

Rev 1

Facility: <u>Diablo Canyon</u>	Date of Examination: <u>01/19/2018</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>	Operating Test Number: <u>L162</u>

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations (NRCL162-A5)	N, R	<b>Review AP-5 Bistable Trip Authorization Form</b>  2.1.7 Ability to evaluate plant performance and make operational judgements based on operating characteristics, reactor behavior, and instrument interpretation. (4.7)
Conduct of Operations (NRCL162-A6)	N, R	<b>Review Rod Position Alignment and Rod Insertion Limits</b>  2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (4.3)
Equipment Control (NRCL162-A7)	M, R	<b>Verify AFD is within Tech Spec Limits</b>  2.2.42 Ability to recognize system parameters that are entry-level conditions for Technical Specifications. (4.6) (Modified from L061C)
Radiation Control (NRCL162-A8)	M, R	<b>Approve Liquid Waste Release Permit</b>  2.3.6 Ability to approve release permits. (3.8) (Modified from L061C)
Emergency Plan (NRCL162-A9)	N, R	<b>Perform an Emergency Classification</b>  2.4.41 Emergency Procedures/Plan. (4.6)

NOTE: All items (five total) are required for SROs. RO applicants require only four items unless they are retaking only the administrative topics (which would require all five items).

\* Type Codes and Criteria:

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

(D)irect from bank ( $\leq 3$  for ROs;  $\leq 4$  for SROs and RO retakes)

(N)ew or (M)odified from bank ( $\geq 1$ )

(P)revious 2 exams ( $\leq 1$ , randomly selected)

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

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**Number:** NRCL162-A1

**Title:** Determine affected indicators due to malfunction of Eagle 21 protection or control channel.

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print	Signature	Date
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**Testing Method:** Perform ☒ Simulate \_\_\_\_\_

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:** Designed for RO candidates in a classroom setting.

**References:**

- OP AP-5, Malfunction of Eagle 21 Protection or Control Channel
- Handout with Annunciator and Reactor Trip and ESF Bistable Channels status

**Alternate Path:** Yes \_\_\_\_\_ No ☒

**Time Critical:** Yes \_\_\_\_\_ No ☒

**Time Allotment:** 20 minutes

**Critical Steps:** 1.3, 1.5

**Job Designation:** RO

**Rev Comments** New

**Gen KA #** 2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation. 4.4

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AUTHOR:	JARED SMITH	DATE:	10/31/17
OPERATIONS REPRESENTATIVE:	CHRIS MEHIGAN	DATE:	10/31/17

REV.0

EVALUATOR WORKSHEET

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- Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. Since this is an administrative JPM, and the simulator is not used, the examinee may be given a copy of the required materials below. The examinee should be given the Initial cue sheet (page 7) along with the handout and procedure.
- Required Materials:**
- OP AP-5, Malfunction of Eagle 21 Protection or Control Channel
  - Handout with Annunciator and Reactor Trip and ESF Bistable Channels status
- Initial Conditions:**
- GIVEN:
- Unit 1 is at 100% power
  - The control room received multiple alarms including PK 06-01 “PPS Channel Set Failure” and PK 06-04 “PPS Trouble”. OP AP-5, Malfunction of Eagle 21 Protection or Control Channel is in progress due to a LCP halt.
  - All Primary and Secondary control systems are within their normal operating limits and controlling properly.
  - Unit 2 BOPCO has been assigned to perform AP-5 att. 4.3 “Eagle 21 Rack Inspection/Compensatory Measure Tracking Sheet” and identification of which red LEDs are LIT.
- Initiating Cue:**
- The Shift Foreman has directed you to determine which protection set and rack is impacted as well as the affected indicators.
  - Document your findings before reporting out. This should include any necessary corrections, comments, and notifications.

- |                       |   |
|-----------------------|---|
| <b>Task Standard:</b> | <b>DO NOT READ TASK STANDARD TO EXAMINEE</b> <ul style="list-style-type: none"><li>• <b>Determined Protection Set 2 Rack 8 affected from LCP Halt.</b></li><li>• Determined affected indicators: PT-506, LT-519/549, TE-433A/B, TE-443A/B, TE-420A/421A/422A/420B/421B, and PT-936.</li></ul> |
|-----------------------|---|

EVALUATOR WORKSHEET

Start Time: _____			
Step		Expected Operator Actions	
1.**		<b><u>Note:</u> Exam copy of OP AP-5 and Handout provided to examinee.</b>	
	Obtain correct procedure	1.1	Referenced OP AP-5, Malfunction of Eagle 21 Protection or Control Channel.
	Perform Step 2. Determine Extent of Eagle 21 Instrument Failure: (RNO column shall be used)	1.2	Observed NOTES 1 and 2 prior to step 2.
	IF PK 06-01 <u>OR</u> PK 06-03 is <u>ON</u> ,	1.3**	Step 2.a.1. RNO Checked PK 06-01 is ON (examinee performed actions in Response Not Obtained column) Referenced handout with Annunciator windows PK06-01 and PK06-04 in alarm. Also, referenced handout with SSPS Protection and Safeguards Bistables illuminated (LC 519A/b, LC 549A/B, PC 936A). Determined Protection Set 2 Rack 8 is affected.
		1.4	Step 2.a.2 RNO <b><u>CUE:</u></b> Another operator has been assigned to perform RNO steps 2.a.2. (Att. 4.3 "Eagle 21 Rack Inspection/Compensatory Measure Tracking Sheet" and identification of which red LEDs are LIT).
	IF PK 06-01 is ON, THEN perform the following:	1.5**	Used handout with Reactor Trip and ESF Bistable Channels status and OP AP-5 attachment 4.1 "Reactor Trip and ESF Bistable Channels to be Placed in Correct Position per Technical Specifications." Student determined Protection Set 2 Rack 8 affected Instrument Channels/Indicators are: PT-506, LT-519/549, TE-433A/B, TE-443A/B, TE-420A/B, TE-421A/B, TE-422A, and PT-936.

\*\* Denotes Critical Step and Sub Steps.

EVALUATOR WORKSHEET

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1.6 Student notified SFM of affected board indicators.

Step was: Sat: \_\_\_\_\_ Unsat \_\_\_\_\_

**Comments:**

**Stop Time:** \_\_\_\_\_

**Total Time:** \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub Steps.

**Follow-up Question Documentation:**

**Question:** \_\_\_\_\_

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**Response:** \_\_\_\_\_

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\_\_\_\_\_

JPM TITLE: Determine affected indicators due to  
malfunction of Eagle 21 protection or  
control channel.

JPM NUMBER: NRCL162-A1

ANSWER KEY

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EXAMINEE RESPONSE
<ul style="list-style-type: none"><li>• <b>Determined Protection Set 2 Rack 8 affected from LCP Halt.</b></li><li>• <b>Determined affected indicators: PT-506, LT-519/549, TE-433A/B, TE-443A/B, TE-420A/421A/422A/420B/421B, and PT-936.</b></li></ul>



- Unit 1 is at 100% power
- The control room received multiple alarms including PK 06-01 “PPS Channel Set Failure” and PK 06-04 “PPS Trouble”. OP AP-5, Malfunction of Eagle 21 Protection or Control Channel is in progress due to a LCP halt.
- All Primary and Secondary control systems are within their normal operating limits and controlling properly.
- Unit 2 BOPCO has been assigned to perform AP-5 att. 4.3 “Eagle 21 Rack Inspection/Compensatory Measure Tracking Sheet” and identification of which red LEDs are LIT.

- The Shift Foreman has directed you to determine which protection set/rack is impacted and the affected indicators.
- Document your findings before reporting out. This should include any necessary corrections, comments, and notifications.

## NRCL162-A1 R0

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

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**Number:** NRCL162-A2

**Title:** Calculate Rod Position Alignment and Rod Insertion Limits

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print	Signature	Date
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**Testing Method:** Perform   X   Simulate           

**Results:** Sat        Unsat        Total Time:            minutes

**Comments:** Designed for RO candidates in a classroom setting.

**References:**

- STP I-1A Routine Shift Checks Required by Licenses, Rev. 137
- COLR 1, U1, COLR for Diablo Canyon Unit 1, Rev. 11
- COLR 2, U2, COLR for Diablo Canyon Unit 2, Rev. 10
- PPC Data printout

**Alternate Path:** Yes        No   X  

**Time Critical:** Yes        No   X  

**Time Allotment:** 15 minutes

**Critical Steps:** 1.1, 2.1, 3.2, 3.3, 3.4, 3.6

**Job Designation:** RO

**Rev Comments** New

**Gen KA #** G2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. 4.3

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AUTHOR:                                 JARED SMITH                                 DATE:           10/31/17          

OPERATIONS  
REPRESENTATIVE:                                 CHRIS MEHIGAN                                 DATE:           10/31/17          

REV.0 P0

EVALUATOR WORKSHEET

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- Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. Since this is an administrative JPM, and the simulator is not used, the examinee may be given a copy of the required materials below. The examinee should be given the Initial cue sheet along with the handout and procedure.
- Required Materials:**
- STP I-1A Routine Shift Checks Required by Licenses, Rev. 137
  - COLR, U1, COLR for Diablo Canyon Unit 1, Rev. 11
  - COLR, U2, COLR for Diablo Canyon Unit 2, Rev. 10
  - PPC Data (Handout)
- Initial Conditions:** GIVEN:
- Unit 1 has been at reduced power for the past 12 hours due to the Heater 2 Drain Pump being out of service for maintenance.
  - All Unit 1 individual rod position PPC addresses have a quality code of good (green) on PPC GRPDIS-DRPI.
- Initiating Cue:**
- You are directed to complete STP I-1A steps 12.10 through 12.12.
  - Document whether each step is satisfactory before reporting out to the Shift Foreman. This should include any necessary comments and/or notifications.

<b>Task Standard:</b>	<b>DO NOT READ TASK STANDARD TO EXAMINEE</b> <ul style="list-style-type: none"><li>• Step 12.10, Determined each rod position on DRPI is within 12 steps of its group step counter.</li><li>• Step 12.11, Checked all shutdown bank step counters are above 225 steps.</li><li>• Step 12.12, Determined COLR insertion limits are NOT met.</li><li>• Step 12.12.6, Notified the SFM that the performance of step 12.13 is required within 1 hour due to COLR insertion limits not met.</li></ul>
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**Start Time:**

	Step	Expected Operator Actions
1.	Perform step 12.10 Rod Position Alignment	<b><u>Note:</u> Observed Note prior to step. Examinee referenced handouts for information.</b>
		<p>1.1** Checked DRPI indications and group step counters. Determined to be within 12 steps of each other. Initialed step 12.10.1.</p> <p>DRPI indicated Control Banks A &amp; B at 228 steps. CBA &amp; CBB step counters indicated 229 steps (1 step difference). DRPI indicated CBC at 222 steps. CBC group step counters indicated 215 steps (7 step difference). DRPI indicated CBD at 96 steps. CBD group step counters indicated 87 steps (9 step difference). All Shutdown banks indicated 228 steps on DRPI and 229 steps on the group step counters (1 step difference).</p> <p>1.2 Marked step 12.10.1.a N/A.</p> <p>1.3 Marked step 12.10.1.b N/A.</p> <p>1.4 Initialed step 12.10.2. Information given in initial conditions.</p>
		<b>Step was: Sat: _____ Unsat _____</b>

**Comments:**

\*\* Denotes Critical Step and Sub Steps.

EVALUATOR WORKSHEET

Step	Expected Operator Actions
2. Perform step 12.11 Shutdown Bank COLR Insertion Limits	<b><u>Note: Examinee referenced handouts for information.</u></b>
2.1**	Checked all shutdown bank step counters. All shutdown bank step counters indicated 229 steps. Determined all are above 225 steps. Initialed step 12.11.1.
2.2	Determined step 12.11.2 is N/A.
2.3	Determined step 12.11.3 is N/A.
Step was: Sat: _____ Unsat: _____	

Comments:

\*\* Denotes Critical Step and Sub Steps.

EVALUATOR WORKSHEET

Step	Expected Operator Actions
3. Perform step 12.12 Control Bank COLR Insertion Limits	<p><b><u>Note:</u> Examinee referenced handouts for information.</b></p>
3.1	<p>Determined thermal power level to be 65.4%. (Used PPC point U4300A15). Initialed step 12.12.1.</p>
	<p><b><u>Note:</u> Examinee referenced Unit1 COLR</b></p>
3.2**	<p>Recorded Insertion limit: <b>Control Bank D</b> at <b>90 steps</b> (acceptable range is Bank D 89 – 91 steps) or <b>Control Bank C</b> at <b>217 steps</b> (acceptable range is CBC 217-218 steps). Initialed step 12.12.2.</p>
3.3**	<p>Recorded demand bank position: Bank D at 87 steps or Bank C at 215 steps. Initialed step 12.12.3.</p>
3.4**	<p>Checked each control bank is NOT at or above the insertion limit. Control Banks C &amp; D are below the COLR Insertion limits. Examinee applied note to step 12.12.4.</p>
3.5	<p>Checked sequence and overlap limits specified in the COLR are met. Initialed step 12.12.5. (Note is acceptable)</p>
3.6**	<p>Determined COLR insertion limits are NOT met. Notified SFM that step 12.13 to be performed within 1 hour due to COLR insertions limits not met. (Examinee may initial step 12.12.6 or leave blank).</p>
	<p><b>Step was: Sat: _____ Unsat _____</b></p>

\*\* Denotes Critical Step and Sub Steps.

EVALUATOR WORKSHEET

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**Comments:**

**Stop Time:** \_\_\_\_\_

**Total Time:** \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub Steps.

**Follow-up Question Documentation:**

**Question:** \_\_\_\_\_

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**Response:** \_\_\_\_\_

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EXAMINEE RESPONSE
<ul style="list-style-type: none"><li>• Step 12.10, Determined each rod position on DRPI is within 12 steps of its group step counter.</li><li>• Step 12.11, Checked all shutdown bank step counters are above 225 steps.</li><li>• Step 12.12, Determined COLR insertion limits are NOT met.</li><li>• Step 12.12.6, Notified the SFM that the performance of step 12.13 is required within 1 hour due to COLR insertion limits not met.</li></ul>

Routine Shift Checks Required by Licenses

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**U1** Section 12: Page 9 of 28

12.10 Rod Position Alignment

Applicability	Requirement	Parameter
MODE 1	SR 3.1.4.1 T36105	Rod Position Alignment

**NOTE:** If one of the position indicators becomes inoperable, then conditions of this LCO remain met by compliance with LCO 3.1.7.

12.10.1 Check each rod position on DRPI is within 12 steps of its respective group step counter.

DB

a. IF one rod is NOT within alignment limit  
AND will NOT be restored to within that limit within one hour,  
THEN perform step 12.13 prior to the end of that hour.

[✓]N/A

b. IF more than one rod is NOT within alignment limit,  
THEN perform step 12.13 within one hour.

[✓]N/A

12.10.2 Check all individual rod position PPC addresses have a quality code of good (green) on PPC GRPDIS-DRPI.

DB

12.11 Shutdown Bank COLR Insertion Limits

Applicability	Requirement	Parameter
MODE 1	SR 3.1.5.1	Shutdown Bank COLR Insertion Limits

12.11.1 Check all shutdown bank step counters are at or above 225 steps.

DB

12.11.2 IF a step counter is NOT operable,  
THEN check DRPI positions of all rods associated with the affected  
step counter were at or above their DRPI positions when the step counter  
was last known to be operable (Ref. PPC window "GRPDIS-DRPI").

[✓]N/A

12.11.3 IF the shutdown bank insertion limit is NOT met,  
THEN perform step 12.13 within 1 hour.

[✓]N/A

Routine Shift Checks Required by Licenses

STP I-1A R137  
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**U1** Section 12: Page 10 of 28

12.12 Control Bank COLR Insertion Limits

Applicability	Requirement	Parameter
MODE 1	SR 3.1.6.2 SR 3.1.6.3	Control Bank COLR Insertion Limits

- 12.12.1 Record thermal power level: 65.4 % DB
- 12.12.2 Record the following from current COLR for present thermal power level: DB  
Insertion limit: Bank: C at 217 steps
- 12.12.3 Record demand bank position: Bank D at 215 steps DB
- 12.12.4 Check each control bank is at or above the insertion limits specified in step 12.12.2. ①
- 12.12.5 IF all control banks are NOT fully withdrawn,  
THEN check sequence and overlap limits specified in the COLR are met  
for control banks NOT fully withdrawn from the core. [ ] N/A DB
- 12.12.6 IF COLR insertion limits are NOT met,  
THEN perform step 12.13 within 1 hour. [ ] N/A \_\_\_\_\_

12.13 SHUTDOWN MARGIN

Applicability	Requirement	Parameter
MODE 1	SR 3.1.4 SR 3.1.5 SR 3.1.6	SHUTDOWN MARGIN

- 12.13.1 IF one or more control rods are NOT within position limits of steps 12.10, 12.11, or 12.12,  
THEN perform the following: [ ] N/A
- Perform STP R-19, "SHUTDOWN MARGIN Determination" within 1 hour. \_\_\_\_\_
  - Document rod(s) outside position limits: \_\_\_\_\_
  - Record SHUTDOWN MARGIN: \_\_\_\_\_ %  $\Delta k/k$ . \_\_\_\_\_
  - Check SHUTDOWN MARGIN  $\geq 1.6\% \Delta k/k$ . \_\_\_\_\_
  - Ensure STP R-19 will continue to be performed every 12 hours. \_\_\_\_\_

**Initial Conditions:**

**GIVEN:**

- Unit 1 has been at reduced power for the past 12 hours due to the Heater 2 Drain Pump being out of service for maintenance.
- All Unit 1 individual rod position PPC addresses have a quality code of good (green) on PPC GRPDIS-DRPI.

**Initiating Cue:**

- You are directed to complete STP I-1A steps 12.10 through 12.12.
- Document whether each step is satisfactory before reporting out to the Shift Foreman. This should include any necessary comments and/or notifications.

EXAMINEE RESPONSE
Step 12.10 Result:
Step 12.11 Result:
Step 12.12 Result:

**U1** Section 12: Page 9 of 2812.10 Rod Position Alignment

Applicability	Requirement	Parameter
MODE 1	SR 3.1.4.1 T36105	Rod Position Alignment

**NOTE:** If one of the position indicators becomes inoperable, then conditions of this LCO remain met by compliance with LCO 3.1.7.

12.10.1 Check each rod position on DRPI is within 12 steps of its respective group step counter.

DB

a. IF one rod is NOT within alignment limit  
AND will NOT be restored to within that limit within one hour,  
THEN perform step 12.13 prior to the end of that hour.

☒ N/A \_\_\_\_\_

b. IF more than one rod is NOT within alignment limit,  
THEN perform step 12.13 within one hour.

☒ N/A \_\_\_\_\_

12.10.2 Check all individual rod position PPC addresses have a quality code of good (green) on PPC GRPDIS-DRPI.

DB12.11 Shutdown Bank COLR Insertion Limits

Applicability	Requirement	Parameter
MODE 1	SR 3.1.5.1	Shutdown Bank COLR Insertion Limits

12.11.1 Check all shutdown bank step counters are at or above 225 steps.

DB

12.11.2 IF a step counter is NOT operable,  
THEN check DRPI positions of all rods associated with the affected  
step counter were at or above their DRPI positions when the step counter  
was last known to be operable (Ref. PPC window "GRPDIS-DRPI").

☒ N/A \_\_\_\_\_

12.11.3 IF the shutdown bank insertion limit is NOT met,  
THEN perform step 12.13 within 1 hour.

☒ N/A \_\_\_\_\_

**U1** Section 12: Page 10 of 28**12.12** Control Bank COLR Insertion Limits

Applicability	Requirement	Parameter
MODE 1	SR 3.1.6.2 SR 3.1.6.3	Control Bank COLR Insertion Limits

- 12.12.1** Record thermal power level: 65.4 % DB
- 12.12.2** Record the following from current COLR for present thermal power level: DB  
Insertion limit: Bank: D at 90 steps
- 12.12.3** Record demand bank position: Bank D at 87 steps DB
- 12.12.4** Check each control bank is at or above the insertion limits specified in step 12.12.2. ①
- 12.12.5** IF all control banks are NOT fully withdrawn,  
THEN check sequence and overlap limits specified in the COLR are met  
for control banks NOT fully withdrawn from the core. [ ] N/A DB
- 12.12.6** IF COLR insertion limits are NOT met,  
THEN perform step 12.13 within 1 hour. [ ] N/A \_\_\_\_\_

**12.13** SHUTDOWN MARGIN

Applicability	Requirement	Parameter
MODE 1	SR 3.1.4 SR 3.1.5 SR 3.1.6	SHUTDOWN MARGIN

- 12.13.1** IF one or more control rods are NOT within position limits of steps 12.10, 12.11, or 12.12,  
THEN perform the following: [ ] N/A
- Perform STP R-19, "SHUTDOWN MARGIN Determination" within 1 hour. \_\_\_\_\_
  - Document rod(s) outside position limits: \_\_\_\_\_
  - Record SHUTDOWN MARGIN: \_\_\_\_\_ %  $\Delta k/k$ . \_\_\_\_\_
  - Check SHUTDOWN MARGIN  $\geq 1.6\% \Delta k/k$ . \_\_\_\_\_
  - Ensure STP R-19 will continue to be performed every 12 hours. \_\_\_\_\_

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT

JOB PERFORMANCE MEASURE

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**Number:** NRCL162-A3

**Title:** CALCULATE AXIAL FLUX DIFFERENCE (AFD)

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print

Signature

Date

**Testing Method:** Perform ☒ Simulate \_\_\_\_\_

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:** Designed for RO candidates in a classroom setting.

**References:**

- STP I-1C, Routine Weekly Checks Required By Licenses, Section 12.2, Rev. 116C
- Volume 9B, Curves and Miscellaneous Data, Figure R23-1F-1, Unit 1 Cycle 21 RAOC Limits, Rev. 331

**Alternate Path:** Yes \_\_\_\_\_ No ☒

**Time Critical:** Yes \_\_\_\_\_ No ☒

**Time Allotment:** 10 minutes

**Critical Steps:** 2.3, 2.4, 4.2, 5.2, 7.2, 8.1

**Job Designation:** RO

**Rev Comments** New

**Gen KA #** G2.2.42 Ability to recognize system parameters that are entry-level conditions for Technical Specifications. 3.9

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**AUTHOR:** \_\_\_\_\_ JARED SMITH \_\_\_\_\_ **DATE:** 10/31/17

**OPERATIONS REPRESENTATIVE:** \_\_\_\_\_ CHRIS MEHIGAN \_\_\_\_\_ **DATE:** 10/31/17

REV.0



**Directions:**

**No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. Since this is an administrative JPM, and the simulator is not used, the examinee may be given a copy of the required materials below.

**Required Materials:**

- Copy of STP I-1C, "Routine Weekly Checks Required By Licenses," Section 12.2 Axial Flux Difference (AFD), Rev. 116C
- Volume 9B, Curves and Miscellaneous Data, Figure R23-1F-1, Unit 1 Cycle 15 RAOC Limits, Rev. 331
- Axial Flux Difference data (Handout)

**Initial Conditions:**

Given:

- Unit 1 rapidly ramped down power due to tube failures on the No. 3 and No. 4 Feedwater Heaters. Reactor power is currently stable at approximately 87%.
- PK03-25, PPC RX ALARM AXIAL FLUX/ROD POSITION input 1251 is illuminated.
- Indicated Reactor Power based on U1169A05 is 86.8%.
- U4300A15 is not available.
- PPC MAX NI power is 100.3% per latest STP R-2B1.

**Initiating Cue:**

- Unit 1 BOPCO has been tasked with performing STP I-1C, "Routine Weekly Checks Required By Licenses," Section 12.2 Axial Flux Difference (AFD). Determine if AFD is within the RAOC limits.
- Document all your findings before reporting out to the Shift Foreman.

**Task Standard:**

**DO NOT READ TASK STANDARD TO EXAMINEE**

- Determined NI-42C and NI-43C exceeds RAOC limits.
- Notified Shift Foreman that 2 excore channels exceed AFD limits.



Start Time: \_\_\_\_\_

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 Obtained STP I-1C, Section 12.2.  <b>Note: Provide exam copy of STP I-1C, Section 12.2 and AFD Handout.</b>  Step was: Sat: _____ Unsat _____*
2. **Calculate current RTP %.	2.1 Ensured step 12.2.1 is marked N/A. (Given in initial conditions)  2.2 Obtained MAX NI Power from initial conditions and recorded as 100.3%. Ensured step 12.2.2.a box STP R-2B1, "PPC Operator Heat Balance" box is left unchecked and STP R-2B2/R-2B3 boxes marked N/A. Initialed step 12.2.2.a  2.3 Calculated % RTP as follows: U1169A05 value (86.8) / PPC Max (100.3) x 100. Approximately 86.5% RTP. (86.4% -86.6% is acceptable).**  <b>Note: Provide calculator (if necessary).</b>  2.4 Verified RTP % to be 86.5%**  Step was: Sat: _____ Unsat _____*
3. Obtain the correct Figure.	3.1 Obtained Figure R23-1F-1 for Unit 1 from Volume 9.  <b>Note: Provide exam copy of Figure R23-1F-1.</b>  Step was: Sat: _____ Unsat _____*

\*Denotes an entry required on the JPM cover sheet.

\*\*Denotes a Critical Step.

Step	Expected Operator Actions
4. **Determine Upper AFD Limit.	<p>4.1 Referenced R23-1F-1.</p> <p>4.2 Step 12.2.3, Determined Upper AFD Limit to be +14.0%.**</p> <p><b>Step was: Sat: _____ Unsat _____*</b></p>
5. **Determine Lower AFD Limit.	<p>5.1 Referenced R23-1F-1.</p> <p>5.2 Step 12.2.3, Determined Lower AFD Limit to be -14.5% (14.0% - 14.5% is acceptable) **</p> <p><b>Step was: Sat: _____ Unsat _____*</b></p>
6. Record indicated AFD values	<p>6.1 Step 12.2.4, Recorded indicated AFD values for each NI.</p> <p><b>Step was: Sat: _____ Unsat _____*</b></p>
7. **Determine AFD is within limits.	<p>7.1 Step 12.2.4, Determined that AFD is within limits for NIs 41C and 44C and “Yes” boxes marked.</p> <p>7.2 Determined that AFD is outside the limits for NIs 42C and 43C and “No” boxes are marked.**</p> <p><b>Step was: Sat: _____ Unsat _____*</b></p>
8. **Check at LEAST 3 excore channels are within AFD Limits.	<p>8.1 Step 12.2.5, Determined that 2 excore channels are NOT within AFD limits. (Examinee may include note on step 12.2.5) Informed SFM of the surveillance results.**</p> <p><b>Step was: Sat: _____ Unsat _____*</b></p>

\*Denotes an entry required on the JPM cover sheet.

\*\*Denotes a Critical Step.

**Stop Time:** \_\_\_\_\_

**Total Time:** \_\_\_\_\_ (Enter total time on the cover page)

\*Denotes an entry required on the JPM cover sheet.  
\*\*Denotes a Critical Step.

ANSWER KEY

---

**EXAMINEE RESPONSE**

- Determined NI-42C and NI-43C exceeds RAOC limits.
- Notified Shift Foreman that 2 excore channels exceed AFD limits.

**U1** Section 12: Page 2 of 20

12.2 Axial Flux Difference (AFD)

[ ] N/A

Applicability	Requirement	Parameter
MODE 1 > 50% RTP	SR 3.2.3.1	Axial Flux Difference

12.2.1 IF using U4300A15, Reactor Calorimetric Power, for power level, THEN record value:

[✓] N/A

Reactor Calorimetric Power: \_\_\_\_\_ % RTP

12.2.2 IF using U1169A05, Average of Power Range Channels, for power level, THEN perform the following:

[ ] N/A

a. Record MAX NI POWER from ONE of the following:

AB

☒ STP R-2B1, "PPC Operator Heat Balance"

[ ] N/A

☒ STP R-2B2, "Manual Operator Heat Balance"

[✓] N/A

☒ STP R-2B3, "DFWCS Operator Heat Balance"

[✓] N/A

MAX NI POWER: 100.3%

b. Calculate % RTP, as follows:

AB

$$\left[ \frac{(\text{U1169A05:}) \quad 86.8}{(\text{MAX NI POWER:}) \quad 100.3} \right] \times 100 = \underline{86.5} \% \text{ RTP}$$

12.2.3 Obtain upper and lower limits based on current power level from R23-1F-1, "Unit 1 Cycle (current cycle) RAOC Limits:"

AB

Upper AFD Limit: 14.0%

Lower AFD Limit: -14.5%

12.2.4 Record the following AFD readings and satisfaction criteria on the following instruments:

AB

☒ NI-41C: -13.5 within limits

[✓] Yes [ ] No

☒ NI-42C: -15.0 within limits

[ ] Yes [✓] No

☒ NI-43C: -15.0 within limits

[ ] Yes [✓] No

☒ NI-44C: -13.0 within limits

[✓] Yes [ ] No

12.2.5 Check AT LEAST three excore channels are within AFD limits.

①

① NI-42C and NI-43C exceed AFD limits.  
(SR 3.2.3.1 is not met). AB

Initial Conditions:      Given:

- Unit 1 rapidly ramped down power due to tube failures on the No. 3 and No. 4 Feedwater Heaters. Reactor power is currently stable at approximately 87%.
- PK03-25, PPC RX ALARM AXIAL FLUX/ROD POSITION input 1251 is illuminated.
- Indicated Reactor Power based on U1169A05 is 86.8%.
- U4300A15 is not available.
- PPC MAX NI power is 100.3% per latest STP R-2B1.

Initiating Cue:

- Unit 1 BOPCO has been tasked with performing STP I-1C, “Routine Weekly Checks Required By Licenses,” Section 12.2 Axial Flux Difference (AFD). Determine if AFD is within the RAOC limits.
- Document all your findings before reporting out to the Shift Foreman.

EXAMINEE RESPONSE	

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

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**Number:** NRCL162-A4

**Title:** Calculate Maximum Stay Time

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print                      Signature                      Date

**Testing Method:** Perform ☒ Simulate \_\_\_\_\_

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:** Designed for RO candidates in a classroom setting.  
modified from L081NRCADM04, L061NRCADM04, & L111NRCADM04

**References:** RP1.ID6, Personnel Dose Limits and Monitoring Requirements, Rev 15

**Alternate Path:** Yes \_\_\_\_\_ No ☒

**Time Critical:** Yes \_\_\_\_\_ No ☒

**Time Allotment:** 15 minutes

**Critical Steps:** 3, 4

**Job Designation:** RO

**Rev Comments** New

**Gen KA #** G2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions. 3.2

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AUTHOR: \_\_\_\_\_ JARED SMITH \_\_\_\_\_ DATE: 10/31/17 \_\_\_\_\_

OPERATIONS  
REPRESENTATIVE: \_\_\_\_\_ CHRIS MEHIGAN \_\_\_\_\_ DATE: 10/31/17 \_\_\_\_\_

REV.0

**Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. Since this is an administrative JPM, and the simulator is not used, the examinee may be given a copy of the required materials below.

**Required Materials:**

- RP1.ID6, Personnel Dose Limits and Monitoring Requirements, Rev 15
- Calculator

**Initial Conditions:** Given:

- The Work Control Shift Foreman (WCSFM) and Work Control Lead (WCL) have assigned you to hang an outage clearance in two locations, which are both in a High Radiation Area.
  - The first portion of the clearance is in an area where the dose rate is 280 mrem/hr, and the work there will take 45 minutes.
  - The second portion of the clearance is in an area where the dose rate is 430 mrem/hr; it is not known how long this work will take.
- Your current year exposure history (per NRC Form 4) is as follows:
  - Deep Dose Equivalent (DDE) = 969 mrem
  - Committed Dose Equivalent (CDE) = 37 mrem
  - Committed Effective Dose Equivalent (CEDE) = 258 mrem
  - Lens Dose Equivalent (LDE) = 24 mrem
  - Shallow Dose Equivalent (SDE) = 555 mrem
  - Effective Dose Equivalent (EDE) = 1331 mrem

**Initiating Cue:**

- The WCSFM has directed you to determine the maximum time you can stay in the High Radiation Area above, to complete the 2<sup>nd</sup> portion of the clearance (once you have completed the first portion of the clearance), and still remain within DCPD administrative annual exposure guideline for Total Effective Dose Equivalent (TEDE, whole body) dose.

**NOTE: Do NOT provide the student with the Task Standard.**

**Task Standard:**

- Determined maximum stay time to be 0.46 hrs (0.46 – 0.47 hrs, or 27.6 – 28.2 minutes).



Start Time: \_\_\_\_\_

Step	Standards
1. Determines current TEDE.	<p><b>Note:</b> TEDE = EDE + CEDE. Steps preceding step 3.2 may be performed in any order.</p> <p>1.1 Determined current TEDE by adding the EDE (1331 mrem) to the CEDE (258 mrem) = <b>1589 mrem</b>.</p> <p>Step was: Sat: _____ Unsat _____</p>
2. Determines dose required to complete 1 <sup>st</sup> portion of clearance.	<p><b>Note:</b> Dose Rate x Stay Time = Dose used for 1<sup>st</sup> portion of clearance.</p> <p>2.1 Multiplied dose rate (280 mrem/hr) time stay time (3/4 hour) = <b>210 mrem</b> used for 1<sup>st</sup> portion of clearance.</p> <p>Step was: Sat: _____ Unsat _____</p>
** 3. Determines dose margin allowed for 2 <sup>nd</sup> portion of clearance.	<p><b>Note:</b> All guidelines and limits can be found in RP1.ID6.</p> <p>3.1 Determined administrative guideline is 2000 mrem for the year.</p> <p>3.2 Determined dose margin for 2<sup>nd</sup> portion of clearance by subtracting current annual dose (1589 mrem) and dose for 1<sup>st</sup> portion of clearance (210 mrem) from dose limit (2000 mrem); <math>2000 - (1589 + 210) =</math> <b>201 mrem margin</b> (for job). **</p> <p>Step was: Sat: _____ Unsat _____</p>

\*\* Denotes a Critical Step.

Step	Standards
** 4. Determines maximum stay time (for 2 <sup>nd</sup> portion of clearance).	4.1 Stay Time = Margin / Dose Rate
	4.2 Stay Time = 201 mrem / 430 mrem/hr..
	4.3 Stay Time = <b>0.467 hrs (allowable range is 0.46-0.47 hrs, or 27.6 - 28.2 minutes) **</b>
	Step was: Sat: _____ Unsat _____

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes a Critical Step.

**EXAMINEE RESPONSE**

- Determined maximum stay time to be **0.46 hrs (0.46 – 0.47 hrs, or 27.6 – 28.2 minutes).**
- **TEDE = EDE + CEDE**  
**1589 mrem = EDE (1331 mrem) + CEDE (258 mrem)**
- **Dose Rate x Stay Time = Dose**  
**(280 mrem/hr) x (3/4 hour) = 210 mrem**
- **(Admin. Guideline = 2000 mrem); 2000 – (1589 + 210) = 201 mrem margin**
- **Stay Time = Margin / Dose Rate**  
**Stay Time = 201 mrem / 430 mrem/hr**  
**Stay Time = 0.467 hrs (allowable range is 0.46-0.47 hrs, or 27.6 - 28.2 minutes)**

\*\* Denotes a Critical Step.

**Initial Conditions:**

Given:

- The Work Control Shift Foreman (WCSFM) and Work Control Lead (WCL) have assigned you to hang an outage clearance in two locations, which are both in a High Radiation Area.
  - The first portion of the clearance is in an area where the dose rate is 280 mrem/hr, and the work there will take 45 minutes.
  - The second portion of the clearance is in an area where the dose rate is 430 mrem/hr; it is not known how long this work will take.
- Your current year exposure history (per NRC Form 4) is as follows:
  - Deep Dose Equivalent (DDE) = 969 mrem
  - Committed Dose Equivalent (CDE) = 37 mrem
  - Committed Effective Dose Equivalent (CEDE) = 258 mrem
  - Lens Dose Equivalent (LDE) = 24 mrem
  - Shallow Dose Equivalent (SDE) = 555 mrem
  - Effective Dose Equivalent (EDE) = 1331 mrem

**Initiating Cue:**

- The WCSFM has directed you to determine the maximum time you can stay in the High Radiation Area above, to complete the 2nd portion of the clearance (once you have completed the first portion of the clearance), and still remain within DCPD administrative annual exposure guideline for Total Effective Dose Equivalent (TEDE, whole body) dose.

**ANSWER (Stay Time) =****Work Area (use back of sheet as needed)**

**EXAMINEE RESPONSE****ANSWER (Stay Time) =**

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

- Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. Since this is an administrative JPM, and the simulator is not used, the examinee may be given a copy of the required materials below. The examinee should be given the Initial cue sheet (page 6) along with the handout and procedure.
- Required Materials:**
- OP AP-5, Malfunction of Eagle 21 Protection or Control Channel, Rev. 43
- Initial Conditions:** GIVEN:
- Unit 1 is at 100% power.
  - STP I-4-P506, "Main Turbine First Stage Pressure Channel PT-506 Calibration" is in progress. PC-506A is in the required status for the duration of the surveillance test.
  - The control room received multiple alarms including PK 06-01 "PPS Channel Set Failure" and PK 06-04 "PPS Trouble". OP AP-5, Malfunction of Eagle 21 Protection or Control Channel is in progress due to a LCP halt on Protection Set 2 Rack 8.
  - All Primary and Secondary control systems are within their normal operating limits and controlling properly. All operator actions have been completed. The WCSFM has completed AP-5, attachment 4.4, "Bistable Trip Authorization," for the LCP Halt.
- Initiating Cue:**
- The Shift Manager has directed you to perform a review of AP-5 attachment 4.4 "Bistable Trip Authorization" form in accordance with step 8 of the procedure.
  - Document all your findings before reporting out. This should include any necessary corrections, comments, and notifications.

<b>Task Standard:</b>	<b>DO NOT READ TASK STANDARD TO EXAMINEE</b> <ul style="list-style-type: none"><li>• Determined LC-549A "P-14" shall be included on attachment 4.4 with the required Bistable status as TRIPPED.</li><li>• Determined PC-936B "Hi-Hi Contmt Press Phase B Isolation and Contmt Spray / Hi-Hi Contmt Press Steam Line Isolation" required status is BYPASS.</li><li>• Determined PC-936A "Contmt Hi Press S.I." required status is Tripped.</li><li>• No other bistables are incorrectly identified for inclusion.</li><li>• <b>Note: Examinee may include that TC-433A should be omitted from the bistable trip authorization form. This is not required to meet the task standard.</b></li></ul>
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**Start Time:** \_\_\_\_\_

Step		Expected Operator Actions
		<b><u>Note:</u> Provide exam copy of AP-5 with attachment 4.4 completed.</b>
1.	Obtain correct procedure	1.1 Referenced OP AP-5 "Malfunction of Eagle 21 Protection or Control Channel."
		<b><u>Note:</u> Examinee may reference AP-5 att. 4.1 for Protection Set 2 Rack 8.</b>
		<b><u>Note:</u> Per initial conditions, PC-506A is in the required status for STP I-4-P506.</b>
	Operator identified AP-5, Attachment 4.4 errors.	1.2 Verified LC-519A "P-14" required status is Tripped.
		1.3 Verified LC-519B S/G Lo Lvl Trip/AFW pump start required status is Tripped.
		1.4** Determined LC-549A "P-14" required status is Tripped and should be included on attachment 4.4.
		1.5 Verified LC-549B "S/G Lo Lvl Trip/AFW pump start" required status is Tripped.
		1.6 Determined TC-433A "LTOP" should not be included on attachment 4.4.
		1.7** Determined PC-936B "Hi-Hi Contmt Press Phase B Isolation and Contmt Spray" required status is Bypass.
		1.8** Determined PC-936A "Contmt Hi Press S.I." required status is Tripped.
		1.9 Notified Shift Manager of errors.
		<b><u>Note:</u> Student should add missing data, line out and correct mistakes on AP-5 attachment 4.4.</b>

Step was: Sat: \_\_\_\_\_ Unsat: \_\_\_\_\_

\*\* Denotes Critical Step and Sub Steps.



**Comments:**

**Stop Time:** \_\_\_\_\_

**Total Time:** \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub Steps.

**Follow-up Question Documentation:**

**Question:** \_\_\_\_\_

\_\_\_\_\_

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**Response:** \_\_\_\_\_

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**EXAMINEE RESPONSE**

- Determined LC-549A “P-14” shall be included on attachment 4.4 with the required Bistable status as TRIPPED.
- Determined TC-433A should be omitted from the bistable trip authorization form.
- Determined PC-936B “Hi-Hi Contmt Press Phase B Isolation and Contmt Spray / Hi-Hi Contmt Press Steam Line Isolation” required status is BYPASS.
- Determined PC-936A “Contmt Hi Press S.I.” required status is Tripped.
- No other bistables are incorrectly identified for inclusion.
- **Note: Examinee may include that TC-433A should be omitted from the bistable trip authorization form. This is not required to meet the task standard.**

Print OP AP-5, “Malfunction of Eagle 21 Protection or Control Channel,” Attachment 4.4. Enter the following data into the indicated locations on the Attachment.<sup>1</sup>

Failed Instrument Channel(s) LCP Halt Date/Time: (today) / (now)  
Protection Set 2 Rack 8

Bistable or Device to be Defeated or Tripped	Location	Required Status
LC 519A P-14	SET 2 RACK 8	Tripped
LC 519B S/G Lo Lvl Trip/AFW Pump Start	SET 2 RACK 8	Tripped
LC 549B S/G Lo Lvl Trip/AFW Pump Start	SET 2 RACK 8	Tripped
TC-433A LTOP	SET 2 RACK 8	Tripped Error #1(Not a Critical Step)
PC 936B Hi-Hi Contmt Press Phase B Isolation and Contmt Spray/Hi-Hi Contmt Press Steam Line Isolation	SET 2 RACK 8	Tripped Bypass Error #2
PC 936A Contmt Hi Press S.I.	SET 2 RACK 8	Bypass Tripped Error #3
LC-549A P-14	SET 2 RACK 8	Tripped Error #4

<sup>1</sup> NOTE: The following *intentional errors* have been made: a) LC-549A is missing, TRIPPED b) PC-936B required status is BYPASS c) PC-936A required status is TRIPPED d) TC-433A should be omitted from the bistable trip form (Not a critical step).

**Initial Conditions:**

**GIVEN:**

- Unit 1 is at 100% power.
- STP I-4-P506, "Main Turbine First Stage Pressure Channel PT-506 Calibration" is in progress. PC-506A is in the required status for the duration of the surveillance test.
- The control room received multiple alarms including PK 06-01 "PPS Channel Set Failure" and PK 06-04 "PPS Trouble". OP AP-5, Malfunction of Eagle 21 Protection or Control Channel is in progress due to a LCP halt on Protection Set 2 Rack 8.
- All Primary and Secondary control systems are within their normal operating limits and controlling properly. All operator actions have been completed. The WCSFM has completed AP-5, attachment 4.4, "Bistable Trip Authorization," for the LCP Halt.

**Initiating Cue:**

- The Shift Manager has directed you to perform a review of AP-5 attachment 4.4 "Bistable Trip Authorization" form in accordance with step 8 of the procedure.
- Document all your findings before reporting out. This should include any necessary corrections, comments, and notifications.

**EXAMINEE RESPONSE**

<b>Number:</b>	NRCL162-A6		
<b>Title:</b>	Review Rod Position Alignment and Rod Insertion Limits		
<b>Examinee:</b>	_____		
<b>Evaluator:</b>	_____	_____	_____
	Print	Signature	Date
<b>Testing Method:</b>	Perform <u>  X  </u>	Simulate <u>          </u>	
<b>Results:</b>	Sat <u>      </u>	Unsat <u>      </u>	Total Time: <u>          </u> minutes
<b>Comments:</b>	Designed for SRO candidates in a classroom setting.		
<b>References:</b>	<ul style="list-style-type: none"> <li>• STP I-1A Routine Shift Checks Required by Licenses, Rev. 137</li> <li>• COLR 1, U1, COLR for Diablo Canyon Unit 1, Rev. 11</li> <li>• COLR 2, U2, COLR for Diablo Canyon Unit 2, Rev. 10</li> <li>• PPC Data printout</li> </ul>		
<b>Alternate Path:</b>	Yes <u>      </u>	No <u>  X  </u>	
<b>Time Critical:</b>	Yes <u>      </u>	No <u>  X  </u>	
<b>Time Allotment:</b>	15 minutes		
<b>Critical Steps:</b>	3.3, 3.4, 3.6		
<b>Job Designation:</b>	SRO		
<b>Rev Comments</b>	New		
<b>Gen KA #</b>	G2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation.		4.4

OPERATIONS  
REPRESENTATIVE: CHRISTOPHER MEHIGAN DATE: 10/31/17

EVALUATOR WORKSHEET

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**Directions:**

**No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. Since this is an administrative JPM, and the simulator is not used, the examinee may be given a copy of the required materials below. The examinee should be given the initial cue sheet along with the handout and procedure.

**Required Materials:**

- STP I-1A Routine Shift Checks Required by Licenses, Rev. 137
- COLR, U1, COLR for Diablo Canyon Unit 1, Rev. 11
- COLR, U2, COLR for Diablo Canyon Unit 2, Rev. 10
- PPC Data (Handout)

**Initial Conditions:**

GIVEN:

- Unit 1 has been at reduced power for the past 12 hours due to the Heater 2 Drain Pump being out of service for maintenance.
- All Unit 1 individual rod position PPC addresses have a quality code of good (green) on PPC GRPDIS-DRPI.

**Initiating Cue:**

- Unit 1 BOPCO has just completed STP I-1A, "Routine Shift Checks Required by Licenses," section 12.10 through 12.12.
- As the Shift Foreman, review the completed section of STP I-1A for accuracy. Document all your findings before reporting out to the Shift Manager. This should include any necessary corrections, comments, notifications, and the identification of applicable TS/ECG and associated actions if appropriate.

**Task Standard:****DO NOT READ TASK STANDARD TO EXAMINEE**

- Step 12.10, Determined each rod position on DRPI was within 12 steps of its group step counter.
- Step 12.11, Checked all shutdown bank step counters were above 225 steps.
- **Note: Step 12.12.5 is not required to meet the task standard. Determined step 12.12.5 was applicable and needed to be performed.**
- Step 12.12.6, Determined COLR insertion limits were NOT met, perform step 12.13 within 1 hour.
- Determined Tech Spec 3.1.6 is applicable due to control bank insertion limits not met, per SR 3.1.6.2.

Start Time: \_\_\_\_\_

Step		Expected Operator Actions
1.	Review step 12.10 Rod Position Alignment	<b><i>Note: Observed Note prior to step. Examinee referenced handouts for information.</i></b>
	1.1	Reviewed each rod position on DRPI indications and group step counters. Determined to be within 12 steps of each other. Ensured step 12.10.1 was initialed.
	1.2	Ensured step 12.10.1.a was marked N/A.
	1.3	Ensured step 12.10.1.b was marked N/A.
	1.4	Ensured step 12.10.2 was initialed. Information given in initial conditions.
		Step was: Sat: _____ Unsat _____

Comments:

\*\* Denotes Critical Step and Sub Steps.

Step		Expected Operator Actions
2.	Review step 12.11 Shutdown Bank COLR Insertion Limits	<b><u>Note:</u> Examinee referenced handouts for information.</b>
		2.1 Determined all shutdown bank step counters were above 225 steps. Ensured step 12.11.1 was initialed.
		2.2 Ensured step 12.11.2 was marked N/A.
		2.3 Ensured step 12.11.3 was marked N/A.
		Step was: Sat: _____ Unsat _____

Comments:

\*\* Denotes Critical Step and Sub Steps.



