERATURE STABLE AT <u>OR</u> TRENDING TO 557^{O}F [Step 9]

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	28	of	41
Event Description:	SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start								

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Check PRZR Valve Status:[Step 10] a. PRZR Safeties - CLOSED
		b. Normal PRZR spray valves -CLOSED
		c. PORVs - CLOSED
		d. Power to at least one block valve - AVAILABLE
		e. Block valves - AT LEAST ONE OPEN
	RO/BOP	Check If RCPs Should Be Stopped:[Step 11]
		a. RCS subcooling - LESS THAN 25^{O}F (55^{O}F FOR ADVERSE CONTAINMENT)
		b. ECCS pumps - AT LEAST ONE RUNNING • CCP -OR- • SI pump
		c. Stop all RCPs.
	RO/BOP	Check If Any SG Is Faulted:[Step 12]
		a. Check pressures in all SGs: a. Go to Step 13. • ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER -OR- • ANY SG COMPLETELY DEPRESSURIZED
		b. Go to EOP-2.0A, FAULTED STEAM GENERATOR ISOLATION, Step 1.
	RO/BOP	Check If SG Tubes Are Ruptured: [Step 13]
		• Condenser off gas radiation - NORMAL (COG-182, 1RE-2959) • Main steamline radiation - NORMAL (MSL-178 through 181, 1RE-2325 through 2328) • SG blowdown sample radiation monitor - NORMAL (SGS-164, 1RE-4200) • No Steam Generator level increasing in an uncontrolled manner
		RNO: Go to EOP-3.0A, STEAM GENERATOR TUBE RUPTURE. Step 1

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	29	of	41
Event Description:	SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start								

Time	Position	Applicant's Actions or Behavior
	US	Transition to EOP-3.0A, STEAM GENERTOR TUBE RUPTURE.
<u>Examiner Note</u>: EOP-3.0, Steam Generator Tube Rupture steps begin here.		
	RO/BOP	Check If RCPs Should Be Stopped: [Step 1]
		a. RCS subcooling ‑LESS THAN 25°F (55°F FOR ADVERSE CONTAINMENT)
		b. ECCS pumps ‑ AT LEAST ONE RUNNING • CCP -OR- • SI pump
		c. Stop all RCPs.
CRITICAL TASK		**Identify and isolate the Ruptured Steam Generator Prior to Commencing an Operator Induced Cooldown per EOP-3.0A.**
CRITICAL TASK	RO/BOP	Identify Ruptured SG(s): SG 1-02 is the only one. [Step 2] • Unexpected increase in any SG narrow range level -OR- • High radiation from any SG blowdown sample line. (SGS‑164, 1‑RE‑4200) -OR- • High radiation from any Main steamline. (MSL‑178 through 181, 1‑RE‑2325 through 2328)
CRITICAL TASK		Identified 1-02 Steam Generator Tubes are ruptured.

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	30	of	41
Event Description:	SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start								

Time	Position	Applicant's Actions or Behavior
		CAUTION: If the TDAFW pump is the only available source of feed flow, steam supply to the TDAFW pump must be maintained from at least one SG.
		CAUTION: At least one SG must be maintained available for RCS cooldown.
		NOTE: If any SG atmospheric opens the Plant Staff should be notified.
CRITICAL TASK	RO/BOP	Isolate Flow From Ruptured SG(s): [Step 3]
		a. Adjust ruptured SG(s) atmospheric controller setpoint to 1160 psig.
		b. Check ruptured SG(s) atmospheric - CLOSED
		c. Close ruptured SG(s) main steamline isolation, and SG drippot isolation valves
		d. Pull-Out steam supply valve handswitch from ruptured SG(s) to Turbine Driven AFW pump – **Not Applicable to SG 1-02**.
		e. Verify blowdown isolation valve(s) from ruptured SG(s) - CLOSED
		CAUTION: If any ruptured SG is faulted, feed flow to that SG should remain isolated during subsequent recovery actions unless needed for RCS cooldown.
	RO/BOP	Check Ruptured SG(s) Level: [Step 4]
		a. Narrow range level - GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT)
CRITICAL TASK		b. Stop AFW flow to ruptured SG(s).

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	31	of 41
Event Description:	SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start							

Time	Position	Applicant's Actions or Behavior
		CAUTION: Major steam flow paths from the ruptured SG(s) should be isolated before initiating RCS cooldown.
	RO/BOP	Check Ruptured SG(s) Pressure - GREATER THAN 420 PSIG. [Step 5]
		CAUTION: If RCPs are NOT running, the following steps may cause a false INTEGRITY STATUS TREE (FRP) indication for the ruptured loop. Disregard ruptured loop Cold Leg Wide Range Temperature indication until after performing Step 32.
		NOTE: After the low steamline pressure SI signal is blocked, main steamline isolation will occur if the high steam pressure rate setpoint is exceeded.
	RO/BOP	Initiate RCS Cooldown: [Step 6]
		a. Check PRZR pressure - LESS THAN 1960 PSIG
		b. Block low steamline pressure SI signal
		c. Determine required core exit temperature from Table 1.

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	32	of	41
Event Description:	SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start								

Time	Position	Applicant's Actions or Behavior

TABLE 1

LOWEST -RUPTURED SG PRESSURE (PSIG)	CORE EXIT TEMPERATURE (°F)
1200	523°F (493°F for Adverse Containment)
1150	518°F (487°F for Adverse Containment)
1100	512°F (481°F for Adverse Containment)
1050	507°F (475°F for Adverse Containment)
1000	501°F (469°F for Adverse Containment)
950	495°F (462°F for Adverse Containment)
900	488°F (454°F for Adverse Containment)
850	482°F (447°F for Adverse Containment)
800	475°F (440°F for Adverse Containment)
750	467°F (431°F for Adverse Containment)
700	459°F (421°F for Adverse Containment)
650	450°F (412°F for Adverse Containment)
600	441°F (402°F for Adverse Containment)
550	431°F (391°F for Adverse Containment)
500	421°F (380°F for Adverse Containment)
450	409°F (366°F for Adverse Containment)
420	402°F (358°F for Adverse Containment)

Time	Position	Applicant's Actions or Behavior
	RO/BOP	d. Dump steam to condenser from intact SG(s) at maximum rate and avoid main steam isolation. 1) Transfer Steam Dump to steam pressure mode. 2) Place the steam pressure controller in manual and increase demand. 3) When P-12 (553°F TAVG) is reached, select bypass interlock on Steam Dumps and continue cooldown.
		e. Place all PRZR heater switches to OFF position.
		f. Core exit TCs - LESS THAN REQUIRED TEMPERATURE
		RNO: Continue with Step 7. WHEN core exit TCs less than required temperature, THEN do Step 6g and 6h.
		g. Stop RCS cooldown.
		h. Maintain core exit TCs - LESS THAN REQUIRED TEMPERATURE
	RO/BOP	Check Intact SG Levels: [Step 7]
		a. Narrow range level - GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT)
		b. Control AFW flow to maintain narrow range level between 43% and 60%.
		CAUTION: If any PRZR PORV opens because of high PRZR pressure, Step 8b should be repeated after pressure decreases to less than the PORV setpoint.
	RO/BOP	Check PRZR PORVs And Block Valves: [Step 8]
		a. Power to block valves - AVAILABLE
		b. PORVs - CLOSED
		c. Block valves - AT LEAST ONE OPEN

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	34	of	41
Event Description:	SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start								

Time	Position	Applicant's Actions or Behavior
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
		CAUTION: Attachment 9 of EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION provides guidance to realign equipment after SI signal has been reset. This attachment should be referenced as necessary to establish support conditions and equipment restoration.
	RO/BOP	IF The Diesels Are Running, THEN Place Both DG EMER STOP/START Handswitches In START. [Step 9]
	RO/BOP	Reset SI. [Step 10]
	RO/BOP	Reset SI Sequencers. [Step 11]
	RO/BOP	Reset Containment Isolation Phase A And Phase B. [Step 12]
	RO/BOP	Reset Containment Spray Signal. [Step 13]
	RO/BOP	Establish Instrument Air And Nitrogen To Containment: [Step 14]
		a. Establish instrument air: • Verify air compressor running. -AND- • Establish instrument air to containment. b. Establish nitrogen: 1) Verify ACCUM 1-4 VENT CTRL, 1-HC-943 - CLOSED 2) Open SI/PORV ACCUM N2 ISOL VLV, 1/1-8880

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	35	of	41
Event Description:	SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start								

Time	Position	Applicant's Actions or Behavior
		CAUTION: RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT), the RHR pumps must be manually restarted to supply water to the RCS.
	RO/BOP	Check If RHR Pumps Should Be Stopped: [Step 15]
		a. RHR pumps - ANY RUNNING WITH SUCTION ALIGNED TO RWST
		b. RCS pressure - GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT)
		c. Stop RHR pumps and place in standby.
		d. Reset RHR auto switchover.
	RO/BOP	Check If RCS Cooldown Should Be Stopped: [Step 16]
		a. Core exit TCs - LESS THAN REQUIRED TEMPERATURE
		• DO NOT proceed until core exit TCs less than required temperature. [Step 16 RNO]
		b. Verify Steps 6g and 6h complete.
	RO/BOP	Check Ruptured SG(s) Pressure - STABLE OR INCREASING [Step 17]
	RO/BOP	Check RCS Subcooling - GREATER THAN 45°F (75°F FOR ADVERSE CONTAINMENT) [Step 18]

Operating Test : NRC	Scenario # 3	Event # 6, 7, 8	Page 36 of 41
Event Description: SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start			

Time	Position	Applicant's Actions or Behavior
	RO/BOP	Depressurize RCS To Minimize Break Flow And Refill PRZR: [Step 19]
		a. Normal PRZR spray - AVAILABLE
		b. Spray PRZR with maximum available spray until ANY of the following conditions satisfied: • BOTH of the following: 1) RCS pressure - LESS THAN RUPTURED SG(s) PRESSURE 2) PRZR level - GREATER THAN 13% (34% FOR ADVERSE CONTAINMENT) -OR- • PRZR level - GREATER THAN 75% (65% FOR ADVERSE CONTAINMENT) -OR- • RCS subcooling - AT 25°F (55°F FOR ADVERSE CONTAINMENT)
		c. Close spray valve(s): 1) Normal spray valves 2) Auxiliary spray valve

When the crew has begun RCS depressurization or at the discretion of the lead examiner, the scenario can be terminated.

