

Facility: <u>Diablo Canyon</u> Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>	Date of Examination: <u>02/24/2020</u> Operating Test Number: <u>L181</u>	
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations (NRCL181-A1)	M, R	Determine H2 Recombiner Settings 2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation. (4.3) (STP Exam 09-2017)
Conduct of Operations (NRCL181-A2)	M, R	Estimate Decay Heat and Heat Removal Rate 2.1.25 Ability to interpret reference materials such as graphs, curves, tables, etc. (3.9) (Bank: LJC-014)
Equipment Control (NRCL181-A3)	N, R	Perform STP I-1A 2.2.37 Ability to determine Operability and/or availability of safety related equipment. (3.6)
Radiation Control (NRCL181-A4)	N, R	Perform RM-19 Channel Check 2.3.5 Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. (2.9)
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 (≤ 3 for ROs; ≤ 4 for SROs and RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 , randomly selected)		

Facility: <u>Diablo Canyon</u>	Date of Examination: <u>02/24/2020</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>	Operating Test Number: <u>L181</u>

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations (NRCL181-A5)	M, R	Apply Overtime Limit Restrictions 2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc (3.9) (NRCADM061-COO-SRO1)
Conduct of Operations (NRCL181-A6)	M, R	Evaluate Fire Zone Operability 2.1.25 Ability to interpret reference materials such as graphs, curves, tables, etc. (4.2) (Bank: LJC-014)
Equipment Control (NRCL181-A7)	N, R	Determine 230 kV Operability 2.2.37 Ability to determine Operability and/or availability of safety related equipment. (4.6)
Radiation Control (NRCL181-A8)	M, R	Authorize Emergency Exposure 2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions. (3.7) (NRCL161-A8)
Emergency Plan (NRCL181-A9)	N, R	Review Emergency Notification for Steam Generator Tube Rupture 2.4.40 Knowledge of SRO responsibilities in emergency plan implementation. (4.5)

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 (≤ 3 for ROs; ≤ 4 for SROs and RO retakes)
 (N)ew or (M)odified from bank (≥ 1)
 (P)revious 2 exams (≤ 1 , randomly selected)

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number:	NRCL181-A1		
Title:	Determine H2 Recombiner Settings		
Examinee:	_____		
Evaluator:	_____	_____	_____
	Print	Signature	Date
Testing Method:	Perform _____ X _____	Simulate _____	
Results:	Sat _____	Unsat _____	Total Time: _____ minutes
Comments:	_____		

References:	OP H-9, Inside Containment H2 Recombination System, R11		
Alternate Path:	Yes	_____	No <u> X </u>
Time Critical:	Yes	_____	No <u> X </u>
Time Allotment:	15 minutes		
Critical Steps:	See Task Standard (pg 2)		
Job Designation:	RO		
Rev Comments:	Bank from STP Exam 09-2017		
Gen KA # / Rating:	2.1.23 – Ability to perform specific system and integrated plant procedures during all modes of plant operation..		4.3

AUTHOR:	<u>LISA TORIBIO</u>	DATE:	<u>02/05/2020</u>
OPERATIONS REPRESENTATIVE:	CHRIS MEHIGAN	DATE:	02/05/2020

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. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the step at which to begin.

Required Materials: OP H-9, Inside Containment H2 Recombination System, rev 11
Picture of Containment pressure meters on VB1
Containment Temperature trend

Initial Conditions: GIVEN:

- A LOCA has occurred on Unit 1
- Containment hydrogen concentration is 2.5%
- The crew is implementing OP H-9, Inside Containment H2 Recombination System to reduce containment hydrogen concentration

Initiating Cue: The Shift Foreman directs you to determine the power setting for H2 Recombiner 1-2 in accordance with OP H-9, Attachment 3, H2 Recombiner Power Output Calculation

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

NOTE: Do NOT provide examinee with Task Standard

Task Standard The candidate determined:

- **Absolute Containment Pressure = 21.7 psia**
- **Cp = 1.35 + 0.05**
- **Power output setting = 56.51 + 2.2 kW**

Start Time: _____

Stop Time: _____

Recombiner 1- 2

NOTE: Use additional copies as needed.

1. Record containment pressure (VB1):

PI-934: 7.0 psig PI-936: 8.0 psig

PI-935: 7.0 psig PI-937: 6.0 psig

2. Calculate average absolute containment pressure (AACP) for current conditions using the following formula:

$$((PI-934 + PI-935 + PI-936 + PI-937) / 4) + 14.7 = AACP$$

$$((\frac{7.0}{PI-934} + \frac{7.0}{PI-935} + \frac{8.0}{PI-936} + \frac{6.0}{PI-937}) / 4) + 14.7 = \frac{21.7}{AACP} \text{ psia}$$

3. Record Pre-LOCA containment temperature: (NA instrument not used)

YR-26 (VB1): 90 °F

PPC Archive: N/A °F

4. Using Pre-LOCA containment temperature, average absolute containment pressure (AACP), and Attachment , determine power correction factor (C_p).

C_p : 1.35 + 0.05

5. Record recombinder reference power (RP) obtained from Volume 9 CMD Table T-VF-1:

RP: 41.86 kW

6. Calculate recombinder power output setting (PS) using the following formula:

$$C_p \times RP = PS$$

$$\frac{1.35 + 0.05}{C_p} \times \frac{41.86}{\text{Ref Pwr}} \text{ kW} = \frac{56.51 + 2.2}{PS} \text{ kW}$$

Red Box Denotes Critical Step

COMMENTS: _____

PRINT LAST NAME/SIGNATURE

INIT

DATE

PRINT LAST NAME/SIGNATURE

INIT

DATE

PRINT LAST NAME/SIGNATURE

INIT

DATE

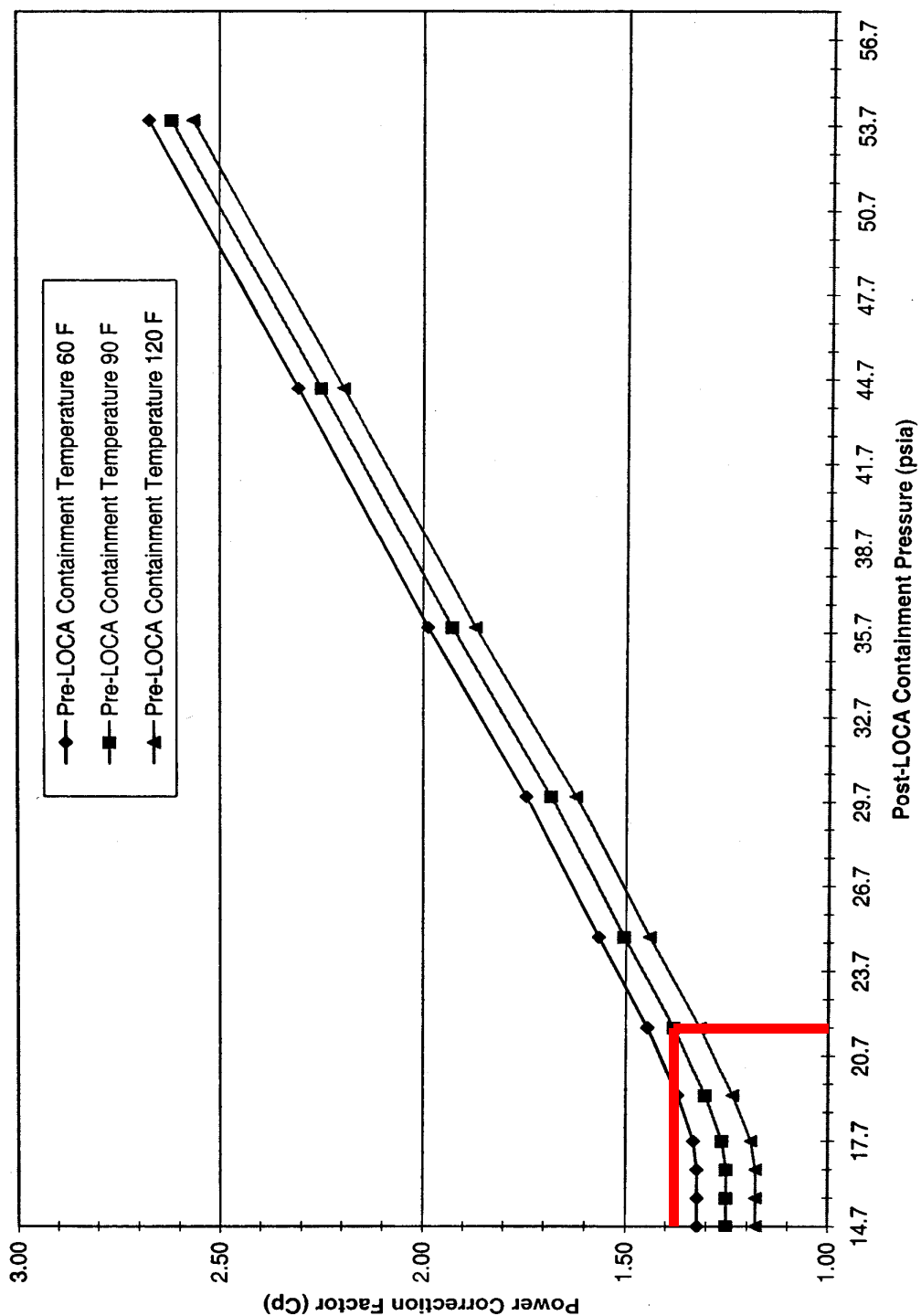
PRINT LAST NAME/SIGNATURE

INIT

DATE

Dry Containment Power Correction Factor Curve

Figure 1



Follow up Question Documentation:

Question:

Response:

Initial Conditions:

GIVEN:

- A LOCA has occurred on Unit 1
- Containment hydrogen concentration is 2.5%
- The crew is implementing OP H-9, Inside Containment H2 Recombination System to reduce containment hydrogen concentration

Initiating Cue:

The Shift Foreman directs you to determine the power setting for H2 Recombiner 1-2 in accordance with OP H-9, Attachment 3, H2 Recombiner Power Output Calculation

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number:	NRCL181-A2		
Title:	Estimate Decay Heat and Heat Removal Rate		
Examinee:	_____		
Evaluator:	_____	_____	_____
	Print	Signature	Date
Testing Method:	Perform _____ X _____	Simulate _____	
Results:	Sat _____	Unsat _____	Total Time: _____ minutes
Comments:	_____		

References:	OP AP SD-5, Loss of Residual Heat Removal, Rev. 10		
Alternate Path:	Yes	_____	No _____ X _____
Time Critical:	Yes	_____	No _____ X _____
Time Allotment:	10 minutes		
Critical Steps:	See task standard		
Job Designation:	RO		
Rev Comments:	Revised from Bank LJC-014 2.1.25 – Ability to interpret reference materials such as graphs, curves, tables, etc.		
Gen KA # / Rating:	3.9		

AUTHOR:	<u>LISA TORIBIO</u>	DATE:	<u>02/05/20</u>
OPERATIONS			
REPRESENTATIVE:	CHRIS MEHIGAN	DATE:	02/05/20

Directions: 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. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the step at which to begin.

Required Materials:

- Calculator
- OP AP SD-5, Loss of Residual Heat Removal, Rev. 10.

Initial Conditions: GIVEN:

- Unit 1 was shut down six days ago for a refueling outage
- RCS has been drained to 108' and is being maintained at that level in accordance with OP A-2:III, Reactor Vessel – Draining to Half Loop/Half Loop Operations With Fuel in Vessel
- Core is still loaded
- RHR pump 1-2 just tripped on overcurrent
 - RHR pump 1-1 can NOT be started
 - RCS temperature is 106 °F
 - NR RVRLIS level is 108'
- The Excel Spreadsheet to calculate heatup rate is unavailable

Initiating Cue: The Shift Foreman has directed you to determine the time to reach 200°F per OP AP SD-5, Appendix B.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

Task Standard:	<u>NOTE:</u> Do NOT provide examinee with Task Standard
	• Determined decay heat load is 12.0 MW (± 0.5 MW)
	• Determined heatup rate was 5.4 °F/min (± 0.225 °F/min)
	• Determined the time to reach 200°F is 17.4 min (± 0.8) min

**Start
Time:** _____

**End
Time:** _____

Follow up Question Documentation:

Question:

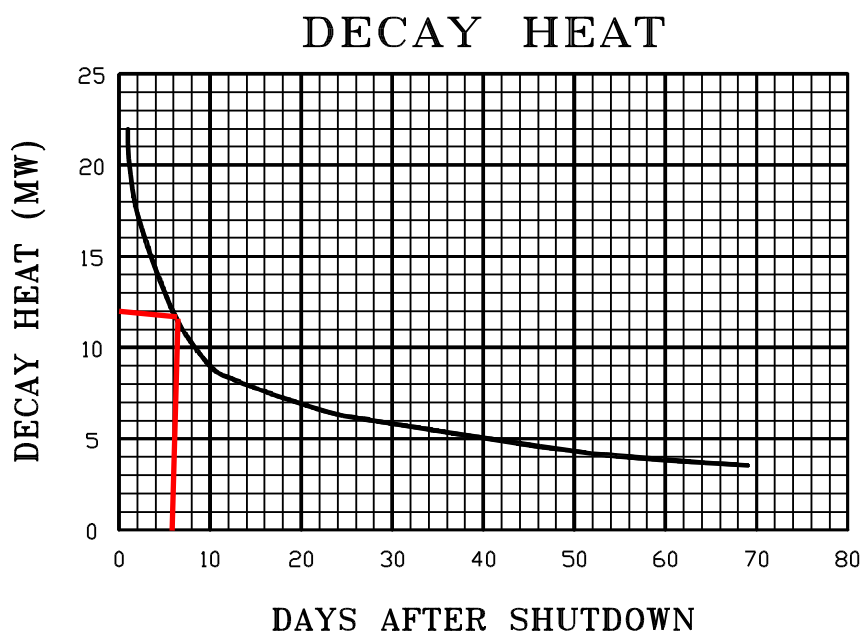
Response:

APPENDIX B

Estimation of Decay Heat and Heatup Rate^{T31417}

NOTE: This appendix is normally performed using an Excel spreadsheet. The Excel spreadsheet is more accurate than using this appendix, and also contains time to core uncover calculations. Use of either this appendix (hard copy) or the Excel spreadsheet is acceptable for determining heatup rates and time to 200°F.

1. PREDICTED HEAT LOAD



2. * REDUCTION FACTOR FOR REFUELED CORES

$$\frac{12.0 (\pm 0.5) \text{ MW}}{\text{Predicted Heat Load}} \times \frac{1.0}{\text{Fraction of Previously Used assemblies Installed in Core}^*} = \frac{12.0 (\pm 0.5) - \text{*Critical}}{\text{Estimated Decay Heat Load}} \text{ MW}$$

* Use 1.0 if unknown

APPENDIX B (Continued)

3. HEAT UP RATE PREDICTION

$$\frac{12.0 (\pm 0.5) \text{ MW X } 0.45}{\text{Estimated Decay Heat Load}} = \frac{5.4 (\pm 0.225) \text{ Degrees per Minute}}{\text{Predicted Heat Up Rate}}$$

***Critical-**

a. INVENTORY FACTOR - Degrees/MW Min

107-ft 0.52

108-ft 0.45

Nozzle Dams Installed **OR** **NO** Nozzle Dams Installed **AND**

SG Tubes Voided SG Tubes Not Voided

110-ft 0.40

112-ft 0.36 0.29

114-ft 0.33 0.27

116-ft 0.31 0.26

≥ 118-ft 0.31 0.054

Upper Internals Removed (Use ≥118-ft if Upper Internals Installed)

120-ft 0.06

130-ft 0.03

138-ft 0.02

4. * ESTIMATED TIME TO REACH 200 DEGREES

$$\frac{200 - 106}{94} \div \frac{5.4 (5.175 - 5.625)}{94} = \frac{17.4 (\pm 0.8) \text{ Minutes to reach 200}}{\text{Actual or Predicted Heat Up Rate}}$$

***Critical**

Initial Conditions: GIVEN:

- Unit 1 was shut down six days ago for a refueling outage
- RCS has been drained to 108' and is being maintained at that level in accordance with OP A-2:III, Reactor Vessel – Draining to Half Loop/Half Loop Operations With Fuel in Vessel
- Core is still loaded
- RHR pump 1-2 just tripped on overcurrent
 - RHR pump 1-1 can NOT be started
 - RCS temperature is 106 °F
 - NR RVRLIS level is 108'
- The Excel Spreadsheet to calculate heatup rate is unavailable

Initiating Cue: The Shift Foreman has directed you to determine the time to reach 200°F per OP AP SD-5, Appendix B.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

DIABLO CANYON POWER PLANT
ABNORMAL OPERATING PROCEDURE

UNITS **1 & 2**

OP AP SD-5
Rev. 10
Page 1 of 7

Loss of Residual Heat Removal

04/01/14
Effective Date

QUALITY RELATED

1. SCOPE

- 1.1 This procedure is used in Modes 5 and 6 when RHR system flow is lost. It provides the actions necessary to regain flow and actions to be taken if RHR flow cannot be regained.
- 1.2 This procedure is NOT to be used if an inventory problem has caused, or has the potential to cause, the loss of the RHR system. Such cases are covered by OP AP SD-2, "Loss of RCS Inventory."

2. SYMPTOMS OR ENTRY CONDITIONS

- 2.1 Rising reactor cooling temperature indication on core exit thermocouples and/or loop wide range RTDs.
- 2.2 Rising RHR Heat Exchanger outlet temperatures.
- 2.3 Loss of flow indication on FI-970 A and B and/or FI-971 A and B.
- 2.4 Possible Annunciator Alarms:
 - 2.4.1 RHR SYSTEM (PK02-16)
 - a. RHR Pp _____ Discharge pressure Hi
 - b. RHR Pp _____ Discharge flow Low
 - 2.4.2 RHR PUMPS (PK02-17)
 - a. RHR pump trouble alarms

<u>ACTION/EXPECTED RESPONSE</u>	<u>RESPONSE NOT OBTAINED</u>
1. <u>CHECK RHR Pp Status:</u> <ul style="list-style-type: none"> a. ANY RHR Pp - RUNNING b. RHR Flow (FI-970/971) AT LEAST: <ul style="list-style-type: none"> • 1550 GPM (Mode 6 GREATER THAN 57 Hours from SD) OR <ul style="list-style-type: none"> • 3300 GPM (Mode 6 LESS THAN 57 Hours from SD) 	<ul style="list-style-type: none"> a. START AT LEAST ONE RHR Pp. <hr/> <ul style="list-style-type: none"> b. PERFORM the FOLLOWING: <ul style="list-style-type: none"> • ENSURE OPEN FCV-641A/B • CHECK RHR Pp Motor Current - GREATER THAN 28 Amps. <p><u>IF</u> Recirc Flow CANNOT Be Verified, <u>THEN</u> STOP the RHR Pp <u>AND</u> CHECK RHR Pp Valve Alignment.</p> <hr/> <p>REFER TO OP AP SD-4, LOSS of COMPONENT COOLING WATER.</p> <hr/> <p>GO TO step 5.</p> <hr/>
2. <u>ENSURE CCW Flow to RHR Heat Exchangers:</u> <ul style="list-style-type: none"> • FCV-364/365 - OPEN • ANY CCW Pp - RUNNING 	
3. <u>ENSURE AT LEAST ONE RHR Train RESTORED:</u> <ul style="list-style-type: none"> • RHR Pp - IN SERVICE • FI-970/971 - FLOW INDICATED • RHR HX Outlet Temp - STABLE OR DECREASING • RCS Temperature - STABLE OR DECREASING 	
4. <u>RETURN to Procedure AND Step In Effect</u>	

<u>ACTION/EXPECTED RESPONSE</u>	<u>RESPONSE NOT OBTAINED</u>
5. <u>CHECK If RCPs Can Be Run:</u>	
a. RCS - INTACT, Capable of Being Pressurized	a. GO TO step 8. -----
b. ANY RCP - CAPABLE of Running	b. GO TO step 8. -----
<ul style="list-style-type: none"> • Pp Coupled • Seal Injection - AVAILABLE • CCW - AVAILABLE • Electrical Power - AVAILABLE 	
c. RCP Seal Delta-P - GREATER THAN 255 PSID	c. <u>IF</u> RCS/VCT pressures CANNOT be adjusted to provide Seal Delta-P of AT LEAST 255 psid, <u>THEN</u> GO TO step 8. -----
6. <u>START ANY Available RCP</u> ^{T32822/T32591}	GO TO step 8. -----
7. <u>CONTINUE Efforts to Restore RHR Pps</u>	-----
8. <u>CHECK RCS Temperatures</u> - STABLE OR DECREASING	GO TO OP AP SD-0, LOSS OF, or INADEQUATE DECAY HEAT REMOVAL. ^{T32822/T32591} -----
9. <u>RETURN to Procedure AND Step In Effect AND Continue Efforts to Restore the RHR System</u>	

- END -

3. APPENDICES

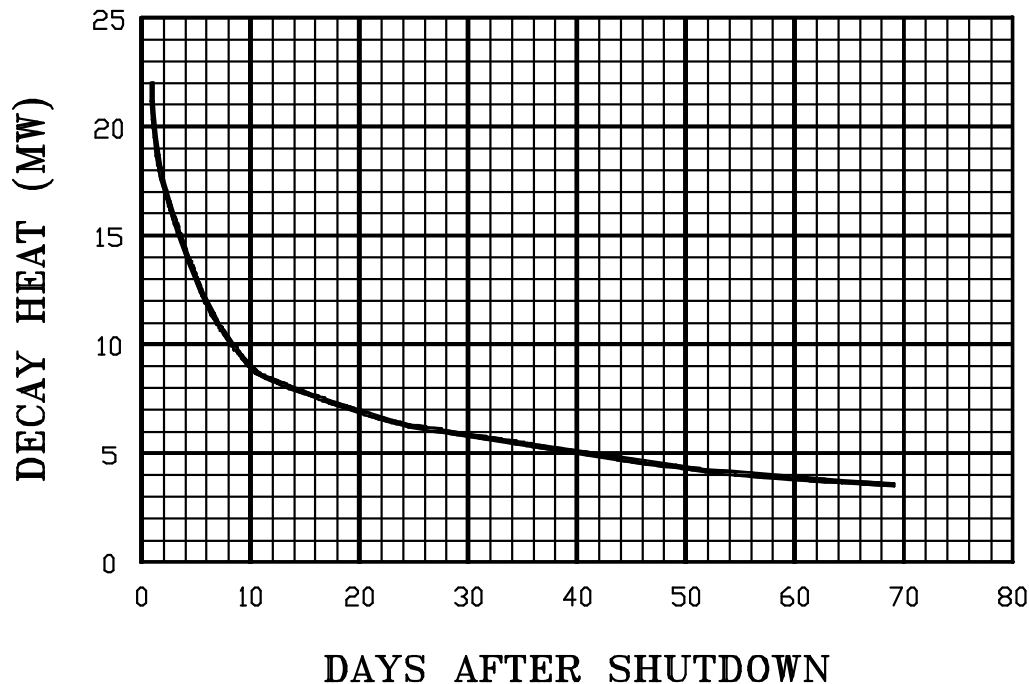
- 3.1 Appendix B, Estimation of Decay Heat and Heatup Rate

4. ATTACHMENTS

- 4.1 Attachment 1, "FoldOut Page"

5. REFERENCES

- 5.1 PG&E NOS/ISAG Calculational File No. 920815-0, "Heatup Rates During an Outage", August 21, 1992
- 5.2 PG&E NOS/ISAG Calculational File No. 920831-0, "Revised Inventory Factors for Reduced Inventory Operations", September 1, 1992
- 5.3 NESNE Calculational file No. N-147, "Inventory Factors for RCS Heatup", August 19, 1994

APPENDIX BEstimation of Decay Heat and Heatup Rate^{T31417/T31098}1. PREDICTED HEAT LOAD**DECAY HEAT**2. REDUCTION FACTOR FOR REFUELED CORES

$$\frac{\text{Predicted Heat Load}}{\text{MW}} \times \frac{\text{Fraction of Previously Used Assemblies Installed in Core}^*}{1} = \frac{\text{Estimated Decay Heat Load}}{\text{MW}}$$

* Use 1.0 if unknown

APPENDIX B (Continued)**3. HEAT UP RATE PREDICTION**

$$\frac{\text{Estimated Decay Heat Load}}{\text{MW}} \times \frac{\text{Inventory Factor}}{\text{Inventory Factor}} = \frac{\text{Predicted Heat Up Rate}}{\text{Degrees per Minute}}$$

a. INVENTORY FACTOR - Degrees/MW Min

107'	0.52
108'	0.45

Nozzle Dams Installed OR SG Tubes Voided		NO Nozzle Dams Installed AND SG Tubes NOT Voided	
110'	0.40	-----	
112'	0.36	0.29	
114'	0.33	0.27	
116'	0.31	0.26	
≥ 118'	0.31	0.054	

Upper Internals Removed (Use ≥118' if Upper Internals Installed)

120'	0.06
130'	0.03
138'	0.02

4. ESTIMATED TIME TO REACH 200 DEGREES

$$\frac{200^{\circ} - \text{Existing Temperature}}{\text{Delta Temp}} \div \frac{\text{Actual or Predicted Heat Up Rate}}{\text{Delta Temp}} = \frac{\text{Minutes to reach 200}}{\text{Minutes to reach 200}}$$

NOTE: In core T/C's will not reflect actual core exit temperatures if ECCS injection is into RCS hot legs.

1.0

EVALUATION OF HEATUP RATE

If Decay heat removal is lost for > 2 minutes:

- Evaluate rate of RCS heatup using Appendix B and change in actual In-core T/C temperatures.
- Determine time until RCS will exceed 200°, inform SM and SFM.

2.0

CONTAINMENT CLOSURE INITIATION CRITERIA

Initiate Containment closure if:

- RCS pressurization takes place due to loss of decay heat removal.
- RCS temperature is projected to raise to > 200° in < one hour
- RHR not restored within 10 minutes with fuel in vessel. ^{T31098}

3.0

CONTAINMENT CLOSURE ACTIONS ^{T31417}

If containment closure is required:

- Sound the Containment Evacuation alarm
- Evacuate non-essential personnel from containment
- Periodically monitor Containment Radiation monitors RM 2, 7, 30, 31
- Ensure Equipment hatch closed
- Ensure at least one personnel hatch door closed
- Ensure at least one emergency personnel hatch door closed
- Ensure Steam generator secondary sides isolated
- Ensure SFS-50 closed or transfer tube flange installed
- Ensure Containment Ventilation Isolation Initiated
- Run all available CFCUs in fast speed

4.0

ALTERNATIVE HEAT REMOVAL METHODS ^{T31098/T32822/T32591}

IF

- RCS begins to pressurize due to loss of RHR
- RCS temperature is projected to raise above 200° in < one hour

THEN

Refer to OP AP SD-0 step 7 to select and implement the alternative method(s) of decay heat removal.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number:	NRCL181-A3		
Title:	Perform STP I-1A		
Examinee:	<hr/>		
Evaluator:	<hr/>	<hr/>	<hr/>
	Print	Signature	Date
Testing Method:	Perform <u> X </u>	Simulate <u> </u>	
Results:	Sat <u> </u>	Unsat <u> </u>	Total Time: <u> </u> minutes
Comments:	Designed for RO candidates in a classroom setting.		

References:	STP I-1A, Routine Shift Checks Required by Licenses, rev 141			
Alternate Path:	Yes	_____	No	_____X_____
Time Critical:	Yes	_____	No	_____X_____
Time Allotment:	15 minutes			
Critical Steps:	See task standard			
Job Designation:	RO			
Rev Comments:	New			
Gen KA # / Rating:	G2.2.37 - Ability to determine operability and/or availability of safety related equipment			

3.6

RON FORTIER	DATE: 02/05/20
AUTHOR	
CHRIS MEHIGAN	DATE: 02/05/20
OPERATIONS REPRESENTATIVE	

Directions: All actions taken by examinee should be clearly documented. 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 (as applicable) and told the steps with which to begin.

Required Materials: STP I-1A, Routine Shift Checks Required by Licenses, Steps 12.5 and 12.6, rev 141

Initial Conditions: Unit 1 is at 100% power

Initiating Cue: You are instructed to perform STP I-1A, Shift Checks Required by Licenses:

- Step 12.5, RCS Accumulator Volume
- Step 12.6, RCS Accumulator Nitrogen Pressure
- Inform the SFM of the results

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

NOTE: Do NOT provide examinee with Task Standard :

Task Standard:

- Step 12.5.3 not met
 - RCS Accumulator 1-2 level change is greater than 3% (5%)
- Step 12.6.2 not met
 - RCS Accumulator 1-2 pressure greater than 640 psig (650 psig)
 - RCS Accumulator 1-3 pressure less than 600 psig (590/585 psig).

Start Time: _____

Stop Time: _____

Follow up Question Documentation:

Question: _____

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

12.5 RCS Accumulator Volume - * out of specification

Applicability	Requirement	Parameter
MODE 1	SR 3.5.1.2 SR 3.5.1.4	RCS Accumulator Volume

12.5.1 In table below, record the following:

- a. Select indicators used. _glh1_
- b. Record levels for indicators selected. _glh1_
- c. Record C-2 level from latest STP C-2 volume. _glh1_

RCS Accum.	<u>VB-1 Ind or PPC Point</u>	Current Level (%)	STP C-2 Level	% Level Change
1-1	LI-950 [X] LI950R []	70	- 68	= 2
	LI-951 [X] LI951R []	70	- 68	= 2
1-2	LI-952 [X] LI952R []	73	- 68	= 5 *
	LI-953 [X] LI953R []	73	- 68	= 5 *
1-3	LI-954 [X] LI954R []	68	- 67	= 1
	LI-955 [X] LI955R []	68	- 67	= 1
1-4	LI-956 [X] LI956R []	69	- 69	= 0
	LI-957 [X] LI957R []	69	- 68	= 1

- d. Calculate level changes in table above. _glh1_

12.5.2 Check all current RCS accumulator levels are $\geq 59\%$ [52%] AND $\leq 75\%$ [82%]. _glh1_

12.5.3 Check all RCS accumulator level changes are $\leq +3\%$ [+5.6%]. _____

12.5.4 IF draining or filling of accumulator(s) has occurred
OR level increase is unacceptable,
THEN request chemistry to perform STP C-2 within 6 hours for affected accumulator(s). []N/A _glh1_

ANSWER KEY

U1 Section 12: Page 7 of 2812.6 RCS Accumulator Nitrogen Pressure * - out of specification

Applicability	Requirement	Parameter
MODE 1	SR 3.5.1.3	RCS Accumulator Nitrogen Pressure

12.6.1 In table below, record the following:

a. Select indicators used.

glh1

b. Record pressure readings for indicators selected.

glh1

RCS Accumulator	<u>VB-1 Ind</u> or <u>PPC Point</u>	Pressure (psig)
1-1	PI-960 [X] PI960R []	610
	PI-961 [X] PI961R []	610
1-2	PI-962 [X] PI962R []	650 *
	PI-963 [X] PI963R []	650 *
1-3	PI-964 [X] PI964R []	590 *
	PI-965 [X] PI965R []	585 *
1-4	PI-966 [X] PI966R []	615
	PI-967 [X] PI967R []	615

12.6.2 Check RCS accumulator nitrogen pressures are ≥ 600 psig [579 psig] AND ≤ 640 psig [664 psig].12.7 Pressurizer Level Channels

Applicability	Requirement	Parameter
MODE 1	Admin	PPC Pressurizer Level Channels

12.7.1 Check the following PPC Pressurizer Level Channels have a quality code of good (green):

- L0480A
- L0481A
- L0482A

12.7.2 IF a quality code is NOT good, THEN document in a notification.

[] N/A

Response: _____

Examinee Response - Key
See attached marked up procedure

Initial Conditions: Unit 1 is at 100% power

Initiating Cue: You are instructed to perform STP I-1A, Shift Checks Required by Licenses:

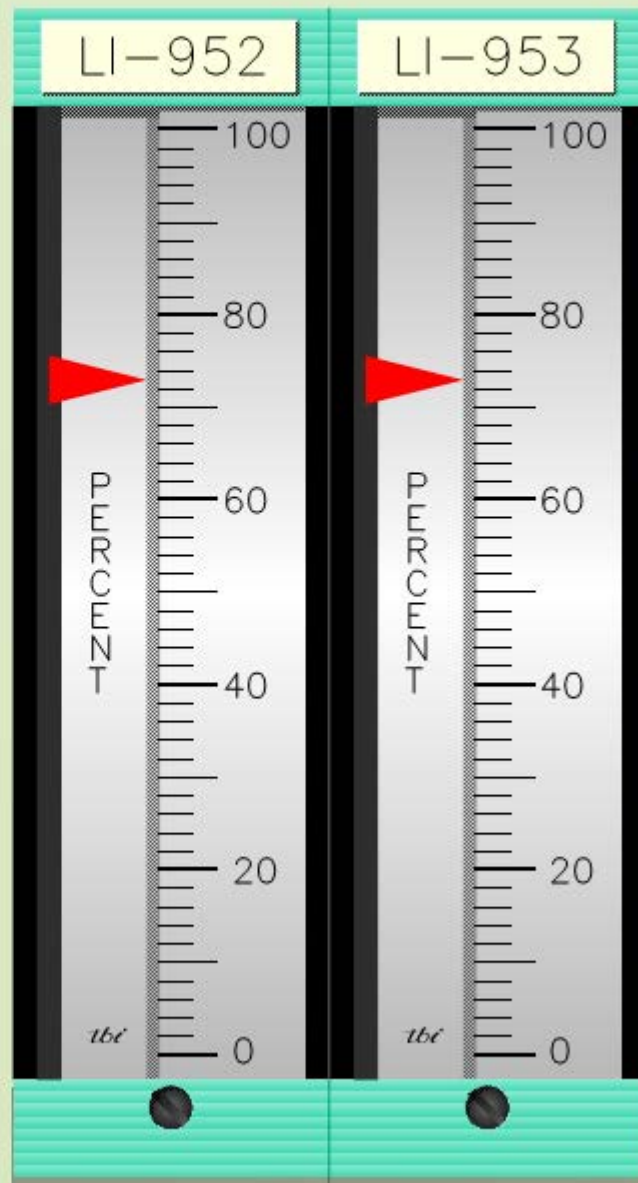
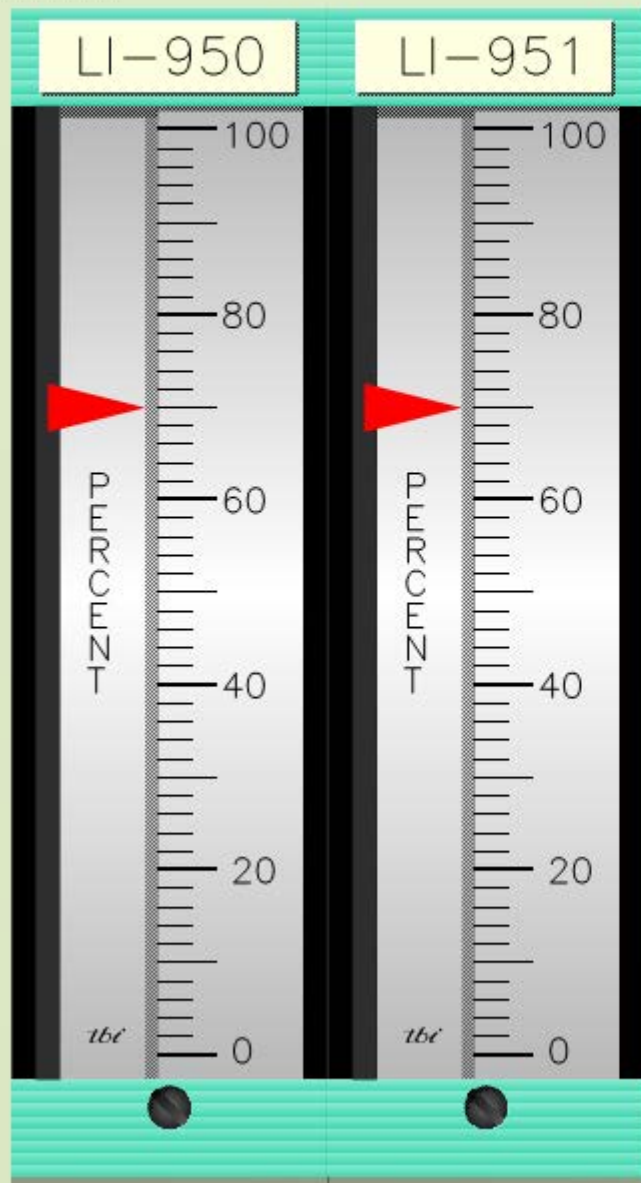
- Step 12.5, RCS Accumulator Volume
- Step 12.6, RCS Accumulator Nitrogen Pressure
- Inform the SFM of the results

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
 - Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
 - If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.
-

1-1

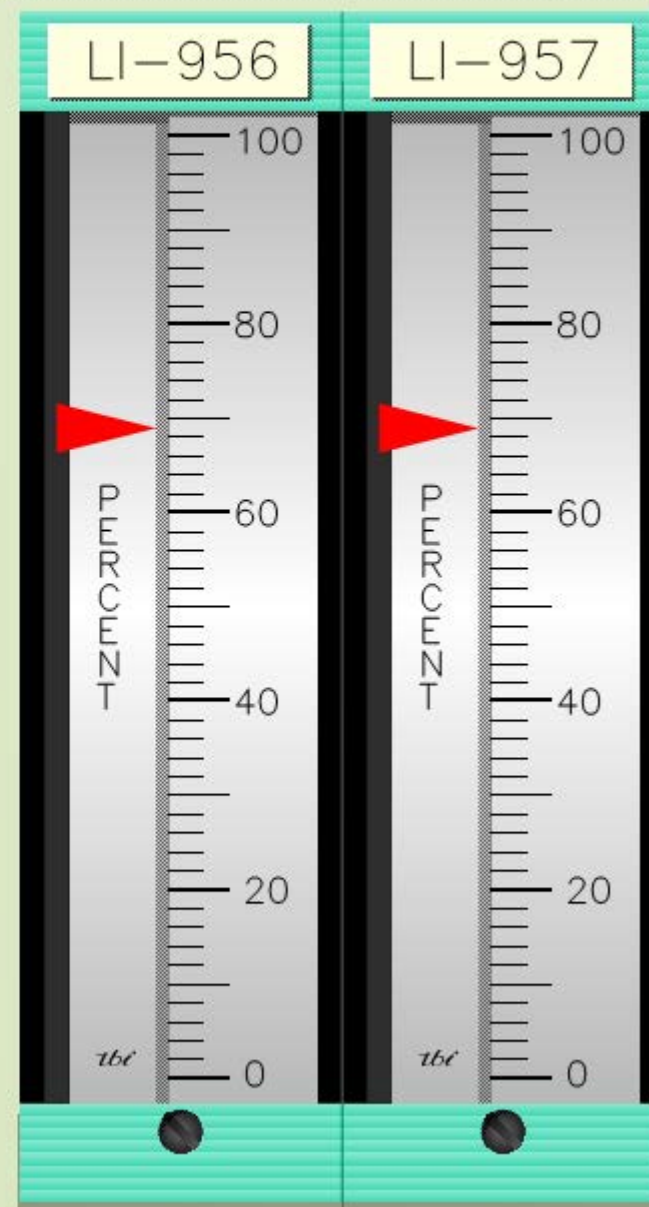
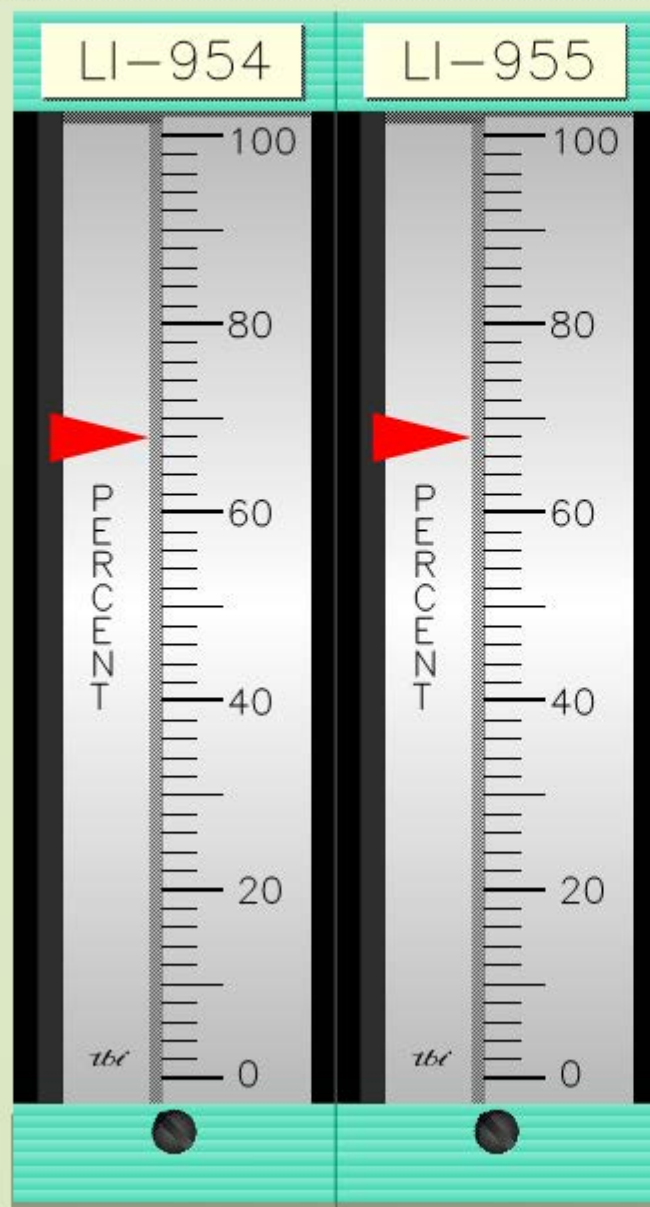
1-2