Step	Expected Operator Actions
3.** Review step 12.12 Control Bank COLR Insertion Limits	<p><b><u>Note:</u> Examinee referenced handouts for information.</b></p>
3.1	<p>Ensured thermal power level to be <b>65.4%</b>. (Used PPC point U4300A15). Ensured step 12.12.1 was initialed.</p>
	<p><b><u>Note:</u> Examinee referenced Unit1 COLR</b></p>
3.2	<p>Checked Unit 1 Insertion limit: Control Bank D at <b>90 steps</b>. Determined that CBD at 90 steps is correct. (Acceptable range is Bank D 89 – 91 steps). Ensured step 12.12.2 was initialed.</p>
3.3**	<p>Reviewed demand bank position: Bank D at 96 steps. Determined step 12.12.3 demand bank position CBD at 96 steps is incorrect (DRPI indication was used). Verified <b>demand bank position should be CBD at 87 steps.</b></p>
3.4**	<p>Determined each control bank is NOT at or above the insertion limit. Determined step 12.12.4 should NOT be initialed. (Examinee may include/recommend a NOTE on step).</p>
3.5	<p>Determined step 12.12.5 IS applicable and step 12.12.5 should be performed. All control banks are NOT fully withdrawn due to being at reduced (65.4%) power.</p>
3.6**	<p>Determined step 12.12.6 is applicable. Determined Step 12.13 shall be performed within 1 hour. Examinee determined Tech Spec 3.1.6 is applicable due to control bank COLR insertion limits NOT met, per SR 3.1.6.2.</p> <p><b>Step was: Sat: _____ Unsat _____</b></p>

\*\* Denotes Critical Step and Sub Steps.

**Comments:**

**Stop Time:** \_\_\_\_\_

**Total Time:** \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub Steps.

**Follow-up Question Documentation:**

**Question:** \_\_\_\_\_

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**Response:** \_\_\_\_\_

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EXAMINEE RESPONSE
<ul style="list-style-type: none"><li>• Step 12.10, Determined each rod position on DRPI was within 12 steps of its group step counter.</li><li>• Step 12.11, Checked all shutdown bank step counters were above 225 steps.</li><li>• <b>Note: Step 12.12.5 is not required to meet the task standard. Determined step 12.12.5 was applicable and needed to be performed.</b></li><li>• Step 12.12.6, Determined COLR insertion limits were NOT met, perform step 12.13 within 1 hour.</li><li>• Determined Tech Spec 3.1.6 is applicable due to control bank insertion limits not met, per SR 3.1.6.2.</li></ul>

Routine Shift Checks Required by Licenses

STP I-1A R137  
Page 18 of 116

**U1** Section 12: Page 9 of 28

12.10 Rod Position Alignment

Applicability	Requirement	Parameter
MODE 1	SR 3.1.4.1 T36105	Rod Position Alignment

NOTE: If one of the position indicators becomes inoperable, then conditions of this LCO remain met by compliance with LCO 3.1.7.

12.10.1 Check each rod position on DRPI is within 12 steps of its respective group step counter.

DB

a. IF one rod is NOT within alignment limit  
AND will NOT be restored to within that limit within one hour,  
THEN perform step 12.13 prior to the end of that hour.

[✓]N/A \_\_\_\_\_

b. IF more than one rod is NOT within alignment limit,  
THEN perform step 12.13 within one hour.

[✓]N/A \_\_\_\_\_

12.10.2 Check all individual rod position PPC addresses have a quality code of good (green) on PPC GRPDIS-DRPI.

DB

12.11 Shutdown Bank COLR Insertion Limits

Applicability	Requirement	Parameter
MODE 1	SR 3.1.5.1	Shutdown Bank COLR Insertion Limits

12.11.1 Check all shutdown bank step counters are at or above 225 steps.

DB

12.11.2 IF a step counter is NOT operable,  
THEN check DRPI positions of all rods associated with the affected  
step counter were at or above their DRPI positions when the step counter  
was last known to be operable (Ref. PPC window "GRPDIS-DRPI").

[✓]N/A \_\_\_\_\_

12.11.3 IF the shutdown bank insertion limit is NOT met,  
THEN perform step 12.13 within 1 hour.

[✓]N/A \_\_\_\_\_

Routine Shift Checks Required by Licenses

STP I-1A R137  
Page 19 of 116

**U1** Section 12: Page 10 of 28

12.12 Control Bank COLR Insertion Limits

Applicability	Requirement	Parameter
MODE 1	SR 3.1.6.2 SR 3.1.6.3	Control Bank COLR Insertion Limits

12.12.1 Record thermal power level: 65.4 % DB

12.12.2 Record the following from current COLR for present thermal power level: DB  
Insertion limit: Bank: D at 90 steps 87

12.12.3 Record demand bank position: Bank D at 96 steps DB

12.12.4 Check each control bank is at or above the insertion limits specified in step 12.12.2. DB ①

12.12.5 IF all control banks are NOT fully withdrawn,  
THEN check sequence and overlap limits specified in the COLR are met  
for control banks NOT fully withdrawn from the core. [ ]N/A DB

12.12.6 IF COLR insertion limits are NOT met,  
THEN perform step 12.13 within 1 hour. [X]N/A ①

2.13 SHUTDOWN MARGIN

Applicability	Requirement	Parameter
MODE 1	SR 3.1.4 SR 3.1.5 SR 3.1.6	SHUTDOWN MARGIN

12.13.1 IF one or more control rods are NOT within position limits of steps 12.10, 12.11, or 12.12,  
THEN perform the following: [ ]N/A

- Perform STP R-19, "SHUTDOWN MARGIN Determination" within 1 hour. \_\_\_\_\_
- Document rod(s) outside position limits: \_\_\_\_\_
- Record SHUTDOWN MARGIN: \_\_\_\_\_ %  $\Delta k/k$ . \_\_\_\_\_
- Check SHUTDOWN MARGIN  $\geq 1.6\% \Delta k/k$ . \_\_\_\_\_
- Ensure STP R-19 will continue to be performed every 12 hours. \_\_\_\_\_

I-1Au1r37.DOC 0815.1503

① Control Bank D is below COLR insertion limits. DB Step 12.12.6 is applicable.

**Initial Conditions:**

**GIVEN:**

- Unit 1 has been at reduced power for the past 12 hours due to the Heater 2 Drain Pump being out of service for maintenance.
- All Unit 1 individual rod position PPC addresses have a quality code of good (green) on PPC GRPDIS-DRPI.

**Initiating Cue:**

- Unit 1 BOPCO has just completed STP I-1A, "Routine Shift Checks Required by Licenses," section 12.10 through 12.12.
- As the Shift Foreman, review the completed section of STP I-1A for accuracy. Document all your findings before reporting out to the Shift Manager. This should include any necessary corrections, comments, notifications, and the identification of applicable TS/ECG and associated actions if appropriate.

**EXAMINEE RESPONSE**

Step 12.10 Result:

Step 12.11 Result:

Step 12.12 Result:

## JOB PERFORMANCE MEASURE

**Number:** NRCL162-A7

**Title:** VERIFY AFD IS WITHIN TECH SPEC LIMITS

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print	Signature	Date
-------	-----------	------

Testing Method	Perform	X	Simulate
1. <b>Visual Inspection</b>	✓	✓	✓
2. <b>Dimensional Measurement</b>	✓	✓	✓
3. <b>Material Analysis</b>	✓	✓	✓
4. <b>Functional Testing</b>	✓	✓	✓
5. <b>Environmental Testing</b>	✓	✓	✓
6. <b>Thermal Cycling</b>	✓	✓	✓
7. <b>Vibration Testing</b>	✓	✓	✓
8. <b>Humidity Testing</b>	✓	✓	✓
9. <b>Salt Crystallization</b>	✓	✓	✓
10. <b>UV Radiation</b>	✓	✓	✓
11. <b>Corrosion Testing</b>	✓	✓	✓
12. <b>Impact Testing</b>	✓	✓	✓
13. <b>Compression Testing</b>	✓	✓	✓
14. <b>Tension Testing</b>	✓	✓	✓
15. <b>Bending Testing</b>	✓	✓	✓
16. <b>Twisting Testing</b>	✓	✓	✓
17. <b>Shear Testing</b>	✓	✓	✓
18. <b>Fatigue Testing</b>	✓	✓	✓
19. <b>Creep Testing</b>	✓	✓	✓
20. <b>Stress Relaxation</b>	✓	✓	✓
21. <b>Dynamic Mechanical Analysis</b>	✓	✓	✓
22. <b>Thermal Gravimetric Analysis</b>	✓	✓	✓
23. <b>Differential Scanning Calorimetry</b>	✓	✓	✓
24. <b>Scanning Electron Microscopy</b>	✓	✓	✓
25. <b>Atomic Force Microscopy</b>	✓	✓	✓
26. <b>X-ray Diffraction</b>	✓	✓	✓
27. <b>Optical Microscopy</b>	✓	✓	✓
28. <b>Scanning Tunneling Microscopy</b>	✓	✓	✓
29. <b>Transmission Electron Microscopy</b>	✓	✓	✓
30. <b>Electron Spectroscopy</b>	✓	✓	✓
31. <b>Photoluminescence Spectroscopy</b>	✓	✓	✓
32. <b>Raman Spectroscopy</b>	✓	✓	✓
33. <b>Infrared Spectroscopy</b>	✓	✓	✓
34. <b>Ultraviolet Spectroscopy</b>	✓	✓	✓
35. <b>Nuclear Magnetic Resonance</b>	✓	✓	✓
36. <b>Mass Spectrometry</b>	✓	✓	✓
37. <b>Gas Chromatography</b>	✓	✓	✓
38. <b>High-Performance Liquid Chromatography</b>	✓	✓	✓
39. <b>Size Exclusion Chromatography</b>	✓	✓	✓
40. <b>Ion Chromatography</b>	✓	✓	✓
41. <b>Thin Layer Chromatography</b>	✓	✓	✓
42. <b>Paper Chromatography</b>	✓	✓	✓
43. <b>Column Chromatography</b>	✓	✓	✓
44. <b>Reverse Phase Chromatography</b>	✓	✓	✓
45. <b>Normal Phase Chromatography</b>	✓	✓	✓
46. <b>Ion Exchange Chromatography</b>	✓	✓	✓
47. <b>Size Exclusion Chromatography</b>	✓	✓	✓
48. <b>Affinity Chromatography</b>	✓	✓	✓
49. <b>Immunoaffinity Chromatography</b>	✓	✓	✓
50. <b>Hydrophobic Interaction Chromatography</b>	✓	✓	✓
51. <b>Ion Exchange Chromatography</b>	✓	✓	✓
52. <b>Reverse Phase Chromatography</b>	✓	✓	✓
53. <b>Normal Phase Chromatography</b>	✓	✓	✓
54. <b>Ion Exchange Chromatography</b>	✓	✓	✓
55. <b>Affinity Chromatography</b>	✓	✓	✓
56. <b>Immunoaffinity Chromatography</b>	✓	✓	✓
57. <b>Hydrophobic Interaction Chromatography</b>	✓	✓	✓
58. <b>Size Exclusion Chromatography</b>	✓	✓	✓
59. <b>Ion Exchange Chromatography</b>	✓	✓	✓
60. <b>Reverse Phase Chromatography</b>	✓	✓	✓
61. <b>Normal Phase Chromatography</b>	✓	✓	✓
62. <b>Ion Exchange Chromatography</b>	✓	✓	✓
63. <b>Affinity Chromatography</b>	✓	✓	✓
64. <b>Immunoaffinity Chromatography</b>	✓	✓	✓
65. <b>Hydrophobic Interaction Chromatography</b>	✓	✓	✓
66. <b>Size Exclusion Chromatography</b>	✓	✓	✓
67. <b>Ion Exchange Chromatography</b>	✓	✓	✓
68. <b>Reverse Phase Chromatography</b>	✓	✓	✓
69. <b>Normal Phase Chromatography</b>	✓	✓	✓
70. <b>Ion Exchange Chromatography</b>	✓	✓	✓
71. <b>Affinity Chromatography</b>	✓	✓	✓
72. <b>Immunoaffinity Chromatography</b>	✓	✓	✓
73. <b>Hydrophobic Interaction Chromatography</b>	✓	✓	✓
74. <b>Size Exclusion Chromatography</b>	✓	✓	✓
75. <b>Ion Exchange Chromatography</b>	✓	✓	✓
76. <b>Reverse Phase Chromatography</b>	✓	✓	✓
77. <b>Normal Phase Chromatography</b>	✓	✓	✓
78. <b>Ion Exchange Chromatography</b>	✓	✓	✓
79. <b>Affinity Chromatography</b>	✓	✓	✓
80. <b>Immunoaffinity Chromatography</b>	✓	✓	✓
81. <b>Hydrophobic Interaction Chromatography</b>	✓	✓	✓
82. <b>Size Exclusion Chromatography</b>	✓	✓	✓
83. <b>Ion Exchange Chromatography</b>	✓	✓	✓
84. <b>Reverse Phase Chromatography</b>	✓	✓	✓
85. <b>Normal Phase Chromatography</b>	✓	✓	✓
86. <b>Ion Exchange Chromatography</b>	✓	✓	✓
87. <b>Affinity Chromatography</b>	✓		

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:** This JPM requires that STP I-1C, Section 12.2 be filled out ahead of time. The required data is included in an attachment to this JPM.

**References:** STP I-1C, Routine Weekly Checks Required By Licenses, Section 12.2,  
Rev. 116C

Volume 9B, Curves and Miscellaneous Data, Figure R23-1F-1, Unit 1  
Cycle 21 RAOC Limits, Rev. 331

**Alternate Path:** Yes \_\_\_\_\_ No   X  

**Time Critical:** Yes \_\_\_\_\_ No X

**Time Allotment:** 10 Minutes

**Critical Steps:** 5.3, 7.2, 8.1, 9.3, 9.4

**Job Designation:** SRO

**Task Number:** G2.2.42 Ability to recognize system parameters that are entry-level conditions for Technical Specifications.

**Rating:** /4.6

AUTHOR: JARED SMITH DATE: 10/31/17

OPERATIONS  
REPRESENTATIVE: CHRISTOPHER MEHIGAN DATE: 10/31/17

REV.0



**Directions:**

The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. Since this is an administrative JPM, and the simulator is not used, the examinee may be given a copy of the required materials below.

**Required Materials:**

- Completed Copy of STP I-1C, "Routine Weekly Checks Required By Licenses," Section 12.2 Axial Flux Difference (AFD), Rev. 116C
- Volume 9B, Curves and Miscellaneous Data, Figure R23-1F-1, Unit 1 Cycle 15 RAOC Limits, Rev. 331
- Axial Flux Difference data (Handout)

**Initial Conditions:**

Given:

- Unit 1 rapidly ramped down power due to tube failures on the No. 3 and No. 4 Feedwater Heaters. Reactor power is currently stable at approximately 87%.
- PK03-25, PPC RX ALARM AXIAL FLUX/ROD POSITION input 1251 is illuminated.
- Indicated Reactor Power based on U1169A05 is 86.8%.
- U4300A15 is not available.
- PPC MAX NI power is 100.3% per latest STP R-2B1.

**Initiating Cue:**

- Unit 1 BOPCO has just completed STP I-1C, "Routine Weekly Checks Required By Licenses," Section 12.2.
- As the Shift Foreman, review the completed STP I-1C data sheet for accuracy and completeness. Document all your findings before reporting out to the Shift Manager. This should include any necessary corrections, comments, notifications, and the identification of applicable TS/ECG and associated actions, if appropriate.

**Task Standard:**

**DO NOT READ TASK STANDARD TO EXAMINEE**

- Step 12.2.3, Determined that -15.0% recorded for Lower AFD Limit is incorrect. The correct Lower AFD Limit is -14.5% (Acceptable range -14.0% - -14.5%).
- Step 12.2.4, Determined that AFD is outside the limits for NIs 42C and 43C and "Yes" boxes are incorrectly marked. The "No" boxes should be marked.
- Step 12.2.5, Determined that at least 3 excore channels are NOT within AFD limits and the step is incorrectly initialed. Tech Spec 3.2.3. Condition A is applicable. Reduce thermal power to less than 50% RTP within 30 minutes.

Start Time: \_\_\_\_\_

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 Obtained STP I-1C, Section 12.2.  <b>Note: Provide completed exam copy of STP-I-1C, Section 12.2.</b>  Step was: Sat: _____ Unsat _____*
2. Verify current RTP %.	2.1 Ensured step 12.2.1 is marked N/A. (U4300A15 is not available, per initial conditions) 2.2 Ensured step 12.2.2.a MAX NI Power is 100.3% and step initialed. 2.3 Calculated U1169A05 value (86.8) / PPC Max (100.3) x 100. Approximately 86.5% RTP (86.4% - 86.6% RTP is acceptable).  <b>Note: Provide calculator (if necessary).</b> 2.4 Verified RTP % to be 86.5%.  Step was: Sat: _____ Unsat _____*
3. Obtain the correct Figure.	3.1 Obtained Figure R23-1F-1 for Unit 1 from Volume 9.  <b>Note: Provide exam copy of Figure R23-1F-1.</b>  Step was: Sat: _____ Unsat _____*
4. Verify Upper AFD Limit.	4.1 Referenced R23-1F-1. 4.2 Step 12.2.3, Determined Upper AFD Limit to be +14.0%. 4.3 Verified +14.0% recorded for Upper AFD Limit.  Step was: Sat: _____ Unsat _____*

\*Denotes an entry required on the JPM cover sheet.

\*\*Denotes a Critical Step.

Step	Expected Operator Actions
5. **Verify Lower AFD Limit.	<p>5.1 Referenced R23-1F-1.</p> <p>5.2 Step 12.2.3, Determined Lower AFD Limit to be approximately -14.5%. (14.0% -14.5% is acceptable)</p> <p>5.3 Determined that -15.0% recorded for Lower AFD Limit is incorrect. **</p> <p><b>Step was: Sat: _____ Unsat _____*</b></p>
6. Verify indicated AFD values	<p>6.1 Step 12.2.4, Verified indicated AFD values recorded for each NI.</p> <p><b>Step was: Sat: _____ Unsat _____*</b></p>
7. **Verify AFD is within limits.	<p>7.1 Step 12.2.4 Verified that AFD is within limits for NIs 41C and 44C and "Yes" boxes marked.</p> <p>7.2 Determined that AFD is outside the limits for NIs 42C and 43C and "Yes" boxes are incorrectly marked.**</p> <p><b>Step was: Sat: _____ Unsat _____*</b></p>
8. **Verify that 2 excore channels exceed AFD Limit.	<p>8.1 Step 12.2.5, Determined that BOPCO has incorrectly initialed that no more than one channel is exceeding the AFD limit. **</p> <p><b>Step was: Sat: _____ Unsat _____*</b></p>

\*Denotes an entry required on the JPM cover sheet.

\*\*Denotes a Critical Step.

Step	Expected Operator Actions
9. **Determine AFD exceeds Tech Spec Limits.	<p>9.1 Referred to Tech Spec 3.2.3.</p> <p>9.2 Referred to Unit 1 COLR Figure 2.</p> <hr/> <p><b>Note:</b> Provide exam copy of Unit 1 COLR Figure 2 (if necessary). (Operator may use Figure R23-1F-1 instead of Unit 1 COLR Figure 2 because these figures provide the same information).</p> <hr/> <p>9.3 Determined AFD is not within limits.**</p> <p>9.4 Determined TS 3.2.3 condition A is applicable, reduce thermal power to less than 50% within 30 minutes.**</p> <p>Step was: Sat: _____ Unsat: _____ *</p>

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

\*Denotes an entry required on the JPM cover sheet.  
\*\*Denotes a Critical Step.

**EXAMINEE RESPONSE**

- Step 12.2.3, Determined that -15.0% recorded for Lower AFD Limit is incorrect. The correct Lower AFD Limit is -14.5%(Acceptable range -14.0% - -14.5%).
- Step 12.2.4, Determined that AFD is outside the limits for NIs 42C and 43C and “Yes” boxes are incorrectly marked. The “No” boxes should be marked.
- Step 12.2.5, Determined that at least 3 excore channels are NOT within AFD limits and the step is incorrectly initialed. Tech Spec 3.2.3. Condition A is applicable. Reduce thermal power to less than 50% RTP within 30 minutes.

**U1** Section 12: Page 2 of 2012.2 Axial Flux Difference (AFD)

[ ] N/A

Applicability	Requirement	Parameter
MODE 1 > 50% RTP	SR 3.2.3.1	Axial Flux Difference

12.2.1 IF using U4300A15, Reactor Calorimetric Power, for power level, THEN record value:

[ ☒ ] N/A

Reactor Calorimetric Power: \_\_\_\_\_ % RTP

12.2.2 IF using U1169A05, Average of Power Range Channels, for power level, THEN perform the following:

[ ] N/A

a. Record MAX NI POWER from ONE of the following:

AB

☒ STP R-2B1, "PPC Operator Heat Balance"

[ ] N/A

☒ STP R-2B2, "Manual Operator Heat Balance"

[ ☒ ] N/A

☒ STP R-2B3, "DFWCS Operator Heat Balance"

[ ☒ ] N/AMAX NI POWER: 100.3%

b. Calculate % RTP, as follows:

AB

$$\left[ \frac{(\text{U1169A05 :}) \quad 86.8}{(\text{MAX NI POWER :}) \quad 100.3} \right] \times 100 = 86.5 \% \text{ RTP}$$

12.2.3 Obtain upper and lower limits based on current power level from R23-1F-1, "Unit 1 Cycle (current cycle) RAOC Limits:"

ABUpper AFD Limit: +14.0%Lower AFD Limit: ~~-15.0%~~ -14.5%

12.2.4 Record the following AFD readings and satisfaction criteria on the following instruments:

AB

☒ NI-41C: \_\_\_\_\_ within limits

[ ☒ ] Yes [ ] No

☒ NI-42C: \_\_\_\_\_ within limits

[ ☒ ] Yes [ ☒ ] No

☒ NI-43C: \_\_\_\_\_ within limits

[ ☒ ] Yes [ ☒ ] No

☒ NI-44C: \_\_\_\_\_ within limits

[ ☒ ] Yes [ ] No

12.2.5 Check AT LEAST three excore channels are within AFD limits.

AB

Tech Spec 3.2.3.A is applicable.

Step 12.2.5 - Examinee may add note to step.

Initial Conditions:

Given:

- Unit 1 rapidly ramped down power due to tube failures on the No. 3 and No. 4 Feedwater Heaters. Reactor power is currently stable at approximately 87%.
- PK03-25, PPC RX ALARM AXIAL FLUX/ROD POSITION input 1251 is illuminated.
- Indicated Reactor Power based on U1169A05 is 86.8%.
- U4300A15 is not available.

PPC MAX NI power is 100.3% per latest STP R-2B1.

Initiating Cue:

- Unit 1 BOPCO has just completed STP I-1C, “Routine Weekly Checks Required By Licenses,” Section 12.2.
- As the Shift Foreman, review the completed STP I-1C data sheet for accuracy and completeness. Document all your findings before reporting out to the Shift Manager. This should include any necessary corrections, comments, notifications, and the identification of applicable TS/ECG and associated actions, if appropriate.

EXAMINEE RESPONSE

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

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**Number:** NRCL162-A8

**Title:** Approve Liquid Radwaste Release Permit.

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

	Print	Signature	Date
<b>Testing Method</b>	Perform <u>  X  </u>	Simulate <u>          </u>	
<b>Results:</b>	Sat <u>          </u>	Unsat <u>          </u>	Total Time: <u>          </u> minutes
<b>Comments:</b>	Designed for SRO Candidates in a classroom setting.		
<b>References:</b>	OP G-1:II, Liquid Radwaste System - Discharge of Liquid Radwaste, Rev. 38 CAP A-5, Liquid Radwaste Discharge Management, Rev. 49		
<b>Alternate Path:</b>	Yes <u>          </u>	No <u>      X      </u>	
<b>Time Critical:</b>	Yes <u>          </u>	No <u>      X      </u>	
<b>Time Allotment:</b>	20 minutes		
<b>Critical Steps:</b>	1.8, 2.1, 3.3, 4.1		
<b>Job Designation:</b>	SRO		
<b>K/A:</b>	G 2.3.6; Ability to approve release permits.		
<b>Rating:</b>	3.8		

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AUTHOR:                                 JARED SMITH                                 DATE:           10/31/17          

OPERATIONS  
REPRESENTATIVE:                                 CHRISTOPHER MEHIGAN                                 DATE:           10/31/17          

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**Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. Since this is an administrative JPM, and the simulator is not used, the examinee may be given a copy of the required materials below.

**Required Materials:**

- OP G-1:II, Liquid Radwaste System - Discharge of Liquid Radwaste, Rev. 38 Completed section 12
- CAP A-5, Rev. 49 Completed Attachment 11 Parts 1 & 2.

**Initial Conditions:**

- Chemistry has issued a discharge permit for PWR 0-2 using CAP A-5 Att. 11 parts 1 & 2. OP G-1:II section 12 has been completed up to step 12.19
- Both Units are operating a full power. CCW heat exchangers 1-1 and 2-1 are currently in service.

**Initiating Cue:**

- As the Unit 1 Shift Foreman, review OP G-1:II section 12, Discharging Process Waste Receiver 0-1 (0-2), and CAP A-5 attachment 11 for accuracy and completeness.
- Document any discrepancies noted and determine if the discharge checklist should be approved or not approved. This should include any necessary corrections, comments, notifications, and the identification of applicable TS/ECG and associated actions if appropriate.

**Task Standard:**

**DO NOT READ TASK STANDARD TO EXAMINEE**

- Step 12.9, Determined PWR 0-1 has been aligned for discharge instead of PWR 0-2
- Step 12.10, Determined the incorrect CCW HX 1-2 was circled to be used for the release.
- Determined RE-18 Calibration expiration date is overdue, making RM-18 INOPERABLE. SFM Reviewed applicable portions of ECG 39.3.
- Discharge authorization was not approved.

Start Time: \_\_\_\_\_

Step	Expected Operator Actions
** 1. Review OP G-1:II section 12 page 1.	<p>1.1 Checked Step 12.1 is initialed.            Reviewed parts 1 and 2 of the discharge permit are complete and signed (CAP A-5 Attachment 11).</p> <p>1.2 Reviewed CAP A-5 Att. 11 parts 1a through 1k are complete and filled out correctly. Checked steps with initials needed are filled out with valid date/time.</p> <p>1.3 Reviewed part 2 of the discharge permit complete. No errors identified.</p> <p>1.4 Checked Step 12.2 is initialed with PWR 0-2 circled.</p> <p>1.5 Checked steps 12.3 and 12.4 are marked N/A. Identified that RE-18 setpoint does not require adjustment. FIT-243 is OPERABLE.</p> <p>1.6 Reviewed step 12.5 performed and independently verified with discharge flowpath aligned to Unit 1.</p> <p>1.7 Checked steps 12.6 through 12.8 were performed and initialed.</p> <p>1.8 Checked step 12.9 is initialed.            Identified error with PWR 0-1 being lined up for discharge instead of PWR 0-2.**</p>

Step was: Sat: \_\_\_\_\_ Unsat \_\_\_\_\_\*

\* Denotes an entry required on the JPM cover sheet.

\*\* Denotes a Critical Step.

Step	Expected Operator Actions
** 2. Review Auxiliary Saltwater checklist (Manual Valve Lineup) verification. OP G-1:II, page 2 of Section 12.	2.1 Checked step 12.10 performed and independently verified with initials. Determined that CCW HX 1-1 is to be circled and to be used, but identified that valve alignment is for CCW HX 1-2.**
	Step was: Sat: _____ Unsat _____*
** 3. Review OP G-1:II section 12 pages 2 -3.	3.1 Checked step 12.11 is initialed. 3.2 Checked step 12.12 is initialed. 3.3 Checked step 12.13.1 is initialed. Identified RE-18 Calibration date has expired.** RE-18 is now INOPERABLE 3.4 Checked step 12.13.2 is initialed and channel checked. 3.5 Checked step 12.13.3 is marked N/A. RR-102 is OPERABLE. 3.6 Checked step 12.13.4 is initialed, source check performed on RE-18 with count rate transcribed on Part 3 of the discharge permit. 3.7 Identified step 12.14 is marked N/A. 3.8 Using step 12.15 table, compared specified "Minimum dilution water flowrate" with the current dilution flow. Determined there is adequate dilution flow. 3.9 Checked step 12.16 is marked N/A. 3.10 Verified step 12.17 and 12.18 are complete and initialed.
	Step was: Sat: _____ Unsat _____*

\* Denotes an entry required on the JPM cover sheet.

\*\* Denotes a Critical Step.

Step	Expected Operator Actions
** 4. Determine if Authorization of permit should be approved.	4.1 Determined that the Authorization should not be approved, based on multiple conditions not meeting the procedural requirements. In addition, it was discovered that RM-18 was INOPERABLE due to expired calibration date. Referred to ECG 39.3 Condition A.**
	Step was: Sat: _____ Unsat _____*

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

\* Denotes an entry required on the JPM cover sheet.

\*\* Denotes a Critical Step.

EXAMINEE RESPONSE
<ul style="list-style-type: none"><li>• PWR 0-1 has been aligned for discharge instead of PWR 0-2.</li><li>• OP G-1:II Section 12 page 2, CCW HX 1-2 is circled to be used for the release.</li><li>• Determined RE-18 Calibration expiration date is overdue, making RM-18 INOPERABLE. SFM Reviewed applicable portions of ECG 39.3.</li><li>• Discharge authorization was not approved.</li></ul>
<div>[ ] APPROVE Discharge [ X ] DO NOT Approve Discharge</div>



\* Denotes an entry required on the JPM cover sheet.

\*\* Denotes a Critical Step.

- Initial Conditions:**
- Chemistry has issued a discharge permit for PWR 0-2 using CAP A-5 Att. 11 parts 1 & 2. OP G-1:II section 12 has been completed up to step 12.19
  - Both Units are operating a full power. CCW heat exchangers 1-1 and 2-1 are currently in service.
- Initiating Cue:**
- As the Unit 1 Shift Foreman, review OP G-1:II section 12, Discharging Process Waste Receiver 0-1 (0-2), and CAP A-5 attachment 11 for accuracy and completeness.
  - Document any discrepancies noted and determine if the discharge checklist should be approved or not approved. This should include any necessary corrections, comments, notifications, and the identification of applicable TS/ECG and associated actions if appropriate.

<input type="checkbox"/> APPROVE Discharge	<input type="checkbox"/> DO NOT Approve Discharge

\* Denotes an entry required on the JPM cover sheet.

\*\* Denotes a Critical Step.

<b>Number:</b>	NRCL162-A9		
<b>Title:</b>	Perform an Emergency Classification		
<b>Examinee:</b>	_____		
<b>Evaluator:</b>	_____	_____	_____
	Print	Signature	Date
<b>Testing Method:</b>	Perform <u>    X    </u>	Simulate <u>          </u>	
<b>Results:</b>	Sat <u>      </u>	Unsat <u>      </u>	Total Time: <u>          </u> minutes
<b>Comments:</b>	Designed for SRO candidates in a classroom setting. ( <u>Note</u> : Any Unsat step requires a <u>numbered</u> comment; use back as needed.)		
<b>References:</b>	<ul style="list-style-type: none"> <li>• EP G-1, Accident Classification and Emergency Plan Activation, Rev.44 Forms 69-21608, 69-21609, 69-21610 (06/19/12, 7/24/13, 12/5/11)</li> </ul>		
<b>Alternate Path:</b>	Yes <u>      </u>	No <u>    X    </u>	
<b>Time Critical:</b>	Yes <u>    X    </u>	No <u>          </u>	
<b>Time Allotment:</b>	15 minutes		
<b>Critical Steps:</b>	2.1,3.1		
<b>Job Designation:</b>	SRO		
<b>Rev Comments</b>	New		
<b>Gen KA #</b>	GEN.2.4.41 - Knowledge of the emergency action level thresholds and classifications.		4.6

OPERATIONS  
REPRESENTATIVE: CHRISTOPHER MEHIGAN DATE: 10/31/17

EVALUATOR WORKSHEET

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**Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. Since this is an administrative JPM, and the simulator is not used, the examinee may be given a copy of the required materials below.

**Required Materials:**

- EP G-1, and EAL Wall Charts.
- Vol 11, Emergency Plan, App D (classification bases), should be available to the examinee.

**Initial Conditions:** GIVEN:

- Unit 1 is in MODE 6 and core offload is in progress.
- Unit 2 is at 100% power. Diesel Generator 2-2 is out of service for maintenance.
- A seismic event has just been felt by the Control Room operations staff, and PK15-24 Seismic Instr System alarm has just annunciated. The highest Earthquake Force Monitor indicator registered 0.160 g on all axis. Both 230kV and 500kV offsite power sources are affected and are unavailable to DCP. GCC reports that 230kV power is expected to be available within thirty-five minutes. All available diesel generators started as required.
- All Unit 1 RVRLIS indications are indicating erroneous values. Unit 1 control room operators observe NI-31 and NI-32 source range detectors oscillating full scale with abnormal count rate fluctuations. Containment closure is established. Refueling SRO reports reactor cavity level is lowering.

**Initiating Cue:**

- The Shift Manager has directed you to classify the event.

<b>Task Standard:</b>	<p><b>DO NOT READ TASK STANDARD TO EXAMINEE</b></p> <ul style="list-style-type: none"><li>• Reported to the Shift Manager, in less than 15 minutes, that Unit 1 Site Area Emergency, CS2.4, is the appropriate emergency plan classification.</li><li>• <u>Basis:</u> Unit 1, Mode 6, with Containment Closure Established: Reactor Vessel level cannot be monitored with indication of core uncover as evidenced by erratic source range monitor indication.</li></ul>
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EVALUATOR WORKSHEET

**Start Time:** \_\_\_\_\_

<b>Step</b>		<b>Expected Operator Actions</b>
1.	Obtain the correct procedure.	1.1 Referenced EP G-1. <b>Step was: Sat: _____ Unsat _____</b>
2.**	Accurately classify the event.	2.1** Classified the event as Unit 1 Site Area Emergency CS2.4. <b>Classification made: _____</b> <b>Step was: Sat: _____ Unsat _____</b>
3.**	Classify the event in a timely manner.	3.1** <b>Classified the event <math>\leq 15</math> min. of the Event Initiation Time. **</b> <b>Classification Time: _____</b> <b>Event Initiation Time: _____</b> <b>(Event initiation time is JPM Start Time)</b> <b>Difference: _____ min**</b> <b>Step was: Sat: _____ Unsat _____</b>

**Comments:**

**Stop Time:** \_\_\_\_\_

**Total Time:** \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub Steps.



EVALUATOR WORKSHEET

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**Follow-up Question Documentation:**

**Question:** \_\_\_\_\_

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**Response:** \_\_\_\_\_

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JPM TITLE: CLASSIFICATION OF A LOSS OF REACTOR VESSEL  
INVENTORY AFFECTING CORE DECAY HEAT REMOVAL  
CAPABILITY WITH IRRADIATED FUEL IN THE REACTOR  
VESSEL

JPM NUMBER: NRCL162-A9

ANSWER KEY

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EXAMINEE RESPONSE
<p><u>Correct Classification:</u> <b>Unit 1 Site Area Emergency, CS2.4</b></p> <ul style="list-style-type: none"><li>• <u>Basis:</u> Unit 1, Mode 6, with Containment Closure Established: Reactor Vessel level cannot be monitored with indication of core uncover as evidenced by erratic source range monitor indication.</li></ul>
<p><u>Lower Level Classifications:</u></p> <p>UNUSUAL EVENT SU1.1 on Unit 2 for a loss of ALL offsite AC power to Unit 2 Vital 4kV buses F, G, and H for greater than 15 minutes.</p> <p>ALERT HA1.1 for both units due to Operating Basis Earthquake (EFM Alert alarm indicating &gt; 0.133 g on the "Z" axis) exceeded.</p>

**GIVEN:**

- Unit 1 is in MODE 6 and core offload is in progress.
- Unit 2 is at 100% power. Diesel Generator 2-2 is out of service for maintenance.
- A seismic event has just been felt by the Control Room operations staff, and PK15-24 Seismic Instr System alarm has just annunciated. The highest Earthquake Force Monitor indicator registered 0.160 g on all axis. Both 230kV and 500kV offsite power sources are affected and are unavailable to DCPD. GCC reports that 230kV power is expected to be available within thirty-five minutes. All available diesel generators started as required.
- All Unit 1 RVRIS indications are indicating erroneous values. Unit 1 control room operators observe NI-31 and NI-32 source range detectors oscillating full scale with abnormal count rate fluctuations. Containment closure is established. Refueling SRO reports reactor cavity level is lowering.

- The Shift Manager has directed you to classify the event.

## EXAMINEE RESPONSE

Facility: <u>Diablo Canyon</u>	Date of Examination: <u>01/19/2018</u>
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test Number: <u>L162</u>

Control Room Systems: * 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U		
System/JPM Title	Type Code*	Safety Function
a. (S1) (004.A2.14) Establish Emergency Boration (Bank LJC-063)	A,D,S	1
b. (S2) (013.A4.01) Respond to CVI Actuation (Modified from NRCL081LJC-S5)	<b>A,EN,M,S</b>	2
c. (S3) (006.A1.13) Respond to High Accumulator Pressure (Bank LJC-009)	D,S	3 (RO Only)
d. (S4) (E03.EA1.1) Start Reactor Coolant Pumps (Bank LJC-044)	D,E,L,S	4P
e. (S5) (022.A4.01) Respond to CFCU High Vibration	<b>A,N,S</b>	5
f. (S6) (064.A4.01) Transfer Vital 4kV Bus from D/G to Startup (Modified from Bank LJC-087)	E,L,M,S	6
g. (S7) (045.A4.01) Perform Load Trim to Match Tave to Tref	<b>N,S</b>	4S
h. (S8) (060.AA1.02) Respond to Gaseous Rad Release	<b>A,N,S</b>	9

In-Plant Systems: * 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. (P1) (004.A2.06) Isolate Dilution Flow Paths (LJP-062)	D,E,L	1
j. (P2) (064.A3.06) Perform a Local Start of a Diesel Generator (LJP-038)	A,D,E,L	6
k. (P3) (067.AA1.08) Manually Operate the Cardox System (LJP-138A)	A,D	8

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

Facility: <u>Diablo Canyon</u>	Date of Examination: <u>01/19/2018</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test Number: <u>L162</u>

Control Room Systems: * 8 for RO, 7 for SRO-I, and 2 or 3 for SRO-U		
System/JPM Title	Type Code*	Safety Function
a. (S1) (004.A2.14) Establish Emergency Boration (Bank LJC-063)	A,D,S	1
b. (S2) (013.A4.01) Respond to CVI Actuation (Modified from NRCL081LJC-S5)	A,EN,M,S	2
c.		
d. (S4) (E03.EA1.1) Start Reactor Coolant Pumps (Bank LJC-044)	D,E,L,S	4P
e. (S5) (022.A4.01) Respond to CFCU High Vibration	A,N,S	5
f. (S6) (064.A4.01) Transfer Vital 4kV Bus from D/G to Startup (Modified from Bank LJC-087)	E,L,M,S	6
g. (S7) (045.A4.01) Perform Load Trim to Match Tave to Tref	N,S	4S
h. (S8) (060.AA1.02) Respond to Gaseous Rad Release	A,N,S	9

In-Plant Systems: * 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. (P1) (004.A2.06) Isolate Dilution Flow Paths (LJP-062)	D,E,L	1
j. (P2) (064.A3.06) Perform a Local Start of a Diesel Generator (LJP-038)	A,D,E,L	6
k. (P3) (067.AA1.08) Manually Operate the Cardox System (LJP-138A)	A,D	8

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

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

**Number:** NRCL162-LJCS1

**Title:** Establish Emergency Boration

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform     X     Simulate           

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:**

**References:** OP AP-6, Emergency Boration, Rev. 20

**Alternate Path:** Yes X No \_\_\_\_\_

**Time Critical:** Yes \_\_\_\_\_ No  X

**Time Allotment:** 15 minutes

**Critical Steps:** 4.1, 4.2, 4.3

**Job Designation:** RO or SRO

<b>Rev Comments/LRN TIPS:</b>	Bank LJC-063 004.A2.14 - Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Emergency Boration.
<b>Gen KA # / Rating:</b>	

**Gen KA # / Rating:** Boration. 3.8 / 3.9

AUTHOR: **LISA TORIBIO** DATE: **10/24/17**

OPERATIONS  
REPRESENTATIVE: CHRISTOPHER MEHIGAN DATE: 10/24/17  
REV. 0



- Directions:** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the steps with which to begin.
- Required Materials:** Provide a copy of the reference procedure (partial procedure allowed), if the task is being done in the plant or lab.
- Initial Conditions:** Unit 1 is shutdown in Mode 3 when an unexplained positive reactivity addition causes source range counts to rise.
- Initiating Cue:** The Shift Foreman directs you to emergency borate in accordance with OP AP-6, Emergency Boration.

**NOTE: Do NOT provide examinee with Task Standard**

- |                       |  |
|-----------------------|--|
| <b>Task Standard:</b> | Emergency boration has been established from the RWST per OP AP-6 by performing the following: <ul style="list-style-type: none"><li>• Opening 8805A and/or 8805B</li><li>• Closing LCV-112B and/or LCV-112C</li><li>• Adjusting charging flow to &gt;90 gpm</li></ul> |
|-----------------------|--|

**Start  
Time:** \_\_\_\_\_

Step	Expected Operator Actions
1. OP AP-6, Step 1.a – 1.g – Initiate emergency boration using make-up controls.	<p>1.1 Ensured charging in service.</p> <p>1.2 Placed VCT makeup control in the BORATE mode.</p> <hr/> <p><b>Note: Appendix A guidance is to borate until control is regained.</b></p> <hr/> <p>1.3 Determined amount of boric acid required per Appendix A.</p> <p>1.4 Set TARGET BATCH.</p> <p>*****</p> <p><b>Cue: “The SFM is referring to EOP FR-S.1, Appendix D, to isolate dilution flow paths and directs you to continue emergency boration.”</b></p> <p>*****</p> <p>1.5 Reset the BATCHED GALLONS indicator to ZERO.</p> <p>1.6 Set BORIC ACID FLOW SP <math>\geq</math> 30 gpm.</p> <p>1.7 Pressed START and checked for 30 gpm boric acid flow.</p>
	<p><b>Step was: Sat</b> _____ <b>Unsat</b> _____</p>

**Comments:**

\*\* Denotes Critical Step and Sub-Steps

<< Alternate Path – Start Point >>

2. OP AP-6, Step 1.g, RNO – Initiate emergency boration using make-up controls.

- 2.1 Determined 30 gpm boric acid flow NOT achieved.

**Note:** Operator may attempt to open FCV-110B manually, and may not complete all normal method emergency boration once FCV-110B is found failed closed.

- 2.2 Diagnosed that FCV-110B is failed closed.  
2.3 Verified boric acid transfer pump is selected to high speed.  
2.4 Closed HCV-104 (BATP 1-1) or HCV-105 (BATP 1-2), as applicable.  
2.5 Verified that VCT pressure is less than 30 psig.  
2.6 Determined that emergency boration flow of at least 30 gpm is NOT attainable.

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

3. OP AP-6, Step 2 – Initiate alternate boration method using CVCS-8104.

- 3.1 Read NOTE prior to Step 2.  
3.2 Attempted to open 8104.  
3.3 Diagnosed that 8104 will NOT open.  
3.4 Determined that emergency boration flow of at least 30 gpm is NOT attainable.

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions
		<b>Note:</b> Only 8805A <u>OR</u> 8805B need be open to satisfy critical step.
** 4.	OP AP-6, Step 2, RNO – Initiate alternate boration method using the RWST.	** 4.1 Opened 8805A <u>and</u> 8805B.
		<b>Note:</b> Closing either LCV-112B <u>OR</u> LCV-112C satisfies critical step.
		** 4.2 Closed LCV-112B <u>and</u> LCV-112C.
		** 4.3 Adjusted charging flow to greater than 90 gpm.
<< Alternate Path – End Point >>		
*****		
Cue: "Another Operator will complete AP-6"		
*****		
Step was: Sat _____ Unsat _____		
Comments:		

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub-Steps

**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Response:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- ☐ Restore the simulator to IC-14 (HSB, 550°F, MOL).
- ☐ Trip the reactor.
- ☐ Reset all shutdown bank step counters to zero.
- ☐ Perform a rod bank update on the PPC.
- ☐ Verify NR-45 is displaying source ranges.
- ☐ Enter Lesson Drill file 1063

Description

Increase VCT level
Ensures VCT pressure < 30 psig
Causes source range NIs to increase by four decades over 10 minutes.
FCV-110B fails closed.
8104 fails closed.
Runs for 10 sec.
Acknowledges alarms

- ☐ If desired, create temporary JPM setup IC.
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet.

**Initial Conditions:** Unit 1 is shutdown in Mode 3 when an unexplained positive reactivity addition causes source range counts to rise.

**Initiating Cue:** The Shift Foreman directs you to emergency borate in accordance with OP AP-6, Emergency Boration.

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

**Number:** NRCL162-LJCS2

**Title:** Respond to CVI Activation

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform     X     Simulate           

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:**

**References:** OP H-4:I, Containment Ventilation – Make Available and Place in Service, Rev. 38  
AR PK02-06, Containment Vent Isolation, Rev. 16

**Alternate Path:** Yes           X           No                                 

**Time Critical:** Yes \_\_\_\_\_ No  X

**Time Allotment:** 15 minutes

**Critical Steps:** 4.2, 4.3, 4.4

**Job Designation:** RO or SRO

Rev Comments Modified from NRCL081LJC-S5

<b>Gen KA # / Rating:</b>	013.A4.01- Ability to manually operate and/or monitor in the control room: ESFAS-initiated equipment which fails to actuate	4.5 / 4.8
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AUTHOR: **LISA TORIBIO** DATE: **08/27/17**

OPERATIONS  
REPRESENTATIVE: CHRISTOPHER MEHIGAN DATE: 10/25/17  
REV.0



**Directions:** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the steps with which to begin.

**Required Materials:** (Required materials here)

**Initial Conditions:** Given:

- Unit 1 is at 75% power preparing for a refueling outage.
- Operations Manager permission is given to begin purging containment
- Shift Foreman will address required Tech Spec actions for the containment purge

**Initiating Cue:** The Shift Foreman directs you to place Containment Purge in service by performing OP H-4:1 starting at step 9.12. Fan S-3 will be used

**NOTE: Do NOT provide examinee with Task Standard**

<b>Task Standard:</b>	All Purge Supply and Exhaust Valves are Closed: <ul style="list-style-type: none"><li>• RCV-11, Containment Purge Exhaust Valve</li><li>• FCV-660, Containment Purge Supply Valve</li><li>• FCV-678, Supply to Gas and Air Particulate Monitors RE-11 &amp; RE-12</li></ul>
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Start  
Time: \_\_\_\_\_

Step		Expected Operator Actions	
1.	OP H-4:I, Steps 9.12.1-9.12.3 - Opens Containment Purge Supply Valves.	1.1	Opened FCV-660 on VB4.
		1.2	Opened FCV-661 on VB4.
		1.3	Determined S-3 will be used and N/A's step 9.12.2.
		1.4	<b><u>Note:</u> Determined Chemistry notification not required in current mode (step 9.12.3)</b>
		Step was: Sat _____ Unsat _____	

Comments:

2.	OP H-4:I, Step 9.12.4,5 - Opens Containment Purge Exhaust valves.	2.1	Opened RCV-11 on VB4.
		2.2	Opened RCV-12 on VB4.
		Step was: Sat _____ Unsat _____	

Comments:

		2.3	<b><u>Note:</u> RM-44 high rad in Containment begins when Fan E-3 switch taken to "ON".</b>
3.	OP H-4:I, Step 9.12.6,7 - Starts Containment Purge Fans.	3.1	Started Fan E-3 on VB4.
		3.2	Started Fan S-3 on VB4.
		Step was: Sat _____ Unsat _____	

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
<b>&lt;&lt; Alternate Path – Start Point &gt;&gt;</b>	
** 4. AR PK02-06, CONTMT VENT ISOLATION.	4.1 Verified CVI automatic actions have taken place by checking Monitor Light Box B.
	** 4.2 Closed FCV-660
	** 4.3 Closed FCV-678
	** 4.4 Closed RCV-11
	4.5 Stopped Fan E-3
	4.6 Stopped Fan S-3

<b>&lt;&lt; Alternate Path – End Point &gt;&gt;</b>
<p style="text-align: center;">*****</p> <p style="text-align: center;"><b>Cue: "Another Operator will continue in the procedure."</b></p> <p style="text-align: center;">*****</p> <p style="text-align: right;">Step was: Sat _____ Unsat _____</p>

**Comments:**

**Stop Time:** \_\_\_\_\_

**Total Time:** \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub-Steps

**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Response:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- ☐ Initialize the simulator to IC-11 (75%, MOL)
- ☐ Run Lesson NRC162-LJCS2.
- ☐ Check **BELLS ON**
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ If Simulator is in FREEZE, go to RUN when the examinee is given the cue sheet.