Examiner Note: These steps are performed by the BOP per EOP-0.0A, Attachment 2.		
	BOP	VERIFY SSW Alignment: [Step 1]
		• VERIFY SSW Pumps – RUNNING. [Step 1.a]
		• VERIFY Diesel Generator Cooler SSW return flow. [Step 1.b]
CRITICAL TASK		**Manually Start Safety Injection Pump 1-01 Prior to completing Attachment 2 of EOP-0.0A, Reactor Trip or Safety Injection.**
	BOP	VERIFY Safety Injection Pumps – RUNNING. [Step 2]
CRITICAL TASK	BOP	• DETERMINE SI Pump 1-01 failed to start and MANUALLY START SI Pump 1-01. [Step 2 RNO]
	BOP	VERIFY Containment Isolation Phase A. [Step 3]
	BOP	VERIFY Containment Ventilation Isolation. [Step 4]
	BOP	VERIFY CCW Pumps – RUNNING. [Step 5]
	BOP	VERIFY RHR Pumps – RUNNING. [Step 6]
	BOP	VERIFY Proper CVCS Alignment: [Step 7]
		• VERIFY both CCPs – RUNNING. [Step 7.a]
		• VERIFY Letdown Relief Valve isolation: [Step 7.b]
		• DETERMINE Letdown Orifice Isolation Valves – CLOSED. [Step 7.b.1)]
		• DETERMINE Letdown Isolation Valves1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [Step 7.b.2)]
	BOP	VERIFY ECCS flow: [Step 8]
		• VERIFY CCP SI flow indicator. [Step 8.a]
		• VERIFY RCS pressure < 1800 PSIG. [Step 8.b]
		• VERIFY SI Pumps discharge flow indicator. [Step 8.c]

Time	Position	Applicant's Actions or Behavior
		• VERIFY RCS pressure > 325 PSIG. [Step 8.d]
	BOP	VERIFY Feedwater Isolation Complete: [Step 9]
		• VERIFY Feedwater Isolation Valves CLOSED. [Step 9]
		• VERIFY Feedwater Isolation Bypass Valves CLOSED. [Step 9]
		• VERIFY Feedwater Bypass Control Valves CLOSED. [Step 9]
		• VERIFY Feedwater Control Valves CLOSED. [Step 9]
	BOP	VERIFY both Diesel Generators – RUNNING. [Step 10]
	BOP	VERIFY Monitor Lights For SI Load Shedding – LIT. [Step 11]
	BOP	VERIFY Proper SI alignment per MLB light indication. [Step 12]
	BOP	VERIFY Components Properly Aligned per Table 1. [Step 13]

Location	Equipment	Description	Condition
CB-03	X-HS-5534	H2 PRG SPLY FN 4	STOPPED
CB-03	X-HS-5532	H2 PRG SPLY FN 3	STOPPED
CB-04	1/1-8716A	RHRP 1 XTIE VLV	OPEN
CB-04	1/1-8716B	RHRP 2 XTIE VLV	OPEN
CB-06	1/1-8153	XS LTDN ISOL VLV	CLOSED
CB-06	1/1-8154	XS LTDN ISOL VLV	CLOSED
CB-07	1/1-RTBAL	RX TRIP BKR	OPEN
CB-07	1/1-RTBBL	RX TRIP BKR	OPEN
CB-07	1/1-BBAL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-07	1/1-BBBL	RX TRIP BYP BKR	OPEN/DEENERGIZED
CB-08	1-HS-2397A	SG 1 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2398A	SG 2 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2399A	SG 3 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2400A	SG 4 BLDN HELB ISOL VLV	CLOSED
CB-08	1-HS-2111C	FWPT A TRIP	TRIPPED
CB-08	1-HS-2112C	FWPT B TRIP	TRIPPED

Operating Test :	NRC	Scenario #	3	Event #	6, 7, 8	Page	39	of	41
Event Description:	SGTR 1-02 ONE Tube, Turbine Fails to Trip, SIP 1-01 Fails to Start								

Time	Position	Applicant's Actions or Behavior

	CB-09	1-HS-2490	CNDS XFER PUMP	STOPPED (MCC deenergized on SI)
	CV-01	X-HS-6181	PRI PLT SPLY FN 17 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6188	PRI PLT SPLY FN 18 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6195	PRI PLT SPLY FN 19 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6202	PRI PLT SPLY FN 20 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6209	PRI PLT SPLY FN 21 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6216	PRI PLT SPLY FN 22 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6223	PRI PLT SPLY FN 23 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6230	PRI PLT SPLY FN 24 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-3631	UPS & DISTR RM A/C FN 1 & BSTR FN 42	STARTED
	CV-01	X-HS-3632	UPS & DISTR RM A/C FN 2 & BSTR FN 43	STARTED
	CV-01	1-HS-5600	ELEC AREA EXH FN 1	STOPPED/DEENERGIZED
	CV-01	1-HS-5601	ELEC AREA EXH FN 2	STOPPED/DEENERGIZED
	CV-01	1-HS-5602	MS & FW PIPE AREA EXH FN 3 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5603	MS & FW PIPE AREA EXH FN 4 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5618	MS & FW PIPE AREA SPLY FN 17	STOPPED/DEENERGIZED
	CV-01	1-HS-5620	MS & FW PIPE AREA SPLY FN 18	STOPPED/DEENERGIZED
	CV-03	X-HS-5855	CR EXH FN 1	STOPPED/DEENERGIZED
	CV-03	X-HS-5856	CR EXH FN 2	STOPPED/DEENERGIZED
	CV-03	X-HS-5731	SFP EXH FN 33	STOPPED/DEENERGIZED
	CV-03	X-HS-5733	SFP EXH FN 34	STOPPED/DEENERGIZED
	CV-03	X-HS-5727	SFP EXH FN 35	STOPPED/DEENERGIZED
	CV-03	X-HS-5729	SFP EXH FN 36	STOPPED/DEENERGIZED

Time	Position	Applicant's Actions or Behavior

Examiner Note: The next four (4) steps would be performed on Unit 2.

	CB-03	2-HS-5538	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5539	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5537	AIR PRG SPLY ISOL DMPR	CLOSED
	CB-03	2-HS-5536	AIR PRG SPLY ISOL DMPR	CLOSED

	BOP	NOTIFY Unit Supervisor attachment instructions complete and to IMPLEMENT FRGs as required. [Step 13]

EOP-0.0A, Attachment 2 steps are now complete.

;CPNPP 2015 NRC Initial Scenario 3
;Load IC20

;INITIAL CONDITIONS

;SIP 1-02 placed in pull out
;Danger Tag on Handswitch
;Breaker racked out
;GEM Cover on Train A SIP HS
IRF SIR02 f:0

;SIP 1-01 Fail to start on SI (Event 8)
IMF SI04C f:1

;Turbine Fails to Auto/Man trip (Event 7)
IMF TC07C f:1

;Auto MSLI Failure Trn A/B (Event 7)
IMF SS02A1 f:1
IMF SS02A2 f:1

;TPCW Auto fill block ((Event 2)
IOR DITPHS3050 f:0

;EVENTS

;N-42 Power Range Fails hi (Event 1)
IMF NI04E f:200 k:1

;TPCW Leak 15 gpm (Event 2)
IMF TP01 f:15 k:2

;Delete override and leak when RO fills (Event 2)
{DITPHS3050.Value=2} DOR DITPHS3050
{DITPHS3050.Value=2} DMF TP01

;Start a second Demin Pump if needed (Event 2)
IRF CMR51 f:3 k:10

;PRZR Lvl trans 460 fails low (Event 3)
IMF RX05B f:0 k:3

;CEV 1-01 Trip with air in leakage
IMF FW16 f:2 k:4
IMF FW17A f:1 k:4

;SG2 10 gpm tube leak (Event 5)
IMF SG01B f:10 k:5

;SG 2 Tube rupture 1 tube (Event 6)
IMF SG02B f:1 k:6

June 2015 NRC Exam

Facility:	CPNPP 1 & 2	Scenario No.:	4	Op Test No.:	
Examiners:		Operators:			

Initial Conditions: Power is at 100%, MOL. EHC pump motor is tagged out. Boric Acid Pump 1-01 is tagged out.

Turnover: Maintain 100% Reactor Power.

Critical Tasks:
- Manually Trip Reactor due to RCP trip prior to exiting EOP-0.0A, Reactor Trip or Safety Injection.
- Manually start at least one low-head (RHR pump) ECCS pump before completion of Attachment 2 of EOP-0.0A, Reactor Trip or Safety Injection.
- Transfer a single train of ECCS to Cold Leg Recirculation per EOS-1.3A, Transfer to Cold Leg Recirculation prior to RWST Empty alarm.

Event No.	Malf. No.	Event Type*	Event Description
1	MS13C	I - RO C - SRO	Atmospheric Relief Valve (1-03) fails open due to PT-2327 failure.
2	RD12C	I - RO TS - SRO	Loss of Digital Rod Position Indication (TS)
3	RX04B	I - BOP TS - SRO	SG 1-02 LT-552 fails high. (TS)
4	FW03B RX03	R – RO C – BOP C - SRO	MFP 1-02 trips. Turbine runs back, but rods require manual insertion.
5	RC04B RP01	M - ALL	RCP 1-02 shaft breaks. Reactor fails to auto trip.
6	RC09B2	M - ALL	LBLOCA
7	RH01A RH01D	C - BOP	RHR Pump 1-01 starts and trips. RHR Pump 1-02 fails to auto start.
8	CS05B	C - BOP	1-HS-4783 (Cont. Spray suction valve) fails to open (stuck closed).

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

Actual	Target Quantitative Attributes
9	Total malfunctions (5-8)
4	Malfunctions after EOP entry (1-2)
4	Abnormal events (2-4)
2	Major transients (1-2)
3	EOPs entered/requiring substantive actions (1-2)
0	EOP contingencies requiring substantive actions (0-2)
3	Critical tasks (2-3)

SCENARIO 4 SUMMARY

Event 1
The first event is Steam Generator Atmospheric Relief Valve 1-03 failing open due to PT-2327 failure. The crew will enter ABN-709, Section 2.0, Steam Line Pressure Instrument Malfunction, and per Step 2 RNO, manually closes 1-ZL-2327, SG 3 ATMOS RLF VLV.

Event 2
The scenario continues with a loss of the Digital Rod Position Indication (DRPI) system. The crew will stop any dilution in progress, and enter ABN-712, Section 4.0. Digital Rod Position Indication Malfunction. The SRO will refer to Technical Specifications. Per Tech. Spec. 3.1.7, Condition B, the crew will place rods in Manual immediately. This also complicates the Reactor Trip later in the scenario requiring an Emergency Boration due to loss of DRPI.

Event 3
SG 1-02 LT-552 fails HIGH. This failure mode causes the FRVs to close, with a resulting lowering SG level. The crew will enter ABN-710, Steam Generator Level Instrumentation Malfunction Operator, and per Step 2 will manually control SG level at programmed level. The SRO will refer to Technical Specifications.

Event 4
Once the operators have control of SG levels and the Unit has stabilized from the previous malfunction, the Main Feed Pump 1-02 trips. The crew will enter ABN-302, Section 2.0, Feedwater Pump Trip. The Main Turbine will automatically runback at 35% per minute to 60% power. The event will be complicated by the fact that the control rods must be inserted in manual during the turbine runback. This will be due to the fact that: 1.) the operators previously placed the rods in manual for loss of DRPI, and/or 2.) If the operators had restored the rods to auto, a malfunction is inserted that will still require manual insertion of rods during the turbine runback.

Event 5
After the crew stabilizes the Unit from the MFP 1-02 trip, RCP 1-02 shaft will fail (breaks). RCS flow in the associated loop reduces until the automatic reactor trip setpoint (due to low RCS loop flow) is reached. The reactor FAILS to auto trip, requiring a manual trip. Loss of DRPI requires an Emergency Boration in accordance with the Foldout Page of EOP-0.0A, Reactor Trip or Safety Injection.

Event 6
Following the manual reactor trip, and after the emergency boration has been initiated, a large break LOCA on Loop 2 occurs due to the dislodged RCP components. Pressurizer pressure lowers to the auto SI setpoint and actuates. RHR Pump 1-01 auto starts on the SI, but immediately trips. RHR Pump 1-02 fails to auto start. The crew must manually start RHR Pump 1-02 to establish low head ECCS flow. This is a Critical Task.