LEVEL

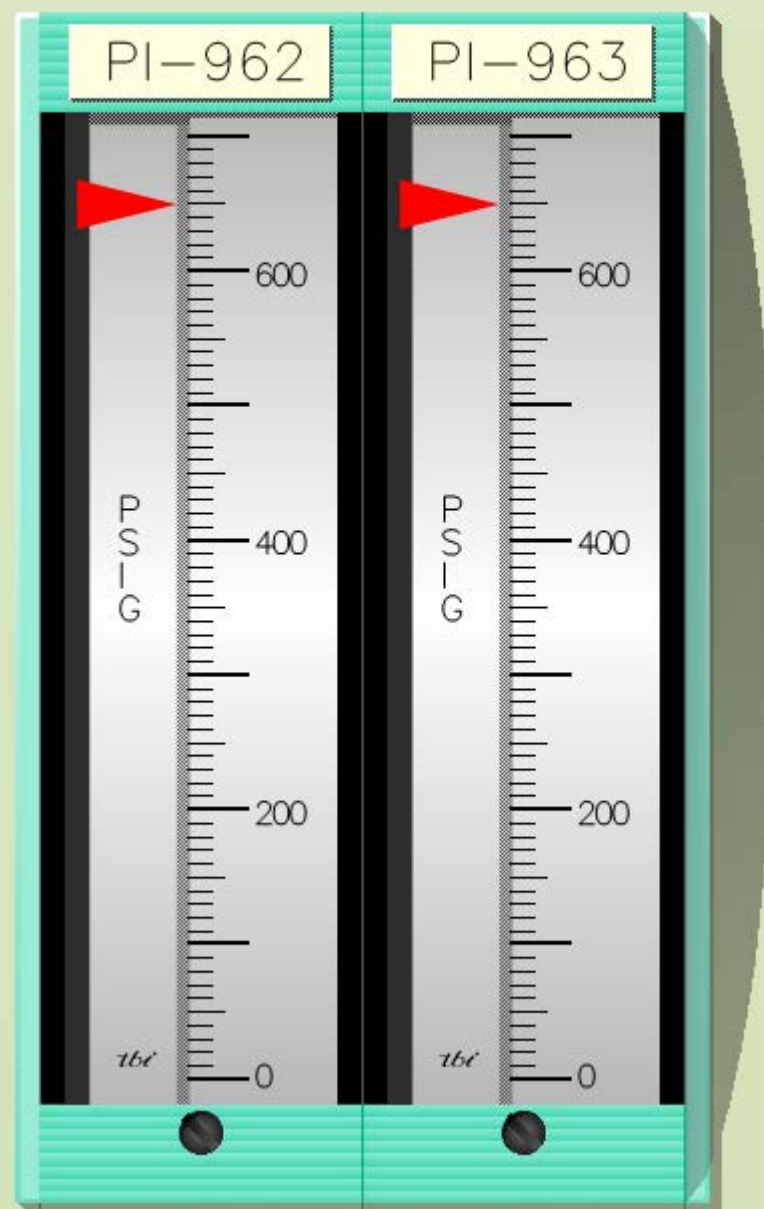
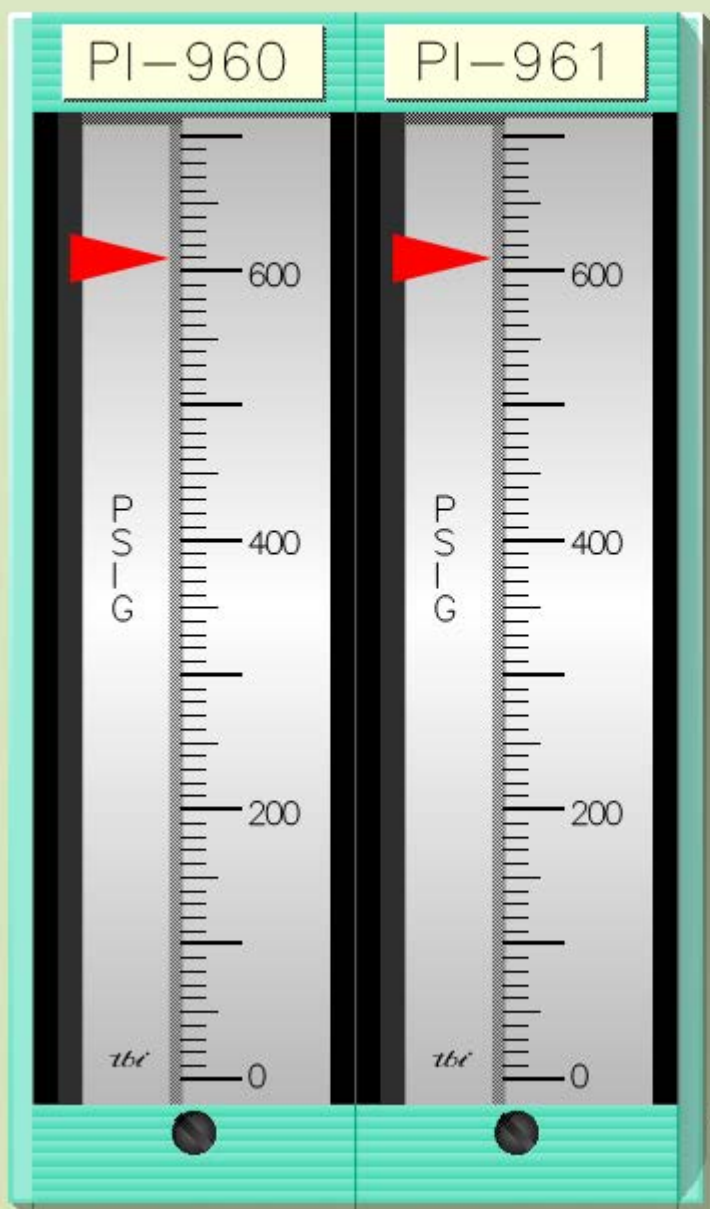
1-3

1-4



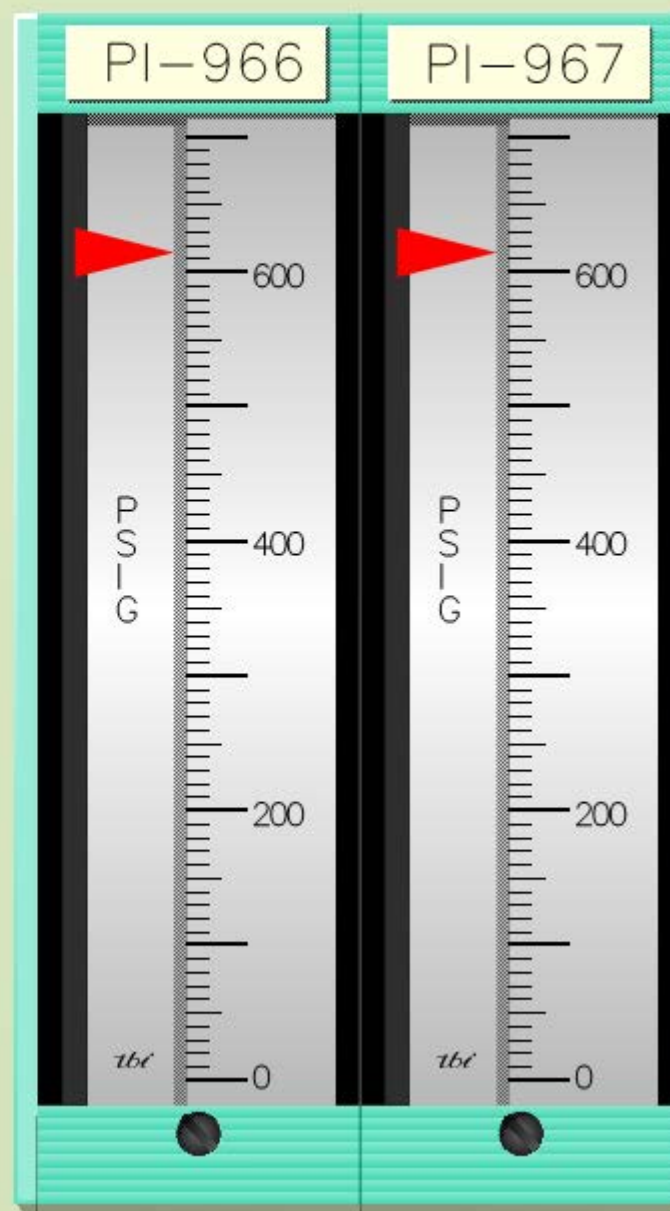
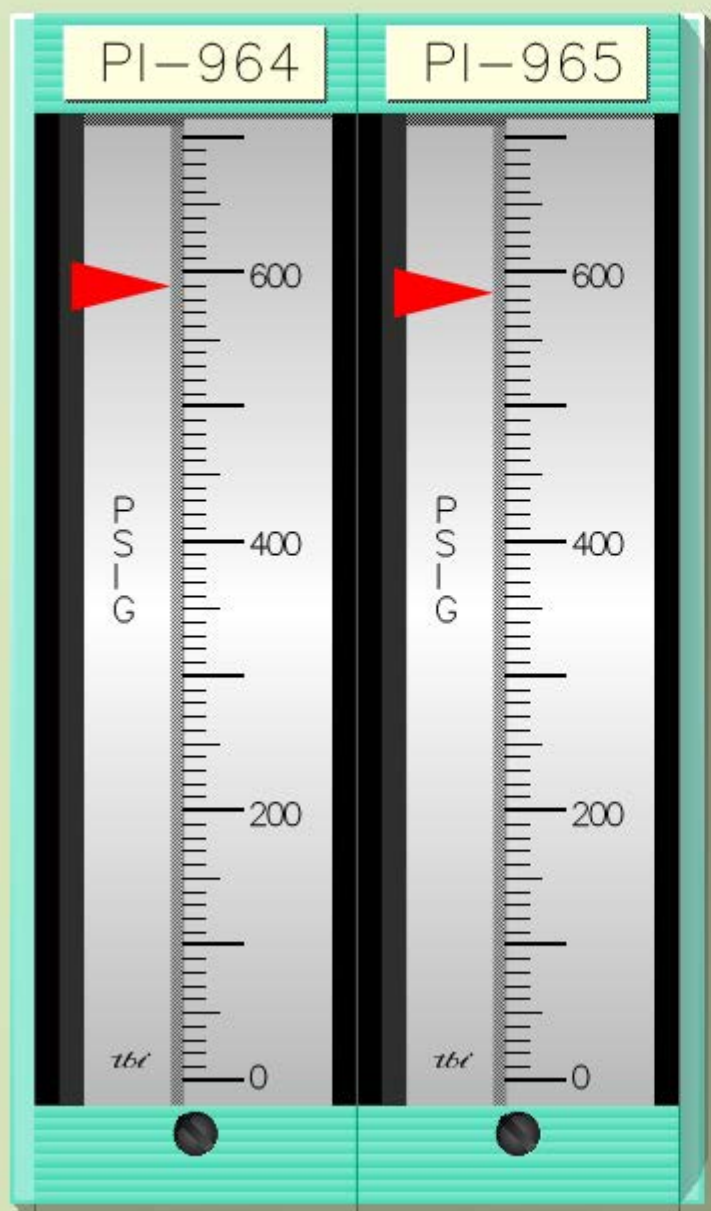
1-1

1-2



1-3

1-4



DIABLO CANYON POWER PLANT
STP C-2
ATTACHMENT 9.1

1 AND 2

TITLE: Accumulator Chemical Concentration Data Sheet

A. Unit: 1 Operating MODE: 1 Date/Time: 02/23/20 0230

B. Reason for Analysis:

☒ Monthly (31 Day) Analysis ☐ Other _____
☐ $\geq 3\%$ level increase or any operational draining or filling. (REFER TO OM12.DC1, "Relieving the Watch," Form 69-09377, for date and time of level change as determined by operations.)

C. Accumulator Boron Concentration	Boron in Limits?			Accumulator Level (%)	
				<u>Vertical Board</u>	<u>PPC</u>
Accumulator #1: <u> 2340 </u> ppm	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	LI—950 <u> 68 </u>	LI950R <u> 68.2 </u>
				LI—951 <u> 68 </u>	LI951R <u> 68.1 </u>
Accumulator #2: <u> 2298 </u> ppm	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	LI—952 <u> 68 </u>	LI952R <u> 67.8 </u>
				LI—953 <u> 68 </u>	LI953R <u> 67.5 </u>
Accumulator #3: <u> 2318 </u> ppm	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	LI—954 <u> 67 </u>	LI954R <u> 67.2 </u>
				LI—955 <u> 67 </u>	LI955R <u> 67.0 </u>
Accumulator #4: <u> 2322 </u> ppm	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	LI—956 <u> 69 </u>	LI956R <u> 68.4 </u>
				LI—957 <u> 68 </u>	LI957R <u> 68.1 </u>

Acceptance Criteria

Accumulator level values have no acceptance criteria in STP C-2.

IF accumulator boron concentration is ≥ 2200 ppm and ≤ 2500 ppm,
THEN the accumulator results are acceptable.
OTHERWISE the results are NOT acceptable.

Accumulator boron concentrations are: ☒ Acceptable ☐ NOT Acceptable

IF NOT acceptable,
THEN perform the following:

- Immediately notify SFM and chemistry foreman.
- Create a notification. # _____

The chemistry foreman shall notify the chemistry engineer of any out-of-limit parameter.

Comments:

12.5 RCS Accumulator Volume

Applicability	Requirement	Parameter
MODE 1	SR 3.5.1.2 SR 3.5.1.4	RCS Accumulator Volume

12.5.1 In table below, record the following:

a. Select indicators used. _____

b. Record levels for indicators selected. _____

c. Record C-2 level from latest STP C-2 volume. _____

RCS Accum.	<u>VB-1 Ind or PPC Point</u>	Current Level (%)	STP C-2 Level	% Level Change
1-1	LI-950 [] LI950R []		-	=
	LI-951 [] LI951R []		-	=
1-2	LI-952 [] LI952R []		-	=
	LI-953 [] LI953R []		-	=
1-3	LI-954 [] LI954R []		-	=
	LI-955 [] LI955R []		-	=
1-4	LI-956 [] LI956R []		-	=
	LI-957 [] LI957R []		-	=

d. Calculate level changes in table above. _____

12.5.2 Check all current RCS accumulator levels are $\geq 59\%$ [52%] AND $\leq 75\%$ [82%]. _____12.5.3 Check all RCS accumulator level changes are $\leq +3\%$ [+5.6%]. _____

12.5.4 IF draining or filling of accumulator(s) has occurred
OR level increase is unacceptable,
THEN request chemistry to perform STP C-2 within 6 hours for affected
 accumulator(s). []N/A _____

U1 Section 12: Page 7 of 2812.6 RCS Accumulator Nitrogen Pressure

Applicability	Requirement	Parameter
MODE 1	SR 3.5.1.3	RCS Accumulator Nitrogen Pressure

12.6.1 In table below, record the following:

a. Select indicators used. _____

b. Record pressure readings for indicators selected. _____

RCS Accumulator	<u>VB-1 Ind</u> or <u>PPC Point</u>	Pressure (psig)
1-1	PI-960 [] PI960R []	
	PI-961 [] PI961R []	
1-2	PI-962 [] PI962R []	
	PI-963 [] PI963R []	
1-3	PI-964 [] PI964R []	
	PI-965 [] PI965R []	
1-4	PI-966 [] PI966R []	
	PI-967 [] PI967R []	

12.6.2 Check RCS accumulator nitrogen pressures are ≥ 600 psig [579 psig] AND ≤ 640 psig [664 psig]. _____12.7 Pressurizer Level Channels

Applicability	Requirement	Parameter
MODE 1	Admin	PPC Pressurizer Level Channels

12.7.1 Check the following PPC Pressurizer Level Channels have a quality code of good (green): _____

- L0480A
- L0481A
- L0482A

12.7.2 IF a quality code is NOT good, THEN document in a notification. _____

[] N/A _____

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-A4
Title: Perform RM-19 Channel Check
Examinee: _____
Evaluator: _____
Print Signature Date
Testing Method: Perform X Simulate _____
Results: Sat _____ Unsat _____ Total Time: _____ minutes
Comments: Designed for RO candidates in a classroom setting.

Operations Policy B-5, Channel Check Criteria, rev 6

References:
Alternate Path: Yes _____ No X
Time Critical: Yes _____ No X
Time Allotment: 10 minutes
Critical Steps: Per Examinee Response - Key
Job Designation: RO
Rev Comments: New
Gen KA # / Rating: G2.3.5 -Ability to use radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc. 2.9

RON FORTIER

AUTHOR

DATE: 11/08/19

CHRIS MEHIGAN

OPERATIONS REPRESENTATIVE

DATE: 11/26/19

Directions: All actions taken by examinee should be clearly documented. 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 (as applicable) and told the steps with which to begin.

Required Materials: Operations Policy B-5,

Initial Conditions: GIVEN:

- Both Unit 1 and 2 are at 100% power
- STP I-1B, Attachment 12.1, MODES 1, 2, and 3 Daily Checklist is being performed
- The operator has reached step 15, CHANNEL CHECK the steam generator blowdown liquid monitor, RM-19

Initiating Cue: You are instructed to use Operations Section Policy B-5, Channel Check Criteria to perform the CHANNEL CHECK for steam generator blowdown liquid monitor, RM-19 and document all your results to support your determination.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

NOTE: Do NOT provide examinee with Task Standard :

Task Standard:

Channel Check is UNSAT due to:

- Range selector switch is set to NARROW
- Setpoint toggle switch selected to HASP #2 (MAINT ONLY)

Start Time: _____

Stop Time: _____

Follow up Question Documentation:

** Denotes Critical Step and Sub-Steps

2. WESTINGHOUSE RAD MONITORS (includes RM-3, 11, 12, 18, 19, 22)

- a. POWER light is ON.
- b. Operation Selector switch set to OPERATE.
- c. Range Selector switch set to WIDE.
- d. Normal analog channel levels and response.
- e. Red LOW ALARM lamp is OFF.

There are additional checks for RM-11, Containment Air Particulate detector:

- f. Sample Selector set to MAIN sample.
- g. PUMP ON light is lit.
- h. FILTER NOT IN MOTION light is OUT.

There is an additional check for RM-3, OWS effluent monitor:

- i. Flow verified through the monitor while the OWS is running.

NOTE: RM-19 setpoint toggle switch selected to the HASP #1 (S/G TO B/D) position.

3. VICTOREEN RAD MONITORS

ANALOG RAD MONITORS (includes RM-71, 72, 73, 74, 30, 31, U-1 RM-29)

- a. Switch selector to OPERATE or ALL.
- b. Green SAFE/FAIL/RESET light is ON.
- c. Normal analog channel levels and response.

DIGITAL RMs (includes RM-14/R, 15/R, 24/R, 28/R, 44A/B, U-2 RM-29)

- a. White NORMAL panel light is ON.
- b. Red SKID PMP light ON.
- c. The Remote Display Units (RDU) on the back panels have digital readouts which must update periodically, generally from 15 to 120 seconds.

NOTES:

- 1. RM-30, 31 detectors measure in R/hr and should generally be less than 1 R/hr on a normal channel check. An auto check of these detectors to 1E3 will occur every 17 minutes to ensure these monitors are not failed low. This auto check is NOT a required channel check.
- 2. RM-29 (Unit 2) detector has a RANGE light which will illuminate when the detector reading drops below its under-range of less than 0.01 mR/hr. When it registers activity greater than 0.01mR/hr, the red RANGE light will go OUT.

4. MISCELLANEOUS RADIATION MONITORS

RM-58, 59

- a. Switch selected to OPERATE.
- b. Green OPERATE light is ON.
- c. Normal analog channel levels and response.

NOTE 1: RM-59 will generally read very low, whereas RM-58 may read significantly higher especially following a refueling on that unit.

NOTE 2: RM-59 - if no pulses occur within approximately 150 seconds, the failure alarm comes in, otherwise the OPERATE light stays illuminated.

RM-23, RADECO monitor (located in PM-205, 115', Aux Bldg)

- a. HIGH and LOW alarm lamps should be ON (these lamps go OUT on an alarm condition).
- b. Normal analog channel levels and response.

RM-25, 26, 51, 52, 53, 54

- a. White NORMAL light is ON (RM-51 through 54).
- b. Yellow FAILURE light is OFF (RM-25, 26).
- c. Normal analog channel levels and response.

Question: _____

Response: _____

Examinee Response - Key
<p>RM-19 Channel Check" SAT: _____</p> <p>UNSAT: __X__</p> <p>Basis for SAT/UNSAT:</p> <ul style="list-style-type: none">• Range selector switch is set to NARROW• Setpoint toggle switch selected to HASP #2 (MAINT ONLY)

Initial Conditions: GIVEN:

- Both Unit 1 and 2 are at 100% power
- STP I-1B, Attachment 12.1, MODES 1, 2, and 3 Daily Checklist is being performed
- The operator has reached step 15, CHANNEL CHECK the steam generator blowdown liquid monitor, RM-19

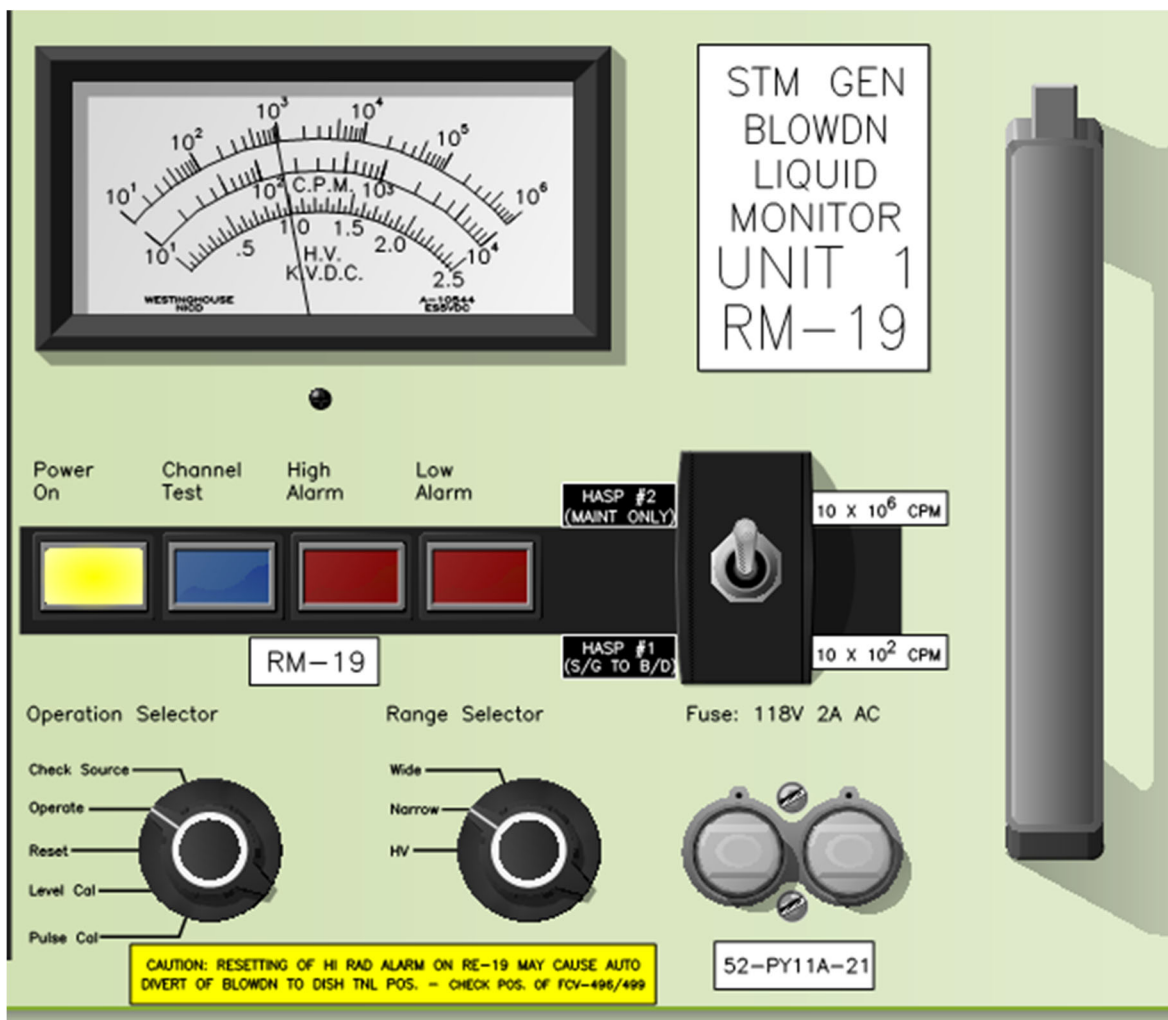
Initiating Cue:

You are instructed to use Operations Section Policy B-5, Channel Check Criteria to perform the CHANNEL CHECK for steam generator blowdown liquid monitor, RM-19 and document all your results to support your determination.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

Examinee Response - Key**RM-19 Channel Check"****SAT:** _____**UNSAT:** _____**Basis for SAT/UNSAT:**



DIABLO CANYON POWER PLANT UNITS 1 AND 2

TITLE: **CHANNEL CHECK CRITERIA**

APPROVED: _____
Operations Manager

As defined in the Technical Specifications (Tech Specs), "a CHANNEL CHECK shall be the qualitative assessment, by observation, of channel behavior during operation. This determination shall include, where possible, comparison of the channel indication and status to other indications or status derived from independent instrument channels measuring the same parameter."

The first sentence of the CHANNEL CHECK definition implies that single instrument channel checks are entirely permissible. The second part of the definition goes on to say where possible, a CHANNEL CHECK of independent, redundant channels measuring the same parameter shall be performed. It is also clear from the definition, that quantitative limits are not applicable to CHANNEL CHECKS.

In the past, several different classes of instruments have presented problems to operators in their CHANNEL CHECKS. These include flow instruments, which utilize square root extractors, radiation monitors, and process analysis instruments (ANI/ANRs). This policy was written to standardize the procedure for performing CHANNEL CHECKS. It is very important that the channel check criteria listed below be used as GUIDELINES for determining channel operability. Remember that not all checks need to be satisfied when determining that a particular instrument is OPERABLE. For example, a channel check criterion for the Radiation Monitors is to check the "POWER light is ON." If the POWER light is found OFF, the monitor may still be OPERABLE. Operators need to look at other indications as well. If the RM were indicating normal background radiation, the analog meter needle was oscillating slightly, all switches were in their normal position, and power fuses were installed, the shift operators should consider the Radiation Monitor OPERABLE. In this case, it is probable the POWER ON light bulb is burned out. The "guideline" status of these CHANNEL CHECK steps must always be recognized.

A. GENERAL CHANNEL CHECK CRITERIA

The criteria listed below are applicable to most channel checks and may be applied to single and/or redundant instrument channels. Whenever an instrument channel is declared inoperable, the SFM needs to consider the effect on protection bistables associated with that indication. Certain criterion listed below will apply to instrument classes listed in the following sections of this policy.

1. Most instrument loops at DCPD utilize a 4-20 mA current scheme. Thus, most zero (0) readings occur at 4 mA. This is termed a "live zero", since the instrument should generate a current output even for the zero reading ("0"). However with various accuracy limits among instruments, it is very possible to have a below zero reading which is normal for that channel. However, if the meter needle is hard against its low limit peg and motionless, the channel may have failed low and should be considered inoperable. Contact I&C for evaluation of the instrument and the SFM for status of channel operability.

2. For redundant instruments measuring the same parameter, one indicator reading GREATER THAN 5% (of scale) higher or lower than other channels should be declared inoperable. An exception to this rule is with the Pressurizer Level Channels, where one indicator reading GREATER THAN 8.5% (of scale) higher or lower than other channels should be declared inoperable. (Reference A0437900/07).
3. Some parameters are measured by both WIDE RANGE and NARROW RANGE instruments, e.g., accumulator levels. Because the instrument loops are calibrated to different ranges, these channels should NOT be considered redundant channels for the purpose of CHANNEL CHECKS.
4. Most analog meters indicate they are updating properly by showing a slight meter needle movement (oscillation). Most digital meters will "refresh" their indications periodically, e.g., every 20 seconds. If an analog meter needle is "rock steady" or oscillating excessively or if a digital indication is not updating periodically, then notify the SFM since the instrument may be inoperable. I&C should be contacted for evaluation of the channel response.
5. Many chart recorders provide the plant with permanent logs. In this case, I&C will calibrate the recorder pen trace more accurately than the meter scale pointer. Most meters and recorders exhibit a small amount of needle or pen oscillation. If this oscillation is excessive, e.g., $\pm 5\%$ of channel scale, the instrument should be considered inoperable. Contact I&C for evaluation of meters or recorders exhibiting this behavior.
6. When comparing NI-31 or 32 with a Gamma-Metrics channel, the channel check is acceptable if the readings are within one decade of each other. (Reference A0603406/03)
7. Section E lists appropriate reference procedures for all instrument checks described within this Policy. Exercise caution when using quantitative test documents for performing CHANNEL CHECKS.

B. RADIATION MONITOR CHECKS

Due to the wide variety of radiation monitors currently in use at DCP, not all the checks listed below can be performed for each class of monitor. Operators should use ONLY those checks which are applicable for the RM they are channel checking. If the validity of an indication on a RMS channel is questioned, the SFM and I&C shall be notified for an evaluation of the problem and a determination of channel operability.

1. Many of the RMS channels below have an analog meter indication. A normal channel check of these meters should indicate background or normal, historical radiation levels. Analog meters are updating properly when they show a slight meter needle movement (oscillation).

2. WESTINGHOUSE RAD MONITORS (includes RM-3, 11, 12, 18, 19, 22)

- a. POWER light is ON.
- b. Operation Selector switch set to OPERATE.
- c. Range Selector switch set to WIDE.
- d. Normal analog channel levels and response.
- e. Red LOW ALARM lamp is OFF.

There are additional checks for RM-11, Containment Air Particulate detector:

- f. Sample Selector set to MAIN sample.
- g. PUMP ON light is lit.
- h. FILTER NOT IN MOTION light is OUT.

There is an additional check for RM-3, OWS effluent monitor:

- i. Flow verified through the monitor while the OWS is running.

NOTE: RM-19 setpoint toggle switch selected to the HASP #1 (S/G TO B/D) position.

3. VICTOREEN RAD MONITORS

ANALOG RAD MONITORS (includes RM-71, 72, 73, 74, 30, 31, U-1 RM-29)

- a. Switch selector to OPERATE or ALL.
- b. Green SAFE/FAIL/RESET light is ON.
- c. Normal analog channel levels and response.

DIGITAL RMs (includes RM-14/R, 15/R, 24/R, 28/R, 44A/B, U-2 RM-29)

- a. White NORMAL panel light is ON.
- b. Red SKID PMP light ON.
- c. The Remote Display Units (RDU) on the back panels have digital readouts which must update periodically, generally from 15 to 120 seconds.

NOTES:

- 1. RM-30, 31 detectors measure in R/hr and should generally be less than 1 R/hr on a normal channel check. An auto check of these detectors to 1E3 will occur every 17 minutes to ensure these monitors are not failed low. This auto check is NOT a required channel check.
- 2. RM-29 (Unit 2) detector has a RANGE light which will illuminate when the detector reading drops below its under-range of less than 0.01 mR/hr. When it registers activity greater than 0.01mR/hr, the red RANGE light will go OUT.

4. MISCELLANEOUS RADIATION MONITORS

RM-58, 59

- a. Switch selected to OPERATE.
- b. Green OPERATE light is ON.
- c. Normal analog channel levels and response.

NOTE 1: RM-59 will generally read very low, whereas RM-58 may read significantly higher especially following a refueling on that unit.

NOTE 2: RM-59 - if no pulses occur within approximately 150 seconds, the failure alarm comes in, otherwise the OPERATE light stays illuminated.

RM-23, RADECO monitor (located in PM-205, 115', Aux Bldg)

- a. HIGH and LOW alarm lamps should be ON (these lamps go OUT on an alarm condition).
- b. Normal analog channel levels and response.

RM-25, 26, 51, 52, 53, 54

- a. White NORMAL light is ON (RM-51 through 54).
- b. Yellow FAILURE light is OFF (RM-25, 26).
- c. Normal analog channel levels and response.

C. FLOW INSTRUMENT (SQUARE ROOT EXTRACTOR) CHECKS

When the plant is operated in a low power condition or following maintenance outages, the accuracy of square root extractor indications is frequently questioned by Operations personnel. In some cases the instrument may be inoperable or it may simply need to be backfilled. It is also possible that low flow conditions will place the square root extractor outside its calibrated range. Any time the validity of an indication is in question, I&C should be notified for an evaluation of the channel.

1. All flow instruments utilizing square root extractors are inherently inaccurate when reading less than 10% of channel scale. No accuracy requirements apply in this range and no operator action is necessary. For example, the AFW flow channels on VB3 are 0-300 gpm scales. No accuracy limits are applicable when reading less than 30 gpm.
2. The following table should aid Operations personnel in performing channel checks on these flow instruments which have no redundant indications:

<u>INSTRUMENT</u>	<u>CHANNEL</u>	<u>CHANNEL CHECK CRITERIA</u>
AFW Flow	FI-157,158, 159,160	>30 gpm, \pm 5 gpm. (Refer. General Channel Check A 1.)
Plant Vent Flow	FR-12	Reasonable comparison with fan configuration of Aux/Fuel Handling Bldg vent modes, e.g., Bldgs Only - Approx. 13E4 cfm.
Radwaste Discharge Flow	FR-20	Verify flow is recording during a release period. If possible, channel check with FR-20A (RWS filter 0-3 discharge).
S/G Blowdown Flow	FR-53	Verify flow is recording during a release period. PM-205, multipoint recorder point # 6 in service with a corresponding digital readout (double or 2X digital readout).
NOTE: The Test switch located in 100', GW area of the Aux Bldg should not be used by Operation's personnel. That switch is reserved for maintenance activities performed by I&C personnel.		
OWS Influent Flow	FR-251 (7 digit totalizer nonresettable)	If an automatic discharge is not observed, start the turbine building waste pumps manually. Once overboard discharge commences, verify totalizer \leq 100gal/min (which corresponds to 66.7% on FI-251) when the OWS is in service and discharging.

D. PROCESS ANALYSIS INSTRUMENT CHECKS

The following table should aid Operators in performing channel checks on various process analysis instruments.

<u>INSTRUMENT</u>	<u>CHANNEL</u>	<u>CHANNEL CHECK CRITERIA</u>
Waste Gas O2 Analyzers	ANI/ANR 75,76	Verify FI-905,906 have approx. 1 scfh, otherwise run WGC for several minutes. Max. difference between channels is $\pm 0.20\%$ O2.
DFO transfer piping leak detection	ANI-501	Display cycles through cables 1-6 and all cables indicate "OK." If remapping is required, refer to OP J-6C:VI.

E. PROCEDURAL REFERENCES

Due to the qualitative nature of a CHANNEL CHECK assessment, the procedures listed below should only be used in a reference capacity. Quantitative limits are not applicable to CHANNEL CHECKS. Moreover, the guideline nature of this Operations Policy should be recognized and applied appropriately. Remember if these references are consulted; use the correct Unit and most recent revision of the procedure.

RADIATION MONITOR CHECKS

1. STP I-18P1, Functional Test of Oily Water Separator Influent Monitor, RM-3
2. STP I-100A, Containment Air Particulate/Gas Radiation Monitor RM-11/RM-12 Functional Test
3. STP I-102A, Functional Test of Liquid Radwaste Discharge Monitor, RM-18
4. STP I-111A, Functional Test of Steam Generator Blowdown Sample Effluent Liquid Monitor, RM-19
5. STP I-103A, Functional Test of Gas Decay Tank Gas Discharge Monitor, RM-22
6. STP I-39-R71.A, Functional Test of Main Steam Line Radiation Monitor, RM-71, 72, 73, 74
7. STP I-18N1, Functional Test of Containment High Range Radiation Monitors, RM-30, RM-31
8. STP I-39-R29.A, High Range Plant Vent Gross Gamma Monitor RM-29 Functional Test
9. STP I-39-R14.A, Plant Vent Noble Gas Radiation Monitor RM-14 Functional Test
10. STP I-39-R14R.A, Plant Vent Noble Gas Radiation Monitor RM-14R Functional Test
11. STP I-39-R24.A, Plant Vent Iodine Radiation Monitor RM-24 Functional Test
12. STP I-39-R24R.A, Plant Vent Iodine Radiation Monitor RM-24R.A Functional Test
13. STP I-39-R28.A, Plant Vent Particulate Radiation Monitor RM-28 Functional Test
14. STP I-39-R28R.A, Plant Vent Particulate Radiation Monitor RM-28R Functional Test
15. STP I-39-R44A.A, Containment Ventilation Exhaust Radiation Monitor RM-44A Functional Test
16. STP I-39-R44B.A, Containment Ventilation Exhaust Radiation Monitor RM-44B Functional Test
17. STP I-119A, Functional Test: Fuel Handling Building Area Radiation Monitors, RM-58 / RM-59
18. STP I-18F1, Functional Test of S/G Blowdown Tank Radiation Monitor RM-23
19. STP I-18M1, Control Room Air Intake Monitor Functional Test (RM-25 & RM-26)
20. STP I-118A, Functional Test of Control Room Pressurization Radiation Monitors, RM-51, 52, 53,

FLOW INSTRUMENTS

1. STP I-3-F50, Auxiliary Feedwater to Steam Generator 1-1 (2-1) Flow Channel FT-50 Calibration
2. STP I-3-F77, Auxiliary Feedwater to Steam Generator 1-2 (2-2) Flow Channel FT-77 Calibration
3. STP I-3-F78, Auxiliary Feedwater to Steam Generator 1-3 (2-3) Flow Channel FT-78 Calibration
4. STP I-3-F79, Auxiliary Feedwater to Steam Generator 1-4 (2-4) Flow Channel FT-79 Calibration
5. STP I-39-F12.B, Plant Vent Flow Measurements System Calibration
6. STP I-19-F243.A, Liquid Radwaste Effluent Line Flow Channel FIT-243 Functional Test
7. STP I-4-F53.A, Steam Generator Blowdown Effluent Line Flow Channel FT-53 Functional Test
8. STP I-27-F251.A, Oily Water Separator System Flow Channel FT-251 Functional

PROCESS ANALYSIS INSTRUMENTS

1. STP I-24-A75.A, Functional Test of Waste Gas System Oxygen Analyzer Channels 75 and 76
2. STP M-121, Diesel Fuel Oil Leak Detection System ANI-501 Functional Test

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-A5

Title: Apply Overtime Limit Restrictions

Examinee: _____

Evaluator: _____

Print _____ Signature _____ Date _____

Testing Method: Perform _____ X _____ Simulate _____

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: _____

References:	OM14.ID1, Fatigue Management Rule Program, rev 30		
Alternate Path:	Yes	_____	No <u> X </u>
Time Critical:	Yes	_____	No <u> X </u>
Time Allotment:	20 minutes		
Critical Steps:	See Examinee Response - Key		
Job Designation:	SRO		
Rev Comments:	Revised from L061 (NRCADM061-COO-SRO1)		
Gen KA # / Rating:	G2.1.5 – Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc.		

3.9

AUTHOR:	<u>LISA TORIBIO</u>	DATE:	<u>02/05/20</u>
OPERATIONS REPRESENTATIVE:	CHRIS MEHIGAN	DATE:	02/05/20

Directions: 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. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the step at which to begin.

Required Materials: OM14.ID1, Fatigue Management Rule Program, rev 30

Initial Conditions: GIVEN:

- It is 0600 on Monday, 2/17
- Unit 1 is operating at 100% power
- Unit 2 is in an outage; currently defueled
- The oncoming Unit 1 Control Operator has just called in sick
- WorkForce scheduling program is out of service
- The following licensed Operators are currently available:

Operator #1			
Day	Start Time	End Time	Position
Sunday, 2/9	0700	1900	Control Operator
Monday, 2/10	0700	1900	Control Operator
Tuesday, 2/11	0700	1900	Control Operator
Wednesday, 2/12	0900	2200	WC Extra
Thursday 2/13	Day Off		
Friday 2/14	0700	2000	Balance of Plant Operator
Saturday, 2/15	1400	1500	TeleCon personnel statement
Sunday 2/16	0700	1900	Control Operator
Monday 2/17 (proposed)	0700	1900	Control Operator

**Initial Conditions
(continued):**

Operator #2			
Day	Start Time	End Time	Position
Sunday, 2/9	1900	0700	Work Control Lead
Monday, 2/10	1900	0700	Work Control Lead
Tuesday, 2/11	Day Off		
Wednesday, 2/12	1900	0700	Control Operator
Thursday, 2/13	1900	0700	Work Control Lead
Friday, 2/14	1900	0700	Work Control Lead
Saturday, 2/15	1900	0700	Control Operator
Sunday 2/16	Day Off		
Monday 2/17 (proposed)	0700	1900	Control Operator

Operator #3			
Day	Start Time	End Time	Position
Sunday, 2/9	1000	1700	Fire Watch
Monday, 2/10	Day Off		
Tuesday, 2/11	0700	2100	Control Operator
Wednesday, 2/12	0700	1900	Balance of Plant Operator
Thursday, 2/13	0700	1900	Balance of Plant Operator
Friday, 2/14	0700	2000	Balance of Plant Operator
Saturday, 2/15	1000	2000	Balance of Plant Operator
Sunday 2/16	Day Off		
Monday 2/17 (proposed)	0700	1900	Control Operator

Initiating Cue: Review the hours worked by the available Operators and determine their ability to fill the watch bill. Document reason(s) each operator is available or unavailable.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

NOTE: Do NOT provide examinee with Task Standard

Task Standard: See Examinee Response Key.

**Start
Time:** _____

**End
Time:** _____

Follow up Question Documentation:

Question:

Response:

Examinee Response - Key

Only Operator #2 can accept the watch without a waiver based on the allowable work hours during Non-Outage Conditions. NOTE: Only reason for unavailability is critical, hours not required with answer.

- **Operator #1 – Not Available**
 - Can not exceed 16 hours in any continuous 24 period: **Satisfactory (max was 13 hours)**
 - Can not exceed 26 hours in any continuous 48 period: **Satisfactory (max was 25 hours)**
 - Can not exceed 72 hours in any continuous 168 period: **Satisfactory (max was 63 hours)**
 - **34 hour continuous break required in any 9 day period: Unsatisfactory (taking the relief watch at 0700 on Monday would result in a continuous break of 33 hours in the past 9 day period)**
 - 10 hour continuous break minimum break required between shifts: **Satisfactory (min was 12 hours)**
- **Operator #2 – Available**
 - Can not exceed 16 hours in any continuous 24 period: **Satisfactory (max was 12 hours)**
 - Can not exceed 26 hours in any continuous 48 period: **Satisfactory (max was 24 hours)**
 - Can not exceed 72 hours in any continuous 168 period: **Satisfactory (max was 72 hours)**
 - 34 hour continuous break required in any 9 day period: **Satisfactory (min was 36 hours)**
 - 10 hour continuous break minimum break required between shifts: **Satisfactory (min was 12 hours)**
- **Operator #3 – Not Available**
 - Can not exceed 16 hours in any continuous 24 period: **Satisfactory (max was 14 hours)**
 - Can not exceed 26 hours in any continuous 48 period: **Satisfactory (max was 24 hours)**
 - **Can not exceed 72 hours in any continuous 168 period: Unsatisfactory (max was 73.0 hours)**
 - 34 hour continuous break required in any 9 day period: **Satisfactory(max was 38 hours)**
 - 10 hour continuous break minimum break required between shifts: **Satisfactory (min was 10 hours)**

Initial Conditions: GIVEN:

- It is 0600 on Monday, 2/17
- Unit 1 is operating at 100% power
- Unit 2 is in an outage; currently defueled
- The oncoming Unit 1 Control Operator has just called in sick
- WorkForce scheduling program is out of service
- The following licensed Operators are currently available:

Operator #1			
Day	Start Time	End Time	Position
Sunday, 2/9	0700	1900	Control Operator
Monday, 2/10	0700	1900	Control Operator
Tuesday, 2/11	0700	1900	Control Operator
Wednesday, 2/12	0900	2200	WC Extra
Thursday 2/13	Day Off		
Friday 2/14	0700	2000	Balance of Plant Operator
Saturday, 2/15	1400	1500	TeleCon personnel statement
Sunday 2/16	0700	1900	Control Operator
Monday 2/17 (proposed)	0700	1900	Control Operator

Operator #2			
Day	Start Time	End Time	Position
Sunday, 2/9	1900	0700	Work Control Lead
Monday, 2/10	1900	0700	Work Control Lead
Tuesday, 2/11	Day Off		
Wednesday, 2/12	1900	0700	Control Operator
Thursday, 2/13	1900	0700	Work Control Lead
Friday, 2/14	1900	0700	Work Control Lead
Saturday, 2/15	1900	0700	Control Operator
Sunday 2/16	Day Off		
Monday 2/17 (proposed)	0700	1900	Control Operator

**Initial Conditions
(continued):**

Operator #3			
Day	Start Time	End Time	Position
Sunday, 2/9	1000	1700	Fire Watch
Monday, 2/10	Day Off		
Tuesday, 2/11	0700	2100	Control Operator
Wednesday, 2/12	0700	1900	Balance of Plant Operator
Thursday, 2/13	0700	1900	Balance of Plant Operator
Friday, 2/14	0700	2000	Balance of Plant Operator
Saturday, 2/15	1000	2000	Balance of Plant Operator
Sunday 2/16	Day Off		
Monday 2/17 (proposed)	0700	1900	Control Operator

Initiating Cue: Review the hours worked by the available Operators and determine their ability to fill the watch bill. Document reason(s) each operator is available or unavailable.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

Evaluation Results and Basis	
Operator #1 ___ Available ___ Unavailable	Basis:
Operator #2 ___ Available ___ Unavailable	Basis:
Operator #3 ___ Available ___ Unavailable	Basis:

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-A6

Title: Evaluate Fire Zone Operability

Examinee: _____

Evaluator: _____

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

Testing Method: Perform X Simulate

Results: Sat Unsat Total Time: minutes

Comments: Designed for SRO candidates in a classroom setting.

References:

- ECG 18.7 – Fire Rated Assemblies
- Fire Protection Drawings 111906-21
- DCPD Operational Requirements for Doors, Drawing 515221-2

Alternate Path: Yes No X

Time Critical: Yes No X

Time Allotment: 15 minutes

Critical Steps: See Examinee Response - Key

Job Designation: SRO

Rev Comments Bank - NRCL161 A6

Gen KA # G2.1.25 - Ability to interpret reference materials, such as graphs, curves, tables, etc. 4.2

RON FORTIER

AUTHOR

DATE: 02/05/20

CHRIS MEHIGAN

OPERATIONS REPRESENTATIVE

DATE: 02/05/20

Directions: All actions taken by examinee should be clearly documented. 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 (as applicable) and told the steps with which to begin.