**Initial Conditions:** Given:

- Unit 1 is at 75% power preparing for a refueling outage.
- Operations Manager permission is given to begin purging containment
- Shift Foreman will address required Tech Spec actions for the containment purge

**Initiating Cue:** The Shift Foreman directs you to place Containment Purge in service by performing OP H-4:1 starting at step 9.12. Fan S-3 will be used

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

**Number:** NRCL162-LJCS3

**Title:** Respond to High Accumulator Pressure

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_  
Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform     X     Simulate           

**Results:** Sat            Unsat            Total Time:            minutes

**Comments:**

**References:** AR PK02-05, Accum Pressure HI-LO, Rev. 18A  
OP B-3B:I, Accumulator Fill and Pressurize, Rev. 28A

**Alternate Path:** Yes            No     X    

**Time Critical:** Yes            No     X    

**Time Allotment:** 20 minutes

**Critical Steps:** 5.1, 5.3, 5.5, 5.6, 5.7, 5.8

**Job Designation:** RO / SRO

**Rev Comments** Bank LJ-009

**Gen KA # / Rating:** 006.A1.13 - Ability to predict and/or monitor changes in parameters  
(to prevent exceeding design limits) associated with operating the  
ECCS controls including: accumulator pressure (level, boron  
concentration) 4.0 / 4.0

**AUTHOR:** \_\_\_\_\_ **LISA TORIBIO** \_\_\_\_\_ **DATE:** 10/24/17

**OPERATIONS**  
**REPRESENTATIVE:** \_\_\_\_\_ **CHRISTOPHER MEHIGAN** \_\_\_\_\_ **DATE:** 10/24/17  
LINE MANAGER **REV. 0**

- Directions:** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the steps with which to begin.
- Required Materials:** None
- Initial Conditions:** Unit is at 100% power. PK02-05 is in alarm
- Initiating Cue:** The Shift Foreman directs you to respond to the alarm and take necessary action to return accumulator parameters to normal in accordance with AR PK02-05 and applicable procedure(s) as required

**NOTE: Do NOT provide examinee with Task Standard**

- Task Standard:** PK02-05 Alarm is cleared for Accum 1-1 Press Hi by performing the following:
- 1) Closing SI-1-8880, Nitrogen Fill Header Isolation Valve
  - 2) Opening SI-1-8875A, Accum Vent & N2 Fill Valve
  - 3) Opening HCV-943, Accumulator N2 Vent Control Valve
  - 4) Reducing Accumulator 1-1 pressure until PK02-05 is CLEARED
  - 5) Closing HCV-943, Accumulator N2 Vent Control, AND SI-1-8875A, Accum Vent & N2 Fill Valves
  - 6) Opening SI-1-8880, Nitrogen Fill Header Isolation Valve
- in accordance with AR PK02-05, Accum Pressure HI-LO and OP B-3B:I, Accumulator Fill and Pressurize.



Start  
Time: \_\_\_\_\_

**Step**

**Expected Operator Actions**

1. Referenced correct procedure

1.1 Entered AR PK02-05, Accum Pressure HI-LO

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

2. AR PK02-05, Step 2.1.1, Check both pressure indicators to confirm the alarm and the high or low pressure condition

2.1 Checked PI-960 and PI-961 to verify alarm is not due to instrument failure

**Note: When Tech Spec referred to, provide the following cue:**

\*\*\*\*\*

**Cue: "The Shift Foreman is addressing all Technical Specification requirements at this time."**

\*\*\*\*\*

2.2 Determined Annunciator PK02-10, ACCUM LEVEL HI-LO was NOT in

2.3 Determined the alarm condition is accumulator 11 high pressure and transitions to Section 2.2 for High Accumulator Pressure

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

3. AR PK02-05, Step 2.2.1, Check if high pressure is due to a level increase

3.1 Determined level is normal and pressure is high from previous step

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
4.	AR PK02-05, Step 2.2.2, Transition to OP B-3B:I, Accumulators – Fill and Pressurize	4.1	Referenced OP B-3B:I, step 6.4 (after reviewing applicable P&Ls)
		Step was: Sat _____ Unsat _____	
<div>Comments:</div>			
** 5.	OP B-3B:I, Accumulators – Fill and Pressurize, step 6.4, Venting an Accumulator	** 5.1	Closed SI-1-8880, Nitrogen Fill Header Isolation Valve.
		5.2	Reviewed CAUTION prior to opening Accum vent valve
		** 5.3	Positioned valve control switch for SI-1-8875A to OPEN
		5.4	Reviews CAUTION prior to opening Accum N2 vent control valve
		** 5.5	Manipulated potentiometer to OPEN valve HCV-943 until accumulator pressure decreased to approximately 625 psig and PK02-05 CLEARED
		<b><u>Note:</u> HCV-943 may be fully closed prior to closing SI-1-8875A.</b>	
		** 5.6	Positioned valve control switch for SI-1-8875A to CLOSE
		** 5.7	Manipulate the potentiometer to CLOSE valve HCV-943
		** 5.8	Opened SI-1-8880, Nitrogen Fill Header Isolation Valve.
		Step was: Sat _____ Unsat _____	
<div>Comments:</div>			

\*\* Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
6. Monitor accumulator pressure	6.1 Ensured that PK02-05 is no longer in alarm
	6.2 Continued to monitor accumulator pressure
	<b><u>Note:</u> Once operator transitions back to AR PK02-05 provide the following CUE:</b>
	*****
	<b>Cue: "Pressure has remained constant for 20 minutes"</b>
	*****
	<b><u>Note:</u> If cause investigation desired, provide the following CUE:</b>
	*****
	<b>Cue: "SFM/crew have found and corrected the cause of problem"</b>
	*****
	Step was: Sat _____ Unsat _____

Comments:

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub-Steps

**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

**Response:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- ☐ Restore the simulator to IC-10 (100% MOL)
- ☐ Run Lesson drl\_1009 and run for 10 seconds or manually insert the following:

Command	Description
Use the chart function for accumulator pressure psisacc(1)	Monitor accumulator 1-1 pressure
insert psisacc(1) 665	Increases accumulator 11 pressure to 650 psig
RUN, then FRZ after 10 seconds	Run for 10 seconds

- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet.

**Initial Conditions:** Unit is at 100% power. PK02-05 is in alarm

**Initiating Cue:** The Shift Foreman directs you to respond to the alarm and take necessary action to return accumulator parameters to normal in accordance with AR PK02-05 and applicable procedure(s) as required

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

**Number:** NRCL162-LJCS4

**Title:** Start Reactor Coolant Pump

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_  
Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform     X     Simulate           

**Results:** Sat            Unsat            Total Time:            minutes

**Comments:**

**References:** EOP E-1.2, Post LOCA Cooldown and Depressurization, App B, Rev. 23

**Alternate Path:** Yes            No     X    

**Time Critical:** Yes            No     X    

**Time Allotment:** 10 minutes

**Critical Steps:** 2.1, 9.1

**Job Designation:** RO / SRO

**Rev Comments/LRN TIPS:** Bank LJC-044  
E03.EA1.1 – Ability to operate and/or monitor the following as they apply to the LOCA Cooldown and Depressurization: components, and functions of control and safety systems including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

**Gen KA # / Rating:** 4.0 / 4.0

**AUTHOR:** \_\_\_\_\_ **LISA TORIBIO** \_\_\_\_\_ **DATE:**     10/24/17    

**OPERATIONS REPRESENTATIVE:** \_\_\_\_\_ **CHRISTOPHER MEHIGAN** \_\_\_\_\_ **DATE:**     10/24/17      
**REV. 0**

- Directions:** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the steps with which to begin.
- Required Materials:** Provide a copy of the reference procedure (partial procedure allowed), if the task is being done in the plant or lab.
- Initial Conditions:** Given:  
A small break loss of coolant accident has occurred. All reactor coolant pumps (RCPs) were previously secured in EOP E-0 when RCS pressure lowered to less than 1300 psig. The operators have just reached Step 14.d of EOP E-1.2
- Initiating Cue:** The Shift Foreman directs you to start RCP 1-2 in accordance with Appendix B of EOP E-1.2.

**NOTE: Do NOT provide examinee with Task Standard**

- |                       |   |
|-----------------------|---|
| <b>Task Standard:</b> | <ul style="list-style-type: none"><li>• RCP 1-2 lift oil pump was started and allowed to run prior to starting RCP 1-2</li><li>• RCP 1-2 is running</li></ul> |
|-----------------------|---|



**Start  
Time:** \_\_\_\_\_

**Step**

**Expected Operator Actions**

1. Obtain the correct procedure.

1.1 Referenced EOP E-1.2, Appendix B.

1.2 Read NOTE and CAUTION.

\*\*\*\*\*

**Cue: "RCP seal cooling has been maintained."**

\*\*\*\*\*

**Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_**

**Comments:**

\*\* 2. EOP E-1.2, Appendix B, Step 1 – Start oil lift pump and run for 2 minutes.

\*\* 2.1 Started the RCP 1-2 oil lift pump.

2.2 Verified that the RCP 1-2 oil lift pump has started.

2.3 Waited for two minutes prior to starting the RCP.

**Note: Step 2.3 is not critical since timer will not allow start of RCP until after two minutes.**

**Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_**

**Comments:**

\*\* Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
3. EOP E-1.2, Appendix B, Step 2 – Reset SI, Phase A or Phase B as necessary to provide RCP support systems.	<p>3.1 Determined that SI is reset (by observing PK08-22 is ON and/or SI Monitor Box SI red status light OFF)</p> <p style="text-align: center;"><u>or</u></p> <p>Depressed the SI RESET pushbuttons.</p> <p>3.2 Determined that Containment Isolation Phase A <u>and</u> Phase B are reset (by observing PK02-01 OFF and/or Phase A and Phase B red monitor lights OFF)</p> <p style="text-align: center;"><u>or</u></p> <p>Depressed the Phase A <u>and</u> Phase B RESET pushbuttons.</p> <p>Step was: Sat _____ Unsat _____</p> <div>Comments:</div>
4. EOP E-1.2, Appendix B, Step 3 – Ensure CCW valves open to RCP thermal barrier and oil coolers.	<p>4.1 Observed that the following CCW valves are OPEN (VB1/Phase B status lights):</p> <ul style="list-style-type: none"><li>• FCV-355</li><li>• FCV-356</li><li>• FCV-749</li><li>• FCV-363</li><li>• FCV-750</li><li>• FCV-357</li></ul> <p>Step was: Sat _____ Unsat _____</p> <div>Comments:</div>

Step		Expected Operator Actions	
5.	EOP E-1.2, Appendix B, Step 4 – Ensure seal DP GREATER THAN 255 PSID	5.1	Observed that RCP 1-2 seal DP is greater than 255 psid (PI-187A/PPC).
		Step was: Sat _____ Unsat _____	
<div>Comments:</div>			
6.	EOP E-1.2, Appendix B, Step 5 – Ensure Seal Injection flow between 8 GPM to 13 GPM.	6.1	Verified seal injection flow (FI-143) between 8 and 13 GPM.
		Step was: Sat _____ Unsat _____	
<div>Comments:</div>			
7.	EOP E-1.2, Appendix B, Step 6 – Ensure Seal Leak Off flow WITHIN limits shown on Appendix B graph.	7.1	Determined that RCP 1-2 SEAL NO 1 RTN FLOW (FR 159/PPC) is within limits on Appendix B graph.
		Step was: Sat _____ Unsat _____	
<div>Comments:</div>			

Step		Expected Operator Actions	
8.	EOP E-1.2, Appendix B, Step 7 – Ensure closed PCV-455A and B, Normal PZR Spray Vlvs, AUTO optional.	8.1	Observed that the PCV-455A CLOSED and PCV-455B CLOSED green lights are ON, with controllers in AUTO. (The operator may shift the controllers to MANUAL.)
		Step was: Sat _____ Unsat _____	

Comments:

** 9.	EOP E-1.2, Appendix B, Step 8 – Start RCP 1-2.	** 9.1	Started RCP 1-2.
		9.2	Verified RCP 1-2 has started.
		9.3	Verified normal operation of RCP 1-2 by observing RCP 1-2 motor amps and loop 2 flow (FI-424, FI-425, FI-426, PPC).
		Step was: Sat _____ Unsat _____	

Comments:

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub-Steps

**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
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\_\_\_\_\_

**Response:** \_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- ☐ INIT to JPM IC-218
- ☐ This SNAP allows entry into EOP E-1.2, "POST LOCA Cooldown and Depressurization," Step 14.d. SI, Containment Isolation Phase A, and Containment Isolation Phase B are reset. Leave simulator in FREEZE.
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet.

**Initial Conditions:**     Given:  
A small break loss of coolant accident has occurred. All reactor coolant pumps (RCPs) were previously secured in EOP E-0 when RCS pressure lowered to less than 1300 psig. The operators have just reached Step 14.d of EOP E-1.2

**Initiating Cue:**        The Shift Foreman directs you to start RCP 1-2 in accordance with Appendix B of EOP E-1.2.

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

**Number:** NRCL162-LJCS5

**Title:** Respond to CFCU High Vibration

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform     X     Simulate           

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:**

OP F-2:II, Component Cooling Water System - Changing Over Pumps and Common Components, Rev. 15

OP H-2:l, Containment Fan Cooler Units – Make Available and System Operation, Rev. 37A.  
AR PK01-21, CONTMT FAN CLRS, Rev. 14

### References:

**Alternate Path:** Yes     X     No           

**Time Critical:** Yes \_\_\_\_\_ No  X

**Time Allotment:** 15 minutes

**Critical Steps:** 3.3, 4.1

**Job Designation:** RO or SRO

Rev Comments New

**Gen KA # / Rating:** 022.A4.01- Ability to manually operate and/or monitor in the control room: CCS fans

3.6 / 3.6

AUTHOR: **LISA TORIBIO** DATE: **08/27/17**

OPERATIONS  
REPRESENTATIVE: **CHRISTOPHER MEHIGAN** DATE: **10/24/17**

**REV.0**



**Directions:** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the steps with which to begin.

**Required Materials:** (Required materials here)

**Initial Conditions:** Given:

- Unit 1 is at 100%.
- Maintenance has requested shutdown of CCW Pump 1-2 in preparation for routine maintenance later this shift.

**Initiating Cue:** The Shift Foreman directs you to start CCW Pump 1-3 and shutdown CCW Pump 1-2 per OP F-2:II Section 6.1.

**NOTE: Do NOT provide examinee with Task Standard**

<b>Task Standard:</b>	CFCU High Vibration is addressed by performing the following: <ul style="list-style-type: none"><li>• Resetting VIB ALARM RESET to validate CFCU 1-3 high vibration condition</li><li>• Depressing STOP button for CFCU 1-3 to shutdown the fan</li></ul>
-----------------------	---

**Start  
Time:** \_\_\_\_\_

<b>Step</b>		<b>Expected Operator Actions</b>	
1.	Obtain the correct procedure.	1.1	Referenced OP F-2:II, Step 6.1, Changing Over CCW Pumps.
		1.2	Placed CCW Pump 1-3 Standby Select switch in "MAN".
		1.3	Placed CCW Pump 1-3 Control Switch in "START".
		1.4	Monitored CCW header flow and motor amperage prior to shutting down CCW Pump 1-2.
		<b><i>Note: High vibration on CFCU 1-3 is triggered 5 seconds after CCW Header C flow exceeds 2500 gpm.</i></b>	
		<b>Step was: Sat _____ Unsat _____</b>	

**Comments:**

**<< Alternate Path – Start Point >>**

2.	AR PK01-21, CONTMT FAN CLRS	2.1	Responded to AR PK01-21, CONTMT FAN CLRS .
		2.2	Determined alarm was caused by high vibration (INPUT 0434).
		<b>Step was: Sat _____ Unsat _____</b>	

**Comments:**

**\*\* Denotes Critical Step and Sub-Steps**

Step		Expected Operator Actions		
**	3.	AR PK01-21, step 2.3.1 – Fan Cooler High Vibration.	3.1	Determined alarm was caused by high vibration on CFCU 1-3.
			3.2	Read NOTE regarding vibration alarm is expected when starting, stopping, or shifting speeds on a CFCU and determined it does not apply.
			** 3.3	Attempted to reset high vibration alarm by pressing VIB ALARM RESET pushbutton (VB1).
			3.4	Identified reflash of PK01-21 due to valid high vibration condition on CFCU 1-3. (alarm returned)
		Step was: Sat _____ Unsat _____		

Comments:

- |   |   |
|---|---|
| <p>** 4. AR PK01-21, step 2.3.3 – Actions if High Vib alarms again for the same CFCU.</p> | <p>** 4.1 Pressed STOP button for CFCU 1-3 on VB-1.</p> |
|---|---|

**Note: CFCU 1-5 is in standby and is also a bus G component. If the Candidate requests guidance on which standby CFCU should be started, provide the following CUE:**

\*\*\*\*\*

**Cue: "Maintain the previous bus configuration for the running CFCUs."**

\*\*\*\*\*

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

Step	Expected Operator Actions
5. OP H-2:I, Step 6.2.1 - "Starting a CFCU"	5.1 Referenced OP H-2:I, Step 6.2, Starting a CFCU. 5.2 Read NOTE prior to Step 6.2.1. <b><i>Note: If the Candidate asks if this is an initial start of the CFCU following maintenance, provide the following CUE:</i></b> ***** <b>Cue: "This is NOT initial start of the CFCU following maintenance".</b> ***** 5.3 Ensured SPEED SELECT switch for chosen CFCU is selected to "LOW". 5.4 Depressed switch to start fan. 5.5 Checked that fan current stabilizes <b>Step was: Sat _____ Unsat _____</b>

Comments:

6. OP H-2:I, Step 6.2.4 – CFCU High Speed desired	6.1 Noted High Speed IS desired. 6.2 Pressed STOP button for CFCU just started on VB-1. 6.3 Immediately placed SPEED SELECT switch in "HIGH" AND depressed select switch to restart the CFCU. 6.4 Returned CFCU Speed Select switch to "LOW". <b>Step was: Sat _____ Unsat _____</b>
---	--

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
7. OP H-2:I, Step 6.2.5 - Annunciator PK01-21, "CONTMT FAN CLRS," in Alarm.	7.1 Checked annunciator printout and confirms cause is high vibration on the CFCU just started.
	7.2 Reset high vibration alarm by pressing VIB ALARM RESET pushbutton (VB1) and notes that PK01-21 does NOT reflash.
	<p><b><u>Note:</u> If Examinee is ready to contact Maintenance regarding CFCU, provide the following CUE:</b></p> <p>*****</p> <p><b>Cue: "Another Operator will continue in the procedure."</b></p> <p>*****</p>

<< Alternate Path – End Point >>

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

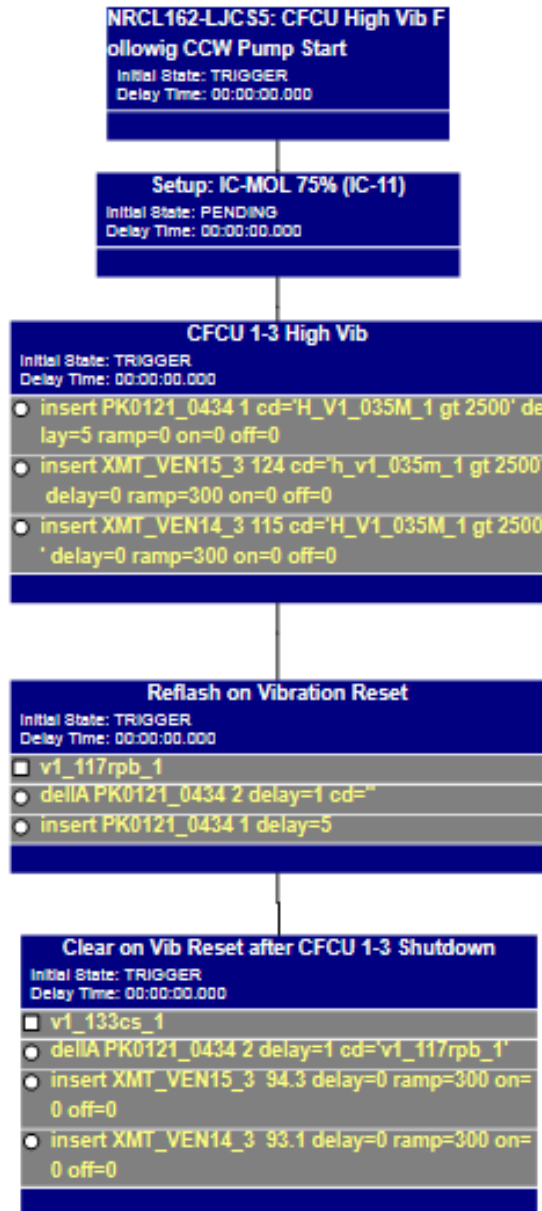
\*\* Denotes Critical Step and Sub-Steps

**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Response:** \_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

- ☐ Initialize the simulator to IC-11 (75%, MOL)
- ☐ Run Lesson NRC162-LJCS5.



- ☐ Check **BELLS ON**
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ If Simulator is in FREEZE, go to RUN when the examinee is given the cue sheet.

**Initial Conditions:** Given:

- Unit 1 is at 100%.
- Maintenance has requested shutdown of CCW Pump 1-2 in preparation for routine maintenance later this shift.

**Initiating Cue:** The Shift Foreman directs you to start CCW Pump 1-3 and shutdown CCW Pump 1-2 per OP F-2:II Section 6.1.



NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

**Number:** NRCL162-LJCS6

**Title:** Transfer Vital 4kV Bus from D/G to Startup

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform     X     Simulate           

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:**

**References:** OP J-6B:V, Diesel Generator 12, Manual Operations, Rev. 37

**Alternate Path:** Yes \_\_\_\_\_ No  X

**Time Critical:** Yes No **X**

**Time Allotment:** 20 minutes

**Critical Steps:** 3.2, 3.3, 3.4, 3.5, 5.1, 5.2, 7.1, 9.1, 9.4, 11.1, 11.2, 11.4, 11.5, 12.5, 12.6, 12.7

**Job Designation:** RO or SRO

**Rev Comments** Modified from Bank LJC-087

<b>Gen KA # / Rating:</b>	064.A4.01- Ability to manually operate and/or monitor in the control room: Local and remote operation of the ED/G.
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<b>Gen KA # / Rating:</b>	control room: Local and remote operation of the ED/G.	4.0 / 4.3
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AUTHOR: **LISA TORIBIO** DATE: **08/27/17**

OPERATIONS  
REPRESENTATIVE: CHRISTOPHER MEHIGAN DATE: 10/24/17  
REV.0

**Directions:** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the steps with which to begin.

**Required Materials:** None

**Initial Conditions:** Given:

- Unit 1 experienced a small break loss of coolant accident.
- 230 kV Power was unavailable at the time of the event and vital 4kV buses transferred to their respective Diesel Generators
- 230 kV has been restored and vital 4kV buses are being transferred off the Diesels and on to Startup.

**Initiating Cue:** The Shift Foreman directs you to parallel Diesel Generator 12 with Startup power, then unload and shutdown the Diesel Generator, per OP J-6B:V.

**NOTE: Do NOT provide examinee with Task Standard**

**Task Standard:**

Vital 4kV Bus G Transfer is complete such that:

- Startup Power is supplying 4kV bus G
- D/G 1-2 is shutdown and in an OPERABLE standby configuration

by performing the following sequence:

- 1) Taking Mode Selector Switch to MANUAL
- 2) Ensuring D/G 1-2 is operating at 60 Hz
- 3) Placing Bus G Xfer to S/U PWR C/O switch to CUT-OUT
- 4) Resetting 4kV Bus G Auto Xfer and verifying blue indicating light is off
- 5) Inserting Sync key into Startup Feeder Breaker switch and turning to ON
- 6) Ensuring synchroscope is turning slowly in the counterclockwise (SLOW) direction and closing 52-HG-14 with the synchroscope slightly before 12 o'clock
- 7) Turning the Sync key to the OFF position
- 8) Inserting Sync key into D/G 1-2 Feeder Breaker switch and turning to ON
- 9) Reducing load to approximately 0.1 MW and opening breaker 52-HG-5
- 10) Shutting down D/G 1-2 by taking the MAN MODE select switch to STOP
- 11) Placing D/G DIR PWR, LOSS OF FLD & BKR OC PROT RLYS C/O SW to CUT-OUT
- 12) Returning Mode Selector Switch to AUTO

In accordance with OP J-6B:V, Diesel Generator 12, Manual Operations, Section 6.4.

**Start** \_\_\_\_\_

\*\* Denotes Critical Step and Sub-Steps

Time: \_\_\_\_\_

Step		Expected Operator Actions	
1.	Obtain the correct procedure.	1.1	Referenced OP J-6B:V, Step 6.4.
		Step was: Sat _____ Unsat _____	

Comments:

2.	OP J-6B:V, step 6.4.1 - Check that the breaker for the oncoming power supply is available and that its potential light is ON.	2.1	Read Note.
		2.2	Checked breaker 52-HG-14 is available.
		2.3	Checked white potential light ON.
		Step was: Sat _____ Unsat _____	

Comments:

** 3.	OP J-6B:V, step 6.4.2 - Prepare the diesel generator for parallel to Startup power.	3.1	Read CAUTION.
		** 3.2	Placed Mode Selector Switch to MANUAL.
		** 3.3	Adjusted Man Speed Control switch to obtain frequency of 60 Hz, as necessary.
		** 3.4	Placed Bus G Xfer to S/U PWR C/O switch to CUT-OUT.
		** 3.5	Reset 4kV Bus G Auto Xfer and verifies indicating light (blue light) is off.
		3.6	Verified generator protective relays CUT-IN.
		Step was: Sat _____ Unsat _____	

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
4.	OP J-6B:V, step 6.4.3 - Ensure 4kV bus G at 60 Hz using governor speed control as needed.	4.1	Verified 60 Hz indicated on Bus G frequency indication.
		4.2	Adjusted Man Speed Control switch to obtain 60 Hz, as necessary.
		Step was: Sat _____ Unsat _____	
<b>Comments:</b>			
** 5.	OP J-6B:V, step 6.4.4 - Ensure 4kV bus G at 60 Hz using governor speed control as needed.	** 5.1	Inserted Sync key into Startup Feeder Breaker switch.
		** 5.2	Turned key to ON position.
		Step was: Sat _____ Unsat _____	
<b>Comments:</b>			
6.	OP J-6B:V, step 6.4.5 - Check proper synchroscope function.	6.1	Observed light out at the 12 o'clock position.
		6.2	Observed lights full bright at 6 o'clock position.
		Step was: Sat _____ Unsat _____	
<b>Comments:</b>			

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions
** 7.	OP J-6B:V, step 6.4.6 - Adjust DG 1-2 speed using the governor speed control for the appropriate generator response.	<b><u>Note:</u> D/G 1-2 is operating well below the load limit which is considered <i>NORMAL</i> in the procedure.</b>
** 7.1	Adjusted Man Speed Control switch to obtain synchroscope turning slowly in the counterclockwise (SLOW) direction.	
		<b>Step was: Sat _____ Unsat _____</b>

Comments:

8.	OP J-6B:V, step 6.4.7 - Adjust DG 1-2 voltage to within 2 volts of the oncoming power voltage	<b><u>Note:</u> D/G 1-2 voltage is already within 2 volts of Aux Power and no adjustment is required</b>
		8.1 Adjusted Man/Auto Volt Control switch to match diesel voltage, w/in 2 volts, to the incoming auxiliary power voltage, as necessary.
		<b>Step was: Sat _____ Unsat _____</b>

Comments:

**	9.	OP J-6B:V, step 6.4.8-11 - WHEN the synchroscope pointer is approaching and is just slightly before the 12 o'clock position, CLOSE Breaker 52-HG-14.	**	9.1	When Synchroscope was slightly before 12 o'clock (counter clockwise direction), closed 52-HG-14.
				9.2	Verified RED light on 52-HG-14 indicating breaker is closed.
				9.3	Observed VARS-OUT.
			**	9.4	Turned Sync key to OFF position.
					Step was: Sat _____ Unsat _____

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
10.	OP J-6B:V, step 6.5.1,2 - Separating DG 1-2 from 4160V Bus G.	10.1	Adjusted Man Speed Control switch to obtain about 0.5 MW at $\leq 0.5$ MW every two minutes.  <b><i>Note: After Candidate has completed first adjustment to lower D/G 1-2 load, provide the following CUE:</i></b>  *****  <b>Cue: "Diesel generator 12 has been at 0.5 MW for 5 minutes."</b>  *****  Step was: Sat _____ Unsat _____

Comments:

** 11.	OP J-6B:V, step 6.5.3-.6 - Separating DG 1-2 from 4160V Bus G.	** 11.1	Inserted Sync key into D/G 1-2 Feeder Breaker switch.
		** 11.2	Turned Sync key to ON position.
		11.3	Read CAUTION.
		** 11.4	Reduced load to about 0.1 MW.
		** 11.5	Promptly Opened Bkr. 52-HG-5.
		11.6	Verified GREEN light on 52-HG-5 indicating breaker is open.
		11.7	Adjusted diesel generator 12 speed and voltage to approximately 60 Hz and 119 VAC indicated, as required.
		Step was: Sat _____ Unsat _____	

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
**	12.	OP J-6B:V, step 6.6 - Manually Secure DG 1-2 from the Control Room and Return to Standby Configuration	
	12.1		Checked Open 52-HG-5.
	12.2		Verified DG 1-2 mode selector switch in MANUAL.
	12.3		Verified DG 1-2 at 60 hz and 119 vac (may require slight adjustment).
	12.4		Verified Feeder Synch switch is in OFF.
**	12.5		Shut down DG 1-2
**	12.6		Placed D/G DIR PWR, LOSS OF FLD & BKR OC PROT RLYS C/O SW to CUT-OUT.
**	12.7		Placed DG1-2 Mode sel switch in AUTO.
	12.8		Verified S/U Pwr C/O switch is CUT IN.
<b><u>Note:</u> If asked about stator temperature trending, provide the following CUE:</b>			
*****			
Cue: "Stator temperature was NOT placed on trend in step 6.2.15."			
*****			
<b><u>Note:</u> If asked about poly bottles, provide the following CUE:</b>			
*****			
Cue: "No poly bottles were installed at the DG fuel leakoff lines."			
*****			
Step was: Sat _____ Unsat _____			

Comments:

\*\* Denotes Critical Step and Sub-Steps

**Stop Time:** \_\_\_\_\_

**Total Time:** \_\_\_\_\_ (Enter total time on the cover page)

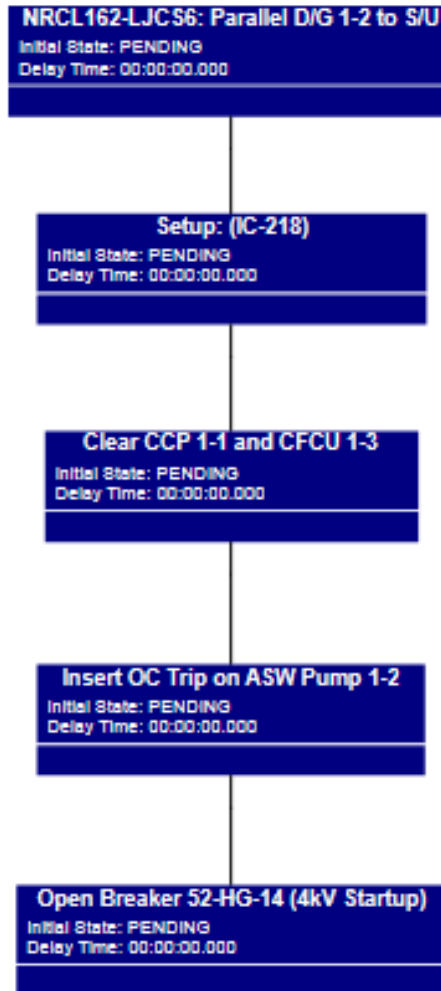
**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
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\_\_\_\_\_  
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**Response:** \_\_\_\_\_  
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\_\_\_\_\_



- ☐ Initialize the simulator to IC-218
- ☐ Run Lesson NRC162-LJCS6



- ☐ Check **BELLS ON**
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ If Simulator is in FREEZE, go to RUN when the examinee is given the cue sheet.

**Initial Conditions:** Given:

- Unit 1 experienced a small break loss of coolant accident.
- 230 kV Power was unavailable at the time of the event and vital 4kV buses transferred to their respective Diesel Generators
- 230 kV has been restored and vital 4kV buses are being transferred off the Diesels and on to Startup.

**Initiating Cue:** The Shift Foreman directs you to parallel Diesel Generator 12 with Startup power, then unload and shutdown the Diesel Generator, per OP J-6B:V.

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

**Number:** NRCL162-LJCS7

**Title:** Perform Turbine Load Trim to Match Tave to Tref

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform     X     Simulate           

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:**

**References:** OP C-3:III, Main Unit Turbine - At Power Operations, Rev. 36

**Alternate Path:** Yes \_\_\_\_\_ No       X      

**Time Critical:** Yes No **X**

**Time Allotment:** 10 minutes

**Critical Steps:** 3.1, 3.3, 4.3, 4.4, 5.2

**Job Designation:** RO or SRO

<b>Rev Comments</b>	New
<b>Gen KA # / Rating:</b>	045.A4.01- Ability to manually operate and/or monitor in the control room: Turbine Valve Indications (throttle, governor, control).

3.1 / 2.9

AUTHOR: **LISA TORIBIO** DATE: **08/27/17**

OPERATIONS  
REPRESENTATIVE: CHRISTOPHER MEHIGAN DATE: 10/24/17  
REV.0

**Directions:** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the steps with which to begin.

**Required Materials:** None

**Initial Conditions:** Given:

- Unit 1 is at 75% following a ramp due to Heater #2 Drip Pump maintenance.
- Current control band for Tave/Tref is plus or minus 0.5 °F.

**Initiating Cue:** The Shift Foreman directs you to perform a small turbine load adjustment of up to 12 MW at 0.7 MW/min with feedbacks out, following the guidance of OP C-3:III, Section 6 as necessary to maintain the current control band.

**NOTE: Do NOT provide examinee with Task Standard**

**Task Standard:**

- Ramp Rate LESS THAN 5 MW/min entered into Turbine Control HMI #
- Load Target LESS THAN current MW Output entered into Turbine Control HMI
- Tave matched to Tref within 0.5°F\*
  - Rods remain at CBD at 192 steps
  - Boron concentration remains at 919 ppm

\* At the Evaluator's discretion, this element of the Task Standard may be met by lowering Tave in the direction of Tref and the associated cue provided prior to step 6.1 of this JPM.

# Ramp rate above 5 MW/min should only be utilized under abnormal conditions and requires following the guidance of OP AP-25, Rapid Load Reduction or Shutdown.

**Start  
Time:** \_\_\_\_\_

<b>Step</b>		<b>Expected Operator Actions</b>	
1.	Obtain the correct procedure.	1.1	Referenced OP C-3:III, Main Unit Turbine – At Power Operations, Step 6.1
		<b>Step was: Sat</b> _____ <b>Unsat</b> _____	

**Comments:**

2.	OP C-3:III, step 6.1.1,2 – Changing Turbine Load.	2.1	Read Note.
		2.2	Ensured VPL was out of the way to make the load change.
		2.3	Noted current Turbine output was greater than 150 MWe and referenced Decision Tree for appropriate feedback configuration
		<b><i>Note: If asked for SFM concurrence for leaving feedbacks out of service, provide the following CUE:</i></b>	
		*****	
		<b>Cue: "Refer to the initial cue".</b>	
		*****	
		<b>Step was: Sat</b> _____ <b>Unsat</b> _____	

**Comments:**

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
** 3.	OP C-3:III, steps 6.1.3-6.1.5 – Specifies Turbine Ramp Rate.	** 3.1	Selected the RAMP RATE button on Turbine Control HMI (CC3).
		3.2	Read NOTE regarding ramp rates > 5 MW/min; determined note is N/A for trim.
		<b><u>Note:</u> Expected rate from initial cue is 0.7 MW/min.</b>	
		** 3.3	Entered ramp rate in MW/MIN on the popup screen and pressed OK.
		3.4	Confirmed correct rate-of-change appeared in the RAMP RATE window.
		Step was: Sat _____ Unsat _____	

Comments:

** 4.	OP C-3:III, steps 6.1.6-6.1.8 – Specifies Turbine Load Target.	4.1	Read NOTE regarding Load Target and Actual Load not being equal when feedbacks are out and determined note is applicable.
		4.2	Noted Tave is LESS THAN Tref and determined Turbine load must be LOWERED.
		** 4.3	Selected the LOAD TARGET button on Turbine Control HMI (CC3).
		<b><u>Note:</u> Expected load target from initial cue is less than or equal to 12 MW in total reduction.</b>	
		** 4.4	Entered a target load lower than current load AND pressed OK.
		4.5	Confirmed correct load appeared in the LOAD TARGET window.
		Step was: Sat _____ Unsat _____	

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions			
**	5.	OP C-3:III, steps 6.1.9 – Initiate ramp by pressing GO.	5.1	Read NOTEs regarding lag between Actual Load and Load Setpoint.	
			**	5.2	Pressed the GO button on Turbine Control HMI (CC3).
				5.3	Monitored Tave/Tref mismatch for delta less than 0.5 °F.
		Step was: Sat _____ Unsat _____			

Comments:

Step	Expected Operator Actions
6. OP C-3:III, steps 6.2 – Places ramp on HOLD.	<p><b><u>Note:</u></b> <i>Evaluator may elect to wait for Tave to be matched to Tref within 0.5°F, or optionally provide the following CUE once observation of load trim rate and target have been deemed adequate.</i></p> <p>*****</p> <p><b>Cue:</b> "Using Time Compression, Tave is now matched to Tref within 0.5°F."</p> <p>*****</p> <p><b><u>Note:</u></b> <i>Provide the following CUE once Tave has been matched to Tref within 0.5°F (actual or simulated using time compression).</i></p> <p>*****</p> <p><b>Cue:</b> "Place the ramp on HOLD and extinguish the HOLD button light".</p> <p>*****</p> <p>6.1 Pressed the HOLD button on Turbine Control HMI (CC3).</p> <p>6.2 Observed LOAD REFERENCE number in pop-up above HOLD button.</p> <p>6.3 Pressed the LOAD TARGET button.</p> <p>6.4 Entered the LOAD REFERENCE number from the pop-up above the HOLD button as the new LOAD TARGET.</p> <p>6.5 Pressed GO.</p> <p>6.6 Verified HOLD light went out.</p> <p><b>Step was: Sat _____ Unsat _____</b></p>

Comments:



**Stop Time:** \_\_\_\_\_

**Total Time:** \_\_\_\_\_ (Enter total time on the cover page)

**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
\_\_\_\_\_  
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**Response:** \_\_\_\_\_  
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\_\_\_\_\_

- ☐ Initialize the simulator to IC-160
- ☐ Check **BELLS ON**.
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ If Simulator is in FREEZE, go to RUN when the examinee is given the cue sheet.

**Initial Conditions:** Given:

- Unit 1 is at 75% following a ramp due to Heater #2 Drip Pump maintenance.
- Current control band for Tave/Tref is plus or minus 0.5 °F.

**Initiating Cue:** The Shift Foreman directs you to perform a small turbine load adjustment of up to 12 MW at 0.7 MW/min with feedbacks out, following the guidance of OP C-3:III, Section 6 as necessary to maintain the current control band.

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

**Number:** NRCL162-LJCS8

**Title:** Respond to Gaseous Rad Release

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform     X     Simulate           

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:**

**References:** OP B-1A:X, CVCS – VCT Degassing, Unit 1, Rev. 33  
OP AP-14, Tank Ruptures, Rev. 20  
AR PK04-24, VCT PRESS/LVL TEMP, Rev 19

**Alternate Path:** Yes           X           No                                 

**Time Critical:** Yes \_\_\_\_\_ No  X

**Time Allotment:** 15 minutes

**Critical Steps:** 6.1, 6.2, 6.3

**Job Designation:** RO or SRO

Rev Comments New

<b>Gen KA # / Rating:</b>	060.AA1.02- Ability to operate and/or monitor the following as they apply to the Accidental Gaseous Radwaste: Ventilation System	2.9 / 3.1
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AUTHOR: **LISA TORIBIO** DATE: **08/27/17**

OPERATIONS  
REPRESENTATIVE: CHRISTOPHER MEHIGAN DATE: 10/24/17  
REV.0

**Directions:** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the steps with which to begin.

**Required Materials:** None

**Initial Conditions:** Given:

- Unit 1 is at 75% power.
- Chemistry requests a VCT degas to be completed per OP B-1A:X. The prerequisites and all applicable precautions and limitations are complete. Steps 6.1.1 through 6.1.5 are complete.

**Initiating Cue:** The Shift Foreman directs you to commence VCT degas starting at step 6.1.6 of OP B-1A:X. Per the completed reactivity brief, utilize blended flow of 20.8 gpm primary water and 2.9 gpm of boric acid..

**NOTE: Do NOT provide examinee with Task Standard**

<b>Task Standard:</b>	<p>Auxiliary Building Ventilation is realigned through the charcoal filters for Unit 1:</p> <ul style="list-style-type: none"><li>• "S" Signal Test on POV1 and POV2</li><li>• Auxiliary Building Ventilation selected to Safeguards Only (VB4 select switch set to Safeguards Only)</li><li>• Auxiliary Building Ventilation Charcoal Filter Preheater energized (VB4 control switch set to "ON")</li></ul> <p>In accordance with OP AP-14, Tank Ruptures, Section 6.</p>
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Start  
Time: \_\_\_\_\_

**Step**

**Expected Operator Actions**

1. OP B-1A:VII, step 6.1.6 – Align VCT for degassing.

**Note: Rupture of VCT triggers off LCV-112A control switch being taken to VC TK**

- 1.1 Attempted to align LCV-112A, VCT Level Cont Divert Vlv, to VC TK.

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

**<< Alternate Path – Start Point >>**

2. AR PK04-24, VCT PRESS/LVL TEMP.

- 2.1 Responded to AR PK04-24, VCT PRESS/LVL TEMP.

- 2.2 Determined cause of alarm is input 744, Volume Cont Tk Press < 15 psig.

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

3. AR PK04-24, steps 2.1.1-2.1.3 – VCT Pressure Hi/Lo

- 3.1 Checked indication to confirm alarm

- PI-139, VCT Pressure (VB2)
- LI-112, VCT Level (VB2)

- 3.2 Determined low pressure is NOT due to level change.

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
4. AR PK04-24, step 2.1.4 – VCT Pressure low without a corresponding change in level.	<div>4.1 Determined there are no evolutions currently in progress that would cause VCT pressure to drop abruptly.</div> <div>4.2 Determined RCP seal return flows were normal.</div> <div><b><i>Note: Booth Operator will report both alarms OFF when candidate call at next step.</i></b></div> <div>4.3 Called the Auxiliary Building Nuclear Operator to verify Hydrogen and Nitrogen low pressure alarms were OFF at the Aux Board HMI.</div> <div><b><i>Note: Provide the following cue if candidate attempts to evaluate possibility of voiding.</i></b></div> <div>*****</div> <div><b>Cue: "Another Operator will evaluate possibility of voiding."</b></div> <div>*****</div> <div>4.4 Determined VCT pressure was low due to a potential tank rupture and went to OP AP-14, Tank Ruptures.</div> <div><b>Step was: Sat _____ Unsat _____</b></div>

Comments:

Step		Expected Operator Actions	
5.	Op AP-14, step 1 – Alert Plant Personnel.	5.1	Made PA to alert plant personnel of VCT rupture in Aux Bldg.
		<b><i>Note:</i></b> <i>If candidate contacts RP to evacuate personnel from the Aux Bldg, provide the following CUE:</i>	
		*****	
		Cue: "The RP Supervisor has been notified and is handling evacuation of the Aux Bldg."	
		*****	
		5.2	Noted need to perform EP R-2, Release of Airborne Radioactive Materials Initial Assessment
		*****	
		Cue: "Another Operator will perform the required EP R-2 Assessment."	
		*****	
		Step was: Sat _____ Unsat _____	
Comments:			
** 6.	Op AP-14, Section 6, step 6.1 – Place Aux Bldg Ventilation Through Charcoal Filters for Unit 1.	** 6.1	Selected "S" Signal Test on <ul style="list-style-type: none"><li>POV1</li><li>POV2</li></ul>
		** 6.2	Placed Auxiliary Building Ventilation in Safeguards Only (VB4)
		** 6.3	Selected Aux Bldg Vent Char Fltr Preheater Control Switch to "ON" to energize charcoal heaters (VB4)
		Step was: Sat _____ Unsat _____	
Comments:			

\*\* Denotes Critical Step and Sub-Steps



Step	Expected Operator Actions
7. Op AP-14, Section 6, step 6.2 – Place Aux Bldg Ventilation Through Charcoal Filters for Unit 2	<p><b><u>Note:</u></b> <i>When candidate request alignment of Unit 2 Aux Bldg ventilation, provide the following CUE:</i></p> <p>*****</p> <p>Cue: "Another Operator will complete the procedure."</p> <p>*****</p>
<< Alternate Path – End Point >>	
Step was: Sat _____ Unsat _____	
<b>Comments:</b>	

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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**Response:** \_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_

- ☐ Initialize the simulator to IC-11 (75%, MOL)
- ☐ Ensure starting VCT pressure range is between 20-24 psig.
- ☐ Run Lesson NRC162-LJCS8.
  
- ☐ Check **BELLS ON**
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ If Simulator is in FREEZE, go to RUN when the examinee is given the cue sheet.

**Initial Conditions:** Given:

- Unit 1 is at 75% power.
- Chemistry requests a VCT degas to be completed per OP B-1A:X. The prerequisites and all applicable precautions and limitations are complete. Steps 6.1.1 through 6.1.5 are complete.

**Initiating Cue:**

The Shift Foreman directs you to commence VCT degas starting at step 6.1.6 of OP B-1A:X. Per the completed reactivity brief, utilize blended flow of 20.8 gpm primary water and 2.9 gpm of boric acid..

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

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**Number:** NRCL162-P1  
**Title:** Isolate Dilution Flow Paths  
**Examinee:** \_\_\_\_\_  
**Evaluator:** \_\_\_\_\_  
Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_  
**Testing Method:** Perform \_\_\_\_\_ Simulate   X    
**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes  
**Comments:** This is a Unit 1 JPM

**References:** EOP FR-S.1, Response to Nuclear Power Generation/ATWS, Rev. 21.  
OP1.ID2, TCOAs, Rev 9 (& TCOA database); TCOA item 21

**Alternate Path:** Yes \_\_\_\_\_ No   X    
**Time Critical:** Yes \_\_\_\_\_ No   X    
**Time Allotment:** 25 minutes  
**Critical Steps:** 3.2, 8.3  
**Job Designation:** RO / SRO  
**Rev Comments/LRN TIPS:** Bank LJP-062  
004.A2.06 - Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Inadvertent boration/dilution.  
**Gen KA # / Rating:** 4.2 / 4.3

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**AUTHOR:** \_\_\_\_\_ **LISA TORIBIO** \_\_\_\_\_ **DATE:**   07/27/17  

**OPERATIONS REPRESENTATIVE:** \_\_\_\_\_ **CHRIS MEHIGAN** \_\_\_\_\_ **DATE:**   10/25/17    
**REV. 0**

- Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. The examinee should be given the “required materials” shown below, and access to other plant references as appropriate.
- Equipment operation “Cues” are contingent on proper operation by the examinee and should be “adjusted” should equipment operation differ from expected.
- Required Materials:** Provide a copy of the reference procedure (partial procedure allowed), if the task is being done in the plant or lab; U1 EOP FR-S.1, App D.
- Initial Conditions:** Given:
- Unit 1 is experiencing an inadvertent dilution
  - Emergency boration is being used to stabilize the plant
- Initiating Cue:** The Shift Foreman directs you to check and isolate any dilution flowpaths to the RCS in accordance with EOP FR-S.1, Appendix D, Step 2.

**NOTE: Do NOT provide examinee with Task Standard**

**Task Standard:** Dilution flow paths to the RCS have been checked and isolated such that the following normally OPEN valves are **CLOSED**:

- CVCS-1-8519, Primary Water to Cation Demineralizer 11 Valve
- CVCS-1-8469, Primary Water to Blender Isolation Valve

in accordance with EOP FR-S.1.

- Time Critical Operator Action (TCOA):** This JPM was evaluated against TCOA # 21 (During power ops - terminate dilution within 15 minutes after Rod Lo-Lo Insertion Limit Alarm).
- This TCOA:
- Is NOT applicable to this JPM; the initial conditions and control room actions for the TCOA are not met, these local actions constitute only part of the operator response, and no formal time validation of these local actions has been performed. The steps required to successfully accomplish the task are designated as critical steps.