Event 7
1-HS-4783 Containment Spray Suction Valve fails to open. Requires manual action to open valve to ensure suction is available to both trains of the Containment Spray System.

Risk Significance:

• Failure of risk important system prior to trip:	Loss of Digital Rod Position and rods in manual RCP shaft break
• Risk significant core damage sequence:	RCP shaft break resulting in LBLOCA Failure of automatic reactor trip Failure of low-head ECCS injection
• Risk significant operator actions:	Manually insert control rods on turbine runback Manually initiate reactor trip Start RHR Pump 1-02 for low-head injection

Critical Task	Safety Significance	Cueing	Measurable Performance Indicators	Performance Feedback
Manually Trip Reactor due to RCP trip prior to exiting EOP-0.0A, Reactor Trip or Safety Injection.	Recognize a failure or an incorrect automatic actuation of an ESF system or component.	Procedural direction at EOP-0.0A Step 1 to determine if a reactor trip has occurred. Position indication of the Reactor Trip breakers and Reactor Power, Annunciator First out alarms.	The operator will manually trip the Reactor with the handswitch on CB-07 or CB-10 placed to trip.	Reactor Trip Breakers open, flux lowering, rod bottom lights lit.
Manually Start RHR Pump 1-01 Prior to completing Attachment 2 of EOP-0.0A, Reactor Trip or Safety Injection.	Recognize a failure or an incorrect automatic actuation of an ESF system or component.	Procedural direction per EOP-0.0A Attachment 2 to start RHR Pump 1-01. Pump indication lights, flow and discharge pressure.	The operator will manually start RHR Pump 1-01.	Indication of pump start including light indication, pressure and flow.
Transfer a single train of ECCS to Cold Leg Recirculation per EOS-1.3A, Transfer to Cold Leg Recirculation prior to RWST Empty alarm.	Recognize entry criteria for EOS-1.3A, Transfer to Cold Leg Recirculation and ensure suction source for core cooling is maintained.	Procedurally driven from EOP-1.0A, to transition upon receipt of RWST LO-LO level alarm to EOS-1.3A. Note that only one full ECCS train can be shifted. Both trains SI and CCP can be supplied from 1 running RHR pump.	The operator(s) will align ECCS for cold leg Recirc by positioning valves using handswitches and a key on the MCB.	ECCS flow is maintained, RWST suction valves are closed, all mini-flow or recirculation paths to the RWST are also isolated.

SIMULATOR OPERATOR INSTRUCTIONS for SIMULATOR SETUP

INITIALIZE to IC #18 and LOAD NRC Scenario 4.					
EVENT	**REM. FUNC.**	**MALF.**	**DESCRIPTION**	**DEMAND VALUE**	**INITIATING PARAMETER**
SETUP	IOR	DITCHS6552	EHC Pump C Tagged out of service	f:0	K0
	IOR	DICVAPBA1	Boric Acid Transfer Pump 1-01 Tagged out of service.	f:0	K0
5		RP01	Reactor fails to auto trip.	f:1	K0
7		RH01D	RHR Pump 1-02 fails to auto start.	f:1	K0
8		CS05B	CT SMP SUCT VLV 2 stuck closed 4783	f:1	K0
1		MS13C	ARV 1-03 fails open due to PT-2327 failure.	f:1300	K1
2		RD12C	Loss of DRPI	f:1	K2
3		RX04B	SG 1-02 LT-552 fails high.	f:100	K3
4		FW03B	Main Feed Pump 1-02 trips.	f:1	K4
4		RD15A	Auto Rods Failure, Work in Manual	f:1	K4
5		RC04B	RCP 1-02 shaft breaks.	f:1	K5
5		RP01	Reactor fails to auto trip.	f:1	K0
6		RC09B2	Large Break LOCA	f:1 d:10	K6
7		RH01A	RHR Pump 1-01 starts and trips.	f:1 d:50	K6
7		RH01D	RHR Pump 1-02 fails to auto start.	f:1	K6
8		CS05B	CT SMP SUCT VLV 2 stuck closed 4783	f:1	K0

Simulator Operator:	**INITIALIZE to IC #18 and LOAD NRC Scenario 4.** **ENSURE all Simulator Annunciator Alarms are ACTIVE.** **ENSURE all Control Board Tags are removed.** **ENSURE Operator Aid Tags reflect current boron conditions.** **ENSURE Rod Bank Update (RBU) is performed.** **ENSURE Turbine Load Rate set at 10 MWe/minute.** **ENSURE 60/90 buttons DEPRESSED on ASD.** **ENSURE ASD speakers are ON to half volume.** **ENSURE Reactivity Briefing Sheet printout provided with Turnover.** **ENSURE procedures in progress are on SRO desk:** **COPY of IPO-003A, Power Operations, Section 5.1, Warmup and Synchronization of the Turbine Generator.** **ENSURE Control Rods are in AUTO with Bank D at 215 steps.** **ENSURE EHC pump C is in Pull Out with a Danger Tag on the Handswitch.** **ENSURE Boric Acid Transfer Pump 1-01 is in Pull out with a Danger Tag on the handswitch.**

Control Room Annunciators in Alarm:

PCIP-1.1 – SR TRN A RX TRIP BLK
PCIP-1.2 – IR TRN A RX TRIP BLK
PCIP-1.4 – CNDSR AVAIL STM DMP ARMED C-9
PCIP-1.6 – RX ≥ 10% PWR P-10
PCIP-2.1 – SR TRN B RX TRIP BLK
PCIP-2.2 – IR TRN B RX TRIP BLK
PCIP-2.5 – SR RX TRIP BLK PERM P-6
PCIP-3.2 – PR TRN A LO SETPT RX TRIP BLK
PCIP-4.2 – PR TRN B LO SETPT RX TRIP BLK
1-ALB-9B-14.5 – ANY EHC PMP CTRL SWITCH IN PULL OUT

Operating Test :	NRC	Scenario #	4	Event #	1	Page	6 of 40
Event Description:	Atmospheric Relief Valve 1-03 fails open due to PT-2327 failure.						

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 1 (Key 1). - MS13C, Steam Generator Pressure Transmitter 1-PT-2327 failure high.		
Indications Available: **1-PI-2327, MSL 3 PRESS pegged high** **1-ZL-2327 SG 3 ATMOS RLF VLV read OPEN light LIT** **Plant Computer alarm Y6704D, SG 3 ATM RLF VLV OPEN**		
	BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE Steam Generator 1-03 Steam Pressure Transmitter (PT-2327) failed high.
	US	DIRECT performance of ABN-709, Steam Line Pressure, Steam Header Pressure, Turbine 1st-Stage Pressure, and Feed Header Pressure Instrument Malfunction, Section 2.0.
	BOP	DETERMINE 1-PI-2327 MSL 3 PRESS indicating - GREATER THAN 60 psig difference between remaining channels. [Step 2.3.1]
	BOP	DETERMINE 1-ZL-2327, SG 3 ATMOS RLF VLV is OPEN AND 1-PI-2327, MSL 3 PRESS NOT indicating NORMAL.
		• Manually CLOSE 1-ZL-2327, SG 3 ATMOS RLF VLV. [Step 2 RNO]
NOTE: If a non-controlling channel has failed, steps 3 through 8 may not need to be performed. Refer to ABN-707, Attachment 1, STEAM FLOW WITH STEAM PRESSURE COMPENSATION TRANSMITTERS.		
	US	Evaluate Technical Specifications. [Step 2.3.11]
		• DETERMINE no LCO entry required.
	US	INITIATE a Condition Report per STA-421, as applicable. [Step 2.3.12]
When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 2.		

Operating Test :	NRC	Scenario #	4	Event #	2	Page	7	of	40
Event Description:	Loss of Digital Rod Position Indication								

Time	Position	Applicant's Actions or Behavior
<u>Simulator Operator</u>: When directed, EXECUTE Event 2 (Key 2). - RD12C, Digital Rod Position Power Failure.		
<u>Indications Available</u>: 6D-3.6 – DRPI URGENT FAIL 6D-3.7 – ANY ROD AT BOT 6D-4.6 – DRPI NON-URGENT FAIL 6D-4.7 – ≥ 2 ROD AT BOT Control Rod Position Indication bezel is dark		
	RO	RESPOND to Annunciator Alarm Procedures.
	RO	RECOGNIZE Control Rod Position bezel is dark and DETERMINE Digital Rod Position Indication failure.
	US	DIRECT performance of ABN-712, Rod Control System Malfunction, Section 4.0.
<u>NOTE</u>: • Half accuracy is indicated by a DRPI NON-URGENT alarm and a flashing general warning light above that indicator. The discrepancy between indicated position and control board step counter for that group should be within the ±12 steps Technical Specification limit, unless rod is actually misaligned. Therefore, either A <u>OR</u> B DRPI operable is sufficient for TS 3.1.7 and TR 13.1.39 position verification. • An actual misaligned rod could appear to be a DRPI malfunction. DRPI malfunctions or other possible malfunction(s) may be eliminated using appropriate section(s) of this procedure. • <u>u</u>C14 may be powered from <u>u</u>C1 (Normal) or <u>u</u>C4 (Alternate).		
	RO	DETERMINE CONTROL ROD POSN bezel - NOT INDICATING. [Step 4.3.1]

Operating Test : NRC	Scenario # 4	Event # 2	Page 8 of 40
Event Description: Loss of Digital Rod Position Indication			

Time	Position	Applicant's Actions or Behavior
Simulator Operator Note:		**When dispatched to check the breakers on 1C14. Wait 3 minutes, then report, "All the breakers are closed, I will contact Prompt Team Electricians to troubleshoot."**
		• Check power supply breakers on uC14 (SFGD 832' wall behind the rod control cabinets) - ON [Step 4.3.1 RNO b.] • 1C14/1/BKR, DATA CAB A • 1C14/2/BKR, DATA CAB B • 1C14/3/BKR, Control Board Display
		• If necessary, shift uC14 power supply per SOP-608A/B. [Step 4.3.1 RNO c.]
	US	DETERMINE Unit is in MODE 1. [Step 4.3.2]
	RO/US	Check Inoperable DRPIs - $\leq$ ONE PER GROUP
	RO	• PLACE 1/1-RBSS, Control Rod Bank Select Switch in MANUAL. [Step 4.3.3 RNO a.]
		• Monitor and record RCS Tavg once per hour. [Step 4.3.3 RNO b]
		• Determine position of non-indicating rod(s) by core power distribution measurement information: [Step 4.3.3 RNO c] 1) Once per 8 hours 2) Within 4 hours after any motion of non-indicating rod which exceeds 24 steps in one direction since last determination of rod's position. -OR- 3) Reduce THERMAL POWER to less than 50% of RTP per IPO-003A/B within 8 hours.
		• Within 24 hours restore inoperable DRPI(s) to operable status such that a maximum of one per group is inoperable. [Step 4.3.3 RNO d]
		• Refer to TS 3.1.7B,C,E [Step 4.3.3 RNO d]

Operating Test : NRC	Scenario #	4	Event #	2	Page	9	of	40
Event Description:	Loss of Digital Rod Position Indication							

Time	Position	Applicant's Actions or Behavior
	US	EVALUATE Technical Specifications.
		• LCO 3.1.7, Rod Position Indication.
		• CONDITION A - One DRPI per group inoperable for one or more groups. • ACTION A.1 - Verify the position of the rods with inoperable position indicators indirectly by using core power distribution measurement information. OR • Reduce THERMAL POWER TO ≤ 50% RTP.
		• CONDITION B – More than one DRPI per group inoperable. • ACTION B.1 – Immediately place the control rods under manual control. • ACTION B.2 – Monitor and record RCS T_{AVG} once per hour. • ACTION B.3 – Verify the position of the rods with inoperable position indicators indirectly by using core power distribution measurement information once per 8 hours. • ACTION B.4 – Restore inoperable position indicators to OPERABLE status such that a maximum of one DRPI per group is inoperable within 24 hours.