Required Materials:

- ECG 18.7 – Fire Rated Assemblies
- eSOMS printout
- Fire Protection Drawings 111906-21
- DCPD Operational Requirements for Doors, Drawing 515221-2

Initial Conditions: GIVEN:

- Unit 1 and Unit 2 are both at 100% power
- Maintenance has just reported that the closing mechanism on Door 326 (Battery Room 115' Elevation) on Unit 1 has failed and the door cannot be closed automatically or manually.

Initiating Cue: The Shift Manager has directed you to determine the required course of action. Document your results and the basis of your decision in the space below before reporting out.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

Task Standard:

DO NOT READ TASK STANDARD TO EXAMINEE

- **Determined ECG 18.7, Condition A.1 “Establish a continuous fire watch on at least one side of the inoperable assembly (door) within 1 hour” is the only applicable TS/ECG action.**
- **Basis – with inoperable detectors in the area, only action is a continuous fire watch.**
 - NOTE: Use of an hourly fire watch patrol is not permitted due to the non-functional fire detection equipment within the same fire zone as the non-functional door.

Stop Time: _____

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

Question: _____

Response: _____

EXAMINEE RESPONSE - Key

- **Required Action:** Establish a continuous fire watch on at least one side of the inoperable assembly within 1 hour.
- **Basis:** Use of an hourly fire watch patrol is not permitted due to the non-functional fire detection equipment within the same fire zone as the non-functional door.

GIVEN:

- Maintenance has just reported that the closing mechanism on Door 326 (Battery Room 115' Elevation) on Unit 1 has failed and the door cannot be closed automatically or manually.

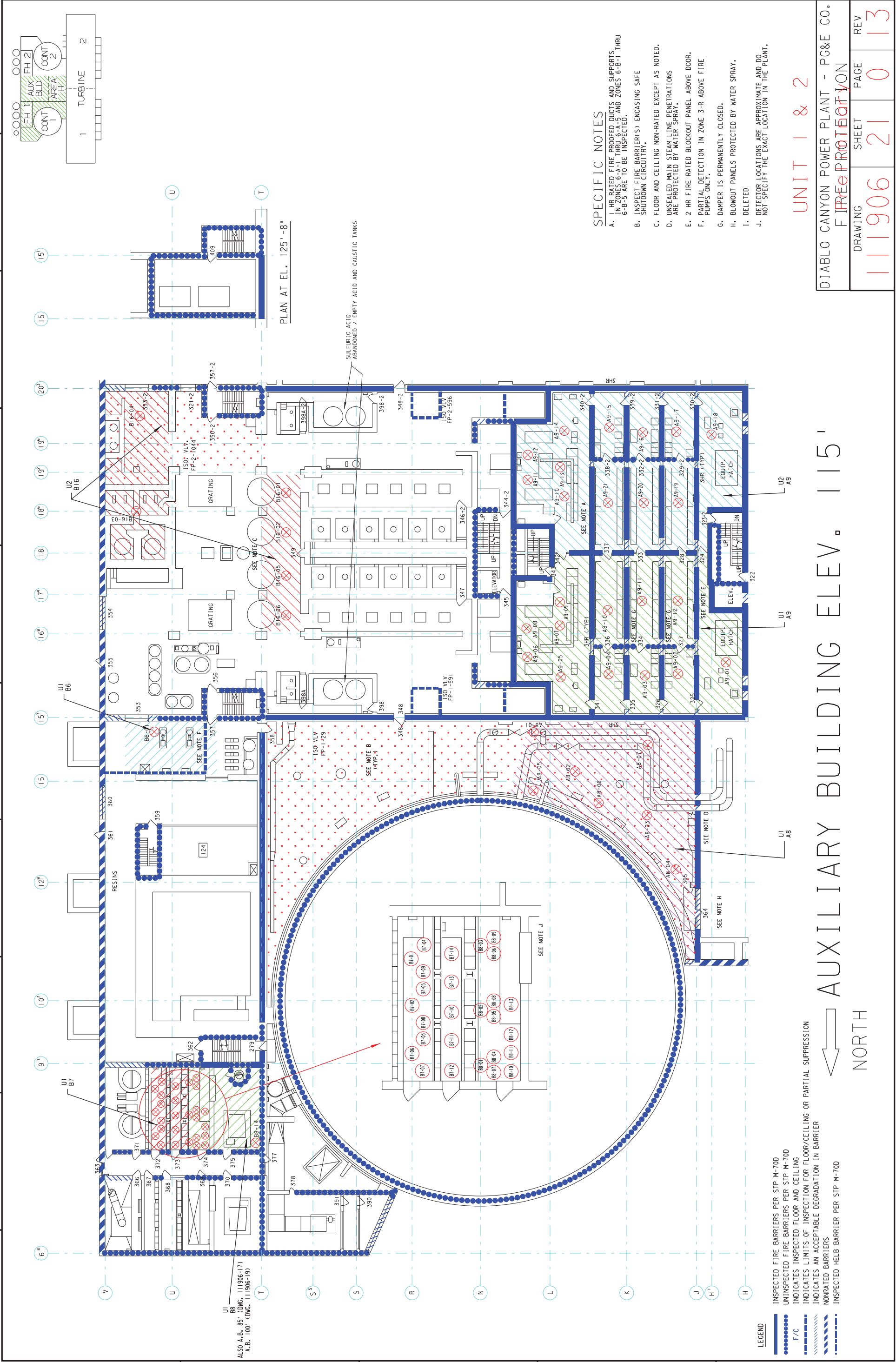
The Shift Manager has directed you to determine the required course of action. Document your results and the basis of your decision in the space below before reporting out.

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

EXAMINEE RESPONSE	
ACTION:	
BASIS:	

RASTER=111906-21-0.dgn
DGN=111906-21-0.dgn
CAD User: ZNS4
Date: 05-22-2018



NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-A7
Title: Determine 230 kV OPERABILITY
Examinee: _____
Evaluator: _____
Print Signature Date
Testing Method: Perform X Simulate _____
Results: Sat _____ Unsat _____ Total Time: _____ minutes
Comments: Designed for SRO candidates in a classroom setting.

References: OP J-2:VIII, rev 32
LCO 3.8.1, AC Sources – Operating, rev 12
Alternate Path: Yes _____ No X
Time Critical: Yes _____ No X
Time Allotment: 10 minutes
Critical Steps: See Examinee Response - Key
Job Designation: SRO
Rev Comments: New
Gen KA # / Rating: G2.2.37 - Ability to determine operability and/or availability of
safety related equipment 4.6

RON FORTIER

AUTHOR

DATE: 02/05/20

CHRIS MEHIGAN

OPERATIONS REPRESENTATIVE

DATE: 02/05/20

Directions: All actions taken by examinee should be clearly documented. 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 (as applicable) and told the steps with which to begin.

Required Materials: OP J-2:VIII, rev 32
LCO 3.8.1

Initial Conditions: GIVEN:

- Both Unit 1 and 2 are at 100% power
- Emergency Diesel Generator 1-2 is declared inoperable
- Two minutes after Diesel Generator 1-2 is declared inoperable, an earthquake causes a grid disturbance
- Grid Control reports:
 - loss of the Morro Bay-Diablo Canyon 230 kV line
 - 230 kV voltage is 230 kV
 - Los Padres Area Load is 350 MW
 - DCPD has 0 capacitors in service and none available
 - Mesa has 4 capacitors and 1 transformer in service
- No operator compensatory actions have been taken
- No LCO ACTION(s) have been entered for any of the above conditions
- LTC is in AUTO
- 52VU11 is OPEN

Initiating Cue: You are instructed to:

- Using OP J-2:VIII, Guidelines for Reliable Transmission Service for DCPD, Attachment 2, 230kV Offsite Power Operability Evaluation - LTC IN AUTO, determine the OPERABILITY of 230 kV at this time (show your work)
- For the given conditions, determine all applicable LCO ACTION(s) to Unit 1, should any exist.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

NOTE: Do NOT provide examinee with Task Standard :

Determined 230 kV system is INOPERABLE for any of the following reasons:

- **230 kV switchyard voltage is below the minimum required for normal transfer (min = 231 kV vs actual = 230 kV) with no comp actions complete**
- **Los Padres Area Load is above the maximum allowed (max = 305 MW vs actual = 350 MW) with no comp actions complete**

Task Standard:

Determined following LCOs all must be entered:

- **LCO 3.8.1.A for 1 Offsite Circuit Inoperable**
- **LCO 3.8.1.B for 1 D/G Inoperable**
- **LCO 3.8.1.D for 1 D/G and 1 Offsite Source Inoperable**

**Start
Time:** _____

**End
Time:** _____

Follow up Question Documentation:

Question: _____

Response: _____

Examinee Response - Key

1. 230 kV is **inoperable**
 - **Determined OP J-2-VIII, Table 1, Row 2-11 (Morro Bay-Diablo Canyon 230 kV Line) applies**
 - **Determined “NO” to 230 kV switchyard voltage greater than Table 1 Normal Transfer Level (230 vs 231)**

NOTE: Candidate may not explicitly mark up attachment but will have verified the next two steps as part of reaching the conclusion that 230 kV is inoperable

 - **(Determined Electrical Configuration is “3”, Power, from attachment 1)**
 - **(Determined “NO” to Comp actions complete)**
 - **Determined 230 kV inoperable**

NOTE: candidate may add comp measures that could be taken to make 230 kV OPERABLE. This is NOT part of the grading criteria. If their answer is based on the comp measures, tell student to refer to their initial cue.
2. Any LCO 3.8.1 Action(s) in effect (all required):
 - **Action A**
 - **Action B**
 - **Action D**

**Initial
Conditions:**

GIVEN:

- Both Unit 1 and 2 are at 100% power
- Emergency Diesel Generator 1-2 is declared inoperable
- Two minutes after Diesel Generator 1-2 is declared inoperable, an earthquake causes a grid disturbance
- Grid Control reports:
 - loss of the Morro Bay-Diablo Canyon 230 kV line
 - 230 kV voltage is 230 kV
 - Los Padres Area Load is 350 MW
 - DCPD has 0 capacitors in service and none available
 - Mesa has 4 capacitors and 1 transformer in service
- No operator compensatory actions have been taken
- No LCO ACTION(s) have been entered for any of the above conditions
- LTC is in AUTO
- 52VU11 is OPEN

Initiating Cue:

You are instructed to:

- Using OP J-2:VIII, Guidelines for Reliable Transmission Service for DCPD, Attachment 2, 230kV Offsite Power Operability Evaluation - LTC IN AUTO, determine the OPERABILITY of 230 kV at this time (show your work)
- For the given conditions, determine all applicable LCO ACTION(s) to Unit 1, should any exist.

NOTE:

You may use any source of information normally available (procedures, prints, etc.).

- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

Examinee Response

1. 230 kV is inoperable or OPERABLE
Basis:

2. LCO Action(s), if any, in effect:

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-A8

Title: Authorize Emergency Exposure

Examinee: _____

Evaluator: _____

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

Testing Method: Perform X Simulate

Results: Sat Unsat Total Time: minutes

Comments: Designed for SRO candidates in a classroom setting.

References: EP RB-2 Emergency Exposure Guidelines, Rev 8.

Alternate Path: Yes No X

Time Critical: Yes No X

Time Allotment: 15 minutes

Critical Steps: See Examinee Response Key

Job Designation: SRO

Rev Comments Modified Bank

Gen KA # G2.3.4 – Knowledge of radiation exposure limits under normal or emergency conditions. 3.7

AUTHOR:	LISA TORIBIO	DATE:	02/05/20
OPERATIONS REPRESENTATIVE:	CHRISTOPHER MEHIGAN	DATE:	02/05/20

REV. 2

Directions: 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. After identifying the appropriate procedure for the task, the examinee may be given the procedure and told the step at which to begin.

Required Materials:

- EP RB-2 Emergency Exposure Guidelines, Rev 8.
- Completed Emergency Exposure Permits for volunteers (Handout 1)

Initial Conditions: GIVEN:

- Both Units were operating at 100% power when a large seismic event occurred resulting in a faulted/ruptured steam generator (S/G 1-3) on Unit 1.
- There is evidence of fuel damage.
- MSIV FCV-43 has failed open and a break downstream of the MSIV is causing S/G 1-3 to blow down in the 115' pen area.
- The Shift Manager has declared a general emergency, FG1.1, for the loss of all three fission product barriers.
- Volunteers have been found to undertake two high priority emergency field activities and the Site Radiation Protection Coordinator has forwarded their associated Emergency Exposure Permits for SEC approval.

Initiating Cue:

- The Shift Manager directs you to review each completed permit and determine whether or not it should be approved.
- Document your recommendations as well as their basis in the space provided below before reporting out

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references. .

Task Standard:

DO NOT READ TASK STANDARD TO EXAMINEE

- Wayne permit should **NOT** be authorized – anticipated TEDE was incorrectly calculated as 4.75 REM. The actual anticipated dose is 5.3125 REM which is above the 5 REM sampling limit.
- Banner permit should **NOT** be authorized – Voluntary consent signature line is marked N/A. Voluntary consent signature IS required for a NO LIMIT exposure authorization.

Start

Time: _____

End

Time: _____

Follow-up Question Documentation:

Question: _____

Response: _____

Examinee Response - KEY		
Volunteer	Approve?	Basis for Approval or Rejection
Wayne	NO	Anticipated TEDE was incorrectly calculated as 4.75 REM. The actual anticipated dose is 5.3125 REM which is above the 5 REM sampling limit.
Banner	NO	Requested NO LIMIT exposure is allowable for the associated activity type, but the volunteer's signature line is incorrectly marked N/A. Volunteer signature is required to acknowledge he/she is fully aware of the risks. (Permit request is for a life-saving activity, but is missing the volunteer's signature).

Initial Conditions:

GIVEN:

- Both Units were operating at 100% power when a large seismic event occurred resulting in a faulted/ruptured steam generator (S/G 1-3) on Unit 1.
- There is evidence of fuel damage.
- MSIV FCV-43 has failed open and a break downstream of the MSIV is causing S/G 1-3 to blow down in the 115' pen area.
- The Shift Manager has declared a general emergency, FG1.1, for the loss of all three fission product barriers.
- Volunteers have been found to undertake two high priority emergency field activities and the Site Radiation Protection Coordinator has forwarded their associated Emergency Exposure Permits for SEC approval.

Initiating Cue:

- The Shift Manager directs you to review each completed permit and determine whether or not it should be approved.
- Document your recommendations as well as their basis in the space provided below before reporting out

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.
- If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references. .

EXAMINEE RESPONSE		
Volunteer	Approve?	Basis for Approval or Rejection
Wayne		
Banner		

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number:	NRCL181-A9		
Title:	Review Emergency Notification for Steam Generator Tube Rupture		
Examinee:	_____		
Evaluator:	_____	_____	_____
	Print	Signature	Date
Testing Method:	Perform _____	Simulate _____	
Results:	Sat _____	Unsat _____	Total Time: _____ minutes
Comments:	_____		

References:	EP G-3, Emergency Notification of Off-Site Agencies, Rev 61		
Alternate Path:	Yes	_____	No <u> X </u>
Time Critical:	Yes	<u> X </u>	No _____
Time Allotment:	15 minutes		
Critical Steps:	Per Examinee Response - Key		
Job Designation:	SRO		
Rev Comments:	New		
Gen KA # / Rating:	G2.4.40 – Knowledge of SRO responsibilities in emergency plan implementation.		4.5

AUTHOR:	<u>LISA TORIBIO</u>	DATE:	<u>02/05/20</u>
OPERATIONS REPRESENTATIVE:	CHRIS MEHIGAN	DATE:	02/05/20

Directions: All actions taken by examinee should be clearly documented. 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 (as applicable) and told the steps with which to begin.

Required Materials: EP G-3, Emergency Notification of Off-Site Agencies, Rev 61

Initial Conditions: GIVEN:

- At 1055, U1 initiated a manual SI due to SGTR
- RCS temperature is 514°F
- At 1100, the SM declared FA1.1
- The ENF program is not working
- The WCSFM has manually prepared the Emergency Notification Form for FA1.1

NOTE: for the purposes of this JPM, this is a **"Drill"**

Initiating Cue: You are directed to review the Emergency Notification Form for the SM to determine if it should be approved, identifying all error should any exist.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

This JPM IS Time Critical

NOTE: Do NOT provide examinee with Task Standard

Task Standard:

(refer to completed ENF form)

- **Box 6 should be "1100" – based on time of declaration given in Initial Conditions**
- **Box 8 should be "Radiological Release in progress" – based on item 5, SGTR is a condition attributable to the emergency event**
- **Box 10 should be "No PAR" based on emergency classification being less than a General Emergency**

Start Time: _____

Stop Time: _____

Total Time: _____ (Enter total time on the cover page – Time Limit: 15 minutes)

Follow up Question Documentation:

Question:

Response:

Examinee Response - Key
See Marked up form – next page

Initial Conditions: GIVEN:

- At 1055, U1 initiated a manual SI due to SGTR
- RCS temperature is 514°F
- At 1100, the SM declared FA1.1
- The ENF program is not working
- The WCSFM has manually prepared the Emergency Notification Form for FA1.1

NOTE: for the purposes of this JPM, this is a **“Drill”**

Initiating Cue: You are directed to review the Emergency Notification Form for the SM to determine if it should be approved, identifying all error should any exist.

NOTE:

- You may use any source of information normally available (procedures, prints, etc.).
- Classroom instruction materials (Lesson Plans, System Training Manuals, PowerPoint presentations, classroom notes, etc.) are not permitted to be used.

If there is a question regarding reference material desired to be used, ask evaluator prior to seeking references.

This JPM IS Time Critical

Facility: <u>Diablo Canyon</u>	Date of Examination: <u>02/24/2020</u>
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test Number: <u>L181</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) (001.A2.11) Dropped Rods During Rod Misalignment Verification (Modified LJC-066)	A,M,S	1
b. (S2) (013.A2.01) Resp to Changing Plant Params During Rx Trip Resp	A,N,EN,L,S	2
c. (S3) (E04.EA1.1) Isolate LOCA Outside Containment (Bank LJC-118)	D,L,S	3
d. (S4P) (011.EA1.11) Transfer to Cold Leg Recirc (Bank LJC-27A)	A,D,L,S	4P
e. (S4S) (059.A2.07) Perform OP AP-15 Immediate Actions for MFP Trip (Bank LJC-247)	A,D,S	4S
f. (S5) (E14.E1.2) Manually Initiate Containment Spray (Bank LJC-010)	D,L,S	5
g. (S6) (064.A4.06) Crosstie Vital Bus G to H (LJC-032)	D,L,S	6
h. (S8) (067.AA2.17) Fire in 480V Bus G Switchgear Room	A,N,S	8
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. (P1) (010.A2.02) Transfer Pzr Heater Grp 23 to Backup Pwr (LJP-029A)	D	3
j. (P2) (062.A2.11) Transfer the TSC to Vital Power(LJP-058A)	A,D,E,L	6
k. (P3) (G2.1.30) Clear Component Cooling Water Header "A"	E,L,N,R	8
<p>* 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.</p>		
* 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>02/24/2020</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	Operating Test Number: <u>L181</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) (001.A2.11) Dropped Rods During Rod Misalignment Verification (Modified LJC-066)	A,M,S	1
b. (S2) (013.A2.01) Resp to Changing Plant Params During Rx Trip Resp	A,N,EN,L,S	2
c. (S3) (E04.EA1.1) Isolate LOCA Outside Containment (Bank LJC-118)	D,L,S	3
d. (S4P) (011.EA1.11) Transfer to Cold Leg Recirc (Bank LJC-27A)	A,D,L,S	4P
e. (S4S) (059.A2.07) Perform OP AP-15 Immediate Actions for MFP Trip (Bank LJC-247)	A,D,S	4S
f. (S5) (E14.E1.2) Manually Initiate Containment Spray (Bank LJC-010)	D,L,S	5
g.		
h. (S8) (067.AA2.17) Fire in 480V Bus G Switchgear Room	A,N,S	8
In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. (P1) (010.A2.02) Transfer Pzr Heater Grp 23 to Backup Pwr (LJP-029A)	D	3
j. (P2) (062.A2.11) Transfer the TSC to Vital Power(LJP-058A)	A,D,E,L	6
k. (P3) (G2.1.30) Clear Component Cooling Water Header "A"	E,L,N,R	8
<p>* 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.</p>		
* 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>02/24/2020</u>
Exam Level: RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>	Operating Test Number: <u>L181</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) (001.A2.11) Dropped Rods During Rod Misalignment Verification (Modified LJC-066)	A,M,S	1
b. (S2) (013.A2.01) Resp to Changing Plant Params During Rx Trip Resp	A,N,EN,L,S	2
c.		
d.		
e.		
f.		
g.		
h.		

In-Plant Systems:* 3 for RO, 3 for SRO-I, and 3 or 2 for SRO-U		
i. (P1) (010.A2.02) Transfer Pzr Heater Grp 23 to Backup Pwr (LJP-029A)	D	3
j. (P2) (062.A2.11) Transfer the TSC to Vital Power(LJP-058A)	A,D,E,L	6
k. (P3) (G2.1.30) Clear Component Cooling Water Header "A"	E,L,N,R	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.	
* 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: NRCL181-LJCS1
Title: Verify Misaligned Rod Is Not Stuck
Examinee: _____
Evaluator: _____
Print _____ Signature _____ Date _____
Testing Method: Perform X Simulate _____
Results: Sat _____ Unsat _____ Total Time: _____ minutes
Comments:

References: OP AP-12B, Control Rod Misalignment, Rev. 19 (include Appendix B)
OP AP-12C, Dropped Control Rod, Rev. 17
Alternate Path: Yes X No _____
Time Critical: Yes _____ No X
Time Allotment: 10 minutes
Critical Steps: 3.1, 5.1, 5.2, 7.2
Job Designation: RO/SRO
Rev Comments/LRN TIPS: Modified from DCPD Bank: LJC-066
DCPD Task # / Rating: 80200 4.0
Gen KA # / Rating: 001.A2.03 – Ability to (a) predict the impacts of the following malfunction or operations on the CRDS- and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: effect of stuck or misaligned rod. 3.5 / 4.2

AUTHOR: _____ **LISA TORIBIO** _____ **DATE:** 02/04/20
OPERATIONS REPRESENTATIVE: _____ **CHRISTOPHER MEHIGAN** _____ **DATE:** 02/04/20
REV. 2

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: OP AP-12B, Control Rod Misalignment (Including Appendix B)
OP AP-12C, Dropped Control Rod

Initial Conditions: Given:

- Unit 1 is at approximately 75% power and was in the process of being returned to 100% following curtailment for condenser cleaning.
- The power increase was stopped 5 minutes ago when control rod K2 was observed to be greater than 12 steps below the other Control Bank D rods based on DRPI.
- Procedure OP AP-12B, Control Rod Misalignment, has been implemented.

Initiating Cue: The Shift Foreman directs you to perform Step 14 of OP AP-12B.

NOTE: Do NOT provide examinee with Task Standard

Task Standard:	<ul style="list-style-type: none">• Determined control rod K2 is NOT stuck by performing the following actions:<ul style="list-style-type: none">○ Turned the ROD BANK/MODE SELECT switch to the CBD position○ Inserted rods for Control Bank D until a DRPI change on rod K2 is observed• Manually tripped reactor before Control Bank D is restored to original demand position recorded on step 2.1 of this JPM.
-----------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Start
Time: _____

Step		Expected Operator Actions	
1.	AP-12B, Step 14.a - Check Grp 1 and grp 2 of each bank – at the same step on demand step counter.	1.1	Read CAUTIONS and NOTE prior to Step 14.a. If asked about RIL, then state the "Another operator will monitor RIL"
		1.2	Checked both groups of bank D at the same step as the demand counter.
		Step was: Sat _____ Unsat _____	

Comments:

NOTE: All positions may be recorded, but are not required.

2.	AP-12B, Step 14.b - Record the bank demand positions.	2.1	Recorded Control Bank D demand position.
		Step was: Sat _____ Unsat _____	

Comments:

** 3.	AP-12B, Step 14.c - Rotate the Rod Bank Selector Switch to the - AFFECTED BANK.	** 3.1	Turned the ROD BANK/MODE SELECT switch to the CBD position.
		Step was: Sat _____ Unsat _____	

Comments:

** Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
4.	AP-12B, Step 14.d - Record the plant process computer position for the affected bank.	4.1	Displayed the Control Bank D position from the plant computer and records the value.
		<i>NOTE: Operator may call up the CBD address listed in App. B of AP-12B (U0052), or record the value from an existing group display.</i>	
		Step was: Sat _____ Unsat _____	
Comments:			
** 5.	AP-12B, Step 14.e,f - Drive the affected bank in several steps (enough to see a DRPI change).	** 5.1	Inserted rods for Control Bank D until a DRPI change is observed.
		** 5.2	Identified that rod K2 moves and diagnoses that rod K2 is not stuck.
		5.3	Reported status to Shift Foreman.
		<i>NOTE: Status of control rod may be reported after rod restored to its recorded position.</i>	
		Step was: Sat _____ Unsat _____	
Comments:			

** Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
6.	AP-12B, Step 14.g - Return the rods in the affected bank to the position recorded in Step 14.b.	6.1	Attempted to move rods back out to original position.

<< Alternate Path – Start Point >>

NOTE: Second rod will drop will drop upon entry into OP AP-12C, "Dropped Control Rod" or after a 30 second delay – whichever comes first.

6.2	Identified single control rod dropped (K02) during restoration of Control Bank D.
6.3	Implemented OP AP-12C, "Dropped Control Rod"

Step was: Sat _____ Unsat _____

Comments:

** 7.	AP-12C, Step 1 - ONLY One Control Rod Dropped. Step 1 RNO - Trip the Reactor and GO TO EOP E-0, "Reactor Trip or Safety Injection"	7.1	Identified second control rod (P10) dropped.
-------	---------------------------------------------------------------------------------------------------------------------------------------	-----	----------------------------------------------

** 7.2 Tripped the Reactor.

<< 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:

- ☐ Restore IC-155 (customized IC built for L181 Exam administration only).
- ☐ Run Lesson file NRCL181-LJCS1.Isn

OR

- ☐ Restore the simulator to IC-11 (75%, MOL).
- ☐ Enter Lesson file L181-LJCS1 with setup.Isn

Description	L3 Commands
Sets rod k2 15 steps below Bank D	insert MAL_ROD3_K02 MOVEABLE delay=0 ramp=0 label ROBERPPCDGRP2NDRF 12 label ROBERPPCDGRP2DRFT(4) 1 label ROBERPPCDGRP2RSPD 1 insert C1_085S_5 1 delay=0 ramp=0 insert C1_086S_1 1 delay=0 ramp=0 della MAL_ROD3_K02 2 delay=1 cd='c1_086s_1' della C1_086S_1 2 delay=1 cd="" della C1_085S_5 2 delay=2 cd=""
Freeze Sim after 60 seconds to allow for temperature transient	unfreeze freeze delay=60
Drop two rods on Rod Cntl Out	insert MAL_ROD3_K02 STATIONARY delay=2 cd='c1_086s_3' insert MAL_ROD3_P10 STATIONARY delay=30 cd='c1_086s_3'

FOR ALL SETUPS

- ☐ Verify Sim has run long enough for Tave to settle.
- ☐ Place Rod Control Switch to Manual after simulator goes to freeze.
- ☐ Set PPC screen at SRO desk to RBU display (rodconfig).
- ☐ Verify step counters matched (group 1 and 2) and RBU are updated to current CBD rod position.
- ☐ Place pink tag for RODS IN MANUAL on CC1.
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet.

Initial Conditions: Given:

- Unit 1 is at approximately 75% power and was in the process of being returned to 100% following curtailment for condenser cleaning.
- The power increase was stopped 5 minutes ago when control rod K2 was observed to be greater than 12 steps below the other Control Bank D rods based on DRPI.
- Procedure OP AP-12B, Control Rod Misalignment, has been implemented.

Initiating Cue: The Shift Foreman directs you to perform Step 14 of OP AP-12B.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-LJCS2

Title: Respond to Changing Plant Parameters During Reactor Trip Response

Examinee: _____

Evaluator: _____

Print _____ Signature _____ Date _____

Testing Method: Perform X Simulate

Results: Sat Unsat Total Time: minutes

Comments:

References: EOP E-0.1, Reactor Trip Response, Rev 43

Alternate Path: Yes X No

Time Critical: Yes No X

Time Allotment: 5 minutes

Critical Steps: 2.4, 6.2

Job Designation: RO/SRO

Rev Comments/LRN TIPS: New

DCPP Task # / Rating: 47080

Gen KA # / Rating: 013.A2.01 – Ability to (a) predict the impacts of the following malfunction or operations on the ESFAS system and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: LOCA. 4.6 / 4.8

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

AUTHOR: LISA TORIBIO **DATE:** 02/04/20

OPERATIONS REPRESENTATIVE: CHRISTOPHER MEHIGAN **DATE:** 02/04/20

REV. 1

identifying the appropriate procedure for the task, the examinee may be given the procedure and told the steps with which to begin.

Required Materials: EOP E-0.1, Reactor Trip Response, Rev 43 (with Fold Out Pages)

Initial Conditions: Given:

- Unit 1 experienced an inadvertent Reactor Trip. The cause is presently unknown.
- The Crew has completed EOP E-0 and has now transitioned to EOP E-0.1, Reactor Trip Response.

Initiating Cue: The Shift Foreman directs you to begin implementation of EOP E-0.1, beginning with Step 1. You are responsible for all procedure actions including Appendices and Foldout Page items.

NOTE: Do NOT provide examinee with Task Standard

- | | |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Task Standard: | <ul style="list-style-type: none">• Provided greater than 435 gpm Aux Feedwater Flow by starting any of the following:
MDAFW Pump 1-2
and/or
MDAFW Pump 1-3
and/or
TDAFW Pump 1-1
Before RCPs secured in EOP FR-H.1• Manually actuated Safety Injection before subcooling falls below 0°F |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Start
Time: _____

Step

Expected Operator Actions

1. E-0.1, Step 1 - Check RCS Temperature Response – Stable or trending to 547 °F.

- 1.1 Checked RCPs running.
- 1.2 Determined RCS temperature was NORMAL.

Step was: Sat _____ Unsat _____

Comments:

- ** 2. E-0.1, Step 2 - Check Fdwtr Status.

- 2.1 Checked RCS temperature less than 554°F.
- 2.2 Checked Feedwater Isolation complete:
- Red Activated Light – ON
 - White Status Light - OFF

NOTE: AFW pump autostarts have been disabled.

- 2.3 Determined total AFW flow was NOT greater than 435 gpm.

- ** 2.4 Started one or more AFW pumps:
- MDAFW Pump 1-2 and/or
 - MDAFW Pump 1-3 and/or
 - TDAFW Pump 1-1

Step was: Sat _____ Unsat _____

Comments:

** Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
	NOTE: Candidate may respond to indications of a LOCA based on Fold Out Page and not complete checks for Control Rod Insertion and Pressurizer Level Control
3. E-0.1, Step 3 – Check all Control Rods fully inserted.	3.1 Determined all control rods fully inserted.
	Step was: Sat _____ Unsat _____
Comments:	
4. E-0.1, Step 4 – Check PZR Level Controls	4.1 Determined pressurizer level NOT greater than 17%.
	4.2 Determined auto isolation of letdown had already occurred.
	4.3 Determined pressurizer heaters already off due to low pressurizer level.
	4.4 Increased charging flow to maximum by throttling FCV-128 full open.
	Step was: Sat _____ Unsat _____
Comments:	

Step	Expected Operator Actions
<< Alternate Path – Start Point >>	
	NOTE: Any of the following may be used to identify SBLOCA.
5. Identifies multiple indications of a small break LOCA.	5.1 Identified indications of Small Break LOCA: <ul style="list-style-type: none"> • RCS Pressure lowering • Pressurizer level lowering • Subcooling lowering • Containment sump levels rising
	Step was: Sat _____ Unsat _____
Comments:	

Step		Expected Operator Actions
** 6.	Implements Fold Out Page Item #2	<u>NOTE:</u> Auto Safety Injection signal for low RCS pressure (1850 psig) has been disabled
		6.1 Determined either Safety Injection Criteria for Fold Out Page Item #2 met: <ul style="list-style-type: none">RCS Subcooling based on Core Exit Thermocouples – Less than 20°FPZR Level – Cannot be maintained greater than 6% OR <ul style="list-style-type: none">RCS Pressure below auto SI setpoint of 1850 psig.
		** 6.2 Manually actuated Safety Injection
		6.3 Informed Shift Foreman transition to EOP E-0, Reactor Trip or Safety Injection is required.

<< 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:

- ☐ Restore IC-156 (customized IC built for L181 Exam administration only). No lesson file is required.

OR

- ☐ Restore the simulator to IC-12 (50%, MOL).
- ☐ Enter Lesson file L181-LJCS2

Description	L3 Commands
Fails Auto SI	insert MAL_PPL3A AUTO insert MAL_PPL3B AUTO
Trip Rx and reset rods	insert C1_072S_3 1 della C1_072S_3 2 delay=2 cd="" insert C1_064S_1 1 della C1_064S_1 2 delay=2 cd=""
Freeze Sim after 60 seconds to allow for temperature transient	unfreeze freeze delay=60
RCS leak (triggered on AFW pump start)	insert MAL_RCS3B 2.5 cd='h_v3_221r_1 or h_v3_222r_1' delay=0 ramp=30

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

Initial Conditions: Given:

- Unit 1 experienced an inadvertent Reactor Trip. The cause is presently unknown.
- The Crew has completed EOP E-0 and has now transitioned to EOP E-0.1, Reactor Trip Response.

Initiating Cue: The Shift Foreman directs you to begin implementation of EOP E-0.1, beginning with Step 1. You are responsible for all procedure actions including Appendices and Foldout Page items.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-S3

Title: Isolate a LOCA Outside Containment

Examinee: _____

Evaluator: _____

Print _____ Signature _____ Date _____

Testing Method: Perform X Simulate

Results: Sat Unsat Total Time: minutes

Comments: _____

References:	EOP ECA-1.2, LOCA Outside Containment, Rev. 6C		
Alternate Path:	Yes	_____	No _____ X _____
Time Critical:	Yes	_____	No _____ X _____
Time Allotment:	10 minutes		
Critical Steps:	3.1, 3.2, 3.4		
Job Designation:	RO/SRO		
Rev Comments/LRN TIPS:	Bank: LJC-118		
DCPP Task # / Rating:	111200, 886600		3.8 / 3.5
Gen KA # / Rating:	E04.EA1.1 – Ability to operate and/or monitor components and functions of control and safety systems including instrumentation, signals, interlocks, failure modes, and automatic and manual features as they apply to a LOCA Outside Containment.		4.0 / 4.0

AUTHOR: _____ **LISA TORIBIO** _____ DATE: **02/04/20**

OPERATIONS

REPRESENTATIVE: _____ **CHRISTOPHER MEHIGAN** _____ DATE: **02/04/20**

REV. 1

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: EOP ECA-1.2, LOCA Outside Containment

Initial Conditions: Given:

- Unit 1 has experienced a Safety Injection
- Automatic actuation of safeguards equipment was verified
- It was determined that SI cannot be terminated and abnormal radiation has been observed in the Auxiliary Building

Initiating Cue: The Shift Foreman directs you to perform the actions for a LOCA outside containment, in accordance with ECA-1.2, starting on step 1.

DO NOT READ TASK STANDARD TO EXAMINEE

Task Standard: Completed actions to isolate LOCA outside containment and identify the correct procedure for recovery as follows:

- **Cut in series contactor toggle switch for 8809B**
- **Closed 8809B, RHR to cold legs 3 and 4**
- **Transitioned to correct EOP procedure – EOP E-1, Loss of Reactor or Secondary Coolant**

**Start
Time:** _____

Step

Expected Operator Actions

1. EOP ECA-1.2, Step 1 – Verify Proper Valve Alignment.

- 1.1 Determined following valves are in the correct position:
- 8702, RCS RHR Suct LP4 HL – CLOSED
 - 8701, RCS RHR Suct LP4 HL – CLOSED
 - 8703, RHR to hot legs 1 and 2 – CLOSED
 - 8802A, SI to hot legs 1 and 2 – CLOSED
 - 8802B, SI to hot legs 3 and 4 – CLOSED

Step was: Sat _____ **Unsat** _____

Comments:

2. EOP ECA-1.2, Step 2.a.1 – Try To Identify And Isolate Break (RHR cold legs 1 and 2)

- 2.1 Cut in series contactor toggle switch for 8809A.
- 2.2 Closed 8809A, RHR to cold legs 1 and 2.
- 2.3 Diagnosed RCS pressure still lowering.
- 2.4 Re-opened 8809A.

Step was: Sat _____ **Unsat** _____

Comments:

Step		Expected Operator Actions	
** 3.	EOP ECA-1.2, Step 2.a.2 – Try To Identify And Isolate Break (RHR cold legs 3 and 4)	** 3.1	Cut in series contactor toggle switch for 8809B.
		** 3.2	Closed 8809B, RHR to cold legs 3 and 4.
		3.3	Determined RCS pressure stable or rising.
		** 3.4	Identified EOP E-1 as correct procedure for recovery.
		Step was: Sat _____ Unsat _____	

Stop Time: _____

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

** Denotes Critical Step and Sub-Steps

Follow up Question Documentation:

Question: _____

Response: _____

- ☐ Restore IC-157 (customized IC built for L181 Exam administration only). No lesson file is required.

OR

- ☐ Restore the simulator to IC-10.
- ☐ Run Lesson file drl_1118 or manually enter the following:

Command	Description
Insert v2_225r_1 0, insert v2_225g_1 1	8701 Green ON, Red OFF
Insert v2_226r_1 0, insert v2_226g_1 1	8702 Green ON, Red OFF
Insert vlv_rhr1_2 1, label rrhh8701 0.5	8702 OPEN, 8701 to 50%
Insert vlv_rhr1_2 0 cd='rrhh8809_2 lt 0.1' ramp=1	(closes when 8809B is CLOSED)
Insert mal_rhr1 400 ramp=5	RHR system leak
delIA mal_rhr1 2 delay=100	
Insert c2_030s_2 1, delIA c2_032s_2 2 delay=5	Actuates SI
Insert v2_266s_1 1 delay=15	Stops CCP 1-3
Insert v2_266s_1 2 delay=20	
Insert v4_388s_3 1 delay=15	ABV Char Htr ON
Insert v4_388s_1 0	
Insert v3_179s_2 0	Stops all but one CB PP set
Insert v3_224s_1 1, Insert v3_225s_1 1	
delIA v3_224s_1 2 delay=60	
delIA v3_225s_1 2 delay=60	
Insert v3_257s_1 1 delay=150, delIA v3_257s_1 2 delay=180	Closes ALL TDAFP LCVs
Insert v3_258s_1 1 delay=150, delIA v3_258s_1 2 delay=180	
Insert v3_259s_1 1 delay=150, delIA v3_259s_1 2 delay=180	
Insert v3_260s_1 1 delay=150, delIA v3_260s_1 2 delay=180	
(only if lesson file NOT RUN) throttle AFW to 150 gpm/SG	Throttle AFW (manually)
RUN, then FRZ after 4 minutes	RUN for 4 minutes

- ☐ Reset SI, Reset Phase A Isolation, Open FCV-584 during 4 minute run.
- ☐ Scroll chart PR-403 forward so operator has a reference point for RCS pressure trends.
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet.

Initial Conditions: Given:

- Unit 1 has experienced a Safety Injection
- Automatic actuation of safeguards equipment was verified
- It was determined that SI cannot be terminated and abnormal radiation has been observed in the Auxiliary Building

Initiating Cue: The Shift Foreman directs you to perform the actions for a LOCA outside containment, in accordance with ECA-1.2, starting on step 1.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-LJCS4P
Title: TRANSFER TO COLD LEG RECIRCULATION
Examinee: _____
Evaluator: _____
Print _____ Signature _____ Date _____
Testing Method: Perform X Simulate _____
Results: Sat _____ Unsat _____ Total Time: _____ TCOA Time: _____
Comments: (Note: Any Unsat step requires a numbered comment; use back as needed.)

References: EOP E-1.3, Transfer to Cold Leg Recirculation, Rev. 34
OP1.ID2, Time Critical/Sensitive Operator Action, Rev. 12

Alternate Path: Yes X No _____

Time Critical: Yes X No _____

Time Allotment: 10 minutes

Critical Steps: 2.2, 2.5, 3.2, 4.1, 5.1, 5.3, 6.2, 6.4, 7.2, 7.4, 10.1, 10.3, 11.3, 11.6, 11.7

Job Designation: RO/SRO

Rev Comments/LRN TIPS: Bank LJC-027A

DCPP Task # / Rating: 331200, 43200, 324800, 323600, 324600 3.5 / 4.5 / 4.0 / 4.0 / 4.0 (all RO)

Gen KA # / Rating: 011.EA1.1 – Ability to operate and/or monitor components and functions of the control and safety systems including instrumentation, signals, interlocks, failure modes, and automatic and manual features. 4.2 / 4.2

UTHOR: _____ **LISA TORIBIO** _____ DATE: **02/04/20**

OPERATIONS REPRESENTATIVE: _____ **CHRISTOPHER MEHIGAN** _____ DATE: **02/04/20**
REV. 2

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. If the task is being done in the plant or lab, and after identifying the appropriate procedure for the task, the examinee may be given the procedure and told what step to begin the task at.

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:

Unit 1 experienced a LBLOCA and RWST level is approaching 33%.

Initiating Cue: The Shift Foreman directs you to preview and perform EOP E-1.3 to align RHR for cold leg recirculation starting at step 1.

This is a time critical JPM.

NOTE: Do NOT provide examinee with Task Standard

Task Standard: RHR has been aligned to the suction of the SI pumps and CCPs for cold leg recirculation by performing the following:

- Stopped RHR Pump 1-1
- Closed 8700A
- Closed 8716A and B
- Closed 8974A and B (only 1 of 2 required; series valves)
- Closed 8105 and 8106 (only 1 of 2 required; series valves)
- Opened 8807A and B (only 1 of 2 required; parallel valves)
- Opened 8982A
- Re-started RHR Pump 1-1
- Opened 8804A

Within the 10 minutes of JPM start time.

Time Critical Operator Action (TCOA):

This JPM was evaluated against TCOA #8 – Operator must transfer to cold leg recirculation within 10 minutes of the RWST reaching the low level setpoint which corresponds to the start time of this JPM. Case 2 – one RHR pump (1-2) does not trip and cannot be stopped from the control room for up to 5 minutes after the RWST reaches 33%.

TCOA start time is when RWST reaches 33% as indicated by PK 0301 coming into alarm. TCOA stop time is when 8804A indicates full open (RED light on, Green light OFF).

This TCOA is applicable to this JPM; the appropriate steps will be designated as critical and the TCOA will be designated time critical.

Start
Time: _____

Step

Expected Operator Actions

Note the time PK03-01, RWST VLV CLSD/LVL HI-LOW, comes into alarm (TCOA start time):

1. E-1.3, Step 1 - Implement Appendix EE.

1.1 Read note regarding FR procedures.

1.2 Assigned operator to complete Appendix EE.

Note: Actions for Appendix EE have already been completed in the setup for this JPM.

Cue: "Using time compression, Appendix EE is complete".

Step was: Sat _____ Unsat _____

Comments:

** 2. E-1.3, Step 2 - Ensure RHR PP 1-2 stopped.

2.1 Observed that both RHR pumps were running (red light ON and/or amps indicated).

<< Alternate Path – Start Point >>

** 2.2 Secured RHR PP 1-1.

2.3 Attempted to secure RHR PP 1-2.

2.4 Dispatched a Nuclear Operator to locally open the breaker for RHR PP 1-2 (52-HH-11).

** 2.5 Skipped to E-1.3, step 4 (Did NOT close 8700B).

Step was: Sat _____ Unsat _____

Comments:

Step		Expected Operator Actions	
**	3. E-1.3, step 4 – Ensure RHR PP 1-1 stopped.	3.1	Observed that RHR PP 1-1 was running (red light ON and/or amps indicated).
		** 3.2	Secured RHR PP 1-1 with control switch (green light ON, and/or no amps indicated).