**Start  
Time:** \_\_\_\_\_

**Step**

1. EOP FR-S.1, Appendix D, Step 2.a.1 – Ensure closed valve CVCS-1-8539, primary water to mixed bed demineralizer 11.

**Expected Operator Actions**

- 1.1 Located valve CVCS-1-8539 at the demineralizer manifold on the 100' elevation (Mixed Bed 1-1 outside wall) of the auxiliary building.
- 1.2 Ensured CVCS-1-8539 is closed.

\*\*\*\*\*

**Cue: "Valve will not move in CW direction."**

\*\*\*\*\*

**Step was: Sat** \_\_\_\_\_ **Unsat** \_\_\_\_\_

**Comments:**

2. EOP FR-S.1, Appendix D, Step 2.a.2 – Ensure closed valve CVCS-1-8538, primary water to mixed bed demineralizer 12.

- 2.1 Located valve CVCS-1-8538 at the demineralizer manifold on the 100' elevation (Mixed Bed 1-1 outside wall) of the auxiliary building.
- 2.2 Ensured CVCS-1-8538 is closed.

\*\*\*\*\*

**Cue: "Valve will not move in CW direction."**

\*\*\*\*\*

**Step was: Sat** \_\_\_\_\_ **Unsat** \_\_\_\_\_

**Comments:**

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
** 3.	EOP FR-S.1, Appendix D, Step 2.a.3 – Ensure closed valve CVCS-1-8519, primary water to cation demineralizer 11.	3.1	Located valve CVCS-1-8519 at the demineralizer manifold on the 100' elevation (Outside wall of cation demin) of the auxiliary building.
		** 3.2	Ensured CVCS-1-8519 is closed.  *****  <b>Cue: “Valve moved CW.”</b> <b>(If turned further)</b> <b>“Valve stopped moving CW.” (hit seat)</b>  *****
		<b>Step was: Sat _____ Unsat _____</b>	

Comments:

4.	EOP FR-S.1, Appendix D, Step 2.a.4 – Ensure closed valve CVCS-1-8500A primary water to deborating demineralizer 1-1 and 1-2 inlet.	4.1	Located valve CVCS-1-8500A at the demineralizer manifold on the 100' (Outside wall of Deborating Demins).
		4.2	Ensured CVCS-1-8500A is closed.  ***** <b>Cue: “Valve will not move in CW direction.”</b> *****
	EOP FR-S.1, Appendix D, Step 2.a.5 – Ensure closed valve CVCS-1-8500B primary water to deborating demineralizer 1-1 and 1-2 outlet.	4.3	Located valve CVCS-1-8500B.
		4.4	Ensured CVCS-1-8500B is closed.  ***** <b>Cue: “Valve will not move in CW direction.”</b> *****
		Step was: Sat _____ Unsat _____	

Comments:

\*\* Denotes Critical Step and Sub-Steps



Step	Expected Operator Actions
5. EOP FR-S.1, Appendix D, Step 2.b.1 – Ensure closed valve CVCS-1-8506A.	5.1 Located valve CVCS-1-8506A at the demineralizer manifold on the 100' elevation (Outside wall of Deborating Demins).  5.2 Ensured CVCS-1-8506A is closed.  ***** <b>Cue: “Valve will not move in CW direction.”</b> *****
EOP FR-S.1, Appendix D, Step 2.b.2 – Ensure closed valve CVCS-1-8506B.	5.3 Located valve CVCS-1-8506B at the demineralizer manifold on the 100' elevation (Outside wall of Deborating Demins).  5.4 Ensured CVCS-1-8506B is closed.  ***** <b>Cue: “Valve will not move in CW direction.”</b> *****  <b>Step was: Sat _____ Unsat _____</b>

Comments:

Step		Expected Operator Actions
6.	EOP FR-S.1, Appendix D, Step 2.c.1 – Ensure closed valve CVCS-1- 8464B, primary water to boric acid pumps 11 & 12.	<p><b><u>Note:</u> If area is a surface contamination area, allow the Operator to point to the valves from outside the SCA.</b></p>
	EOP FR-S.1, Appendix D, Step 2.c.2 – Ensure closed valve CVCS-1-8464A, primary water to boric acid pumps 11 & 12.	<p>6.1 Located valve CVCS-1-8464B at the boric acid pump skid on the 100' elevation of the auxiliary building.</p> <p>6.2 Ensured CVCS-1-8464B is closed.</p> <p>*****</p> <p><b>Cue: “Valve will not move in CW direction.”</b></p> <p>*****</p> <p>6.3 Located valve CVCS-1-8464A at the boric acid pump skid on the 100' elevation of the auxiliary building.</p> <p>6.4 Ensured CVCS-1-8464A is closed.</p> <p>*****</p> <p><b>Cue: “Valve will not move in CW direction.”</b></p> <p>*****</p> <p><b>Step was: Sat _____ Unsat _____</b></p>
<p><b>Comments:</b></p>		

Step	Expected Operator Actions
7. EOP FR-S.1, Appendix D, Step 2.d.1 – Ensure chemical mixing tank is isolated.	7.1 Located valve CVCS-1-8435 outside the blender room on the 100' elevation of the auxiliary building.  7.2 Ensured CVCS-1-8435 is closed.  ***** <b>Cue: “Valve will not move in CW direction.”</b> *****
EOP FR-S.1, Appendix D, Step 2.d.2 – Ensure chemical mixing tank is isolated.	7.3 Located valve CVCS-1-8454 outside the blender room on the 100' elevation of the auxiliary building.  7.4 Ensured CVCS-1-8454 is closed.  ***** <b>Cue: “Valve will not move in CW direction.”</b> *****  Step was: Sat _____ Unsat _____

Comments:

Step		Expected Operator Actions	
**	8.	EOP FR-S.1, Appendix D, Step 2.d.3 – Check flow on FIT-111.	8.1 Located flow indicating transmitter FIT-111 outside the blender room on the 100' elevation of the auxiliary building in Mechanical Panel 1-PM-96.
			***** <b>Cue: "FIT-111 indicates 10 gpm."</b> *****
			8.2 Located valve CVCS-1-8469 outside the blender room on the 100' elevation of the auxiliary building.
**	8.3	Closed CVCS-1-8469.	***** <b>Cue: "FIT-111 indicates 0 gpm."</b> *****
			Step was: Sat _____ Unsat _____

Comments:

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub-Steps

**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Response:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Initial Conditions:** Given:

- Unit 1 is experiencing an inadvertent dilution
- Emergency boration is being used to stabilize the plant

**Initiating Cue:** The Shift Foreman directs you to check and isolate any dilution flowpaths to the RCS in accordance with EOP FR-S.1, Appendix D, Step 2.

NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

---

**Number:** NRCL162-P2

**Title:** Perform a Local Start of a Diesel Generator

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform \_\_\_\_\_ Simulate   X  

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:** This is a Unit 1 JPM

**References:** OP AP-8A, Control Room Inaccessibility, Establishing HSB, Rev. 43

**Alternate Path:** Yes   X   No \_\_\_\_\_

**Time Critical:** Yes \_\_\_\_\_ No   X  

**Time Allotment:** 20 minutes

**Critical Steps:** 1.3, 2.2, 2.3, 3.2, 4.2, 8.2, 9.2

**Job Designation:** RO / SRO

**Rev Comments/LRN TIPS:** Bank LJP-038

**Gen KA # / Rating:** 064.A3.06 – Ability to monitor automatic operation of the ED/G system including: start and stop. 3.3 / 3.4

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**AUTHOR:** \_\_\_\_\_ **LISA TORIBIO** \_\_\_\_\_ **DATE:**   08/24/17  

**OPERATIONS**

**REPRESENTATIVE:** \_\_\_\_\_ **CHRIS MEHIGAN** \_\_\_\_\_ **DATE:**   10/25/17  

**REV. 0**

- Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. The examinee should be given the “required materials” shown below, and access to other plant references as appropriate.
- Equipment operation “Cues” are contingent on proper operation by the examinee and should be “adjusted” should equipment operation differ from expected.
- Required Materials:** Copy of OP AP-8A (Unit 1), Section 9, Step 9.6
- Initial Conditions:** Given:
- A fire in the vertical boards has required an evacuation of the control room.
  - U-1 control has been established from the Hot Shutdown Panel.
- Initiating Cue:** The Shift Foreman directs you to establish local control and start diesel generator 1-2 in accordance with OP AP-8A, Section 9, Step 9.6.

**NOTE: Do NOT provide examinee with Task Standard**

- Task Standard:** Diesel Generator 1-2 has been started by sequentially
- 1) Placing 125V DC Control Power Transfer Switch (EQD-12) to OFF
  - 2) Placing droop switch to the ISOC position
  - 3) Placing the Mode Control selector switch to the TEST position
  - 4) Placing the diesel generator 12 control selection switch to the LOCAL position
  - 5) Placing the Remote Shutdown Fuse Selector (43DC-12/SS) switch to the BACKUP position
  - 6) Placing the 125V DC control Power transfer switch (EQD-12) in BACKUP position.
  - 7) Placing the Engine Control switch to the START position.
- in accordance with OP AP-8A, Section 9, Step 9.6.

- Site Safety Standard:** All personnel entering the Diesel Generator room shall have double hearing protection in their possession. The individual performer shall have double hearing protection in place prior to simulating the manual start of Diesel Generator 1-2. Per TQ2.ID8, Rev. 17, the same safety standard shall be used for simulated tasks.



Start  
Time: \_\_\_\_\_

Step		Expected Operator Actions	
** 1.	OP AP-8A, Step 9.6.2 – Place the 125 VDC Control Power Transfer Switch (EQD-12) in "OFF".	1.1	Read and observed procedure CAUTIONs prior to Step 9.6.
		1.2	Located the 125 V DC Control Power Transfer Switch on the right side of the DG 1-2 DC Cont Pwr Transfer Switch Panel.
		** 1.3	Placed the 125V DC Control Power Transfer Switch (EQD-12) in OFF  ***** <b>Cue: "EQD-12 is in the OFF (middle) position."</b> *****  Step was: Sat _____ Unsat _____

Comments:

** 2.	OP AP-8A, Step 9.6.3, 4 –Place Droop Switch on excitation cubicle to "ISOC" and place Mode Control Switch in "Test".	2.1	Located the diesel generator 12 droop switch on the excitation cubicle.
		** 2.2	Placed the droop switch to the ISOC position.  ***** <b>Cue: "The Droop Switch is in the ISOC position."</b> *****  Step was: Sat _____ Unsat _____

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions
**	2.3	Placed the Mode Control selector switch to the TEST position.  *****  <b>Cue: “The Mode Control Switch is in the TEST position.”</b>  *****  <b>Step was: Sat _____ Unsat _____</b>

Comments:

Step		Expected Operator Actions			
**	3.	OP AP-8A, Step 9.6.5 - Place Control Selection switch on excitation cubicle in "LOCAL".	3.1	Located the diesel generator 12 control selection switch on the excitation cubicle.	
			**	3.2	Placed the diesel generator 12 control selection switch to the LOCAL position.
					*****
					Cue: "The Control Selector Switch is in the LOCAL position."
					*****
					Step was: Sat _____ Unsat _____

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
** 4.	OP AP-8A, Step 9.6.6 - Place Remote Shutdown Fuse Selector switch (43DC-12/SS) on control panel in "BACKUP".	4.1	Located the 43DC-12/SS switch on the diesel generator 12 local control panel.
		** 4.2	Placed the Remote Shutdown Fuse Selector switch to the BACKUP position. ***** <b>Cue: "The Remote Shutdown Fuse Selector switch is in the BACKUP position."</b> ***** <b>Step was: Sat _____ Unsat _____</b>

Comments:

5.	OP AP-8A, Step 9.6.7 - Place 125 VDC Control Power Transfer Switch (EQD-12) in "NORMAL".	5.1	Placed the 125V DC Control Power Transfer Switch to NORMAL. ***** <b>Cue: "The EQD-12 is in the NORMAL (top) position."</b> ***** <b>Step was: Sat _____ Unsat _____</b>
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Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
6.	OP AP-8A, Step 9.6.8 - Press Alarm Relay Reset pushbutton on control panel.	6.1	Located the alarm relay reset push button on diesel generator 12 local control panel.
		6.2	Depressed the alarm relay reset push button. ***** <b>Cue: "The Alarm Reset push button has been depressed and returned to normal."</b> *****
		Step was: Sat _____ Unsat _____	

Comments:

7.	OP AP-8A, Step 9.6.9 - Place engine control switch (DE-12) on control panel in "START".	<b><u>Note:</u> Per DCP Site Safety Standards, the individual performer should have double hearing protection in place prior to simulating start of Diesel Generator 1-2.</b>	
		7.1	Read NOTE
		7.2	Located the START/STOP switch at the diesel generator 12 local control panel.
		7.3	Placed the START/STOP switch to the START position. ***** <b>Cue: "There was no audible noise level change in the room (the diesel generator did not start)."</b> *****
		Step was: Sat _____ Unsat _____	

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
<< Alternate Path – Start Point >>	

- |   |   |
|---|---|
| <p>** 8. OP AP-8A, Step 9.6.10.a-c - IF DG 1-2 did NOT start, transfer Control Power to Backup.</p> | <p>8.1 Located control power transfer switch EQD-12 opposite the diesel generator 12 local control panel.</p>   |
|   | <p>** 8.2 Placed the 125V DC control Power transfer switch (EQD-12) in OFF, waits 10 seconds, then places in BACKUP position.</p> <p>*****</p> <p><b>Cue: “The normal power supply light is OFF and the backup power supply light is ON.”</b></p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p> |

Comments:

- |   |  |
|---|--|
| <p>** 9. OP AP-8A, Step 9.6.10.d - Place engine control switch (DE-12) on control panel in "START".</p> | <p>9.1 Located the Engine Control switch at the diesel generator 12 local control panel.</p>   |
|   | <p>** 9.2 Placed the Engine Control switch to the START position.</p> <p>*****</p> <p><b>Cue: “Normal DG startup noise level is heard.”</b></p> <p>*****</p> |

<< Alternate Path – End Point >>

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
10. OP AP-8A, Step 9.6.11 – Contact HSDP	10.1 Notified the SFM at the U-1 HSDP of DG status, and asks if 4KV bus voltage is satisfactory ***** Cue: “The U-1 SFM reports that DG 1-2 operation and 4KV bus voltage are satisfactory.” ***** Step was: Sat _____ Unsat _____

Comments:

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

**Follow up Question Documentation:**

**Question:** \_\_\_\_\_  
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**Response:** \_\_\_\_\_  
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\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Initial Conditions:** Given:

- A fire in the vertical boards has required an evacuation of the control room.
- U-1 control has been established from the Hot Shutdown Panel.

**Initiating Cue:** The Shift Foreman directs you to establish local control and start diesel generator 1-2 in accordance with OP AP-8A, Section 9, Step 9.6.



NUCLEAR POWER GENERATION  
DIABLO CANYON POWER PLANT  
JOB PERFORMANCE MEASURE

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**Number:** NRCL162-P3

**Title:** Manually Operate the Cardox System

**Examinee:** \_\_\_\_\_

**Evaluator:** \_\_\_\_\_

Print \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_

**Testing Method:** Perform \_\_\_\_\_ Simulate   X  

**Results:** Sat \_\_\_\_\_ Unsat \_\_\_\_\_ Total Time: \_\_\_\_\_ minutes

**Comments:** **This is a Unit 2 JPM**

**References:** Units 1&2, OP K-2B:II, Manual Use of the Cardox System, Rev. 11

**Alternate Path:** Yes   X   No \_\_\_\_\_

**Time Critical:** Yes \_\_\_\_\_ No   X  

**Time Allotment:** 15 minutes

**Critical Steps:** 2.4, 3.1, 3.2

**Job Designation:** RO or SRO

**Rev Comments/LRN TIPS:** Bank LJP-138A  
067.AA1.08 – Ability to operate and / or monitor the following as they apply to the Plant Fire on Site: Fire fighting equipment used on each class of fire.

**Gen KA # / Rating:** 3.4 / 3.7

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**AUTHOR:** \_\_\_\_\_ **LISA TORIBIO** \_\_\_\_\_ **DATE:**   08/30/17  

**OPERATIONS REPRESENTATIVE:** \_\_\_\_\_ **CHRISTOPHER MEHIGAN** \_\_\_\_\_ **DATE:**   10/25/17  

**REV. 0**

**Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by examinee should be clearly demonstrated and verbalized to the evaluator. The examinee will be given the initial conditions and initiating cue. The task standard will NOT be read to the examinee. The examiner will then ask if any clarifications are needed. The examinee should be given the “required materials” shown below, and access to other plant references as appropriate.

Equipment operation “Cues” are contingent on proper operation by the examinee and should be “adjusted” should equipment operation differ from expected.

**Required Materials:** Copy of OP K-2B:II, Section 6.3.

**Initial Conditions:** Given:

- A fire has been reported in the Unit 2 Cable Spreading Room.
- Automatic actuation of the Cable Spreading Room cardox has not occurred.
- Manual Control Room actuation of the Unit 2 Cable Spreading Room did not work.
- There are NO personnel in either Cable Spreading Room.

**Initiating Cue:** The Shift Foreman directs you to locally actuate cardox discharge to the Unit 2 Cable Spreading Room, per OP K-2B:II, Step 6.3.

**NOTE: Do NOT provide examinee with Task Standard**

<b>Task Standard:</b>	Cardox is initiated to the U2 Cable Spreading Room for the proper duration, in accordance with OP K-2B:II by performing the following: <ul style="list-style-type: none"><li>• Opening 2-FCV-102</li><li>• Opening 0-FCV-104</li><li>• Reclosing 2-FCV-102</li></ul>
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**Start  
Time:** \_\_\_\_\_

<b>Step</b>		<b>Expected Operator Actions</b>	
1.	OP K-2B:II, Step 6.3.1 – Attempts local discharge to U-2 Cable Spreading Room via pushbutton.	1.1	Read NOTE prior to Step 6.3.1.
		1.2	For 2-FCV-102, pulled cover and depressed button. ***** <b>Cue: “NO audible flow noise is heard in the CO<sub>2</sub> piping.”</b> *****
		1.3	Determined that CO <sub>2</sub> discharge did not occur, and moved on to next step. <b>Step was: Sat</b> _____ <b>Unsat</b> _____

**Comments:**

<< Alternate Path – Start Point >>

Step		Expected Operator Actions	
**	2.	OP K-2B:II, Step 6.3.2.a-c – Manually actuates CO <sub>2</sub> to the Cable Spreading Room.	2.1 Read CAUTION prior to Step 6.3.2.a.
			2.2 Verified personnel are clear of the Unit 2 Cable Spreading Room. ***** <b>Cue: “There are no personnel in the Cable Spreading Room.”</b> *****
			<b>Note: The valve handle is parallel to the pipe when the valve is open.</b>
			2.3 Verified abort valve for Unit 2 Cable Spreading Room is open (2-HCV-2074). ***** <b>Cue: “The valve operator for 2-HCV-2074 is in line/parallel with the piping.”</b> *****
			** 2.4 Broke glass and opened pilot for 2-FCV-102.
			2.5 Read note prior to step to open 0-FCV-104. ***** <b>Cue: “NO audible flow noise is heard in the CO<sub>2</sub> piping.”</b> *****
			Step was: Sat _____ Unsat _____

Comments:

\*\* Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
** 3.	OP K-2B:II, Step 6.3.2.d-e – Manually opens the Selector Pilot Control Valve.	** 3.1	At the storage tank, broke glass and opened the Master Valve 0-FCV-104.  ***** <b>Cue: “Audible flow noise is heard in the CO<sub>2</sub> piping.”</b> *****  <b>Note: Give following Cue only after examinee verbalizes that valve will be kept open for between 2 minutes and 35 to 2 minutes 45 seconds.</b> *****  <b>Cue: “Two minutes and 40 seconds have elapsed.”</b> *****
		** 3.2	Closed the Selector Pilot Control Valve 2-FCV-102.  ***** <b>Cue: “There is no more audible flow noise in the CO<sub>2</sub> piping.”</b> *****

<< Alternate Path – End Point >>

Step was: Sat \_\_\_\_\_ Unsat \_\_\_\_\_

Comments:

Stop Time: \_\_\_\_\_

Total Time: \_\_\_\_\_ (Enter total time on the cover page)

\*\* Denotes Critical Step and Sub-Steps

**Follow up Question Documentation:**

**Question:**

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**Response:**

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**Initial Conditions:** Given:

- A fire has been reported in the Unit 2 Cable Spreading Room.
- Automatic actuation of the Cable Spreading Room cardox has not occurred.
- Manual Control Room actuation of the Unit 2 Cable Spreading Room did not work.
- There are NO personnel in either Cable Spreading Room.

**Initiating Cue:** The Shift Foreman directs you to locally actuate cardox discharge to the Unit 2 Cable Spreading Room, per OP K-2B:II, Step 6.3.

Facility: Diablo Canyon (PWR) Scenario No: 1 Op-Test No: L162 NRC

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: 3% power with CCP 1-2 In Service (75 gpm letdown); MFP 1-1 supplying S/Gs; on Startup Power; MOL, 1234 ppm boron

Turnover: In OP L-3, performing step 6.28, raising power to 8%.

Event No	Malf No.	Event Type*	Event Description (See Summary for Narrative Detail)
1	N/A	R (ATC, SRO)	Raise reactor power from 3% to $\approx$ 8% <b>OP L-3</b> , sec 6.28
2	XMT_RMS23_3 1E+006	TS, I (BOP, SRO)	S/G Blowdown RM-23 fails high. FCV-498/ FCV-499 and half of sample valves fail to isolate, but can be manually closed ( <b>ECG 39.3.B</b> )(PK11-17)
3	PMP_CVC2_2 OVERLOAD_DEV_FAIL	TS, C (ALL)	Centrifugal Charging Pump 1-2 OC Trip requiring restoration of letdown ( <b>TS 3.5.2.A</b> ) ( <b>AP-17</b> )
4	XMT_MSS1_3 15 ramp=300	I (ATC, SRO)	PT-507, Steam Generator Header Pressure Transmitter, slow failure low causing Group I dumps to close. ( <b>AP-5</b> )
5	PMP_AFW1_2 OVERLOAD_DEV_FAIL PMP_AFW2_2 OVERLOAD_DEV_FAIL BST_MFW1_1 1	TS, C (ALL)	MFP 1-1 trips. MDAFW pumps start but trip; requires start of TDAFW pump. ( <b>TS 3.7.5.D</b> )(PK09-12, AP-15)
6	MAL_MSS6A 90 ramp=240 MAL_MSS6A 0 delay=10 cd='jpplsia'	M (ALL)	S/G 1-1 Safety Lifts; reseats 10 seconds after SI
7	CVC9CVC_CCP11_MTRSHEAR delay=30 cd='jpplsia'	C (BOP)	CCP 1-1 shaft shear 30 seconds after SI
8	VLV_PZR4_2 0.3 cd='jpplsia' delay=60	C (BOP)	Pressurizer PORV PCV-455C fails slightly open on trip requiring manual isolation by associated block valve
9	MAL_RCS3B 3.5 cd='V1_240S_1 or V1_241S_1' delay=0 ramp=15	M (ALL)	SBLOCA after SI is terminated in <b>E-1.1</b>

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



Target Quantitative Attributes (Per Scenario; See Section D.5.d) (from form ES301-4)	Actual Attributes
1. Total malfunctions (5–8) (Events 2,3,4,5,6,7,8,9)	8
2. Malfunctions after EOP entry (1-2) (Event 7,8)	2
3. Abnormal events (1–4) (Events 2,3,4,5)	4
4. Major transients (1-2) (Events 6,9)	2
5. EOPs entered/requiring substantive actions (1–2) (E-1.1)	1
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)(See description below)	2

Critical Task	Justification	Reference
(S1CT-1) Close the block MOV upstream of the stuck open PORV prior to performance of step 8 of EOP E-0, Reactor Trip or Safety Injection.	The open PORV and block valve constitute the degradation of a fission product barrier. Closing the block valve is essential to safety since failure to do so results in the unnecessary continuation of the degraded condition.	<ul style="list-style-type: none"> <li>Westinghouse Owner's Group WCAP-17711-NP</li> </ul>
(S1CT-2) Reinitiate SI before a severe challenge to the Core Cooling Critical Safety Function develops (magenta path on F-0.2 Core Cooling).	Degraded core cooling is caused by a substantial loss of primary coolant. Reinitiation of high pressure safety injection is the most effective method to restore RCS inventory and core cooling. The effectiveness of safety injection in restoring core cooling is determined by the trend in core exit TC temperatures or RVLIS full range when the RCPs are tripped.	<ul style="list-style-type: none"> <li>Background Information for WOG Emergency Response Guideline HFRC2BG Rev 3.</li> </ul>
<i>Per NUREG-1021, Appendix D, if an operator or crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.</i>		

## SCENARIO SUMMARY – NRC #1

1. Control rods are used to raise power from 2% to  $\approx$  8% **OP L-3, Secondary Plant Startup**, step 6.28. ATC operator complies with 1 step pull and wait procedural requirement while monitoring relevant controls and diverse indicators. Shift Foreman provides reactivity oversight.
2. S/G Blowdown RM-23 fails high resulting in only a partial blowdown isolation. The crew responds, manually isolating the unactuated sample isolation valves and realigning blowdown discharge to the Equipment Drain Receiver, following the guidance of **AR PK11-17, SG BLOW DOWN HI RAD**. Shift Foreman enters **ECG 39.3.B, Radioactive Liquid Effluent Monitoring Instrumentation**, for Steam Generator Blowdown Tank (RM-23) inoperable.
3. Charging Pump CCP 1-2 trips on over current. The crew responds by entering **OP AP-17, Loss of Charging** to restore normal charging and letdown. Shift Foreman enters Tech Spec **3.5.2.A, ECCS – Operating**, for one ECCS train inoperable.
4. PT-507, Steam Generator Header Pressure Transmitter, slowly fails low causing Group I dumps to close. Crew diagnoses the failure and takes manual control of HC-507. **OP AP-5, Malfunction of Eagle 21 Protection or Control Channel** is used to address the failure and return primary and secondary to normal bands.
5. MFP 1-1 trips on high vibration. Both MDAFW pumps start initially, but trip on overcurrent. The crew enters **AR PK09-12, Main Feedwater Pump Trip**, and follow the guidance of **OP AP-15, Loss of Feedwater Flow, Section B: Single Operating MFP Trips**, starting the TDAFW pump, tripping the turbine, and inserting rods in manual to reduce power to 2%. Shift Foreman enters Tech Spec **3.7.5.D, AFW System**, for two AFW trains inoperable.
6. S/G 1-1 Safety lifts causing uncontrollable depressurization of S/G 1-1. Shift Foreman directs board operators to trip the reactor and initiate Safety Injection once reactor trip has been verified. The crew enters **EOP E-0, Reactor Trip or Safety Injection**. The safety valve reseats 45 seconds after Safety Injection initiates. The crew throttles AFW to control the cooldown as they work their way towards SI termination.
7. CCP 1-1 fails due to a sheared shaft 30 seconds after SI actuation. The board operator identifies the condition based on low motor amps and flow.
8. Board operators also identify PCV-455C in mid-position. The valve will not close and must be isolated using the associated block valve 8000B **(S1CT-1) Close the block MOV upstream of the stuck open PORV before performing step 8 of EOP E-0).**
9. Once termination criteria has been met, the crew transitions to **EOP E-1.1, SI Termination**. A SBLOCA occurs immediately following the shutdown of Safety Injection Pump 1-2. The crew performs the final critical task of reinitiating Safety Injection **(S1CT-2) Reinitiate SI before a severe challenge to the Core Cooling Critical Safety Function develops (magenta path on F-0.2 Core Cooling).**

The scenario is terminated once ECCS pumps have been restarted.

**Op-Test No.: L162-NRC**

**Scenario No.: 1**

**Event No.: 1**

Page 1 of 16

**Event Description:**     **Raise Power to 8%**

Time	Position	Applicant's Actions or Behavior
<b>Note:</b> Procedure step numbers are included at the front of each action/comment in parenthesis, where applicable.		
<b>(OP L-3, Secondary Plant Startup, starting at step 6.28)</b>		
	SRO	Reads NOTE prior to step 6.28
	ATC	<ul style="list-style-type: none"> <li>(6.28) Slowly raises power to 8% by pulling control rods one step at a time.</li> </ul>
	SRO	Provides reactivity oversight while raising power
	BOP	<ul style="list-style-type: none"> <li>(6.29) Monitors feed/steam delta P (PI-509, VB3 or CC2, DFWCS HMI on CC3)</li> <li>(6.30) Verifies that DFWCS maintains constant delta P during rise in power</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Reads NOTE prior to step 6.31</li> </ul>
Proceed to the next event once reactivity manipulation adequately observed and power > 3.5%, per the lead examiner.		

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**\*\* Critical Task**

Op-Test No.: L162-NRCScenario No.: 1Event No.: 2Page 2 of 16Event Description: S/G Blowdown RM-23 Fails High

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnosis made by using one or more of the following: <ul style="list-style-type: none"> <li>• PK11-17, SG BLOW DOWN HI RAD</li> <li>• Several blowdown isolation and sample valves going closed</li> </ul>
	SRO	Implements PK11-17, SG BLOW DOWN HI RAD
<b>(AR PK11-17, SG BLOW DOWN HI RAD)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>• (1) Reads input 1242 and determines failure is from RE-23, goes to section 2.1 for General Actions</li> </ul>
	SRO/BOP	(2.1.1) Determines blowdown isolated and SG Blowdown Tank shift to Equipment Drain Receiver did not occur (partial isolation only) <ul style="list-style-type: none"> <li>• Closes OC SG blowdown isolation valves (red light out, green light lit) <ul style="list-style-type: none"> <li>◦ FCV-151, FCV-154 (VB3)</li> </ul> </li> <li>• Closes SG blowdown sample valves (red light out, green light lit) <ul style="list-style-type: none"> <li>◦ FCV-250, FCV-248 (VB3)</li> </ul> </li> <li>• Closes FCV-498, Disch Tunnel (red light out)</li> <li>• Opens FCV-499, Equip Drn Rcvr (blue light lit)</li> </ul>
	SRO	(2.1.2 – 2.1.9) Performs several "evaluate" steps and directs Chemistry to sample S/Gs.
	SRO/BOP	(2.1.10) Places the RE 19 & 23 Hi Rad SG BD & Smpl Vlvs (O.C.) Iso Defeat C/O SW in "CUT IN" (up) position (VB3)
	SRO	Enters <b>ECG 39.3.B, Radioactive Liquid Effluent Monitoring Instrumentation</b> , for Steam Generator Blowdown Tank (RM-23) inoperable. Required actions: Stop any discharge in progress. Discharges may be made, provided grab samples are performed prior to release. Restore to OPERABLE status within 30 days.
<b><i>Proceed to the next event once ECG addressed, per the lead examiner.</i></b>		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 1Event No.: 3Page 3 of 16Event Description: Centrifugal Charging Pump 1-2 OC Trip

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnosis of CCP 1-2 OC trip is made from one or more of the following: <ul style="list-style-type: none"> <li>• CCP 1-2 blue OC light is lit, and the pump is no longer running (VB2, lower center)</li> <li>• PK04-17, CCP 1-2 alarm (OC trip input)</li> <li>• PKs 05-01 – 05-04, due to RCP seal low flow alarms</li> <li>• Observes low charging flow and/or RCP seal flows (CC2, PPC, VB2 meters)</li> <li>• Observes letdown has isolated (VB2, upper skirt)</li> </ul>
	SRO	Implements OP AP-17, Loss of Charging, Section A, Loss of All Charging
<b>(OP AP-17, Loss of Charging starting at section A, Loss of All Charging)</b>		
	SRO/BOP	<ul style="list-style-type: none"> <li>• (1.a ) Verifies suction flow path               <ul style="list-style-type: none"> <li>○ VCT level and pressure – normal (VB2, PPC)</li> <li>○ LCV-112B and LCV-112C open (CCP suction) (VB2, lower center)</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• (1.b) Determines that pump venting not required at this time</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (1.c) Verifies 8105 and 8106 open (CCP recircs) (VB2, lower center)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>• (1.d) Closes FCV-128 (CC2 right side)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (1.e) Starts standby CCP (specific pump specified by SRO) (VB2, lower center)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>• (1.f) Establishes charging flow to RCP seals only (all CC2, right side)               <ul style="list-style-type: none"> <li>○ Throttles FCV-128 open to establish 8-13 gpm each to RCP seal</li> <li>○ Throttles HCV-142 to closed or nearly closed</li> </ul> </li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 1Event No.: 3Page 4 of 16Event Description: Centrifugal Charging Pump 1-2 OC Trip (cont)

Time	Position	Applicant's Actions or Behavior
<b>(OP AP-17, Loss of Charging starting at section A, Loss of All Charging, cont)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>• (1.g,h) Adjusts charging in manual to return level to program(FCV-128) (CC2)</li> <li>• (2) Adjusts HCV-142 to maintain RCP seal flows 8-13 gpm (CC2)</li> <li>• (3.a) Checks Pzr level &gt; 17% (CC2 recorder, PPC, VB2 meter)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (3.b) Checks letdown in service; determines normal letdown can be restored (VB2, upper left skirt)</li> </ul>
<b>(OP AP-17, Loss of Charging, App R)</b>		
	BOP/ATC	<ul style="list-style-type: none"> <li>• Reads CAUTION prior to step 1, App. R regarding high letdown temperature and the potential for lifting RV-8117. <ul style="list-style-type: none"> <li>○ (1.a) Checks FCV-355 open (it is) (VB1, lower left skirt)</li> <li>○ (1.b) Opens TCV-130 to 40% demand (VB2, lower middle)</li> <li>○ (1.c) Ensures 8149A,B, and C are closed (they are) (VB2, upper middle skirt)</li> <li>○ (1.d) Opens LCV-459 and LCV-460 (VB2, upper middle skirt)</li> <li>○ (1.e) Checks 8152 open (VB2, upper middle skirt)</li> <li>○ (1.f) Opens PCV-135 to 60% demand (VB2, lower middle)</li> <li>○ (1.g) Adjusts charging to ≈ 87 gpm (ATC) (CC2)</li> <li>○ (1.h) Opens 8149B or C – 75 gpm orifice stop valve (VB2, upper middle skirt)</li> <li>○ (1.i) Adjusts PCV-135 for 350 psig on PI-135 and returns to AUTO (VB2, upper middle).</li> <li>○ (1j) Adjusts TCV-130 for 90°F-110°F on TI-130 and returns to AUTO (VB2, upper middle).</li> <li>○ (1k) Checks RV-8117 Letdown Relief Valve tailpipe temperature to verify relief valve is seated (TI-129 VB2, middle)</li> </ul> </li> </ul>
<b>(OP AP-17, Loss of Charging starting at section A, Loss of All Charging, cont)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>• (3.c) Adjusts charging in manual to return level to program by throttling FCV-128 for flow, and maintaining RCP seal flows 8-13 gpm using HCV-142 (CC2)</li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 1**

**Event No.: 3**

Page 5 of 16

**Event Description:** Centrifugal Charging Pump 1-2 OC Trip (cont)

Time	Position	Applicant's Actions or Behavior
<b>(OP AP-17, Loss of Charging starting at section A, Loss of All Charging, cont)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>• (4.a – d.) Checks VCT Makeup Control               <ul style="list-style-type: none"> <li>○ Checks VCT level 14% to 87% (LI-112 on VB2)</li> <li>○ Reads NOTE prior to step 4.b</li> <li>○ Checks VCT pressure 15 to 60 psig (PI-135 on VB2)</li> <li>○ VCT makeup control (YIC-100) in AUTO mode and set for current RCS boron concentration which is displayed on Iamicaid above ATC PPC displays (CC2)</li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (4.e) Verifies instrument air is available (VB4 lower left area)</li> <li>• (5) Checks LCV-112B and LCV-112C open, providing suction from the VCT(VB2, middle skirt)</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• (6) Reviews Tech Specs and enters <b>Tech Spec 3.5.2.A</b> – One train of ECCS inoperable. Required actions:               <ul style="list-style-type: none"> <li>○ Verify only one subsystem in the ECCS train is inoperable, and determine there is no common cause failure in the same subsystem in the operable ECCS train within 72 hours</li> <li>○ Restore train to operable status within 14 days.</li> </ul> </li> </ul>
<b>Proceed to the next event once Tech Specs addressed, per the lead examiner.</b>		

## \*\* Critical Task

Op-Test No.: L162-NRC      Scenario No.: 1      Event No.: 4      Page 6 of 16

Event Description:    **Steam Header Pressure Transmitter PT-507 Slow Failure**

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnoses PT-507 failed low from one or more of the following: CC-2 Indications: <ul style="list-style-type: none"> <li>Tave, Pressurizer level, Pressurizer pressure - rising</li> </ul> CC-3 Indications: <ul style="list-style-type: none"> <li>HC-507 demand lowers to 0%</li> </ul> VB-3 Indications: <ul style="list-style-type: none"> <li>Group I 40% Steam Dump (PCV-1, 3, 6, 8) – go closed</li> <li>Dump Demand (UI-500) lowers to 0%.</li> </ul>
	SRO/ATC	Takes manual control of HC-507 and reopens Group I dump valves to stabilize plant
	SRO	Enters OP AP-5, Malfunction of Eagle-21 Protection or Control Channel
<b>(OP AP-5, Malfunction of Eagle-21 Protection or Control Channel)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1.0) Confirms that Steam Generator pressure was NOT controlling properly in Auto and has been taken to manual (CC3, HC-507). Directs Tave be returned to prior steady-state value</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(2.0) Determines that the failure is not Eagle-21 related (PK06-01 and PK06-03 are OFF)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(3.0) Determines failure is not associated with a <math>\Delta T</math> channel (VB2)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(4.0) Verifies steam dumps are not open as result of instrument failure or spurious actuation. (Dumps SHOULD be open to maintain temperature for current 3% power conditions. Shift Foreman SHOULD NOT enter RESPONSE NOT OBTAINED column)</li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task



**Op-Test No.: L162-NRC                      Scenario No.: 1                      Event No.: 4                      Page 7 of 16**

**Event Description:**     **Steam Header Pressure Transmitter PT-507 Slow Failure (cont)**

[illegible]

## \*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 1Event No.: 5Page 8 of 16Event Description: MFP 1-1 trips; MDAFW pumps start but trip

Time	Position	Applicant's Actions or Behavior
<b>Note:</b> If the crew manually trips the reactor in response to this failure, the scenario major event (S/G safety valve lifting) will be initiated and the scenario continued. A manual reactor trip would be considered a post-scenario Critical Task.		
	ALL	Diagnoses MFP 1-1 trip from one or more of the following: <ul style="list-style-type: none"> <li>• PK09-12, Main Feedwater Pump Trip</li> </ul>
<b>(PK09-12, Main Feedwater Pump Trip, (if entered))</b>		
	SRO	<ul style="list-style-type: none"> <li>• (1) Reads input 557 and confirms MFP 1-1 has tripped; goes to section 2.1 for General Actions</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• (2.1.1-2.1.2) Notes Reactor is below 15% , therefore, auto Rx trip doesn't apply, nor does the requirement to manually trip the reactor.</li> <li>• (2.1.3) Notes programmed ramp is not applicable for current configuration</li> <li>• (2.1.4) Implements <b>OP AP-15, Loss of Feedwater Flow</b></li> </ul>
<b>(OP AP-15, Loss of Feedwater Flow)</b>		
	SRO	<ul style="list-style-type: none"> <li>• Determines Section B: Single Operating MFP Trips is the appropriate section; goes to page 8.</li> </ul> (Section B: Single Operating MFP Trips: <ul style="list-style-type: none"> <li>• (1) Checks power is less than 15%</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (2) Checks status of AFW pumps (VB3)               <ul style="list-style-type: none"> <li>○ Notes MDAFW pumps have tripped.</li> <li>○ Step requires all AFW pumps to be running; starts TDAFW pump</li> </ul> </li> <li>• (3) Determines MFP 1-2 is NOT latched (therefore NOT available for loading); follows RNO to step 5.</li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 1**

**Event No.: 5**

Page 9 of 16

**Event Description:** MFP 1-1 trips; MDAFW pumps start but trip (cont)

[illegible]

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**\*\* Critical Task**

Op-Test No.: L162-NRC

**Scenario No.: 1**

**Event No.: 6**

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**Event Description:** S/G 1-1 Safeties Lift Requiring Safety Injection

[illegible]

## \*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 1 Event No.: 6,7,8 Page 11 of 16

**Event Description:** S/G 1-1 Safeties Lift Requiring Safety Injection  
 CCP 1-1 Shaft Shear 30 seconds after Safety Injection  
 PCV-455C lifts on trip (CT)

Time	Position	Applicant's Actions or Behavior
<b>(EOP E-0, Reactor Trip or Safety Injection)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Verifies reactor trip (trip bkrs open (VB2 upper left), rods on bottom (VB2 upper left DRPI panel), NIs decreasing (CC1 left)</li> <li>(2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps).</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(3) Checks vital 4kv buses (VB4, vital busses F/G/H have white lights on mimic busses)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(4) Checks if SI actuated (PK08-21 ON, also checks VB1 red train lights and/or train equipment to verify both trains actuated)</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(5) Directs App E implemented (usually to BOP)(see page 15)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(6) Checks RCS temperature – stable (temps will initially be dropping due to faulted S/G; AFW should be throttled back (VB2, upper panel lower area)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(7) Checks Pzr PORVs and Pzr safeties (closed) / PORV block valves (all open, and no elevated tailpipe temps or sonic flows on safeties/PORVs (VB2 – upper panel, far right); checks Pzr sprays closed (CC2)               <ul style="list-style-type: none"> <li>Identifies 455C is OPEN and attempts closing valve but is unsuccessful (VB2)</li> <li>Closes block valve 8000B (S1CT-1)**</li> </ul> </li> <li>(8) Checks RCP trip criteria (RCS pressure [VB2, PPC] &lt; 1300 psig and SI or ECCS CCPs running (VB1 and VB2))</li> </ul> <p><b>** (Critical Task)(S1CT-1, Close the block MOV upstream of the stuck open PORV prior to performance of step 8 of EOP E-0).</b></p>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 1 Event No.: 6 Page 12 of 16

Event Description: S/G 1-1 Safeties Lift Requiring Safety Injection

Time	Position	Applicant's Actions or Behavior
<b>(EOP E-0, Reactor Trip or Safety Injection, con't)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(9) Determines S/G are NOT faulted               <ul style="list-style-type: none"> <li>May note S/G 1-1 is depressurized, but has stabilized</li> <li>None are completely depressurized</li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(10) Determines S/G are NOT ruptured               <ul style="list-style-type: none"> <li>Checks RE-71/72/73/74 and RE-15/19 recorders on VB2 (and PPC); (all normal)</li> <li>PK11-06/18-OFF, PK 11-17 in from previous RM-23 failure.</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(11) Checks RCS intact               <ul style="list-style-type: none"> <li>(11a) Determines containment pressure is normal (VB1 meters, PPC)</li> <li>(11b) Determines containment sump levels normal (VB1 meters, PAMS)</li> <li>(11c) Determines containment radiation is normal (RM-11, 02, 07)</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(12) Checks if ECCS Flow Should Be Reduced               <ul style="list-style-type: none"> <li>RCS Subcooling &gt; 20 °F (YI-31 on VB2 – upper panel, far right or SPDS)</li> <li>Secondary Heat Sink                   <ul style="list-style-type: none"> <li>Total AFW Flow &gt; 435 gpm (VB3)</li> <li>S/G NR Level &gt; 15% on at least one S/G (VB3)</li> </ul> </li> <li>WR RCS Pressure Stable or Rising</li> <li>PRZ Level &gt; 12%</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(13) Checks SI Reset</li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 1 Event No.: 6,7 Page 13 of 16

**Event Description:** S/G 1-1 Safeties Lift Requiring Safety Injection  
CCP 1-1 Shaft Shear 30 seconds after Safety Injection

Time	Position	Applicant's Actions or Behavior
<b>(EOP E-0, Reactor Trip or Safety Injection, con't)</b>		
<b>Note:</b> CCP 1-1 has a sheared shaft and may still be running if not shutdown as part of EOP E-0, Appendix E actions		
	SRO/ALL	<ul style="list-style-type: none"> <li>• (14) Aligns Charging               <ul style="list-style-type: none"> <li>○ (14.a) Checks ECCS CCP running                   <ul style="list-style-type: none"> <li>▪ Identifies low amperage on CCP 1-1 indicating a sheared shaft (VB2)</li> <li>▪ Shuts down CCP 1-1 (VB2)</li> </ul> </li> <li>○ (14.b) Depresses Vital 4kV Auto Transfer Relay Resets: Blue Light – OFF</li> <li>○ (14.c,d) Stops CCP 1-3 if CCP 1-1 still running; will leave CCP 1-3 running if they secure CCP 1-1.</li> </ul> </li> </ul>
	SRO/ALL	<ul style="list-style-type: none"> <li>• (15) Checks RCS pressure stable or rising – (VB2)</li> <li>• (16) Isolates Charging Injection               <ul style="list-style-type: none"> <li>○ Closes 8803A &amp; B (VB2)</li> <li>○ Closes 8801A &amp; B (VB2)</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>• (17) Establishes normal charging flow               <ul style="list-style-type: none"> <li>○ (17.a) Opens HCV-142 to 20% (CC2)</li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>○ (17.b) Opens 8107 and 8108, Norm Charging to Regen Hx Stop Valves (VB2).</li> <li>○ (17.c) Ensures 8146 OR 8147 – OPEN (VB2)</li> <li>○ (17.d) Ensures 8145 AND 8148 - CLOSED</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>○ (17.e) Throttles open FCV-128 to establish charging flow.</li> <li>• (18) Controls Charging Flow to Maintain PZR Level               <ul style="list-style-type: none"> <li>○ (6.a) Adjusts FCV-128 charging flow and HCV-142 to maintain:                   <ul style="list-style-type: none"> <li>▪ PZR Level - Stable, between 17% and 60%.</li> </ul> </li> <li>○ Seal injection to each RCP between 8 and 13 gpm.</li> </ul> </li> <li>• (19) Transitions to <b>EOP E-1.1, SI Termination, Step 7.</b></li> </ul>

\*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 1 Event No.: 9 Page 14 of 16

Event Description: SBLOCA after SI Termination in E-1.1 (CT)

Time	Position	Applicant's Actions or Behavior
<b>(EOP E-1.1, SI Termination)</b>		
<b>Note:</b> Procedure is started on step 7 since first six steps are duplicated in last part of E-0, just prior to transition. SBLOCA is triggered on shutdown on SI pump 1-2.		
	SRO/BOP	<ul style="list-style-type: none"> <li>(7) Checks if SI pumps should be stopped               <ul style="list-style-type: none"> <li>(7.a) Checks RCS Pressure –                   <ul style="list-style-type: none"> <li>Stable or rising</li> <li>Greater than 1650 psig</li> <li>No SI flow indications</li> </ul> </li> <li>(7.b) Stops both SI Pumps</li> </ul> </li> <li>(8) Checks if RHR pumps should be stopped               <ul style="list-style-type: none"> <li>(8.a) Checks RHR pumps running with suction aligned to the RWST</li> <li>(8.b) Shuts down both RHR pumps</li> </ul> </li> </ul>
<b>Note:</b> Indications of SBLOCA may have been identified prior to reaching this step and addressed as Fold Out Page action.		
	ALL	<ul style="list-style-type: none"> <li>(9) Ensures ECCS Flow Not Required               <ul style="list-style-type: none"> <li>(9.a) Subcooling greater than 20°F</li> <li>(9.b) PZR Level GREATER THAN 12%</li> </ul> </li> </ul>
	ALL	<ul style="list-style-type: none"> <li>(9.a RNO) Start ECCS Pps as necessary               <ul style="list-style-type: none"> <li><b>(9.a.1.b RNO) Starts available SI Pumps (S1CT-2)**</b></li> <li>(9.a.1.c RNO) Starts one RHR pump</li> <li>(9.a.2.a RNO) Open 8803A and 8803B</li> <li>(9.a.2.b RNO) Open 8801A and 8801B</li> <li>(9.a.2.c RNO) Close 8107 and 8108</li> </ul> </li> </ul> <p><b>** (Critical Task)(S1CT-2, Reinitiate SI before a severe challenge to the Core Cooling Critical Safety Function develops. Note: only 1 SI pump is required to meet the critical task.</b></p>
Scenario may be terminated any time after Injection Flow has been re-established (completion of S1CT-2).		