When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 3.

Operating Test :	NRC	Scenario #	4	Event #	3	Page	10	of	40
Event Description:	Steam Generator Level Transmitter LT-552 Failure High.								

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 3 (Key 3). - RX04B, Steam Generator 1-02 Level Transmitter (LT-552) fails high.		
Indications Available: 8A-2.8 – SG 2 STM & FW FLO MISMATCH 8A-2.12 – SG 2 LVL DEV 1-LI-552, SG 2 LVL (NR) CHAN II indication failed high Plant Computer Alarm L6423A SG2 LVL (NR) CHAN II HI-HI		
	RO/BOP	RESPOND to Annunciator Alarm Procedures.
	BOP	RECOGNIZE Steam Generator 1-02 Level Transmitter (LT-552) failed high.
	US	DIRECT performance of ABN-710, Steam Generator Level Instrumentation Malfunction, Section 2.0.
	BOP	DETERMINE controlling level channel has failed. [Step 2.3.1]
	BOP	Manually CONTROL 1-LK-520, SG 2 FW FLO CTRL as necessary to maintain Steam Generator 1-02 at programmed level. [Step 2.3.2]
CAUTION: • Turbine Trip AND Feedwater Isolation will occur if 2 or more of the 3 HI-HI level bistables for the SAME steam generator are TRIPPED. [C] • IF preferred level control channel has failed (551, 552, 553, or 554) AND automatic steam generator water level control is restored using alternate level control channel, THEN Step 9 must be completed within 72 hours for required channel protection coincidence.		
	BOP	VERIFY instruments on common instrument line indicate NORMAL. [Step 2.3.3]
		• VERIFY Loop 2 Instruments FT-522, LT-529, FT-523, and LT-528 responding normally per Attachment 1.

Operating Test :	NRC	Scenario #	4	Event #	3	Page	11	of 40
Event Description:	Steam Generator Level Transmitter LT-552 Failure High.							

Time	Position	Applicant's Actions or Behavior
		CAUTION: • Turbine Trip AND Feedwater Isolation will occur if 2 or more of the 3 HI-HI level bistables for the SAME steam generator are TRIPPED. [C] • IF preferred level control channel has failed (551, 552, 553, or 554) AND automatic steam generator water level control is restored using alternate level control channel, THEN Step 9 must be completed within 72 hours for required channel protection coincidence.
	BOP	DETERMINE all HI-HI level bistable windows on TSLB-3 for Steam Generator 1-02 are DARK. [Step 2.3.4]
		NOTE: • Preferred level control channel switch positions are LQY-551, 552, 553, and 554. • Alternate level control channel switch positions are LY-519, 529, 539, and 549. • IF an alternate level control channel that is selected for control has failed, THEN the preferred level control channel may be substituted for "alternate" in the following steps.
	BOP	VERIFY automatic SG level control available: [Step 2.3.5]
		• OBSERVE alternate level control channel 1-LI-529A indication NORMAL. [Step 2.3.5.a]
		• DETERMINE automatic level control desired by Unit Supervisor. [Step 2.3.5.b]
	BOP	PLACE 1-LS-529C, Steam Generator 2 Level Channel Select to the LY-529 position. [Step 2.3.6]
	BOP	VERIFY affected Steam Generator level is stable at program level. [Step 2.3.7]

Operating Test :	NRC	Scenario #	4	Event #	3	Page	12	of	40
Event Description:	Steam Generator Level Transmitter LT-552 Failure High.								

Time	Position	Applicant's Actions or Behavior
NOTE: There is a 15-20 sec lag for input from the alternate channel to be seen by the level control circuit. The level deviation alarm should clear or the operator should wait 15-20 seconds before placing the control valves in automatic after selecting the alternate channel.		
	BOP	PLACE 1-LK-520, SG 2 FW FLO CTRL in AUTO and MONITOR operation. [Step 2.3.8]
	US	EVALUATE Technical Specifications.
		• LCO 3.3.1.E, Reactor Trip System Instrumentation.
		• CONDITION E - One channel inoperable. • ACTION E.1 - Place channel in trip within 72 hours.
		• LCO 3.3.2.D, ESFAS Instrumentation.
		• CONDITION D - One channel inoperable. • ACTION D.1 - Place channel in trip within 72 hours.
		• LCO 3.3.2.I, ESFAS Instrumentation.
		• CONDITION I - One channel inoperable. • ACTION I.1 - Place channel in trip within 72 hours.

When Technical Specifications are addressed, or at Lead Examiner discretion, PROCEED to Event 4.

Operating Test : NRC	Scenario # 4	Event # 4	Page 13 of 40
Event Description: Main Feedwater Pump 1-02 trips. Control rods require manual insertion.			

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 4 (Key 4). **- FW03B, Main Feedwater Pump 1-02 trip.** **- RD15A, Automatic Rod Control Failure, Manual Rod Control Works.**		
Indications Available: **1-ALB-8A-1.3 – FWPT B TRIP** **1-ALB-8A-1.8 – SG 1 STM & FW FLO MISMATCH** **1-ALB-8A-2.8 – SG 2 STM & FW FLO MISMATCH** **1-ALB-8A-3.8 – SG 3 STM & FW FLO MISMATCH** **1-ALB-8A-4.8 – SG 4 STM & FW FLO MISMATCH** **1-ALB-6D-1.9 – ANY TURB RUNBACK EFFECTIVE** **1-ALB-6D-1.10 – AVE T_{AVE}-T_{REF} DEV**		
	RO/BOP	RESPOND to Annunciator Alarm Procedures.
	RO/BOP	RECOGNIZE trip of Main Feedwater Pump B, turbine runback in progress with no automatic control rod insertion.
	US	DIRECT performance of ABN-302, Feedwater, Condensate, Heater Drain System Malfunction, Section 2.0.
CAUTION: • The status of the secondary heat sink and available feedwater must be closely monitored during the performance of this procedure. The Reactor should be manually tripped if secondary heat sink cannot be maintained. • Using Load Target to reduce load without rods in AUTO can result in excessive TAVE-TREF mismatch before C-7 activates. This mismatch may cause an SI when steam dumps trip open. NOTE: • Diamond step 1 denotes Initial Operator Actions. • Should a reactor trip occur at any time during performance of this procedure, immediately proceed to EOP-0.0A/B, Reactor Trip or Safety Injection.		
	◊ RO ◊ ◊ BOP ◊	VERIFY automatic plant response. Determine that a Turbine Runback is IN PROGRESS and control rods are NOT moving in automatic. [Step 2.3.1]
	◊ RO ◊	• SELECT 1/1-RBSS, CONTROL BANK SELECT in MANUAL and insert control rods. [Step 2.3.1 RNO a]

Operating Test : NRC	Scenario # 4	Event # 4	Page 14 of 40
Event Description: Main Feedwater Pump 1-02 trips. Control rods require manual insertion.			

Time	Position	Applicant's Actions or Behavior
	RO	STABILIZE Reactor power. [Step 2.3.2]
CAUTION:		• Reactor power must be established at a value within the capability of available feedwater. Auxiliary feedwater pumps can supply approximately 6% reactor power.
	BOP	VERIFY Main Feedwater Flow to Steam Generators. [Step 2.3.3]
		• Main Feed Pump 1-01 RUNNING AND • Main Feedwater ALIGNED [Step 2.3.3.a]
NOTE:		Differential pressure between feedwater and steamline may decrease following a Turbine Runback. The following computer points may aid the operator: • U5002A FW-MS HDR DP • U5003A DELTA PROGRAM-ACTUAL DP • P5446A FW STM FLOW SETPOINT
	BOP	VERIFY feedwater header pressure greater than main steam header pressure. [Step 2.3.3.b]
	BOP	VERIFY 1-FK-2290, FWP B RECIRC FLO CTRL – CLOSED [Step 2.3.3.c]
NOTE:		Control Rod insertion should be allowed to continue even if ΔI is outside the band. Continued rod insertion is required to return Tave to Tref as soon as possible so that steam demand is reduced such that One Main Feedwater Pump can maintain proper SG levels.
	RO/BOP	VERIFY Tave - TRENDING TO TREF. [Step 2.3.4] • 1-TI-412A, AVE TAVE - TREF DEV

Operating Test :	NRC	Scenario #	4	Event #	4	Page	15	of	40
Event Description:	Main Feedwater Pump 1-02 trips. Control rods require manual insertion.								

Time	Position	Applicant's Actions or Behavior
		NOTE: Step 5 is a continuous action step.
	BOP	CONTROL Main Feed flow to maintain narrow range level between 60% and 75%. [Step 2.3.5]
		NOTE: Differential pressure between feedwater and steamline may decrease with only one Main Feedwater Pump in operation. The following computer points may aid the operator: • U5002A FW-MS HDR DP • U5003A DELTA PROGRAM-ACTUAL DP • P5446A FW STM FLOW SETPOINT
	BOP	Monitor Main Feedwater response. [Step 2.3.6]
		VERIFY differential pressure between feedwater and main steam pressure <u>80 psid</u> to <u>181 psid</u> (P5446A) [Step 2.3.6.a]
		SG FW FLO CTRL Valves - AUTO [Step 2.3.6.b] • 1-FK-510, SG 1 FW FLO CTRL • 1-FK-520, SG 2 FW FLO CTRL • 1-FK-530, SG 3 FW FLO CTRL • 1-FK-540, SG 4 FW FLO CTRL
		VERIFY MFP flow 1-FI-2289, FWP A SUCT FLO is ≤ 22,000 gpm [Step 2.3.6.c]
	RO	VERIFY the following: [Step 2.3.7]
		• RODS - ABOVE ROD INSERTION LIMIT [Step 2.3.7.a]
		• ΔFLUX - (AFD) WITHIN LIMITS [Step 2.3.7.b]
	BOP	<u>WHEN</u> steam dumps close, THEN reset steam dump arming signal (C-7 interlock). [Step 2.3.8]
		• 43/1-SD, STM DMP MODE SELECT
	US	NOTIFY QSE Generation Controller and update GAPS to "Create Current Condition" for the down power. [Step 2.3.9]

Operating Test : NRC	Scenario # 4	Event # 4	Page 16 of 40
Event Description: Main Feedwater Pump 1-02 trips. Control rods require manual insertion.			