<< Alternate Path – End Point >>

Step was: Sat _____ Unsat _____

Comments:

** 4. E-1.3, step 5 - Close 8700A, RHR pump 1 normal suction valve.

** 4.1 Closed 8700A.

4.2 Observed green light (only) ON for 8700A.

Step was: Sat _____ Unsat _____

Comments:

** 5. E-1.3, step 6 - Close 8716A and B, RHR pump discharge crosstie valves.

** 5.1 Closed 8716A.

5.2 Observed green light (only) ON for 8716A.

** 5.3 Closed 8716B.

5.4 Observed green light (only) ON for 8716B.

Step was: Sat _____ Unsat _____

Comments:

Step		Expected Operator Actions	
**	6. E-1.3, step 7 - Isolate ECCS PPs Recirc Paths.	6.1	Observed RCS Pressure is < 1500 psig (VB-2, any PPC).
		<u>Note: Valves are in series. Only one is required closed to meet the critical step criteria.</u>	
		** 6.2	Closed 8974A.
		6.3	Observed green light (only) ON for 8974A.
		** 6.4	Closed 8974B.
		6.5	Observed green light (only) ON for 8974B.
		Step was: Sat _____ Unsat _____	

Comments:

**	7.	E-1.3, step 7 - Isolate ECCS PPs Recirc Paths (cont)	7.1	<u><i>Note: Valves are in series. Only one is required closed to meet the critical step criteria.</i></u>
			** 7.2	Closed 8105.
			7.3	Observed green light (only) ON for 8105.
			** 7.4	Closed 8106.
			7.5	Observed green light (only) ON for 8106.
Step was: Sat _____ Unsat _____				

Comments:

	8. E-1.3, step 8 - Check Containment Recirc Sump Level.	8.1	Observed Containment Recirc Sump Level > 92' on LI-940 & 941.
		Step was: Sat _____ Unsat _____	

Comments:

Step	Expected Operator Actions
9. E-1.3, step 9 – Verify RHR PP 1-2 Alignment.	9.1 Observed that RHR PP 1-2 was running (red light ON and/or amps indicated).

<< ALTERNATE PATH START POINT >>

9.2 Skipped to E-1.3, step 10.

Step was: Sat _____ Unsat _____

Comments:

** 10. E-1.3, step 10 - Crosstie SI PP suction to CCPs.

Note: Valves are in parallel. Only one is required open to meet the critical step criteria.

- ** 10.1 Opened 8807A.
- 10.2 Observed red light (only) ON for 8807A.
- ** 10.3 Opened 8807B.
- 10.4 Observed red lights (only) ON for 8807B.
- 10.5 Observed both ECCS CCPs are running (red lights ON).

<< ALTERNATE PATH END POINT >>

Step was: Sat _____ Unsat _____

Comments:

Step		Expected Operator Actions	
**	11. E-1.3, step 11 - Verify RHR PP 1-1 Alignment.	11.1	Observed that RHR PP 1-1 is not running (green light ON and/or no amps).
		11.2	Observed green light (only) ON for 8700A.
		** 11.3	Opened 8982A.
		11.4	Observed red light (only) ON for 8982A.
		11.5	Verified RHR HX 1-1 in service per App EE. ***** Cue: App EE has been completed. Both RHR HXs are in service per the appendix. *****
**	11 E-1.3, step 11 - Verify RHR PP 1-1 Alignment (continued)	** 11.6	Started RHR pump 1-1.
		** 11.7	Opened 8804A. Note the time 8804A indicated full OPEN (TCOA stop time): _____
		Step was: Sat _____ Unsat _____	

Comments:

12. E-1.3, step 12 - Check at least one RHR PP running in Cold Leg Recirc Lineup.

Cue: The SFM has assigned other operators to complete this procedure.

Stop Time: _____

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

Note: See page 1 for TCOA start/stop description.

TCOA Start

Time:

Time PK03-01 came into alarm

TCOA Stop

Time:

Time 8804A indicated full OPEN

TCOA Total

Time:

(Enter TCOA time on the cover page)

TCOA: SAT _____ **UNSAT** _____ (TCOA time must be \leq 10 minutes)

Follow up Question Documentation:

Question: _____

Response: _____

- Initialize to JPM Custom IC-158.
- Execute lesson NRCL181-LJC4SP.lsn.
- This SNAP allows entry into EOP E-1.3 at Step 1. RWST level is slightly above 33%. Both RHR pumps are running.
Step 1 (App EE has been completed by other operators, using time compression).
- Inform the examiner that the simulator setup is complete.

NOTE: This JPM is time critical. Do NOT go to run until the examiner or examinee indicates that they are ready to begin. RWST low level will occur shortly after going to RUN.

- ☐ Go to RUN when the examinee states they are ready to perform the task.

Initial Conditions:

Given:

Unit 1 experienced a LBLOCA and RWST level is approaching 33%.

Initiating Cue:

The Shift Foreman directs you to preview and perform EOP E-1.3 to align RHR for cold leg recirculation starting at step 1.

This is a time critical JPM.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-LJCS4S

Title: PERFORM OP AP-15 IMMEDIATE ACTIONS FOR MAIN FEED PUMP TRIP

Examinee: _____

Evaluator: _____
Print Signature Date

Testing Method: Perform X Simulate _____

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: OP AP-15, Loss of Feedwater Flow, Rev 26.

Alternate Path: Yes X No _____

Time Critical: Yes _____ No X

Time Allotment: 5 minutes

Critical Steps: 2.3, 5.3, 5.4

Job Designation: RO/SRO

Rev Comments/LRN TIPS: Bank LJC-247

DCPP Task # / Rating: 47220 4.0

Gen KA # / Rating: 059.A2.07 – Ability to predict the impact of tripping of the MFW pump turbine on MFW and based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations. 3.0 / 3.3

AUTHOR: _____ **LISA TORIBIO** _____ **DATE:** 02/04/20

OPERATIONS
REPRESENTATIVE: _____ **CHRISTOPHER MEHIGAN** _____ **DATE:** 02/04/20
REV. 1

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: Hard Card for Unit 1 OP AP-15, Loss of Feedwater Flow

Initial Conditions: Given:

- Unit 1 is at 100% power
- PK09-12, Main Feedwater Pump Trip, and PK09-13, Main Feedwater Pump No. 11, have just alarmed
- The Shift Foreman has announced he is entering OP AP-15, Loss of Feedwater Flow

Initiating Cue: The SFM directs you to perform immediate actions in response to plant conditions. OP AP-15 Immediate Action Hard Card may be used.

NOTE: Do NOT provide examinee with Task Standard

Task Standard:	<ul style="list-style-type: none">• AFW Pumps 1-2 and 1-3 are running• Rod Control is in MANUAL• Rods inserted at maximum available rate (48 steps/min)
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INSTRUCTOR WORKSHEET

**Start
Time:** _____

Step**Expected Operator Actions**

1. Obtain the correct Hard Card.

1.1 Hard Card for OP AP-15 Immediate Actions.

Step was: Sat _____ **Unsat** _____

Comments:

** 2. Step 1 – CHECK Reactor Power Less Than 80%.

2.1 Read **CAUTION** regarding attempts to stabilize plant online.

2.2 Determined power was greater than 80%.

** 2.3 Performed Step 1 RNO

- Started AFW Pp 1-2
- Started AFW Pp 1-3

Step was: Sat _____ **Unsat** _____

Comments:

** Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
3.	Step 2 - REDUCE Turbine Load.	3.1	Determined turbine load was greater than 650 MW.
		3.2	Determined programmed ramp executing appropriately: <ul style="list-style-type: none">• DEH MW feedback in service• TARGET set for 550 MW• RAMP RATE at 225 MW/min
		Step was: Sat _____ Unsat _____	

Comments:

4.	Step 3 – CHECK MFW Pp Suction Pressure GREATER THAN 260 PSIG	4.1	Determined MFW Pp Suction Pressure was greater than 260 PSIG.
		Step was: Sat _____ Unsat _____	

Comments:

Step		Expected Operator Actions	
** 5.	Step 4 – ENSURE Rods Controlling Properly in AUTO.	5.1	Checked Tave/Tref mismatch greater than 1.5 °F.
		5.2	Determined rods were NOT controlling properly in Auto.

<<Alternate Path – Start Point>>

- ** 5.3 Placed Rod Control in MANUAL,
- ** 5.4 Inserted rods at maximum available rate of 48 steps/min.

<<Alternate Path – End Point>>

Note: Once DRPI has indicated a change in rod position, provide the following Cue:

Cue: “Another Operator will continue with the performance of OP AP-15”.

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:

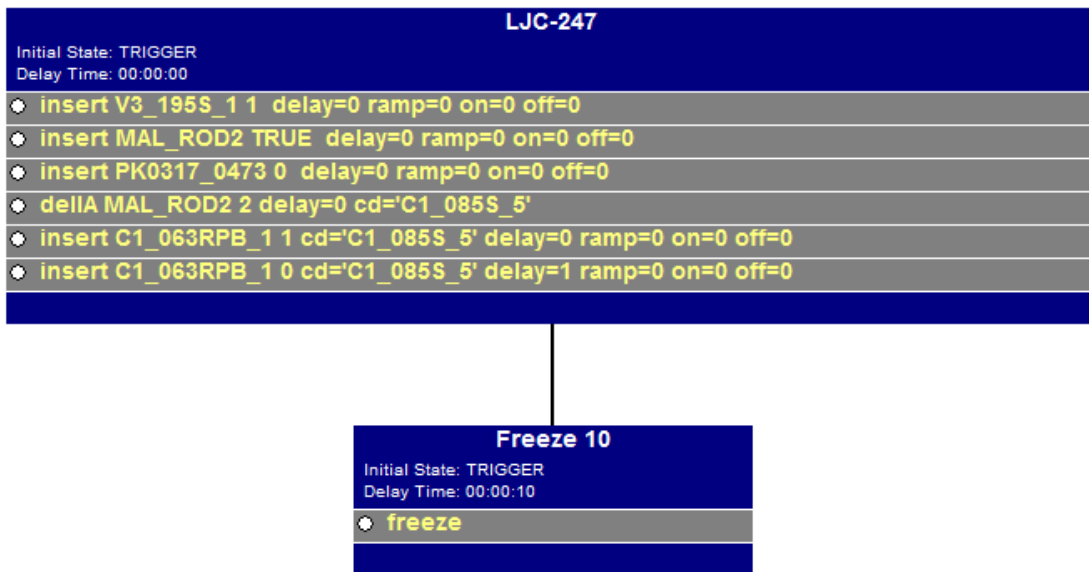
Question: _____

Response: _____

- ☐ Restore IC-159 (customized IC built for L181 Exam administration only). No lesson file is required.

OR

- ☐ Restore the simulator to IC-10. .
- ☐ Run Lesson drl_1247.lsn or manually insert the following:



- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when instructed by examiner.

Initial Conditions: Given:

- Unit 1 is at 100% power
- PK09-12, Main Feedwater Pump Trip, and PK09-13, Main Feedwater Pump No. 11, have just alarmed
- The Shift Foreman has announced he is entering OP AP-15, Loss of Feedwater Flow

Initiating Cue: The SFM directs you to perform immediate actions in response to plant conditions. OP AP-15 Immediate Action Hard Card may be used.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-LJCS5

Title: Initiate Containment Spray Manually

Examinee: _____

Evaluator: _____

Print _____ Signature _____ Date _____

Testing Method: Perform X Simulate

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: EOP FR-Z.1, Response to High Containment Pressure, Rev. 12

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 10 minutes

Critical Steps: 3.1, 4.2, 4.5

Job Designation: RO/SRO

Rev Comments/LRN TIPS: Bank LJC-010

DCPP Task # / Rating: 849200, 835600 3.7 / 3.6

Gen KA # / Rating:	E14.EA1.1 – Ability to operate and/or monitor components and the functions of control and safety systems, including instrumentation, signals, interlocks, failure modes and automatic and manual features as they apply to high containment pressure.	3.7 / 3.7
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AUTHOR: LISA TORIBIO DATE: 02/04/20

OPERATIONS
REPRESENTATIVE: CHRISTOPHER MEHIGAN DATE: 02/04/20
REV. 1

- 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. If the task is being done in the plant or lab, and after identifying the appropriate procedure for the task, the examinee may be given the procedure and told what step to begin the task at.
- 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:
- Unit 1 experienced a LOCA
 - EOP E-1 is in progress and Safety Injection is reset
 - Containment pressure is > 25 psig
 - A MAGENTA path on the Containment Critical Safety Function Status Tree has been confirmed
 - All higher priority critical safety functions have been addressed
- Initiating Cue:** The Shift Foreman directs you to manually initiate containment spray in accordance with EOP FR-Z.1, starting at step 3.c

DO NOT READ TASK STANDARD TO EXAMINEE

- Task Standard:** Containment spray is manually initiated and aligned for injection phase in accordance with EOP FR-Z.1, Step 3 such that:
- **Containment Spray Pump 1-1 RUNNING with discharge valve 9001A OPEN**
 - **Containment Spray Pump 1-2 RUNNING with discharge valve 9001B OPEN**
 - **8994A, Spray Additive Tank Outlet Valve A: OPEN**
 - **8994B, Spray Additive Tank Outlet Valve B: OPEN**
- Prior to the completion of FR-Z.1.

Start
Time: _____

Step

Expected Operator Actions

1. Obtain the correct procedure.

1.1 References EOP FR Z.1.

Cue (if required): "Start with Step 3.c"

Step was: Sat _____ Unsat _____

Comments:

2. FR-Z.1, Step 3.c – Containment pressure greater than 22 psig.

2.1 Determines Containment Spray IS required - containment pressure is greater than 22 psig (PI-934, PI-935, PI-936, PI-937 on VB1)

If asked about ECA-1.1, provide the following:

Cue: "Refer to Initial Conditions."

Step was: Sat _____ Unsat _____

Comments:

** 3. FR-Z.1, Step 3.d - RNO Start the containment spray pumps.

** 3.1 Turns control switches to the START position for containment spray pumps 1-1 and 1-2 (VB1)

Step was: Sat _____ Unsat _____

Comments:

** Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
**	4.	SFR-Z.1, step 3.e - Checks containment spray system for proper valve alignment.	
	4.1	Determines that Containment Spray System is NOT in proper emergency alignment based on Containment Spray Pump Discharge Valves 9001A and 9001B position indication lights (VB1):	
		<ul style="list-style-type: none">Red lights OFF / Green lights ON	
**	4.2	Takes control switch for 9001A and B to OPEN position and verifies valve position lights indicate OPEN (VB1):	
		<ul style="list-style-type: none">Red lights ON / Green lights OFF	
	4.3	Verifies 8992 open.	
	4.4	Determines Spray Add Tank Outlet valves are NOT in proper emergency alignment based on 8994A and 8994B position indication lights (VB1):	
		<ul style="list-style-type: none">Red lights OFF / Green lights ON	
**	4.5	Takes control switch for 8994A and B to OPEN position and verifies valve position lights indicate OPEN (VB1):	
		<ul style="list-style-type: none">Red lights ON / Green lights OFF	
		Step was: Sat _____	Unsat _____

Comments:

5. FR-Z.1, Step 3.f – Check Containment Isolation Phase B valves - Closed

5.1 Determines Containment Isolation Phase B valves are closed based on Monitor Light Box D indications (VB1):

- Red lights ON / White lights OFF

Step was: Sat _____ Unsat _____

Comments:

** Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
6. FR-Z.1, step 3.g – Stops CCP 1-3.	6.1 Turns control switch to the STOP/RESET position for Centrifugal Charging Pump 1-3. Verifies <ul style="list-style-type: none">• Red light OFF / Green light ON (VB2) ***** Cue: “Another operator will continue with the procedure”. ***** Step was: Sat _____ Unsat _____

Comments:

Stop Time: _____

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

Follow up Question Documentation:

Question: _____

Response: _____

- ☐ Restore IC-160 (customized IC built for L181 Exam administration only). No lesson file is required.
- ☐ Perform the following:
 1. Select CSF-5 on SPDS.
- ☐ After the simulator goes to FREEZE, Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet and has verified containment pressure greater than 22 psig (containment pressure lowers quickly from CFCU cooling once the simulator is taken to RUN).

Initial Conditions:

Given:

- Unit 1 experienced a LOCA
- EOP E-1 is in progress and Safety Injection is reset
- Containment pressure is > 25 psig
- A MAGENTA path on the Containment Critical Safety Function Status Tree has been confirmed
- All higher priority critical safety functions have been addressed

Initiating Cue:

The Shift Foreman directs you to manually initiate containment spray in accordance with EOP FR-Z.1, starting at step 3.c

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-LJCS6

Title: Crosstie of Vital BUS G to H

Examinee: _____

Evaluator: _____

Print Signature Date

Testing Method: Perform X Simulate

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: EOP ECA-0.3, Restore 4kV Buses, Appendix X and Appendix Q, Rev. 21

Alternate Path: Yes _____ No X

Time Critical: Yes No **X**

Time Allotment: 20 minutes

Critical Steps: 2.1, 3.1, 5.2, 6.1, 7.1, 9.2, 10.1, 12.1, 12.2, 12.3, 13.1, 13.2, 13.3, 17.1

Job Designation: RO/SRO

Rev Comments/LRN TIPS: Bank LJC-032

DCPP Task # / Rating: 573800 3.5

Gen KA # / Rating:	062.A4.07 – Ability to manually operate and/or monitor synchronizing and paralleling of different ac supplies in the control room.	3.1 / 3.1
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AUTHOR: **LISA TORIBIO** DATE: **12/03/19**

OPERATIONS
REPRESENTATIVE: **CHRISTOPHER MEHIGAN** DATE: **12/04/19**

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. 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:
- U-1 was operating at 100%.
 - A reactor trip and safety injection has occurred concurrent with a loss of all off-site power.
 - Diesel generator 11 and diesel generator 13 have failed due to lube oil pressure problems.
 - Diesel generator 12 is supplying 4kV bus G.
 - CCW Pp 12 has failed resulting in a complete loss of CCW flow.
 - Steps 4.a and 4.b of ECA-0.3, Appendix X have been completed.
- Initiating Cue:** The Shift Foreman directs you to crosstie 4kV bus G to energize 4kV and 480V bus H per EOP ECA-0.3, Appendix X, commencing at step 4.c. The Shift Manager has concurred with this implementation.

DO NOT READ TASK STANDARD TO EXAMINEE

- Task Standard:** 4KV and 480 V bus H are energized from DG 1-2 in accordance with ECA-0.3, appendix X as by performing the following sequence:
- Step 4.c - Opens 52-HH-10.
 - Step 4.d - Calls the operator in the field to open all 480V Bus H breakers.
 - Step 4.f - Manually depresses both SI reset pushbuttons (Train A and Train B).
 - Step 4.g - Places all Xfer to S/U PWR C/O toggle switches to CUT-OUT for Vital 4kV buses F, G, and H.
 - Step 4.h - Depress all auto transfer reset pushbuttons for Vital 4kV buses F, G, and H.
 - Step 4.j - Opens Startup Feeder Breakers 52-HF-14 and 52-HH-14.
 - Step 4.k - Opens Startup Feeder 52-HG-15.
 - Step 4.m – Inserts sync key for 4kV bus H start up feeder breaker and turns switch to on. Closes 4kV bus H start up feeder breaker 52-HH-14.
 - Step 4.n – Inserts sync key for 4kV bus G start up feeder breaker and turns switch to on. Closes 4kV bus G start up feeder breaker 52-HG-14.
 - Step 4.r – 4kV to 480V bus feeder breaker for bus H, 52-HH-10.

Start
Time: _____

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 References ECA-0.3, Appendix X, step 4.c. Step was: Sat _____ Unsat _____
Comments:	
** 2. Step 4.c - Verify OPEN the 4kV to 480 VAC bus feeder breaker for the de-energized bus to be reenergized	** 2.1 Opens 52-HH-10 (VB4). 2.2 Verifies that 52-HH-10 has opened (VB4). Step was: Sat _____ Unsat _____
Comments:	
** 3. Step 4.d - On the de-energized 480V bus to be reenergized, open all 480V breakers.	** 3.1 Calls the operator in the field to open all 480V Bus H breakers. <hr/> <p><i>Note: 480V Bus H breakers are in the correct OPEN position for this JPM. Inform the Examinee that Time Compression is being used.</i></p> <hr/> <p>*****</p> <p>Cue: “(using time compression) An Operator has opened all the 480V breakers on bus 1H.”</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p>
Comments:	

** Denotes Critical Steps and Sub-Steps

	Step		Expected Operator Actions												
4.	Step 4.e - Cut in the DIR PWR, LOSS OF FIELD, & BKR OC PROT RLYS for diesel generator 12.	4.1	Places D/G DIR PWR, LOSS OF FLD & BKR OC PROT RLYS C/O SW to CUT-IN (VB4).												
			Step was: Sat _____ Unsat _____												
Comments:															
** 5.	Step 4.f - Reset SI.	5.1	Checks PK08-21 "Safety Injection Actuation" status (VB3).												
		** 5.2	Manually depresses both pushbuttons.												
		5.3	Checks at least one of the following: <div style="margin-left: 20px;"> <input type="checkbox"/> Monitor Light Box B "Safety Injection" red light OFF (VB1). OR <input type="checkbox"/> PK08-21, "Safety Injection Actuation" not ON (VB3). </div>												
			Step was: Sat _____ Unsat _____												
Comments:															
** 6.	Step 4.g - Cutout the auto transfer FCOs for 4kV and 12kV buses.	** 6.1	Places all Xfer to S/U PWR C/O toggle switch to CUT-OUT (VB4, VB5). <div style="margin-left: 20px;"> <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;">Vital 4kV</td> <td style="text-align: center;">Non-Vital 4kV</td> <td style="text-align: center;">12 kV</td> </tr> <tr> <td><input type="checkbox"/> Bus F **</td> <td><input type="checkbox"/> Bus D</td> <td><input type="checkbox"/> Bus D</td> </tr> <tr> <td><input type="checkbox"/> Bus G **</td> <td><input type="checkbox"/> Bus E</td> <td><input type="checkbox"/> Bus E</td> </tr> <tr> <td><input type="checkbox"/> Bus H **</td> <td></td> <td></td> </tr> </table> </div>	Vital 4kV	Non-Vital 4kV	12 kV	<input type="checkbox"/> Bus F **	<input type="checkbox"/> Bus D	<input type="checkbox"/> Bus D	<input type="checkbox"/> Bus G **	<input type="checkbox"/> Bus E	<input type="checkbox"/> Bus E	<input type="checkbox"/> Bus H **		
Vital 4kV	Non-Vital 4kV	12 kV													
<input type="checkbox"/> Bus F **	<input type="checkbox"/> Bus D	<input type="checkbox"/> Bus D													
<input type="checkbox"/> Bus G **	<input type="checkbox"/> Bus E	<input type="checkbox"/> Bus E													
<input type="checkbox"/> Bus H **															
			Step was: Sat _____ Unsat _____												
Comments:															

** Denotes Critical Steps and Sub-Steps

Step		Expected Operator Actions		
** 7.	Step 4.h - Depress all auto transfer reset pushbuttons.	** 7.1	Depresses all AUTO XFER RESET pushbuttons, if required (VB4, VB5).	
			Vital 4kV	Non-Vital 4kV 12 kV
			<input type="checkbox"/> Bus F **	<input type="checkbox"/> Bus D <input type="checkbox"/> Bus D
			<input type="checkbox"/> Bus G **	<input type="checkbox"/> Bus E <input type="checkbox"/> Bus E
			<input type="checkbox"/> Bus H **	
		7.2	Verifies that all Auto Xfer indicating blue lights are off. (VB4, VB5).	
			Step was: Sat _____ Unsat _____	

Comments:

8. Step 4.i - Verify OPEN all vital 4kV bus auxiliary feeder breakers.

8.1 Observes that all vital 4kV bus aux feeder breakers are OPEN (VB4):

- 52-HH-13 OPEN
- 52-HG-13 OPEN
- 52-HF-13 OPEN

Step was: Sat _____ Unsat _____

Comments:

** 9. Step 4.j - Verify OPEN all vital 4kV bus startup feeder breakers.

9.1 Observes 52-HG-14 is OPEN (VB4).

** 9.2 Opens Startup Feeder Breakers (VB4)

- 52-HF-14
- 52-HH-14

Step was: Sat _____ Unsat _____

Comments:

** Denotes Critical Steps and Sub-Steps

Step		Expected Operator Actions	
**	10.	Step 4.k - Verify OPEN the 4kV startup feeder breaker 52-HG-15.	** 10.1 Opens 52-HG-15 (VB4).
			10.2 Verifies that 52-HG-15 has opened

Step was: Sat _____ Unsat _____

Comments:

11. Step 4.l - Verify that Steps 4.b and 4.c of this appendix are complete.

11.1 Reads CAUTION and NOTE.

Cue: "Another operator will monitor the stability of the DG, and open the S/U feeder breaker if needed."

If requests status of steps 4.b and 4.c, provide the following cue:

Cue: "Refer to your initial conditions"

Step was: Sat _____ Unsat _____

Comments:

Step		Expected Operator Actions			
**	12.	Step 4.m - Close 4kV startup feeder breaker for the de-energized bus being reenergized.	**	12.1	Inserts sync key for 4kV bus H startup feeder breaker 52-HH-14 (VB4).
			**	12.2	Turns sync switch to ON.
			**	12.3	Closes 52-HH-14.
				12.4	Verifies that 52-HH-14 has closed.
Step was: Sat _____ Unsat _____					

Comments:

**	13.	Step 4.n - Close the 4kV startup feeder breaker for the bus that will be supplying power to the de-energized bus	**	13.1	Inserts sync key for 4kV bus G startup feeder breaker 52-HG-14 (VB4).
			**	13.2	Turns sync switch to ON.
			**	13.3	Closes 52-HG-14.
				13.4	Verifies that 52-HG-14 has closed.
				13.5	Verifies running diesel generator remains stable.
					Step was: Sat _____ Unsat _____

Comments:

** Denotes Critical Steps and Sub-Steps

Step		Expected Operator Actions	
14.	Step 4.o - Monitors for an SI	14.1	<p>*****</p> <p>Cue: “Another operator will monitor for an SI, and open the bus G S/U feeder if required.”</p>
15.	Step 4.p - IMPLEMENT Appendix Q to start 4kV loads as needed on the reenergized bus	15.1	<p>*****</p> <p>Cue: “An operator has been stationed at VB4 with Appendix Q and is monitoring the diesel generator.”</p> <p>*****</p> <p>Cue: “The SFM will coordinate the starting of any 4KV loads that are required. Please continue with Appendix X.”</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p>

Comments:

16.	Step 4.q - Verify that Step 4.d of this Appendix is complete PRIOR to performing the next step.	16.1	<p>Verifies that Step 4.d of this Appendix is complete.</p> <p>*****</p> <p>Cue: “Steps 4.d of this appendix is complete.”</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p>
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Comments:

** 17. Step 4.r - Close the 4kV to 480V bus feeder breaker for the reenergized bus.

** 17.1 Closes 52-HH-10.

Verifies that 52-HH-10 has closed.

Step was: Sat _____ **Unsat** _____

Comments:

** Denotes Critical Steps and Sub-Steps

Step	Expected Operator Actions
18. Step 4.s - Implement Appendix Q for starting 480V loads as needed.	<p>18.1 Implements Appendix Q for starting 480V bus loads as needed.</p> <p>*****</p> <p>Cue: "The SFM will coordinate the starting of 480 vac loads that are required. Another operator will monitor and implement App Q."</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p>
<div>Comments:</div>	

Stop Time: _____

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

Follow up Question Documentation:

Question: _____

Response: _____

- ☐ Restore the simulator to the IC-10 (100%, MOL).
- ☐ Enter lesson file drl_1032 or manually insert the following:

- ☐ Command Description

Insert loa_sis3 OPEN delay=60 Insert loa_rhr10 OPEN delay=60 Insert loa_css8 OPEN delay=60 Insert loa_ccw31 OPEN delay=60 Insert loa_afw14 OPEN delay=60 Insert dsc_ven14 OPEN delay=60	Strips vital 4KV Bus H
Insert mal_deg1a 2 Insert mal_deg1c 2	Fails DGs 1-1 and 1-3
Insert mal_syd1 1 Insert mal_syd1_btw 1	Loss of Offsite Power
Insert mal_ppl2a 1 delIA mal_ppl2a 2 delay=2 insert mal_ppl2b 1 delIA mal_ppl2b 2 delay=2	Inadvertant SI
Insert pmp_ccw2 4 delay=4	OC trip on CCW PP 1-2
RUN	Runs simulator

- ☐ Run lesson drl_0063 (Strips 480v bus H). Manual insert is not practical due to large number of actions.
- ☐ Freeze simulator
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet.

Initial Conditions: Given:

- U-1 was operating at 100%.
- A reactor trip and safety injection has occurred concurrent with a loss of all off-site power.
- Diesel generator 11 and diesel generator 13 have failed due to lube oil pressure problems.
- Diesel generator 12 is supplying 4kV bus G.
- CCW Pp 12 has failed resulting in a complete loss of CCW flow.
- Steps 4.a and 4.b of ECA-0.3, Appendix X have been completed.

Initiating Cue: The Shift Foreman directs you to crosstie 4kV bus G to energize 4kV and 480V bus H per EOP ECA-0.3, Appendix X, commencing at step 4.c. The Shift Manager has concurred with this implementation.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-LJCS8

Title: Respond to Fire in the 480V Bus G Switchgear Room

Examinee: _____

Evaluator: _____
Print Signature Date

Testing Method: Perform X Simulate _____

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: OP AP-34.3.11, Fire Response – 480 V Bus G Switchgear Room, Rev 0

Alternate Path: Yes X No _____

Time Critical: Yes _____ No X

Time Allotment: 10 minutes

Critical Steps: 4.1, 4.3, 4.4, 4.9

Job Designation: RO/SRO

Rev Comments/LRN TIPS: New

DCPP Task # / Rating: 89481 3.0 / 3.0

Gen KA # / Rating: 067.AA2.17 – Ability to determine and interpret the following as they apply to the Plant Fire on Site: systems that may be affected by the fire. 3.5 / 4.3

AUTHOR: _____ **LISA TORIBIO** _____ **DATE:** 02/04/20

OPERATIONS REPRESENTATIVE: _____ **CHRISTOPHER MEHIGAN** _____ **DATE:** 02/04/20
REV. 1

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: OP AP-34.3.11, Fire Response – 480 V Bus G Switchgear Room, Rev 0

Initial Conditions: Given:

- A fire has been reported and verified as valid in the 480 V Bus G switchgear room.
- The crew has entered AP-34 and determined Fire Response procedure AP-34.3.11 applies.

Initiating Cue: The Shift Foreman directs you to implement OP AP-34.3.11, Fire Response – 480 V Bus G Switchgear Room.

NOTE: Do NOT provide examinee with Task Standard

Task Standard:	<p>Realign charging as follows:</p> <ul style="list-style-type: none">• CCP 1-3 - STOPPED• Charging pump suction from the RWST, 8805A – OPENED• VCT outlet to charging pumps, LCV-112B – CLOSED• CCP 1-1 – RUNNING <p>Prior to exiting OP AP-34.3.11, Fire Response – 480 V Bus G Switchgear Room</p>
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**Start
Time:** _____

Step

1. AP-34.3.11, Step 1 - Check reactor does NOT trip and Safety Injection does NOT actuate.

Expected Operator Actions

- 1.1 Noted reactor was NOT tripped and Safety Injection had NOT actuated.

Step was: Sat _____ **Unsat** _____

Comments:

NOTE: This is a continuous action step. The running charging pump will begin cavitating shortly after the original check, requiring the candidate to return to step 2 to implement RNO actions.

2. AP-34.3.11, Step 2 - Check suction to running charging pumps.

- 2.1 Determined VCT level and pressure in normal band.
2.2 Identified charging pump suction flow path available through LCV-112B and LCV-112C.
2.3 Checked charging pump 1-3 amps stable.
2.4 Checked charging header flow FI-128A stable.
2.5 Checked charging header pressure PI-142A stable.

Step was: Sat _____ **Unsat** _____

Comments:

Step		Expected Operator Actions	
3.	AP-34.3.11, Step 3 - Check RWST drain path isolated.	3.1	Checked PK08-21 OFF.
		<u>NOTE:</u> PK05-01, 02, 03, 04 alarm shortly after CCP 1-3 cavitation begins. If Examinee opts to perform PK steps, provide the following Cue:	

		Cue: “Another Operator will address Annunciator Responses”	

		3.2	Noted reduced flow to RCP seals.
		3.3	Identified CCP 1-3 amps – NOT stable.
		Step was: Sat _____ Unsat _____	
Comments:			
<< Alternate Path – Start Point >>			
** 4.	AP-34.3.11, Step 2 RNO – Align charging pump suction to RWST.	** 4.1	Stopped CCP 1-3.
		<u>NOTE:</u> May additionally close letdown isolation valves LCV-459 and LCV-460.	
		4.2	Isolated letdown by closing orifice valve: <ul style="list-style-type: none">8149 C
		** 4.3	Opened charging pump suction from the RWST: <ul style="list-style-type: none">8805A
		** 4.4	Closed VCT outlet to the charging pumps: <ul style="list-style-type: none">LCV-112B
		4.5	Informs Shift Foreman CCP 1-3 must be vented prior to restart.
		4.6	*****
		Cue: “CCP 1-3 will be vented prior to restarting the pump”	

(Step continued on next page)

** Denotes Critical Step and Sub-Steps

	Step	Expected Operator Actions
**	4. AP-34.3.11, Step 2 RNO – Align charging pump suction to RWST. (cont)	4.7 Checked charging pump recirc isolation lines 8105 and 8106 are open. 4.8 Closed charging flow control valve FCV-128 ** 4.9 Started CCP 1-1 4.10 Opened FCV-128 to establish minimum charging flow to seals only (approx 32 gpm; 8gpm/seal) 4.11 Noted requirement to establish letdown per OP AP-17, Loss of Charging

<< Alternate Path – End Point >>

4.12 *****
Cue: “Other Operators will continue with system restoration.”

Step was: Sat _____ Unsat _____

Comments:

Stop Time: _____

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

Follow up Question Documentation:

Question:

Response:

- ☐ Restore the simulator to IC-10 (100%, MOL).
- ☐ Enter Lesson file L181-LJCS8

Description	L3 Commands
Activate PK10-10 Fire Detected	Insert PK1010_0674 FAIL_TO_TRUE
Cavitate CCP 1-3 (Paused)	insert CVC_932TASTEM 0.1 ramp=4

- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet.
- ☐ When Examinee goes to check FI-128A, Charging Header Flow, on CC2, activate **CVC_932TASTEM 0.1 ramp=4**

Initial Conditions: Given:

- A fire has been reported and verified as valid in the 480 V Bus G switchgear room.
- The crew has entered AP-34 and determined Fire Response procedure AP-34.3.11 applies.

Initiating Cue: The Shift Foreman directs you to implement OP AP-34.3.11, Fire Response – 480 V Bus G Switchgear Room.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-P1

Title: Transfer Pressurizer Heater Group 23 to Backup Power

Examinee: _____

Evaluator: _____

Print _____ Signature _____ Date _____

Testing Method: Perform _____ Simulate X

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: (Note: Any Unsat step requires a numbered comment; use back as needed.)

This is a Unit 2 JPM

References:	U2 OP A-4A:I, Pressurizer - Make Available, Rev. 26		
Alternate Path:	Yes	_____	No <u> X </u>
Time Critical:	Yes	_____	No <u> X </u>
Time Allotment:	15 minutes		
Critical Steps:	4.2, 8.2, 10.1		
Job Designation:	RO/SRO		
Rev Comments/LRN TIPS:	Bank: LJP-029A		
DCPP Task # / Rating:	109800		3.6
	010.A2.01 – Ability to predict the impact of heater failures on the PZR PCS and based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations.		
Gen KA # / Rating:			3.3 / 3.6

AUTHOR:	<u>LISA TORIBIO</u>	DATE:	<u>02/05/20</u>
APPROVED BY:	<u>CHRIS MEHIGAN</u>	DATE:	<u>02/05/20</u>
	LINE MANAGER		REV.2

- 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:** A copy of U2 OP A-4A:I, Section 6.4.
- Initial Conditions:** Given:
- Unit 2 is in MODE 1.
 - An electrical fault has deenergized 480VAC bus 23E.
 - Offsite power is available
- Initiating Cue:** The Shift Foreman directs you to transfer pressurizer heater group 23 to its backup power supply in accordance with OP A-4A:I, Section 6.4. Another Operator has been assigned to monitor bus loading during the transfer.

NOTE: Do NOT provide examinee with Task Standard

- | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Task Standard:</p> <p>Pressurizer heater group 2-3 is powered from its backup supply as follows:</p> <ul style="list-style-type: none">• Control power toggle switch in OFF position• Transfer switch EPPH23 in DOWN (backup) position• DC control power knife switch 72-52-2H-74 - CLOSED |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

**Start
Time:** _____

Step		Expected Operator Actions	
1.	Reference procedure section 6.4	1.1	Read caution and note.
		1.2	Went to step 6.4.2 for Pzr Heater Group 2-3.
		1.3	Read caution.
		1.4	Recognized that off-site power is available and went to Section 6.4.2b.
		Step was: Sat _____ Unsat _____	

Comments:

2.	OP A-4A:I, Step 6.4.2.b.1,2 – Place control switch for heater group 23 in the OFF position.	2.1	Went to or called the control room to ensure the position of the control switch for heater group 23 is in OFF. ***** Cue: “The Control Room Operator reports the control switch for heater group 23 is in the OFF position and the green light is ON.” ***** Step was: Sat _____ Unsat _____
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Comments:

Step		Expected Operator Actions	
3.	OP A-4A:I, Step 6.4.2.b.3.a – Ensure the following for 52-23E-2, Press Heater Group #23: <ul style="list-style-type: none">• Breaker OPEN	3.1	Located the normal breaker for heater group 23 on load center 23E.
		3.2	Ensured that the breaker is OPEN. ***** Cue: “The OPEN (green) indicator is showing on the breaker.” ***** Step was: Sat _____ Unsat _____
<div>Comments:</div>			
** 4.	OP A-4A:I, Step 6.4.2.b.3.b – Ensure the following for 52-23E-2, Press Heater Group #23: <ul style="list-style-type: none">• 72-52-23E-02, DC Control Power Cut Out Switch, in "OFF"	4.1	Located the DC control power switch for the heater group 23 normal breaker on load center 23E.
		** 4.2	Placed the control power toggle switch in the OFF position (left switch in bank of 3). <u>Note:</u> Use pointer to indicate toggle switch is in the DOWN (OFF) position. ***** Cue: “The toggle switch is positioned here.” ***** Step was: Sat _____ Unsat _____
<div>Comments:</div>			

** Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
5. OP A-4A:I, Step 6.4.2.b.4.a-Check heater group 23 backup breaker 52-2H-74 open.	<p>5.1 Located the heater group 23 backup breaker.</p> <p>5.2 Checked that the breaker is open.</p> <p>*****</p> <p>Cue: "The OPEN (green) indicator is showing on the breaker."</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p>
<div>Comments:</div>	
6. OP A-4A:I, Step 6.4.2.b.4.b - Check open the DC control power knife switch 72-52-2H-74 for the heater group 23 backup breaker.	<p>6.1 Located the DC control power knife switch for heater group 23 (located above the vital breaker).</p> <p>*****</p> <p>Cue: "You may open the cabinet."</p> <p>*****</p> <p>6.2 Ensured the knife switch is open.</p> <p>*****</p> <p>Cue: "The knife switch is as described."</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p>
<div>Comments:</div>	

Step	Expected Operator Actions
7. OP A-4A:I, Step 6.4.2.b.5.a - Ensure both white potential lights on manual transfer switch EPPH23, Press Heater 2-3 Transfer Switch are OFF.	<p>7.1 Located the manual transfer switch on the wall next to the 52-2H-74 breaker.</p> <hr/> <p><u>Note:</u> Normal breaker may be available, white light may be ON.</p> <hr/> <p>7.2 Checked BOTH white lights OFF</p> <ul style="list-style-type: none"> Normal supply 52-23E-2 Backup supply 52-2H-74 <p>*****</p> <p>Cue: "Both white lights are OFF."</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p>
Comments:	
** 8. OP A-4A:I, Step 6.4.2.b.5.b,c - Move the transfer switch down to the backup (vital bus) position.	<p>*****</p> <p>Cue: "Another Operator will complete all required sealed component change forms and re-sealing."</p> <p>*****</p> <p>8.1 Simulated removing seal.</p> <p>** 8.2 Positioned switch EPPH23 to the backup supply (down position).</p> <hr/> <p><u>Note:</u> Use pointer to indicate transfer switch is in the down (BACKUP) position.</p> <hr/> <p>*****</p> <p>Cue: "The transfer switch is positioned here."</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p>
Comments:	

** Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions
9.	OP A-4A:I, Step 6.4.2.b.6.a - Rack in or check racked in 52-2H-74.	<i>Note: This breaker is normally racked in. This step would become critical if the breaker were initially racked out. OP J-7A:II would only be needed in this "unusual" case.</i>
9.1	Racked in or checked racked in 52-2H-74, (Breaker is flush with the breaker cabinet - RACKED IN).	***** Cue: "Breaker is as described." ***** Step was: Sat _____ Unsat _____
<div>Comments:</div>		
** 10.	OP A-4A:I, Step 6.4.2.b.6.b - Close the DC control power knife switch for the heater group 23 backup breaker.	** 10.1 Closed the DC control power knife switch 72-52-2H-74 (knife switch is UP). ***** Cue: "The knife switch is as described." ***** Step was: Sat _____ Unsat _____
<div>Comments:</div>		

** Denotes Critical Step and Sub-Steps

Step	Expected Operator Actions
11. OP A-4A:I, Step 6.4.2.b.6.c,d - Ensure the DC Charging Power Switch for heater group 23 backup breaker (52-2H-74) is on and springs charged.	<p>11.1 Located the DC Charging Power Switch on the lower front of 52-2H-74.</p> <p>11.2 Ensured the following:</p> <ul style="list-style-type: none">• CHARGING POWER switch is in the ON (UP) position• SPRINGS CHARGED flag displayed <p>*****</p> <p>Cue: "The switch is in the described position, and the 'Springs Charged' flag is showing on the breaker."</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p> <div>Comments:</div>
12. Notify the control room of the status of heater group 23.	<p>12.1 Notified the control room that heater group 23 has been transferred to the backup power supply.</p> <p>*****</p> <p>Cue: "The Control Operator will complete the procedure and energize heater group 23."</p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p> <div>Comments:</div>

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 2 is in MODE 1.
- An electrical fault has deenergized 480VAC bus 23E.
- Offsite power is available

Initiating Cue: The Shift Foreman directs you to transfer pressurizer heater group 23 to its backup power supply in accordance with OP A-4A:I, Section 6.4. Another Operator has been assigned to monitor bus loading during the transfer.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number:	NRCL181-P2		
Title:	Transfer the TSC to Vital Power		
Examinee:	_____		
Evaluator:	_____	_____	_____
	Print	Signature	Date
Testing Method:	Perform _____	Simulate <u> X </u>	
Results:	Sat _____	Unsat _____	Total Time: _____ minutes
Comments:	_____		

This is a Unit 1 JPM

References:	EOP ECA-2.1, Uncontrolled Depressurization of All Steam Generators, Appendix J, Rev. 27A OP J-6B:VI, Manual Operation of DG 1-3, Unit 1 – Rev. 37 OP J-6B:VI, Manual Operation of DG 2-3, Unit 2 – Rev. 33		
Alternate Path:	Yes	<u> X </u>	No <u> </u>
Time Critical:	Yes	<u> </u>	No <u> X </u>
Time Allotment:	20 minutes		
Critical Steps:	3.1, 4.1, 7.1, 7.2		
Job Designation:	RO/SRO		
Rev Comments/LRN TIPS:	Converted to new format, updated references. Rev 2A for reference procedure number revision only – no impact to JPM. LOF supervisor approves.		
DCPP Task # / Rating:	896600		3.0 / 3.0
	062.A2.11 – Ability to predict the impact of aligning standby equipment with correct emergency power source on the ac distribution system and based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations.		
Gen KA # / Rating:			3.7 / 4.1

AUTHOR:	<u>LISA TORIBIO</u>	DATE:	<u>02/05/20</u>
OPERATIONS REPRESENTATIVE	<u>CHRISTOPHER MEHIGAN</u>	DATE:	<u>02/05/20</u>
	LINE MANAGER		REV. 2

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 ECA-2.1, Appendix J.
Copy of OP J-6B:VI for D/G 1-3 and 2-3. (only once asked for)

Initial Conditions: Given:

- Unit 1 experienced a steam break and uncontrolled depressurization of all steam generators.
- Offsite power was lost to both units.
- The SEC has given permission to place the TSC on vital power.
- The TSC is manned and requires vital power.
- Diesel generator 1-3 is supplying Unit 1 4 kV Bus F and is carrying 2.12 MW load @ a 0.8 pf.
- Diesel generator 2-3 is supplying Unit 2 4 kV Bus F and is carrying 2.26 MW load @ a 0.8 pf.