\*\* Critical Task



**Op-Test No.: L162-NRC**

**Scenario No.: 1**

**Event No.: 7**

Page 15 of 16

**Event Description:** EOP E-0, Reactor Trip or Safety Injection, Appendix E, ESF Auto Actions, Secondary and Auxiliaries Status

Time	Position	Applicant's Actions or Behavior
(EOP E-0, Appendix E)		
	BOP	Implements App E (ESF Auto Actions, Secondary and Auxiliaries Status): <ul style="list-style-type: none"> <li>• (1a) Checks no personnel in Containment (part of turnover; may not voice)</li> <li>• (1b) Announces trip/SI on PA system</li> <li>• (2) Checks main generator – tripped (PK14-01 ON, output bkrs OPEN, CC3 right side)</li> <li>• (3 &amp; 4) Verifies Phase A and Containment Vent Isolation complete (VB1, ESF status lights, red lights ON, white lights OFF);</li> <li>• (5) Verify ESF (SI) actuation complete</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (6) Verifies Feedwater isolation complete (F.W. Isolation and S.G. Level Portions of Monitor Light Box C: red lights ON, white light OFF.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (7) Determines Containment Spray and Phase B Isolation is NOT required (Contmt Isol, Phase B portion of Monitor Light Box D: red lights are OFF)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (8) Checks Main Steamline Isolation complete (Main Steam Isolation portion of Monitor Light Box D: red light OFF, white light are OFF)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (9) Checks AFW status <ul style="list-style-type: none"> <li>○ AFW Pp 1-2 and 1-3 both tripped</li> <li>○ TDAFW IS required.</li> <li>○ Verifies min of 435 gpm flow (VB3 center) or S/G level &gt; 15%</li> </ul> </li> </ul>
		(continued on next page)

### \*\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 1Event No.: 7Page 16 of 16

**Event Description:** EOP E-0, Reactor Trip or Safety Injection, Appendix E, ESF Auto Actions, Secondary and Auxiliaries Status (cont)

Time	Position	Applicant's Actions or Behavior
<b>(EOP E-0, Appendix E)</b>		
<b>Note:</b> CCP 1-1 has a sheared shaft and may still be running if not previously identified		
	BOP	<ul style="list-style-type: none"> <li>(10) Checks ECCS flows (charging injection (VB2 upper panel left), SI, RHR (both on VB1 upper panel)               <ul style="list-style-type: none"> <li>Identifies low amperage on CCP 1-1 indicating a sheared shaft (VB2)</li> <li>Shuts down CCP 1-1 (VB2)</li> </ul> </li> <li>(11) Reports ESF and AFW status to the Shift Foreman (Shift Foreman may direct operator to continue on in Appendix E, or redirect to higher priority tasks)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>(12) Checks excess letdown; notes NOT in service prior to trip</li> <li>(13) Checks secondary systems (MFPs tripped (VB2, green lights ON), stops all but one CB Pp set, takes LCV-12 control switch to CONT ONLY.</li> <li>(14) Verifies proper operation of Aux Bldg and Control Rm vent systems (VB4 vent status light panel white lights); turns on aux bldg vent charcoal filter preheater (VB4 lower panel, left side) and verifies containment iodine fans secured (VB4, lower panel),</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>(15) Verifies available DGs running normally (VB4, freq (60), volts (120), speed (900))</li> <li>(16) Verifies vital batteries supplied by chargers (charger and bus volts on VB5, upper panel middle/lower area);</li> <li>(17) Verifies MSRs reset (CC3 Triconex HMI)</li> <li>(18) Throttles RCP seal injection flows to normal if needed (FCV-128, to 8-13 gpm each, CC2)</li> <li>(19) Checks PK11-04 NOT IN (SFP alarm)</li> <li>(20) Notifies Shift Foreman of completion.</li> </ul>
<i>(Board Operator will rejoin crew upon completion of Appendix or when called upon by Shift Foreman)</i>		

\*\* Critical Task

## Attachment 1 – Scenario Set-up & Booth Actions

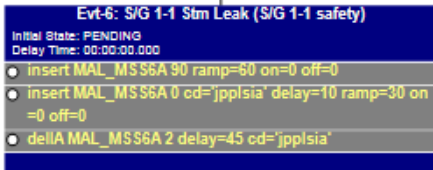
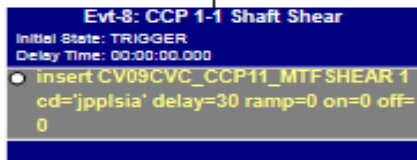
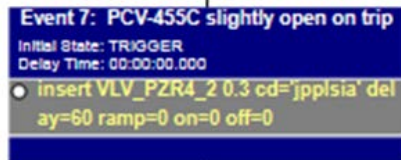
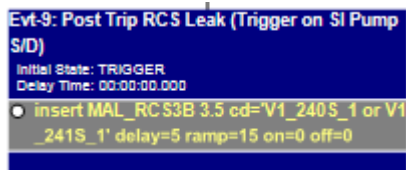
X = manual entry required

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	IC	RESTORE 150	3% power BOL, C <sub>B</sub> - 1234
X	Setup	N/A	Check 75 gpm letdown in service. BOL Reactivity Handbook and Charts
	The Plant Abnormal Status Board for Surveillance Requirements		FWPs on Long Recirc
	Copies of Procedures, Attachments; Appendixes; Foldout Pages; Annunciator Response Procedures and commonly used forms are in binders and <b>NOT</b> Marked up		<b>OP L-3 (marked up), PK09-12, 11-17, AP-5, AP-15, AP-17, EOP E-0, E-1.1</b>
X	0 min	Tools > Simple SBT	Before crew takes the watch. Use Simple SBT, Data Recorder File: sbt_sim.drb, min 960 iterations (30 sec). <u>Critical Task Specific Data Capture:</u> <ul style="list-style-type: none"> <li>S2CT1: 8000B Position.</li> <li>S2CT2: SI pump amps, discharge pressure, and suction pressure</li> </ul>
X	0 min	Lesson L161 NRC-S1.Isn	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by FILE or MANUALLY (below)
X	<u>Evt-1: Raise Power</u> (approx. 3 min after taking watch per lead examiner)	<u>Evt-1: Place Holder for Raise Power to 8% (OP L-3, Stp 6.28)</u> Initial State: PENDING Delay Time: 00:00:00.000	Want power to reach at least 3.5% prior to next event so delta T is adequate for subsequent failures such as Evt-4 (PT-507 failure). Monitor power for Mode transitions risk.
X	<u>Evt-2: S/G Blowdown RM-23 fails high</u> (Once once reactivity manipulation adequately observed, per the lead examiner)	<u>Evt-2: RM-23 Fails High (Partial B/D Isolation)</u> Initial State: PENDING Delay Time: 00:00:00.000 ● insert XMT_RMS23_3 1E+006 delay=5 ramp=0 on=0 off=0	Aux Watch - When dispatched to check status of RE-23, wait 5-6 minutes, then report local panel indication is pegged high. No spings currently alarming in the area, however.
X	<u>Evt-3: Centrifugal Charging Pump 1-2 OC Trip.</u> (Once Evt-2 ECG has been addressed, per lead examiner)	<u>Evt-3: CCP 1-2 OC Trip</u> Initial State: PENDING Delay Time: 00:00:00.000 ● insert PMP_CVC2_2 OVERLOAD_DEV_FAIL delay=0 ramp=0 on=0 off=0	Record which pump is started (CCP 1-1 or 1-3). When dispatched to check pump (Aux Watch) and breaker: <ul style="list-style-type: none"> <li>(Turbine Watch) report breaker 52-HG-09 tripped open; no obvious cause.</li> <li>(Aux Watch) report smell of burnt insulation, hot to the touch.</li> </ul>
X	<u>Evt-4: PT-507 Fails High</u> (Once Evt-3 TS have been addressed, per lead examiner)	<u>Evt-4: PT-507 Fails Low</u> Initial State: PENDING Delay Time: 00:00:00.000 ● insert XMT_MSS1_3 15 delay=0 ramp=300 on=0 off=0	Expect call to I&C for failure. Note where OOS stickers are placed on Sim floor for clean-up (exam security).
X	<u>Evt-5: MFP 1-1 trips. MDAFW pumps start but trip</u> (Once temperature has been stabilized, per lead examiner)	<u>Evt-5: MFP 1-1 Trip; AFW OC Trips</u> Initial State: PENDING Delay Time: 00:00:00.000 ● insert PMP_AFW1_2 OVERLOAD_DEV_FAIL cd=H_V3_221R_1' delay=2 ramp=0 on=0 off=0 ● insert PMP_AFW2_2 OVERLOAD_DEV_FAIL cd=H_V3_222R_1' delay=1 ramp=0 on=0 off=0 ● insert BST_MFW1_1 1 delay=0 ramp=0 on=0 off=0	When dispatched to check AFW pumps (Aux Watch) and MFP and breakers (Turbine Watch): <ul style="list-style-type: none"> <li>(Turbine Watch) report: <ul style="list-style-type: none"> <li>All stop valves indicate closed on pedestal; verified locally as well.</li> <li>dropped flag on breaker 52-HH-08 (AFW 1-2) and tripped open</li> <li>dropped flag on breaker 52-HF-09 (AFW 1-3) and tripped open</li> </ul> </li> <li>(Aux Watch) report no obvious cause on MDAFW pumps</li> </ul>

(con't on next page)

## Attachment 1 – Scenario Set-up & Booth Actions (con't)

X = manual entry required A = activate from EVENT file

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION						
<u>Evt-6:S/G 1-1 Safeties Lift Requiring Safety Injection</u> (Once crew has reduced power, per lead examiner)		Malfunction ramps in over 240 seconds to allow crew time to manually safety inject.						
<u>Evt-7: CCP 1-1 shaft shear 30 seconds after SI (post-EOP entry)</u>		If sent to locally investigate, report that pump is making loud, high-pitched whining noise.						
<u>Evt-8:PCV-455C fails 30% open 60 seconds after SI (post-EOP entry)</u>		RECORD TIME AT WHICH 8000B is closed: _____						
<u>Evt-9:SBLOCA after SI is terminated in E-1.1 (post-EOP entry)</u>		RECORD TIME AT WHICH SI PUMPS ARE STARTED BY CREW PER E-1.1 <table><tr><th>Pump</th><th>Time</th></tr><tr><td> </td><td> </td></tr><tr><td> </td><td> </td></tr></table>	Pump	Time				
Pump	Time							



# Diablo Canyon Power Plant Operations Shift Log



## Unit 1

*Unit 1 Days at Power: 0 Days*

**Operating Mode: 2**

**Gross Generation: 0 MWe**

**Power Level: 3%**

**Net Generation: 0 MWe**

### Today - Dayshift

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#### Shift Manager Turnover:

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PRA RISK STATUS NEXT SHIFT:	Green
GRID STATUS NEXT SHIFT:	Normal
AVERAGE RCS CALCULATED LEAKRATE:	0.01 gpm
CONDENSER INLEAKAGE:	< 0.01 gpd
CONDENSER D/Ps:	NW 5.9 SW 6.4 NE 6.3 SE 6.1 PSID
MAIN GENERATOR H2 USAGE:	325 scfd / 327 scfd 5 day ave
SPENT FUEL POOL:	Temp = 80°F; Time to 200°F = 30 hrs using actual temp (F-ID-7A)

#### NEW PRIORITY WORK:

- None

#### SHUTDOWN TECH SPECS / ECGS:

- None

#### ECG ACTIONS THAT IF COMPLETION TIME NOT MET ECG 0.3 IS ENTERED:

- None

#### TURNOVER ITEMS:

- Reactor trip occurred 7 days ago.
- The reactor was declared critical and power stabilized at 2% power late last shift.
- CCP 1-2 is in service with 75 gpm letdown.
- The unit is currently aligned to Startup.
- MFP 1-1 is in service and supplying feedwater.
- MFP 1-2 is in the process of being aligned and is unavailable at this time.
- No one is in Containment.

#### PRIORITY ITEMS FOR NEXT SHIFT:

- Continue with OP L-3, step 6.28, and raise power to approximately 8%.

## Shift Foreman Turnover

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### ANNUNCIATORS IN ALARM:

- There are no unexpected alarms - all current alarms are consistent with current mode and power level.

### TURNOVER ITEMS:

- U-1: 3% and preparing to raise power to approximately 8%.
- U-2: 100% power

### REACTIVITY MANAGEMENT:

- Time in core life: BOL.
- Power History: Previously at 100% for 17 days. Currently power level is approximately 3% following a reactor trip a week ago (MFP trip during maintenance).
- Boron concentration is 1234 ppm from a sample taken 2 hours ago.
- Control Rod Height: 136 steps on CBD.

### CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- None

### OTHER ABNORMAL PLANT STATUS

- None

Facility: Diablo Canyon (PWR) Scenario No: 2 Op-Test No: L162 NRC

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: 50% with CCP 1-3 and MFP 1-1 OOS; CCP 1-2 IS; MOL, 1000 ppm boron

Turnover: MFP 1-2 has elevated vibrations. ODM held earlier established action plan with ramping guidelines should conditions degrade.

Event No	Malf No.	Event Type*	Event Description (See Summary for Narrative Detail)
1	GGACRL_94BTVP 1	C, BOP	Gen Voltage Regulator fails requiring manual voltage control on the base adjuster (PK14-22).
2	VLV_CVC16_2 .11 delay=15 ramp=3	TS, C (ALL)	CVCS-8152 fails to 90% closed requiring Excess Letdown to be placed in service (PK04-21, AP-18) (TS 3.6.3.A).
3	MAL_SEI1 0.12 delay=0 ramp=15 ASISRWST 1.6e6 delay=10 ramp=1800	C, TS only (SRO)	Large seismic event causes rupture of RWST. (PK06-20, TS 3.5.4.B).
4	MAL_MFW2B 2.45 delay=0 ramp=60	C (ALL)	Vibrations on MFP 1-2 rise to ODM limit, requiring predesignated Unit 1 shutdown at 6 MW/min. (AP-25).
5	MAL_SEI1 0.2 cd='bsisrwst lt 54.6' delay=0 ramp=10 MAL_RCS1C 100%_DBA cd='bsisrwst lt 54.5'	M (ALL)	DBA LOCA on aftershock.
6	MAL_PPL5A BOTH MAL_PPL5B BOTH	C (BOP)	ATWS (13D/E Work)
7	MAL_PPL1A FAILURE_TO_INIT	C (BOP)	Phase A Train A fails to actuate.
8	MAL_CNM3 100 cd='rsih8980 lt 0.02' delay=60 ramp=15	C (ATC)	Sump blockage.

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d) (from form ES301-4)	Actual Attributes
1. Total malfunctions (5–8) (Events 1,2,4,5,6,7,8)	7
2. Malfunctions after EOP entry (1-2) (Events 6,7,8)	3
3. Abnormal events (1–4) (Events 1,2,4)	3
4. Major transients (1-2) (Event 5)	1
5. EOPs entered/requiring substantive actions (1–2) (E-1, E-1.3, ECA-1.3)	3
6. EOP contingencies requiring substantive actions (0–2) (ECA-1.3)	1
7. Critical tasks (2–3)(See description below)	2

Critical Task	Justification	Reference					
(S2CT-1) Initiate reactor trip prior to performance of E-0, step 2.	The safeguards systems that protect the plant during accidents are designed assuming that only decay heat and pump heat are being added to the RCS. Failure to manually trip the reactor causes a extreme challenge to the subcriticality critical safety function (red path on F-0.1 subcriticality) beyond that irreparably introduced by the postulated conditions.	<ul style="list-style-type: none"><li>Westinghouse Owner’s Group WCAP-17711-NP</li><li>Calc G.2 Rev 5 (08151-2169)</li><li>OP1.ID2, Time Critical Operator Actions Rev 8A, #34.</li></ul>					
(S2CT-2) Stop all running ECCS pumps with suction aligned to the containment recirc sump by the completion of ECA-1.3, step 5: <table><tr><td><ul style="list-style-type: none"><li>CCP 1-1</li></ul></td><td><ul style="list-style-type: none"><li>CCP 1-2</li></ul></td></tr><tr><td><ul style="list-style-type: none"><li>SIP 1-1</li></ul></td><td><ul style="list-style-type: none"><li>SIP 1-2</li></ul></td></tr><tr><td><ul style="list-style-type: none"><li>RHRP 1-1</li></ul></td><td><ul style="list-style-type: none"><li>RHRP 1-2</li></ul></td></tr></table>	<ul style="list-style-type: none"><li>CCP 1-1</li></ul>	<ul style="list-style-type: none"><li>CCP 1-2</li></ul>	<ul style="list-style-type: none"><li>SIP 1-1</li></ul>	<ul style="list-style-type: none"><li>SIP 1-2</li></ul>	<ul style="list-style-type: none"><li>RHRP 1-1</li></ul>	<ul style="list-style-type: none"><li>RHRP 1-2</li></ul>	<ul style="list-style-type: none"><li>Background Information for Westinghouse Owners Group Sump Blockage Guideline, Rev 0.</li></ul>
<ul style="list-style-type: none"><li>CCP 1-1</li></ul>	<ul style="list-style-type: none"><li>CCP 1-2</li></ul>						
<ul style="list-style-type: none"><li>SIP 1-1</li></ul>	<ul style="list-style-type: none"><li>SIP 1-2</li></ul>						
<ul style="list-style-type: none"><li>RHRP 1-1</li></ul>	<ul style="list-style-type: none"><li>RHRP 1-2</li></ul>						

*Per NUREG-1021, Appendix D, if an operator or crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.*



## SCENARIO SUMMARY – NRC #2

1. Generator Voltage Regulator trips due to a loss of sensing voltage. The crew responds by entering **AR PK14-22, GENERATOR VLTG REG TRIP** and determine the voltage regulator is now operating in manual mode. Annunciator guidance is followed to maintain a lagging power factor.
2. Letdown Hx Inlet Valve, CVCS-8152 fails 90% closed causing letdown to divert to the Pressurizer Relief Tank. **AR PK04-21, LETDOWN PRESS / FLOW TEMP** comes into alarm, directing the crew to isolate Normal Letdown and place Excess Letdown in service per **OP B-1A:IV, CVCS – Excess Letdown – Place In Service and Remove From Service**. Alternately, the crew may elect to enter **OP AP-18, Letdown Line Failure**, which provides equivalent guidance. Shift Foreman enters **TS 3.6.3.A – Containment Isolation Valves**, for one containment isolation valve inoperable.
3. A 0.12 g seismic event results in a rupture of RWST, causing level to lower rapidly. The crew identifies RWST level lowering by monitoring level indications on VB-2 or by evaluating **AR PK06-20, PPC Select** which identifies RWST level is below the alarm setpoint. Field operators report a crack in the RWST extending down to approximately the 50% level. The Shift Foreman enters **TS 3.5.4.B – Refueling Water Storage Tank (RWST)** for borated water volume less than the required minimum of 455,300 gallons (~94%).
4. Vibrations on MFP 1-2 rise to 2.5 mil which corresponds to a ODM limit, requiring predesignated Unit 1 shutdown at 6 MW/min. A ramp is commenced following the guidance of **OP AP-25, Rapid Load Reduction or Shutdown**.
5. A 0.20 g seismic aftershock results in 100% DBA LOCA.
6. The crew enters **E-0, Reactor Trip or Safety Injection**, performing their immediate actions. A reactor trip fails to automatically actuate (ATWS); manual Rx Trip control switches are ineffective as well. Control board operators perform their respective response actions: ATC drives control rods inward and BOP manually opens control rod breakers 13D/E on VB5 **(S2CT-1) Initiate reactor trip prior to performance of E-0, step 2)**.
7. With the reactor tripped, the crew continues on, checking for actuation of emergency safeguards equipment and diagnosing conditions consistent with a large break LOCA (high containment pressure, loss of pressurizer pressure and level, loss of subcooling, high containment sump levels). The crew identifies RCP trip criteria are met, and with Shift Foreman concurrence, trip all four RCPs. Shift Foreman directs the BOP Operator to complete **Appendix E, ESF AUTO ACTIONS, SECONDARY AND AUXILIARIES STATUS**, and continues on in E-0. Train A of Phase A, Containment Isolation, fails to actuate, requiring board operators to manually align the associated inside containment isolation valves.

*(continued on next page)*

## **SCENARIO SUMMARY – NRC #2**

8. The Shift Foreman continues through E-0 diagnostic steps, and transitions to **E-1, Loss of Reactor or Secondary Coolant**. Functional restoration status trees are checked and crew identifies transition criteria for **FR-P.1, Response to Imminent Pressurized Thermal Shock**. Conditions will be met for exiting the procedure at the first step.

When RWST level reaches 33%, the crew transitions immediately to **E-1.3, Transfer to Cold Leg Recirculation**, and performs the required alignment steps. When RWST suction valve SI-8980 is isolated, ECCS recirculation flow is lost due to sump blockage. The crew transitions to **ECA-1.3, Sump Blockage** either directly, or by way of **ECA-1.1, Loss of Emergency Coolant Recirculation**, where they secure all running ECCS pumps (**S2CT-2, Stop all running ECCS pumps with suction aligned to the containment recirc sump by the completion of ECA-1.3, step 5**).

The scenario is terminated once Critical Task S2CT-2 is complete.

Op-Test No.: L162-NRC Scenario No.: 2 Event No.: 1 Page 1 of 19

Event Description: Generator Voltage Regulator Trip

Time	Position	Applicant's Actions or Behavior
<b>Note:</b> Procedure step numbers are included at the front of each action/comment in parenthesis, where applicable.		
	ALL	Diagnosis made by using one or more of the following: <ul style="list-style-type: none"> <li>• PK014-22, GENERATOR VLTG REG TRIP, in alarm</li> <li>• Main Gen Auto Voltage Regulator Mode Selector light indicating "TEST"</li> </ul>
	SRO	Implements PK014-22, GENERATOR VLTG REG TRIP
<b>(PK14-22, GENERATOR VLTG REG TRIP)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>• (2.1.1-2.1.3) Reads input 830 and determines only the voltage regulator tripped. <ul style="list-style-type: none"> <li>◦ Notes that Main Gen Auto Voltage Regulator Mode Selector light has changed state from AUTO (red) to TEST (amber).</li> <li>◦ Determines Main Generator Voltage Regulator has failed to manual.</li> </ul> </li> </ul>
	SRO	Reads NOTE regarding need to use Main Generator Manual Voltage Base Adjuster for voltage changes once the Main Gen Auto Vltg Reg Mode Sel switch is placed in "OFF" (next step).
	SRO/BOP	<ul style="list-style-type: none"> <li>• (2.1.3.a) Places the Main Gen Auto Vltg Reg Mode Sel switch in "OFF" (CC3).</li> <li>• (2.1.3.b) Places the Supplementary Excitation (Power System Stabilizer) control switch in "OFF" (CC3).</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• (2.1.3.c) Directs board operator to maintain a lagging power factor while on the Main Generator Manual Voltage Base Adjuster.</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (2.1.3.d) Contacts Turbine Watch to check the exciter control panel for the cause of the voltage regulator trip (dropped flag).</li> <li>• (2.1.3.e) Requests SM Contact maintenance.</li> </ul>
<b>Proceed to the next event once PK actions complete, per the lead examiner.</b>		

\*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 2 Event No.: 2 Page 2 of 19

Event Description: Letdown Hx Inlet Valve, CVCS-8152 fails 90% closed

Time	Position	Applicant's Actions or Behavior
<b>Note:</b> The crew may address the malfunction using only PK04-21, or may elect to enter OP AP-18, Letdown Line Failure, which provides equivalent guidance. Both procedure flowpaths are described below.		
	ALL	Diagnosis made by using one or more of the following: <ul style="list-style-type: none"> <li>AR PK04-21, LETDOWN PRESS / FLOW TEMP in alarm</li> <li>Letdown flow lowering slightly (VB2)</li> <li>Letdown RV temperature elevated (VB2)</li> <li>Position lights for Letdown Hx Inlet Valve, CVCS-8152, indicating mid stroke (both red and green lights illuminated)</li> </ul>
	SRO	AR PK04-21, LETDOWN PRESS / FLOW TEMP in alarm
<b>(AR PK04-21, LETDOWN PRESS / FLOW TEMP)(N/A if not used)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Reads input 320 and determines failure is from 8152 going partially closed, goes to section 2.1 for General Actions</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.1) Notes need to direct Chemistry to isolate argon injection if letdown is isolated.</li> </ul>
<b>Note:</b> The SFM may elect to treat letdown passing through letdown RV valve 8117 as a letdown leak.		
	SRO	<ul style="list-style-type: none"> <li>(2.1.2) Notes reduced letdown flow, elevated temperature on letdown RV-8117, and mid-position indication on letdown Hx inlet valve CVCS-8152.</li> <li>May transition to <b>OP AP-18, Letdown Line Failure. (see Page 3)</b></li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.3-2.1.7) Determines steps are N/A.</li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 2Event No.: 2Page 3 of 19Event Description: Letdown Hx Inlet Valve, CVCS-8152 fails 90% closed (cont)

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	<ul style="list-style-type: none"> <li>(2.1.8) Determines RV-8117, letdown to the PRT has lifted               <ul style="list-style-type: none"> <li>(2.1.8.a) Directs BOP to monitor PRT pressure, level and temperature. (VB2)</li> <li>(2.1.8.b) Notes need to reset RV-8117 when plant conditions permit</li> <li>(2.1.8.c,d) Determines RV-8117 leakrate to PRT is greater than 0.1 gpm                   <ul style="list-style-type: none"> <li>References Tech Specs and enters <b>Tech Spec 3.6.3.A – Containment Isolation Valves</b> for one or more penetration flow paths with one containment isolation valve inoperable. Required actions: isolate the affected penetration flow path within 4 hours.</li> <li>Closes CVCS-8149C, 75 gpm Ltdn Orifice Stop valve</li> <li>Determines CVCS-8152 can NOT be closed from the Control Room (VB2)</li> </ul> </li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(2.1.9.a) Determines normal letdown can NOT be maintained and ensures letdown is isolated by checking the following valves CLOSED:               <ul style="list-style-type: none"> <li>CVCS-8149A, 45 gpm Ltdn Orifice Stop (VB2)</li> <li>CVCS-8149B, 75 gpm Ltdn Orifice Stop (VB2)</li> <li>CVCS-8149C, 75 gpm Ltdn Orifice Stop (VB2)</li> <li>CVCS-HCV-133, Ltdn from RHR HX Out (VB2)</li> </ul> </li> <li>Establish Excess Letdown (see next page), per <b>OP B-1A:IV, CVCS - Excess Letdown - Place In Service and Remove From Service</b></li> </ul>
<b>(OP AP-18, Letdown Line Failure (if used))</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Ensures no load changes are in progress.</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(2) Isolates letdown               <ul style="list-style-type: none"> <li>Ensures Letdown Orifice Stop Valve, 8149C Closed (VB2)</li> <li>Closes Regen Heat Exchanger Inlet Valves, LCV-459 and 460 (VB2)</li> <li>Verifies RHR to Letdown Flow Control Valve, HCV-133 (RHR Ltdn) closed (VB2)</li> </ul> </li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 2Event No.: 2Page 4 of 19Event Description: Letdown Hx Inlet Valve, CVCS-8152 fails 90% closed (cont)

Time	Position	Applicant's Actions or Behavior
<b>(OP AP-18, Letdown Line Failure, cont)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(3) Checks for RCS Leakage – verifies that Pzr level and RCS press are both stable/rising (there was never an indication of leakage) (VB2, CC2, PPC)</li> <li>(4) Reduces charging to minimum (RCP seals only), using FCV-128 (or HC-459D) and HCV-142 (approx. 8 gpm on RCP seals, with HCV-142 closed (or near closed) (CC2).</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(5) Establish Excess Letdown (see below), per <b>OP B-1A:IV, CVCS - Excess Letdown - Place In Service and Remove From Service</b></li> <li>(6) Contacts RP and Chemistry regarding Excess Letdown being placed in service</li> </ul>
<b>(OP B-1A:IV, CVCS - Excess Letdown - Place In Service and Remove From Service)</b>		
	ATC	<ul style="list-style-type: none"> <li>(6.1.1) Verifies charging at minimum (seals only)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>(6.1.2) Contacts RP for rad conditions/posting</li> </ul>
<b>Note: If Shift Manager asked in regard to flushing or crew attempts to perform flush, provide the following cue:</b>		
<b><u>CUE:</u> Excess letdown line flushing is NOT needed.</b>		
	BOP	<ul style="list-style-type: none"> <li>(6.1.3) Skips line flush, moves on to next step</li> <li>(6.1.4) Opens FCV-361, CCW to Excess Ltdn HX (VB1)</li> <li>(6.1.5) Verifies pot for HCV-123, Excess Letdown Pressure Control, CLOSED (at 0) (VB2)</li> <li>(6.1.6) Opens 8166/8167, Excess Letdown isolation valves (VB2)</li> <li>(6.1.7) is N/A</li> <li>(6.1.8) Slowly opens HCV-123 to establish excess letdown (VB2)</li> <li>(6.1.9) Adjusts HCV-123 to provide approximately 40 gpm letdown at NOP</li> </ul>
	ATC/BOP	<ul style="list-style-type: none"> <li>(to end of scenario) HCV-123 and FCV-128 (or HC-459D) are now used to control Pzr Level</li> </ul>
<b>Proceed to the next event once Excess Letdown established and Tech Specs addressed, per the lead examiner.</b>		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 2**

**Event No.: 3**

Page 5 of 19

**Event Description:** RWST Rupture from Seismic Event

[illegible]

### \*\* Critical Task

Op-Test No.: L162-NRC      Scenario No.: 2      Event No.: 4      Page 6 of 19

Event Description:    Rising MFP 1-2 Vibrations

Time	Position	Applicant's Actions or Behavior
<p><b>Note:</b> As noted in Turnover, System Engineer is actively evaluating MFP 1-2 vibrations. If Control Room has not identified increased level by the time Tech Specs addressed (above), call from field will be made to Control Room requesting data.</p>		
	BOP	<ul style="list-style-type: none"> <li>During board walkdown notes vibration levels on MFP 1-2 have increased to 2.5 mil which corresponds to an ODM threshold for a 6 MW/min ramp</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Implements OP AP-25, Rapid Load Reduction</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(1a) Determines runback/programmed ramp is not in progress (may not vocalize, since this ramp is initiated by the crew)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>Ramp is started (guidance is also on lamicaid pegboard on CC3):               <ul style="list-style-type: none"> <li>(1b) MW and IMP feedbacks are placed in service (all on Triconex turbine HMI, CC3)</li> <li>(1c) <math>\approx</math> 60 MWe load target is entered into Triconex HMI</li> <li>(1d) Sets ramp rate to 6 mw/min</li> <li>(1e) Pushes GO</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(2) Verifies that control rods are inserting properly in AUTO (VB2)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(3) Verifies ON all pressurizer backup heaters (CC1)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(4) Verifies charging flow adequate to prevent letdown flashing: may take manual control of Pzr level               <ul style="list-style-type: none"> <li>Places HC-459D (master level controller) or FCV-128 (charging flow controller) in manual (CC2)</li> <li>Keeps charging high enough to prevent letdown from flashing (VB2)</li> </ul> </li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task



Op-Test No.: L162-NRCScenario No.: 2Event No.: 4Page 7 of 19Event Description: Rising MFP 1-2 Vibrations (cont)

Time	Position	Applicant's Actions or Behavior
<b>(OP AP-25, Rapid Load Reduction (cont))</b>		
	SRO/BOP	<ul style="list-style-type: none"> <li>(5) Verifies DFWCS in AUTO and controlling S/G levels (CC3 MFW HMI, VB3, PPC) <ul style="list-style-type: none"> <li>Checks MFW control and bypass valves in AUTO</li> <li>Checks both MFPs and their controller in AUTO</li> <li>May check level trends, as well as steam flow/feed flow trends (CC3, PPC, and/or big VB3 DFWCS electronic recorders)</li> </ul> </li> </ul>
<b>Note:</b> Boration values described below are representative of the conditions given, but will vary based on the actual ramp rate and target specified by SRO.		
	SRO/ATC	<ul style="list-style-type: none"> <li>(6) Performs boration (the following guidance is on the boration checklist in the reactivity handbook) <ul style="list-style-type: none"> <li>Presses STOP on M/U Ctrlr HMI (CC2)</li> <li>Presses BORATE on HMI</li> <li>Sets target gallons for boration (as decided above, and per the Shift Foreman); verifies batch is reset</li> <li>Sets boric acid flowrate</li> <li>Presses START, and monitors boration</li> <li>Once stopped, either returns to AUTO (presses AUTO, then START), or performs additional boration per the Shift Foreman</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>The Shift Foreman provides reactivity oversight for the ramp</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(7) Checks MFP suction pressure greater than 260 psig (VB3)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(8) Checks Tav<sub>g</sub> trending to T<sub>ref</sub> (PPC, CC1)</li> <li>(9) Checks Pressurizer pressure and level trending to programmed band (PPC, CC2)</li> </ul>
<b>Next event triggered as soon as ramp commenced, per Lead Examiner</b>		

\*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 2 Event No.: 5,6 Page 8 of 19

Event Description: Seismically Induced Large Break LOCA  
ATWS

Time	Position	Applicant's Actions or Behavior
<p><b>Phase B actuation is time 0 for TCOA to trip the RCPs within 5 minutes of meeting RCP trip criteria in EOP network. (Red Phase B lights will illuminate under PK01 Annunciator Panel).</b></p> <p>Record Start Time: _____</p>		
	ALL	<p>LOCA is diagnosed from one or more of the following:</p> <ul style="list-style-type: none"> <li>• Sudden loss of Pressurizer level coincident with loss of subcooling and RCS pressure approaching atmospheric</li> <li>• Numerous AR PKs coming into alarm associated with sump levels and containment environment</li> </ul> <p>ATWS is diagnosed from one or more of the following:</p> <ul style="list-style-type: none"> <li>• AR PK04-11 and PK04-12, REACTOR TRIP INITIATE in alarm</li> <li>• AR PK04-14, REACTOR TRIP ACTUATED NOT in alarm</li> <li>• DRPI indication of rods NOT inserted</li> <li>• Reactor Trip Breakers closed (red light on)</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• Directs/performs manual Reactor Trip followed by manual Safety Injection once Reactor Trip has been verified.</li> <li>• Implements EOP E-0, Reactor Trip or Safety Injection</li> </ul>
<b>(EOP E-0, Reactor Trip or Safety Injection)</b>		
<p><b><u>Note:</u> Attempts to manually trip the reactor may be done prior to entry into EOP E-0 or as part of E-0, step 1 RNO.</b></p>		
	ALL	<p>Performs immediate actions:</p> <ul style="list-style-type: none"> <li>• (1) Ensure reactor trip: <ul style="list-style-type: none"> <li>○ Identifies reactor is NOT tripped based on the following: <ul style="list-style-type: none"> <li>▪ Rx Trip breakers did NOT open (VB2)</li> <li>▪ NIs are NOT lowering (CC1)</li> <li>▪ Rod bottom lights are NOT lit(VB2); moves to step 1 RNO</li> </ul> </li> </ul> </li> </ul>
	ATC/BOP	<ul style="list-style-type: none"> <li>• (1 RNO) May attempt trip using manual switch (CC1 or VB2)</li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L161-NRC Scenario No.: 2 Event No.: 5,6 Page 9 of 19

Event Description: Seismically Induced Large Break LOCA (cont)  
ATWS (cont) (CT)

Time	Position	Applicant's Actions or Behavior
<b>(EOP E-0, Reactor Trip or Safety Injection(cont))</b>		
	SRO/BOP	<ul style="list-style-type: none"> <li>(1 RNO) Observes that reactor is still critical (same indications as when trip attempted) <b>Opens breakers for busses 13D and 13E (VB5, lower panel 480 vac bus breakers) to de-energize the rod drive MGs which causes breakers to open (S2CT-1)**</b> <ul style="list-style-type: none"> <li>Dispatches operator to open reactor trip breakers locally</li> </ul> </li> </ul> <p><b>**(Critical Task)(S2CT-1) Initiate reactor trip prior to performance of E-0, step 2.</b></p>
	SRO/ATC	<ul style="list-style-type: none"> <li>(2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps).</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(3) Checks vital 4kv buses (VB4)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(4) Checks if SI actuated (PK08-21 ON, also checks VB1 red train lights and/or train equipment to verify both trains actuated) (VB1 upper right, or CC2 right)</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(5) Directs App E implemented (usually to BOP)(see page 18)</li> </ul>
		<ul style="list-style-type: none"> <li>(6) Checks RCS temperature stable or lowering to 547°F <ul style="list-style-type: none"> <li>Notes temperature has dropped significantly due to LBLOCA,(VB2)</li> <li>May throttle AFW to minimum, but recognizes low temperature is due to LOCA</li> </ul> </li> </ul>
		<ul style="list-style-type: none"> <li>(7) Checks Pzr PORVs and Pzr Safeties and Spray Valves <ul style="list-style-type: none"> <li>Safeties closed (closed); no sonic flow, tailpipe temperature is elevated, but consistent with containment environment (VB2 )</li> <li>PORVs closed and associated block valves open (VB2)</li> <li>Pzr Sprays closed (green lights on) (CC2)</li> </ul> </li> </ul>
(continued on next page)		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 2Event No.: 5Page 10 of 19Event Description: Seismically Induced Large Break LOCA (cont)

Time	Position	Applicant's Actions or Behavior
		<b>(EOP E-0, Reactor Trip or Safety Injection, continued)</b>
	SRO/ATC	<ul style="list-style-type: none"> <li>(8) Checks RCP trip criteria; <ul style="list-style-type: none"> <li>Ensures all RCPs are tripped (VB2) <b>(TCOA)*</b></li> <li>Action to trip RCPs may have already been completed as part of Foldout Page items 2.0 or 3.0</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(9) Determines S/G are NOT faulted <ul style="list-style-type: none"> <li>May note S/Gs are depressurizing, but as consequence of LBLOCA cooldown</li> <li>None are completely depressurized</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(10) Determines S/G are NOT ruptured <ul style="list-style-type: none"> <li>Checks RE-71/72/73/74 and RE-15/19 recorders on VB2 (and PPC); (all normal)</li> <li>PK11-06/17/18 (all OFF)</li> <li>May request samples</li> </ul> </li> </ul>
	SRO/ALL	<ul style="list-style-type: none"> <li>(11) Checks RCS intact (it is not) (<u>note</u>: only one valid abnormal reading needed to transition from E-0) <ul style="list-style-type: none"> <li>(11a) Determines containment pressure is NOT normal (VB1 meters, PPC)</li> <li>(11b) Determines containment sump levels NOT normal (VB1 meters, PAMS)</li> <li>(11c) Determines containment radiation is NOT normal (RM-11, 02, 07 are all in alarm)</li> <li>(11 RNO) Places 2<sup>nd</sup> ASW/CCW HX in service (opens FCV-603 and FCV-431, VB1 far left), and transitions to EOP E-1, Loss of Reactor or Secondary Coolant</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Performs procedure transition brief for E-1, and implements CSFST (if required)</li> </ul>
		<b>*(TCOA) #67 - Trip RCPs within 5 minutes of meeting RCP trip criteria in EOP network.</b>
		(continued on next page)

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 2Event No.: 5Page 11 of 19Event Description: Seismically Induced Large Break LOCA (cont)

Time	Position	Applicant's Actions or Behavior
<b>Note:</b> A CSFST RED or MAGENTA path may occur prior to EOP E-1 entry or before the end of the scenario (FR-P.1 on PTS); If it occurs, it will be a short entry (perform a single step and exit)		
	SRO	Implements FR-P.1, Imminent PTS (if RED or MAGENTA path occurs)
	<b>(ONLY IF FR-P.1, Imminent PTS, is entered; otherwise, this section is N/A)</b>	
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Checks RCS pressure (low), and RHR flow (normal); exits to procedure in effect</li> </ul>
	SRO	Implements EOP E-1, Loss of Reactor or Secondary Coolant
<b>(EOP E-1, Loss of Reactor or Secondary Coolant)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Checks RCPs tripped (already done, VB2)</li> </ul>
	ALL	<ul style="list-style-type: none"> <li>(2 &amp; 3) Checks for faulted/ruptured S/Gs               <ul style="list-style-type: none"> <li>Faulted – checks all S/G pressures on VB3 (not uncontrolled drop/depressurized; all are dropping slowly, as the primary is now the heat sink for the secondary)</li> <li>Ruptured – checks RE-71/72/73/74 and RE-15/19 recorders on VB2 (and PPC; no upward trends or spikes, unless containment “shine” is noted), and PK11-06/17/18 (alarms not in); requests chemistry to sample S/Gs for activity (as follows, if done):                   <ul style="list-style-type: none"> <li>Verifies phase A containment isolation reset (VB1)</li> <li>Opens FCV-584 (air to containment) (VB4, lower left)</li> <li>Opens blowdown isolation valves inside containment (FCV-760, 761, 762, 763) if requested for sampling</li> </ul> </li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(4) Maintains S/G levels 25-65%</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(5) Re-verifies PORVs closed and associated block valves open (VB2 – upper panel, far right)</li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 2Event No.: 5Page 12 of 19Event Description: Seismically Induced Large Break LOCA (cont)

Time	Position	Applicant's Actions or Behavior
		(EOP E-1, Loss of Reactor or Secondary Coolant)
	SRO/ATC	<ul style="list-style-type: none"> <li>(6) Determines Containment Spray should remain in service               <ul style="list-style-type: none"> <li>(a) PK01-18 is ON</li> <li>(b) Checks if Spray Additive Tank Level is less than 16% (VB1, to right of Cont Press/Temp display)                   <ul style="list-style-type: none"> <li>Assigns continuous action to monitor level, and isolate tank when level falls below 16% by performing the following (step 6c):                       <ul style="list-style-type: none"> <li>Reset both trains of Containment Spray (VB1, middle)</li> <li>Close 8994A and 8994B</li> <li>Dispatch operator to open breakers for 8994A/B (VB1, middle skirt)</li> </ul> </li> </ul> </li> <li>(7) Containment radiation levels are above normal (PK11-21 is ON, RE-2/RE-7 in alarm) (b RNO) Verifies spray system still in service (VB1, middle skirt)</li> </ul> </li></ul>
	SRO	<ul style="list-style-type: none"> <li>(8) Determines ECCS flow should NOT be reduced               <ul style="list-style-type: none"> <li>(a) RCS subcooling is less than 20°F (SCMM YI-31, lower center VB2)</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>Reads CAUTION regarding running RHR pump with cooling to associated heat exchanger</li> <li>(9) Determines RHR pump should NOT be stopped               <ul style="list-style-type: none"> <li>(a.1) Notes pressure is less than 300 psig (a.1 RNO) Checks all available RHR pumps running, continues to step 11</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(11) Checks if Diesel Generators should be stopped               <ul style="list-style-type: none"> <li>Checks Vital 4kV buses powered from Off-Site (they are)</li> <li>Resets SI</li> <li>Stops all D/Gs and places respective control switch in AUTO</li> </ul> </li> </ul>
(continued on next page)		

\*\*Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 2**

**Event No.: 5**

Page 13 of 19

**Event Description:** Seismically Induced Large Break LOCA (cont)

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**\*\*Critical Task**

Op-Test No.: L162-NRC Scenario No.: 2 Event No.: 5 Page 14 of 19

Event Description: E-1.3, Cold Leg Recirc Alignment (TCOA)

Time	Position	Applicant's Actions or Behavior
(EOP E-1.3, Transfer to Cold Leg Recirculation)		
At 33% in RWST is time 0 for TCOA to complete transition to cold leg recirc in 10 minutes (PK03-01 will also alarm). Record Start Time: _____		
Note: Due to the time critical nature of this procedure, the SFM will assign App EE to a Reactor Operator and continue on through the main procedure body with the remaining Operator.		
	SRO	<ul style="list-style-type: none"> <li>(1) Implement Appendix EE</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>(1) App EE assigned/performed:               <ul style="list-style-type: none"> <li>(App EE, 1) All (6) series contactor switches are cut in (VB2, upper panel)</li> <li>(App EE, 2, 3) Verifies reset of SI and both trains of Phase A and Phase B (VB1, upper panel)</li> <li>(App EE, 4) Ensures ASW/CCW is aligned to 2 ASW Pumps through 2 heat exchanges (2 CCW HXs are in service, VB1, far left)</li> <li>(App EE, 5) Places RHR HX 1-2 in service                   <ul style="list-style-type: none"> <li>Opens outlet valve, FCV-364 (VB1, far right)</li> </ul> </li> <li>(App EE, 6) Places RHR HX 1-1 in service                   <ul style="list-style-type: none"> <li>Opens outlet valve FCV-365 (VB1, far right)</li> </ul> </li> <li>(App EE, 7 &amp; 8) Verifies CCP 1-3 stopped (VB2); makes PA announcement concerning Cold Leg Recirc</li> <li>(App EE, 9) Dispatches operators to rack in breakers for 8980 and 8976.</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(2, 3) Verifies RHR Pp 1-2 stopped and closes 8700B (VB1, lower right)</li> <li>(4, 5) Verifies RHR Pp 1-1 stopped and closes 8700A (VB1, lower right)</li> <li>(6) Closes RHR crosstie valves 8716 A/B (VB1, lower center)</li> <li>(7) Isolates ECCS Pp recirc paths by closing 8974 A/B, and closing 8105 / 8106 (VB2)</li> <li>(8) Verifies recirc sump level &gt; 92 ft ( VB1 upper right side)</li> </ul>
(TCOA) #8 – Transfer to cold leg recirculation within 10 minutes after RWST reaches low level setpoint.		
(continued on next page)		

\*\* Critical Task



Op-Test No.: L162-NRC Scenario No.: 2 Event No.: 5 Page 15 of 19

Event Description: E-1.3, Cold Leg Recirc Alignment (cont) (TCOA)

Time	Position	Applicant's Actions or Behavior
(EOP E-1.3, Transfer to Cold Leg Recirculation)		
<b>Note:</b> TCOA completion time is associated with completing alignment of first train of ECCS; it is not necessary to record completion time for second train.		
	SRO/ATC	<ul style="list-style-type: none"> <li>(9) Places RHR Pump 1-2 in Cold Leg Recirc Alignment               <ul style="list-style-type: none"> <li>9.a Checks RHR Pp 1-2 stopped and 8700B closed</li> <li>9.b Opens recirc suction valve 8982B (VB1, lower right)</li> <li>9.c Ensures RHR Hx 1-2 in service per Appendix EE (VB1, lower right)</li> <li>9.d Starts RHR Pp 1-2 (verifies flows, amps) (both on VB1, lower right)</li> <li>9.e Opens crosstie 8804B (VB1, lower center)</li> <li>9.f-h Verifies SI Pps running and RHR Pp amps w/i limits</li> </ul> </li> <li>(10) Crossties SI Pump Suction to Charging Pump Suction               <ul style="list-style-type: none"> <li>10.a Opens crossties 8807A and/or 8807B (VB1, lower center)                   <ul style="list-style-type: none"> <li>(TCOA completion time _____)</li> </ul> </li> <li>10.b Verifies CCP 1-1 and 1-2 running</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(11) Places RHR Pump 1-1 in Cold Leg Recirc Alignment               <ul style="list-style-type: none"> <li>11a Checks RHR Pp 1-1 stopped and 8700A Closed</li> <li>11.b Opens recirc suction valve 8982A (VB1, lower right)</li> <li>11.c Ensures RHR Hx 1-1 is in service per Appendix EE (VB1, lower right)</li> <li>11.d Starts RHR Pp 1-1 (verifies flows, amps) (both on VB1, lower right)</li> <li>11.e Opens crosstie 8804A (VB1, lower center)</li> <li>11.f-h Verifies SI Pps running and RHR Pp amps w/i limits</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(12) Observes one train of RHR train is now in cold leg recirc lineup</li> </ul>
<b>Note:</b> Closing SI-8980 triggers sump blockage malfunction event. Fold Out Page, Item 3 directs transition to a contingency procedure (ECA-1.1 or 1-3) for a loss of emergency coolant recirculation, depending on the cause.		
	ATC	<ul style="list-style-type: none"> <li>(13) Closes normal ECCS pump suction valves: 8805 A/B, 8976, and 8980</li> </ul>
(continued on next page)		

\*\* Critical Task

**Op-Test No.:** L162-NRC      **Scenario No.:** 2      **Event No.:** 5      **Page** 16 **of** 19

**Event Description:** E-1.3, Cold Leg Recirc Alignment (cont)

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**\*\* Critical Task**

Op-Test No.: L162-NRC Scenario No.: 2 Event No.: 8 Page 17 of 19

Event Description: ECA-1.3, Sump Blockage Guideline (CT)