Time	Position	Applicant's Actions or Behavior
	US	INITIATE equipment repairs per STA-606. [Step 2.3.10]
	US	CHECK Chemistry Sampling Requirement: [Step 2.3.11]
		• SG ARVS - REMAINED CLOSED AND • TDAFW Pump - REMAINED STOPPED [Step 2.3.11.a]
		NOTIFY Chemistry to perform RCS Isotopic analysis for iodine between 2 and 6 hours after power change. [Step 2.3.11.b RNO]
	RO	RESET Turbine Runback per ABN-401. [Step 2.3.12]
NOTE: IF Reactor power decreased to less than 5%, THEN do not increase power until all MODE 1 AND 2 requirements are completed.		
	US	Return to procedure and step in effect AND adjust power as desired. [Step 2.3.13]
Examiner Note:		**The following steps are from ABN-401, Main Turbine Malfunction, Section 8.0, Turbine Reloading After Runback. These steps are used for RESET of the turbine runback.**
NOTE: • For Auto Pump Trip Runbacks, there is a 9 minute time delay before the condition will clear such that load reference can be restored. • The Runback Bar will turn white when the Runback is clear. • Do not raise Main Turbine load above the runback setpoint unless the signal which generated the runback is cleared (manual runback reset, HDP breaker racked out or HDP running, etc.). If load is raised above the runback setpoint and the signal is not cleared, a runback will be re-initiated.		
	BOP	Verify ANY TURB RUNBACK EFFECTIVE (6D-1.9) - DARK [Step 8.3.1]
	BOP	In the "Load Control" Section, ENSURE Load Rate Setpoint Controller is set to support reload or current plant conditions. [Step 8.3.2]

Operating Test : NRC	Scenario # 4	Event # 4	Page 17 of 40
Event Description: Main Feedwater Pump 1-02 trips. Control rods require manual insertion.			

Time	Position	Applicant's Actions or Behavior
	BOP	In the "Load Control" Section, ensure the Load Target Setpoint Controller is set for actual MW. [Step 8.3.3]
	BOP	DETERMINE Manual Runback was not used. [Step 8.3.4]
	BOP	Verify the turbine runback is reset.
	US	Verify Runback -LESS THAN 15% WITHIN ONE HOUR. Notify Chemistry to perform RCS Isotopic analysis for iodine between 2 and 6 hours after power change. [Step 8.3.6 RNO]
	US	Control turbine load as required per IPO-003A/B. [Step 8.3.7]
	US	Notify Nuclear Engineering of runback. [Step 8.3.8]
	US	Initiate a CR, if required per STA-421. [Step 8.3.9]
	US	Initiate repair per STA-606. [Step 8.3.10]
When turbine runback has been reset, or at the discretion of the Lead Examiner, PROCEED to EVENT 5.		

Operating Test : NRC	Scenario # 4	Event # 5	Page 18 of 40
Event Description: RCP 1-02 shaft breaks. Reactor fails to auto trip.			

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 5 (Key 5). - RC04B, RCP 1-02 shaft shear.		
Indications Available: Multiple alarms		
	RO/BOP	RECOGNIZE loss of Reactor Coolant System flow, and failure of the reactor to automatically trip.
CRITICAL TASK		**Manually Trip Reactor due to RCP trip prior to exiting EOP-0.0A, Reactor Trip or Safety Injection.**
CRITICAL TASK	RO	PLACE 1/1-RTC, RX TRIP BKR in TRIP to manually TRIP the Reactor.
	US	DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
	RO	VERIFY Reactor Trip: [Step 1]
		• VERIFY Reactor Trip Breakers - AT LEAST ONE OPEN. • Neutron flux – DECREASING [Step 1.a]
Examiner Note: Digital Rod Position Indication is deenergized, the reactor operator will emergency borate from the foldout page (Attachment 1A) after step 4 of EOP-0.0A, Reactor Trip or Safety Injection.		
	RO	All control rod position rod bottom lights - ON [Step 1.b]
	BOP	VERIFY Turbine Trip: [Step 2]
		• VERIFY all HP Turbine Stop Valves - CLOSED. [Step 2]
	BOP	VERIFY Power to AC Safeguards Buses: [Step 3]
		• VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a]
		• VERIFY both AC Safeguards Buses – ENERGIZED. [Step 3.b]
	RO/BOP	DETERMINE SI is NOT actuated and is NOT required. [Step 4]

Operating Test :	NRC	Scenario #	4	Event #	5	Page	19	of	40
Event Description:	RCP 1-02 shaft breaks. Reactor fails to auto trip.								

Time	Position	Applicant's Actions or Behavior
Examiner Note: **The RO will initiate Emergency Boration in accordance with the Foldout page step of EOP-0.0A, Attachment 1A, Step 2., 2nd bullet, "Control rod position indication is NOT available (3600 gallons of 7000 ppm boric acid)."**		
	RO	Initiate Emergency Boration per ABN-107, due to Control rod position indication is NOT available (3600 gallons of 7000 ppm boric acid). [Step Att. 1A 2. 2nd bullet]
Examiner Note: EOS-0.1A, Reactor Trip Response steps begin here.		
	US	Transition to EOS-0.1A, Reactor Trip Response.
	RO	CHECK RCS Temperature -
		Check RCPs – ANY RUNNING [Step 1 a.]
		RCS AVERAGE TEMPERATURE STABLE AT OR TRENDING TO 557°F [Step 1 b.]
NOTE: When establishing feedwater to SGs, at least two SGs should be used.		
	RO/BOP	CHECK FW Status:
		VERIFY Reactor Trip Breakers – OPEN. [Step 2 a.]
		CHECK RCS average temperatures < 564ºF. [Step 2 b.]
		VERIFY Feedwater Isolation - ISOLATION Complete. [Step 2 c.]
	BOP	DETERMINE total AFW flow to SGs > 460 GPM. [Step 2 d.]
	RO	Check PRZR Level Control:
		Level – GREATER THAN 17% [Step 3 a.]
		Verify charging – INSERVICE [Step 3 b.]
		Verify letdown – IN SERVICE [Step 3 c.]
		Level – TRENDING TO 25% [Step 3 d.]
	RO	CHECK PRZR Pressure Control:
		DETERMINE PRZR Pressure > 1820 PSIG. [Step 4 a.]

Operating Test :	NRC	Scenario #	4	Event #	5	Page	20	of	40
Event Description:	RCP 1-02 shaft breaks. Reactor fails to auto trip.								

Time	Position	Applicant's Actions or Behavior
		DETERMINE PRZR Pressure - TRENDING TO 2235 PSIG. [Step 4 b.]
	BOP	CHECK Steam Generator Levels:
		Narrow ranger level – 43% [Step 5 a.]
		• Maintain total fee flow greater than 460 gpm until narrow range level greater than 43% in at least one SG. [Step 5 a. RNO a.]
		Control feed flow to maintain narrow range level between 43% and 60%. [Step 5 b.]
After checking SG Narrow range levels, or at the discretion of the Lead Examiner, PROCEED to EVENT 6.		

Operating Test : NRC	Scenario # 4	Event # 6, 7, 8	Page 21 of 40
Event Description: LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck			

Time	Position	Applicant's Actions or Behavior
Simulator Operator: When directed, EXECUTE Event 6 (Key 6). **- RC09B2, Large Break LOCA (10 seconds after shaft shear).**		
Indications: **RCS Pressure lowering.** **PRZR Level lowering.** **CAG-197, Containment Air PIG alarming.** **Containment Sump level and fill rate Alarms.** **Containment air cooler fill rate alarms.**		
	RO/BOP	RECOGNIZE loss of Reactor Coolant System inventory and Initiate Safety injection, if not actuated automatically.
	US	Transition to AND DIRECT performance of EOP-0.0A, Reactor Trip or Safety Injection.
	RO	VERIFY Reactor Trip: [Step 1]
Examiner Note: Digital Rod Position Indication is deenergized, the reactor operator should have begun emergency boration from the foldout page (Attachment 1A) after step 4 of EOP-0.0A, Reactor Trip or Safety Injection.		
	RO	All control rod position rod bottom lights - OFF [Step 1.b], emergency boration in progress.
	BOP	VERIFY Turbine Trip: [Step 2]
		• VERIFY all HP Turbine Stop Valves - CLOSED. [Step 2]
	BOP	VERIFY Power to AC Safeguards Buses: [Step 3]
		• VERIFY AC Safeguards Buses – AT LEAST ONE ENERGIZED. [Step 3.a]
		• VERIFY both AC Safeguards Buses – ENERGIZED. [Step 3.b]
	RO/BOP	Check SI Status: [Step 4]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8	Page	22	of	40
Event Description:	LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck								

Time	Position	Applicant's Actions or Behavior
	RO	Check if SI Is Actuated: • SI actuation as indicated on the First Out Annunciator 1-ALB-6C. • SI Actuated blue status light – ON [Step 4 a.]
	RO	Verify Both Trains SI Actuated: • SI Actuated blue status light – ON <u>NOT</u> FLASHING [Step 4 b.]

CAUTION: A Safety Injection actuation will affect normal egress from the Containment Building. Attachment 9 of this procedure provides instructions to evacuate personnel from the Containment during a Safety Injection actuation.

Examiner Note: EOP-0.0A, Attachment 2 steps performed by the BOP are identified at the end of the scenario.

NOTE: Attachment 2 is required to be completed before FRGs are implemented.

Time	Position	Applicant's Actions or Behavior
	US/BOP	INITIATE Proper Safeguards Equipment Operation Per Attachment 2. [Step 5]
	RO	VERIFY AFW Alignment: [Step 6]
		• MDAFW Pumps – RUNNING. [Step 6.a]
		• TDAFW Pump in PULLOUT per Foldout Page. [Step 6.b]
		• AFW total flow – GREATER THAN 460 GPM. [Step 6.c]
		• AFW valve alignment - PROPER ALIGNMENT. [Step 6.d]
	RO	VERIFY Containment Spray Not Required: [Step 7]
		Containment pressure - HAS REMAINED LESS THAN 18.0 PSIG [Step 7.a]

Time	Position	Applicant's Actions or Behavior
		VERIFY Containment Spray AND Phase B Actuation initiated. [Step 7.a RNO a.1)]
		VERIFY appropriate MLB indication for CNTM SPRAY (BLUE WINDOWS) AND PHASE B (ORANGE WINDOWS). [Step 7.a RNO a.2)]
		VERIFY containment spray flow at approximately 3500 gpm per pump. [Step 7.a RNO a.3)]
		Ensure CHEM ADD TK DISCH VLVs – OPEN [Step 7.a RNO a.4)] • 1-HS-4752 • 1-HS-4753
		STOP all RCPs. [Step 7.a RNO a.5)]
	RO	CHECK If Main Steamlines Should Be Isolated: [Step 8]
		• DETERMINED Containment pressure - GREATER THAN 6.0 PSIG [Step 8.a]
		• VERIFY main steam isolation complete: [Step 8.b] • Main Steam isolation valves • Before MSIV drippot isolation valves
	RO	CHECK RCS Temperature: [Step 9]
		a. VERIFY RCS Average Temperature – STABLE AT OR TRENDING TO 557°F. [Step 9]
		STOP dumping steam. [Step 9 RNO a.]
		• REDUCE total AFW flow to minimize the cooldown.
		• MAINTAIN a minimum of 460 gpm until level in at least one SG is greater than 50%.
		• STOP Turbine Driven AFW pump.