Initiating Cue: The Unit 1 Shift Foreman directs you to place the TSC on U-1 vital power, per ECA-2.1, Appendix J, starting with Step 3.

NOTE: Do NOT provide examinee with Task Standard

Task Standard: TSC Transfer Switch Normal Power:

- **Breaker 52-22J-40 in the OFF position.**

TSC is being provided power from Unit 2 D/G 2-3 via:

- **Switch EPTSN to BACKUP power.**
- **Switch EPTSC to the NORMAL (U-2) position.**
- **Breaker 52-2F-47 in the ON position.**

**Start
Time:**

Step		Expected Operator Actions	
1.	ECA-2.1, Appendix J, Step 3 – Check D/G 1-3 loaded and able to support additional loading.	1.1	Referenced D/G 1-3 load in initial conditions.
		1.2	Referenced OP J-6B:VI, Precautions and Limitations Step 5.10 for D/G 1-3 load limits.
		<u>Note:</u> Supply copy of procedure OP J-6B:VI P&Ls to student when they indicate they will refer to a procedure for D/G load limits.	
		1.3	Determined that D/G 1-3 can support additional 106.2 KW loading. (2.6 Mw – 2.12 MW = .48 MW or 480 KW)
		Step was: Sat _____ Unsat _____	

Comments:

Note: Examinee may elect to evaluate support capability of D/G 2-3 at this time, but is expected to align the TSC to D/G 1-3 per Shift Foreman directions given in cue. Mark Step N/A if evaluation of D/G 2-3 not performed at this time.

2.	ECA-2.1, Appendix J, Step 3 – Check D/G 2-3 loaded and able to support additional loading (Optional step since D/G 1-3 is capable of carrying load).	2.1	Referenced OP J-6B:VI, Precautions and Limitations Step 5.10 for D/G 2-3 load limits.
		2.2	Determined DG 2-3 has room for an additional 106.2 KW of load (2.6 Mw – 2.26 MW = .34 MW or 340 KW)
		Step was: Sat _____ Unsat _____	

Comments:

Step		Expected Operator Actions	
		<u>Note:</u> JPM steps 3.1, 3.2, and 3.3 may be done in any order (bulleted steps in the procedure).	
** 3.	ECA-2.1, Appendix J, Step 5 – Open the following breakers:	** 3.1	Placed breaker 52-22J-40 (EPTSN TSC PWR TRANSF SW NORMAL SOURCE) in the OFF position.
	• Open breaker 52-22J-40 (TSC XFER SW)	<u>Note:</u> Use pointer to indicate breaker is in the DOWN (OFF) position.	
		***** Cue: “An audible "clunk" is heard, and the breaker is positioned here, as described.” *****	
	• Open breaker 52-2F-47 (TSC 480V POWER TO EPTSC)	3.2	Noted that breaker 52-2F-47 (ON SITE TECHNICAL SUPPORT CENTER 480V POWER TO EPTSC) is in the OFF position.
		<u>Note:</u> Use pointer to indicate breaker is in the DOWN (OFF) position.	
		***** Cue: “The breaker is positioned here, as described.” *****	
	• Open breaker 52-1F-67 (TSC TRANSFER SWITCH)	3.3	Noted that breaker 52-1F-67 (TSC TRANSFER SWITCH) is in the OFF position.
		<u>Note:</u> Use pointer to indicate breaker is in the DOWN (OFF) position.	
		***** Cue: “The breaker positioned here, as described.” *****	
		Step was: Sat _____ Unsat _____	

Comments:

** Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions
		<p><u>Note:</u> <i>Switch is on west wall of 2F 480 VAC switchgear room. When examinee goes describes need to address sealed component change form, provide the following cue:</i></p> <p>*****</p> <p>Cue: <i>"The sealed component change form needs will be addressed by another Operator."</i></p> <p>*****</p>
** 4.	ECA-2.1, Appendix J, Step 6 – In the 2F MCC Room, switch EPTSN, TSC Power Transfer Switch, to BACKUP.	<p>** 4.1 Placed switch EPTSN in the BACKUP (EPTSC) position.</p> <p><u>Note:</u> <i>Use pointer to indicate breaker is in the BACKUP (EPTSC) position.</i></p> <p>*****</p> <p>Cue: <i>"The switch is positioned here, as described."</i></p> <p>*****</p> <p>Step was: Sat _____ Unsat _____</p>
Comments:		

Step	Expected Operator Actions
5. ECA-2.1, Appendix J, Step 7 – Supply Power from Unit 1: a) Switch EPTSC, Power Transfer Unit Selector Switch to BACKUP.	5.1 Placed EPTSC switch (TSC Power Transfer Unit Selector Switch) to the BACKUP position. <u>Note:</u> Use pointer to indicate breaker is in the BACKUP position. ***** Cue: “The switch is positioned here, as described.” ***** <u>Note:</u> When the Examinee attempts to close the breaker to align power from Unit 1, the breaker WILL NOT CLOSE. The Examinee should recognize aligning TSC to Unit 2 as a viable alternative. 5.2 Attempted to place breaker 52-1F-67 in the ON position. ***** Cue: “The breaker REMAINS AS IS with the word OFF showing on the lower breaker handle.” ***** 5.3 Determined Unit 1 is not capable of supplying power to TSC. <u>Note:</u> If Examinee asks for direction, provide the following CUE: ***** Cue: “What do you recommend?” ***** Step was: Sat _____ Unsat _____

Comments:

<< Alternate Path – Start Point >>

Step	Expected Operator Actions
	<p><u>Note:</u> <i>If Examinee requests direction from Control Room due to original field alignment becoming unavailable, provide the following cue:</i></p>
	<p>*****</p>
	<p><u>Cue:</u> <i>“Take the appropriate action”</i></p>
	<p>*****</p>
	<p><u>Note:</u> <i>Mark step N/A if evaluation of D/G 2-3 load support was performed earlier.</i></p>
<p>6. ECA-2.1, Appendix J, Step 4 – Check D/G 2-3 loaded AND able to support an additional 106.2 KW loading.</p>	<p>6.1 Referenced OP J-6B:VI, Precautions and Limitations Step 5.10 for D/G 2-3 load limits.</p>
	<p>6.2 Determined that DG 2-3 has room for an additional 106.2 KW of load (2.6 MW – 2.26 MW = .34 MW or 340 KW)</p>
	<p>Step was: Sat _____ Unsat _____</p>
<p>Comments:</p>	

Step		Expected Operator Actions	
		<u>Note:</u> Switch is also on west wall of 2F 480VAC switchgear room, next to EPTSN switch. Unit 2 is the NORMAL position	
** 7.	ECA-2.1, Appendix J, Step 8 – Supply Power from Unit 2: a) Switch EPTSC, Power Transfer Unit Selector Switch to NORMAL.	** 7.1	Places EPTSC switch (TSC Power Transfer Unit Selector Switch) to the NORMAL position.
		<u>Note:</u> Use pointer to indicate breaker is in the NORMAL position.	

		Cue: "Cue: "The switch is positioned here, as described."	

	b) Close 52-2F-47, TSC 480V Power to EPTSC.	** 7.2	Places breaker 52-2F-47 in the ON position.
		<u>Note:</u> Use pointer to indicate breaker is in the up (ON) position.	

		Cue: "An audible "clunk" is heard, and the breaker is positioned here, as described."	

		Step was: Sat _____ Unsat _____	

<< Alternate Path – End Point >>

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 experienced a steam break and uncontrolled depressurization of all steam generators.
- Offsite power was lost to both units.
- The SEC has given permission to place the TSC on vital power.
- The TSC is manned and requires vital power.
- Diesel generator 1-3 is supplying Unit 1 4 kV Bus F and is carrying 2.12 MW load @ a 0.8 pf.
- Diesel generator 2-3 is supplying Unit 2 4 kV Bus F and is carrying 2.26 MW load @ a 0.8 pf.

Initiating Cue: The Unit 1 Shift Foreman directs you to place the TSC on U-1 vital power, per ECA-2.1, Appendix J, starting with Step 3.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL181-P3

Title: Clear Component Cooling Water Header "A"

Examinee: _____

Evaluator: _____

Print _____ Signature _____ Date _____

Testing Method: Perform _____ Simulate X

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: (Note: Any Unsat step requires a numbered comment; use back as needed.)

OP AP SD-4, Loss of Component Cooling Water, Rev 23, Appendix A	
References:	OVID 106714-02
Alternate Path:	Yes _____ No <u> X </u>
Time Critical:	Yes _____ No <u> X </u>
Time Allotment:	15 minutes
Critical Steps:	1.4, 2.3, 3.3
Job Designation:	RO/SRO
Rev Comments/LRN TIPS:	New
DCPP Task # / Rating:	-
Gen KA # / Rating:	G2.1.30 – Ability to locate and operate components, including local controls. 4.4 / 4.0

AUTHOR: _____ **LISA TORIBIO** _____ DATE: **02/05/20**

OPERATIONS

REPRESENTATIVE: _____ **CHRISTOPHER MEHIGAN** _____ DATE: **02/05/20**

REV. 1

- 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;
- OP AP SD-4, Appendix A
 - OVID 106714-02
- Initial Conditions:** Given:
- Unit 1 is in Mode 5.
 - The Control Room is currently implementing OP AP SD-4, Loss of Component Cooling Water, due to CCW system outleakage.
 - Local inspection of CCW indicates the leak is between CCW Pump 1-1 discharge and CCW HX 1-1 outlet valve FCV-430.
 - CCW HX 1-2 is currently in service.
- Initiating Cue:** The Shift Foreman directs you to isolate a portion of CCW Header "A" by performing OP AP SD-4, Appendix A, Step 1.a.1.

NOTE: Do NOT provide examinee with Task Standard

- | | |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Task Standard: | CCW Header "A" loads isolated as follows: <ul style="list-style-type: none">• 1-CCW-18, CCW Pump 1-1 Discharge to Header A - CLOSED• 1-CCW-19, CCW Pump 1-2 Discharge to Header A - CLOSED• 1-CCW-20, CCW Pump 1-3 Discharge to Header A - CLOSED |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Start

Time: _____

	Step	Expected Operator Actions
**	1. OP AP SD-4, Appendix A, Step 1.a.1 – Close all three CCW pump discharge valves to CCW HX #1:	
	<ul style="list-style-type: none"> • CCW-18 	
		1.1 1-CCW-18 at the discharge of CCW Pump 1-1 (73' elevation aux building)
		1.2 Noted valve is sealed in the open position and will require seal component change forms. ***** Cue: The Shift Foreman has assigned another operator to complete all required sealed component change forms and resealing. *****
		1.3 Removed seal (simulated).
**	1.4 Rotated the handle until the arrow points to 0 degrees (or "C") (simulated).	***** Cue (if required): The valve is now positioned as you described. *****
		Step was: Sat _____ Unsat _____

Comments:

** Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
**	2.	OP AP SD-4, Appendix A, Step 1.a.1 – Close all three CCW pump discharge valves to CCW HX #1 (cont):	2.1 1-CCW-19 at the discharge of CCW Pump 1-2 (73' elevation aux building)
		<ul style="list-style-type: none">• CCW-19	2.2 Removed seal (simulated).
			** 2.3 Rotated the handle until the arrow points to 0 degrees (or "C") (simulated).

Cue (if required): The valve is now positioned as you described.			

		Step was: Sat	Unsat

Comments:

** Denotes Critical Step and Sub-Steps

Step		Expected Operator Actions	
**	3.	OP AP SD-4, Appendix A, Step 1.a.1 – Close all three CCW pump discharge valves to CCW HX #1 (cont):	
		<ul style="list-style-type: none">CCW-20	
	3.1	1-CCW-20 at the discharge of CCW Pump 1-3 (73' elevation aux building)	
	3.2	Removed seal (simulated).	
**	3.3	Rotated the handle until the arrow points to 0 degrees (or "C") (simulated).	

		Cue (if required): The valve is now positioned as you described.	

		Step was: Sat _____ Unsat _____	

Comments:

If Candidate continues on in Appendix A

Cue: Another operator will complete isolation of CCW Header "A".

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 in Mode 5.
- The Control Room is currently implementing OP AP SD-4, Loss of Component Cooling Water, due to CCW system outleakage.
- Local inspection of CCW indicates the leak is between CCW Pump 1-1 discharge and CCW HX 1-1 outlet valve FCV-430.
- CCW HX 1-2 is currently in service.
- Initiating Cue:** The Shift Foreman directs you to isolate a portion of CCW Header "A" by performing OP AP SD-4, Appendix A, Step 1.a.1.

Facility: Diablo Canyon (PWR) Scenario No: 1 Op-Test No: L181 NRC

Examiners: _____ Operators: _____

Initial Conditions: 2% with MFW in service, aligned to Start-Up Power. MOL with CFCU 1-1 OOS.

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 2% to \approx 8% OP L-3 , sec 6.28.
2	VLV_CVC22_2 .5 delay=0 ramp=15	I (ALL)	Regen Hx Isolation Valve, LCV-459, fails to mid-position (OP AP-18).
3	H_V1_034M_1, XMT_VEN6_3, XMT_VEN7_3, XMT_VEN8_3	TS, C (BOP, SRO)	CFCU 1-2 high stator/bearing temperature due to low CCW flow (AR PK01-21, TS 3.6.6.C).
4	RLY_PPL63_2 OPEN RLY_PPL59_2 OPEN	TS, I (ALL)	SSPS relay actuation causes inadvertent start of TDAFW pump and blowdown sample isolation valves to close (AR PK04-03, OP D-1:III, OP1.DC10; TS 3.7.5.B).
5	MAL_MSS4 1.57E+07 ramp=30	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; No manual close for FCV-42.
7	MAL_PPL3B BOTH	C (BOP)	Safety Injection, Train B fails to actuate.
*(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)	6
2. Malfunctions after EOP entry (1-2) (Events 6,7)	2
3. Abnormal events (1–4) (Events 2,3,4)	3
4. Major transients (1-2) (Event 5)	1
5. EOPs entered/requiring substantive actions (1–2) (E-2, E-1.1)	2
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)(See description below)	3

Critical Task	Justification	Reference
<p>(S1CT-1) Shutdown TD AFW pump prior to any Steam Generator Overfill (S/G wide range greater than 100%) by either:</p> <ul style="list-style-type: none"> Closing LCV-106,107, 108, 109 to the individual S/Gs OR Closing steam supply valves FCV-37 and FCV-38 to leads 2 and 3 respectively OR Directing FCV-95 closed in the field 	<p>Carryover into the steam lines can result in damage to downstream piping and valves, placing the secondary heat sink at risk. High steam generator level can also result in reactivity excursions due to excessive cooldown of the primary system.</p>	<ul style="list-style-type: none"> Tech Spec 3.3.2 Basis Documentation
<p>(S1CT-2) Stop uncontrolled RCS cooldown before a severe challenge to Integrity Safety Function develops (magenta path on F-0.4 RCS Integrity) as follows:</p> <ul style="list-style-type: none"> Close Main Steam Isolation Valves FCV-41, FCV-43, FCV-44. Dispatch Operator to close FCV-42 (S/G 1-2 steamline isolation). Isolate feed flow to S/G 1-2 by closing/verifying closed LCV-107 and LCV-111. <i>(Note: LCV-107 is critical only when TDAFW pump is running or capable of an autostart).</i> Isolate steam flow from S/G 1-2 by closing/verifying closed FCV-37. Maintains the minimum heatsink requirements (435 gpm until S/G NR level is greater than 15% in one non-faulted S/G) by controlling flow to S/Gs 1-1, 1-3, and 1-4. 	<p>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</p>	<ul style="list-style-type: none"> Background Information for WOG Emergency Response Guideline
<p>(S1CT-3) Terminate SI prior to rupture of PRT by closing 8801A/B OR 8803A/B.</p>	<p>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.</p>	<ul style="list-style-type: none"> Westinghouse Owner's Group WCAP-17711-NP

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 #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. Regen Hx Isolation Valve, LCV-459, drifts to mid-position causing letdown orifice valve 8149C to close. Shift Foreman enters **OP AP-18, Letdown Line Failure**. Excess Letdown is established per **OP B-1A:IV CVCS - Excess Letdown - Place In Service and Remove From Service**.
3. CFCU 1-2 has a loss of CCW flow due to debris migration causing stator and motor bearing temperatures to rise rapidly and bring in annunciator alarm **PK01-21, Contmt Fan Clr**. Reactor operators identify low flow indications on vertical boards and rapidly rising stator/bearing temperatures using plant process computer trends. The crew secures the CFCU to prevent motor damage and contacts maintenance/engineering for assistance. Shift Foreman enters **TS 3.6.6 Condition C**, one required CFCU system inoperable such that a minimum of two CFCUs remain OPERABLE (7 day).
4. SSPS relay actuation results in Turbine Driven AFW (TDAFW) Pump Steam Supply Isolation Valve, FCV-95, failing open and isolation of half of the blowdown sample valves inside and outside containment. S/G levels rise and RCS temperature lowers. FCV-95 cannot be closed and the crew must isolate the TDAFW Pump by closing the LCVs to the individual S/Gs or by closing steam supply valves FCV-37 and FCV-38 from leads 2 and 3 respectively, or by directing FCV-95 manually closed in the field **(S1CT-1) Shutdown TD AFW pump prior to Steam Generator Overfill**. Shift Foreman implements **TS 3.7.5.B, AFW System** for one AFW train inoperable (72 hrs).
5. A main steamline break develops downstream of the Main Steam Isolation Valves, outside containment. S/G pressure drops rapidly resulting in an automatic Reactor Trip and Safety Injection. The crew enters **EOP E-0, Reactor Trip or Safety Injection**.
6. Train B of Safety Injection fails to actuate, requiring the crew to perform numerous manual alignments and pump starts as part of **Appendix E, ESF Auto Actions, Secondary and Auxiliaries Status**.
7. All four main steam isolation valves fail open. Steam leads 1, 3, and 4 may be closed from the control room, but lead 2 (FCV-42) requires field action. The crew transitions to **EOP E-2, Faulted Steam Generator Isolation** to isolate S/G 1-2 and dispatches an operator to locally close FCV-42 as part of the critical task to stop the uncontrolled cooldown **(S1CT-2) Stop uncontrolled cooldown before a severe challenge (magenta path) develops on F-0.4 RCS Integrity**.
8. The crew transitions to **EOP E-1.1, SI Termination** where they complete the final critical task of the scenario **(S1CT-3) Terminate SI prior to rupture of PRT**.

The scenario is terminated once the final critical task is complete.

Op-Test No.: L181-NRCScenario No.: 1Event No.: 2Page 2 of 15Event Description: Regen Hx Isolation Valve, LCV-459, Fails to mid-position

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnoses charging flow problem from: <ul style="list-style-type: none"> RCP seal flows lowering (due to controller throttling back) (VB2 meters, PPC). Pzr level rising slowly (due to charging/letdown mismatch) (VB2 meters, PPC, CC2 recorder). VCT level dropping slowly (VB2 recorder, PPC). Dual position indication lights illuminated on mimic board for LCV-459 (VB2).
	SRO	<ul style="list-style-type: none"> Implements OP AP-18, "Letdown Line Failure".
(OP AP-18, "Letdown Line Failure")		
	SRO/ATC	<ul style="list-style-type: none"> (1) Ensures no load changes, heatups, or draindowns are in progress.
	SRO/BOP	<ul style="list-style-type: none"> (2) Isolates letdown <ul style="list-style-type: none"> Ensures Letdown Orifice Stop Valve, 8149C is closed (VB2). Closes other Regen Heat Exchanger Inlet Valve, LCV-460 (VB2). Verifies RHR to Letdown Flow Control Valve, HCV-133 (RHR Letdown) is closed (VB2).
	SRO/ATC	<ul style="list-style-type: none"> (3) Checks for RCS Leakage – verifies that Pzr level and RCS press are both stable/rising (VB2, CC2, PPC).
	ATC	<ul style="list-style-type: none"> (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).
	SRO/BOP	<ul style="list-style-type: none"> (5) Establish Excess Letdown (see next page), per OP B-1A:IV, "CVCS - Excess Letdown - Place In Service and Remove From Service", Section 6.1 "Place Excess Letdown in Service".
	BOP	<ul style="list-style-type: none"> (6) Contacts RP and Chemistry regarding Excess Letdown being placed in service.
<i>(continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRC

Scenario No.: 1

Event No.: 2

Page 3 of 15

Event Description: Regen Hx Isolation Valve, LCV-459, Fails to mid-position (continued)

[illegible]

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 1 Event No.: 3 Page 5 of 15

Event Description: CFCU 1-2 high stator/bearing temperature due to low CCW flow

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> Observes PK01-21 (Contmt Fan Clr) and informs the Shift Foreman.
(AR PK01-21, "Contmt Fan Clr")		
	SRO	Enters AR PK01-21, "Contmt Fan Clr" <ul style="list-style-type: none"> (1.0) Identifies input 441 (Contmt Fans Temp PPC) goes to section 2.1, Fan High Temp.
	ATC	<ul style="list-style-type: none"> (2.1.1) Checks annunciator and PPC; determines the affected component is CFCU 1-2.
Note: The Crew may elect to secure CFCU 1-2 at any point after discovering the lack of CCW flow and rising CFCU bearing alarms.		
	BOP	<ul style="list-style-type: none"> (2.1.2) Checks CCW flow on all CFCUs. Observes CFCU 1-2, FI-35 (VB1, vertical section), is several hundred gpm below normal and trending down. (2.1.3) Checks containment ambient air temperature less than 120°F. (VB1, vertical section).
	SRO	Reads note regarding CFCU ability to be run at elevated temperatures (stator/bearings), without affecting the component lifetime. <ul style="list-style-type: none"> (2.1.4) Notes documentation is required if CFCU is left in service with high temperature alarms.
Note 1: Reactor Operators will be monitoring CFCU 1-2 stator and bearing temperatures using Plant Process Computer (PPC). Actual stator temperature at this point will vary based on crew pace through annunciator response, but is most likely above the limit described below.		
Note 2: CFCU 1-2 will trip on overcurrent if fan is still running 7 min after stator temp reaches 380°F.		
	SRO	<ul style="list-style-type: none"> (2.1.5) Notes need to contact engineering for evaluation if fan will be left in service with stator temperature above 293°F. (2.1.6) Provides direction to shutdown CFCU 1-2 per OP H-2:II, "Containment Fan Coolers - Shutdown, Placing in Standby, and Clearing" or OP H-2:I, "Containment Fan Cooler Units - Make Available and System Operation". Enters TS 3.6.6.C for one required CFCU system inoperable (7 day shutdown tech spec). <ul style="list-style-type: none"> CFCU 1-2 inoperable due to no CCW flow and beginning stages of damage to the motor.
<i>(continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 1 Event No.: 3 Page 6 of 15Event Description: CFCU 1-2 high stator/bearing temperature due to low CCW flow (continued)

Time	Position	Applicant's Actions or Behavior
(OP H-2:II, "Containment Fan Coolers - Shutdown, Placing in Standby, and Clearing") if used, else N/A		
	BOP	<ul style="list-style-type: none"> Reviews Precautions and Limitations. (6.1) Stops CFCU 1-2, by pressing associated STOP control on VB1 (center).
	ATC	<ul style="list-style-type: none"> Acknowledges reflash on PK01-21 for CFCU 1-2 high vibration (expected during coast down) after verifying input.
	BOP	<ul style="list-style-type: none"> Resets CFCU Vibration alarm to clear annunciator panel (VB1, lower).
Note 1: There is an 18 second time delay between switch press and actual CFCU start.		
(OP H-2:I, "Containment Fan Cooler Units - Make Available and System Operation") if used, else N/A		
	BOP	<ul style="list-style-type: none"> Reviews Precautions and Limitations. Reads three notes regarding delay time on start and expected alarms. (6.4.1.a) Starts CFCU 1-5 by setting the associated speed select switch to LOW and depressing the switch to start the CFCU VB1 (center). (6.4.1.b) Checks amps stable VB1 (center). (6.4.1.c) May switch CFCU to high speed operation as follows: <ul style="list-style-type: none"> Presses "STOP" pushbutton for the CFCU 1-5. Immediately places SPEED SELECT switch to "HIGH" AND depresses switch to restart the CFCU. Checks current stabilizes. Returns speed select switch to "LOW". (6.4.1.d) When PK01-21, "Contmt Fan Clrs" alarm comes in for high vibration: <ul style="list-style-type: none"> Confirms alarm input is for high vibration on CFCU 1-5. Presses VIB ALARM RESET pushbutton to reset the alarm (VB1). (6.4.2) Stops CFCU 1-2, by pressing associated STOP control on VB1 (center).
	ATC	<ul style="list-style-type: none"> Acknowledges reflash on PK01-21 for CFCU 1-2 high vibration (expected during coast down) after verifying input.
	BOP	<ul style="list-style-type: none"> Resets CFCU Vibration alarm to clear annunciator panel (VB1, lower).
Proceed to the next event once Tech Specs addressed, per Lead Examiner.		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 1Event No.: 4Page 7 of 15

Event Description: SSPS relay actuation causes Inadvertent TDAFW Pump Start and Blowdown Sample Line Isolation (CT)

Time	Position	Applicant's Actions or Behavior
	ALL	<p>Diagnoses TDAFW Pump Start from one or more of the following:</p> <ul style="list-style-type: none"> • RCS Temperature lowers (secondary cooldown) (CC2, VB2 meters, PPC) • Feedflow / Steamflow rates diverging (CC3, VB3) • RED light on FCV-95 illuminated indicating OPEN w/Tach reading ~ 4500 RPM (VB3) • TDAFW Discharge Pressure ~ 1200 psig, AFW Flow to S/Gs all reading top of scale (VB3) • Diagnoses Blowdown Sample Line Isolation from blowdown valve position indicator lights for FCV-151, 154, 157, 160, 244, 246, 248, and 250 (VB-3)
	ALL	<ul style="list-style-type: none"> • Reviews primary and secondary side parameters and determines plant is not stable (i.e. in a transient) based on the following indications: <ul style="list-style-type: none"> ○ RCS Temperature lowers (secondary cooldown) (CC2, VB2 meters, PPC) • Reviews secondary side for changed conditions affecting secondary load/efficiency <ul style="list-style-type: none"> ○ Review of secondary side indications identifies Feedflow / Steamflow mismatch due to excess supply from the TDAFW pump. Numerous pressure, flow, and level gauges confirm the pump is actively feeding forward.
	SRO/BOP	<ul style="list-style-type: none"> • Foreman implements TS 3.7.5.B, AFW System for one AFW train inoperable. Restore to operable status (72 hr). • Directs isolation of the TDAFW Pump. May reference OP D-1:III, "Auxiliary Feedwater System – Shutdown and Clearing" or direct isolation by any of the following methods: <ul style="list-style-type: none"> • Closing the LCVs -106, 107, 108, and 109 to the individual S/Gs ** OR • Closing steam supply valves FCV-37 and FCV-38 to leads 2 and 3 respectively ** OR • Directing FCV-95 closed in the field ** <p>**(Critical Task) (S1CT-1) Shutdown TD AFW pump prior to any Steam Generator Overfill (S/G wide range greater than 100%)</p>
Proceed to the next event once Tech Spec addressed, per the lead examiner.		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 1 Event No.: 5,6,7 Page 8 of 15

Event Description: MSLB Outside Containment, downstream of MSIVs; MSIVs Fail Open

Time	Position	Applicant's Actions or Behavior
	ALL	Crew identifies RCS temperature lowering, pressurizer level and pressure lowering based on the following: Annunciator Response Alarms: <ul style="list-style-type: none"> • PK09-01, 09-02, 09-03, 09-04 due to lowering S/G pressure and level • PK09-15, DIGITAL FEEDWATER CONT SYSTEM (due to feedflow/steam flow mismatch) • PK05-16, PZR PRESSURE HI/LO (pressure low due to cooldown) • PK04-06, PROTECT CHANNEL ACTIVATED (for Tave less than 554°F on loop 1 due to cooldown) • PK04-14, REACTOR TRIP ACTUATED (if not manually actuated). • PK08-21, SAFETY INJECTION ACTUATION (if not manually actuated w/reactor trip). • RCS Cooldown Indications: PPC, VB2, and CC1 trends • Increased Steam Flow: PPC, VB3, CC3 steam flow meters, record, and trends
	SRO	<ul style="list-style-type: none"> • May direct manual reactor trip and shutting of MSIVs. • Implements EOP E-0, "Reactor Trip or Safety Injection".
	ALL	<ul style="list-style-type: none"> • Perform immediate actions.
(EOP E-0, "Reactor Trip or Safety Injection")		
	SRO/ATC	<ul style="list-style-type: none"> • (1) Ensures reactor trip (trip bkrs open, rods on bottom, NIs decreasing) (VB2, CC1). • (2) Ensures turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps).
	SRO/BOP	<ul style="list-style-type: none"> • (3) Ensures all vital 4kv buses energized (VB4, all vital buses white lights on mimic buses with power supplied by Startup).
(continued on next page)		

(continued on next page)

**** Critical Task**

Op-Test No.: L181-NRCScenario No.: 1Event No.: 6Page 9 of 15Event Description: MSLB Outside Containment, downstream of MSIVs; MSIVs Fail Open (continued)(CT)

Time	Position	Applicant's Actions or Behavior												
(EOP E-0, "Reactor Trip or Safety Injection", continued)														
	SRO/ATC	<ul style="list-style-type: none">(4) Checks if SI actuated (PK08-21 ON) and reports Train B of SI failed to actuate.												
	SRO/BOP	<ul style="list-style-type: none">Closes MSIVs FCV-41, 43, and 44.**Reports FCV-42 will not close. May dispatch field operator to manually isolate FCV-42 following the guidance of EOP E-0 or E-2, Appendix L. <p>**(Critical Task) (S1CT-2, Stop RCS Cooldown)- Partial</p>												
	SRO/BOP	<ul style="list-style-type: none">(5) Directs App E implemented (usually to BOP)(see page 13).<ul style="list-style-type: none">Board manipulations are as follows:<ul style="list-style-type: none">Manually initiates Main Unit Trip (CC3)Manually actuates Phase A (VB1)Manually start the following pumps and CFCUs:<table><tr><td>• CCP 1-2</td><td>• ASW 1-2 (after taking to manual)</td></tr><tr><td>• SIP 1-2</td><td>• RHR 1-1</td></tr><tr><td colspan="2">• CFCU 1-3 (and CFCU 1-5 if not running)</td></tr></table>Manually positions the following valves:<table><tr><td>• 8803B OPEN</td><td>• LCV-112C CLOSED</td></tr><tr><td>• 8801B OPEN</td><td>• 8108 CLOSED</td></tr><tr><td colspan="2">• 8805B OPEN</td></tr></table><ul style="list-style-type: none">Stops CCP 1-3Closes Excess Letdown Isolation Valves 8166 and 8167 (VB2).Switch LCV-12 to CONT ONLY (VB3).Main Feedwater Recirc Valves FCV-53 & 54: OPEN (VB3).Stops all but one CB Pp set.Turn on Aux bldg vent charcoal filter preheater (VB4).Throttles RCP seal injection flows to normal if needed (FCV-128, to 8-13 gpm each, CC2).	• CCP 1-2	• ASW 1-2 (after taking to manual)	• SIP 1-2	• RHR 1-1	• CFCU 1-3 (and CFCU 1-5 if not running)		• 8803B OPEN	• LCV-112C CLOSED	• 8801B OPEN	• 8108 CLOSED	• 8805B OPEN	
• CCP 1-2	• ASW 1-2 (after taking to manual)													
• SIP 1-2	• RHR 1-1													
• CFCU 1-3 (and CFCU 1-5 if not running)														
• 8803B OPEN	• LCV-112C CLOSED													
• 8801B OPEN	• 8108 CLOSED													
• 8805B OPEN														
(continued on next page)														

** Critical Task

Op-Test No.: L181-NRCScenario No.: 1Event No.: 6Page 10 of 15Event Description: MSLB Outside Containment, downstream of MSIVs; MSIVs Fail Open (continued)(CT)

Time	Position	Applicant's Actions or Behavior
(EOP E-0, "Reactor Trip or Safety Injection", continued)		
	SRO/ATC	<ul style="list-style-type: none"> (6) Checks RCS temperature NOT stable <ul style="list-style-type: none"> Throttles AFW flow while maintaining minimum of 435 gpm flow** Dispatches field operator to close FCV-42 per Appendix L (if not done earlier)** (7) Checks Pzr PORVs and Pzr safeties (closed) / PORV block valves (all open and power available), and no elevated tailpipe temps or sonic flows on safeties/PORVs (VB2 – upper panel, far right); checks Pzr sprays closed (CC2). (8) Checks RCP trip criteria (RCS pressure [VB2, PPC] < 1300 psig and SI or ECCS CCPs running; determines RCPs should be secured (VB2). (9) Checks for faulted S/Gs <ul style="list-style-type: none"> Notes MSIV FCV-42 could NOT be closed from the control room. S/G pressure continuing to lower on S/G 1-2 (VB3). <p>** (Critical Task) (S1CT-2, Stop RCS Cooldown)- Partial</p>
	SRO	<ul style="list-style-type: none"> Transitions to EOP E-2 (next page).
(EOP E-2, "Faulted S/G Isolation")		
	SRO	Reads three CAUTIONS prior to step 1.
	SRO/ATC	<ul style="list-style-type: none"> (1) Checks if MSIV FCV-42 is still open. <ul style="list-style-type: none"> Dispatches field operator to close FCV-42 per Appendix L (if not done earlier)** Notes bypasses are closed (VB3, upper panel, left side). (2) Checks for any intact S/G – notes S/G 1-1, 1-3, and 1-4 are intact. <p>** (Critical Task) (S1CT-2, Stop RCS Cooldown)- Partial</p>
	SRO/ATC	<ul style="list-style-type: none"> (3) Identifies 1-2 S/G as faulted (VB3, pressure is still dropping in uncontrolled manner, or completely depressurized at this point).
(continued on next page)		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 1 Event No.: 6 Page 13 of 15Event Description: MSLB Outside Containment, downstream of MSIVs; MSIVs Fail Open (continued)

Time	Position	Applicant's Actions or Behavior												
(EOP E-0, "Appendix E - ESF Auto Actions, Secondary and Auxiliaries Status")														
	BOP	<p>Implements "App E (ESF Auto Actions, Secondary and Auxiliaries Status)":</p> <ul style="list-style-type: none">(1) Notifies Plant Personnel.<ul style="list-style-type: none">Checks no personnel in Containment (part of turnover; may not voice); Announces trip/SI on PA system.(2) Checks main generator – tripped.<ul style="list-style-type: none">PK14-01 OFF, output breakers OPEN, Exciter Field Breaker - OPEN (CC3 right side)Manually initiates Main Unit Trip (CC3).(3 & 4) Ensures Phase A and Containment Vent Isolation complete (VB1, ESF status lights, red lights- Trn A ON, Trn B OFF, various white lights ON).<ul style="list-style-type: none">Manually actuates Phase A (VB1).(5) Ensures ESF (SI) actuation complete (VB1, ESF status lights, red light ON, various white lights ON).<ul style="list-style-type: none">Manually start the following pumps and CFCUs:<table><tr><td>• CCP 1-2</td><td>• ASW 1-2 (after taking to manual)</td></tr><tr><td>• SIP 1-2</td><td>• RHR 1-1</td></tr><tr><td colspan="2">• CFCUs 1-3, (and CFCU 1-5 if not running)</td></tr></table>Manually positions the following valves:<table><tr><td>• 8803B OPEN</td><td>• LCV-112C CLOSED</td></tr><tr><td>• 8801B OPEN</td><td>• 8108 CLOSED</td></tr><tr><td colspan="2">• 8805B OPEN</td></tr></table>(6) Verifies Feedwater isolation complete (F.W. Isolation and S.G. Level Portions of Monitor Light Box C: red lights ON, white lights OFF (VB1).	• CCP 1-2	• ASW 1-2 (after taking to manual)	• SIP 1-2	• RHR 1-1	• CFCUs 1-3, (and CFCU 1-5 if not running)		• 8803B OPEN	• LCV-112C CLOSED	• 8801B OPEN	• 8108 CLOSED	• 8805B OPEN	
• CCP 1-2	• ASW 1-2 (after taking to manual)													
• SIP 1-2	• RHR 1-1													
• CFCUs 1-3, (and CFCU 1-5 if not running)														
• 8803B OPEN	• LCV-112C CLOSED													
• 8801B OPEN	• 8108 CLOSED													
• 8805B OPEN														
(continued on next page)														

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 1 Event No.: 6 Page 14 of 15Event Description: MSLB Outside Containment, downstream of MSIVs; MSIVs Fail Open (continued)

Time	Position	Applicant's Actions or Behavior
(EOP E-0, Appendix E - ESF Auto Actions, Secondary and Auxiliaries Status)		
	BOP	<ul style="list-style-type: none"> • (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 (VB1)). • (8) Checks Main Steamline Isolation complete (Main Steam Isolation portion of Monitor Light Box D: red light ON, white light ON for FCV-42 (VB1)). <ul style="list-style-type: none"> ◦ Dispatches field operator to close FCV-42 per Appendix L if not previously directed. • (9) Checks AFW status <ul style="list-style-type: none"> ◦ Both MDAFW pumps running with flow throttled to maintain greater than 435 gpm min flow (VB3). • (10) Checks ECCS flows (charging injection (VB2), SI, RHR (VB1)) <ul style="list-style-type: none"> ◦ Shuts down CCP 1-3 (VB2). • (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). • (12) Isolates excess letdown – 8166 and 8167 (VB2). • (13) Checks secondary systems MFPs tripped (VB3, green lights ON), stops all but one CB Pp set, takes LCV-12 control switch to CONT ONLY, takes FCV-53 and FCV-54 to RECIRC. • (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). • (15) Verifies available DGs running normally (VB4). • (16) Verifies vital batteries indicate normal voltage and positive charging amps VB5). • (17) Verifies MSRs reset (Triconex HMI)(CC3). • (18) Throttles RCP seal injection flows if needed (FCV-128, to 8-13 gpm each, CC2). • (19) Checks PK11-04 NOT IN (SFP alarm). • (20) Notifies Shift Foreman of completion.
<i>(Board Operator will rejoin crew upon completion of Appendix or when called upon by Shift Foreman)</i>		

** Critical Task

Event Description: EOP E-2, "Appendix HH, Isolate Faulted Steam Generator" (CT)

** Critical Task

Attachment 1 – Scenario Set-up & Booth Actions

X = manual entry required

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	IC	RESTORE IC-47	2%; MOL, C _B – See Turnover Sheet
X	Setup	N/A	CFCU 1-1 OOS; CFCU 1-2, 1-3, 1-4 running in HIGH; CFCU 1-5 is OFF.
	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 NOT Marked up		OP B-1A:IV, D-1:III, H-2:II, PK01-21, AP-18, EOP E-0, E-2, E-1.1
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"> S1CT1: TDAFW flow and S/G levels S1CT2: FCV-42 position, AFW flow S1CT3: ECCS Injection Flow
X	0 min	Lesson L181 NRC-S1.lsn	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	Placeholder only
X	<u>Evt-2: LCV-459, Fails to mid-position</u> (Once power raised 0.5%, per lead examiner)	<u>Evt-2: LCV-459 Fails Mid-Position (OP PK, AP, or EOP)</u> Initial State: PENDING Delay Time: 00:00:00.000 ● insert VLV_CVC22_2.5 delay=0 ramp=15 on=0 off=0	LCV-459, Fails to mid-position
X	<u>Evt-3: CFCU 1-2 High Stator Temp</u> (once Excess Ltdn established, per Lead Examiner)	<u>Event 3A - CFCU 1-2 Stator Temp Rising</u> Initial State: PENDING Delay Time: 00:00:00.000 ● insert H_V1_034M_1 795 delay=0 ramp=120 on=0 off=0 ● insert XMT_VEN6_3 115 delay=0 ramp=150 on=0 off=0 ● insert XMT_VEN7_3 124 delay=0 ramp=150 on=0 off=0 ● insert XMT_VEN8_3 382 delay=0 ramp=150 on=0 off=0 <u>Event 3B - CFCU 1-2 Stator Temp H - OC after 5 min at 38</u> Initial State: TRIGGER Delay Time: 00:00:00.000 ■ TXMT(CFCU2) GT 380 ● insert PMP_VEN6_MTRF 56.44 cd=H_V1_232r_1 delay=0 ramp=5 on=0 off=0 ● insert XMT_VEN6_3 94.5 cd=H_V1_232G_1 delay=0 ramp=600 on=0 off=0 ● insert XMT_VEN7_3 93.6 cd=H_V1_232G_1 delay=0 ramp=600 on=0 off=0 ● insert XMT_VEN8_3 91.3 cd=H_V1_232G_1 delay=0 ramp=600 on=0 off=0	Stator and bearing temperatures ramp up over 2-3 minutes. CFCU will trip on overcurrent if it has not been shut down within 7 minutes of reaching 380°F. If crew does not request removing CFCU 1-2 from service, enter command to have CFCU 1-2 trip on OC when it restarts due to SI signal.
X	<u>Evt-4: Inadvertent start of TDAFW pump</u> (Once Evt-2 TS have been addressed, per lead examiner)	<u>Evt-4: SSPS failure causes TDAFW pump start (TS 3.7.5.B)</u> Initial State: PENDING Delay Time: 00:00:00.000 ● insert RLY_PPL63_2 OPEN delay=0 ramp=0 on=0 off=0 ● insert RLY_PPL58_2 OPEN delay=0 ramp=0 on=0 off=0	Inadvertent start of TDAFW pump and partial blowdown isolation
X	<u>Evt-5: MSLB on S/G 1-2</u> (Once Evt-4 TS have been addressed, per lead examiner)	<u>Evt-5 (Major): MSLB Downstream of MSIVs (Trigger if helpful)</u> Initial State: PENDING Delay Time: 00:00:00.000 ● insert MAL_MSS4 1.856E+07 delay=0 ramp=30 on=0 off=0	MSLB downstream of MSIVs.

(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: MSIVs Fail Open (post trip)</u>	<p>Evt-6: MSIVs Fail Open; No manual close for FCV-4x</p> <p>Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert VLV_MSS7_1 1 delay=0 ramp=0 on=0 off=0 ● insert VLV_MSS8_1 1 delay=0 ramp=0 on=0 off=0 ● insert VLV_MSS9_1 1 delay=0 ramp=0 on=0 off=0 ● insert VLV_MSS10_1 1 delay=0 ramp=0 on=0 off=0 ● delIA VLV_MSS7_1 2 delay=0 cd=V3_183s_1' ● delIA VLV_MSS9_1 2 delay=0 cd=V3_185S_1' ● delIA VLV_MSS10_1 2 delay=0 cd=V3_186S_1' 	<p>All four MSIVs fail open. FCV-41, 43, and 44 can be closed in the control room. Crew will need to call to have FCV-42 closed.</p> <p>DO NOT CLOSE FCV-42 UNTIL CREW HAS ENTERED E-2.</p>
<u>Evt-7: SI, Train B fails to actuate (post trip)</u>	<p>Evt-7: Safety Injection Train B Fails</p> <p>Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert MAL_PPL3B BOTH delay=0 ramp=0 on=0 off=0 	<p>Crew will manually initiate Safety Injection in response to MSLB. Failure will require manual starting of Train B ECCS pumps and manual alignment of valves.</p>



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: 2%

Net Generation: 0 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 5.7 SW 5.7 NE 5.7 SE 5.8 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 EMERGENT WORK:

- CFCU 1-1 OOS for Bearing Replacement

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.
- MFP 1-1 is in service and supplying feedwater.
- The unit is currently aligned to Startup Power (230 kV).
- OP L-0 has been signed off for Mode 1 Entry.
- No one is in Containment.
- CFCU 1-1 OOS for Bearing Replacement.

PRIORITY ITEMS FOR NEXT SHIFT:

- Continue with OP L-3, step 6.28, and stabilize power at approximately 8%.

ANNUNCIATORS IN ALARM:

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

Shift Foreman Turnover

TURNOVER ITEMS:

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

REACTIVITY MANAGEMENT:

- Time in core life: MOL.
- Power History: Previously at 100% for 17 days. Currently power level is approximately 2% following a reactor trip a week ago (MFP trip during maintenance).
- Boron concentration is 1259 ppm from a sample taken 2 hours ago.
- Control Rod Height: 158 steps on CBD.
- Rod motion: used to maintain current power level and to raise power to 8%.

CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- None

OTHER ABNORMAL PLANT STATUS

- None

Facility: Diablo Canyon (PWR) Scenario No: 2 Op-Test No: L181 NRC

Examiners: _____ Operators: _____

Initial Conditions: 75% Power, MOL with AFW 1-2 cleared for a bearing oil leak

Turnover: At 75% power for SCCW HX Clearance

Event No	Malfunction No.	Event Type*	Event Description (See Summary for Narrative Detail)
1	H5ESP_INIT_455G 0 ramp=20 RCCIPCSDI_H5DHC455GSPUPTFFREEZE TRUE	I (ATC, SRO)	Pressurizer Spray Valve PCV-455A setpoint failure causing RCS pressure to slowly lower (AR PK05-16, OP AP-13).
2	XMT_PZR24_3 ramp=1	TS, I (BOP, SRO)	PT-474, Pressurizer Pressure Transmitter, Fails Low (OP AP-5, TS 3.3.1.E, M, 3.3.2.D, 3.4.11.B).
3	XMT_CVC2_3 ramp=75	I (BOP, SRO)	PT-135 Fails High causing letdown pressure control valve to go full open (AR PK04-21).
4	MAL_RCS4H 30.0	TS, C (ALL)	30 gpm SGTL on loop 4; plant shutdown required (OP AP-3, OP AP-25, TS 3.4.13.B).
5	MAL_RCS4H 400.0 ramp=60	M (ALL)	Tube leak grows to 400 gpm rupture during ramp offline.
6	MAL_EPS5A_2 DIFFERENTIAL cd='H_V5_194B_1' delay=10	C (BOP, SRO)	12 kV Bus D feeder breaker trips on differential on transfer to startup power.
7	MAL_EPS4D_2 DIFFERENTIAL cd='h_v4_221r_1'	C (ALL)	4kV Bus G differential trip on transfer to startup power.
*(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 1,2,3,4,5,6,7)	7
2. Malfunctions after EOP entry (1-2) (Events 6,7)	2
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-3)	1
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)(See description below)	3

Critical Task	Justification	Reference
<p>(S2CT-1) Isolate the ruptured steam generator from the intact steam generators prior to commencing cooldown of the RCS in step 10.b (10% steam dump) by completing the following:</p> <p>Isolate feedwater by ensuring closed: LCV-109 (TDAFW Level Control Valve) LCV-113 (MDAFW Level Control Valve)</p> <p>Isolate steam flow by closing FCV-44 (MSIV)</p>	<p>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.</p>	<ul style="list-style-type: none"> W Margin to Overfill (CN-CRA-05-53 Rev1) W Offsite Doses (CN-CRA-05-54) SGTR UFSAR 15.4.3 WCAP-17711-NP
<p>(S2CT-2) Perform RCS cooldown at maximum rate to CETC target temperature specified in E-3, step 6, using steam dumps such that RCS subcooled margin still exists following the cooldown.</p> <p><i>Maximum rate cooldown requires 10% steam dumps on intact S/Gs to be at least 90% open.</i></p>	<p>Transition to contingency procedures to address inadequate subcooling or Pressurized Thermal Shock conditions results in delaying RCS depressurization and SI termination. This delay allows excess inventory in the ruptured S/G to continue to increase, with the potential of challenging SG overpressure components or causing an overfill condition to occur.</p>	<ul style="list-style-type: none"> W Margin to Overfill (CN-CRA-05-53 Rev1) SGTR UFSAR 15.4.3 WCAP-17711-NP
<p>(S2CT-3) Depressurize the RCS to meet depressurization criteria specified in E-3, App GG prior to stopping any Safety Injection pump.</p>	<p>Failure to stop reactor coolant leakage into a ruptured SG by depressurizing the RCS complicates mitigation of the event and constitutes a “significant reduction of safety margin beyond that irreparably introduced by the scenario”.</p>	<ul style="list-style-type: none"> W Margin to Overfill (CN-CRA-05-53 Rev1) SGTR UFSAR 15.4.3 WCAP-17711-NP
<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 #2

1. Pressurizer Spray Valve controller failure causes PCV-455A to ramp open and RCS pressure begins to lower slowly. **PK05-16, PZR PRESSURE HI/LO** alarms when RCS pressure reaches 2210 psig. The crew follows AR PK05-16 guidance to take manual control and close the spray valve. The crew may follow up with the actions of **OP AP-13, Malfunction of Reactor Pressure Control System** or **OP AP-5, Malfunction of Eagle-21 Protection or Control Channel**, to restore pressure to normal using manual control. Alternately, the crew may diagnose the failure prior to the annunciator response activating and enter OP AP-13 directly which also directs taking manual control and closing the spray valve.
2. PT-474, Pressurizer Pressure Transmitter, fails low bringing in multiple Annunciator Alarms. There is no transient associated with this failure, but the failure has significant Operational implications due to its input function as part of various Reactor Protection logic schemes. When failed low, PT-474's interlock function prevents Pressurizer PORVs PCV-455C and PCV-474 from opening on a valid high pressure signal; only PCV-456 will still function. The Shift Foreman may elect to enter any of the associated Annunciator Response alarms, but in all cases, will be directed to **OP AP-5, Malfunction of Eagle-21 Protection or Control Channel**, which provides information regarding indications, controls, and a listing of the associated Tech Specs:
 - **TS 3.3.1.E, PC-474C High Press Trip & TC 441C OT Delta T Trip** (72 hrs).
 - **TS 3.3.1.M, PC 474A Low Press Trip** (72 hrs).
 - **TS 3.3.2.D, PC 474D Low Press S.I.** (72 hrs).
 - **TS 3.4.11, PC 474B PORV Press Interlock**
 - **PCV-474 (non-class I), 3.4.11.B1 & B2 to close & remove power from associated block valve** (1 hr)
 - **PCV-455C (class I), 3.4.11.B1 & B2 to close & remove power from associated block valve** (1 hr); **3.4.11.B3 to return to OPERABLE status** (72 hrs).
3. PT-135, Transmitter for Letdown Pressure Control Valve, fails High causing letdown pressure control valve to go full open and letdown flow to rise. **AR PK04-21, LETDOWN PRESS / FLOW TEMP** comes into alarm for Letdown Heat Exchanger Outlet Pressure High as a result of the failed transmitter, while actual letdown pressure lowers to approximately 90 psig as a result of full open control valve response. Letdown flow increases approximately 8 gpm above normal, resulting in a charging/letdown mismatch. Procedural guidance in AR PK04-21 directs crew to take manual control of PCV-135. Crew performs diagnostic brief to determine nature of the malfunction as well as actions required to restore letdown pressure back to normal band.
4. Steam Generator 1-4 develops a 30 gpm tube leak as indicated by rising counts on various radiation monitors. The crew enters **OP AP-3, Steam Generator Tube Failure**. Shift Foreman determines **TS 3.4.13.B, RCS Operational Leakage** applies and enters **OP AP-25, Rapid Load Reduction or Shutdown** for the ramp off-line.
5. During the ramp the tube leak develops into a 400 gpm rupture. The crew determines the leak is substantial in size based on a rapid drop in pressurizer level. The Shift Foreman directs a reactor trip and safety injection and the crew enters **EOP E-0, Reactor Trip or Safety Injection**.

(continued)

SCENARIO SUMMARY – NRC #2

6. On the transfer to start up power, 4 kV bus G experiences a differential fault. 12kV bus D also trips on differential causing a loss of vacuum as well as tripping of RCPs 1-2 and 1-4.
7. The crew transitions to **EOP E-3, Steam Generator Tube Rupture**, based on RM-74 and rising S/G 1-4 level, where they address the following critical tasks:
 - **(S2CT-1) Isolate the ruptured steam generator from the intact steam generators prior to commencing cooldown.**
 - **(S2CT-2) Perform RCS cooldown at maximum rate to CETC target temperature.**
 - **(S2CT-3) Depressurize the RCS to meet depressurization criteria specified in Appendix GG.**

The scenario is terminated once the crew has completed critical task S2CT-3.

Op-Test No.: L181-NRCScenario No.: 2Event No.: 1Page 1 of 21Event Description: Pressurizer Spray PCV-455A setpoint fails low

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnoses spray problem from: <ul style="list-style-type: none"> • RCS Pressure lowering (VB2, PPC). • PK05-16 actuation when RCS pressure reaches 2210 psig. • Spray valve indicating open (CC2).
(AR PK05-16, "PZR PRESSURE HI/LO") if entered, else N/A		
	SRO	<ul style="list-style-type: none"> • (2.1.1) Advises crew that entry into EOP E-0 is required in the event of a reactor trip.
Note: Crew may refer to AR PK05-16 prior to annunciator actuating at 2210 psig, in which case the following step would not apply.		
	SRO/BOP	<ul style="list-style-type: none"> • (2.1.2) Notes RCS pressure is less than 2210 psig. <ul style="list-style-type: none"> o Checks PORVs closed (VB2). o Checks both spray valves closed <ul style="list-style-type: none"> ▪ Notes Pressurizer Spray Valve, PCV-455A is NOT closed (CC2). ▪ Takes manual control and closes PCV-455A.
Note: Turning on pressurizer backup heaters will allow crew to restore RCS pressure to the normal bank. Manual control, however, will be required for the duration of the scenario.		
	SRO/ATC	<ul style="list-style-type: none"> • (2.1.2) Notes RCS pressure is less than 2210 psig. <ul style="list-style-type: none"> o Turns on PZR backup heaters (CC1).
	SRO	<ul style="list-style-type: none"> • (2.1.3) Checks if RCS pressure is less than 2175 psig. <ul style="list-style-type: none"> o If yes, references TS 3.4.1 for RCS departure from nucleate boiling limits.
	SRO/ATC	<ul style="list-style-type: none"> • (2.1.4) Verifies HC-455K, Pzr Pressure Controller, set at 78.8% Setpoint (2235 psig).
	SRO/BOP	<ul style="list-style-type: none"> • (2.1.5) Performs a channel check of all Pzr pressure channels (VB2).
(Continued on next page)		

** Critical Task

Op-Test No.: L181-NRC

Scenario No.: 2

Event No.: 1

Page 2 of 21

Event Description: Pressurizer Spray PCV-455A setpoint fails low (continued)

Time	Position	Applicant's Actions or Behavior
	SRO/ATC	<ul style="list-style-type: none"> Reads note regarding PCS automatic control channel selection. (2.1.6) Checks pressurizer pressure channel readings for channel check.
	SRO	<ul style="list-style-type: none"> Goes to OP AP-5, "Malfunction of Eagle 21 Protection or Control Channel."
(OP AP-5, "Malfunction of Eagle-21 Protection or Control Channel") if used, else N/A		
	SRO/ATC	<ul style="list-style-type: none"> (1) Determines primary and secondary control systems are NOT controlling properly in AUTO. <ul style="list-style-type: none"> Takes manual control of PCV-455A and closes (if not done previously).
	SRO/BOP	<ul style="list-style-type: none"> (2) Determines that the failure is not Eagle-21 related (PK06-01 and PK06-03 are OFF).
	SRO/ATC	<ul style="list-style-type: none"> (3) Determines failure is associated with Pressurizer Pressure, but failure does not affect the currently selected ΔT channel (VB2).
	SRO/BOP	<ul style="list-style-type: none"> (4) Verifies steam dumps are not open.
	SRO	<ul style="list-style-type: none"> (5) Notifies I&C of apparent pressurizer spray control failure. Reads CAUTION regarding Eagle 21 design failure impact to outputs prior to step 6. (6) Notes requirements to take channel OOS prior to maintenance.
	SRO/ATC	<ul style="list-style-type: none"> (7-8) Determines remaining steps of procedure do not apply and exits OP AP-5.
(Continued on next page)		

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** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 1Page 3 of 21Event Description: Pressurizer Spray PCV-455A setpoint fails low (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"> (1) Notes there are no load changes in progress.
	SRO/BOP	<ul style="list-style-type: none"> (2) Checks PZR PORVs – CLOSED (VB2). (3) Checks PZR Safety Relief Valves (VB2): <ul style="list-style-type: none"> (3.a) Sonic flow indicators – approx. ZERO. (3.b) Tail pipe temp – LESS THAN 185°F.
	SRO	<ul style="list-style-type: none"> Reads Caution regarding RCPs and normal spray supply.
	SRO/ATC	<ul style="list-style-type: none"> (4.a) Checks normal PRZ spray valves – CLOSED (CC2): <ul style="list-style-type: none"> PCV-455A PCV-455B <ul style="list-style-type: none"> Notes 455A is NOT closed. Takes manual control and closes valve.
	SRO/BOP	<ul style="list-style-type: none"> (4.b) Checks auxiliary PRZ spray valves – CLOSED (VB2): <ul style="list-style-type: none"> 8145 and 8148
	SRO/ATC	<ul style="list-style-type: none"> (5) Checks Pressurizer Heaters (CC1): <ul style="list-style-type: none"> (5.a) Notes normal power is available. (5.b) Notes PZR pressure is LESS THAN 2250 psig. (5.c RNO) If PZR pressure is NOT GREATER THAN 2210 psig; turns on all available backup PZR heaters.
	SRO/BOP	<ul style="list-style-type: none"> (6) Checks all pressure control channels operable (VB2, PCS).
	SRO/ATC	<ul style="list-style-type: none"> (7.a) Restores RCS Pressure to normal band (2210-2260 psig) using manual control.
Proceed to the next event once Pressurizer Pressure under control, per Lead Examiner)		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 2Page 4 of 21Event Description: PT-474, Pressurizer Pressure Transmitter, Fails Low

Time	Position	Applicant's Actions or Behavior
(AR PK04-06, "PROTECT CHANNEL ACTIVATED") if entered, else mark N/A		
	SRO	<ul style="list-style-type: none"> (1.0) Goes to section 2.1, General Actions. (2.1.1,2) Notes Annunciator Response contains reactor trip criteria and advises Crew. (2.1.3) Notes there are no surveillance tests in progress to cause the alarm.
	SRO/ATC	<ul style="list-style-type: none"> (2.1.4) Checks PPC for ALL protection channel bistables "OFF". (2.1.5) Identifies failed channel. <ul style="list-style-type: none"> Refers to TS 3.3.1, "Reactor Trip System (RTS) Instrumentation". Goes to OP AP-5, "Malfunction of Protection or Control Channel" (see pg 5)
(AR PK05-16, "PZR PRESSURE HI/LO") If entered, else mark N/A		
	SRO	<ul style="list-style-type: none"> (1.0) Goes to section 2.1, General Actions. (2.1.1) Notes Annunciator Response contains reactor trip criteria and advises Crew.
	SRO/ATC	<ul style="list-style-type: none"> (2.1.2,3) Notes actual pressurizer pressure is less NOT less than 2210 psig (PORV/spray actuation) or 2175 psig (RCS departure from nucleate boiling limits). (2.1.4) Verifies HC-455K, Pzr Pressure Controller, set at 78.8% Setpoint (2235 psig).
	SRO/BOP	<ul style="list-style-type: none"> (2.1.5) Performs a channel check of all Pzr pressure channels; identifies PI-474 reading bottom of scale (VB2). Reads NOTE regarding PCS Control Set input selection scheme (Median Select, based on 2nd highest out of channels) and possible failure scheme (3 of 4 inputs detected bad). (2.1.6) Checks for Pressurizer pressure channel abnormal reading. Identifies PI-474 reading bottom of scale (VB2). <ul style="list-style-type: none"> Check HC-455K in AUTO and controlling Pzr pressure with P_{ACT} and P_{REF} nearly matched (CC2). Goes to OP AP-5, "Malfunction of Protection or Control Channel" (see next page)
<i>(Continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 2Page 5 of 21Event Description: PT-474, Pressurizer Pressure Transmitter, Fails Low (continued)

Time	Position	Applicant's Actions or Behavior
(AR PK06-21, "PROCESS CONTROL SYS TROUBLE") If entered, else mark N/A		
	SRO	<ul style="list-style-type: none"> (1.0) Goes to Section 2.1, PCS Rack Channel Trouble.
	SRO/BOP	<ul style="list-style-type: none"> (2.1.1) Checks PCS HMI on CC4 to determine alarming channel. (2.1.2) May check PY-17N (behind hot shutdown panel) for no breakers tripped. (2.1.3) REFERS to Attachment for individual alarm input. <ul style="list-style-type: none"> Identifies mPzrPres_Dev, PT-455/PT-456/PT-457/PT-474 Pzr Press Channel Deviation (NON SAFETY RELATED CONTROL SET 1) Notes input has no associated automatic or Operator actions.
(OP AP-5, "Malfunction of Eagle-21 Protection or Control Channel")		
	SRO/ATC	<ul style="list-style-type: none"> (1) Determines primary and secondary control systems are controlling properly in AUTO.
	SRO/BOP	<ul style="list-style-type: none"> (2) Determines that the failure is not Eagle-21 related (PK06-01 and PK06-03 are OFF).
	SRO/ATC	<ul style="list-style-type: none"> (3) Determines failure is not associated with the selected ΔT channel (VB2).
	SRO/BOP	<ul style="list-style-type: none"> (4) Verifies steam dumps are not open as result of instrument failure or spurious actuation.
	SRO	<ul style="list-style-type: none"> (5) Notifies I&C of apparent pressurizer controller failure. Reads CAUTION regarding Eagle 21 design failure impact to outputs prior to step 6. (6) Notes requirements to take channel OOS prior to maintenance.
(Continued on next page)		

** Critical Task

Op-Test No.: L181-NRC

Scenario No.: 2

Event No.: 2

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Event Description: PT-474, Pressurizer Pressure Transmitter, Fails Low (continued)

Time	Position	Applicant's Actions or Behavior
(OP A-4A:III, "Pressurizer – Shutdown and Clearing")		
	BOP	Section 6.4 – "RCS-1-PCV-455C – Removing from Service at Power", step 6.4 <ul style="list-style-type: none">• (6.4.3) Places PCV-455C control switch to CLOSE (VB2)• (6.4.4.a) Closes 8000B, Block Valve B.• (6.4.4.b) Contacts field operator to open associated breaker 52-1G-46.
	BOP	Section 6.6 – "RCS-1-PCV-474 – Removing from Service at Power", step 6.6. <ul style="list-style-type: none">• (6.6.3) Places PCV-474 control switch to CLOSE (VB2)• (6.6.4.a) Closes 8000A, Block Valve A.• (6.6.4.b) Contacts field operator to open associated breaker 52-1F-40.
Proceed to the next event once Tech Specs are addressed, per Lead Examiner		

**** Critical Task**

Op-Test No.: L181-NRC Scenario No.: 2 Event No.: 3 Page 8 of 21Event Description: PT-135, Transmitter for Letdown Pressure Control Valve, Fails High

Time	Position	Applicant's Actions or Behavior
Note: PK04-21 already in alarm from PT-474 failure (Event 2), but may be entered.		
(AR PK04-21, "LETDOWN PRESS / FLO TEMP")		
	SRO	<ul style="list-style-type: none"> Enters AR PK04-21, "LETDOWN PRESS / FLO TEMP" <ul style="list-style-type: none"> (1.0) Identifies input 393 (Letdn HX Outlet Press Hi) and goes to section 2.1, General Actions. Reads two CAUTIONS (potential reactivity impact of letdown temperature excursions and elevated dose rate concerns if argon injection continues with letdown isolated. (2.1.1) Notes if letdown is isolated, argon injection must be isolated as well. (2.1.2) Notes requirement to go to seals only charging if letdown gets isolated.
Note: Crew may call for diagnostic brief during annunciator response implementation		
	ALL	<ul style="list-style-type: none"> (2.1.3) Checks for indications of a letdown line break: <ul style="list-style-type: none"> Letdown flow decrease – NO, flow has risen approximately 8 gpm. Letdown pressure decrease – PI-135 reads high while letdown flow rise indicates pressure has fallen. Containment sump level increasing – NO, sumps remain stable. VCT level decreasing – NO, VCT level begins to rise very slowly. Determines indications are not consistent with a letdown leak.
	SRO/BOP	<ul style="list-style-type: none"> (2.1.4) Checks if letdown HX outlet pressure is high. <ul style="list-style-type: none"> Notes PI-135 reads high, but letdown flow behavior indications the opposite Takes manual control of PCV-135 (VB2). Adjusts PCV-135 using alternate indications (Letdown flow rate, net charging, etc.) or from knowledge of normal demand setting for PCV-135 Hand Controller (VB2).

(Continued on next page)

** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 3Page 9 of 21Event Description: PT-135, Transmitter for Letdown Pressure Control Valve, Fails High (continued)

Time	Position	Applicant's Actions or Behavior
(AR PK04-21, "LETDOWN PRESS / FLO TEMP", continued)		
	SRO	<ul style="list-style-type: none"> Notes letdown flow can be controlled with PPCV-135 in manual from previous step. <ul style="list-style-type: none"> (2.1.5) Step is N/A - letdown flow is controlling properly in manual; it is not necessary to isolate letdown.
	SRO/ATC	<ul style="list-style-type: none"> Determines remainder of PK steps do not match plant conditions <ul style="list-style-type: none"> (2.1.6) Step is N/A - Letdown Heat Exchanger outlet temperature is NOT high (normal band). (2.1.7) Step is N/A - Charging flow was slightly low; may adjust as needed to maintain Pressurizer level within established bands. (2.1.8) Step is N/A - Charging appears norm (not lost).
	SRO/BOP	<ul style="list-style-type: none"> Determines remainder of PK steps do not match plant conditions: <ul style="list-style-type: none"> (2.1.9) Step is N/A - There are no indications that RV-8117 has lifted (PRT temperature, level, and pressure are all normal). (2.1.10, 11, 12, 13) Step is N/A - Letdown is not at risk; normal Letdown alignment should be maintained.
	SRO	<ul style="list-style-type: none"> May review probable causes for the alarm and identify PT-135 failed high. May reference OP AP-5, Malfunction of Eagle 21 Protection or Control Channel to aid in diagnostics.
(OP AP-5, "Malfunction of Eagle-21 Protection or Control Channel") if used, else mark N/A		
<u>Note:</u> Only step 1 is applicable to the malfunction; remaining steps have not been listed.		
	SRO/ATC	<ul style="list-style-type: none"> (1) Determines primary and secondary control systems was NOT controlling properly in AUTO, performs RNO actions: <ul style="list-style-type: none"> Takes manual control of PCV-135 (VB2). Adjusts PCV-135 using alternate indications (Letdown flow rate, net charging, etc.) or from knowledge of normal demand setting for PCV-135 Hand Controller (VB2).
<i>Proceed to the next event once PCV-135 is being controlled properly in MANUAL, per Lead Examiner</i>		

** Critical Task

Op-Test No.: L181-NRC

Scenario No.: 2

Event No.: 4

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Event Description: 30 gpm SGTL on loop 4

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnoses Steam Generator Tube Leak from one or more of the following: <ul style="list-style-type: none"> Increased charging flow (PPC, CC2). Air ejector off-gas hi-rad in alarm (PPC, RM-15/15R) (PK11-06). Steam generator blowdown hi-rad and/or isolation (PPC, RM-19,23) (PK11-17).
	ATC	<ul style="list-style-type: none"> Observes PK11-06 input 423 (SJAE Hi-Rad) alarming and informs the Shift Foreman.
	ATC/BOP	<ul style="list-style-type: none"> May check PPC and/or VB2 Recorders (lower left) for upscale readings/ trends on rad monitors.
(AR PK11-06, "SJAE HI-RAD", starting at step 2.1) if entered, otherwise this section is N/A		
	SRO/BOP	<ul style="list-style-type: none"> (2.1.1) Checks for upscale readings on both RM-15 and 15R (PPC, RCDR-3 VB2 lower left) (both are in alarm; may be over ranged). <ul style="list-style-type: none"> (2.1.1.a) Implements OP O-4, "Primary to Secondary Steam Generator Tube Leak Detection". (2.1.1.b) Notifies Chemistry of abnormal condition. (2.1.1.c) Transitions to OP AP-3, "Steam Generator Tube Failure".
Note: Review of OP O-4 shutdown criteria is also covered as part of OP AP-3, "Steam Generator Tube Failure" (if not addressed during AR PK11-06 response)		
	BOP	<ul style="list-style-type: none"> Reviews OP O-4, "Primary to Secondary Steam Generator Tube Leak Detection" for action levels and shutdown criteria. Evaluates OP O-4 action level using PPC Group Display. Determines current OP O-4 action level as 3 (leak >= 100 gpd) and updates Shift Foreman.

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**** Critical Task**

Op-Test No.: L181-NRCScenario No.: 2Event No.: 4Page 11 of 21Event Description: 30 gpm SGTL on loop 4 (continued)

Time	Position	Applicant's Actions or Behavior
(OP AP-3, "Steam Generator Tube Failure")		
	SRO	<ul style="list-style-type: none"> Reads NOTE prior to step 1 regarding requirement to complete procedure actions unless superseded by EOP E-3 , "Steam Generator Tube Rupture".
<u>Note:</u> Maintaining Pressurizer level stable is a Continuous Action. Associated RNO steps are performed when crew reports applicable conditions exist (i.e unable to maintain pressurizer level).		
	SRO/ATC	<ul style="list-style-type: none"> (1) Checks pressurizer level and charging flow. <ul style="list-style-type: none"> (1.a) May take charging to MANUAL control and attempt to adjust charging and seal flow to maintain pressurizer level (CC2).
	SRO/BOP	<ul style="list-style-type: none"> (1.a RNO) May start additional charging pump IF requested by ATC (VB2)
	SRO/ATC	<ul style="list-style-type: none"> (1.b) Checks for continuing decrease in pressurizer level. <ul style="list-style-type: none"> Determines leak rate is approximately 30 gpm. Readjusts charging and seal flow (CC2). Determines pressurizer level is stable (CC2, PPC) (Continuous Action to Monitor). May isolate Letdown by closing 8149C and LCV-459/460 (VB2).
	SRO/BOP	<ul style="list-style-type: none"> (2) Identify affected steam generator. <ul style="list-style-type: none"> (2.a) Determines that no S/G levels are rising unexpectedly (VB3 meters, PPC). (2.b) Identifies main steamline rad monitor 74 rising (VB2 recorders, upper left; PPC). (2.c) Verifies S/G blowdown isolation/sample valves open (VB3 lower left). (Depending on pace of crew, blowdown may have isolated due to high rad on RM-23; RNO step is performed to allow sampling by chemistry). <ul style="list-style-type: none"> (2.c RNO) Checks blowdown isolation due to RM-23 in alarm (PPC, RCDR-3 VB2 lower left); Places RE-19, 23 Hi Rad S/G Blowdown and Sample Valve iso defeat cutout switch to "cut-in" and opens blowdown sample valves (FCV-244, 246, 248, 250) (VB3, lower left). (2.d) Contacts Chemistry to perform S/G sampling per CAP AP-1.
(Continued on next page)		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 4Page 12 of 21Event Description: 30 gpm SGTL on loop 4 (continued); Ramp Offline

Time	Position	Applicant's Actions or Behavior
(OP AP-3, "Steam Generator Tube Failure")		
	SRO/ATC	<ul style="list-style-type: none"> (3-Continuous Action to Monitor) Determines VCT level can be maintained by RCS makeup (CC2,VB2, PPC).
	SRO	<ul style="list-style-type: none"> (4) Determines plant shutdown requirement. <ul style="list-style-type: none"> (4.a) Determines leak rate greater than O-4 shutdown criteria. (4.b) Due to O-4 criteria, implements OP AP-25, Rapid Load Reduction or Shutdown. Reviews T.S. 3.4.13.B, RCS Operational Leakage, – Primary to secondary LEAKAGE. Required actions: Be in MODE 3 within 6 hours.
(OP AP-25, "Rapid Load Reduction or Shutdown")		
	SRO	<ul style="list-style-type: none"> (1.a) Determines runback/programmed ramp is not in progress (may not vocalize, since this ramp is initiated by the crew).
	SRO/BOP	<ul style="list-style-type: none"> Starts load reduction (guidance is also on lamicoid pegboard on CC3): <ul style="list-style-type: none"> (1.b) Places MW and IMP feedbacks in service (all on Triconex turbine HMI, CC3). (1.c,d) Sets load target and ramp rate (greater than or equal to 5 MW/min) (1.e) Pushes GO. (1.f) Contacts Chemistry to advise 15%/hr shutdown rate will be exceeded.
	SRO/ATC	<ul style="list-style-type: none"> (2) Ensures control rods are inserting in AUTO (CC1). (3) Turns on Pressurizer heaters if not on from earlier event (CC1). (4) Checks charging adequate to prevent flashing in the letdown system; may take manual control to ensure adequate flow (CC2).
	SRO/BOP	<ul style="list-style-type: none"> (5) Ensures DFWCS is controlling S/G levels in AUTO (MFW control/bypass valves; MFPs all in AUTO) (CC2)(VB3).
<i>(Continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 4Page 13 of 21Event Description: Tube Rupture during ramp offline

Time	Position	Applicant's Actions or Behavior
Note 1: Specific boration values will be based on the actual ramp rate and target specified by SRO. Note 2: Tube leak becomes 400 gpm rupture 30 seconds after boration starts.		
	SRO/ATC	<ul style="list-style-type: none"> (6) Performs boration (the following guidance is on the boration checklist in the reactivity handbook). <ul style="list-style-type: none"> Presses STOP on M/U Ctrl HMI (CC2). Presses BORATE on HMI. Sets target gallons for boration; verifies batch is reset. Sets boric acid flowrate. Presses START, and monitors boration. Once stopped, either returns to AUTO (presses AUTO, then START), or performs additional boration per the Shift Foreman(CC2).
	SRO/BOP	<ul style="list-style-type: none"> (7) Checks MFP suction pressure greater than 260 psig (VB3).
	SRO/ATC	<ul style="list-style-type: none"> (8) Checks Tavg trending to Tref (PPC, CC1). (9) Checks Pressurizer pressure and level trending to programmed band (PPC, CC2). Reports rapid decrease in Pressurizer pressure and level. Returns to OP AP-3, step 1.a RNO.
(OP AP-3, "Steam Generator Tube Failure", starting at step 1.a RNO)		
	SRO/BOP	<ul style="list-style-type: none"> (1.a RNO) Starts additional CCP (if not done earlier). (1.b RNO) Isolates letdown (if not done earlier).
	ATC	<ul style="list-style-type: none"> Reports PZR level cannot be maintained.
	SRO	<ul style="list-style-type: none"> Directs Rx trip/SI and transition to E-0.
	ATC	<ul style="list-style-type: none"> Performs Rx trip and SI.

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** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 5,6,7Page 14 of 21Event Description: Reactor Trip / Safety Injection

Time	Position	Applicant's Actions or Behavior
(EOP E-0, "Reactor Trip or Safety Injection")		
	SRO/ATC	<ul style="list-style-type: none"> (1) Verifies reactor trip (trip bkr's open, rods on bottom, NIs decreasing) (VB2, CC1). (2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps).
	SRO/BOP	<ul style="list-style-type: none"> (3) Checks vital 4kv bus status (VB4, vital buses F/H white lights on mimic buses). <ul style="list-style-type: none"> Reports differential on bus G following transfer to startup power.
	SRO/ATC	<ul style="list-style-type: none"> (4) Checks SI actuated (PK08-21 ON, also checks VB1 red train light ON and/or train equipment to verify both trains actuated). <ul style="list-style-type: none"> Both trains of SI actuated as indicated by PK08-21, SI red light above Monitor Light Box C (VB1), and both trains of SI/RHR pumps running (VB1 skirt).
	SRO	<ul style="list-style-type: none"> (5) Directs implementation of App E (usually given to BOP); See page 19. <ul style="list-style-type: none"> All failures are related to loss of 4kV Bus G. Field Operators should be assigned to manually close associated valves. Board manipulations are as follows: <ul style="list-style-type: none"> Switch LCV-12 to CONT ONLY (VB3). Main Feedwater Recirc Valves FCV-53 & 54: OPEN (VB3). Turn on Aux bldg vent charcoal filter preheater (VB4).
	SRO/ATC	<ul style="list-style-type: none"> (6) Checks RCS temperature stable or lowering to 547°F. <ul style="list-style-type: none"> AFW Pp 1-2 OOS; 1-3 is running (VB3). TDAFW is running and required (VB3). (7) Checks Pzr PORVs and Pzr Safeties and Spray Valves. <ul style="list-style-type: none"> Safeties closed; no sonic flow, tailpipe temperature normal (VB2). PCV-456 is closed with 8000C open; PCV-474 is closed – may restore power to 8000A (VB2). Pzr Sprays closed (green lights on) (CC2). (8) Checks RCP trip criteria; <ul style="list-style-type: none"> RCS WR Pressure is greater than 1300 PSIG, trip criteria, however RCP 1-2 and 1-4 tripped off on loss of 12kV Bus D (VB2).
<i>(Continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 5Page 15 of 21Event Description: Reactor Trip / Safety Injection (continued) (CT)

Time	Position	Applicant's Actions or Behavior
(EOP E-0, "Reactor Trip or Safety Injection") (continued)		
	SRO/ATC	<ul style="list-style-type: none"> (9) Determines S/G are NOT faulted. <ul style="list-style-type: none"> No S/G lowering in an uncontrolled manner or completely depressurized.
	SRO/ATC	<ul style="list-style-type: none"> (10) Checks for ruptured S/G. <ul style="list-style-type: none"> Notes RE-74 elevated and S/G 1-4 level rising. Directs transition to EOP E-3, "Steam Generator Tube Rupture".
(EOP E-3, "Steam Generator Tube Rupture")		
	SRO/ATC	<ul style="list-style-type: none"> (1) Notes RCPs 1-2 and 1-4 are not running (VB2).
	SRO/ATC	<ul style="list-style-type: none"> (2) Identifies S/G 1-4 as ruptured (RM-74 in alarm; indications of rising level without feed during E-0).
	SRO/BOP	<ul style="list-style-type: none"> (3) Implements Appendix FF to isolate ruptured S/G 1-4 (see pg 21 – contains CT step)
	SRO/ATC	<ul style="list-style-type: none"> Reads CAUTION regarding maintaining isolation of Faulted/Ruptured S/G (do not feed). (4.a) Notes ruptured S/G level is greater than 15%. (4.b) Isolates Feed flowpaths to S/G 1-4: <ul style="list-style-type: none"> Takes LCV-113 to MANUAL and closes the valve (S2CT-1)(partial) ** Directs field action to close of LCV-109 (S2CT-1)** <p>** (Critical Task) (S2CT-1) Isolate the ruptured steam generator from the intact steam generators prior to commencing cooldown of the RCS in step 10.b (10% steam dump)</p>
	SRO/ATC	<ul style="list-style-type: none"> (5) Checks ruptured S/G pressure greater than 225 psig.
(Continued on next page)		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 5Page 17 of 21Event Description: Reactor Trip / Safety Injection (continued) (CT)

Time	Position	Applicant's Actions or Behavior
(EOP E-3, "Steam Generator Tube Rupture", continued)		
	SRO/ATC	<ul style="list-style-type: none"> (10) Initiates RCS Cooldown Using 10% Steam Dumps. <ul style="list-style-type: none"> (10.a) Verifies Appendix FF is complete. (10.b) Manually opens PCV-19, 20, and 21 (10% Steam Dumps) to at least 90% to dump steam at maximum possible rate. (S2CT-2) ** (10.c) Continues on in procedure at step 11 while cooldown continues. (10.d) Stops the cooldown when ALL Core Exit Thermocouples are less the required target temperature. (S2CT-2) ** (10.e) Stabilizes temperature slightly less than required temperature using steam dumps in AUTO. <p>** (Critical Task) (S2CT-2) Perform RCS cooldown at maximum rate to CETC target temperature specified in E-3, step 6, using 10% steam dumps such that RCS subcooled margin still exists following the cooldown.</p>
	SRO/BOP	<ul style="list-style-type: none"> (11.a,b) Maintains intact S/G levels while controlling S/G NR levels between 20%-65%. (11.c) May throttle TDAFW flow to maintain level within band.
	SRO/BOP	<ul style="list-style-type: none"> (12) CHECK PZR PORVs and Block Valves. <ul style="list-style-type: none"> (12.a,c) Notes power is available to block valve 8000C and valve is open. <ul style="list-style-type: none"> Directs field operator to restore power to 8000A (if not done earlier). (12.b) PZR PORVs – all closed.
	SRO/BOP	<ul style="list-style-type: none"> (13) Resets Safety Injection (VB1).
	SRO/BOP	<ul style="list-style-type: none"> (14) Resets both Trains Phase A (Phase B was not in) (VB1).
	SRO/BOP	<ul style="list-style-type: none"> (15) Opens FCV-584 to restore Instrument Air to Containment and checks header pressure greater than 90 psig (VB4).
(Continued on next page)		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 2Event No.: 5Page 18 of 21Event Description: Reactor Trip / Safety Injection (continued) (CT)

Time	Position	Applicant's Actions or Behavior
(EOP E-3, "Steam Generator Tube Rupture") (continued)		
	SRO/BOP	<ul style="list-style-type: none"> (16) Shuts down RHR pump 1-2.
	SRO/ATC	<ul style="list-style-type: none"> (17) Checks RCS cooldown stopped before continuing on to depressurization of RCS.
	SRO/BOP	<ul style="list-style-type: none"> (18) Checks ruptured S/G pressure stable or rising.
	SRO/BOP	<ul style="list-style-type: none"> (19) Checks Subcooling greater than 40°F.
	SRO/BOP	<ul style="list-style-type: none"> Reads note regarding use of a PORV for depressurization if normal spray is determined to be ineffective. (20) Notes RCP 1-2 not running and determines normal Pressurizer Spray will not be effective. (21) Depressurizes the RCS using one PZR PORV: <ul style="list-style-type: none"> Reduces RCS pressure until criteria of Appendix GG has been met: (S2CT-3) ** <ul style="list-style-type: none"> RCS Pressure - LESS THAN Ruptured S/G Pressure AND PZR Level – GREATER THAN 12% [40%] OR PZR Level – GREATER THAN 74% [66%] OR RCS Subcooling Based on Core Exit T/Cs LESS THAN 20°F (Subcooled Margin Monitor, YI-31 or Appendix C) <p>**(Critical Task) (S2CT-3) Depressurize the RCS until Appendix GG criteria has been met.</p>
The scenario is terminated once critical task S2-CT3 is complete and PORV used for depressurization has been closed.		

Op-Test No.: L181-NRC Scenario No.: 2 Event No.: 5 Page 19 of 21Event Description: SGTR (S/G 1-4) (cont)

Time	Position	Applicant's Actions or Behavior
(EOP E-0, Appendix E - ESF Auto Actions, Secondary and Auxiliaries Status)		
	BOP	<p>Implements App E (ESF Auto Actions, Secondary and Auxiliaries Status):</p> <ul style="list-style-type: none"> • (1a) Checks no personnel in Containment (part of turnover; may not voice). • (1b) Announces reactor trip/SI on PA system. • (2) Checks main generator – tripped (PK14-01 is ON). • (3) Verifies Phase A (VB1, ESF status lights, red lights ON, some white lights ON). <ul style="list-style-type: none"> ○ Determines all failures are related to loss of 4kV Bus G. • (4) Verifies Containment Vent Isolation complete - red lights ON, white lights OFF (VB1). • (5) Verifies ESF (SI) actuation complete - red lights ON, some white lights ON (VB1). <ul style="list-style-type: none"> ○ Determines all failures are related to loss of 4kV Bus G. • (6) Verifies Feedwater isolation complete (F.W. Isolation and S.G. Level Portions of Monitor Light Box C: red lights ON, white lights ON (VB1)). <ul style="list-style-type: none"> ○ Determines all failures are related to loss of 4kV Bus G. • (7) Determines Containment Spray and Phase B Isolation are NOT required (Contmt Isol, Phase B portion of Monitor Light Box D: red lights are OFF (VB1)). • (8) Checks Main Steamline Isolation complete (Main Steam Isolation portion of Monitor Light Box D: red light OFF, white light OFF (VB1)). • 9) Checks AFW status: <ul style="list-style-type: none"> ○ AFW Pp 1-2 OOS; AFW Pp 1-3 running. ○ TDAFW is running and IS required. • (10) Checks ECCS flows (charging injection (VB2), SI, RHR (VB1)). <ul style="list-style-type: none"> ○ Notes CCP 1-2 and 1-3 (VB2) off due to bus G loss. • (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). • (12) Checks excess letdown; notes NOT in service prior to trip (VB2). • (13) Checks secondary systems (MFPs tripped (VB2, green lights ON) <ul style="list-style-type: none"> ○ Selects FCV-53/54 to recirc. ○ Stops all but one CB Pp set. ○ Takes LCV-12 control switch to CONT ONLY.

(continued on next page)

** Critical Task

Op-Test No.: L181-NRC

Scenario No.: 2

Event No.: 5

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Event Description: SGTR (S/G 1-4) (cont)

[illegible]

Op-Test No.: L181-NRCScenario No.: 2Event No.: 5Page 21 of 21Event Description: EOP E-3, Appendix FF, "Isolate Ruptured Steam Generator" (CT)

Time	Position	Applicant's Actions or Behavior
		(EOP E-3, Appendix FF, Isolate Ruptured Steam Generator)
	BOP	<p>Reads CAUTION regarding TDAFW as only source of feedflow prior to step 1.</p> <ul style="list-style-type: none"> (1) Reads step to ensure S/G 1-4 10% steam dump controller (PCV-22) set to 1040 psig and in AUTO (VB3). (2) Checks S/G 1-4 10% steam dump valve closed (PCV-22) (VB3). (3) Checks S/G 1-4 MSIV and bypass (FCV-44 and FCV-24) valves closed (VB3). <ul style="list-style-type: none"> Closes S/G 1-4 MSIV, FCV-44 (S2CT-1)(partial) ** (4) Notes no TDAFW steam valves associated w/ S/G 1-4 (VB3). (5) Verifies S/G 1-4 SGBD valves outside cnmt (FCV-160 and FCV-244) closed (VB3). (6) Verifies S/G 1-4 is isolated from intact S/G (S/G 1-4 MSIV and MSIV Bypass are both closed as are all intact S/G MSIV and MSIV Bypasses). (7) Informs Shift Foreman S/G 1-4 isolation is complete. <p>**(Critical Task) (S2CT-1) Isolate the ruptured steam generator from the intact steam generators prior to commencing cooldown of the RCS in step 10.b (10% steam dump)</p>
	BOP	<ul style="list-style-type: none"> (8) Removes WR Thot input to SCMM for loop 4 (behind boards, PAMS panel behind VB3). <ul style="list-style-type: none"> Goes to PAM3 panel. Checks Loop 4 Thot Disabled. (9) Contacts Chemistry to sample S/Gs per CAP AP-1. <ul style="list-style-type: none"> Ensures SI Reset (VB1). Ensures Phase A, Train A & B Reset (VB1). Open Instrument Air to Containment FCV-584 (VB4). When Chemistry is prepared to Sample, ensures Inside Containment S/G Blowdown Valves FCV-760-763 opened (VB3).