Time	Position	Applicant's Actions or Behavior
(ECA-1.3, Sump Blockage Guideline)		
	SRO	<ul style="list-style-type: none"> <li>Reads caution that any pump receiving suction from a RHR pump should be stopped before stopping the RHR pump.</li> <li>Reads caution that If any ECCS pump loses suction or shows indication of cavitation, the pump should be stopped.</li> <li>Reads note that CSF Status Trees should be monitored for information only</li> <li>Reads note that Indications of cavitation or sump level change should be monitored following any change of recirculation flow.</li> </ul>
<p><b>Note:</b> The following step assumes ECCS pumps are still operating. SRO should follow the RNO column if the RHR pumps have been shutdown due to evidence of cavitation.</p>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Checks RHR pumps for indications of cavitation</li> <li>(1 RNO 1) Verifies containment spray from RHR is secured by checking 9003A and 9003B closed (VB1)</li> <li>(1 RNO 2) Reduces RHR flow by throttling RHR Hx Inlet Flow Control Valves, HCV-637 and HCV-638 (VB1)</li> <li>(1 RNO 3) Determines throttling flow is ineffective and secures ECCS Pumps taking suction from RHR:               <ul style="list-style-type: none"> <li>CCP 1-1 **</li> <li>CCP 1-2**</li> <li>SIP 1-1**</li> <li>SIP 1-2**</li> </ul> </li> <li>(1 RNO 4) Determines cavitation CANNOT be prevented and secures RHR pumps:               <ul style="list-style-type: none"> <li>RHR 1-1**</li> <li>RHR 1-2**</li> </ul> </li> </ul> <p><b>**(Critical Task) (S2CT-2, Stop all running ECCS pumps with suction aligned to the containment recirc sump by the completion of ECA-1.3, step 5).</b></p>
Scenario may be terminated any time after running CCPs, SIPs, and RHRPs have shutdown (completion of S2CT-2)		

\*\* Critical Task

Op-Test No.: L162-NRC      Scenario No.: 2      Event No.: 7      Page 18 of 19

**Event Description:** EOP E-0, Reactor Trip or Safety Injection, Appendix E, ESF Auto Actions, Secondary and Auxiliaries Status  
Phase A Train A fails to actuate

Time	Position	Applicant's Actions or Behavior
	(EOP E-0, Appendix E)	
	BOP	<p>Implements App E (ESF Auto Actions, Secondary and Auxiliaries Status):</p> <ul style="list-style-type: none"> <li>• (1a) Checks no personnel in Containment (part of turnover; may not voice)</li> <li>• (1b) Announces trip/SI on PA system</li> <li>• (2) Checks main generator – tripped (PK14-01 ON, output bkrs OPEN, CC3 right side)</li> <li>• (3 &amp; 4) Verifies Phase A and Containment Vent Isolation complete (VB1, ESF status lights, red lights ON, white lights OFF) <ul style="list-style-type: none"> <li>○ Determines Phase A, Train A (inside containment) did not actuate and performs manual isolation of the following valves: <ul style="list-style-type: none"> <li>▪ 9355A</li> <li>▪ 9356A</li> <li>▪ CVCS-8112, Seal Water Return</li> <li>▪ FCV-253, 255, 258, 500 – Rad Waste Isolation</li> </ul> </li> </ul> </li> <li>• (5) Verify ESF (SI) actuation complete; manual alignment of Train B pumps and valves will be required.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (6) Verifies Feedwater isolation complete (F.W. Isolation and S.G. Level Portions of Monitor Light Box C: red lights ON, white light OFF).</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (7) Verifies Containment Spray and Phase B Isolation (Contmt Isol, Phase B portion of Monitor Light Box D: red lights are ON)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (8) Checks Main Steamline Isolation complete (Main Steam Isolation portion of Monitor Light Box D: red light ON, white light are OFF)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (9) Checks AFW status <ul style="list-style-type: none"> <li>○ AFW Pp 1-2 and 1-3 both running; TDAFW is NOT required.</li> <li>○ Verifies min of 435 gpm flow (VB3 center) or S/G level &gt; 15%</li> </ul> </li> </ul>
(continued on next page)		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 2Event No.: 7Page 19 of 19

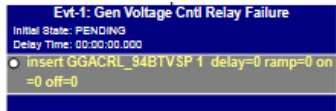
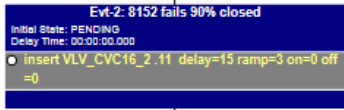
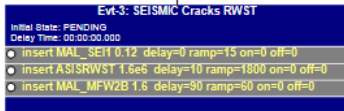
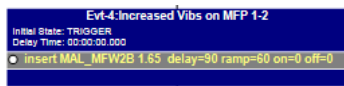
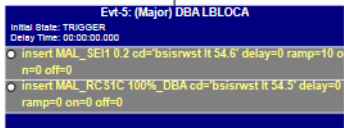
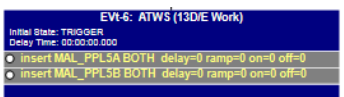
**Event Description:** EOP E-0, Reactor Trip or Safety Injection, Appendix E, ESF Auto Actions, Secondary and Auxiliaries Status (cont)  
Phase A Train A fails to actuate

Time	Position	Applicant's Actions or Behavior
	(EOP E-0, Appendix E)	
	BOP	<ul style="list-style-type: none"> <li>(10) Checks ECCS flows (charging injection (VB2 upper panel left), SI, RHR (both on VB1 upper panel))</li> <li>(11) Reports ESF and AFW status to the Shift Foreman (Shift Foreman may direct operator to continue on in Appendix E, or redirect to higher priority tasks)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>(12) Checks excess letdown in service prior to trip <ul style="list-style-type: none"> <li>Closes EXCESS LTDN, CVCS- 8166 and 8167</li> </ul> </li> <li>(13) Checks secondary systems (MFPs tripped (VB2, green lights ON), stops all but one CB Pp set, takes LCV-12 control switch to CONT ONLY.</li> <li>(14) Verifies proper operation of Aux Bldg and Control Rm vent systems (VB4 vent status light panel white lights); turns on aux bldg vent charcoal filter preheater (VB4 lower panel, left side) and verifies containment iodine fans secured (VB4, lower panel),</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>(15) Verifies available DGs running normally (VB4, freq (60), volts (120), speed (900))</li> <li>(16) Verifies vital batteries supplied by chargers (charger and bus volts on VB5, upper panel middle/lower area);</li> <li>(17) Verifies MSRs reset (CC3 Triconex HMI)</li> <li>(18) Throttles RCP seal injection flows to normal if needed (FCV-128, to 8-13 gpm each, CC2)</li> <li>(19) Checks PK11-04 NOT IN (SFP alarm)</li> <li>(20) Notifies Shift Foreman of completion.</li> </ul>
(Board Operator will rejoin crew upon completion of Appendix or when called upon by Shift Foreman)		

\*\* Critical Task

## Attachment 1 – Scenario Set-up & Booth Actions

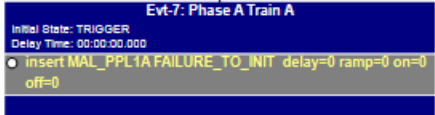
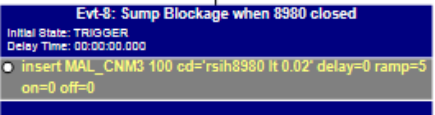
X = manual entry required

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	IC	RESTORE 151	50% power MOL, C <sub>B</sub> – 1000 (MOL)
X	Setup	N/A	CCP 1-3 & MFP 1-1 OOS; Caution Tags MFP 1-2 Elevated Vibrations (verify ~ 1.3 mils); clear vibration alarms on VB4 Verify PPC Select setup for RWST Level Low
	The Plant Abnormal Status Board for Surveillance Requirements		Excess Ltdn Last in Service 3 days ago; CB – 1025 ppm
	Copies of Procedures, Attachments; Appendixes; Foldout Pages; Annunciator Response Procedures and commonly used forms are in binders and <b>NOT</b> Marked up		<b>OP B-1A:IV, PK04-21, PK06-20, PK14-22, AP-18, AP-25, EOP E-0, E-1, E-1.3, ECA-1.1, ECA-1.3</b>
X	0 min	Tools > Simple SBT	Before crew takes the watch. Use Simple SBT, Data Recorder File: sbt_sim.drb, min 960 iterations (30 sec). <u>Critical Task Specific Data Capture:</u> <ul style="list-style-type: none"> <li>S2CT1: 13D and 13E Breaker Position.</li> <li>S2CT2: RHR, SI, and Charging pump amps, discharge pressure, and suction pressure; SI-8980 position.</li> </ul>
X	0 min	Lesson L162 NRC-S2.Isn	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by FILE or MANUALLY (below)
X	<u>Evt-1:Gen Voltage Regulator failure</u> (approx. 3 min after taking watch per lead examiner)		Will automatically fail to manual. When dispatched (Turbine Watch) report back There is a dropped flag at the panel but can't tell what it is for; will have to get assistance from Electrical Maintenance.
X	<u>Evt-2:CVCS-8152 90% closed</u> (Once SFM exits PK for Evt-1, per lead examiner)		Will contact RP for postings associated w/Excess Ltdn placed in service. Verify crew isolates flowpath once App E is entered. When Aux Watch contacted, regarding level in RCDT, report approximately 20% level.
X	<u>Evt-3:Seismic/RWST rupture</u> (Once Evt-2 TS have been addressed, per lead examiner)		If not yet dispatched, call C/R 5 minutes after seismic as part of Aux Bldg walkdown and report water is flooding the 115' back yard area due to a crack in the RWST at the mid-way (50%) point.
	<u>Evt-4:Seismic/RWST rupture/MFP 1-2 elevated vibs</u> (Once Evt-2 TS have been addressed, per lead examiner)		If contacted to verify vibrations on MFP 1-2, use Instructor Console to report values.
X	<u>Evt-5: 100% DBA LOCA</u> (Triggered on RWST Level adequate to stay in E-1.3)		Note: Trigger point is set to ensure adequate break flow to fill recirc sump to 92 ft.
X	<u>Evt-6: ATWS (13D/E Work)</u> (Post Trip)		Critical Task to open 13D/E. Radio Ops Rep on floor if needed to verify request to open Rx Breakers locally.

(con't on next page)

## Attachment 1 – Scenario Set-up & Booth Actions (con't)

X = manual entry required A = activate from EVENT file

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
<u>Evt-7:Phase A Train A fails to actuate – Post Trip</u>		Phase A, Train A FAILS TO ACTUATE (post-EOP entry) When called from C/R to close 8152, position @ 0% open
<u>Evt-8:Sump blockage when SI-8980 is closed</u>		Critical Task to shutdown ECCS pumps with suction aligned to recirc sump.



# Diablo Canyon Power Plant Operations Shift Log



## Unit 1

**Unit 1 Days at Power: 111 Days**

**Operating Mode: 1**

**Gross Generation: 601 MWe**

**Power Level: 50%**

**Net Generation: 551 MWe**

### Today - Dayshift

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#### Shift Manager Turnover:

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PRA RISK STATUS NEXT SHIFT:	Green
GRID STATUS NEXT SHIFT:	Normal
AVERAGE RCS CALCULATED LEAKRATE:	0.01 gpm
CONDENSER INLEAKAGE:	< 0.01 gpd
CONDENSER D/Ps:	NW 5.9 SW 6.4 NE 6.3 SE 6.1 PSID
MAIN GENERATOR H2 USAGE:	325 scfd / 327 scfd 5 day ave
SPENT FUEL POOL:	Temp = 80°F; Time to 200°F = 30 hrs using actual temp (F-ID-7A)

#### NEW PRIORITY WORK:

- CCP 1-3 emergent motor bearing oil leak identified end of last shift.

#### SHUTDOWN TECH SPECS / ECGS:

- None

#### ECG ACTIONS THAT IF COMPLETION TIME NOT MET ECG 0.3 IS ENTERED:

- ECG 8.1 -> CCP 1-3, due in 6 days.

#### TURNOVER ITEMS:

- Unit was ramped to  $\approx$  50% 8 days ago for high vibrations on the MFP 1-1. Bearings replacement in progress. RTS estimate mid-day shift tomorrow.
- ODM held for elevated vibrations on MFP 1-2; increased monitoring has been implemented. Should vibrations rise, but remain less than the 4.0 mil vibration limit of AR PK09-14, ODM decision calls for unit load reduction as follows, until vibration levels lower:
  - o 1.5-2.0 mils: 5.0 MW/min
  - o 2.1-2.5 mils: 6.0 MW/min
  - o 2.6-3.0 mils: 7.0 MW/min
  - o 3.1-3.5 mils: 8.0 MW/min
  - o 3.6-4.0 mils: 9.0 MW/min

#### PRIORITY ITEMS FOR NEXT SHIFT:

- Maintain plant stable at current power level.



## Shift Foreman Turnover

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### ANNUNCIATORS IN ALARM:

- There are no unexpected alarms - all current alarms are consistent with current mode and power level.

### TURNOVER ITEMS:

- U-1: 50%. Slightly elevated vibrations on MFP 1-2
- U-2: 100% power

### REACTIVITY MANAGEMENT:

- Time in core life: MOL.
- Power History: Steady State @ 50% for 8 days, previously at 100% for 103 day (MFP OOS for maintenance).
- Boron concentration is 1000 ppm from a sample taken 2 hours ago.
- Control Rod Height: 175 steps on CBD.
- Diluting the RCS approximately 25 gallons every 1.5 hrs.
- The last dilution was completed 15 min ago.

### CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- None

### OTHER ABNORMAL PLANT STATUS

- None

Facility: Diablo Canyon (PWR) Scenario No: 3 Op-Test No: L162 NRC

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: 75% with CFCU 1-5 OOS; MOL, 919 ppm boron

Turnover: At 75% power due to grid instability.

Event No	Malf No.	Event Type*	Event Description (See Summary for Narrative Detail)
1	EECKSELECT2382371XPWR 0	C, TS (BOP, SRO)	Load Tap Changer Auto Control Failure (PK20-04) TS 3.8.1.A
2	XMT_CVC16_3 150 delay=0 ramp=15	I (BOP, SRO)	TE-130 fails high (PK04-21, AP-5)
3	N/A	R (ALL)	Backdown Order; Shed 150 mw over next 15 minutes (AP-25).
4	DSC_ROD1 cd='smss lt 800'	C, TS (ATC, SRO)	DRPI loss of normal power requires ramp to be placed on hold, rods taken to manual. (AR PK03-21) (TS 3.1.7.B)
5	MAL_MSS4 720000 delay=0 ramp=60	M (ALL)	MSLB outside containment
6	VLV_MSS7_2, VLV_MSS8_2, VLV_MSS9_2, VLV_MSS10_2 1	C (ALL)	All MSIVs fail open

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d) (from form ES301-4)	Actual Attributes
1. Total malfunctions (5–8) (Events 1,2,3,4,5,6)	6
2. Malfunctions after EOP entry (1-2) (Event 6)	1
3. Abnormal events (1–4) (Events 1,2,3,4)	4
4. Major transients (1-2) (Event 5)	1
5. EOPs entered/requiring substantive actions (1–2) (E-2, ECA-2.1)	2
6. EOP contingencies requiring substantive actions (0–2) (ECA-2.1)	1
7. Critical tasks (2–3)(See description below)	2

Critical Task	Justification	Reference
(S3CT-1) Stop uncontrolled cooldown by controlling AFW flow before a severe challenge to Integrity Safety Function develops (magenta path on F-0.4 RCS Integrity)	An event or series of events which leads to a relatively rapid and severe reactor vessel downcomer cooldown can result in a thermal shock to the vessel wall that may lead to a small flaw, which may already exist in the vessel wall, growing into a larger crack. The growth or extension of such a flaw may lead, in some cases (where propagation is not stopped within the wall), to a loss of vessel integrity	<ul style="list-style-type: none"> <li>Background Information for WOG Emergency Response Guideline</li> </ul>
(S3CT-2) Terminate SI prior to rupture of PRT by closing 8801A/B and/or 8803A/B. (Note: CT is met by closing either 8801A/B OR 8803A/B.)	Failure to terminate ECCS flow when SI termination criteria are met results in overfill of the Pressurizer and the eventual rupture of the PRT. This constitutes the avoidable degradation of the RCS as a fission product barrier.	<ul style="list-style-type: none"> <li>Westinghouse Owner's Group WCAP-17711-NP</li> </ul>
<p><i>Per NUREG-1021, Appendix D, if an operator or crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.</i></p>		

### **SCENARIO SUMMARY – NRC #3**

1. Startup Transformer 1-1 Load Tap Changer control power supply fails. Crew responds per **AR PK20-04, SU TRANSF 11, 12, OR 21 LOCAL ANNUN**, and manually controls transformer voltage. Shift Foreman enters **TS 3.8.1.A, AC Sources – Operating** for one required offsite circuit inoperable.
2. Letdown heat exchanger temperature element TE-130 fails high, causing actual letdown temperature to lower. **AR PK04-21, LETDOWN PRESS / FLO TEMP** comes into alarm, directing the crew to take manual control of letdown temperature (TCV-130), to restore temperature to normal range. Alternately, the crew may elect to follow the guidance of **OP AP-5, Malfunction of Eagle 21 Protection or Control Channel**.
3. Shift Manager reports a confirmed Grid Control Center backdown order due to grid instability. Unit 1 is directed to shed 150 MW within 15 minutes. The Shift Foreman determines an appropriate ramp rate to meet the backdown order requirement (may assign this task to reactor operator) and implements **OP AP-25, Rapid Load Reduction or Shutdown**. The ATC determines an initial boration based on the Reactivity Handbook and advises the Shift Foreman of his recommendation. The BOP enters the programmed ramp into the turbine control system. The reactivity evolutions are implemented sequentially, with the Shift Foreman providing oversight.
4. DRPI power failure due to normal supply breaker tripping open near the end of the ramp. Ramp is placed on hold, rods are taken to manual, and Tave is matched within 1.5 °F (if required) per **AR PK03-21, DRPI FAILURE / ROD BOTTOM**. The Shift Foreman enters **TS 3.1.7.B - Rod Position Indication** for more than one DRPI per group inoperable.
5. A main steamline break develops downstream of the Main Steam Isolation Valves, outside containment. The crew identifies the need to isolate the Main Steam Isolation Valves and perform a safety injection (SI) based on pressurizer pressure and level lowering rapidly. Shift Foreman directs a reactor trip and SI and enters **EOP E-0, Reactor Trip or Safety Injection**.
6. All four main steam isolation valves fail open. The crew transitions to **EOP E-2, Faulted Steam Generator Isolation**, and then to **EOP ECA-2.1, Uncontrolled Depressurization of All Steam Generators**. The crew performs the critical tasks of stopping the uncontrolled cooldown **(S3CT-1) Stop uncontrolled cooldown before a severe challenge (magenta path ) develops on F-0.4 RCS Integrity** by minimizing feedflow and then terminating safety injection **(S3CT-2) Terminate SI prior to rupture of PRT**.

**The scenario is terminated once SI is terminated .**

**Op-Test No.:** L162-NRC      **Scenario No.:** 3      **Event No.:** 1      **Page** 1 **of** 17

**Event Description:** Load Tap Changer Auto Control Failure

[illegible]

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**\*\* Critical Task**

**Op-Test No.: L162-NRC**

**Scenario No.: 3**

**Event No.: 1**

Page 2 of 17

**Event Description:** Load Tap Changer Auto Control Failure (cont)

[illegible]

### \*\* Critical Task

**Op-Test No.:** L162-NRC      **Scenario No.:** 3      **Event No.:** 2      **Page** 3 **of** 17

**Event Description:** Letdown heat exchanger temperature element, TE-130, Fails High

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnosis made by using one or more of the following: <ul style="list-style-type: none"> <li>TE-130 temperature high (VB2, center vertical)</li> <li>PK04-21 alarm (on letdown low temp)</li> </ul>
	SRO	May implement <b>AR PK04-21, LETDOWN PRESS / FLOW TEMP</b> or <b>OP AP-5, Malfunction of Eagle 21 Protection or Control Channel</b>
<b>(AR PK04-21, LETDOWN PRESS / FLOW TEMP, (if implemented – else mark N/A))</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Reads input 394 and determines failure is from TE-130, goes to section 2.1 for General Actions</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.1) Notes need to direct Chemistry to isolate argon injection if letdown is isolated</li> <li>(2.1.2-2.1.4) Determines steps are N/A.</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(2.1.5) Determines RV-8117, letdown to the PRT has lifted <ul style="list-style-type: none"> <li>(2.1.5.a) Places TCV-130 in "MAN". (VB2)</li> <li>(2.1.5.b) Adjusts TCV-130 control setpoint back to normal range (VB2)</li> <li>(2.1.5.c) Notes PK06-22 is NOT in alarm; step is N/A</li> <li>(2.1.5.d) Notes TCV-130 did not fail to manual - was placed in manual; step is N/A</li> </ul> </li> <li>(2.1.5.e) Determines CCW flow to the Letdown Hx is adequate when in manual</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.6-2.1.12) Determines remaining steps are N/A.</li> </ul>
<b>(OP AP-5, Malfunction of Eagle 21 Protection or Control Channel, (if implemented – else mark N/A))</b>		
<i>(continued on next page)</i>		

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**\*\* Critical Task**

Op-Test No.: L162-NRC Scenario No.: 3 Event No.: 2 Page 4 of 17

Event Description: Letdown heat exchanger temperature element, TE-130, Fails High, continued

Time	Position	Applicant's Actions or Behavior
<b>(OP AP-5, Malfunction of Eagle-21 Protection or Control Channel, continued)</b>		
	SRO/BOP	<ul style="list-style-type: none"> <li>(1) Determines Primary and Secondary Control Systems are NOT controlling properly in AUTO (specifically TCV-130 has a failure)(VB2)</li> <li>(1.a RNO) Places TCV-130 in "MAN" and adjusts TCV-130 control setpoint back to normal range (VB2)</li> <li>(1.b RNO) Notes failure is due to single instrument and not an entire Process Control Rack</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(2) Determines not an Eagle-21 failure based on PK06-01 and PK06-03 - OFF</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(3) Notes no Delta T channel failure (step is N/A) (VB2)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(4) Checks steam dumps not actuated (no armed, open, or tripped open signals) (VB3)</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(5) Notifies I&amp;C</li> </ul>
	SRO	<p>Reads CAUTION before step 6 regarding Eagle 21 design feature associated with rack issues and notes as N/A for this failure</p> <ul style="list-style-type: none"> <li>(6) Reminds crew of necessity to ensure affected channels are removed from service prior to maintenance</li> </ul>
	SRO/BOP	<p>(7) Reviews Attachments 4.1 (Rx Trip and ESF Bistable Channel positioning per TS) and 4.2 (Process Control System Racks) to determine affected controls and indicators</p> <ul style="list-style-type: none"> <li>(a) Determines TE-130 is part of non-safety related control set IV</li> <li>(b) Determines TI-130 is the only control board indicator affected and places OOS on VB2.</li> </ul>
<b><i>Proceed to the next event once manual temperature control is established, per the lead examiner.</i></b>		

\*\* Critical Task



Op-Test No.: L162-NRC Scenario No.: 3 Event No.: 3 Page 5 of 17

Event Description: Grid Control Center Backdown Order to Shed 150 MW over 15 minutes

Time	Position	Applicant's Actions or Behavior
<b>Cue:</b> (from Shift Manager) I have just received and validated a backdown order from the Grid Control Center (GCC) due to instability on the 230 kV system. Unit 1 is directed to shed 150 MW total in the next 15 minutes. I will address OP J-2:VIII, OP AP-35, and Ops Policy B-1 requirements.		
	SRO	Implements OP AP-25, Rapid Load Reduction
	<b>(OP AP-25, Rapid Load Reduction)</b>	
	SRO	Enters OP AP-25, Rapid Load Reduction <ul style="list-style-type: none"> <li>(1.a) Notes runback/programmed ramp is not in progress (may not vocalize, since this ramp is initiated by the crew)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>Commences ramp (guidance is also on lamicoid pegboard on CC3 or Shift Foreman will hand off Step 1 sheet to BOP):               <ul style="list-style-type: none"> <li>(1.b) MW and IMP feedbacks are placed in service (all on Triconex turbine HMI, CC3)</li> <li>(1.c) <math>\approx 720</math> MWe (871-150, approximate) load target is entered into Triconex HMI</li> <li>(1.d) Sets ramp rate to <math>\approx 15</math> mw/min (approximate rate; actual rate dictated by Shift Foreman)</li> <li>(1.e) Pushes GO</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(1.f) Determines downpower is less than 15%.</li> </ul>
	ATC	<ul style="list-style-type: none"> <li>(2) Verifies that control rods are inserting properly in AUTO (CC1)</li> <li>(3) Turns Pressurizer Backup heaters on (CC1)</li> <li>(4) Checks charging adequate to prevent flashing in the letdown system; may take manual control to ensure adequate flow (CC2)</li> </ul>
(continued on next page)		

\*\* Critical Task

**Op-Test No.: L162-NRC                      Scenario No.: 3                      Event No.: 3                      Page 6 of 17**

**Event Description:**    **Grid Control Center Backdown Order to Shed 150 MW over 15 minutes (cont)**

Time	Position	Applicant's Actions or Behavior
	(OP AP-25, Rapid Load Reduction, continued)	
	SRO/BOP	<ul style="list-style-type: none"><li>• (5) Ensures DFWCS is controlling S/G levels in AUTO (MFW control/bypass valves; MFPs all in AUTO) (CC2)(VB3)</li></ul>
<b>Note:</b> Boration values described below are representative of the conditions given, but will vary based on the actual ramp rate and target specified by SRO.		
	SRO/ATC	<ul style="list-style-type: none"><li>• (6) Performs boration (the following guidance is on the boration checklist in the reactivity handbook)<ul style="list-style-type: none"><li>○ Presses STOP on M/U Ctrl HMI (CC2)</li><li>○ Presses BORATE on HMI</li><li>○ Sets target gallons for boration verifies batch is reset</li><li>○ Sets boric acid flowrate</li><li>○ Presses START, and monitors boration</li><li>○ Once stopped, either returns to AUTO (presses AUTO, then START), or performs additional boration per the Shift Foreman(CC2)</li></ul></li></ul>
	SRO/BOP	<ul style="list-style-type: none"><li>• (7) Checks MFP suction pressure greater than 260 psig (VB3)</li></ul>
	SRO/ATC	<ul style="list-style-type: none"><li>• (8) Checks Tavg trending to Tref (PPC, CC1)</li><li>• (9) Checks Pressurizer pressure and level trending to programmed band (PPC, CC2)</li></ul>
Next event triggered automatically at Turbine Power < 735 MW		

## \*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 3 Event No.: 4 Page 7 of 17Event Description: DRPI Power Failure During Ramp

Time	Position	Applicant's Actions or Behavior
	ALL	DRPI power loss is diagnosed from one or more of the following: <ul style="list-style-type: none"> <li>DRPI Panel is "dark", with no rod position lights (VB2, left, black DRPI panel)</li> <li>PK03-21 alarms on two inputs</li> </ul>
	SRO	Implements AR PK03-21, DRPI Failure / Rod Bottom
<b>(AR PK03-21, DRPI Failure / Rod Bottom)</b>		
	SRO	<ul style="list-style-type: none"> <li>(1) Selects section 2.1 from DRPI urgent failure input 553</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(2.1.1) Takes manual control of rods by placing bank selector switch in MAN, and verifying normal manual speed on meter (45-51 gpm) (CC1 right)</li> </ul>
<b>Note: If SFM asks SM for guidance stopping the Backdown Order ramp, SM should provide the following cue:</b>		
<b>Shift Manager Cue "Unit 2 was directed to shed remaining load when DRPI lost power"</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(2.1.2) Places ramp on hold (ramp is close to completion)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(2.1.3) May review diverse indicators to be used (step counters, bank overlap, NIs, and RCS temperature) if moving rods is required due to Tave/Tref mismatch &gt; 1.5°F prior to DRPI restoration.</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.4) Enters <b>Tech Spec 3.1.7.B – Rod Position Indication</b> for more than one DRPI per group inoperable which requires rod control to be placed in manual immediately. Crew will also need to perform the following monitoring actions until DRPI is returned to service: <ul style="list-style-type: none"> <li>Monitor and record reactor coolant system Tavg once per hour</li> <li>Verify rod position using indirectly using power distribution once every 8 hours</li> <li>Restore to operable status within 24 hours</li> </ul> </li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

**Op-Test No.: L162-NRC                      Scenario No.: 3                      Event No.: 4                      Page 8 of 17**

**Event Description:** DRPI Power Failure During Ramp (cont)

Time	Position	Applicant's Actions or Behavior
(AR PK03-21, DRPI Failure / Rod Bottom)(cont)		
<b>Shift Manager Cue (if asked for next step) There are currently no loads on their backup source (from the OP O-13)</b>		
	SRO/BOP	<ul style="list-style-type: none"> <li>(2.1.5.a) Directs transfer of DRPI to backup power per OP A-3:I (all field actions; may send Nuclear Operator to normal breaker first to investigate)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(2.1.5.b) Once DRPI is restored, Rod Control is returned to auto by placing the back selector in AUTO, and verifying 8 spm on the speed indicator (CC1, right)</li> </ul>
Proceed to the next event once control rods are back in AUTO, and Tech Specs have been discussed, per the lead examiner.		

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**\*\* Critical Task**

Op-Test No.: L162-NRCScenario No.: 3Event No.: 5,6Page 9 of 17

**Event Description:** MSLB Outside Containment, downstream of MSIVs  
All MSIV Fail Open

Time	Position	Applicant's Actions or Behavior
	ALL	<p>Crew identifies RCS temperature lowering, pressurizer level and pressure lowering based on the following:</p> <p>Annunciator Response Alarms:</p> <ul style="list-style-type: none"> <li>AR PK09-01, S/G 1-1 PRESS, LVL FLOW (due to lowering S/G 1-1 pressure and level)</li> <li>AR PK09-15, DIGITAL FEEDWATER CONT SYSTEM (due to feedflow/steam flow mismatch)</li> <li>AR PK05-16, PZR PRESSURE HI/LO (pressure low due to cooldown)</li> <li>AR PK04-06, PROTECT CHANNEL ACTIVATED (for Tave less than 554 °F on loop 1 due to cooldown)</li> </ul> <p>RCS Cooldown Indications: PPC, VB2, and CC1 trends</p> <p>Increased Steam Flow: PPC, VB3, CC3 steam flow meters, record, and trends</p> <p>Lowering S/G 1-1 pressure and level: VB3 and PPC</p>
	SRO	<ul style="list-style-type: none"> <li>Directs manual reactor trip and shutting of MSIVs</li> <li>Implements <b>EOP E-0, Reactor Trip or Safety Injection</b></li> </ul>
	ALL	<ul style="list-style-type: none"> <li>Perform immediate actions</li> </ul>
<b>(EOP E-0, Reactor Trip or Safety Injection)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Verifies reactor trip (trip bkrs open (VB2 upper left), rods on bottom (VB2 upper left DRPI panel), NIs decreasing (CC1 left).</li> <li>(2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps).</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(3) Checks vital 4kv buses (VB4, all vital buses white lights on mimic buses with power supplied by Startup).</li> </ul>
<b>Note: SI setpoint is unlikely to be reached until after transition is made out of E-0.</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(4) Checks if SI actuated (PK08-21 OFF, also checks SSPS ESF status lights on VB1 and PK02-02 to verify SI is NOT required).</li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 3 Event No.: 5,6 Page 10 of 17

**Event Description:** MSLB Outside Containment, downstream of MSIVs (cont)  
All MSIV Fail Open (cont)

Time	Position	Applicant's Actions or Behavior
		(EOP E-0, Reactor Trip or Safety Injection)
<b>Note:</b> The Shift Foreman may direct closing of the MSIVs at VB3, which will be unsuccessful. Appendix L, Local Closing of Main Steam Isolation Valves, may be implemented at this time		
	SRO/BOP	<ul style="list-style-type: none"> <li>(4 RNO) Checks AFW status (VB3, AFW Pp 1-2 &amp; 1-3 will be running), and exits E-0 for E-0.1 May throttle AFW LCVs on VB3 lower left to limit RCS cooldown.</li> </ul>
	ALL	<ul style="list-style-type: none"> <li>Implements CSFSTs</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>Transitions to EOP E-0.1, Reactor Trip Response, and performs procedure transition brief</li> </ul>
		(EOP E-0.1, Reactor Trip Response)
<b>Note :</b> EOP E-0.1 actions will be performed until crew initiates SI or SI setpoint is reached, which will most likely occur before the first step of E-0.1 is complete. There is no requirement to perform any particular E-0.1 actions prior to the transition back to E-0.		
	ALL	<ul style="list-style-type: none"> <li>(1) Checks Tavg stable or trending towards 547 °F. Notes cooldown is due to steam leak and directs safety injection. Re-enters to E-0.</li> </ul>
(EOP E-0, Reactor Trip or Safety Injection(re-entry))		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Verifies reactor trip (trip bkrs open (VB2 upper left), rods on bottom (VB2 upper left DRPI panel), NIs decreasing (CC1 left).</li> <li>(2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps).</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(3) Checks vital 4kv buses (VB4, all vital buses white lights on mimic buses with power supplied by Startup).</li> </ul>
(continued on next page)		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 3**

**Event No.: 5,6**

Page 11 of 17

**Event Description:** MSLB Outside Containment, downstream of MSIVs (cont)  
All MSIV Fail Open (cont)

[illegible]

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**\*\* Critical Task**

**Op-Test No.:** L162-NRC

**Scenario No.: 3**

**Event No.: 5,6**

Page 12 of 17

**Event Description:** MSLB Outside Containment, downstream of MSIVs (cont)  
All MSIV Fail Open (cont)

[illegible]

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**\*\* Critical Task**



Op-Test No.: L162-NRCScenario No.: 3Event No.: 5,6Page 13 of 17

**Event Description:** MSLB Outside Containment, downstream of MSIVs (cont) (CT)  
All MSIV Fail Open (cont)

Time	Position	Applicant's Actions or Behavior
(EOP ECA-2.1, Uncontrolled Depressurization of ALL S/Gs, cont)		
<b>Note:</b> Step to check for 100°F/hr cooldown is a continuous action step. Throttling AFW will cause RED PATH on CSF-3 (Heat Sink). Crew will transition to EOP FR-H.1, check the first step, and return to this procedure.		
	ALL	<ul style="list-style-type: none"> <li>(3) Controls feedflow to minimize RCS Cooldown               <ul style="list-style-type: none"> <li>(3a) Observes RCS has cooled down more than 100°F in last hour (VB2/PPC)                   <ul style="list-style-type: none"> <li><b>(3a RNO) Throttles AFW to each S/G down to approx 25 gpm indicated on FI-157, FI-158, FI-159, and FI-160 (VB3) (S3CT-1)**</b></li> </ul> </li> <li>(3b) Controls S/G levels &lt; 65% NR (all below NR at this point)</li> <li>(3c) Observes that RCS temperatures are still dropping slowly (VB2/PPC)</li> </ul> </li> </ul> <p><b>**(Critical Task) (S3CT-1) Stop uncontrolled cooldown by controlling AFW flow before a severe challenge to Integrity Safety Function develops</b></p>
	SRO/ATC	<ul style="list-style-type: none"> <li>(4) Checks of RCPs should be stopped               <ul style="list-style-type: none"> <li>(4a) Determines subcooling is greater than 20°F and goes to next step based on RNO direction</li> </ul> </li> <li>(5) Checks Pzr PORVs and Pzr Safeties and Spray Valves               <ul style="list-style-type: none"> <li>Safeties closed (closed); no sonic flow, tailpipe temperature are normal (VB2 )</li> <li>PORVs closed and associated block valves open (VB2)</li> <li>Pzr Sprays closed (green lights on) (CC2)</li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(6) Checks Secondary System Radiation and determines S/G are NOT ruptured               <ul style="list-style-type: none"> <li>Checks RE-71/72/73/74 and RE-15/19 recorders on VB2 (and PPC); (all normal)</li> <li>PK11-06/17/18 (all OFF)</li> <li>Requests samples from Chemistry</li> </ul> </li> </ul>

(continued on next page)

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 3**

**Event No.: 5,6**

Page 14 of 17

**Event Description:** MSLB Outside Containment, downstream of MSIVs (cont)  
All MSIV Fail Open (cont)

[illegible]

**\*\* Critical Task**

**Op-Test No.: L162-NRC**

**Scenario No.: 3**

**Event No.: 5,6**

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**Event Description:** MSLB Outside Containment, downstream of MSIVs (cont) (CT)  
All MSIV Fail Open (cont)

[illegible]

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**\*\* Critical Task**

Op-Test No.: L162-NRC      Scenario No.: 3      Event No.: 5      Page 16 of 17

**Event Description:** EOP E-0, Reactor Trip or Safety Injection, Appendix E, ESF Auto Actions, Secondary and Auxiliaries Status (CT)

Time	Position	Applicant's Actions or Behavior
	(EOP E-0, Appendix E)	
	BOP	Implements App E (ESF Auto Actions, Secondary and Auxiliaries Status): <ul style="list-style-type: none"> <li>• (1a) Checks no personnel in Containment (part of turnover; may not voice)</li> <li>• (1b) Announces reactor trip/SI on PA system</li> <li>• (2) Checks main generator – tripped (PK14-01 ON, output bkrs open, CC3 right side)</li> <li>• (3 &amp; 4) Verifies Phase A and Containment Vent Isolation complete (VB1, ESF status lights, red lights ON, white lights OFF);</li> <li>• (5) Verify ESF (SI) actuation complete;</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (6) Verifies Feedwater isolation complete (F.W. Isolation and S.G. Level Portions of Monitor Light Box C: red lights ON, white light OFF.</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (7) Determines Containment Spray and Phase B Isolation is NOT required (Contmt Isol, Phase B portion of Monitor Light Box D: red lights are OFF)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (8) Checks Main Steamline Isolation complete (Main Steam Isolation portion of Monitor Light Box D: red light ON, white light are ON)               <ul style="list-style-type: none"> <li>○ Determines Main Steamline Isolation is not complete.</li> <li>○ Directs field to implement Appendix L (may have been completed earlier in scenario)</li> </ul> </li> </ul>
	BOP	(9) Checks AFW status <ul style="list-style-type: none"> <li>• AFW Pp 1-2 and 1-3 both running</li> <li>• TDAFW IS NOT required.</li> <li>• Verifies min of 435 gpm flow (VB3 center) or S/G level &gt; 15%</li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 3Event No.: 5,6Page 17 of 17


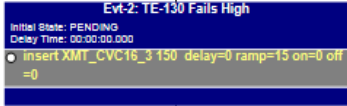
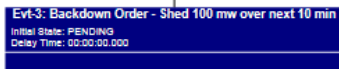
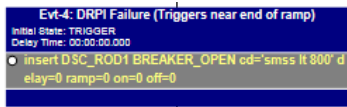
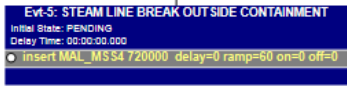
**Event Description:** EOP E-0, Reactor Trip or Safety Injection, Appendix E, ESF Auto Actions, Secondary and Auxiliaries Status  
MSLB Outside Containment, downstream of MSIVs

Time	Position	Applicant's Actions or Behavior
	(EOP E-0, Appendix E, cont)	
	BOP	<ul style="list-style-type: none"> <li>(10) Checks ECCS flows (charging injection (VB2 upper panel left), SI, RHR (both on VB1 upper panel)</li> <li>(11) Reports ESF and AFW status to the Shift Foreman (Shift Foreman may direct operator to continue on in Appendix E, or redirect to higher priority tasks)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>(12) Checks excess letdown; notes NOT in service prior to trip</li> <li>(13) Checks secondary systems (MFPs tripped (VB2, green lights ON), stops all but one CB Pp set, takes LCV-12 control switch to CONT ONLY.</li> <li>(14) Verifies proper operation of Aux Bldg and Control Rm vent systems (VB4 vent status light panel white lights); turns on aux bldg vent charcoal filter preheater (VB4 lower panel, left side) and verifies containment iodine fans secured (VB4, lower panel),</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>(15) Verifies available DGs running normally (VB4, freq (60), volts (120), speed (900))</li> <li>(16) Verifies vital batteries supplied by chargers (charger and bus volts on VB5, upper panel middle/lower area);</li> <li>(17) Verifies MSRs reset (CC3 Triconex HMI)</li> <li>(18) Throttles RCP seal injection flows to normal if needed (FCV-128, to 8-13 gpm each, CC2)</li> <li>(19) Checks PK11-04 NOT IN (SFP alarm)</li> <li>(20) Notifies Shift Foreman of completion.</li> </ul>
(Board Operator will rejoin crew upon completion of Appendix or when called upon by Shift Foreman)		

\*\* Critical Task

## Attachment 1 – Scenario Set-up & Booth Actions

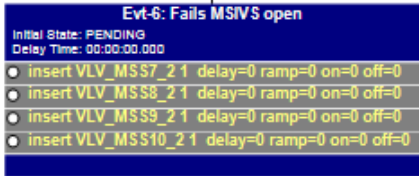
X = manual entry required

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	IC	RESTORE 152	75% power MOL, C <sub>B</sub> - 919
X	Setup	N/A	CFCU 1-5 OOS
	The Plant Abnormal Status Board for Surveillance Requirements		None
	Copies of Procedures, Attachments; Appendixes; Foldout Pages; Annunciator Response Procedures and commonly used forms are in binders and <b>NOT</b> Marked up		<b>OP B-1A:XII, PK03-21, PK04-21, PK20-04, AP-5, AP-25, EOP E-0, E0.1, E-2, ECA-2.1</b>
X	0 min	Tools > Simple SBT	Before crew takes the watch. Use Simple SBT, Data Recorder File: sbt_sim.drb, min 960 iterations (30 sec). <u>Critical Task Specific Data Capture:</u> <ul style="list-style-type: none"> <li>S3CT1: AFW Flow and valve positions. Tcold, all loops.</li> <li>S3CT2: PRT pressure and level; 8801A, 8801B, 8803A, and 8803B valve positions (specifically when a complete flow path goes CLOSED).</li> </ul>
X	0 min	Lesson L161 NRC-S3.Isn	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by FILE or MANUALLY (below)
X	<u>Evt-1: LTC Auto Controller Fails</u> (approx. 3 min after taking watch per lead examiner)		Power Supply failure (normal and switch to backup) cause LTC to fail to low tap. When turbine watch dispatched to check SUT 1-1, report local alarm panel in for LTC V Reg to B/U and LTC upper/lower tap limit.
X	<u>Evt-2: TE-130 fails high</u> (Once Evt-1 TS have been addressed, per lead examiner)		Letdown heat exchanger temperature element TE-130 fails high
X	<u>Evt-3: Grid Disturbance, GCC ramp of 150 MW in 15 min</u> (Cue given by SM)		If GCC contacted, report call was made to SM to report conditions.
X	<u>Evt-4: DRPI power loss</u> (Triggers off MW < 800)		DRPI power loss. Transfer to B/U when directed; delay 5 minutes to run command (LOA_ESPI BACKUP)
X	<u>Evt-5: MSLB Outside Containment</u> (Once temperature has been stabilized, per lead examiner)		MSLB outside containment

(con't on next page)

## Attachment 1 – Scenario Set-up & Booth Actions (con't)

X = manual entry required A = activate from EVENT file

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
<u>Evt-6: All 4 MSIVs fail open – Post Trip</u>		All 4 MSIVs failed open. MSIVs will remain failed open for duration of scenario. When directed to perform App L, respond to all calls stating unable to close and have requested assistance from mechanical maintenance.



# Diablo Canyon Power Plant Operations Shift Log



## Unit 1

*Unit 1 Days at Power: 111 Days*

**Operating Mode: 1**

**Gross Generation: 871 MWe**

**Power Level: 75%**

**Net Generation: 821 MWe**

### Today - Dayshift

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#### Shift Manager Turnover:

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PRA RISK STATUS NEXT SHIFT:	Green
GRID STATUS NEXT SHIFT:	Normal
AVERAGE RCS CALCULATED LEAKRATE:	0.01 gpm
CONDENSER INLEAKAGE:	< 0.01 gpd
CONDENSER D/Ps:	NW 5.9 SW 6.4 NE 6.3 SE 6.1 PSID
MAIN GENERATOR H2 USAGE:	325 scfd / 327 scfd 5 day ave
SPENT FUEL POOL:	Temp = 80°F; Time to 200°F = 30 hrs using actual temp (F-ID-7A)

#### NEW PRIORITY WORK:

- CFCU 1-5 OOS for backdraft damper replacement.

#### SHUTDOWN TECH SPECS / ECGS:

- None

#### ECG ACTIONS THAT IF COMPLETION TIME NOT MET ECG 0.3 IS ENTERED:

- None

#### TURNOVER ITEMS:

- Unit was ramped to 75% yesterday under a backdown order associated with grid instability.

#### PRIORITY ITEMS FOR NEXT SHIFT:

- Maintain current power level.

#### Shift Foreman Turnover

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ANNUNCIATORS IN ALARM:



- There are no unexpected alarms - all current alarms are consistent with current mode and power level.

#### TURNOVER ITEMS:

- U-1: maintain 75% - no one in containment.
- U-2: maintain 75% - no one in containment.

#### REACTIVITY MANAGEMENT:

- Time in core life: MOL.
- Power History: Steady State at 100% for past 111 days.
- Boron concentration is 919 ppm from a sample taken 2 hours ago.
- Control Rod Height: 191 steps on CBD.
- Diluting the RCS approximately 25 gallons every 1.5 hrs.
- The last dilution was completed 30 min ago.

#### CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- None

#### OTHER ABNORMAL PLANT STATUS

- None

Facility: Diablo Canyon (PWR) Scenario No: 4 Op-Test No: L162 NRC

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: 100% with MAFW Pump 1-3 OOS; MOL, 878 ppm boron

Turnover:

Event No	Malf No.	Event Type*	Event Description (See Summary for Narrative Detail)
1	MAL_NIS6A 200 delay=0 ramp=420	<b>I, TS (ALL)</b>	NI-41 slow failure HIGH ( <b>AP-5; Multiple TS</b> (see summary section))
2	XMT_RCS6_3 -376.0 ramp=60	<b>I, TS only (SRO)</b>	PT-403 fails low ( <b>PK05-07, 09</b> )( <b>TS 3.3.3.A</b> )
3	MAL_CWS2C 2.3 delay=0 ramp=2	<b>C (ALL)</b>	Condenser In-leakage ( <b>PK12-05, AP-20 &amp; 25</b> )
4	XMT_CND29_3 282 ramp=240 XMT_CND30_3 278 ramp=240 CD04CND_CDP13_MTFSEIZUR 1 cd='(h_v3_225r_1 and (txmtcbmo(3) gt 280))' delay=15	<b>C (BOP, SRO)</b>	CBP Set 1-3 high bearing temp when ramp reaches 1000 MW ( <b>PK10-06</b> )
5	MAL_SEI1 0.15 delay=0 ramp=10 CNV_MFW3_2 0 delay=0 ramp=60	<b>M (ALL)</b>	FCV-510 fails closed following seismic event.
6	MAL_RCS4F 600 cd='fnispr_2 lt 5' delay=0 ramp=10	<b>M (ALL)</b>	600 gpm SGTR (S/G 1-2)
7	MAL_PPL3A BOTH, MAL_PPL3B BOTH	<b>C (ALL)</b>	SI Actuation Fails (both auto and manual)
8	CNV_RCS1_2 CNV_RCS2_2	<b>C (BOP)</b>	Prz Sprays failed closed / PORV used for depressurization fails opened; block valve can not be closed

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d) (from form ES301-4)	Actual Attributes
1. Total malfunctions (5–8) (Events 1,3,4,5,6,7,8)	7
2. Malfunctions after EOP entry (1-2) (Events 7,8)	2
3. Abnormal events (1–4) (Events 1,3,4)	3
4. Major transients (1-2) (Event 5,6)	2
5. EOPs entered/requiring substantive actions (1–2) (E-3, ECA-3.1)	2
6. EOP contingencies requiring substantive actions (0–2) (ECA-3.1)	1
7. Critical tasks (2–3)(See description below)	3

Critical Task	Justification	Reference
(S4CT-1) Manually trip the reactor before S/G 1-1 reaches dry out conditions as indicated by WR level less than 10%.	Steam Generator Level below 15% narrow range in 1 of 4 loops after a power level dependent time delay, normally generates a reactor trip signal to protect against a loss of heat sink. For this scenario, power remains above 50%, so the time delay = 0. Once the S/G has reached dry out conditions, it is no longer capable of RCS heat removal. Furthermore, the S/G is susceptible to structural damage as the result of thermal shock once feedwater is re-established from the Auxiliary Feedwater System.	<ul style="list-style-type: none"> <li>• WOG Backgd HFHR1BG_R3</li> </ul>
(S4CT-2) Manually align at least one train of SIS actuated safeguards before transition out of EOP E-0, Reactor Trip or Safety Injection.	FSAR analysis predicates acceptable results on the assumption that, at the very least, one train of safeguards has actuated and is providing flow to the core. Failure to start and manually align the minimum required safeguards equipment results in the persistence of degraded emergency core cooling system capacity.	<ul style="list-style-type: none"> <li>• WCAP-17711-NP, CT-2</li> <li>• WOG Backgrnd HE0BG_R2</li> </ul>
(S4CT-3) Isolate the ruptured steam generator from the intact steam generators prior to commencing cooldown of the RCS in step 9.c (40% steam dumps) or 10.b (10% steam dump) by completing the following: Isolate feedwater by ensuring closed: <ul style="list-style-type: none"> <li>• LCV-107 (MDAFW Level Control Valve)</li> <li>• LCV-111 (TDAFW Level Control Valve)</li> </ul> Isolate steamflow by ensuring closed: <ul style="list-style-type: none"> <li>• FCV-42 (S/G 1-2 MSIV)</li> <li>• FCV-37 (S/G 1-2 supply to TD AFW Pp)</li> </ul>	SG inventory increase leads to water release through the S/G PORV or safety valve(s) or to SG overfill, which would seriously compromise the SG as a fission-product barrier and complicate mitigation.	<ul style="list-style-type: none"> <li>• W Margin to Overfill (CN-CRA-05-53 Rev1)</li> <li>• W Offsite Doses (CN-CRA-05-54)</li> <li>• SGTR UFSAR 15.4.3</li> <li>• WCAP-17711-NP</li> </ul>

*Per NUREG-1021, Appendix D, if an operator or crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.*

## SCENARIO SUMMARY – NRC #4

1. Power Range Nuclear Instrument NI-41 slowly fails high causing inward rod motion. Crew diagnoses failure, and once motion is deemed unwarranted, takes rods to manual. Failure is addressed per **OP AP-5, Malfunction of Eagle 21 Protection or Control Channel**, which removes the failed channel from service and directs the Shift Foreman to address **Tech Specs 3.3.1.D,E,S,T Reactor Trip System Instrumentation; ECG 37.2 Axial Flux Difference (AFD) monitoring, and ECG 37.3 (Quadrant Power Tilt Ratio Alarms)**.
2. PT-403, RCS Wide Range Pressure Transmitter, fails low. The crew responds to **PK05-07, Subcooling Margin Lo/Lo-Lo** and **PK05-09, RVLIS Lo Lvl RVLIS/SCMM Trouble**, identifying the affected instrumentation. Shift Foreman addresses **TS 3.3.3.A, Post Accident Monitoring Instrumentation**.
3. A saltwater leak develops in the SW quadrant of the condenser, bringing in **AR PK12-05, COND PPS DISCH HDR CATION CONDT'Y HI**. The crew determines cation conductivity is elevated and the Shift Foreman enters **OP AP-20, Condenser Tube Leak**, which calls for a 25 MW/min ramp to 50%. The crew immediately implements **OP AP-25, Rapid Load Reduction or Shutdown** to commence the ramp.
4. Annunciator **AR PK10-06, CNDS & CNDS BSTR PPS** comes into alarm due to rising bearing temperatures on Condensate Booster Pump Set (CBP) 1-3. Reactor operators identify rapidly rising bearing temperatures using plant process computer trends. The crew manually starts CBP 1-2 and secures CBP 1-3 to prevent motor damage.  
*(Note: Malfunction is designed to trip CBP 1-3 if crew has not shut the pump down within 15 seconds of bearing temperature reaching 280°F. The Autostart of CBP 1-2 has been disabled and will require a manual start).*
5. A 0.15 seismic event results in Main Feed Reg valve FCV-510 failing closed. S/G 1-1 level can not be maintained. S/G 1-1 Low Level trip has been disabled and the crew must manually trip the reactor **(S4CT-1) Manually trip the reactor before S/G 1-1 reaches dry out conditions.**
6. A 600 gpm tube rupture develops on S/G 1-2 when the reactor trips. The crew enters **EOP E-0, Reactor Trip or Safety Injection**, and identifies the rupture based on various radiation alarms, rising counts on RM-72, and the inability to maintain RCS pressure and pressurizer level following the trip.
7. Both auto and manual Safety Injection (SI) actuation signals fail and the crew must manually start and align SI actuated equipment **(S4CT-2) Manually align at least one train of SIS actuated safeguards before transition out of EOP E-0.**

*(continued on next page)*

## SCENARIO SUMMARY – NRC #4

8. The crew transitions to **EOP E-3, Steam Generator Tube Rupture**, and where they perform the critical task of isolating S/G 1-2 **(S4CT-3) Isolate the ruptured steam generator from the intact steam generators prior to commencing cooldown of the RCS.**\*\*\* Depressurization of the RCS is commenced following the cooldown. Pressurizer spray valves fail to operate and a PORV must be used. When the crew attempts to stop the depressurization, both the PORV and associated block valve fail to operate in the closed direction, and the Shift Foreman transitions to **EOP ECA-3.1, SGTR with Loss of Reactor Coolant – Subcooled Recovery Desired.**

**The scenario is terminated once the cooldown to Cold Shutdown in ECA-3.1 has been commenced or verified.**

\*\*\* **CT / TCOA note:** SGTR was evaluated against Time Critical Operator Actions (TCOAs) # 2 (SGTR); initial power level and supporting equipment conditions differ significantly from the conditions used in this scenario. For these reasons, the S/G TCOAs will remain critical (a critical task, per WOG), but TCOA time limits will not be applied to this scenario.

Op-Test No.: L162-NRCScenario No.: 4Event No.: 1Page 1 of 25**Event Description:** Power Range Nuclear Instrument NI-41 Slow Failure High

Time	Position	Applicant's Actions or Behavior
<b>Note:</b> Procedure step numbers are included at the front of each action/comment in parenthesis, where applicable.		
	ALL	Diagnoses power range NI-41 failure from the following: <ul style="list-style-type: none"><li>NI-41 meter failing high (CC1, VB2 lower chart)</li><li>Several PK alarms, all associated with power range NIs, have alarmed</li><li>Turbine power (PPC, CC3 turbine control) has not changed, <math>T_{ave}</math> is close to <math>T_{ref}</math>, but controls rods are moving in (CC1)</li></ul>
	ATC	Takes control rods to manual (due to inward rod motion caused by NI-41 failing high) (CC1)
	SRO	Enters OP AP-5, Malfunction of Eagle-21 Protection or Control Channel
	(OP AP-5, Malfunction of Eagle-21 Protection or Control Channel)	
<b>Note:</b> Depending on how quickly this failure is diagnosed, and how quickly control rods are placed in manual (fairly high worth area for rods), there may be an immediate need to control temperature. If needed, the Shift Foreman may choose to use the turbine load to raise $T_{ave}$ , or may "move up" a substep in OP AP-5 to bypass the C2 rod stop (that prevents outward rod motion), so that rods are again available. If failure identified fairly quickly, these responses may be delayed until rod control is restored (below).		
	SRO/ATC	<ul style="list-style-type: none"><li>(1) Determines Primary and Secondary Control Systems are NOT controlling properly in AUTO (specifically Rod Control has a failure)</li><li>(1.a RNO) Verifies Rod Control has been taken to manual. Restores <math>T_{ave}</math> to <math>T_{ref}</math> (if needed; see note above). This may be done by ramping the turbine down, or by moving rods out (see below for bypassing rod stop C2)</li><li>(1.b RNO) Notes failure is due to single instrument and not an entire Process Control Rack</li></ul>
	SRO	Reads NOTES regarding Channel Set Failure Alarm and failure of LCP prior to step 2 and determines they are not applicable for this failure
(continued on next page)		

\*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 4 Event No.: 1 Page 2 of 25

Event Description: Power Range Nuclear Instrument NI-41 Slow Failure High, continued

Time	Position	Applicant's Actions or Behavior
		(OP AP-5, Malfunction of Eagle-21 Protection or Control Channel, continued)
	SRO/ATC	<ul style="list-style-type: none"> <li>(2) Determines not an Eagle-21 failure based on PK06-01 and PK06-03 - OFF</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(3) Notes no impact since Loop 2 is selected for TR-411 recorder (step is N/A) (VB2)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(4) Checks steam dumps not actuated (no armed, open, or tripped open signals) (VB3)</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(5) Notifies I&amp;C</li> </ul>
	SRO	<p>Reads CAUTION before step 6 regarding Eagle 21 design feature associated with rack issues and notes as N/A for this failure</p> <ul style="list-style-type: none"> <li>(6) Reminds crew of necessity to ensure affected channels are removed from service prior to maintenance</li> </ul>
	SRO/BOP	<p>(7) Reviews Attachments 4.1 (Rx Trip and ESF Bistable Channel positioning per TS) and 4.2 (Process Control System Racks) to determine affected controls and indicators</p> <ul style="list-style-type: none"> <li>(a) Places OOS tags on NI-41 (CC1, VB2) and OTdT (VB2)</li> <li>(b) Determines NI-41 provides control inputs and can be defeated/bypassed (these actions may be done at several steps in OP AP-5; pg 19 of Att 4.1) (all of these switches are "in back" on the NI panels, all on the right hand cabinet, four switches on the top drawer, and the last switch on the middle drawer) <ul style="list-style-type: none"> <li>Places rod stop bypass switch to N41 position (this one cause defeat alarm, PK07-07, and allows rod movement)</li> <li>Places power mismatch switch to the N41 position</li> <li>Places quadrant power tilt upper section to the N41 position</li> <li>Places quadrant power tilt lower section to the N41 position</li> <li>Places comparator defeat switch to the N41 position</li> </ul> </li> </ul>
(continued on next page)		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 4**

**Event No.: 1**

Page 3 of 25

**Event Description:** Power Range Nuclear Instrument NI-41 Slow Failure High, continued

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**\*\*Critical Task**



Op-Test No.: L162-NRC Scenario No.: 4 Event No.: 2 Page 4 of 25

Event Description: PT-403, RCS Wide Range Pressure Transmitter, Fails Low

Time	Position	Applicant's Actions or Behavior
<b>Note: AR PK05-07, SUBCOOLING MARGIN LO/LO-LO and AR PK05-09, RVLIS LO LVL, RVLIS/SCMM TROUBLE , both alarm. SRO may use either PK to address the issue provided all applicable TS and ECGs are identified.</b>		
	All	Diagnoses PT-403 has failed low from one or more of the following (VB-2): <ul style="list-style-type: none"> <li>PK05-07, SUBCOOLING MARGIN LO/LO-LO</li> <li>PK05-09, RVLIS LO LVL, RVLIS/SCMM TROUBLE</li> </ul> VB-3 Indications: <ul style="list-style-type: none"> <li>PR-403, LOOP 4 HOT LEG PRESS – WIDE RANGE = 0 psig (bottom of scale low)</li> <li>YI-31, SUBCOOL MARGIN MON – TRAIN B = -40°F (bottom of scale low)</li> </ul>
	If AR PK05-07 is entered; otherwise this section is N/A	
	SRO/ATC	<ul style="list-style-type: none"> <li>(1.0) Identifies input 1600 (Subcooled Mon Lo-Lo Margin from RVLIS Train B) and goes to section 2.1 for General Actions</li> </ul>
	SRO	Reads NOTE regarding P-10 prior to step 2.1
	SRO/BOP	<ul style="list-style-type: none"> <li>(2.1.1) Observes diverse RCS pressure and temperature indications and determines subcooled margin is NOT low. Identifies PR-403 reading bottom of scale as indication of failed instrument (PPC, CC1, CC2, VB2)</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.2) Determines RCS is NOT approaching a saturated condition and continues to next step</li> </ul>
	ALL	<ul style="list-style-type: none"> <li>(2.1.3) Confirms specific instrument failure as PT-403: <ul style="list-style-type: none"> <li>(2.1.4.a) Determines failure is associated with RVLIS/SCMM, Train B</li> <li>(2.1.4.b) Checks train-specific subcooling indications to confirm failure (PPC, SPDS Train B, YI-31 on VB2, PAM4 Display – may use any)</li> </ul> </li> </ul>
(continued on next page)		

\*\* Critical Task

Op-Test No.: L162-NRC      Scenario No.: 4      Event No.: 2      Page 5 of 25

Event Description:    PT-403, RCS Wide Range Pressure Transmitter, Fails Low (cont)

Time	Position	Applicant's Actions or Behavior
		(AR PK05-07, continued)
	SRO	Reads NOTE regarding possible Thermocouple Monitoring System failure (PK05-15) and determines it doesn't apply
	SRO	<ul style="list-style-type: none"> <li>(2.1.3) Confirms specific instrument failure as PT-403 (continued):               <ul style="list-style-type: none"> <li>(2.1.3.c) Notes PK05-15 is NOT in alarm and continues to next step</li> <li>(2.1.3.d) References AP-5, Malfunction of Protection or Control Channel as time permits (described later in this section)</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.4) Reviews ECG 7.8, Accident Monitoring Instrumentation for applicability. Determines LCO is met (required number of channels and minimum channels operable =1)</li> </ul>
		If AR PK05-09 is entered; otherwise this section is N/A
	SRO/ATC	<ul style="list-style-type: none"> <li>(1.0) Identifies inputs 1208 (Reactor Vessel Level Lo Train B) and 1209 (RVLIS/SCMM Trouble Train B); goes to section 2.1 for General Actions</li> </ul>
	SRO	Reads NOTE regarding O/E on erroneous RVLIS low level alarms prior to step 2.1.1
	SRO/BOP	<ul style="list-style-type: none"> <li>(2.1.1) Checks RVLIS on PAM 4 and determines low subcooled margin reading is causing the alarm (PAM4 is located in area behind vertical boards)</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.2) Determines RVLIS is NOT low and continues to next step</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(2.1.3) Observes diverse RCS pressure and temperature indications and determines subcooled margin is NOT low</li> </ul>
(continued on next page)		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 4Event No.: 2Page 6 of 25**Event Description:** PT-403, RCS Wide Range Pressure Transmitter, Fails Low (cont)

Time	Position	Applicant's Actions or Behavior
		(AR PK05-09, continued)
	ALL	<ul style="list-style-type: none"> <li>(2.1.4) Identifies specific instrument failure as PT-403:               <ul style="list-style-type: none"> <li>(2.1.4.a) Determines failure is associated with RVLIS/SCMM, Train B</li> <li>(2.1.4.b) Checks PAM4 (Train B) I/O Summary Screen inputs and identifies failed pressure transmitter (PAM4 is located in area behind vertical boards)</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.5) Enters TS 3.3.3.A, Post Accident Monitoring Instrumentation for inoperable channel associated with RCS Pressure (Wide Range) and Reactor Vessel Level Indicating System (RVLIS) functions. Required action: restore to operable status within 30 days</li> </ul>
		If OP AP-5 is referenced; otherwise this section is N/A
<b>Note:</b> PT-403 provides no controlling functions. Shift Foreman may go directly to OP AP-5, Attachment 4.1 to identify / confirm previous identification of applicable Tech Specs and ECGs.		
	SRO	<ul style="list-style-type: none"> <li>Enters TS 3.3.3.A, Post Accident Monitoring Instrumentation for inoperable channel associated with RCS Pressure (Wide Range) and Reactor Vessel Level Indicating System (RVLIS) functions. Required action: restore to operable status within 30 days.</li> </ul>
	SRO/BOP	Places Out of Service stickers on the following affected equipment: <ul style="list-style-type: none"> <li>PR-403 (VB-2)</li> <li>RVLIS TRAIN B (PAM 1, behind VB-5)</li> <li>Sub-cooled Margin Monitor (VB-2)</li> </ul>
<b>Proceed to the next event once Tech Specs have been addressed per lead examiner</b>		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 4**

**Event No.: 3**

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**Event Description:**     **Condenser In-Leakage**

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**\*\* Critical Task**

Op-Test No.: L162-NRCScenario No.: 4Event No.: 3Page 8 of 25Event Description: Condenser In-Leakage, continued

Time	Position	Applicant's Actions or Behavior
		<b>(OP AP-20, Condenser Tube Leak , continued)</b>
	SRO/BOP	<p>Reads NOTE regarding identification of leak location and implementation of compensatory actions.</p> <ul style="list-style-type: none"> <li>• (2) Determines area of leak (condenser quadrant) (PPC) <ul style="list-style-type: none"> <li>○ Identifies South West quadrant</li> <li>○ Requests confirmation of location from Polisher Watch</li> <li>○ May direct Chemistry to sample locally</li> </ul> </li> </ul>
	SRO/BOP	<p>Reads CAUTION regarding requirement to trip Rx if FCV-230 (condensate polisher demineralizer bypass valve) goes open for any reason.</p> <ul style="list-style-type: none"> <li>• (3) Performs actions to prevent bypass of condensate demineralizers <ul style="list-style-type: none"> <li>○ (3.a) Verifies FCV-230 closed (VB3, lower right skirt)</li> <li>○ (3.b) Directs Turbine Watch to open supply breaker for FCV-230</li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (4) Monitors Feedwater Cation Conductivity for indications of condensate demin breakthrough; (PPC)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (5) Evaluates Attachment 4.1, Condenser Tube Leak Corrective Action Limits <ul style="list-style-type: none"> <li>○ Determines minimum ramp is 25MW/min down to 50% power</li> <li>○ Initiates ramp (CC3, Turbine Control HMI) (see next page)</li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (6-11) May perform additional actions to minimize secondary contamination in parallel with implementation of OP AP-25. <ul style="list-style-type: none"> <li>○ Takes manual control and closes Condenser Hotwell Reject Valve, LCV-12 (VB3, lower right skirt)</li> <li>○ Directs field realignment of CWP 1-1 Auto Reclose and SCW Hx</li> </ul> </li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 4Event No.: 3Page 9 of 25Event Description: **Condenser In-Leakage, continued**

Time	Position	Applicant's Actions or Behavior
<b>(OP AP-25, Rapid Load Reduction )</b>		
	SRO	<ul style="list-style-type: none"> <li>(1a) Determines runback/programmed ramp is not in progress (may not vocalize, since this ramp is initiated by the crew)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>Ramp is started (guidance is also on lamicoid pegboard on CC3):               <ul style="list-style-type: none"> <li>(1b) MW and IMP feedbacks are placed in service (all on Triconex turbine HMI, CC3)</li> <li>(1c) <math>\approx</math> 550 MWe load target is entered into Triconex HMI</li> <li>(1d) Sets ramp rate to 25 mw/min</li> <li>(1e) Pushes GO</li> <li>(1f) Notifies Chemistry of power decrease greater than 15% in one hour</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(2) Verifies that control rods are inserting properly in AUTO (VB2)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(3) Verifies ON all pressurizer backup heaters (CC1)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(4) Verifies charging flow adequate to prevent letdown flashing: may take manual control of Pzr level               <ul style="list-style-type: none"> <li>Places HC-459D (master level controller) and/or FCV-128 (charging flow controller) in manual (CC2)</li> <li>Keeps charging high enough to prevent letdown from flashing (VB2)</li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(5) Verifies DFWCS in AUTO and controlling S/G levels (CC3 MFW HMI, VB3, PPC)               <ul style="list-style-type: none"> <li>Checks MFW control and bypass valves in AUTO</li> <li>Checks both MFPs and their controller in AUTO</li> <li>May check level trends, as well as steam flow/feed flow trends (CC3, PPC, and/or big VB3 DFWCS electronic recorders)</li> </ul> </li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 4**

**Event No.: 3**

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**Event Description:**     **Condenser In-Leakage, continued**

Time	Position	Applicant's Actions or Behavior
(OP AP-25, Rapid Load Reduction (cont))		
<b>Note:</b> Boration values described below are representative of the conditions given, but will vary based on the actual ramp rate and target specified by SRO.		
	SRO/ATC	<ul style="list-style-type: none"> <li>• (6) Performs boration (the following guidance is on the boration checklist in the reactivity handbook)               <ul style="list-style-type: none"> <li>○ Presses STOP on M/U Ctrlr HMI (CC2)</li> <li>○ Presses BORATE on HMI</li> <li>○ Sets target gallons for boration (as decided above, and per the Shift Foreman); verifies batch is reset</li> <li>○ Sets boric acid flowrate</li> <li>○ Presses START, and monitors boration</li> <li>○ Once stopped, either returns to AUTO (presses AUTO, then START), or performs additional boration per the Shift Foreman</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• The Shift Foreman provides indirect reactivity oversight for the ramp</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (7) Checks MFP suction pressure greater than 260 psig (VB3)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>• (8) Checks Tavg trending to Tref (PPC, CC1)</li> <li>• (9) Checks Pressurizer pressure and level trending to programmed band (PPC, CC2)</li> </ul>
Next event is set to auto trigger at 1000 MW		

## \*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 4 Event No.: 4 Page 11 of 25

Event Description: Condensate Booster Pump 1-3 High Bearing Temperature During Ramp

Time	Position	Applicant's Actions or Behavior
<p><b>Note:</b> Condensate Booster Pump 1-3 pump bearing temperatures rise over four minutes. This causes alarm PK10-06. The pump shaft will seize and the pump trips on overcurrent 15 seconds after bearing temperature reaches 280 degrees if not shutdown by the crew. Autostart of standby CBP 1-2 will fail, requiring manual start by the crew</p>		
	ALL	<p>Diagnoses CBP 1-3 high pump bearing temperature and trip from the following:</p> <ul style="list-style-type: none"> <li>• PK10-06, CNDS &amp; CNDS BSTR PPS , in alarm</li> <li>• Rising pump bearing temperatures on PPC</li> </ul>
<p><b>Note:</b> Crew may follow guidance of AR PK10-06 for engineering evaluation or may elect to shutdown pump based on OP1.DC10, Conduct of Operations guidance for protection of plant equipment.</p>		
<p><b>AR PK10-06 CNDS &amp; CNDS BSTR PPS (If used, else mark N/A)</b></p>		
	SRO/BOP	<ul style="list-style-type: none"> <li>• (2.3.1) Dispatches an Operator to determine cause of high temperature</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>• Reads NOTE regarding temperature limits prior to step 2.3.2</li> <li>• (2.3.2) Notes requirement to document temperature and lapsed time period if pump set is left in service with actual high temperature alarms</li> <li>• (2.3.3) Notes direction to contact engineering for evaluation if stator temperature is 248°F or above</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (2.3.4.a) Starts standby CBP 1-2 (VB3, lower center skirt)</li> <li>• (2.3.4.b) Stops CBP 1-3 (VB3, lower center skirt)</li> </ul>
<p><b>OP1.DC10, Conduct of Operations - guidance for protection of plant equipment (27.22.6)</b></p>		
	SRO/BOP	<ul style="list-style-type: none"> <li>• Starts standby CBP 1-2 (VB3, lower center skirt)</li> <li>• Stops CBP 1-3 (VB3, lower center skirt)</li> </ul>
<p>(continued on next page)</p>		

\*\* Critical Task



**Op-Test No.: L162-NRC**

**Scenario No.: 4**

**Event No.: 4**

Page 12 of 25

**Event Description:**    **Condensate Booster Pump 1-3 High Bearing Temperature During Ramp, continued**

Time	Position	Applicant's Actions or Behavior
	ALL	(If not stopped preemptively) Diagnoses CBP 1-3 overcurrent trip from the following: <ul style="list-style-type: none"> <li>• PK10-06, CNDS &amp; CNDS BSTR PPS , reflashes</li> <li>• Reduction in Feedpump Suction Pressure (VB3, upper right center)</li> <li>• Overcurrent (blue) light on for CBP 1-3 (VB3, lower center skirt)</li> </ul>
	SRO	Enters OP AP-15: Section D Loss of Feedwater Flow – Condensate/Booster Pump Set Trip
<b>(OP AP-15: Section D, Loss of Feedwater Flow – Condensate/Booster Pump Set Trip (N/A if already stopped))</b>		
	SRO/BOP	<ul style="list-style-type: none"> <li>• (1) Determines all available CBPs running</li> <li>• (2) Checks Main Feed Pump suction pressure greater than 260 psig (VB3, upper center)</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• May direct Turbine Watch to walk down pump and breaker</li> <li>• May request maintenance to investigate issue</li> <li>• (3) Exits AP-15</li> </ul>
<i>Proceed to the next event once Condensate Booster Pump failure has been addressed, per lead examiner</i>		

## \*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 4**

**Event No.: 5**

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**Event Description:** Loop 1 Feedwater Reg Valve, FCV-510, Fails Closed following seismic event (CT)

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**\*\*Critical Task**

**Op-Test No.: L162-NRC**

**Scenario No.: 4**

**Event No.: 5**

Page 14 of 25

**Event Description:**    **Loop 1 Feedwater Reg Valve, FCV-510, Fails Closed, continued**

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**\*\* Critical Task**

Op-Test No.: L162-NRC Scenario No.: 4 Event No.: 5 Page 15 of 25

Event Description: Loop 1 Feedwater Reg Valve, FCV-510, Fails Closed, continued

Time	Position	Applicant's Actions or Behavior
<b>(EOP E-0.1, Reactor Trip Response)</b>		
<b>Note 1:</b> EOP E-0.1 actions will be performed until crew identifies SGTR, which will most likely occur within the first step or two of E-0.1; there is no requirement to perform any particular E-0.1 actions prior to the transition back to E-0.		
	ATC/BOP	<ul style="list-style-type: none"> <li>(1) Checks Tavg stable or trending towards Tref (if should be); may start TDAFW if levels low and throttle LCVs to control RCS temperature (VB3)</li> </ul>
	ATC/BOP	<ul style="list-style-type: none"> <li>(2) Checks Feedwater Isolation (FWI) complete               <ul style="list-style-type: none"> <li>Checks Tave &lt; 554°F (expected, given initial power level)</li> <li>Checks FWI MLB (monitor light box) (VB1, upper center), RED light ON, WHITE lights OFF (they are, this actuation occurs if &lt; 554°F)</li> <li>Checks AFW flow &gt; 435 gpm (the flow will be adequate, and S/G levels will be at or near normal) (VB3)</li> </ul> </li> </ul>
	ATC	<ul style="list-style-type: none"> <li>(3) Checks all control rods – fully inserted (they are) (VB2 upper left, for DRPI panel)</li> </ul>
	ATC/BOP	<ul style="list-style-type: none"> <li>(4) Checks Pzr and level control               <ul style="list-style-type: none"> <li>Checks Pzr level &gt; 17% (it is) (VB2 meter, CC2 recorder, PPC)</li> <li>Checks charging and letdown in service (they both are) (CC2 and VB2 CVCS mimic)</li> <li>Checks Pzr level trending to 22%; operates FCV-128 and HCV-142 (CC2) to control Pzr level 22% - 60% (RNO)</li> <li>Operates Pzr heaters as needed (auto/manual) to maintain normal pressure (normal auto operation expected at this point, with pressure returning to normal or normal already)</li> </ul> </li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 4Event No.: 6,7Page 16 of 25Event Description: 600 GPM SGTR on S/G 1-2

SI Actuation Fails (both auto and manual) (CT)

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnoses of SGTR is made using one or more of the following: <ul style="list-style-type: none"> <li>Pressurizer level and pressure lowering (PPC, CC2, VB2)</li> <li>S/G 1-2 level rising (PPC, VB3)</li> <li>Main steam line hi-rad rising, loop 2 (RM-72) (PPC, VB2) (not visible for several minutes after initial break)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>May attempt to isolate letdown (VB2, upper center skirt)</li> </ul>
<b>Note:</b> Failure of both Auto and Manual actuation of Safety Injection will require manual starting of ECCS pumps and positioning of injection flowpath valves. These manipulation may be completed as part of EOP E-0, Appendix E. (see page 23).		
	ALL	<ul style="list-style-type: none"> <li>Initiates manual SI (CC2, far right) <ul style="list-style-type: none"> <li>Determines Manual SI unsuccessful (may try VB1 switch, which fails as well)</li> <li>Performs manual alignment of SI equipment (S4CT-2)**</li> </ul> </li> </ul> <p><b>**(Critical Task) (S4CT-2) Manually align at least one train of SIS actuated safeguards before transition out of EOP E-0, Reactor Trip or Safety Injection. Note only one train is required to meet the critical task.</b></p>
<b>(Re-enters EOP E-0, Reactor Trip or Safety Injection )</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Verifies reactor trip (trip bkrs open, rods on bottom, NIs decreasing) (VB2, CC1)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(3) Checks vital 4kv bus status (VB4, vital busses F/G/H have white lights on mimic busses)</li> </ul>
(continued on next page)		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 4Event No.: 6Page 17 of 25Event Description: 600 GPM Post-Trip SGTR on S/G 1-2 (cont)

Time	Position	Applicant's Actions or Behavior
<b>(EOP E-0, Reactor Trip or Safety Injection , continued)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(4) Checks SI actuated (PK08-21 is OFF but equipment is manually aligned) <ul style="list-style-type: none"> <li>Both trains of SI/RHR pumps running (VB1 skirt)</li> </ul> </li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(5) Directs implementation of App E (usually given to BOP); See page <b>23</b></li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(6) Checks RCS temperature stable or lowering to 547°F <ul style="list-style-type: none"> <li>AFW Pp 1-2 is running; may start TDAFW if not previously started.</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(7) Checks Pzr PORVs and Pzr Safeties and Spray Valves <ul style="list-style-type: none"> <li>Safeties closed (closed); no sonic flow, tailpipe temperature normal (VB2 – upper panel, far right)</li> <li>PORVs closed and associated block valves open (VB2 – upper panel, far right)</li> <li>Pzr Sprays closed (green lights on) (CC2)</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(8) Checks RCP trip criteria; <ul style="list-style-type: none"> <li>RCS WR Pressure is greater than 1300 PSIG, trip criteria is not met (VB2).</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(9) Determines S/G are NOT faulted <ul style="list-style-type: none"> <li>No S/G lowering in an uncontrolled manner or completely depressurized</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(10) Checks for ruptured S/G <ul style="list-style-type: none"> <li>Notes RE-72 elevated with and S/G 1-2 level rising</li> <li>Directs transition to EOP E-3, Steam Generator Tube Rupture</li> </ul> </li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 4**

**Event No.: 6**

Page 18 of 25

**Event Description:** 600 GPM Post-Trip SGTR on S/G 1-2 (cont) (CT)

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**\*\* Critical Task**

Op-Test No.: L162-NRCScenario No.: 4Event No.: 6Page 19 of 25Event Description: 600 GPM Post-Trip SGTR on S/G 1-2 (cont)

Time	Position	Applicant's Actions or Behavior
<b>(EOP E-3, Steam Generator Tube Rupture )</b>		
	SRO	<ul style="list-style-type: none"> <li>Reads CAUTION that RCP Trip Criteria is NOT applicable after operator begins RCS cooldown.</li> <li>(9) Initiates RCS Cooldown Using 40% Steam Dumps <ul style="list-style-type: none"> <li>(9.a) Verifies Appendix FF is complete</li> </ul> </li> </ul>
<b>Note: If AR PK 08-07, Lo Lo Tave Permissive (P-12) is active, Shift Foreman will need to pull step 9.d forward to unblock the 40% steam dump valves. If 40% dump valves not used, following step is N/A.</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(9) Initiates RCS Cooldown Using 40% Steam Dumps (continued) <ul style="list-style-type: none"> <li>(9.b) Places Steam Dumps in Steam Pressure Mode <ul style="list-style-type: none"> <li>Place HC-507 in MANUAL and reduce demand to 0%</li> <li>Place Steam Dump Mode Select Switch in STEAM PRESSURE</li> </ul> </li> <li>(9.c) Dumps steam at maximum rate possible without achieving a main steam line isolation (less than 120 psi/min).</li> <li>(9.d) Places Steam Dump Control in Bypass Intlk (Train A and B) to re-arm 40% dumps if P-12 activates (or is already active)</li> <li>(9.e) Will continue on in procedure at step 11 while cooldown continues.</li> <li>(9.f) Stops the cooldown when ALL Core Exit Thermocouples are less than required target temperature.</li> <li>(9.g) Stabilizes temperature slightly less than required temperature using steam dumps in AUTO.</li> </ul> </li> </ul>
<b>Note: If MSL Isolation occurs while using 40% steam dumps, Shift Foreman may elect to continue cooldown using 10% dump valves (described below) to avoid unnecessary delays. N/A if 10% dump valves not used.</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(10) Initiates RCS Cooldown Using 10% Steam Dumps <ul style="list-style-type: none"> <li>(10.a) Verifies Appendix FF is complete</li> <li>(10.b) Manually opens PCV-19, 21, and 22 (10% Steam Dumps) to 100% to dump steam at maximum possible rate.</li> <li>(10.c) Continues on in procedure at step 11 while cooldown continues.</li> <li>(10.d) Stops the cooldown when ALL Core Exit Thermocouples are less the required target temperature.</li> <li>(10.e) Stabilizes temperature slightly less than required temperature using steam dumps in AUTO</li> </ul> </li> </ul>
<i>(continued on next page)</i>		



Op-Test No.: L162-NRC Scenario No.: 4 Event No.: 6 Page 20 of 25

Event Description: 600 GPM Post-Trip SGTR on S/G 1-2 (cont)

Time	Position	Applicant's Actions or Behavior
<b>Note:</b> If MSL Isolation occurs while using 40% steam dumps, Shift Foreman may elect to continue cooldown using 10% dump valves (described below) to avoid unnecessary delays. N/A if 10% dump valves not used.		
	SRO/BOP	<ul style="list-style-type: none"> <li>(11) Controls AFW flow to maintain intact S/G levels 20% - 65%; should raise AFW flow to intact S/Gs before or immediately after starting cooldown (VB3, skirt)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(12) CHECK PZR PORVs and Block Valves               <ul style="list-style-type: none"> <li>(12.a,c) Power available to block valves and all open</li> <li>(12.b) PZR PORVs – all closed</li> </ul> </li> </ul>
<b>Note:</b> May elect not to reset SI since never actuated due to malfunction		
	SRO/BOP	<ul style="list-style-type: none"> <li>(13) Resets Safety Injection (VB1)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(14) Resets both Trains Phase A (Phase B was not in) (VB1)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(15) Restores Instrument Air to Containment and checks header pressure greater than 90 psig (VB4)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(16) Shuts down RHR pumps</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(17) Checks RCS cooldown stopped before continuing on to depressurization of RCS</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(18) Checks ruptured S/G pressure stable or rising (should be ≈950-1040 psig, and stable)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(19) Checks Subcooling greater than 40°F</li> </ul>
(continued on next page)		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 4**

**Event No.: 6**

Page 21 of 25

**Event Description:** 600 GPM Post-Trip SGTR on S/G 1-2 (cont)

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**\*\* Critical Task**



Op-Test No.: L162-NRCScenario No.: 4Event No.: 6,7Page 23 of 25

**Event Description:** 600 GPM Post-Trip SGTR on S/G 1-2  
SI Actuation Fails (both auto and manual) (CT)

Time	Position	Applicant's Actions or Behavior
		(EOP E-0, Appendix E - ESF Auto Actions, Secondary and Auxiliaries Status)
<b>Note:</b> Failure of both Auto and Manual actuation of Safety Injection will require manual starting of ECCS pumps and positioning of injection flowpath valves. These manipulation may be completed prior to performance of Appendix E.		
	BOP	Implements App E (ESF Auto Actions, Secondary and Auxiliaries Status): <ul style="list-style-type: none"> <li>• (1a) Checks no personnel in Containment (part of turnover; may not voice)</li> <li>• (1b) Announces reactor trip/SI on PA system</li> <li>• (2) Checks main generator – tripped (PK14-01 ON, output bkrs OPEN, CC3 right side)</li> <li>• (3 &amp; 4) Verifies Phase A and Containment Vent Isolation complete (VB1, ESF status lights, red lights ON, white lights OFF – may need to actuate due to SI failure);</li> <li>• (5) Verify ESF (SI) actuation complete; manual alignment of Safety Injection pumps and valves will be required due to actuation failure (S4CT-2)**</li> </ul> <p><b>**(Critical Task) (S4CT-2) Manually align at least one train of SIS actuated safeguards before transition out of EOP E-0, Reactor Trip or Safety Injection. Note only one train is required to meet the critical task.</b></p>
	BOP	<ul style="list-style-type: none"> <li>• (6) Verifies Feedwater isolation complete (F.W. Isolation and S.G. Level Portions of Monitor Light Box C: red lights ON, white light OFF).</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (7) Determines Containment Spray and Phase B Isolation is NOT required (Contmt Isol, Phase B portion of Monitor Light Box D: red lights are OFF)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>• (8) Checks Main Steamline Isolation complete (Main Steam Isolation portion of Monitor Light Box D: red light OFF, white light are OFF)</li> </ul>
	BOP	(9) Checks AFW status <ul style="list-style-type: none"> <li>• AFW Pp 1-2 running; TDAFW IS required.</li> <li>• Verifies min of 435 gpm flow (VB3 center) or S/G level &gt; 15%</li> </ul>
(continued on next page)		

\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 4**

Event No.: 6

Page 24 of 25

**Event Description:** 600 GPM Post-Trip SGTR on S/G 1-2 (cont)

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## \*\*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 4**

**Event No.: 6**

Page 25 of 25

**Event Description:** 600 GPM Post-Trip SGTR on S/G 1-2 (CT)

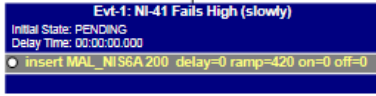
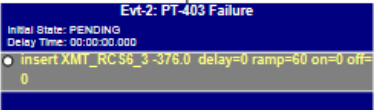
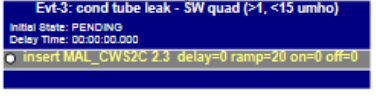
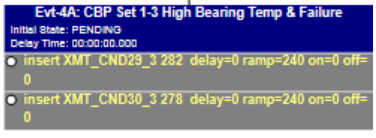
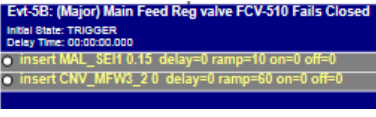
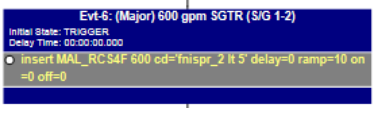
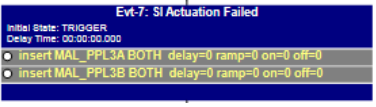
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**\*\* Critical Task**

## Attachment 1 – Scenario Set-up & Booth Actions

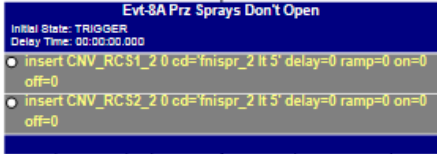
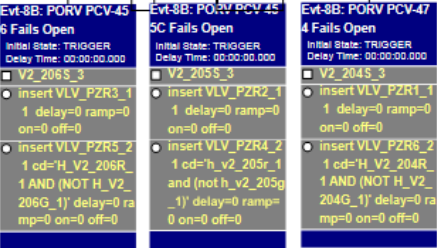
X = manual entry required

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	IC	RESTORE 153	100% power MOL, C <sub>B</sub> - 878
X	Setup	N/A	MDAFW 1-3 OOS Verify AutoReclose Lamacoid is realigned to CWP 1-1
	The Plant Abnormal Status Board for Surveillance Requirements		None
	Copies of Procedures, Attachments; Appendixes; Foldout Pages; Annunciator Response Procedures and commonly used forms are in binders and <b>NOT</b> Marked up		<b>PK05-07, PK05-09, PK10-06, PK12-05, AP-5, AP-15, AP-20, AP-25, EOP E-0, E-0.1, E-3, ECA-3.1</b>
X	0 min	Tools > Simple SBT	Before crew takes the watch. Use Simple SBT, Data Recorder File: sbt_sim.drb, min 960 iterations (30 sec). <u>Critical Task Specific Data Capture:</u> <ul style="list-style-type: none"> <li>S4CT1: NI Power Level and S/G 1-1 level.</li> <li>S4CT2: ECCS pump discharge pressure and amps; 8801A/B, 8803A/B, 8805A/B, and 112B/C valve positions</li> <li>S4CT3: LCV-107, LCV-111, FCV-42, FCV-24, FCV-37 valve positions</li> </ul>
X	0 min	Lesson L161 NRC-S4.Isn	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by FILE or MANUALLY (below)
X	<u>Evt-1: NI-41 Fails High</u> (approx. 3 min after taking watch per lead examiner)		Slow failure high on NI-41
X	<u>PT-403: Fails Low</u> (once TS for Evt-1 have been addressed per lead examiner)		PT-403 fails low
X	<u>Evt-3: Cond Tube Leak</u> (once Evt-2 TS addressed per lead examiner)		When Polisher Watch contacted, use PPC screen values to report conductivity value after verifying failure has completed ramp. Location of leak is SW quad. See Lesson File for drills to swap Hx and Auto Reclose as well as opening breaker for FCV-230.
X	<u>Evt-4: CBP Set 1-3 Brg</u> (Triggers off MW < 800)		When dispatched to pump, report back no oil visible in the motor bearing sight glass. Charred appearance around the bearing housing.
X	<u>Evt-5: FRV-510 fails closed</u> (Once crew has shutdown CWP)		Auto reactor trips have been overridden for Critical Task purposes.
	<u>Evt-6: 600 gpm SGTR</u> (ramps in immediately after trip)		600 gpm SGTR on S/G 1-2
	<u>Evt-7: Auto/Man SI failed</u> (post-trip)		Auto/Manual SI failed – requires manual alignment of ECCS valves and starting of pumps.

(con't on next page)

## Attachment 1 – Scenario Set-up & Booth Actions (con't)

X = manual entry required A = activate from EVENT file

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
<u>Evt-8A: PRZ Sprays Failed Closed (post-trip)</u>		PZR Sprays failed closed – forces crew to PORV
<u>Evt-8B: PRZ Sprays Failed Closed (post-trip)</u>		PORV used for depressurization and associated block valve will fail open – forces transition into ECA-3.1





# Diablo Canyon Power Plant Operations Shift Log



## Unit 1

*Unit 1 Days at Power: 111 Days*

**Operating Mode: 1**

**Gross Generation: 1197 MWe**

**Power Level: 100%**

**Net Generation: 1147 MWe**

### Today - Dayshift

---

#### Shift Manager Turnover:

---

PRA RISK STATUS NEXT SHIFT:	Green
GRID STATUS NEXT SHIFT:	Normal
AVERAGE RCS CALCULATED LEAKRATE:	0.01 gpm
CONDENSER INLEAKAGE:	< 0.01 gpd
CONDENSER D/Ps:	NW 4.9 SW 4.4 NE 4.3 SE 5.1 PSID
MAIN GENERATOR H2 USAGE:	325 scfd / 327 scfd 5 day ave
SPENT FUEL POOL:	Temp = 80°F; Time to 200°F = 30 hrs using actual temp (F-ID-7A)

#### NEW PRIORITY WORK:

- None

#### SHUTDOWN TECH SPECS / ECGS:

- TS 3.7.5.B → MDAFW 1-3 OOS, due in 60 hours

#### ECG ACTIONS THAT IF COMPLETION TIME NOT MET ECG 0.3 IS ENTERED:

- None

#### TURNOVER ITEMS:

- MDAFW 1-3 OOS for routine maintenance; expected back next shift.

#### PRIORITY ITEMS FOR NEXT SHIFT:

- Maintain current power level.

## Shift Foreman Turnover

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### ANNUNCIATORS IN ALARM:

- There are no unexpected alarms - all current alarms are consistent with current mode and power level.

### TURNOVER ITEMS:

- U-1: maintain 100% - no one in containment.
- U-2: maintain 100%.

### REACTIVITY MANAGEMENT:

- Time in core life: MOL.
- Power History: Steady State at 100% for past 111 days.
- Boron concentration is 878 ppm from a sample taken 2 hours ago.
- Control Rod Height: 229 steps on CBD.
- Diluting the RCS approximately 25 gallons every 1.5 hrs.
- The last dilution was completed 30 min ago.

### CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- None

### OTHER ABNORMAL PLANT STATUS

- None

Facility: Diablo Canyon (PWR) Scenario No: 5 Op-Test No: L162 NRC

Examiners: \_\_\_\_\_ Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial Conditions: 100% with AFWP 1-2 OOS; MOL, **878** ppm boron

Turnover:

Event No	Malf No.	Event Type*	Event Description (See Summary for Narrative Detail)
1	VLV_PZR6_2 0.1 delay=0 ramp=5	<b>C, TS</b> (BOP, SRO)	PCV-474 slowly drifts open (AP-13)( <b>TS 3.4.11.B</b> ).
2	PK1823_0132 1	<b>C, TS</b> (BOP, SRO)	Ground on ASW Pump 1-1 (PK18-23)( <b>TS 3.7.8.A</b> ).
3	GGAHRL_62GSC3TVSP 0 MAL_GEN3 LO_FLOW delay=10 della MAL_GEN3 2 cd='smss lt 925'	<b>C (ATC, SRO)</b>	Partial Stator Water cooling flow/partial runback ( <b>PK14-19, PK12-12, AP-25</b> ).
4	MAL_CVC8A	<b>C (ATC, SRO)</b>	Seal Injection Filter 1-1 plugs causing reduction in charging flow to RCP seals ( <b>PK04-22</b> ).
5	RLY_PPL37 CLOSED(TRUE)	<b>M (ALL)</b>	Spurious Phase B causes isolation of CCW Header C requiring Reactor Trip and tripping of all four RCPs ( <b>PK01-08, AP-11</b> ).
6	MAL_AFW1 1 cd='H_V3_109M_1 GT 0.1' MAL_MFW2A,B 25 cd='fnispr lt 5.0' MAL_EPS4C_2 DIFFERENTIAL	<b>C (ALL)</b>	Bus F trips on differential on reactor trip causing loss of DRPI and AFW pump 1-3. Both MFPs Trip and TDAFP trips on overspeed; (post trip).