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8	Page	24	of	40
Event Description:	LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck								

Time	Position	Applicant's Actions or Behavior
	RO	CHECK PRZR Valve Status: [Step 10]
		VERIFY PRZR Safeties – CLOSED. [Step 10.a]
		VERIFY Normal PRZR Spray Valves – CLOSED. [Step 10.b]
		VERIFY PORVs – CLOSED. [Step 10.c]
		VERIFY Power to at least 1 Block Valve – AVAILABLE. [Step 10.d]
		VERIFY Block Valves – AT LEAST ONE OPEN. [Step 10.e]
	RO	CHECK if RCPs Should Be Stopped: [Step 11]
		RECOGNIZE that RCPs have previously been stopped.
	RO/BOP	CHECK if Any Steam Generator Is Faulted: [Step 12]
		• VERIFY any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. [Step 12.a] -OR- • VERIFY any Steam Generator pressure – COMPLETELY DEPRESSURIZED. [Step 12.a]
		GO to Step 13. [Step 12.a RNO]
	RO/BOP	CHECK if Steam Generator Tubes Are NOT Ruptured: [Step 13]
		• VERIFY Condenser Off Gas radiation – NORMAL.
		• VERIFY Main Steam Line radiation – NORMAL.
		• VERIFY SG Blowdown Sample Radiation Monitor – NORMAL.
		• VERIFY levels in all Steam Generators – NORMAL.
	RO/BOP	CHECK if RCS is Intact: [Step 14]
		• VERIFY Containment pressure – LESS THAN 1.3 PSIG.
		• VERIFY Containment recirculation sump levels – NORMAL.
		• VERIFY Containment radiation levels – NORMAL.
		• GO to EOP-1.0A, Loss of Reactor or Secondary, Step 1. [Step 14 RNO]
	US	TRANSITION to EOP-1.0A, Loss of Reactor or Secondary Coolant, Step 1.

Operating Test : NRC	Scenario # 4	Event # 6, 7, 8	Page 25 of 40
Event Description: LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck			

Time	Position	Applicant's Actions or Behavior
Examiner Note: • **Shortly after entry into EOP-1.0A, ORANGE paths on Integrity and Containment will require a transition to FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition.** ▪ **The Unit Supervisor should immediately exit EOP-1.0A and enter FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition.** ▪ **Upon exit of FRP-0.1A, the US should immediately exit the FRP and enter FRZ-0.1A, Response to High Containment Pressure**		
Examiner Note: **FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition, steps begin here.**		
	US	TRANSITION to FRP-0.1A, Response to Imminent Pressurized Thermal Shock Condition
	US/RO	CHECK RCS pressure - GREATER THAN 425 PSIG [Step 1]
		• DETERMINE total RHR pump injection flow is greater than 750 gpm. [Step 1 RNO]
	US	RETURN to procedure and step in effect.
Examiner Note: **FRZ-0.1A, Response to High Containment Pressure, steps begin here.**		
	US	TRANSITION to FRZ-0.1A, Response to High Containment Pressure.
	US/RO	CHECK Containment pressure – GREATER THAN 50 PSIG. [Step 1]
	RO/BOP	• DETERMINE proper Containment Spray alignment was verified in EOP-0.A. [Step 1 RNO]
	US	• RETURN to procedure and step in effect.

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8	Page	26	of	40
Event Description:	LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck								

Time	Position	Applicant's Actions or Behavior
Examiner Note: **The following steps are from EOP-1.0A, Loss of Reactor or Secondary Coolant.**		
CAUTION: Following a high energy line rupture inside containment, the operator should not rely upon steam generator water level indications in any depressurized steam generators.		
NOTE: As PRZR Temperature decreases the error on indicated PRZR level will increase. Attachment 2 may be used to determine actual PRZR level.		
	US/RO	CHECK If RCPs Should Be Stopped: [Step 1]
		RECOGNIZE RCPs have been previously stopped.
	RO/BOP	CHECK if Any Steam Generator Is Faulted: [Step 2]
		• VERIFY any Steam Generator pressure – DECREASING IN AN UNCONTROLLED MANNER. [Step 2.a]
		• VERIFY any Steam Generator pressure – COMPLETELY DEPRESSURIZED. [Step 2.a]
		• GO to Step 3. [Step 2.a RNO]
	BOP	CHECK Intact Steam Generator Levels: [Step 3]
		• VERIFY Narrow range level – GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT). [Step 3.a]
		• MAINTAIN total AFW flow greater than 460 GPM until narrow range level GREATER THAN 43% (50% FOR ADVERSE CONTAINMENT). [Step 3.a RNO]
	US	CHECK Secondary Radiation NORMAL: [Step 4]
		• VERIFY Condenser off gas radiation – NORMAL. [Step 4]

Operating Test : NRC	Scenario # 4	Event # 6, 7, 8	Page 27 of 40
Event Description: LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck			

Time	Position	Applicant's Actions or Behavior
		• VERIFY Main Steam Line radiation – NORMAL. [Step 4]
		• VERIFY SG Blowdown Sample Radiation Monitor – NORMAL. [Step 4]
		CAUTION: If any PRZR PORV opens because of high PRZR pressure, Step 5b should be repeated after pressure decreases to less than the PORV setpoint.
	US	CHECK PRZR PORVs and Block Valves: [Step 5]
		• VERIFY power Block Valves – AVAILABLE. [Step 5.a]
		• VERIFY PORVs – CLOSED. [Step 5.b]
		• VERIFY Block Valves – AT LEAST ONE OPEN. [Step 5.c]
	US/RO	CHECK if ECCS Flow Should Be Reduced: [Step 6]
		• VERIFY Secondary heat sink conditions – SATISFIED. [Step 6.a]
		• VERIFY RCS subcooling – GREATER THAN 25°F (55°F FOR ADVERSE CONTAINMENT). [Step 6.b]
		• GO to Step 7 and OBSERVE CAUTIONS Prior to Step 7. [Step 6.b RNO]
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment.
		CAUTION: When time permits, Attachment 9 of EOP-0.0A, REACTOR TRIP OR SAFETY INJECTION should be performed to realign equipment after an SI signal has been reset.
	RO/BOP	RESET ESF Actuation Signals. [Step 7]

Time	Position	Applicant's Actions or Behavior
	BOP	PLACE both EDG EMERG STOP/START handswitches in START. [Step 7.a]
	RO/BOP	RESET SI. [Step 7.b]
		• DEPRESS 1/1-SIRA, TRAIN A SI RESET pushbutton.
		• DEPRESS 1/1-SIRB, TRAIN A SI RESET pushbutton.
	RO/BOP	RESET SI Sequencers. [Step 7.c]
		• At SI Sequencer Train A Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• PLACE ON/RESET toggle switch in ON.
		• At SI Sequencer Train B Cabinet, DEPRESS SI SEQR RESET green pushbutton then PLACE ON/RESET toggle switch in RESET.
		• PLACE ON/RESET toggle switch in ON.
	RO/BOP	Reset Containment Isolation Phase A and Phase B. [Step 7.d]
		• DEPRESS 1/1-C1PARA, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PARB, CNTMT ISOL – PHASE A RESET pushbutton.
		• DEPRESS 1/1-C1PBRA, CNTMT ISOL – PHASE B RESET pushbutton.
		• DEPRESS 1/1-C1PBRB, CNTMT ISOL – PHASE B RESET pushbutton.
	RO/BOP	RESET Containment Spray Signal. [Step 7.e]
		• DEPRESS 1/1-CSRA, TRAIN A CS RESET pushbutton.
		• DEPRESS 1/1-CSRB, TRAIN B CS RESET pushbutton.
		<u>CAUTION:</u> RCS pressure should be monitored. If RCS pressure decreases in an uncontrolled manner to less than 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT) the RHR pumps must be manually restarted to supply water to the RCS.
	US	CHECK If RHR Pumps Should Be Stopped: [Step 8]

Operating Test : NRC	Scenario # 4	Event # 6, 7, 8	Page 29 of 40
Event Description: LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck			

Time	Position	Applicant's Actions or Behavior
	RO/BOP	• VERIFY RCS pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.a.1)]
		• GO to Step 10. [Step 8.a.1) RNO]
	US	CHECK If Diesel Generators Should Be Stopped: [Step 10]
	RO/BOP	• VERIFY both AC Safeguards Buses ENERGIZED by Offsite Power. [Step 10.a]
	RO/BOP	• PLACE both EDG EMERG STOP/START handswitches in STOP. [Step 10.b]
NOTE: Verification of at least one flowpath from a RHR pump to the RCS via a SI pump or CCP is sufficient to verify cold leg recirculation capability.		
		• VERIFY Train A RHR Pump – AVAILABLE. [Step 11.a.1)]
		DETERMINE Train A RHR Pump NOT available.
		• VERIFY Train B RHR Pump – AVAILABLE. [Step 11.a.1)]
		• VERIFY CCW to Train B RHR Pump – AVAILABLE. [Step 11.a.1)]
		• VERIFY 1/1-8811B, CNTMT SMP TO RHRP 2 SUCT ISOL VLV – AVAILABLE. [Step 11.a.1)]
		• VERIFY 1/1-8804A, RHRP 1 TO CCP SUCT VLV – AVAILABLE. [Step 11.a.2)]
		• VERIFY 1/1-8804B, RHRP 2 TO SIP SUCT VLV – AVAILABLE. [Step 11.a.2)]
	RO/BOP	• CHECK Auxiliary Building and Safeguards Building radiation – NORMAL: [Step 11.b]
		• CHECK PC-11 monitors – NORMAL <u>OR</u> Notify Radiation Protection to take local Radiation Surveys. [Step 11.b]
	US	• NOTIFY Chemistry to obtain RCS samples to assist in determining extent of the accident. [Step 11.c]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8	Page	30	of	40
Event Description:	LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck								

Time	Position	Applicant's Actions or Behavior
	US	• NOTIFY Chemistry to obtain RCS samples to assist in determining extent of the accident. [Step 11.c]
	US	• CONTACT Plant Staff to EVALUATE plant equipment. [Step 11.d]
	US	CHECK if RCS Cooldown and Depressurization Is Required: [Step 12]
	RO/BOP	• VERIFY RCS pressure – GREATER THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 12.a]
	RO/BOP	• VERIFY RHR Pump flow greater than 750 GPM and GO to Step 13. [Step 12.a RNO]
	US	CHECK If Transfer to Cold Leg Recirculation Is Required. [Step 13]
	RO/BOP	• VERIFY RWST Level – LESS THAN LO-LO LEVEL. [Step 13.a]
	US	TRANSITION to EOS-1.3A, Transfer to Cold Leg Recirculation, Step 1. [Step 13.b]

<u>Examiner Note</u>: The following steps are from EOS-1.3A, Transfer to Cold Leg Recirculation.

CAUTION:	Steps 1 through 3 should be performed without delay. FRGs should not be implemented prior to completion of these steps.