Attachment 1 – Scenario Set-up & Booth Actions

X = manual entry required

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	IC	RESTORE IC-11	75%; MOL, C _B – See Turnover
X	Setup	Lesson drl_0120.lsn	Clears AFW 1-2
	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 NOT Marked up		AR PK04-06, PK04-21, PK05-16, 06-21, PK011-06, OP AP-3, AP-5, AP-13, AP-25, EOP E-0, E-3
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"> S2CT1: LCV-109 and LCV-113 valve position (or flow into S/G 1-4) S2CT2: PCV-19, 20, 21 valve position; CETC (2 highest) S2CT3: RCS Pressure, PZR Pressure, S/G 1-4 Pressure, Subcooling
X	0 min	Lesson L181 NRC-S2.lsn	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by FILE or MANUALLY (below)
X	<u>Evt-1: PCV-455A setpoint failure</u> (approx. 3 min after taking watch per lead examiner)	Evt-1: PCV-455A Setpoint Failure Initial State: PENDING Delay Time: 00:00:00.000 ● insert H5ESP_INIT_455G 0 ramp=20 ● insert RCCIPCSDL_H5DHC455GSPUPTFFREEZE TRUE	Setpoint ramps to zero over 20 seconds and can not be reset.
X	<u>Evt-2: PT-474 Fails Low</u> (once pressurizer pressure returned to normal band, per lead examiner)	Evt-2: PT-474 Fails Low (AP-5) Initial State: PENDING Delay Time: 00:00:00.000 ● insert XMT_PZR24_3 1102 delay=0 ramp=1 ● insert VLV_PZR1_1 1 cd=NOT H_V2_195R_1' delay=0	Check for OOS stickers on PI-474 and PR-455 and pink tags. When contacted as Turbine Watch, open breakers for 8000A and 8000B when requested (see field action branch of lesson file).
X	<u>Evt-3: PT-135 fails high</u> (once Evt-2 TS addressed per lead examiner)	Evt-3: PT-135 Fails Hi (PK 04-21) Initial State: PENDING Delay Time: 00:00:00.000 ● insert XMT_CVC2_3 1 delay=0 ramp=75	PT-135 fails high.
X	<u>Evt-4: 30 gpm tube leak on S/G 1-4</u> (once PT-135 being controlled in manual, per lead examiner)	Evt-4: S/G 1-4 30 gpm tube leak; ramp (AP-3, AP-25) Initial State: PENDING Delay Time: 00:00:00.000 ● insert MAL_RCS4H 30.0 delay=0 ramp=0	Crew will contact chemistry for sampling and power reduction > 15%/hr.
	<u>Evt-5: 400 gpm tube rupture (Major)</u> (triggers 30 sec after FCV-110A opening for boration)	Evt-5: S/G 1-4 400 gpm tube rupture (E-3) Initial State: TRIGGER Delay Time: 00:00:00.000 ● insert MAL_RCS4H 400 cd=h_v2_221r_1' delay=30 ramp=60	Scenario Major – 400 gpm SGTR on S/G 1-4.
	<u>Evt-6: 12 kV Bus D Feeder Breaker Diff</u> (post trip)	Evt-6: 12kV Bus D Feeder Breaker Diff Trip Initial State: TRIGGER Delay Time: 00:00:00.000 ● insert MAL_EPS5A_2 DIFFERENTIAL cd=h_V5_194B_1' delay=10 ramp=0 on=0 off=0	Results in loss of Condenser and RCPs 1-2 & 1-4.
	<u>Evt-7: 4kV Bus G Diff on xfer to S/U</u> (post trip)	Evt-7: Bus G Diff Trip on Xfer to S/U Initial State: TRIGGER Delay Time: 00:00:00.000 ● insert MAL_EPS4D_2 DIFFERENTIAL cd=h_v4_221r_1' delay=2 ramp=0 on=0 off=0	Crew will contact field for closure of FCV-431 and control of TDAFW LCVs Note: Closing LCV-109 is part of the Critical Task to isolate the rupture S/G. Document the time isolation is requested and when crew notified complete: Time LCV-109 isolation requested: _____ Time notified: _____

X = manual entry required



Diablo Canyon Power Plant Operations Shift Log



Unit 1

Unit 1 Days at Power: 111 Days

Operating Mode: 1

Gross Generation: 860 MWe

Power Level: 75%

Net Generation: 810 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 5.7 SW 5.7 NE 5.7 SE 5.8 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 EMERGENT WORK:

- MDAFW 1-2 OOS due to low dP during routine surveillance test

SHUTDOWN TECH SPECS / ECGS:

- TS 3.7.5.B → MDAFW 1-2, OOS due in 68 hours.

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

- None

TURNOVER ITEMS:

- MDAFW 1-2 estimated RTS is 8 hours
- Unit is operating at 75% due to a SCCW Hx Clearance

PRIORITY ITEMS FOR NEXT SHIFT:

- MDAFW 1-2 repair

Shift Foreman Turnover

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 100%.

REACTIVITY MANAGEMENT:

- Time in core life: MOL.
- Power History: Steady State at 75% for past 3 days.
- Boron concentration is 966 ppm from a sample taken 2 hours ago.
- Control Rod Height: 194 steps on CBD.
- Diluting the RCS approximately 25 gallons every 1.5 hrs.
- The last dilution was completed 30 minutes ago.

CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- None

OTHER ABNORMAL PLANT STATUS

- None

Facility: Diablo Canyon (PWR) Scenario No: 3 Op-Test No: L181 NRC

Examiners: _____ Operators: _____

Initial Conditions: 100% Power, MOL with AFW 1-2 cleared

Turnover: At 100% power with AFW 1-2 cleared

Event No	Malf No.	Event Type*	Event Description (See Summary for Narrative Detail)
1	PMP_CVC3_2 OVERLOAD_DEV_FAIL	TS, C (ALL)	CCP 1-3 OC Trip (OP AP-17, ECG 8.1.A).
2	AS01ASW_ASP11_MTFSEIZUR 1	TS, C (BOP, SRO)	ASW Pp 1-1 Seizes; Pp 1-2 can not be started (OP AP-10, TS 3.0.3).
3	MAL_CWS3A 80 MAL_CWS3B 75 MAL_CWS1A 0.15 ramp=120 MAL_CWS1B 0.15 ramp=150	C (ALL)	High DP on Intake Screens; ramp required (AR PK13-01, OP AP-7, OP AP-25).
4	PMP_CWS1_2 OVERLOAD_DEV_FAIL cd='smss lt 1140' PMP_CWS2_2 OVERLOAD_DEV_FAIL cd='smss lt 1080'	M (ALL)	Both Circ Water pumps trip off during ramp, requiring Reactor Trip (OP AP-7).
5	MAL_EPS4C_2 DIFFERENTIAL cd='fnispr lt 5' delay=30	C (ALL)	Vital 4kV Bus F differential trip.
6	VLV_PZR4_2 0.3 cd='jpplp4' delay=60	C (BOP)	Pressurizer PORV PCV-455C fails slightly open on trip requiring manual isolation by associated block valve
7	MAL_AFW1 1 cd='fnispr lt 5'	C (ALL)	Turbine driven AFW pump overspeed 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 1,2,3,4,5,6,7)	7
2. Malfunctions after EOP entry (1-2) (Events 5,6,7)	3
3. Abnormal events (1–4) (Events 1,2,3)	3
4. Major transients (1-2) (Event 4)	1
5. EOPs entered/requiring substantive actions (1–2) (E-0.1, FR-H.1)	2
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
(S3CT-1) Close the motor operated block valve upstream of the stuck open PORV prior to rupture of the PRT.	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"> Westinghouse Owner's Group WCAP-17711-NP
(S3CT-2) Establish a secondary heat sink as indicated by: <ul style="list-style-type: none"> WR level rising Core Exit Thermocouple temperatures lowering 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.	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."	<ul style="list-style-type: none"> FR-H.1 Background Document (HFRH1BG), Rev. 3.
<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 #3

1. Charging Pump CCP 1-3 trips on over current. The crew responds by entering **OP AP-17, Loss of Charging** to restore normal charging and letdown. Shift Foreman enters **ECG 8.1.A – Charging Pump No. 3 Inoperable** (establish fire watch; restore to operable status within 7 days).
2. ASW Pump 1-1 trips due to a seized shaft. Standby ASW Pump 1-2 fails to autostart and cannot be started manually. The Shift Foreman implements **OP AP-10, Loss of Auxiliary Salt Water** and cross-ties to the Unit 2 ASW system via the ASW cross-tie valve FCV-601. Shift Foreman enters **T.S. 3.0.3** for two trains of ASW inoperable on Unit 1.
3. Screen differential pressure begins to rise quickly, bringing in **AR PK13-01, Bar Racks/Screens**. Following annunciator guidance, the crew enters **OP AP-7, Degraded Condenser, Section C: Traveling Screen Problem** and begins to reduce load to 50% or less per **OP AP-25, Rapid Load Reduction**.
4. Both Circ Water pumps trip off during ramp, requiring the crew to manually trip the Reactor per OP AP-7. The crew enters **EOP E-0, Reactor Trip or Safety Injection** and performs their immediate actions.
5. On the trip, vital 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.
6. Board operators also identify PCV-455C in mid-position. The valve will not close and must be isolated using the associated block valve 8000B **(S3CT-1) Close the motor operated block valve upstream of the stuck open PORV prior to rupture of the PRT.**
7. The TDAFW pump trips on overspeed. Steam Generator levels are initially high enough to provide an adequate secondary side heat sink and the crew transitions to **EOP E-0.1, Reactor Trip Response** to stabilize the plant. Steam Generator levels slowly lower below the minimum required level of 15% narrow range and the crew transitions to **EOP FR-H.1, Response to Loss of Secondary Heat Sink**. With the condenser unavailable, Condensate is used to restore a secondary side heat sink **(S3CT-2) Establish a secondary heat sink.**

The scenario is terminated once Critical Task S3CT-2 is complete

Event Description: Centrifugal Charging Pump 1-3 OC Trip

(continued on next page)

Rev 1

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 1 Page 2 of 14

Event Description: Centrifugal Charging Pump 1-3 OC Trip (continued)

Time	Position	Applicant's Actions or Behavior
(OP AP-17, "Loss of Charging - Section A, Loss of All Charging", continued)		
	SRO/ATC	<ul style="list-style-type: none"> (2.d,e) Places FCV-128, CHARGING PUMP FLOW CONTROL, in MANUAL and closes (CC2).
	SRO/BOP	<ul style="list-style-type: none"> (2.f) Starts an available charging pump (CCP 1-1 or 1-2)(VB2).
	SRO/ATC	<ul style="list-style-type: none"> (2.g,h) Adjusts charging in manual to return level to program (FCV-128) (CC2). (3) Adjusts HCV-142 to maintain RCP seal flows 8-13 gpm (CC2). (4.a) Checks Pzr level > 17% (CC2 recorder, PPC, VB2 meter).
	SRO/BOP	<ul style="list-style-type: none"> (4.b) Checks letdown in service; determines normal letdown can be restored (VB2, upper left skirt).
(OP AP-17, "Loss of Charging – Appendix R")		
	BOP/ATC	<ul style="list-style-type: none"> 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"> (1.a) Checks FCV-355 open (it is) (VB1, lower left skirt). (1.b) Opens TCV-130 to 40% demand (VB2, lower middle). (1.c) Ensures 8149A,B, and C are closed (they are) (VB2, upper middle skirt). (1.d) Opens LCV-459 and LCV-460 (VB2, upper middle skirt). (1.e) Checks 8152 open (VB2, upper middle skirt). (1.f) Opens PCV-135 to 60% demand (VB2, lower middle). (1.g) Adjusts charging to \approx 87 gpm (ATC) (CC2). (1.h) Opens 8149B or C – 75 gpm orifice stop valve (VB2, upper middle skirt). (1.i) Adjusts PCV-135 for 350 psig on PI-135 and returns to AUTO (VB2, upper middle). (1.j) Adjusts TCV-130 for 90°F-110°F on TI-130 and returns to AUTO (VB2, upper middle). (1.k) Checks RV-8117 Letdown Relief Valve tailpipe temperature to verify relief valve is seated (TI-129 VB2, middle).
<i>(continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 1 Page 3 of 14Event Description: Centrifugal Charging Pump 1-3 OC Trip (continued)

Time	Position	Applicant's Actions or Behavior
(OP AP-17, "Loss of Charging – Appendix R", continued)		
	SRO/BOP	<ul style="list-style-type: none"> (4.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). (5.a – d.) Checks VCT Makeup Control: <ul style="list-style-type: none"> Checks VCT level 14% to 87% (LI-112 on VB2). Reads NOTE prior to step 5.b. Checks VCT pressure 15 to 60 psig (PI-135 on VB2). VCT makeup control (YIC-100) in AUTO mode and set for current RCS boron concentration which is displayed on lamicaid above ATC PPC displays (CC2).
(OP AP-17, "Loss of Charging starting at section A, Loss of All Charging", continued)		
	SRO/BOP	<ul style="list-style-type: none"> (5.e) Verifies instrument air is available (VB4 lower left area). (6) Checks LCV-112B and LCV-112C open, providing suction from the VCT(VB2, middle skirt).
	SRO	<ul style="list-style-type: none"> (7) Reviews Tech Specs/ECGs and enters ECG 8.1.A – CCP 1-3 inoperable. Required actions: <ul style="list-style-type: none"> Establish a continuous fire watch in the ECCS Centrifugal Charging Pump (CCP) room Immediately. OR <ul style="list-style-type: none"> Inspect the ECCS CCP room with a fire watch once per hour. AND <ul style="list-style-type: none"> Verify the ECCS CCP associated smoke detection equipment is OPERABLE. AND <ul style="list-style-type: none"> Verify the ECCS CCP associated fire suppression system is OPERABLE. AND <ul style="list-style-type: none"> Restore Charging Pump No. 3 to OPERABLE status within 7 days.
Proceed to the next event once ECGs are addressed, per the lead examiner		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 2 Page 4 of 14

Event Description: ASW Pump 1-1 Seizure

Time	Position	Applicant's Actions or Behavior
	ATC	Observes PK01-03 (ASW Pp OC trip) and PK01-01 (three low press / low dP inputs) alarming, and informs the Shift Foreman.
	ATC/BOP	Observes that 1-1 ASW Pp has a blue OC light (VB1, far left), and reports condition to the Shift Foreman.
(AR PK01-03, "Aux Salt Water Pumps") if entered, else N/A		
	SRO	<ul style="list-style-type: none"> (1.0) Goes to section 2.1, due to OC trip inputs.
	SRO/BOP	<ul style="list-style-type: none"> (2.1.1) Determines that the standby ASW pump is NOT running with normal current (did not start); takes 1-2 ASW pp to MAN, and attempts to start it.
	SRO	<ul style="list-style-type: none"> (2.1.2) Determines ASW flow has NOT been restored; goes to OP AP-10, Loss of Auxiliary Saltwater.
(OP AP-10, "Loss of Auxiliary Salt Water")		
	SRO/BOP	<ul style="list-style-type: none"> (1) Determines neither ASW pump is running. (1.a,b,c RNO) Informs SM to contact Watch Commander. Determines Unit 2 ASW Pump 2-1 is available for cross-tie. Goes to Section 6. (6.2.1) Directs Unit 2 to CLOSE 2-FCV-495 and OPEN 2-FCV-496. (6.2.2) N/A (6.2.3) Opens FCV-601 (VB1, lower far left skirt). (6.2.4) Directs Unit 2 to start stand-by ASW Pump 2-1.
	SRO	<ul style="list-style-type: none"> (1.e RNO) Implement Tech Spec 3.0.3 for two trains of ASW inoperable. Required action: Initiate shutdown within 1 hour. Be in MODE 3 within 7 hours.
	SRO/BOP	<ul style="list-style-type: none"> (1.f RNO) Contacts Aux Watch to stop any radwaste discharge in progress.
Proceed to the next event once Tech Specs addressed, per the lead examiner.		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 3 Page 5 of 14Event Description: High Screen DP

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> Observes PK13-01 (Bar Racks/Screens) alarming, and informs the Shift Foreman.
(AR PK13-01, "Bar Racks/Screens")		
	SRO/ATC	<ul style="list-style-type: none"> Reads CAUTION regarding potential screen damage. (2.2.1) Checks the PPC "Intake Screens" display.
	SRO	<ul style="list-style-type: none"> (2.2.2-2.2.4) N/A.
	SRO/BOP	<ul style="list-style-type: none"> (2.2.5) Calls the Intake Watch to check if all available screens are running.
	SRO	<ul style="list-style-type: none"> (2.2.6) N/A.
	SRO/ATC	<ul style="list-style-type: none"> (2.2.7) Checks if screen D/P of ANY of the bays exceeds 15 inches, and if so, checks the associated screens are operating as follows: <ul style="list-style-type: none"> CWP Bay 1-1 - Screens 1-1 through 1-3 running at or trending toward 30 fpm. CWP Bay 1-2 - Screens 1-4 through 1-6 running at or trending toward 30 fpm. U1 ASW Bay - Screen 1-7 running at or trending toward 10.8 feet per minute.
	SRO	<ul style="list-style-type: none"> (2.2.8) Determines screen D/P cannot be reduced to less than 8 inches, IMPLEMENTs OP AP-7, "Degraded Condenser."
(OP AP-7, "Degraded Condenser – Section C, Traveling Screen Problem.")		
	SRO	<ul style="list-style-type: none"> Reads Cautions about screen stalling, backflow concerns, and need for tripping the reactor if both Circ Water pumps are lost. Reads Note about PPC indication.

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** Critical Task

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 3 Page 6 of 14

Event Description: High Screen DP (continued)

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** Critical Task

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 3,4 Page 7 of 14

Event Description: Ramp / Reactor Trip

Time	Position	Applicant's Actions or Behavior
(OP AP-25, "Rapid Load Reduction or Shutdown")		
	SRO	<ul style="list-style-type: none"> Directs reduction of turbine load. <ul style="list-style-type: none"> (1.a) Determines runback/programmed ramp is not in progress (may not vocalize, since this ramp is initiated by the crew).
	SRO/BOP	<ul style="list-style-type: none"> Directs board operator to input ramp parameters (CC3): <ul style="list-style-type: none"> (1.b) Places MW and IMP feedbacks in service (all on Triconex turbine HMI). (1.c,d) Sets load target and ramp rate. (1.e) Pushes GO. (1.f) Contacts Chemistry to advise 15%/hr shutdown rate will be exceeded.
	SRO/ATC	<ul style="list-style-type: none"> (2) Ensures control rods are inserting in AUTO (CC1). (3) Turns Pressurizer heaters on (CC1). (4) Checks charging adequate to prevent flashing in the letdown system; may take manual control to ensure adequate flow (CC2).
	SRO/BOP	<ul style="list-style-type: none"> (5) Verifies DFWCS in AUTO and controlling S/G levels (CC3 MFW HMI, VB3, PPC): <ul style="list-style-type: none"> (5.a) Checks MFW control and bypass valves in AUTO. (5.b) Checks both MFPs and their controller in AUTO. (5.c) May check level trends, as well as steam flow/feed flow trends (CC3, PPC, and/or big VB3 DFWCS electronic recorders).
Note: CWP 1-1 will trip 30 seconds after boration is started causing a programmed ramp to commence. CWP 1-2 will trip when generator output reaches 1080 MW. Shift Foreman may direct Reactor Trip at this time.		
	SRO/ATC	<ul style="list-style-type: none"> (6) Initiates boration (CC2).
	ALL	<ul style="list-style-type: none"> Identifies CWP 1-1 trip and notes programmed ramp in progress (VB4). Identifies CWP 1-2 trip (VB4).
	SRO/ATC	<ul style="list-style-type: none"> Directs/performs Reactor Trip.
Remaining Events Trigger Automatically		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 5,6,7 Page 8 of 14Event Description: Reactor Trip (continued) (CT)

Time	Position	Applicant's Actions or Behavior
(EOP E-0, "Reactor Trip or Safety Injection")		
<p>Note 1: On the trip, a loss of vital 4kV bus F and an overspeed trip of the TDAFW pump leaves the crew with no AFW flow. S/G levels are initially above the minimum required level of 15% NR, but lowering. Crew will enter E-0.1, "Reactor Trip Response", but will transition to EOP FR-H.1, "Response to Loss of Secondary Heat Sink", once all four S/G levels fall below 15% NR.</p> <p>Note 2: PCV-455C partially opens on the trip, resulting in a critical task to close the associated block valve, 8000B.</p>		
	SRO/ATC	<ul style="list-style-type: none"> (1) Verifies reactor trip (trip bkrs open, rods on bottom, NIs decreasing) (VB2, CC1) (2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps)
	SRO/BOP	<ul style="list-style-type: none"> (3) Checks vital 4kv bus status (VB4, vital buses G/H white lights on mimic buses). <ul style="list-style-type: none"> Reports differential on bus F. (3 RNO) Refers to EOP ECA-0.3, "Restore 4kV Buses" while continuing in E-0.
	SRO/ATC	<ul style="list-style-type: none"> (4) Checks for SI actuated (PK08-21 ON), checks safeguards bistable status light panel. <ul style="list-style-type: none"> Reports Safety Injection has not actuated and is NOT required.
	SRO/BOP	<ul style="list-style-type: none"> (4.a RNO) continued <ul style="list-style-type: none"> Notes no one in containment per shift turnover. Directs announcement of Reactor Trip over Public Address System.
	SRO/ATC	<ul style="list-style-type: none"> (4.a RNO) Checks feedflow greater than 435 gpm; notes 0 gpm flow, but S/G NR level IS greater than 15% in atleast one S/G. <ul style="list-style-type: none"> Directs Transition to EOP E-0.1 "Reactor Trip Response".
	ANY	<ul style="list-style-type: none"> Identifies PORV 455C partially open and attempts to close. Valve will not close. Closes PORV block valve MOV-8000B (VB2 lower right)** **(Critical Task) (S3CT-1) Close the motor operated block valve upstream of the stuck open PORV prior to rupture of the PRT.
(continued on next page)		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 5,7 Page 9 of 14

Event Description: Reactor Trip Response

Time	Position	Applicant's Actions or Behavior
(EOP E-0.1, "Reactor Trip Response")		
Note 1: Crew will continue to monitor S/G levels and transition to EOP FR-H.1, "Response to Loss of Secondary Heat Sink", once all four S/G levels fall below 15% NR. There is no requirement for crew to complete steps of E-0.1 once extreme challenge to secondary heat sink condition exists.		
	SRO/ATC	<ul style="list-style-type: none"> (1) Checks RCS temperature stable or trending to 547°F based on RCS Loop Tav_g (RCPs running) (VB2, lower center chart recorders or PPC). <ul style="list-style-type: none"> If RCS temp < 547°F and decreasing: (Not: expected) <ul style="list-style-type: none"> checks steam dumps (VB3, indicator lights middle) and S/G blowdown isolation valves outside containment (VB3, lower left skirt) all closed. Also checks MSRs reset on on Turbine Control HMI (CC3). RCS temp > 547°F and increasing: <ul style="list-style-type: none"> If required, sets 10% dump controllers to 1005 psig, (83.8% setpoint) (VB3, lower left). verifies dumps modulate open to control temperature at 547°F. Monitoring of RCS temperature stable assigned as Continuous Action.
	SRO/BOP	<ul style="list-style-type: none"> (2) Checks Feedwater Status: <ul style="list-style-type: none"> (a) RCS temperature < 554°F (VB2, lower center chart recorders or PPC) (NOTE: expected). (b) Checks if Feedwater Isolation has occurred. (b.1) Feedwater Isolation portion of Monitor Light Box C (Red lights ON / White lights OFF) (VB1). (c) Checks total AFW flow greater than 435 GPM (VB3, upper middle).
	SRO/ATC	<ul style="list-style-type: none"> (3) Checks Rods fully inserted (VB2-DRPI). <ul style="list-style-type: none"> No DRPI due to loss of 4kV bus F (VB2) Rx Trip breakers are open, power is lowering (VB2, CC1) Determines reactor is tripped.

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**** Critical Task**

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 5,7 Page 10 of 14Event Description: Reactor Trip Response (continued) (CT – may already be complete)

Time	Position	Applicant's Actions or Behavior
(EOP E-0.1, "Reactor Trip Response", continued)		
Note 1: Crew will continue to monitor S/G levels and transition to EOP FR-H.1, "Response to Loss of Secondary Heat Sink", once all four S/G levels fall below 15% NR. There is no requirement for crew to complete steps of E-0.1 once extreme challenge to secondary heat sink condition exists.		
	SRO/ATC	<ul style="list-style-type: none"> (4) Checks Pressurizer level controls: <ul style="list-style-type: none"> (a) Level greater than 17% (VB2, middle right). (b) Charging in service with adequate flow (VB2)(CC2). (c) Letdown in service (VB2, upper middle skirt). (d) Pressurizer level trending to 22% (VB2, middle right). (may adjust charging to maintain level 22% to 60%). (e) May energize pressurizer heaters (CC1, lower left).
	SRO/ATC	<ul style="list-style-type: none"> Reads CAUTION regarding Aux Spray and notes as N/A (Aux Spray not in service). (5) Checks Pressurizer pressure control: <ul style="list-style-type: none"> (a) Pressure greater than 1850 psig (VB2, far right). (b) Pressure stable or trending to 2235 psig (VB2)(CC2). (b RNO) Directs closing of PCV-455C block valve, MOV-8000B, if not already completed (VB2 lower right)** <p>**(Critical Task) (S3CT-1) Close the motor operated block valve upstream of the stuck open PORV prior to rupture of the PRT.)</p>
	SRO/BOP	<ul style="list-style-type: none"> (6) Checks S/G NR levels greater than 15%: <ul style="list-style-type: none"> (a) Reports all S/G NR levels greater than 15%, but lowering (VB3, upper middle). (b) Reports with no AFW flow (VB3, upper middle). (c, d) Checks TD AFW Pump required for heat removal. <ul style="list-style-type: none"> Reports TD AFW pump is tripped on overspeed (VB3, center skirt).
	SRO	<ul style="list-style-type: none"> Directs transition to EOP FR-H.1, "Response to Loss of Secondary Heat Sink".
(continued on next page)		

** Critical Task

Op-Test No.: L181-NRC

Scenario No.: 3

Event No.: 7

Page 11 of 14

Event Description: **Loss of Secondary Heat Sink**

Time	Position	Applicant's Actions or Behavior
(EOP FR-H.1, "Response to Loss of Secondary Heat Sink")		
	SRO	Enters EOP FR-H.1 (LOSHS) due to loss of AFW (complete) and low S/G levels.
	SRO/BOP	<ul style="list-style-type: none"> (1) Determines total feedflow less than 435 gpm is NOT the result of operator actions.
	SRO/ATC	<ul style="list-style-type: none"> (2) Determines Secondary Heat Sink is required. <ul style="list-style-type: none"> (2.a) RCS Pressure is GREATER than any intact S/G ; (RCS pressure (VB2); S/G pressure (VB3)). (2.b) RCS Hot Leg Temp is GREATER than 350°F; (VB2, lower (chart recorder)).
	SRO/ATC	<ul style="list-style-type: none"> (3) Checks at least one ECCS CCP available. <ul style="list-style-type: none"> (3.a) CCP 1-2 is either available or in service.
	SRO/BOP	<ul style="list-style-type: none"> (4) Tries to establish AFW flow to at least one S/G: <ul style="list-style-type: none"> (4.a) Verifies Blowdown and Sample isolation valves outside containment are closed (VB3, lower left skirt). (4.b.1) Verifies CST level is GREATER than 10% (VB3, middle). (4.b.2) Verifies none of the AFW pumps are running (VB3, middle). (4.b-c RNOs) Dispatches operators to locally check lineups and investigate pump trips; May check on status on getting AFW 1-2 returned to service.
	SRO/ATC	<ul style="list-style-type: none"> (5) Stops all four RCPs (VB2, right).
	SRO/BOP	<ul style="list-style-type: none"> (6) Notes Condenser is NOT available due to loss of both CWP's (no vacuum). (6 RNO) Adjusts 10% dump controllers to 1005 psig, (83.8% setpoint) (VB3, lower left).
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**** Critical Task**

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 7 Page 12 of 14Event Description: Loss of Secondary Heat Sink (continued) (CT)

Time	Position	Applicant's Actions or Behavior
(EOP FR-H.1, "Response to Loss of Secondary Heat Sink", continued)		
	SRO/BOP	<ul style="list-style-type: none"> Reads CAUTION regarding monitoring of Hotwell level. (7.a) Checks at least one Condensate Booster Pump Set running in recirc (VB3, center skirt).
	SRO/ATC	<ul style="list-style-type: none"> (7.b) Takes manual control of all Main Feedwater Reg Valves and Main Feedwater Reg Valves Bypasses and sets demand to zero (DFWCS HMI on CC3).
	SRO/BOP	<ul style="list-style-type: none"> (7.c) Checks Feedwater Isolation Valves open (VB3, lower left). (7.d) Determines Main Feedwater is NOT available (Condenser NOT available) (PK08-14 NOT lit) and goes to step 9 (Establish Feed from Condensate System).
	SRO/ATC	<p>Reads CAUTIONS before step 9.a regarding blocking/unblocking of automatic SI actuation.</p> <p>Reads NOTE regarding parallel performance of S/G and RCS depressurization (steps 9.c in parallel with steps 9.a-b) and the need to stop S/G depressurization if PK06-06 comes in before SI signal are blocked (needed to prevent unwanted SI):</p> <ul style="list-style-type: none"> (9.a.1) Depressurizes RCS to less than 1915 PSIG (P-11) using any available PORV (VB2, lower right vertical). (9.a.2) After P-11 actuates (PK08-06), blocks RCS low pressure SI ((2) train switches) and low steamline pressure SI signals ((2) train switches)(CC2). (9.a.3) Maintains RCS pressure below P-11 (1500 and 1865 PSIG) using PORV (VB2).
	SRO/BOP	<ul style="list-style-type: none"> (9.b.1) Verifies Main Feedwater Isolation Valves OPEN (VB3, lower left)** (9.b.2) Verifies Main Feedwater Isolation signal OFF (PK09-11); resets as needed (VB3, center). <p>**(Critical Task) (Part of S3CT-2, Establish feedwater flow into at least one S/G prior to reaching bleed and feed criteria).</p>
(continued on next page)		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 3 Event No.: 7 Page 13 of 14Event Description: Loss of Secondary Heat Sink (continued) (CT)

Time	Position	Applicant's Actions or Behavior
(EOP FR-H.1, "Response to Loss of Secondary Heat Sink", continued)		
	SRO/BOP	<ul style="list-style-type: none"> (9.b.2) Verifies Main Feedwater Isolation signal OFF (PK09-11); resets as needed (VB3, center).
	SRO/ATC	<ul style="list-style-type: none"> (9.b.3) Throttles open Main Feedwater Reg Valves OR Main Feedwater Bypass Valves** (CC3 DFWCS HMI). **(Critical Task) (Part of S3CT-2, Establish feedwater flow into at least one S/G prior to reaching bleed and feed criteria).
	SRO/BOP	<ul style="list-style-type: none"> (9.b.4) Bypasses feedwater heaters and condensate demineralizers (opens FCV-55 and FCV-230) (VB3, skirt, lower right).
Note 1: Once the crew has successfully opened one of the 10% dump valves to 90% or greater, a corresponding safety will temporarily lift, causing pressure to lower faster, and then reseal. This malfunction is added to reduce scenario run time where the crew has no verifiable actions to perform and is simply monitoring the depressurization.		
	SRO/BOP	<ul style="list-style-type: none"> Reads CAUTION before step 9.c regarding potential for low Tave Feedwater Isolation. Reads NOTE about Low Tavg causing Feedwater Isolation and the need to reopen feedwater valves. (9.c) Depressurizes ONE intact S/G to LESS THAN 490 PSIG at MAXIMUM RATE** <ul style="list-style-type: none"> (9.c.1) Verifies all MSIV and MSIV bypass valves closed (VB3, lower left). (9.c.2) Places one 10% dump valve in manual and opens to 90% or greater; Red indicator light ON, green indicator light OFF (VB3, middle)** **(Critical Task) (Part of S3CT-2, Establish feedwater flow into at least one S/G prior to reaching bleed and feed criteria).
	SRO/ATC	<ul style="list-style-type: none"> (9.c.3) Checks charging in service; may maximize during depressurization to prevent losing Pressurizer level during the cooldown.
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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 IC-10	100%; MOL, C _B – See Turnover Sheet
X	Setup	N/A	AFW 1-2 OOS Verify Liquid Rad Discharge and Chlorination lamicoids lined up to the 1-2 Train
	The Plant Abnormal Status Board for Surveillance Requirements		Set CCP 1-2 boron concentration within 10 ppm of current boron concentration.
	Copies of Procedures, Attachments; Appendixes; Foldout Pages; Annunciator Response Procedures and commonly used forms are in binders and NOT Marked up		AR PK01-01, PK01-03, PK04-16, PK05-01,02,03,04, PK13-01, OP O-4, O-28, AP-7, AP-10, AP-17, AP-25, EOP E-0, E-0.1, ECA-0.3, FR-H.1 Provide Booth with copies of PK13-01 and AP-7
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"> S3CT1: 8000B position and PRT parameters S3CT2: Feedwater iso, reg, and bypass valve positions; 10% steam dump valve positions; S/G feedflow; S/G pressures; CETCs.
X	0 min	Lesson L181 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: CCP 1-3 OC Trip</u> (approx. 3 min after taking watch per lead examiner)	Evt-1: CCP 1-3 OC Trip (AP-17) Initial State: PENDING Delay Time: 00:00:00.000 ● insert PMP_CVC3_2 OVERLOAD_DEV_FAIL delay=0 ramp=0 on=0 off=0	Aux Watch reports burnt electrical smell in CCP 1-3 pump room. Turbine Watch reports no issues noted.
X	<u>Evt-2: ASW Pp 1-1 Shaft Seizure</u> (once Evt-1 TS addressed per lead examiner)	Evt-2: ASW Pump 1-1 Seizure Initial State: PENDING Delay Time: 00:00:00.000 ● insert CW07CWS_ASWPP11_MTFSEIZUR 1 delay=0 ramp=0	ASW 1-1 shaft seizure and OC trip; ASW 1-2 autostart failure.
X	<u>Evt-3: Intake Screen High DP</u> (once Evt-2 TS addressed per lead examiner)	Evt-3: High DP on Screen - Ramp Required (PK13-01, AP-7) Initial State: PENDING Delay Time: 00:00:00.000 ● insert MAL_CWS3A 80 delay=0 ramp=0 ● insert MAL_CWS3B 75 delay=0 ramp=0 ● insert MAL_CWS1A 0.15 delay=0 ramp=120 ● insert MAL_CWS1B 0.15 delay=0 ramp=150	When contacted as Intake watch: <ul style="list-style-type: none"> Report Kelp attack; All screen running but heavily loaded.
X	<u>Evt-4: CWP's Trip (Major)</u> (triggers 30 secs after start of boration)	Evt-4: (Major) CWP's Trip Initial State: TRIGGER Delay Time: 00:00:00.000 ● insert PMP_CWS1_2 OVERLOAD_DEV_FAIL c d='h_v2_272r_1' delay=30 ramp=0 ● insert PMP_CWS2_2 OVERLOAD_DEV_FAIL c d='smss lt 1080' delay=0 ramp=0	CWP 1-1 trips 30 seconds after FCV-110A starts to open (boration for ramp) triggering programmed ramp. CWP 1-2 trips @ 1080 MW.
X	<u>Evt-5: 4kV Bus F Diff</u> (post trip)	Evt-5: 4kV Bus F Diff (Post Trip) Initial State: TRIGGER Delay Time: 00:00:00.000 ● insert MAL_EPS4C_2 DIFFERENTIAL c d='fnispr lt 5' delay=5 ramp=0	4kV Bus F Differential Trip – Loss of AFW 1-3 (part of Loss of Heat Sink).

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

X = manual entry required A

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
<u>Evt-6:PCV-455C partial opening</u> (post trip)	<div> <div>Evt 6: PCV-455C slightly open on trip</div> <div>Initial State: TRIGGER Delay Time: 00:00:00.000</div> <div>● insert VLV_PZR4_2 0.3 cd='fnispr_1 lt 5' delay=0 ramp=0</div> </div>	PORV fails 30% open.
<u>Evt-7 (TDAFW trip):</u> <u>(post trip)</u>	<div> <div>Evt-7: TDAFW Overspeed trip</div> <div>Initial State: TRIGGER Delay Time: 00:00:00.000</div> <div>● insert MAL_AFW1 1 cd='fnispr lt 5' delay=0 ramp=0</div> </div>	When contacted, report FCV-152 trip handle shattered.



Diablo Canyon Power Plant Operations Shift Log



Unit 1

Unit 1 Days at Power: 111 Days

Operating Mode: 1

Gross Generation: 1187 MWe

Power Level: 100%

Net Generation: 1137 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 5.7 SW 5.7 NE 5.7 SE 5.8 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 EMERGENT WORK:

- MDAFW 1-2 OOS due to low dP during routine surveillance test.

SHUTDOWN TECH SPECS / ECGS:

- TS 3.7.5.B → MDAFW 1-2, OOS due in 68 hours.

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

- None

TURNOVER ITEMS:

- MDAFW 1-2, estimated RTS is 8 hours.

PRIORITY ITEMS FOR NEXT SHIFT:

- MDAFW 1-2 repair.

Shift Foreman Turnover

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 3 days.
- Boron concentration is 906 ppm from a sample taken 2 hours ago.
- Control Rod Height: 231 steps on CBD.
- Diluting the RCS approximately 25 gallons every 1.5 hrs.
- The last dilution was completed 30 minutes ago.

CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- None

OTHER ABNORMAL PLANT STATUS

- None

Facility: Diablo Canyon (PWR) Scenario No: 4 Op-Test No: L181 NRC

Examiners: _____ Operators: _____

Initial Conditions: **75% Power, MOL with D/G 1-2 OOS**

Turnover: **At 75% power for SCCW HX Clearance**

Event No	Malf No.	Event Type*	Event Description (See Summary for Narrative Detail)
1	AB01ABV_E2_MTVIGAIN 65 cd='H_V4_176R_1 and H_V4_180L_1' delay=5	TS, C (BOP, SRO)	Overcurrent trip on E-2 during Aux Building fan swaps (OP H-1:II, AR PK 15-17, TS 3.7.12.B).
2	XMT_CVC19_3 0.0 ramp=120	I (ATC, SRO)	LT-112 Fails Low (auto make-up) (OP AP-19, AP-5).
3	MAL_RCS3B .07	TS, C (ALL)	70 gpm RCS leak on Loop 2 (OP AP-1, TS 3.4.13.A).
4	MAL_SEI1 0.21 ramp=10 MAL_GEN4_3 TRIP delay=10 cd='jmlsei1' LOA_SYD6 (SYD7, SYD8, SYD16) OPEN delay=15 cd='jmlsei1' LOA_SYD16 Energized cd='jmlsei1' delay=15	C (BOP, SRO)	Seismic event causing Full Load Rejection (OP AP-2, AP-25).
5	DR04CND_HDP11_MTF SHEAR 1 PMP_CND1_1 AS_IS delIA PMP_CND1_1 2 delay=0 cd='V3_223S_3'	C (ATC, SRO)	Digital Feedwater controller failure requiring reactor trip (OP AP-2).
6	MAL_SYD2 0 cd='fnispr lt 5' delay=2 MAL_EPS4E_2 DIFFERENTIAL cd='h_v4_217r_1' MAL_DEG1C_2 NO_RESET cd='H_V4_224R_1'	M (ALL)	Loss of all A/C power.
7	VLV_AFW7_1 1 DelIA VLV_AFW7_1 2 cd='V3_219S_3'	C (BOP, SRO)	TDAFW Pump fails to autostart – manual start required.

***(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 1,2,3,4,5,6,7)	7
2. Malfunctions after EOP entry (1-2) (Event 7)	1
3. Abnormal events (1–4) (Events 1,2,3,4,5)	5
4. Major transients (1-2) (Event 6)	1
5. EOPs entered/requiring substantive actions (1–2) (ECA-0.0, ECA-0.2)	2
6. EOP contingencies requiring substantive actions (0–2) (ECA-0.0, ECA-0.2)	2
7. Critical tasks (2–3)(See description below)	2

Critical Task	Justification	Reference
(S4CT-1) Energize at least one vital AC bus prior to implementation of FLEX strategies (ECA-0.0, step 10 RNO) associated with entry into Extended Loss of AC Power Event (ELAP) conditions	Failure to restore vital AC power from an available source when available represents an unnecessary continuation of a degraded electrical condition and unnecessarily complicates the mitigation strategy	<ul style="list-style-type: none"> • WCAP-17711-NP, CT-24 • ECA-0.0 Background Document (HECA00BG), Rev. 3.
(S4CT-2) Establish flow from at least one safety injection pump prior to transition out of ECA-0.2.	Failure to manually start at least one high/intermediate head injection pump under the postulated conditions constitutes misoperation or incorrect crew performance in which the crew does not prevent degraded core cooling capacity.	<ul style="list-style-type: none"> • WCAP-17711-NP, CT-7

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. The crew performs a normal weekly fan swap for the Aux Building Ventilation System per **OP H-1:II, Auxiliary Building Safeguards Ventilation (ABVS) – Normal Operation, Section 6.1**. Exhaust Fan E-2 trips shortly after the swap bringing in **AR PK15-17, Aux & FHB Vent Pwr Failure**. Exhaust Fan E-1 restarts automatically and a field operator is dispatched to investigate. Shift Foreman enters **TS 3.7.12.B, Auxiliary Building Ventilation System (ABVS)** for one ABVS train inoperable (7 days).
2. Volume Control Tank (VCT) level channel LT-112 fails low, causing a continuous (and erroneous) makeup signal. The crew diagnoses the level channel failure by comparing other VCT parameters, and by using **OP AP-19, Malfunction of the Reactor Makeup Control System**. The makeup system is secured, and makeup is accomplished (if needed) using manual mode (or enabling the auto mode for short periods). Crew may elect to use **OP AP-5, Malfunction of Eagle 21 Protection or Control Channel** to take manual control of **Makeup Control System**.
3. A 70 gpm RCS leak develops, requiring entry in **OP AP-1, Excessive Reactor Coolant System Leakage**. The crew adjusts charging flow and eventually starts a second charging pump to stabilized pressurizer pressure. VCT level can be maintained at the current leak rate, however, and the crew determines a plant shutdown is required. Shift Foreman enters **TS 3.4.13.A, RCS Operational Leakage** (4 hrs).
4. A significant seismic event results in a full load rejection on Unit 1. The crew recognizes the condition based on numerous power level alarms and the ensuing secondary side transient. The crew monitors primary and secondary system responses, most notably rod control, steam dumps, and digital feedwater, to ensure all systems respond appropriately in automatic. Shift Foreman implements **OP AP-2, Full Load Rejection** to stabilize the plant.
5. During the ramp down, Digital Feedwater fails to manual and the Shift Foreman directs a Reactor trip.
6. Startup power is lost on the trip followed by a bus differential fault on vital 4kV bus H. Diesel Generator 1-3 trips and cannot be reset. The crew transitions to **EOP ECA-0.0, Loss of All Vital AC Power**.
7. The turbine driven AFW pump fails to autostart requiring the crew to manually start the pump and dispatch field operators to throttle flow.
8. Grid Control Center informs the crew that 230kV start up power is not available, but 500 kV is available. The crew performs actions to isolate RCP seal cooling.
9. Power is restored to vital 4kV buses F and G following the guidance of **ECA-0.0, Appendix DD (Backfeed from 500kV Power)** **(S4CT-1) Energize at least one vital AC bus from prior to implementation of FLEX strategies**.
10. The crew transitions to **EOP ECA-0.2, Loss of All AC Power with SI Required** where they manually start safeguards equipment. The crew performs the final scenario critical task **(S4CT-2) Establish flow from at least one safety injection pump**.

The scenario is terminated once injection flow is established.