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d) (from form ES301-4)	Actual Attributes
1. Total malfunctions (5–8) (Events 1,2,3,4,5,6)	6
2. Malfunctions after EOP entry (1-2) (Events 6)	1
3. Abnormal events (1–4) (Events 1,2,3,4)	4
4. Major transients (1-2) (Event 5)	1
5. EOPs entered/requiring substantive actions (1–2) (FR-H.1)	1
6. EOP contingencies requiring substantive actions (0–2) (FR-H.1)	1
7. Critical tasks (2–3)(See description below)	2

Critical Task	Justification	Reference
<p>(S5CT-1) Trip all four Reactor Coolant Pumps (RCPs) as indicated by:</p> <ul style="list-style-type: none"> <li>RCP Breaker position = OPEN</li> <li>RCP Amperage lowering</li> <li>RCP thrust bearing temperatures lowering</li> </ul> <p>prior to a partial loss of reactor coolant flow due to Reactor Coolant Pump failure.</p>	<p>RCPs are susceptible to catastrophic failure and a loss of reactor coolant flow if left running in the absence of adequate bearing cooling flow. If the reactor is at power at the time of the accident, the immediate effect of loss of coolant flow is a rapid increase in the coolant temperature. This increase could result in DNB with subsequent fuel damage if the reactor is not tripped promptly.</p>	<ul style="list-style-type: none"> <li>FSAR Accident Analysis, Section 15.2.5 – Partial Loss of Forced Reactor Coolant Flow</li> </ul>
<p>(S5CT-2) Establish a secondary heat sink as indicated by:</p> <ul style="list-style-type: none"> <li>WR level rising</li> <li>Core Exit Thermocouple temperatures lowering</li> </ul> <p>Prior to reaching bleed and feed criteria which is defined as wide range S/G level in any three S/Gs less than 18% [26%] AND narrow range S/G level in all four S/Gs less than 15% [25%] narrow range.</p>	<p>A loss of all feedwater transient is characterized by a depletion of secondary inventory and eventual degradation of secondary heat transfer capability. As secondary heat transfer capability degrades, core decay heat generation will increase RCS temperature and pressure causing loss of RCS inventory similar in nature to a small break loss of coolant accident. Failure to restore a secondary heat sink when it is possible to do so constitutes “a significant reduction of safety margin beyond that irreparably introduced by the scenario.”</p>	<ul style="list-style-type: none"> <li>FR-H.1 Background Document (HFRH1BG), Rev. 3.</li> </ul>
<p><i>Per NUREG-1021, Appendix D, if an operator or crew significantly deviates from or fails to follow procedures that affect the maintenance of basic safety functions, those actions may form the basis of a CT identified in the post-scenario review.</i></p>		

## SCENARIO SUMMARY – NRC #5

1. Pressurizer Pressure Control Valve PCV-474 drifts open and must be isolated using the associated 8000-A block valve. Shift Forman enters **TS 3.4.11.B Pressurizer Power Operated Relief Valves (PORVs)** – for one PORV inoperable for reasons other than excessive seat leakage.
2. Running ASW Pump 1-1 experiences a ground on 4 kV Bus F. The crew follows the guidance of **AR PK18-23, 4KV BUS F GROUND OC ALARM**, and shuts down ASW pump 1-1 after starting the 1-2 pump. Shift Forman enters **TS 3.7.8.A, Auxiliary Saltwater (ASW) System** for one train inoperable.
3. Low Stator Coil Cooling Water flow causes a turbine runback. The crew responds per **AR PK14-19, STATOR WTR CLG SYSTEM**, and **OP AP-25, Rapid Load Reduction or Shutdown**. The low flow condition clears quickly (approximately 925 MW), and the crew stabilizes the plant.
4. In-service Seal Injection Filter 1-1 plugs, reducing flow to RCP seals and bringing in **AR PK04-22, RCP Seal Inj Fltr Delta-P Hi**. Reactor Operators verify CCP seal cooling is still being maintained by CCW and ATC operator throttles RCP seal injection hand control valve, HCV-142, as needed to maintain pressurizer level. Shift Foreman establishes bands for pressurizer level and confirms field operators have been dispatched to swap seal injection filters.
5. A spurious actuation of Train A, Phase B results in the isolation of CCW Header C. The crew responds per **AR PK01-08, CCW HEADER C**, or alternately, **OP AP-11, Section E: Loss of CCW Flow to RCPs**, which calls for tripping the reactor and then tripping all four RCPs. **(S5CT-1) Trip all four Reactor Coolant Pumps (RCPs)**.
6. The crew enters **E-0, Reactor Trip or Safety Injection** and performs their immediate actions. On the trip, 4 kV bus F trips on differential. DRPI loses power, but crew is able to determine the reactor has tripped based on diverse indications (lowering reactor power and reactor trip breakers open). MDAFW Pump 1-3 is also lost due to the bus failure. Both main feedpumps trip and the TDAFW pump trips on overspeed leading to Loss of Heat Sink condition. The crew transitions to **EOP FR-H.1, Response to Loss of Secondary Heat Sink**. With the condenser available, Main Feed is used to restore a secondary side heat sink **(S5CT-2) Establish a secondary heat sink**.

The scenario is terminated once Critical Task S5CT-2 is complete.

**Op-Test No.: L162-NRC**

**Scenario No.: 5**

**Event No.: 1**

Page 1 of 17

**Event Description:** Pressurizer Pressure Control Valve PCV-474 (PORV) Drifts Open

<b>Time</b>	<b>Position</b>	<b>Applicant's Actions or Behavior</b>
	ALL	Diagnoses PCV-474 open using one or more of the following indications: <ul style="list-style-type: none"> <li>• PK05-20, PZR RELIEF/SAFETY VLVS OPEN in alarm</li> <li>• PK05-23, PZR SAFETY OR RELIEF LINE TEMP in alarm</li> <li>• Pressurizer pressure lowering (CC2, VB2), back up heaters on (CC1), sprays closed (CC2)</li> <li>• Both RED and GREEN position indicator lights illuminated on PCV-474 (VB2, far right, lower)</li> <li>• PORV discharge temperature elevated (TI-463) (VB2, far right, middle)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• Takes action to manually close PCV-474 (unsuccessful)</li> <li>• Closes associated block valve (8000A)</li> </ul>
<b>Note:</b> AR PK05-23 will redirect crew to AR PK05-20 for guidance		
	(AR PK05-20, Pressurizer Relief/Safety Valves Open) if entered, else N/A	
	SRO/ATC	<ul style="list-style-type: none"> <li>• (1) Identifies input 1150 (Pzr Relief Vlv PCV-474 Open) and goes to section 2.1, General Actions</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>• (2.1.1) Notes requirement to enter EOP E-0, Reactor Trip or Safety Injection if reactor trips at any time.</li> <li>• Reads NOTE regarding isenthalpic steam release corresponding to a PORV tailpipe temperature of approximately 230°F; May direct board operator to check current PORV discharge temp (TI-463) (VB2, far right, middle)</li> <li>• (2.1.2) Checks for indications of rapid drop in actual pressurizer pressure; may transition to OP AP-13</li> </ul>

(continued on next page)

### **\*\* Critical Task**

Op-Test No.: L162-NRC Scenario No.: 5 Event No.: 1 Page 2 of 17Event Description: Pressurizer Pressure Control Valve PCV-474 (PORV) Drifts Open, (continued)

Time	Position	Applicant's Actions or Behavior
		(OP AP-13, Malfunction of Reactor Pressure Control System ) if entered; else N/A
	SRO	<ul style="list-style-type: none"> <li>(1) Notes there are no load changes in progress</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(2) Checks all PORVs closed (PCV-474, 455C, 456) (VB2, far right, lower) <ul style="list-style-type: none"> <li>Notes PCV-474 position lights indicate valve is open</li> </ul> </li> <li>(2 RNO) Checks pressurizer pressure less than 2335 psig (it is); <ul style="list-style-type: none"> <li>May reattempt closing PCV-474 (valve remains off its seat)</li> <li>Ensures associated block valve 8000A is closed</li> </ul> </li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(3) Checks pressurizer safety relief valves closed (VB2, far right, middle) <ul style="list-style-type: none"> <li>Sonic flow reading zero (they are)</li> <li>Tailpipe temperature <math>\leq 185^{\circ}\text{F}</math> (they are)</li> </ul> </li> </ul>
	ALL	<p>Reads CAUTION regarding potential need for stopping RCPs if spray valve has failed</p> <ul style="list-style-type: none"> <li>(4.a) Checks normal pressurizer spray valves closed (PCV-455A/B) (CC2, upper middle right) (green lights On, both are closed)</li> <li>(4.b) Checks aux spray valves closed (8145 &amp; 8148) (VB2, far right skirt) (both are closed)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(5) Checks pressurizer backup heater status (far left CC1) <ul style="list-style-type: none"> <li>(5.a) Heaters are lined up to normal power (normal power indicating lights are illuminated (CC1))</li> <li>(5.b,c) Status of heaters will depend on pressure transient from PORV opening <ul style="list-style-type: none"> <li>If pressurizer pressure &gt; 2250 psig, ensures all heaters turned off</li> <li>If pressurizer pressure &lt; 2210 psig, ensures all heaters turned on</li> </ul> </li> </ul> </li> </ul>
(continued on next page)		

\*\* Critical Task

**Op-Test No.: L162-NRC                      Scenario No.: 5                      Event No.: 1                      Page 3 of 17**

**Event Description:** Pressurizer Pressure Control Valve PCV-474 (PORV) Drifts Open, (continued)

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**\*\* Critical Task**



Op-Test No.: L162-NRC Scenario No.: 5 Event No.: 2 Page 4 of 17

Event Description: Ground on ASW Pp 1-1

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnoses ground using one or more of the following indications: <ul style="list-style-type: none"> <li>PK18-23, 4KV BUS F GROUND OC ALARM in alarm</li> </ul>
	SRO	Implements PK18-23, 4KV BUS F GROUND OC ALARM
<b>(AR PK18-23, 4KV BUS F GROUND OC ALARM)</b>		
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Identifies input 132 (ASW Pp 1-1 Fdr Grd) and goes to section 2.1, General Actions</li> </ul>
	SRO	<ul style="list-style-type: none"> <li>(2.1.1) Determines ASW Pp 1-1 must be shut down (May use OP E-5:IV – see below). <ul style="list-style-type: none"> <li>Places ASW Pp 1-2 Standby Select Switch to Manual (VB1)</li> <li>Starts ASW Pp 1-2 (VB1)</li> <li>Shuts down ASW Pp 1-1 (VB1)</li> </ul> </li> <li>(2.1.2) Determines ground was limited to ASW Pp 1-1 (PK18-23 clears when pump is shutdown)</li> <li>(2.1.3) Directs maintenance to locate and repair the defective circuit</li> <li>(2.1.4) Enters <b>TS 3.7.8.A, – Operating, Condition A</b> – for one ASW train inoperable; restore to operable status within 72 hours.</li> </ul>
<b>OP E-5:IV, Auxiliary Saltwater System – Swapping Pumps or HXs During Single CCW HX Operation (N/A if not used)</b>		
	BOP	<ul style="list-style-type: none"> <li>Reviews PRECAUTIONS AND LIMITATIONS</li> <li>Performs Section 6.1-Swapping an ASW Pump and CCW Heat Exchanger Train <ul style="list-style-type: none"> <li>(6.1.1) Notes ASW Pump 1-1 is running with CCW HX 1-1 in service (VB1)</li> <li>(6.1.2) Contacts Intake Watch to secure continuous chlorination to ASW Bay 1-1</li> <li>(6.1.3) Contacts Aux Watch to ensure no liquid radwaste discharge in progress</li> <li>(6.1.4) Directs U2 to place standby ASW pump in MANUAL</li> </ul> </li> </ul>
<i>(continued on next page)</i>		

\*\* Critical Task

**Op-Test No.: L162-NRC                      Scenario No.: 5                      Event No.: 2                      Page 5 of 17**

**Event Description:**      **Ground on ASW Pp 1-1 (cont)**

Time	Position	Applicant's Actions or Behavior
OP E-5:IV, Auxiliary Saltwater System (cont)(N/A if not used)		
	BOP	<ul style="list-style-type: none"> <li>○ (6.1.5) Places Mode Selector Switch for ASW pump 1-2 in "MANUAL" (VB1)</li> <li>○ (6.1.6) Places Control Switch for ASW pump 1-2 in "START" to start ASW pump 1-2 (VB1)</li> <li>○ (6.1.7) Ensures ASW pump 1-2 amps are stable (VB1)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>○ (6.1.8) Opens CCW HX saltwater inlet valve FCV-603 (VB1)</li> <li>○ (6.1.9) Ensures differential pressure across both CCW HXs is within normal range (VB1)</li> <li>○ (6.1.10) Opens CCW HX 1-2 shell-side outlet valve FCV-431 (VB1)</li> <li>○ (6.1.11) Closes CCW HX 1-1 shell-side outlet valve FCV-430 (VB1)</li> <li>○ (6.1.12) Closes CCW HX 1-1 saltwater inlet valve FCV-602 (VB1)</li> <li>○ (6.1.13) Checks that differential pressure across HX1-1 is less than 50 inches (VB1)</li> </ul>
	BOP	<ul style="list-style-type: none"> <li>○ (6.1.14) Shuts down ASW Pump 1-1 (VB1)</li> <li>○ (6.1.15) May elect to place Mode Selector Switch for ASW pump 1-1 in "MANUAL" (VB1)</li> <li>○ (6.1.16) Directs U2 to place standby ASW pump in "AUTO"</li> <li>○ (6.1.17) Updates SRO on current ASW train alignment</li> <li>○ (6.1.18) May direct Intake Watch to align ASW Bay 1-2 for continuous chlorination</li> </ul>
Proceed to Next Event once Tech Specs addressed, per Lead Examiner		

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**\*\* Critical Task**

Op-Test No.: L162-NRCScenario No.: 5Event No.: 3Page 6 of 17**Event Description:** Loss of Stator Cooling Partial Runback

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnoses Stator cooling runback from the following: <ul style="list-style-type: none"> <li>• PK14-19, Stator Wtr Clg System, alarms with Stator Clg Wtr Coil flow low and very low inputs (0266, 0666)</li> <li>• RUNBACK light is on, on turbine HMI (CC3)</li> <li>• PK12-12, DEH System, alarms, with input 0715, Turbine Runback</li> <li>• MW are dropping (CC3, PPC)</li> </ul>
	SRO	Dispatches TB watchstander to stator cooling water skid to investigate
<b>Note:</b> SRO may initially enter OP AP-30, as directed by AR PK14-19, or may go directly to OP AP-25 to address the runback.		
<b>OP AP-30, Main Generator Malfunction</b>		
	SRO	Implements OP AP-30 Section G, Stator Wtr Clg System Trouble (as time permits)
	SRO/ATC	(1) Identifies alarm inputs PK14-19 0266 & 0666
	SRO/BOP	(2) Identifies turbine runback initiated
	SRO	Goes to OP AP-25 and delegates OP AP-30 to BOP to implement
<b>OP AP-25, Rapid Load Reduction or Shutdown</b>		
	SRO/BOP	(1) Verifies runback in progress (dropping MW, RED runback light) (CC3)
	ATC	(2) Verifies that control rods are inserting properly in AUTO (VB2, intermittent green IN light)
(continued on next page)		

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 5Event No.: 3Page 7 of 17**Event Description:** Loss of Stator Cooling Partial Runback (Continued)

Time	Position	Applicant's Actions or Behavior	
		<b>OP AP-25, Rapid Load Reduction, con't</b>	
	ATC	(3)	Verifies ON all pressurizer backup heaters (CC1, left)
		(4)	Places HC-459D (master level controller) and/or FCV-128 (charging flow controller) in manual (CC2) <ul style="list-style-type: none"> <li>Keeps charging high enough to prevent letdown from flashing (VB2)</li> </ul>
	BOP	(5)	Verifies DFWCS in AUTO and controlling S/G levels (CC3 MFW HMI, VB3, PPC) <ul style="list-style-type: none"> <li>Checks MFW control and bypass valves in AUTO</li> <li>Checks both MFPs and their controller in AUTO</li> <li>May check level trends, as well as steam flow/feed flow trends (CC3, PPC, and/or big VB3 DFWCS electronic recorders)</li> </ul>
	ATC	(6)	RCS is borated per reactivity handbook for approx 25% load reduction (the following guidance is on the boration checklist in the reactivity handbook) <ul style="list-style-type: none"> <li>Presses STOP on M/U Ctrlr HMI (CC2)</li> <li>Presses BORATE on HMI</li> <li>Sets target gallons for boration (as decided above, and per the Shift Foreman); verifies batch is reset</li> <li>Sets boric acid flowrate</li> <li>Presses START, and monitors boration</li> <li>Once stopped, either returns to AUTO (presses AUTO, then START), or performs additional boration per the Shift Foreman</li> </ul>
	SRO	The Shift Foreman provides indirect reactivity oversight for the ramp	
	BOP	(7)	Checks secondary system status: <ul style="list-style-type: none"> <li>(7a) MFP suction is verified adequate (PPC, VB3 meter; will remain &gt; 260 psig)</li> </ul>
(continued on next page)			

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 5Event No.: 3Page 8 of 17**Event Description:** Loss of Stator Cooling Partial Runback (Continued)

Time	Position	Applicant's Actions or Behavior	
		<b>OP AP-25, Rapid Load Reduction, con't</b>	
	ATC	(8)	Verifies proper operation of steam dumps, Tave trending to Tref (VB3, red/green indicator lights; Tave/Tref from CC1 recorder/PPC)
		(9)	Checks pressurizer pressure and level trending to program (actual will be close to program, but may need adjustments) (CC2, PPC)
	SRO	(10)	Determines if it is desired to shut down the #2 Htr Drip Pp (it is currently running, can remain running or be shutdown at this power level) (VB3, upper panel, center)
		(11)	Determine if the unit can remain on line; the Shift Foreman determines that the unit can remain at this power level
	ALL	(12)	Stabilizes the plant once ramp completed (as time permits) <ul style="list-style-type: none"> <li>• T<sub>ave</sub> within 1.5 °F of T<sub>ref</sub> (ATC)</li> <li>• Axial flux difference (AFD) in target band (or borating to get it there); rods &gt; RIL (ATC)</li> <li>• S/Gs are trending towards program level (CC3, VB3, PPC) (they will be stable and close to program level of 65%) (BOP)</li> <li>• MFP D/Ps are on program (DFWCS HMI on CC3) (D/P will be very close to program, and stable) (BOP)</li> <li>• Pzr pressure and level stable, in normal bands (CC2, PPC) (ATC)</li> <li>• Returns turbine to standby status (BOP)               <ul style="list-style-type: none"> <li>• Takes MW and IMP pressure feedbacks OUT on Triconex turbine control HMI (CC3)</li> <li>• Sets valve position limit (VPL) to 1-2% above current value (same controller)</li> </ul> </li> <li>• May perform reactivity brief, or update (ALL)</li> </ul>
<b>Note:</b> It is not anticipated that the crew will progress past this point in AP-25.			
<b>Next Event Auto Triggers when boration is within 15 gallons of target</b>			

\*\* Critical Task

Op-Test No.: L162-NRCScenario No.: 5Event No.: 4Page 9 of 17Event Description: Seal Injection Filter 1-1 Plugged

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnoses Reactor Makeup Controller problem from the following: <ul style="list-style-type: none"> <li>Lowering seal injection flow to all RCPs (VB2, middle right)</li> <li>PKs 05-01, 05-02, 05-03, 05-04 in alarm due to RCP seal low flow alarms</li> <li>PKs 04-22 in alarm for High RCP Seal injection Filter DP</li> </ul>
	BOP/ATC	<ul style="list-style-type: none"> <li>May check CCW flow to RCP thermal barriers (VB1, left)</li> <li>May check RCP parameters to verify cooling (PPC picture, VB2 meters)</li> </ul>
	BOP/ATC	<ul style="list-style-type: none"> <li>May check CCW flow to RCP thermal barriers (VB1, left)</li> <li>May check RCP parameters to verify cooling (PPC picture, VB2 meters)</li> </ul>
	ATC	<ul style="list-style-type: none"> <li>Attempts to raise seal injection flow using HCV-142 (seal backpressure) and/or FCV-128 (charging flow controller). (CC2)</li> <li>Identifies potential impact on Pressurizer level (charging flow lowering as more flow is directed toward seals); re-adjusts to maintain pressurizer level.</li> </ul>
	ATC	<ul style="list-style-type: none"> <li>Identifies input 498 for PK04-22, RCP Seal Injection Filter Delta-P Hi</li> </ul>
	AR PK04-22, RCP Seal Injection Filter Delta-P Hi	
	SRO	<ul style="list-style-type: none"> <li>(1) Determines input is for RCP Seal Injection Filter 1-1 and goes to General Actions section.</li> <li>Reads CAUTION regarding 24 hour limit for operating RCPs without injection flow</li> </ul>
<u>Note:</u> If seal flow adjustment was previously attempted, it is not necessary to repeat action		
	SRO/ATC	<ul style="list-style-type: none"> <li>(2.1.1) Attempts to throttle HCV-142 while adjusting FCV-128 to establish 8-13 gpm seal injection flow to each RCP. <ul style="list-style-type: none"> <li>Recognizes charging flow lowering with no change in seal flow</li> <li>Readjusts seal flow to maintain pressurizer level</li> </ul> </li> </ul>
(continued on next page)		

\*\* Critical Task



Op-Test No.: L162-NRC      Scenario No.: 5      Event No.: 5      Page 11 of 17

**Event Description:**    **Spurious Phase B and Isolation of CCW Header C**

Time	Position	Applicant's Actions or Behavior
	ALL	<p>Diagnoses Spurious Phase B and Isolation of CCW Header C using one or more of the following indications:</p> <ul style="list-style-type: none"> <li>• PK01-08, CCW HEADER C in alarm</li> <li>• PK05-01,02,03,04, RCPs in alarm</li> <li>• PK04-21, LETDOWN PRESS / FLO TEMP in alarm</li> <li>• FCV-355, HDR C ISOL VLV (VB1)</li> <li>• FCV-356, CCW SSPLY to RCP'S and RX VSL SPRT CLRS (VB1)</li> <li>• FCV-749, RCP BRG OIL &amp; SPRT CLR RTN ISO VLV in the CLOSED position (VB1)</li> <li>• FCV-750, RCP THERMAL BARRIER RTN ISO VLV in the CLOSED position (VB1)</li> </ul>
	SRO/ATC	Identifies inputs 1372, 265, 428, 429 for AR PK01-08, AR PK01-08, U1, CCW HEADER C
<p><b>Note:</b>    Crew may enter AR PK01-08 or OP AP-11, Malfunction of Component Cooling Water System.</p> <p><b>(AR PK01-08, CCW HEADER C) (Mark N/A if not used) Note: Multiple inputs are received for this AR PK, all of which result in a reactor trip and tripping of the RCPs. Only the first is listed below.</b></p>		
	SRO	<ul style="list-style-type: none"> <li>• (1) Follows input 428 for RCP Thermal Barrier CCW Flo Lo and goes to step 2.2.</li> <li>• Reads CAUTION regarding high flow and determines it does not apply</li> <li>• Read NOTE regarding actuation of Containment Isolation Phase B due to the isolation of CCW header C and the associated conditions related to tripping the reactor and stopping RCPs; determines the NOTE will apply.</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>• (2.2.1) Ensures two CCW pumps running (VB1).</li> <li>• (2.2.2) Determines FCV-355, Header C Supply and FCV-356, Supply to RCP and Rx Vessel Support Coolers are both CLOSED and cannot be opened (VB1).</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>• (2.2.3) Checks RCP lower radial bearing temperatures and determines they are rising.</li> <li>• (2.2.4) Attempts to maintain seal injection flow between 8 and 13 gpm, but is unable to due to clogged seal injection filter.</li> </ul>
(continued on next page)		

\*\* Critical Task



**Op-Test No.: L162-NRC**

**Scenario No.: 5**

**Event No.: 5**

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**Event Description:** Spurious Phase B and Isolation of CCW Header C (cont) (CT)

[illegible]

**\*\* Critical Task**

**Op-Test No.: L162-NRC                      Scenario No.: 5                      Event No.: 5                      Page 13 of 17**

**Event Description:**    **Loss of Seal Injection and Thermal Barrier Cooling / Reactor Trip (CT)**

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**\*\* Critical Task**

**Op-Test No.: L162-NRC                      Scenario No.: 5                      Event No.: 6                      Page 14 of 17**

**Event Description:**    **Loss of Secondary Heat Sink**

Time	Position	Applicant's Actions or Behavior
		(EOP E-0, Reactor Trip or Safety Injection)
	SRO/ATC	<ul style="list-style-type: none"> <li>(1) Verifies reactor trip (trip breakers open(VB2 upper left), rods on bottom (VB2 upper left DRPI panel), NIs decreasing (CC1 left))</li> <li>(2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps)</li> </ul>
	SRO/BOP	<ul style="list-style-type: none"> <li>(3) Checks vital 4kv busses (VB4, vital buses G/H have a white lights on the mimic buses; bus F has a blue differential light indicating the bus has tripped)</li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(4) Checks if SI actuated (PK08-21 OFF, also checks SSPS ESF status lights on VB1 and PK02-02 to verify SI is NOT required)</li> </ul>
	ALL	<ul style="list-style-type: none"> <li>(4 RNO) Checks AFW status (VB3), and determines there is no AFW flow.               <ul style="list-style-type: none"> <li>MDAFW 1-2 OOS</li> <li>MDAFW 1-3 has no power due to loss of bus F</li> <li>TDAFW tripped on overspeed</li> </ul> </li> </ul>
	ALL	Implements CSFSTs Identifies RED PATH for Heat Sink on CSFSTs
	SRO	Enters EOP FR-H.1 (LOSHS) due to loss of AFW (complete) and low S/G levels

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**\*\* Critical Task**

**Op-Test No.: L162-NRC                      Scenario No.: 5                      Event No.: 6                      Page 15 of 17**

**Event Description:**    **Loss of Secondary Heat Sink (cont)**

[illegible]

### \*\* Critical Task

**Op-Test No.: L162-NRC**

**Scenario No.: 5**

**Event No.: 6**

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**Event Description:**    **Loss of Secondary Heat Sink (cont)**

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### \*\* Critical Task

Op-Test No.: L162-NRC Scenario No.: 5 Event No.: 6 Page 17 of 17


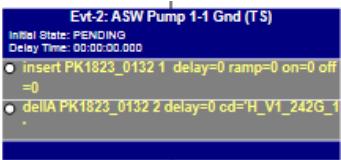
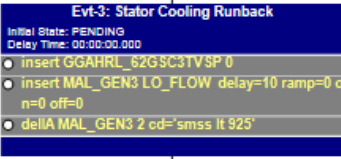
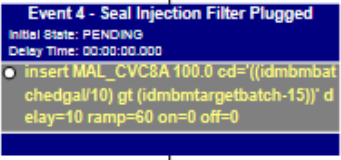
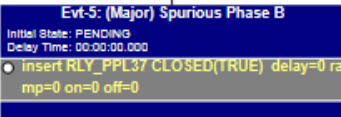
Event Description: Loss of Secondary Heat Sink (cont) (CT)

Time	Position	Applicant's Actions or Behavior
<b>(FR-H.1, Response to Loss of Secondary Heat Sink)</b>		
	SRO/BOP	<ul style="list-style-type: none"> <li>(7.d) Establishes Main Feedwater flow capability               <ul style="list-style-type: none"> <li>(7.d.1) Determines Condenser is available, C9 (PK08-14) is ON</li> <li>(7.d.2) Checks MSIVS OPEN</li> <li>(7.d.3) Checks manual isolation for HP steam to MFW Pumps – OPEN</li> <li>(7.d.4) Determines both Main Feedwater Pumps are available, but not latched; goes to RNO</li> <li>(7.d.4) Restarts MFW Pump                   <ul style="list-style-type: none"> <li>a) Ensure FCV-53 AND FCV-54 switches in RECIRC.</li> <li>b) Press ALARM/TRIP RESET on MFW Pp S/U station (VB3).</li> <li>c) Take Trip/Latch switch to RESET to latch the MFW Pp Turbine (Hold until latched, ~ 2 min).</li> <li>d) Press RAMP UP TO IDLE, ensure ramp to ~ 600 RPM.</li> <li>e) Press IDLE TO STANDBY, ensure ramp to ~ 3000 RPM.</li> </ul> </li> <li>(7.d.5) Raises MFW Pp speed until discharge pressure is 100 PSIG GREATER THAN S/G Pressure</li> </ul> </li> </ul>
	SRO/ATC	<ul style="list-style-type: none"> <li>(7.d.6) Checks PK09-11, FEEDWATER ISOLATION – OFF</li> <li>(7.d.7) Throttles open Mn Fdwtr Cont Bypass Vlvs OR Mn Fdwtr Cont Vlvs</li> <li>(8.a) Determines S/G NR Levels are NOT GREATER THAN 15% in at least one S/G               <p><b>(8.a RNO) Verifies and maintains Feedflow to at least one S/G such that</b></p> <ul style="list-style-type: none"> <li><b>WR S/G Level is rising **</b></li> <li><b>Core Exit TCs are lowering**</b></li> </ul> <p><b>**(S5CT-2) Establish a secondary heat sink prior to reaching bleed and feed criteria.</b></p> </li> </ul>
<b>Terminate the scenario once secondary side heat sink has been reestablished (completion of S5CT-2), per the Lead Examiner</b>		

\*\* Critical Task

## Attachment 1 – Scenario Set-up & Booth Actions

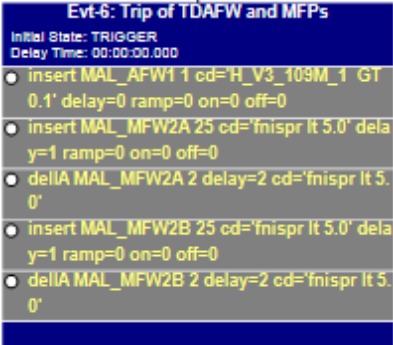
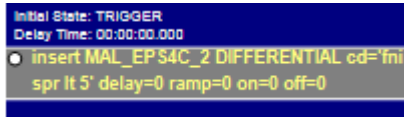
X = manual entry required

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	IC	RESTORE 154	100% power MOL, C <sub>B</sub> - 919
X	Setup	N/A	MDAFW 1-2 OOS
	The Plant Abnormal Status Board for Surveillance Requirements		None
	Copies of Procedures, Attachments; Appendixes; Foldout Pages; Annunciator Response Procedures and commonly used forms are in binders and <b>NOT</b> Marked up		<b>OP B-1A:1, OP E-5:IVPK01-08, PK04-22, PK05-01, 02, 03, 04, PK05-20, PK05-23, PK14-19, PK18-23, AP-11, AP-13, AP-25, AP-28, AP-30 EOP E-0, E-0.1, FR-H.1</b>
X	0 min	Tools > Simple SBT	Before crew takes the watch. Use Simple SBT, Data Recorder File: sbt_sim.drb, min 960 iterations (30 sec). <u>Critical Task Specific Data Capture:</u> <ul style="list-style-type: none"> <li>S5CT1: RCP Breaker Position</li> <li>S5CT2: AFW Flow, S/G Level, CETs</li> </ul>
X	0 min	Lesson L161 NRC-S5.Isn	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by FILE or MANUALLY (below)
X	<u>Evt-1: PCV-455C drifts open</u> (approx. 3 min after taking watch per lead examiner)		When contacted as Turbine Watch, remove power from 8000A after 5 minute delay using field action portion of lesson file (Remove Pwr From 8000A)
X	<u>Evt-2: ASWP 1-1 Gnd</u> (Once Evt-1 TS have been addressed, per lead examiner)		When contacted as Turbine Watch, report check at 4kV breaker for ASW 1-1 indicates low reading for Ammeter Selector position 1. Delay approximately 5 minutes prior to making report. If directed to clear ASW pump 1-1, use Field Action portion of lesson file (Clear ASW 1-1)
X	<u>Evt-3: Partial Runback on Stator Cooling loss</u> (Once Evt-2 TS have been addressed, per lead examiner)		When dispatched as Turbine Watch to check stator cooling, wait until runback has cleared (925 MW). Report backup pump is running, no clear indication of what caused the in-service pump to trip.
X	<u>Evt-4: Seal Inj Filter Plugged</u> (Triggers off boration 15 gal from finish)		When dispatched as Aux Watch, report filter dP reading slightly over 60 #s (after 5 minute delay)
X	<u>Evt-5: Spurious Phase B (single SSPS relay)</u> (Once charging control re-est, per lead examiner)		Partial Phase B caused by single SSPS relay. Critical Task to trip all four RCPs due to a loss of all cooling and potential for catastrophic failure of the pumps.

(con't on next page)

## Attachment 1 – Scenario Set-up & Booth Actions (con't)

X = manual entry required A = activate from EVENT file

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
<u>Evt-6A: Trip of TDAFW and FW Pumps; loss of 4kV Bus F – Post Trip</u>		<p>Trip of FW pumps added to ensure low S/G level for entry into FR-H.1. Main feed will be success path to restore secondary side cooling.</p> <p>When dispatched as Aux Watch to check on TDAFW pump, after 4 minutes, report trip latch mechanism has shattered; unable to reset pump.</p> <p>If contacted regarding status of MDAFW 1-2, report minimum estimate for RTS is 3 hours.</p>
<u>Evt-6B: Loss of 4kV Bus F – Post Trip</u>		<p>Loss of 4kV Bus F causes loss of MDAFW 1-3. Files to support AP-27 for loss of Bus F are contained in the Field Actions branch of the lesson file.</p>





# Diablo Canyon Power Plant Operations Shift Log



## Unit 1

**Unit 1 Days at Power: 110 Days**

**Operating Mode: 1**

**Gross Generation: 1197 MWe**

**Power Level: 100%**

**Net Generation: 1147 MWe**

### Today - Dayshift

---

#### Shift Manager Turnover:

---

PRA RISK STATUS NEXT SHIFT:	Green
GRID STATUS NEXT SHIFT:	Normal
AVERAGE RCS CALCULATED LEAKRATE:	0.01 gpm
CONDENSER INLEAKAGE:	< 0.01 gpd
CONDENSER D/Ps:	NW 4.9 SW 4.4 NE 4.3 SE 4.1 PSID
MAIN GENERATOR H2 USAGE:	325 scfd / 327 scfd 5 day ave
SPENT FUEL POOL:	Temp = 80°F; Time to 200°F = 30 hrs using actual temp (F-ID-7A)

#### NEW PRIORITY WORK:

- AFW 1-2 emergent motor bearing oil leak identified end of last shift.

#### SHUTDOWN TECH SPECS / ECGS:

- TS 3.7.5.B → AFW 1-2, due in 65 hours.

#### ECG ACTIONS THAT IF COMPLETION TIME NOT MET ECG 0.3 IS ENTERED:

- None

#### TURNOVER ITEMS:

- None

#### PRIORITY ITEMS FOR NEXT SHIFT:

- Maintain current power level.

## Shift Foreman Turnover

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### ANNUNCIATORS IN ALARM:

- There are no unexpected alarms - all current alarms are consistent with current mode and power level.

### TURNOVER ITEMS:

- U-1: maintain 100% - no one in containment.
- U-2: maintain 100%.

### REACTIVITY MANAGEMENT:

- Time in core life: MOL.
- Power History: Steady State at 100% for past 111 days.
- Boron concentration is 878 ppm from a sample taken 2 hours ago.
- Control Rod Height: 229 steps on CBD.
- Diluting the RCS approximately 25 gallons every 1.5 hrs.
- The last dilution was completed 30 min ago.

### CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- None

### OTHER ABNORMAL PLANT STATUS

- None

## Group I (I1, I2, R1, R2)

Facility: <b>DCPP</b>		Date of Exam: <b>Jan 19, 2018</b>										Operating Test Number: <b>L162</b>						
A P P L I C A N T	E V E N T  T Y P E	Scenarios																
		Day-1 (S4)			Day-2 (S1)			Day-3 (S2)			Day-4 (S5)			T O T A L	M I N I M U M(*)  R I U			
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P					
RO1	RX															1	1	0
<input checked="" type="checkbox"/> SRO-I	NOR															1	1	1
<input type="checkbox"/> SRO-U	I/C		1,3,7				2,3,5,7,8				1,2,4,6,7				13	4	4	2
	MAJ		5,6				6,9				5				5	2	2	1
	TS														0	0	2	2
RO2	RX					1									1	1	1	0
<input checked="" type="checkbox"/> SRO-I	NOR															1	1	1
<input type="checkbox"/> SRO-U	I/C			1,3,4,7,8		3,4,5						1,2,6			11	4	4	2
	MAJ			5,6		6,9						5			5	2	2	1
	TS														0	0	2	2
RO	RX															1	1	0
<input type="checkbox"/> SRO-I1	NOR															1	1	1
<input checked="" type="checkbox"/> SRO-U	I/C	1,3,4,7						1,2,4				3,4,6			10	4	4	2
	MAJ	5,6						5				5			4	2	2	1
	TS	1,2						2,3							4	0	2	2
RO	RX				1										1	1	1	0
<input type="checkbox"/> SRO-I2	NOR															1	1	1
<input checked="" type="checkbox"/> SRO-U	I/C				2,3,4,5			2,4,8			1,2,3,4,6				12	4	4	2
	MAJ				6,9			5			5				4	2	2	1
	TS				2,3,5						1,2				5	0	2	2

Instructions:

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- 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 I/C malfunctions on a one for one basis.
- 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.
- For new reactor facility licensees that use the ATC operator primarily for monitoring plant parameters, the chief examiner may place SRO I applicants in either the ATC or BOP position to best evaluate the SRO I in manipulating plant controls.

## Group II (I3, I4, R3, R4)

Facility: <b>DCPP</b>		Date of Exam: <b>Jan 19, 2018</b>										Operating Test Number: <b>L162</b>						
A P P L I C A N T	E V E N T  T Y P E	Scenarios																
		Day-1 (S4)			Day-2 (S1)			Day-3 (S2)			Day-4 (S5)			T O T A L	M I N I M U M(*)  R I U			
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION							
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P					
RO3 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX															1	1	0
	NOR															1	1	1
	I/C		1,3,7				2,3,5,7,8				1,2,4,6,7				13	4	4	2
	MAJ		5,6				6,9				5				5	2	2	1
	TS														0	0	2	2
RO4 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX					1									1	1	1	0
	NOR															1	1	1
	I/C			1,3,4,7,8		3,4,5						1,2,6			11	4	4	2
	MAJ			5,6		6,9						5			5	2	2	1
	TS														0	0	2	2
RO <input type="checkbox"/> SRO-I2 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX															1	1	0
	NOR															1	1	1
	I/C	1,3,4,7						1,2,4				3,4,6			10	4	4	2
	MAJ	5,6						5				5			4	2	2	1
	TS	1,2						2,3							4	0	2	2
RO <input type="checkbox"/> SRO-I3 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX				1										1	1	1	0
	NOR															1	1	1
	I/C				2,3,4,5			2,4,8			1,2,3,4,6				12	4	4	2
	MAJ				6,9			5			5				4	2	2	1
	TS				2,3,5						1,2				5	0	2	2

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## Group III (I5, R5, R6)

Facility: <b>DCPP</b>		Date of Exam: <b>Jan 19, 2018</b>										Operating Test Number: <b>L162</b>					
A P P L I C A N T	E V E N T  T Y P E	Scenarios															
		Day-1 (S4)			Day-2 (S1)			Day-3 (S2)			Day-4 (S5)			T O T A L	M I N I M U M(*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S U R	A T C	B O P	S R O	A T C	B O P				
		R	I	U													
RO5 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U	RX														1	1	0
	NOR														1	1	1
	I/C		1,3,7				2,3,5,7,8				1,2,4,6,7				13	4	4
	MAJ		5,6				6,9				5				5	2	2
	TS														0	2	2
RO6 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U	RX					1									1	1	1
	NOR														1	1	1
	I/C			1,3,4,7,8		3,4,5									8	4	4
	MAJ			5,6		6,9									4	2	2
	TS														0	2	2
RO <input type="checkbox"/> SRO-I5 <input checked="" type="checkbox"/> SRO-U	RX				1										1	1	1
	NOR														1	1	1
	I/C	1,3,4,7			2,3,4,5				2,4,8						11	4	4
	MAJ	5,6			6,9				5						5	2	2
	TS	1,2			2,3,5										5	0	2
RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

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## Group IV (I6, R7, R8)

Facility: <b>DCPP</b>		Date of Exam: <b>Jan 19, 2018</b>		Operating Test Number: <b>L162</b>													
A P P L I C A N T	E V E N T  T Y P E	Scenarios												T O T A L	M I N I M U M(*)		
		Day-1 (S4)			Day-2 (S1)			Day-3 (S2)			Day-4 (S5)						
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S U R	A T C	B O P	S R O	A T C	B O P				
		R	I	U													
RO5 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX														1	1	0
	NOR														1	1	1
	I/C		1,3,7				2,3,5,7,8				1,2,4,6,7				13	4	4
	MAJ		5,6				6,9				5				5	2	2
	TS														0	2	2
RO6 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX					1									1	1	1
	NOR														1	1	1
	I/C			1,3,4,7,8		3,4,5									8	4	4
	MAJ			5,6		6,9									4	2	2
	TS														0	2	2
RO <input type="checkbox"/> SRO-I5 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX				1										1	1	1
	NOR														1	1	1
	I/C	1,3,4,7			2,3,4,5				2,4,8						11	4	4
	MAJ	5,6			6,9				5						5	2	2
	TS	1,2			2,3,5										5	0	2
RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

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## Spare

Facility: <b>DCPP</b>		Date of Exam: <b>Jan 19, 2018</b>											Operating Test Number: <b>L162</b>				
A P P L I C A N T	E V E N T  T Y P E	Scenarios															
		Spare			Day-2 (S1)			Day-3 (S2)			Day-4 (S5)			T O T A L	M I N I M U M (*)		
		CREW POSITION			CREW POSITION			CREW POSITION			CREW POSITION						
		S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P	S R O	A T C	B O P				
															R	I	U
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX	3	3	3											1	1	0
	NOR														1	1	1
	I/C	1,2,4	4,6	1,2,6											4	4	2
	MAJ	5	5	5											2	2	1
	TS	1,4													0	2	2
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX														1	1	0
	NOR														1	1	1
	I/C														4	4	2
	MAJ														2	2	1
	TS														0	2	2

Instructions:

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Facility: <b>DCPP</b>		Date of Examination: <b>January 19, 2018</b>								Operating Test No.: <b>L162</b>							
Competencies	<b>GROUP I APPLICANTS</b>																
	RO <input type="checkbox"/> <b>SRO-I1</b> <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				RO <input type="checkbox"/> <b>SRO-I2</b> <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				<b>RO1</b> <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				<b>RO2</b> <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				
	SCENARIO				SCENARIO				SCENARIO				SCENARIO				
	1	2	4	5	1	2	4	5	1	2	4	5	1	2	4	5	
Interpret/ Diagnose Events and Conditions		2,3,4,5, 6,7,8	1,2,3,4, 5,6,7,8	3,4,5,6	1,2,3,4, 5,6,7,8, 9	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6	2,3,4,5, 6,7,8	1,2,3,4, 5,6,7,8	2,3,5,8		1,2,3,4, 5,6,9		1,3,4,5, 6,7,8	1,2,3,4, 5,6	
Comply With and Use Procedures (1)		1,2,6,7, 8	1,2,3,4, 5,6,7,8	3,4,5,6	1,2,3,4, 5,6,9	2,4,5,6, 7,8		1,2,3,4, 5,6	2,3,5,6, 7,8,9	1,2,4,5, 6,7,8	1,3,6,7		1,3,4,5, 6,9		1,3,6,7, 8	1,2,5,6	
Operate Control Boards (2)				3,4,5,6		2,4,5,8			2,3,5,6, 7,8,9	1,2,4,5, 6,7	1,3,5,6, 7		1,3,4,5, 6,9		1,2,3,4, 5,6,7,8	1,2,5,6	
Communicate and Interact		1,2,3,4, 5,6,7,8	1,2,3,4, 5,6,7,8	2,3,4,5, 6	1,2,3,4, 5,6,7,8, 9	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6	2,3,5,6, 7,8,9	1,2,3,4, 5,6,7,8	1,2,3,4, 5,6,7,8		1,3,4,5, 6,9		1,2,3,4, 5,6,7,8	1,2,3,4, 5,6	
Demonstrate Supervisory Ability (3)		1,2,4,5, 6,7,8	1,2,4,5, 6,8		1,2,3,4, 5,6,9			1,2,3,4, 5,6									
Comply With and Use Tech Specs. (3)		1,2	2,3		2,3,5			1,2									
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																	

**Instructions:**

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Facility: <b>DCPP</b>		Date of Examination: <b>January 19, 2018</b>								Operating Test No.: <b>L162</b>							
Competencies	<b>GROUP II APPLICANTS</b>																
	RO <input type="checkbox"/> <b>SRO-I3</b> <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				RO <input type="checkbox"/> <b>SRO-I4</b> <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				<b>RO3</b> <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				<b>RO4</b> <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				
	SCENARIO				SCENARIO				SCENARIO				SCENARIO				
	1	2	4	5	1	2	4	5	1	2	4	5	1	2	4	5	
Interpret/ Diagnose Events and Conditions		2,3,4,5, 6,7,8	1,2,3,4, 5,6,7,8	3,4,5,6	1,2,3,4, 5,6,7,8, 9	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6	2,3,4,5, 6,7,8	1,2,3,4, 5,6,7,8	2,3,5,8		1,2,3,4, 5,6,9		1,3,4,5, 6,7,8	1,2,3,4, 5,6	
Comply With and Use Procedures (1)		1,2,6,7, 8	1,2,3,4, 5,6,7,8	3,4,5,6	1,2,3,4, 5,6,9	2,4,5,6, 7,8		1,2,3,4, 5,6	2,3,5,6, 7,8,9	1,2,4,5, 6,7,8	1,3,6,7		1,3,4,5, 6,9		1,3,6,7, 8	1,2,5,6	
Operate Control Boards (2)				3,4,5,6		2,4,5,8			2,3,5,6, 7,8,9	1,2,4,5, 6,7	1,3,5,6, 7		1,3,4,5, 6,9		1,2,3,4, 5,6,7,8	1,2,5,6	
Communicate and Interact		1,2,3,4, 5,6,7,8	1,2,3,4, 5,6,7,8	2,3,4,5, 6	1,2,3,4, 5,6,7,8, 9	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6	2,3,5,6, 7,8,9	1,2,3,4, 5,6,7,8	1,2,3,4, 5,6,7,8		1,3,4,5, 6,9		1,2,3,4, 5,6,7,8	1,2,3,4, 5,6	
Demonstrate Supervisory Ability (3)		1,2,4,5, 6,7,8	1,2,4,5, 6,8		1,2,3,4, 5,6,9			1,2,3,4, 5,6									
Comply With and Use Tech Specs. (3)		1,2	2,3		2,3,5			1,2									
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																	

**Instructions:**

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Facility: <b>DCPP</b>		Date of Examination: <b>January 19, 2018</b>								Operating Test No.: <b>L162</b>							
Competencies	<b>GROUP III APPLICANTS</b>																
	RO <input type="checkbox"/> <b>SRO-I5</b> <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				<b>RO5</b> <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				<b>RO6</b> <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				
	SCENARIO				SCENARIO				SCENARIO				SCENARIO				
	1	2	4	5	1	2	4	5	1	2	4	5	1	2	4	5	
Interpret/ Diagnose Events and Conditions	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,7,8	1,2,3,4,5,6,7,8		2,3,4,5,6,7,8	1,2,3,4,5,6,7,8	2,3,5,8		1,2,3,4,5,6,9		1,3,4,5,6,7,8						
Comply With and Use Procedures (1)	1,2,3,4,5,6,9	2,4,5,6,7,8	1,2,3,4,5,6,7,8		2,3,5,6,7,8,9	1,2,4,5,6,7,8	1,3,6,7		1,3,4,5,6,9		1,3,6,7,8						
Operate Control Boards (2)		2,4,5,8			2,3,5,6,7,8,9	1,2,4,5,6,7	1,3,5,6,7		1,3,4,5,6,9		1,2,3,4,5,6,7,8						
Communicate and Interact	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,7,8	1,2,3,4,5,6,7,8		2,3,5,6,7,8,9	1,2,3,4,5,6,7,8	1,2,3,4,5,6,7,8		1,3,4,5,6,9		1,2,3,4,5,6,7,8						
Demonstrate Supervisory Ability (3)	1,2,3,4,5,6,9		1,2,4,5,6,8														
Comply With and Use Tech Specs. (3)	2,3,5		2,3														
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																	

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Facility: <b>DCPP</b>		Date of Examination: <b>January 19, 2018</b>								Operating Test No.: <b>L162</b>							
Competencies	<b>GROUP IV APPLICANTS</b>																
	RO <input type="checkbox"/>				<b>RO7</b> <input checked="" type="checkbox"/>				<b>RO8</b> <input checked="" type="checkbox"/>				RO <input type="checkbox"/>				
	<b>SRO-I6</b> <input checked="" type="checkbox"/>				SRO-I <input type="checkbox"/>				SRO-I <input type="checkbox"/>				SRO-I <input type="checkbox"/>				
	SRO-U <input type="checkbox"/>				SRO-U <input type="checkbox"/>				SRO-U <input type="checkbox"/>				SRO-U <input type="checkbox"/>				
	SCENARIO				SCENARIO				SCENARIO				SCENARIO				
	1	2	4	5	1	2	4	5	1	2	4	5	1	2	4	5	
Interpret/ Diagnose Events and Conditions	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,7,8	1,2,3,4,5,6,7,8		2,3,4,5,6,7,8	1,2,3,4,5,6,7,8	2,3,5,8		1,2,3,4,5,6,9		1,3,4,5,6,7,8						
Comply With and Use Procedures (1)	1,2,3,4,5,6,9	2,4,5,6,7,8	1,2,3,4,5,6,7,8		2,3,5,6,7,8,9	1,2,4,5,6,7,8	1,3,6,7		1,3,4,5,6,9		1,3,6,7,8						
Operate Control Boards (2)		2,4,5,8			2,3,5,6,7,8,9	1,2,4,5,6,7	1,3,5,6,7		1,3,4,5,6,9		1,2,3,4,5,6,7,8						
Communicate and Interact	1,2,3,4,5,6,7,8,9	1,2,3,4,5,6,7,8	1,2,3,4,5,6,7,8		2,3,5,6,7,8,9	1,2,3,4,5,6,7,8	1,2,3,4,5,6,7,8		1,3,4,5,6,9		1,2,3,4,5,6,7,8						
Demonstrate Supervisory Ability (3)	1,2,3,4,5,6,9		1,2,4,5,6,8														
Comply With and Use Tech Specs. (3)	2,3,5		2,3														
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																	

**Instructions:**

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