Time	Position	Applicant's Actions or Behavior
	US/RO	RESET SI. [Step 1]
		RECOGNIZE SI previously reset.
	RO	VERIFY CCW Flow As Required: [Step 2]
		• From RHR heat exchangers
		• From Containment Spray heat exchangers

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8	Page	31	of	40
Event Description:	LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck								

Time	Position	Applicant's Actions or Behavior
		CAUTION: Any ECCS pump taking suction from RWST should be stopped at RWST EMPTY. Any Containment Spray pump taking suction from RWST should be stopped when RWST level reaches 0%.
		CAUTION: Any ECCS or Containment Spray pump that loses suction or shows indication of cavitation should be stopped. The CCP and SI pump should be stopped before stopping the RHR pump.
		CAUTION: SI pumps should be stopped if RCS pressure is greater than their shutoff head pressure.
CRITICAL TASK STATEMENT		**Transfer a single train of ECCS to Cold Leg Recirculation per EOS-1.3A, Transfer to Cold Leg Recirculation prior to RWST Empty alarm.**
CRITICAL TASK	RO/BOP	Align ECCS For Cold Leg Recirculation: [Step 3]
		• Check open CNTMT SMP TO RHRP 1 AND RHRP 2 SUCT ISOL VLVS: [Step 3.a]
		• 1/1 - 8811A
		• 1/1 - 8811B
	RO	Close RWST TO RHRP 1 AND RHRP 2 SUCT VLVS: [Step 3.b]
		• 1/1 - 8812A
		• 1/1 - 8812B
	BOP	Close SIP 1 AND SIP 2 MINIFLO VLVS: [Step 3.c]
		• 1/1 - 8814A
		• 1/1 - 8814B
		• 1/1 - 8813

Time	Position	Applicant's Actions or Behavior
	RO	Close RHRP 1 AND RHRP 2 XTIE VLVS: [Step 3.d]
		• 1/1 - 8716A
		• 1/1 - 8716B
	RO	Close the CCP ALT MINIFLO ISOL VLVS: [Step 3.e]
		• 1/1 - 8511A
		• 1/1 - 8512B
		• 1/1 - 8511B
		• 1/1 - 8512A
	BOP	Open SI < - - > CHRG SUCT HDR XTIE VLVS: [Step 3.f]
		• 1/1 - 8807A
		• 1/1 - 8807B
		Open RHRPs TO CCP / SIP SUCT VLVs: [Step 3.g]
		• 1/1 - 8804A
		• 1/1 - 8804B
	US/RO	Align Containment Spray System for Recirculation: [Step 4]
		• Check RWST level - LESS THAN 6% [Step 4.a]
		• Continue with Step 5. [Step 4.a RNO]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8	Page	33	of	40
Event Description:	LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck								

Time	Position	Applicant's Actions or Behavior
		CAUTION: ECCS recirculation flow to RCS must be maintained at all times.
		CAUTION: If offsite power is lost after SI reset, manual action may be required to restart safeguards equipment (CCP will be running with no suction).
	RO/BOP	Perform The Following To Complete Recirculation Alignment: [Step 5]
		• DETERMINE ECCS aligned for cold leg recirculation. [Step 5.a]
		• Verify closed CCP MINIFLO VLVS: [Step 5.b]
		• 1/1 - 8110
		• 1/1 - 8111
	RO	• Close RWST TO CHRG PMP SUCT VLVS: [Step 5.c]
		• 1/1 - LCV - 112D
		• 1/1 - LCV - 112E
		• Verify CCP injection flow. [Step 5.d]
	BOP	• Close RWST TO SIP SUCT VLV: [Step 5.e]
		• 1/1 - 8806
		• Verify SIP discharge flow (s). [Step 5.f]
		• Check RHR status: [Step 5.g]
		• Both RHR Trains running in cold leg recirculation.
		• Reset RHR Auto switchover.
		• Check Containment Spray aligned for recirculation. [Step 5.h]
		• Complete Step 4.b PRIOR TO continuing. [Step 5.h RNO]

Operating Test :	NRC	Scenario #	4	Event #	6, 7, 8	Page	34	of	40
Event Description:	LBLOCA, RHR 1-02 Fail To Auto Start, 1-01 RHR Trips, CT Smp Suct Vlv 4783 Stuck								

Time	Position	Applicant's Actions or Behavior
	BOP	• Realign Containment Spray System as follows: [Step 4.b]
		• Open CNTMT SMP TO CSP 1 & 3 AND 2 & 4 SUCT ISOL VLVs:
		• 1-HS-4782
		• 1-HS-4783
	BOP	DETERMINE that 1-HS-4783 will NOT open. [Step 4.b RNO]
		• Place CSPs 1-02 and 1-04 in PULL-OUT. [Step 4.b RNO Step 1)]
		• Place affected CS HX OUT VLV in PULL-OUT.
	US	• Consult Plant Staff to determine contingency actions.
		• Close RWST TO CSP 1 & 3 AND 2 & 4 SUCT VLVs:
		• 1-HS-4758
		• 1-HS-4759
	BOP	IF containment spray pumps have been stopped due to RWST level, THEN perform the following:
		• DETERMINE containment spray pumps have not been stopped.
	RO/BOP	Verify Monitor Lights for CNTMT SMP RECIRC on 1-MLB-4A3 and 1-MLB-4B3 are LIT. [Step 5.i]
	BOP	Record containment recirculation sump level: ____________________ feet [Step 5.j]
	BOP	Make plant announcement that recirculation flow has been established for ECCS or Containment Spray as applicable. [Step 5.k]
When recirculation flow has been established and plant announcement has been made, or at Lead Examiner's discretion, TERMINATE the scenario.		

Operating Test :	NRC	Scenario #	4	Event #	7	Page	35	of	40
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior
Examiner Note:		**These steps are performed by the BOP per EOP-0.0, Reactor Trip or Safety Injection, Attachment 2**
		CAUTION: If during performance of this procedure the SI sequencer fails to complete its sequence, Attachment 3 may be used to ensure proper equipment operation for major equipment.
	BOP	VERIFY SSW Alignment: [Step 1]
		• VERIFY SSW Pumps – RUNNING. [Step 1.a]
		• VERIFY EDG Cooler SSW return flow. [Step 1.b]
	BOP	VERIFY Safety Injection Pumps – RUNNING. [Step 2]
	BOP	VERIFY Containment Isolation Phase A – APPROPRIATE MLB LIGHT INDICATION (RED WINDOWS). [Step 3]
	BOP	VERIFY Containment Ventilation Isolation – APPROPRIATE MLB LIGHT INDICATION (GREEN WINDOWS). [Step 4]
	BOP	VERIFY CCW Pumps – RUNNING. [Step 5]

Operating Test :	NRC	Scenario #	4	Event #	7	Page	36	of 40
Event Description:	Main Steam Line Break on SG 1-02 inside containment.							
Time	Position	Applicant's Actions or Behavior						

CRITICAL TASK STATEMENT		**Manually start at least one low-head (RHR pump) ECCS pump before transition out of EOP-0.0A, Reactor Trip or Safety Injection.**
	BOP	VERIFY RHR Pumps – RUNNING. [Step 6]
		• RECOGNIZE RHR Pump 1-01 has tripped.
CRITICAL TASK	BOP	• Determine 1-02 RHR pump did NOT auto start, <u>AND</u> START 1-02 RHR pump.
	BOP	VERIFY Proper CVCS Alignment: [Step 7]
		• VERIFY both CCPs – RUNNING. [Step 7.a]
		• VERIFY Letdown Relief Valve Isolation: [Step 7.b]
		• Letdown Orifice Isolation Valves – CLOSED. [Step 7.b.1)]
		• Letdown Isolation Valves 1/1-LCV-459 & 1/1-LCV-460 – CLOSED. [Step 7.b.2)]
	BOP	VERIFY ECCS flow: [Step 8]
		• CCP SI flow indicator – CHECK FOR FLOW. [Step 8.a]
		• RCS pressure – LESS THAN 1700 PSIG (1800 PSIG FOR ADVERSE CONTAINMENT). [Step 8.b]
		• SIP discharge flow indicator – CHECK FOR FLOW. [Step 8.c]
		• RCS pressure – LESS THAN 325 PSIG (425 PSIG FOR ADVERSE CONTAINMENT). [Step 8.d]
		• GO to Step 9. [Step 8.d RNO]
	BOP	VERIFY Feedwater Isolation Complete: [Step 9]
		• Feedwater Isolation Valves – CLOSED.
		• Feedwater Isolation Bypass Valves – CLOSED.
		• Feedwater Bypass Control Valves – CLOSED.
		• Feedwater Control Valves – CLOSED.
	BOP	VERIFY Diesel Generators – RUNNING. [Step 10]

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY Monitor Lights for SI Load Shedding on 1-MLB-9 and 1-MLB-10 – LIT. [Step 11]

NOTE: The MLB indication for SI alignment includes components which may be in a different alignment to support unit conditions. MSIVs, MSLs BEF MSIV D/POT ISOL, TDAFWP STEAM SUPPLIES, TDAFWP RUN, MDAFWP FLO CTRL VLVs and TDAFWP FLO CTRL VLVs may be exceptions to the expected MLB indication.

Time	Position	Applicant's Actions or Behavior
	BOP	VERIFY Proper SI alignment – PROPER MLB LIGHT INDICATION. [Step 12]
	BOP	INITIATE periodic monitoring of Spent Fuel Cooling. [Step 13]
		• Spent Fuel Pool temperature (T2900A, T2901A).
		• Spent Fuel Pool level (L4800A, L4801A, L4802A, L4803A).

NOTE: Any previously removed missile shield(s) that affects the Control Room, Auxiliary, Safeguards or Fuel Building pressure boundary is required to be restored upon initiation of a Safety Injection Signal.

NOTE: When the SI sequencer has timed out,the Reactor Makeup Water Pump with its handswitch in Auto will restart.

Time	Position	Applicant's Actions or Behavior			
	BOP	VERIFY Components on Table 1 are Properly Aligned. [Step 14]			
		Location	Equipment	Description	Condition
		CB-03	X-HS-5534	H2 PRG SPLY FN 4	STOPPED
		CB-03	X-HS-5532	H2 PRG SPLY FN 3	STOPPED
		CB-04	1/1-8716A	RHRP 1 XTIE VLV	OPEN
		CB-04	1/1-8716B	RHRP 2 XTIE VLV	OPEN
		CB-06	1/1-8153	XS LTDN ISOL VLV	CLOSED/H.S. IN CLOSED

Operating Test :	NRC	Scenario #	4	Event #	7	Page	38	of	40
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior

	CB-06	1/1-8154	XS LTDN ISOL VLV	CLOSED/H.S. IN CLOSED
	CB-07	1/1-RTBAL	RX TRIP BKR	OPEN
	CB-07	1/1-RTBBL	RX TRIP BKR	OPEN
	CB-07	1/1-BBAL	RX TRIP BYP BKR	OPEN/DEENERGIZED
	CB-07	1/1-BBBL	RX TRIP BYP BKR	OPEN/DEENERGIZED
	CB-08	1-HS-2397A	SG 1 BLDN HELB ISOL VLV	CLOSED
	CB-08	1-HS-2398A	SG 2 BLDN HELB ISOL VLV	CLOSED
	CB-08	1-HS-2399A	SG 3 BLDN HELB ISOL VLV	CLOSED
	CB-08	1-HS-2400A	SG 4 BLDN HELB ISOL VLV	CLOSED
	CB-08	1-HS-2111C	FWPT A TRIP	TRIPPED
	CB-08	1-HS-2112C	FWPT B TRIP	TRIPPED
	CB-09	1-HS-2490	CNDS XFER PUMP	STOPPED (MCC deenergized on SI)
	CV-01	X-HS-6181	PRI PLT SPLY FN 17 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6188	PRI PLT SPLY FN 18 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6195	PRI PLT SPLY FN 19 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6202	PRI PLT SPLY FN 20 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6209	PRI PLT SPLY FN 21 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6216	PRI PLT SPLY FN 22 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6223	PRI PLT SPLY FN 23 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-6230	PRI PLT SPLY FN 24 & INTK DMPR	STOPPED/DEENERGIZED
	CV-01	X-HS-3631	UPS & DISTR RM A/C FN 1 & BSTR FN 42	STARTED
	CV-01	X-HS-3632	UPS & DISTR RM A/C FN 2 & BSTR FN 43	STARTED
	CV-01	1-HS-5600	ELEC AREA EXH FN 1	STOPPED/DEENERGIZED
	CV-01	1-HS-5601	ELEC AREA EXH FN 2	STOPPED/DEENERGIZED
	CV-01	1-HS-5602	MS & FW PIPE AREA EXH FN 3 & EXH DMPR	STOPPED/DEENERGIZED

Operating Test :	NRC	Scenario #	4	Event #	7	Page	39	of	40
Event Description:	Main Steam Line Break on SG 1-02 inside containment.								

Time	Position	Applicant's Actions or Behavior

	CV-01	1-HS-5603	MS & FW PIPE AREA EXH FN 4 & EXH DMPR	STOPPED/DEENERGIZED
	CV-01	1-HS-5618	MS & FW PIPE AREA SPLY FN 17	STOPPED/DEENERGIZED
	CV-01	1-HS-5620	MS & FW PIPE AREA SPLY FN 18	STOPPED/DEENERGIZED
	CV-03	X-HS-5855	CR EXH FN 1	STOPPED/DEENERGIZED
	CV-03	X-HS-5856	CR EXH FN 2	STOPPED/DEENERGIZED
	CV-03	X-HS-5731	SFP EXH FN 33	STOPPED/DEENERGIZED
	CV-03	X-HS-5733	SFP EXH FN 34	STOPPED/DEENERGIZED
	CV-03	X-HS-5727	SFP EXH FN 35	STOPPED/DEENERGIZED
	CV-03	X-HS-5729	SFP EXH FN 36	STOPPED/DEENERGIZED

Examiner Note: The next four (4) steps would be performed on Unit 2.

	CB-03	2-HS-5538	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5539	AIR PRG EXH ISOL DMPR	CLOSED
	CB-03	2-HS-5537	AIR PRG SPLY ISOL DMPR	CLOSED
	CB-03	2-HS-5536	AIR PRG SPLY ISOL DMPR	CLOSED

	BOP	NOTIFY Unit Supervisor attachment instructions complete AND to IMPLEMENT FRGs as required. [Step 14]

EOP-0.0A, Attachment 2 steps are now complete.

;CPNPP 2015 NRC Initial Scenario 4
;Load IC18

;INITIAL CONDITIONS

;EHC Pump C Tagged out.
IOR DITCHS6552 f:0

;Complicates Emergency Boration on DRPI loss
;1-01 Boric Acid pmp oos
IOR DICVAPBA1 f:0

;RHR 1-02 Fails to auto start (Event 7)
IMF RH01D f:1

;CT SMP Suct 2 stuck closed 4783 (Event 8)
IMF CS05B f:1

;Reactor Auto Trip Fail (Event 5)
IMF RP01 f:1

;EVENTS

;2327 Fail Hi, ARV 1-03 Opens (Event 1)
IMF MS13C f:1300 k:1

;Loss of DRPI (Event 2)
IMF RD12C f:1 k:2

;SG 1-02 LT 552 fails hi (Event 3)
IMF RX04B f:100 k:3

;MFP 1-02 Trips (Event 4)
IMF FW03B f:1 k:4

;Auto Rods Failure (Event 4)
IMF RD15A f:1 k:4

;RCP 1-02 Shaft Breaks (Event 5)
IMF RC04B f:1 k:5

;RC Loop 2 CL LBLOCA (Event 6)
IMF RC09B2 f:1 d:10 k:6

;RHR 1-01 Trips after SI (Event 7)
IMF RH01A f:1 d:50 k:6

Facility: **Comanche Peak** Date of Exam: **June 2015** Operating Test No.: **1**

APPLICANT	EVENT TYPE	NRC EXAM OUTLINE SUBMITTAL												TOTAL	MINIMUM(*)		
		Scenario 1			Scenario 2												
		CREW POSITION			CREW POSITION												
		SRO	ATC	BOP	SRO	ATC	BOP								R	I	U
RO 1	RX			---		1								**1**	1	1	0
	NOR			1		---								**1**	1	1	1
	I/C			2,3,5		2,3,5								**6**	4	4	2
	MAJ			6		6,7								**3**	2	2	1
	TS			---		---								**0**	0	2	2
RO 2	RX			---		1								**1**	1	1	0
	NOR			1		---								**1**	1	1	1
	I/C			2,3,5		2,3,5								**6**	4	4	2
	MAJ			6		6,7								**3**	2	2	1
	TS			---		---								**0**	0	2	2
RO 3	RX		1				---							**1**	1	1	0
	NOR		---				1							**1**	1	1	1
	I/C		4,5,7,8				4							**5**	4	4	2
	MAJ		6				6,7							**3**	2	2	1
	TS		---				---							**0**	0	2	2
SRO-I 1	RX		1		---									**1**	1	1	0
	NOR		---		1									**1**	1	1	1
	I/C		4,5,7,8		5									**5**	4	4	2
	MAJ		6		6,7									**3**	2	2	1
	TS		---		2,3,4									**3**	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the “at-the-controls (ATC)” and “balance-of-plant (BOP)” positions; Instant SROs must do one scenario, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position.

2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.

3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant’s competence count toward the minimum requirements specified for the applicant’s license level in the right-hand columns.

Facility: **Comanche Peak** Date of Exam: **June 2015** Operating Test No.: **1**

NRC EXAM OUTLINE SUBMITTAL

APPLICANT	EVENT TYPE	Scenario 1 CREW POSITION			Scenario 2 CREW POSITION									TOTAL	MINIMUM(*)		
		SRO	ATC	BOP	SRO	ATC	BOP								R	I	U
SRO-I 2	RX		1		---									**1**	1	1	0
	NOR		---		1									**1**	1	1	1
	I/C		4,5,7,8		5									**5**	4	4	2
	MAJ		6		6,7									**3**	2	2	1
	TS		---		2,3,4									**3**	0	2	2
SRO-U 1	RX	---					---							**0**	1	1	0
	NOR	1					1							**2**	1	1	1
	I/C	3,5					4							**3**	4	4	2
	MAJ	6					6,7							**3**	2	2	1
	TS	2,4					---							**2**	0	2	2
SRO-U 2	RX	---					---							**0**	1	1	0
	NOR	1					1							**2**	1	1	1
	I/C	3,5					4							**3**	4	4	2
	MAJ	6					6,7							**3**	2	2	1
	TS	2,4					---							**2**	0	2	2
SRO-U 3	RX	---			---									**0**	1	1	0
	NOR	1			1									**2**	1	1	1
	I/C	3,5			5									**3**	4	4	2
	MAJ	6			6,7									**3**	2	2	1
	TS	2,4			2,3,4									**5**	0	2	2

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the “at-the-controls (ATC)” and “balance-of-plant (BOP)” positions; Instant SROs must do one scenario, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position.

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3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant’s competence count toward the minimum requirements specified for the applicant’s license level in the right-hand columns.

Facility: CPNPP Date of Examination: 06/01/15 Operating Test No. June NRC

	Applicants											
	SRO-U1				SRO-U2				SRO-U3			
Competencies	SCENARIO				SCENARIO				SCENARIO			
	1	2	3		1	2	3		1	2	3	
Interpret/Diag-nose Events and Conditions	2,3,4, 5,6,8	-	-		2,3,4,5 ,6,8	4,6,7, 8	-		-	-	1,2,3,4 ,5,6	
Comply With and Use Procedures (1)	1,2,3, 4,5,6, 7,8	-	-		1,2,3,4 ,5,6,7, 8	1,4,5, 6,7,8	-		-	-	1,3,4,5 ,6	
Operate Control Boards (2)	N/A	-	-		N/A	1,4,5, 6,7,8	-		-	-	N/A	
Communicate and Interact	1,2,3, 4,5,6, 7,8	-	-		1,2,3,4 ,5,6,7, 8	1,4,5, 6,7,8	-		-	-	1,2,3,4 ,5,6,7, 8	
Demonstrate Supervisory Ability (3)	1,2,3, 4,5,6, 7,8	-	-		1,2,3,4 ,5,6,7, 8	N/A	-		-	-	1,2,3,4 ,5,6	
Comply With and Use Tech. Specs. (3)	2,4	-	-		2,4	N/A	-		-	-	1,3, 5	

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

Facility: CPNPP	Date of Examination: 06/01/15				Operating Test No. June NRC							
	Applicants											
Competencies	SRO-I1				SRO-I2							
	SCENARIO				SCENARIO							
	1	2	3		1	2	3					
Interpret/Diagnose Events and Conditions	4,5,6, 7,8	2,3,4, 5,6,7	-		4,5,6,7 ,8	2,3,4,5 ,6,7	-					
Comply With and Use Procedures (1)	1,4,5, 6,7,8	1,2,3, 4,5,6, 7	-		1,4,5,6 ,7,8	1,2,3,4 ,5,6,7	-					
Operate Control Boards (2)	1,4,5, 6,7,8	N/A	-		1,4,5,6 ,7,8	N/A	-					
Communicate and Interact	1,2,4, 5,6,7, 8	1,2,3, 4,5,6, 7,8	-		1,2,4,5 ,6,7,8	1,2,3,4 ,5,6,7, 8	-					
Demonstrate Supervisory Ability (3)	N/A	1,2,3, 4,5,6, 7	-		N/A	1,2,3,4 ,5,6,7	-					
Comply With and Use Tech. Specs. (3)	N/A	2,3 ,4	-		N/A	2,3, 4	-					

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

Facility: CPNPP Date of Examination: 06/01/15 Operating Test No. June NRC												
	Applicants											
Competencies	RO1				RO2				RO3			
	SCENARIO				SCENARIO				SCENARIO			
	1	2	3		1	2	3		1	2	3	
Interpret/Diagnose Events and Conditions	2,3,5,8	4,6,7,8	1,3,4,5,6		2,3,5,8	2,3,5,6,7	-		-	2,3,5,6,7	2,4,5,6,7,8	
Comply With and Use Procedures (1)	1,2,3,5,6	1,4,5,6,7,8	1,3,4,5,6		1,2,3,5,6	1,2,3,5,6,7	-		-	1,2,3,5,6,7	1.2,4,5,6,7,8	
Operate Control Boards (2)	1,2,3,5,6	1,4,5,6,7,8	1,3,4,5,6		1,2,3,5,6	1,2,3,5,6,7	-		-	1,2,3,5,6,7	1,2,4,5,6,7,8	
Communicate and Interact	1,2,3,5,6,8	1,4,5,6,7,8	1,3,4,5,6		1,2,3,5,6,8	1,2,3,5,6,7	-		-	1,2,3,5,6,7	1,2,4,5,6,7,8	
Demonstrate Supervisory Ability (3)	N/A	N/A	N/A		N/A	N/A	-		-	N/A	N/A	
Comply With and Use Tech. Specs. (3)	N/A	N/A	N/A		N/A	N/A	-		-	N/A	N/A	

Notes:

(4) Includes Technical Specification compliance for an RO.

(5) Optional for an SRO-U.

(6) Only applicable to SROs.