Event Description: Perform Weekly Aux Building Supply and Exhaust Fan Swap

(continued on next page)

Rev 1

Op-Test No.: L181-NRCScenario No.: 4Event No.: 1Page 2 of 16Event Description: Perform Weekly Aux Building Supply and Exhaust Fan Swap (continued)

Time	Position	Applicant's Actions or Behavior
(AR PK15-16, "Aux and FHB Vent Sys") if used, else N/A		
	SRO/ATC	<ul style="list-style-type: none"> Enters AR PK15-16, "Aux & FHB Vent Sys" for input 311, AFHBVS Trouble POV2.
	SRO/BOP	<ul style="list-style-type: none"> Reads note regarding operation of Tricon HMI screens on VB4. (2.1) AFHBVS POV Trouble Alarms. <ul style="list-style-type: none"> (2.2.1) Checks that redundant exhaust fan train started automatically. (2.1.2) Contacts I&C to investigate trouble alarms. (2.1.3) N/A (2.1.4) May check for individual alarm input as follows: <ul style="list-style-type: none"> (2.1.4.a) Selects Active Alarms screen on Tricon HMI (VB4). (2.1.4.b) Refers to Attachment 2 for individual alarm description. (2.1.5-2.1.6) N/A (2.1.7) Refers to TS 3.7.12.B for one ABVS train inoperable. Required action: Restore ABVS train to Operable status (7 days).
(AR PK16-22, "480V BUS 1H") if used, else N/A		
	SRO/ATC	<ul style="list-style-type: none"> Enters AR PK16-22, "480V Bus 1H" for input 301, 480V Bus-1H Mtrs TOL Trip.
	SRO/BOP	<ul style="list-style-type: none"> (2.3) Motor Thermal Overload: <ul style="list-style-type: none"> (2.3.1) Determines E-2 is the load that tripped. (2.3.2) Verifies E-1 started automatically. (2.3.3) May refer to OPS Policy B-2, "Electrical Alarm Relay Responses," to address the overload.
<i>Proceed to the next event once Tech Specs are addressed, per Lead Examiner</i>		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 4Event No.: 2Page 3 of 16Event Description: VCT Level Channel LT-112 Fails Low (causes auto makeup)

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnosis of makeup control failure is made by one or more of the following: <ul style="list-style-type: none"> Automatic makeup is running, but VCT level shows normal (LT-114) (PPC as L0112A, HSDP). LT-112 shows low level (0%), but VCT pressure shows normal, and CCP operation (suction) is normal (all on VB2). Yokogawa recorder (L0112A) (VB2 upper left).
	ATC	Takes Makeup Control to STOP (on the makeup control HMI, CC2) (may be done before or during entry into AP).
	SRO	Implements OP AP-19, "Malfunction of the Reactor Makeup Control System" or OP AP-5, "Malfunction of Eagle 21 Protection or Control Channel".
(For OP AP-19, "Malfunction of the Reactor Makeup Control System"), if entered, else N/A		
	SRO/ATC	<ul style="list-style-type: none"> (1.a) Ensures M/U set to correct mode (AUTO and stopped based on unwarranted makeup) (CC2). (1.b) Determines auto makeup should NOT be selected to start due to undesired makeup operation.
	SRO/BOP	<ul style="list-style-type: none"> (2) Checks makeup system pumps and valves lineup up, and in AUTO (VB2, lower center).
	ATC/BOP	<ul style="list-style-type: none"> (3) Verifies VCT level channels OPERABLE: <ul style="list-style-type: none"> Observes discrepancy between LT-112 (0%), and LT-114 (normal level). May use VCT pressure and/or normal CCP operation to diagnose that LT-112 has failed.
	ALL	<ul style="list-style-type: none"> (3 RNO) May refer to Appendix A, "Guide to Failed VCT Level Channel", step 1.b.1 to determine what effect the failed LT-112 will have on makeup system operation.
<i>(continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 4 Event No.: 2 Page 4 of 16

Event Description: VCT Level Channel LT-112 Fails Low (causes auto makeup) (continued)

Time	Position	Applicant's Actions or Behavior
(OP AP-19, "Malfunction of the Reactor Makeup Control System", continued)		
	ATC/BOP	<ul style="list-style-type: none"> (4) Verifies CCP suction parameters are normal (CCP flow/amps/ pressure, VCT level/pressure; VB2 and CC2 meters) (as time permits).
	SRO	<ul style="list-style-type: none"> (5) Notifies Tech Maintenance to troubleshoot and repair (as time permits).
(For OP AP-5, "Malfunction of Eagle 21 Protection or Control Channel") if entered, else N/A		
	SRO/ATC	<ul style="list-style-type: none"> (1) Confirms that Makeup Controller was NOT controlling properly in Auto and has been taken to manual (CC2). <ul style="list-style-type: none"> Refers to Attachment 5.2, "Process Control System Racks", for indications and controls affected.
	SRO/BOP	<ul style="list-style-type: none"> (2) Determines that the failure is not Eagle-21 related (PK06-01 and PK06-03 are OFF).
	SRO/ATC	<ul style="list-style-type: none"> (3) Determines failure is not associated with a ΔT channel (VB2). (4) Determines Steam Dump valves are controlling properly.
	SRO	<ul style="list-style-type: none"> (5) Contacts I&C to investigate. Reads caution regarding Eagle 21 design feature and notes it does not apply. (6) Ensures affected channel is removed from service prior to performing maintenance. (7) Uses Attachments 5.1 and 5.2 to determine affected indicators and evaluate TS/ECGs. Determines no TS impact.
<i>Proceed to the next event once Make-up control system in STOP, per the lead examiner.</i>		

** Critical Task

Op-Test No.: L181-NRC Scenario No.: 4 Event No.: 3 Page 5 of 16Event Description: 70 gpm RCS Leak on Loop 2

Time	Position	Applicant's Actions or Behavior
	ALL	Diagnoses RCS leak from one or more of the following: <ul style="list-style-type: none"> • Drain and/or Sump high level alarms (PK15-01) • Pzr level lowering (PPC, CC2 recorder, VB2 meters) • Charging flow demand and/or low level deviation alarms (PK05-21) • Containment parameters slowly rising (temp, press) (PPC, VB1 recorder, PAMS panels)
Note: Leak starts instantaneously at 70 gpm. The crew may raise charging by opening FCV-128 and adjusting HCV-142 (CC2) in order to maintain pressurizer level prior to entering OP AP-1, "Excess Reactor Coolant System Leakage".		
	SRO	Enters OP AP-1, "Excess Reactor Coolant System Leakage".
(OP AP-1, "Excess Reactor Coolant System Leakage")		
	SRO/ATC	<ul style="list-style-type: none"> • (1.a) Determines pressurizer level and charging flow are NOT normal. <ul style="list-style-type: none"> ○ Charging flow is elevated and pressurizer level is slowly lowering (CC2). • (1.a) Adjusts charging and seal flow to maintain pressurizer level. <ul style="list-style-type: none"> ○ May adjust seal flows using HCV-142 (CC2) to maintain 8-13 gpm. ○ May raise charging in manual using master level controller (HC-459D)(CC2) or flow controller (FCV-128)(CC2).
Note: Monitoring Pressurizer level and charging flow - NORMAL is a Continuous Action. Associated RNO steps are performed when crew reports applicable conditions exist (i.e. unable to maintain pressurizer level).		
	SRO/ATC	<ul style="list-style-type: none"> • (1.a) Determines pressurizer level is still lowering (Continuous Action to Monitor).
	SRO/BOP	<ul style="list-style-type: none"> • (1.a.1 RNO) Starts second charging pump (VB2, Lower middle skirt).
	SRO/ATC	<ul style="list-style-type: none"> • (1.a.2 RNO) Checks for continuing decrease in pressurizer level: <ul style="list-style-type: none"> ○ Readjusts charging and seal flow (CC1). ○ Determines pressurizer level has stabilized (PPC, VB2, CC2).
(continued on next page)		

** Critical Task

Op-Test No.: L181-NRC

Scenario No.: 4

Event No.: 3

Page 6 of 16

Event Description: 70 gpm RCS Leak on Loop 2 (continued)

Time	Position	Applicant's Actions or Behavior
(OP AP-1, "Excessive Reactor Coolant System Leakage", continued)		
	SRO/ATC	<ul style="list-style-type: none">• (2) Checks RCS pressure greater than 2210 psig and stable (VB2) (\approx 2220-2250 psig).• (3) Determines RCS Makeup can keep up with leak.<ul style="list-style-type: none">○ Makeup Control is in AUTO (CC2).○ VCT Level is stable (PPC, VB2 RCDR-4 just below DRPI).
Note: Remainder of procedure focuses on identifying the actual leak location and is not part of the scenario design. The procedure does not direct review of Tech Specs until after the leak location has been identified and may need to be addressed as a follow up question.		
	SRO	If not already completed, reviews T.S. 3.4.13.A, RCS Operational Leakage – RCS operational LEAKAGE not within limits for reasons other than pressure boundary LEAKAGE or primary to secondary LEAKAGE. Required actions: Reduce LEAKAGE to within limits within 4 hrs.
Proceed to the next event once Tech Specs are addressed, per Lead Examiner		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 4Event No.: 4Page 7 of 16Event Description: Seismically Induced Full Load Rejection

Time	Position	Applicant's Actions or Behavior
Note: Seismic event initiates load rejection; it is not intended that the crew respond in detail to the earthquake.		
	ALL	<p>Crew Diagnoses Earthquake from the following:</p> <ul style="list-style-type: none"> Physical shaking of room PK15-24, "Seismic Instr System" <p>Crew Diagnoses load rejection based on the following:</p> <ul style="list-style-type: none"> Generator load dropping Generator output breakers open. Steam Dumps activated Rods stepping in
	SRO	Implements OP AP-2, "Full Load Rejection".
(OP AP-2, "Full Load Rejection")		
	SRO	Reads CAUTION regarding need for manual trip if deliberate operator action to stabilize the plant ON LINE is unlikely.
	SRO/ATC	<ul style="list-style-type: none"> (1) Verifies that control rods are inserting properly in AUTO (CC1). (2) Verifies proper operation of steam dumps, Tave trending to Tref (VB3, red/green indicator lights; Tave/Tref from CC1 recorder/PPC).
	SRO/BOP	<ul style="list-style-type: none"> (3) Checks MFP suction adequate: <ul style="list-style-type: none"> (3.a) Notes standby Condensate/booster pump set did not autostart (VB3): <ul style="list-style-type: none"> Takes Standby Select switch to Manual Manually starts standby pump set (3.b) Determines MFP suction is NOT adequate (PPC, VB3 meter). <ul style="list-style-type: none"> MFP suction should recover after standby Condensate/booster pump is started (4) Checks DFWCS in AUTO and controlling S/G levels (CC3 MFW HMI, VB3, PPC): <ul style="list-style-type: none"> (4.a) Determines MFW control and bypass valves in have failed to manual. (4.a RNO) Directs Reactor Trip.

** Critical Task

Op-Test No.: L181-NRCScenario No.: 4Event No.: 5,7Page 8 of 16Event Description: Manual Reactor Trip

Time	Position	Applicant's Actions or Behavior
(EOP E-0, "Reactor Trip or Safety Injection")		
	SRO/ATC	<ul style="list-style-type: none"> (1) Verifies reactor trip (trip bkrs open, rods on bottom prior to loss of bus F, NIs decreasing) (VB2, CC1). (2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps).
	SRO/BOP	<ul style="list-style-type: none"> (3) Checks vital 4kV bus status (VB4, white lights on mimic buses). <ul style="list-style-type: none"> Reports all vital 4kV buses de-energized.
	SRO	<ul style="list-style-type: none"> Directs Transition to ECA-0.0, "Loss of All Vital AC Power".
(ECA-0.0, "Loss of All Vital AC Power")		
	SRO/ATC	<ul style="list-style-type: none"> (1) Re-verifies reactor trip; (trip bkrs open, rods on bottom prior to loss of bus F, NIs decreasing) (VB2, CC1). (2) Re-verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps).
	SRO	Reads notes regarding CSF Status Trees being monitored for INFO only and need for radios.
	SRO/ATC	<ul style="list-style-type: none"> (3) Performs RCS isolation steps: <ul style="list-style-type: none"> (3a) Ensures letdown isolated (VB2): <ul style="list-style-type: none"> Verifies 8149C closed. May close LCV-459/460. (3b) Checks Pzr PORVs closed (VB2). (3c) Checks Excess Letdown isolated (8166/8167, VB2 lower far right). (3d) Ensures NSSS sample valves closed (VB1 lower left): <ul style="list-style-type: none"> Closes NSSS Pressurizer Liquid Sample Isolation Valves (9355A/B). Closes NSSS RCS Sample Isolation Valves (9356A/B).
<i>(continued on next page)</i>		

Op-Test No.: L181-NRC Scenario No.: 4 Event No.: 6,7 Page 9 of 16

Event Description: Loss of All A/C Power

Time	Position	Applicant's Actions or Behavior
(ECA-0.0, "Loss of All Vital AC Power", continued)		
Note: Once started, TDAFW will require stationing of local operators to control the TDAFP LCVs.		
	SRO/BOP	<ul style="list-style-type: none"> • (4) Verifies AFW status. <ul style="list-style-type: none"> ○ Checks AFW flow is not > 435 gpm (VB3 upper center meters, SPDS). ○ May start TDAFW pump by opening FCV-95 (VB4).
Note: Shift Foreman may authorize an attempted reset of the shutdown relay and DG start for D/G 1-3 or will dispatch field operators to walk down the diesel prior to attempting restoration. D/G 1-3 will not reset.		
	SRO/BOP	<ul style="list-style-type: none"> • (5) Attempts to restore power to any vital bus. <ul style="list-style-type: none"> ○ (5.a) Attempts to start D/G 1-3. <ul style="list-style-type: none"> ▪ Places D/G 1-3 Mode Select Switch in Manual (VB4). ▪ Places D/G 1-3 Manual Mode Stop/Start Switch to Stop (VB4). ▪ Depresses the bus F 4kV Auto Xfer Reset pushbutton (VB4). ▪ Depresses D/G Shutdown Relay & Alarm Reset for D/G 1-3 (yellow lamicoid, just below associated diesel tachometer, VB4). ▪ Checks for alarms that would prevent D/G 1-3 from starting. ▪ Places D/G 1-3 Mode Select Switch back in Auto (VB4). <ul style="list-style-type: none"> • Notes D/G 1-3 fails to autostart. ▪ Attempts manual start of D/G 1-3: <ul style="list-style-type: none"> • Places D/G 1-3 Mode Select Switch in Manual (VB4). • Places D/G 1-3 Manual Mode Stop/Start Switch to Start (VB4). ○ (5.a RNO) May dispatch field operators to attempt local start of D/G 1-3.
Note: If the crew enquires about grid status, GCC reports 230kV has experienced significant damage. 500kV is available. Crew may also determine 500kV is available by checking Sync voltage on CC3.		
	SRO/BOP	<ul style="list-style-type: none"> ○ (5.b RNO) Implements Appendix DD, "Backfeed from 500KV System" (see page 15).
(continued on next page)		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 4Event No.: 6Page 11 of 16Event Description: Loss of All A/C Power (continued)

Time	Position	Applicant's Actions or Behavior											
(ECA-0.0, "Loss of All Vital AC Power", continued)													
	SRO/ATC	<ul style="list-style-type: none">(9) Isolates safeguards loads from deenergized vital buses:<ul style="list-style-type: none">Installs control switch interlocks on the following:<table><tr><td>4KV Vital Bus F<ul style="list-style-type: none">ASW Pump 1-1CCW Pump 1-1SI Pump 1-1CCP 1-1AFW Pump 1-3</td><td>4KV Vital Bus G<ul style="list-style-type: none">ASW Pump 1-2CCW Pump 1-2CS Pump 1-1RHR Pump 1-1CCP 1-2</td><td>4KV Vital Bus H<ul style="list-style-type: none">CCW Pump 1-3CS Pump 1-2SI Pump 1-2RHR Pump 1-2AFW Pump 1-2</td></tr></table>Places Standby Select switches to MANUAL (VB1):<ul style="list-style-type: none">ASW Pump 1-1 and 1-2CCW Pump 1-1, 1-2, and 1-3Ensures all CFCU Speed Select switches in LOW (VB1) and dispatches operators to open all CFCU breakers.<table><tr><td><ul style="list-style-type: none">CFCU No. 1-1 52-1F-02</td><td><ul style="list-style-type: none">CFCU No. 1-4 52-1H-01</td></tr><tr><td><ul style="list-style-type: none">CFCU No. 1-2 52-1F-01</td><td><ul style="list-style-type: none">CFCU No. 1-5 52-1G-02</td></tr><tr><td colspan="2"><ul style="list-style-type: none">CFCU No. 1-3 52-1G-01</td></tr></table>			4KV Vital Bus F <ul style="list-style-type: none">ASW Pump 1-1CCW Pump 1-1SI Pump 1-1CCP 1-1AFW Pump 1-3	4KV Vital Bus G <ul style="list-style-type: none">ASW Pump 1-2CCW Pump 1-2CS Pump 1-1RHR Pump 1-1CCP 1-2	4KV Vital Bus H <ul style="list-style-type: none">CCW Pump 1-3CS Pump 1-2SI Pump 1-2RHR Pump 1-2AFW Pump 1-2	<ul style="list-style-type: none">CFCU No. 1-1 52-1F-02	<ul style="list-style-type: none">CFCU No. 1-4 52-1H-01	<ul style="list-style-type: none">CFCU No. 1-2 52-1F-01	<ul style="list-style-type: none">CFCU No. 1-5 52-1G-02	<ul style="list-style-type: none">CFCU No. 1-3 52-1G-01	
4KV Vital Bus F <ul style="list-style-type: none">ASW Pump 1-1CCW Pump 1-1SI Pump 1-1CCP 1-1AFW Pump 1-3	4KV Vital Bus G <ul style="list-style-type: none">ASW Pump 1-2CCW Pump 1-2CS Pump 1-1RHR Pump 1-1CCP 1-2	4KV Vital Bus H <ul style="list-style-type: none">CCW Pump 1-3CS Pump 1-2SI Pump 1-2RHR Pump 1-2AFW Pump 1-2											
<ul style="list-style-type: none">CFCU No. 1-1 52-1F-02	<ul style="list-style-type: none">CFCU No. 1-4 52-1H-01												
<ul style="list-style-type: none">CFCU No. 1-2 52-1F-01	<ul style="list-style-type: none">CFCU No. 1-5 52-1G-02												
<ul style="list-style-type: none">CFCU No. 1-3 52-1G-01													
Note: On completion of Appendix DD, Shift Foreman will implement continuous action step 6 and go to step 28.													
	SRO/BOP	<ul style="list-style-type: none">(28) Determines at least one 4kV vital bus is energized.											
	SRO/ATC	<ul style="list-style-type: none">(29) Checks S/G pressure; maintains pressure using 10% steam dumps.											
	SRO/BOP	<ul style="list-style-type: none">Reads CAUTION regarding overloading capacity of power sources.(30) Ensures following realigned/loaded on energized vital buses:<ul style="list-style-type: none">480 volt bus – energized.125 V DC batteries and associated battery chargers.											
	SRO	<ul style="list-style-type: none">Reads NOTE regarding RCP seal cooling.(31) Identifies ECA-0.2, "Loss of All AC Power With SI Required" as the appropriate recovery procedure.											
(continued on next page)													

** Critical Task

Op-Test No.: L181-NRCScenario No.: 4Event No.: 6Page 12 of 16Event Description: Start Engineered Safeguards Systems

Time	Position	Applicant's Actions or Behavior																		
(ECA-0.2, "Loss of All Vital AC With SI Required")																				
	SRO	<ul style="list-style-type: none"> Reads CAUTION regarding CSF Status Trees being monitored for INFO only prior to the completion of step 11. Reads NOTE regarding waiting for restoration of multiple buses before continuing on in the procedure. 																		
Note: May use monitor light box test switch to view valve status.																				
	SRO/ATC	<ul style="list-style-type: none"> (1) Ensures SI RESET (status lights, VB1 and PK08-21 out). (2) Checks RWST level greater than 33%. (VB1) (3) Manually aligns SI valves to establish injection alignment: <ul style="list-style-type: none"> (3.a) Checks Monitor Light Box A – White lights out (VB1). (3.b) Checks Monitor Light Box C – Some white lights ON (VB1). <ul style="list-style-type: none"> Repositions the following per Appendix I, SI Valve Alignment for Injection Mode (VB2): <table border="1"> <tbody> <tr> <td>CHARGING INJECTION OUTLETS</td> <td>8801 A&B</td> <td>Open</td> </tr> <tr> <td>CHARGING INJECTION INLETS</td> <td>8801 A&B</td> <td>Open</td> </tr> <tr> <td>CHG TO REGEN HX STOP</td> <td>8107</td> <td>Closed</td> </tr> <tr> <td>CHG TO REGEN HX STOP</td> <td>8108</td> <td>Closed</td> </tr> <tr> <td>CHG PP SUCT FROM RWST</td> <td>8805 A&B</td> <td>Open</td> </tr> <tr> <td>CHP PP SUCT FROM VCT</td> <td>LCV-112 B&C</td> <td>Closed</td> </tr> </tbody> </table> (3.c) Ensures CCP recirc valves, 8105 and 8106 are OPEN. (4) Checks RCP Thermal Barrier CCW Isolation status: <ul style="list-style-type: none"> (4.a) Checks all CCW pumps not running (VB1). (4.b) Notes/verifies FCV-357 closed per earlier direction (VB1). 	CHARGING INJECTION OUTLETS	8801 A&B	Open	CHARGING INJECTION INLETS	8801 A&B	Open	CHG TO REGEN HX STOP	8107	Closed	CHG TO REGEN HX STOP	8108	Closed	CHG PP SUCT FROM RWST	8805 A&B	Open	CHP PP SUCT FROM VCT	LCV-112 B&C	Closed
CHARGING INJECTION OUTLETS	8801 A&B	Open																		
CHARGING INJECTION INLETS	8801 A&B	Open																		
CHG TO REGEN HX STOP	8107	Closed																		
CHG TO REGEN HX STOP	8108	Closed																		
CHG PP SUCT FROM RWST	8805 A&B	Open																		
CHP PP SUCT FROM VCT	LCV-112 B&C	Closed																		
	SRO/BOP	<ul style="list-style-type: none"> (5) Manually loads Safeguards Equipment on vital 4kV buses F and G: <ul style="list-style-type: none"> (5.a) Checks vital 4Kv auto transfer relays reset – blue lights out (VB4). 																		
	SRO/ATC	<ul style="list-style-type: none"> (5.b) Ensures ASW pump standby select switches in MANUAL (VB1): <ul style="list-style-type: none"> ASW Pump 1-1 ASW Pump 1-2 																		

(continued on next page)

** Critical Task

Op-Test No.: L181-NRC

Scenario No.: 4

Event No.: 6

Page 13 of 16

Event Description: Start Engineered Safeguards Systems, (continued)

[illegible]

(continued on next page)

**** Critical Task**

Op-Test No.: L181-NRCScenario No.: 4Event No.: 6Page 15 of 16Event Description: Loss of All A/C Power (continued) – Appendix DD, "Backfeed from 500KV System"

Time	Position	Applicant's Actions or Behavior																			
	BOP	<ul style="list-style-type: none">(1) Determines 500kV power is available:<ul style="list-style-type: none">Checks Sync bus volts approximately 120V (uses sync key on CB 532 or 632; CC3).																			
	BOP	<ul style="list-style-type: none">(2) Ensures Main Generator Exciter Field Breaker – OPEN (CC3).(3) Opens Motor Operated Disconnect (CC3).(4) Cuts out Generator Protective Relay Toggle Switches (VB4):<table><tr><td>○ 62AMG1/62AMG11, Anti Motoring</td><td>○ 21G1, Main Gen Backup</td></tr><tr><td>○ 3XG1/3XG11, Sequential</td><td>○ 46G1, Negative Sequence</td></tr><tr><td>○ 87YG1, Differential</td><td>○ 81G1/T3, UF-55HZ</td></tr><tr><td>○ 51RU, Unit Runback Fail Trip</td><td>○ 38G1, Turbine Thrust Bearing Wear</td></tr><tr><td>○ 94LSL1, Loss of System Load</td><td>○ 81G1/T2, UF-57HZ</td></tr><tr><td>○ 40G1, Loss of Field</td><td>○ 81G1/T1, UF-58HZ</td></tr><tr><td>○ 59G1, Overvoltage</td><td>○ OXP2\K3, Over Excitation</td></tr><tr><td>○ 59NG1, Neutral Running Overvoltage</td><td>○ 51E1, Exciter Overcurrent</td></tr><tr><td>○ 51STU1, Unit S/U Overcurrent</td><td>○ 78G1, Main Gen Out of Step</td></tr></table>		○ 62AMG1/62AMG11, Anti Motoring	○ 21G1, Main Gen Backup	○ 3XG1/3XG11, Sequential	○ 46G1, Negative Sequence	○ 87YG1, Differential	○ 81G1/T3, UF-55HZ	○ 51RU, Unit Runback Fail Trip	○ 38G1, Turbine Thrust Bearing Wear	○ 94LSL1, Loss of System Load	○ 81G1/T2, UF-57HZ	○ 40G1, Loss of Field	○ 81G1/T1, UF-58HZ	○ 59G1, Overvoltage	○ OXP2\K3, Over Excitation	○ 59NG1, Neutral Running Overvoltage	○ 51E1, Exciter Overcurrent	○ 51STU1, Unit S/U Overcurrent	○ 78G1, Main Gen Out of Step
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○ 59NG1, Neutral Running Overvoltage	○ 51E1, Exciter Overcurrent																				
○ 51STU1, Unit S/U Overcurrent	○ 78G1, Main Gen Out of Step																				
	BOP	<ul style="list-style-type: none">(5) Directs field operator to cutout the following Generator Protective Relay Switches in the back of Generator Relay Board RG Section 1 (128ft Cable Spreading Room):<ul style="list-style-type: none">62GSC3-TCO, Low Flow and Run Back Failure Trip Cutout62GSC4-TCO, Mn Gen Stator Amps CutoutANS2CX-TCO, Stator Cooling Water Low Flow Condc t Hi Trip Cutout62GSC5-TCO, Stator Cooling Water Flow Greater than 60 min Trip Cutout																			
(continued on next page)																					

** Critical Task

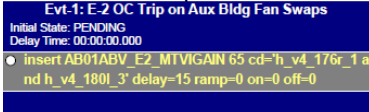
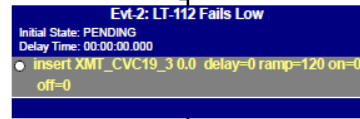
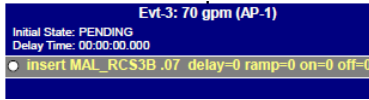
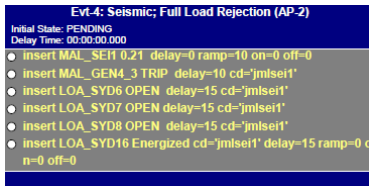
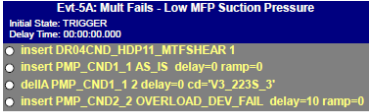
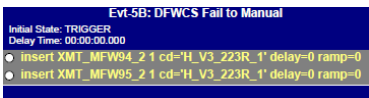
Op-Test No.: L181-NRCScenario No.: 4Event No.: 6Page 16 of 16Event Description: Loss of All A/C Power – Appendix DD, "Backfeed from 500KV System" (continued)(CT)

Time	Position	Applicant's Actions or Behavior
	BOP	<ul style="list-style-type: none"> • (6) Ensures the Gen Output Bkrs Reset Pushbutton (VB4) – Blue Light OFF. • (7) Resets Unit Trip Lockout Relays (VB4): <ul style="list-style-type: none"> o 86G1 o 86G11 • (8) Closes the 500kV output breakers (CC3): <ul style="list-style-type: none"> o Inserts and takes sync switch for CB 532 to MAN SYN position. <ul style="list-style-type: none"> ▪ Closes CB 532 o Takes sync switch for CB532 to OFF position and removes. o Inserts and takes sync switch for CB 632 to MAN SYN position. <ul style="list-style-type: none"> ▪ Closes CB 632 o Takes sync switch for CB 632 to OFF position and removes. • (9) Cuts out 4kV vital bus autotransfer to startup switches (VB4): <ul style="list-style-type: none"> o Bus G o Bus F • (10) Ensures the 4kV vital bus autotransfer relays are reset (VB4): <ul style="list-style-type: none"> o Bus G - Blue light off. o Bus F – Blue light off. • (11) Contacts field operators to ensure safe conditions in the switchgear rooms for energizing 4kV vital buses: <ul style="list-style-type: none"> o Breaker cubicles – doors closed. o Personnel clear of 4kV vital buses. • (12) Ensures 4kV Bus F and G Startup Feeder breakers and D/G Feeder breakers are OPEN.
Note: Board Operator will update the crew prior to energizing the vital buses.		
	BOP	<ul style="list-style-type: none"> • (13) Closes 4kV Aux Feeder Breakers on available buses (VB4): (S4CT-1)** <ul style="list-style-type: none"> o Inserts and takes sync switch for Bus G, 52-HG-13 to CLOSE position <ul style="list-style-type: none"> ▪ Closes 52-HG-13, Aux Xfrm 1-2 4kV FDR to Bus G o Takes sync switch back to OFF and removes o Inserts and takes sync switch for Bus F, 52-HF-13 to CLOSE position <ul style="list-style-type: none"> ▪ Closes 52-HF-13, Aux Xfrm 1-2 4kV FDR to Bus F o Takes sync switch back to OFF and removes <p>** (Critical Task) (S4CT-1) Energize at least one vital AC bus from prior to implementation of FLEX strategies (ECA-0.0, step 10 RNO) associated with entry into Extended Loss of AC Power Event (ELAP) conditions.</p>
The scenario may be terminated once Safety Injection flow is verified.		

** Critical Task

Attachment 1 – Scenario Set-up & Booth Actions

X = manual entry required

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	IC	RESTORE IC-11 (Alt - Use IC-11 and swap ASW trains (1-2 in service w/1-1 shut down; may use Swap2ASWP2.lsn or perform manually)	75%; MOL, C _B – See Turnover Sheet
X	Setup	N/A	D/G 1-2 OOS; Verify ABVS supply fan S-31 and exhaust fan E-1 in service. Check for OOS stickers from LT-112 failure in prior run of scenario.
	The Plant Abnormal Status Board for Surveillance Requirements		STP I-1C – Completed 1 hour ago, due in 7 hours.
	Copies of Procedures, Attachments; Appendixes; Foldout Pages; Annunciator Response Procedures and commonly used forms are in binders and NOT Marked up		OP J-2:V, PK03-17, PK11-21, AP-1, AP-2, AP-5, AP-19, EOP E-0, ECA-0.0, ECA-0.2
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"> S4CT1: Vital 4kV Bus Voltage S4CT2: ECCS Injection Flow
X	0 min	Lesson L181 NRC-S4.lsn	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by FILE or MANUALLY (below)
X	<u>Evt-1: E-2 OC Trip during fan swap</u> (approx. 3 min after taking watch per lead examiner)		E-2 trips 15 seconds after S-32 is started. If dispatched to check fan, report smell of burnt insulation in fan room.
X	<u>Evt-2: LT-112 Fails Low</u> (once Evt-1 ECG addressed, per Lead Examiner)		Causes auto make-up.
X	<u>Evt-3: RCS Leak</u> (once Evt -2 auto makeup secured, per Lead Examiner)		Bottom of loop 2 cold leg.
X	<u>Evt-4: Seismically induced Full Load Rejection</u> (once Evt-3 boration complete and TS addressed, per lead examiner)		Full Load Rejection following large seismic event.
X	<u>Evt-5: Low MFP suction pressure and DFWC fails to manual.(Major)</u> (DFW failure triggers off manual start of CBP set)	 	Low MFP Suction caused by Htr 2 drip pump shaft shear, OC trip of CBP 1-2, and standby CBP autostart failure (manual start works) DFWCS fails to manual from PT 508A & B loss of pwr (2 of 3 PCS input control transmitters). Expected response is Manual Rx Trip; Turbine/Rx will auto trip if no action taken by crew.

(con't on next page)

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

X = manual entry required

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
<u>Evt-6: Loss of All AC (Major)</u>	<p>Evt-6: (Major) Loss of ALL AC Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert MAL_EPS4E_2 DIFFERENTIAL cd='mispr lt 5' delay=5 ramp=0 on=0 off=0 ● insert MAL_SYD2 0 cd='mispr lt 5' delay=2 ramp=0 on=0 off=0 ● insert MAL_DEG1C_2 NO_RESET cd='H_V4_224 R_1' delay=0 ramp=0 on=0 off=0 	<p>Bus H Differential and loss of Startup both triggered on Rx trip. D/G 1-3 shutdown relay trigger on D/G 1-3 feeder breaker close. When directed to walkdown D/G 1-3, report back no obvious issues identified.</p> <p>Once crew enters ECA-0.0, clear generator fault.</p> <p>When GCC contacted, report 230 kV appears to have sustained significant damage but 500 kV is available.</p>
<u>Evt-7 TDAFW Pump autostart failure (post trip)</u>	<p>Evt-7: FCV-95 FAILS TO OPEN automatically Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert VLV_AFW7_1 1 delay=0 ramp=0 on=0 off=0 ● delIA VLV_AFW7_1 2 delay=0 cd='v3_219s_3' 	<p>FCV-95 fails to open in auto but can be opened manually in the C/R.</p>



Diablo Canyon Power Plant Operations Shift Log



Unit 1

Unit 1 Days at Power: 111 Days

Operating Mode: 1

Gross Generation: 860 MWe

Power Level: 75%

Net Generation: 810 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 5.7 SW 5.7 NE 5.7 SE 5.8 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 EMERGENT WORK:

- None

SHUTDOWN TECH SPECS / ECGS:

- D/G 1-2 Lube oil heater replacement. TS 3.8.1 Action B – due in 6 days

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

- None

TURNOVER ITEMS:

- Unit is operating at 75% due to a SCCW Hx Clearance

PRIORITY ITEMS FOR NEXT SHIFT:

- Complete D/G 1-2 return to service and testing following repairs.
- Perform swap of ABVS Supply and Exhaust Fans per OP H-1:II, step 6.1.

ANNUNCIATORS IN ALARM:

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

Shift Foreman Turnover

TURNOVER ITEMS:

- U-1: maintain 75% - no one in containment.
- U-2: maintain 100%.

REACTIVITY MANAGEMENT:

- Time in core life: MOL.
- Power History: Steady State at 75% for past 3 days.
- Boron concentration is 966 ppm from a sample taken 2 hours ago.
- Control Rod Height: 194 steps on CBD.
- Diluting the RCS approximately 25 gallons every 1.5 hrs.
- The last dilution was completed 30 minutes ago.

CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- Perform STP I-1C for D/G 1-2 OOS every 8 hours.

OTHER ABNORMAL PLANT STATUS

- None

Facility: Diablo Canyon (PWR) Scenario No: 5 Op-Test No: L181 NRC

Examiners: _____ Operators: _____

Initial Conditions: 100% Power, MOL with PT-403 OOS

Turnover: At 100% power with PT-403 OOS

Event No	Malf No.	Event Type*	Event Description (See Summary for Narrative Detail)
1	None	N (ATC, BOP)	Swap to CCP 1-1 from CCP 1-3 per OP B-1A:V, section 6.1
2	CC01CCW_CCP11_MTF SHEAR 1	TS, C (BOP, SRO)	CCW Pp 11 Shaft Shear (AR PK01-11; TS 3.7.7.A).
3	MAL_PPL7J 1	TS, I (ALL)	Eagle 21 DFP-1 Halt in Rack 10 (OP AP-5; TS 3.3.1.E,M; 3.3.2.D, L; 3.4.11).
4	PK1421_0829 1	C (ALL)	Loss of Main Transformer Cooling (AR PK14-21, AP-25)
5	MAL_SEI1 0.31 delay=0 ramp=15 MAL_PPL5A; PPL5B BOTH	M (ALL)	Large seismic with no automatic or manual reactor trip (ATWS).
6	MAL_RCS3C 10.0 cd='jmlsei1' delay=10 ramp=60	M (ALL)	SBLOCA following seismic; ramps in over 60 seconds.
7	MAL_PPL1A FAILURE_TO_INIT MAL_PPL1B FAILURE_TO_INIT	C (BOP)	Phase A – Train A and B fail to actuate requiring manual alignment.
8	MAL_SYD2 0 cd='jpplsia' delay=15 PMP_SIS2_2 OVERLOAD_DEV_FAIL cd='h_v4_218r_1' delay=3 PMP_CVC2_1 AS_IS BKR_EPS15 AS_IS BKR_EPS9_1 OVERCURRENT cd='H_V4_225R_1' MAL_AFW1 TRIP cd='h_v3_109m_1 gt 3000'	C (ALL)	Combination of electrical and mechanical failures result in no high or intermediate injection along with degraded secondary side heat removal capabilities requiring manual starts of available charging pump safety injection pump.

*(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)	7
2. Malfunctions after EOP entry (1-2) (Events 7,8)	2
3. Abnormal events (1–4) (Events 2,3,4)	3
4. Major transients (1-2) (Event 5,6)	2
5. EOPs entered/requiring substantive actions (1–2) (E-1)	1
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)(See description below)	3

Critical Task	Justification	Reference
(S5CT-1) Trip the Reactor by manually de-energizing 480V Buses 13D and 13E within 90 seconds of AR PK04-11, Reactor Trip Initiate coming into alarm.	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 challenge to the subcriticality critical safety function beyond that irreparably introduced by the postulated conditions.	<ul style="list-style-type: none"> Westinghouse Owner's Group WCAP-17711-NP Calc G.2 Rev 5 (08151-2169) OP1.ID2, Time Critical Operator Actions Rev 12, #34.
(S5CT-2) Manually close containment isolation valves such that at least one valve is closed on each Phase A containment penetration before transitioning out of EOP E-0.	Failure to perform the critical task leads to an unnecessary release of fission products to the auxiliary building, increasing the potential for release to the environment and reducing accessibility to vital equipment within the auxiliary building	<ul style="list-style-type: none"> WCAP-17711-NP, CT-11
(S5CT-3) Start CCP 1-2 and SIP 1-2, so as to avoid a severe (Magenta) challenge to the Core Cooling critical status function.	Failure to manually start available ECCS pumps under postulated conditions constitutes misoperation or incorrect crew performance in which the crew does not prevent "degraded emergency core cooling system (ECCS) capacity.	<ul style="list-style-type: none"> WCAP-17711-NP, CT-39 HFRC1BG Rev 3

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 #5

1. Crew performs normal charging pump swap per **OP B-1A:V, CVCS – Transfer Charging Pumps, Section 6.1.**
2. **AR PK01-11, CCW Pp 1-1 Recirc** comes into alarm for FCV-606, CCW Pump 1-1 Recirc Valve, open. Crew identifies low pump amps on VB-1 and dispatches Nuclear Operator to investigate. Field reports no audible flow sound in spite of indications motor is running. CCW Pump 1-3 is started manually and CCW Pump 1-1 shutdown. **TS 3.7.7.A, Vital Component Cooling Water (CCW) System**, is entered for one loop of CCW inoperable (72 hrs).
3. Eagle 21 experiences a Digital Filter Processor (DFP) halt on rack 10. Associated indicators PI-456, LI-460A, FI-415, FI-425, FI-435, FI-445 (VB2), and PR-445, LR-459 (CC2) fail “as-is” as well as control channels for PORV 456 (PT-456) and Pressurizer Level Control (LT-460). Crew responds per OP AP-5, Malfunction of Eagle 21 Protection or Control Channel. Shift Foreman reviews Tech Specs, entering:
 - **TS 3.3.2.D, PC 456D Low Press SI** (72 hrs).
 - **TS 3.3.1.E, PC 456A High Press Trip** (72 hrs).
 - **TS 3.3.1.M, PC 456C Low Press Trip** (72 hrs).
 - **TS 3.3.1.M, LC 460A High Level Trip** (72 hrs).
 - **TS 3.3.1.M, FC-415(425,435,445) RCS Loop 1 (2,3,4) Flow** (72 hrs).
 - **TS 3.3.2.L, PC-456 B, P-11** (1 hr).
 - **TS 3.4.11.B1, B2, & B3 PC-456E, to close & remove power from associated block valve (1 hr) and restore to operable** (72 hrs).
4. Crew responds to **AR PK14-21, MAIN TRANSF.** A nuclear operator is dispatched to investigate local alarms and reports back that NO cooling fans or oil pumps are running on the Main Bank C Transformer. Shift Foreman enters **OP AP-25, Rapid Load Reduction or Shutdown** and directs a 50 MW/min power reduction while Maintenance and field Operators attempt to restore transformer cooling.
5. A large earthquake (0.31 g) occurs during the ramp, but the reactor fails to trip automatically. The crew performs the immediate actions of **EOP E-0, Reactor Trip or Safety Injection** and successfully trips the reactor by opening the breakers for 480 V buses 13D and 13E to de-energize the control rod drive mechanism (CRDM) allowing control rods to fully drop into the core **(S5CT-1) Trip the Reactor by manually de-energizing 480V Buses 13D and 13E.**
6. A SBLOCA occurs as a result of the earthquake, but both trains of Phase A fail to actuate. The crew performs manual alignment of Phase A containment isolation valves per **Appendix E, ESF Auto Actions, Secondary and Auxiliaries Status (S5CT-2) Manually close containment isolation valves such that at least one valve is closed on each Phase A containment penetration.**
7. Startup power is lost shortly after Safety Injection initiates and a combination of electrical and mechanical failures result in the loss of both ECCS charging pumps and safety injection pumps, with CCP 1-2 and SIP 1-2 capable of being started manually. Secondary heat removal is affected as well. The turbine driven AFW pump trips on overspeed and AFW pump 1-3 has no power due to a loss of 4kV bus F. The crew performs the critical task of starting the available ECCS pumps **(S5CT-3) Start CCP 1-2 and SIP 1-2 so as to avoid a severe (Magenta) challenge to the Core Cooling critical status function.**

(continued)

SCENARIO SUMMARY – NRC #5

8. The crew proceeds through E-0, transitioning to **E-1, Loss of Reactor or Secondary Coolant**, where they check for subsequent failures and determine the optimal procedure flow path for long term recovery.

The scenario is terminated once the crew begins evaluation of Plant Status in E-1.

Op-Test No.: L181-NRC

Scenario No.: 5

Event No.: 1

Page 1 of 16

Event Description: Swap to CCP-1-1 From CCP 1-3 per OP B-1A:V, Section 6.1

[illegible]

**** Critical Task**

Op-Test No.: L181-NRCScenario No.: 5Event No.: 2Page 2 of 16Event Description: CCW Pp 11 Shaft Shear

Time	Position	Applicant's Actions or Behavior
Note: OP AP-11, "Malfunction of Component Cooling Water System" may also be referenced for guidance on starting the standby CCW Pump, however, adequate guidance is provided in the AR PK.		
	ATC	<ul style="list-style-type: none"> Observes PK01-11, "CCW PP 1-1 RECIRC" alarming and informs the Shift Foreman
(AR PK01-11, "CCW PP 1-1, RECIRC")		
	SRO	<ul style="list-style-type: none"> (2.1) Reads note describing alarm behavior - alarm is enabled 10-30 seconds after pump is started and disabled when the pump is shut down. <ul style="list-style-type: none"> Notes alarm is active when CCW Pp 1-1 amps fall below 44 amps.
	BOP	<ul style="list-style-type: none"> (2.1.1) Reports pump is running; motor current reading is approx 16 amps (VB1). <ul style="list-style-type: none"> May report CCW Header flow lower on all three headers (~ 4000-6000 gpm on each) (VB1).
	SRO/BOP	<ul style="list-style-type: none"> Reads note describing local reset of recirc valve. (2.1.2) Dispatches Nuclear Operator to investigate.
Note: Nuclear Operator in the field will report the following: Recirc valve FCV-606 is open, but there is no sound of flow in the adjacent piping. The pump is running, but sounds unusually high pitched.		
	SRO/BOP	<ul style="list-style-type: none"> (2.1.3.a,b) Starts stand-by CCW Pp 1-3 and shuts down CCW Pp 1-1 (if not already done)(VB1). (2.1.3.c) N/A May use OP F-2:II, "Component Cooling Water System - Changing Over Pumps and Common Components" for guidance on swapping CCW pumps.
	SRO	<ul style="list-style-type: none"> (2.1.3.d) Shift Foreman enters T.S. 3.7.7.A, Vital Component Cooling Water (CCW) System for one loop of CCW inoperable. Required action: restore vital loop to operable status (72 hours).
(continued on next page)		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 5Event No.: 3Page 4 of 16Event Description: Eagle 21 DFP-1 Halt in Rack 10

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> Observes PK06-01 (PPS CHANNEL SET FAILURE) and PK06-04 (PPS TROUBLE) alarming and informs the SFM.
	SRO	<ul style="list-style-type: none"> Enters OP AP-5, Malfunction of Eagle-21 Protection or Control Channel
(OP AP-5, "Malfunction of Eagle-21 Protection or Control Channel")		
	SRO/ATC	<ul style="list-style-type: none"> (1) Ensures Primary and Secondary Control Systems Controlling Properly in AUTO.
	SRO	<ul style="list-style-type: none"> Reads notes prior to Step 2. (2) Determines extent of Eagle 21 Instrument Failure. <ul style="list-style-type: none"> Identifies Protection Set 2 affected by PK06-01 & PK06-04 inputs. Dispatches operator to locally identify affected rack per Attachment 5.3. Identifies instruments affected by Rack 10 malfunction Attachment 5.1. <ul style="list-style-type: none"> PT-456, Pressurizer Pressure (PI-456 – VB2)(PR-455 - CC2) LT-460, Pressurizer Level (LI-460A – VB2)(LR-459 – CC2) FT-415, RCS Loop 1 Flow (FI-415 – VB2) FT-425, RCS Loop 2 Flow (FI-425 – VB2) FT-435, RCS Loop 3 Flow (FI-435 – VB2) FT-445, RCS Loop 4 Flow (FI-445 – VB2)
	SRO/ATC	<ul style="list-style-type: none"> (3) Rotates TR-411 to channel other than Loop 2 (CC1).
	SRO/BOP	<ul style="list-style-type: none"> (4) Checks steam dumps NOT actuated: <ul style="list-style-type: none"> Steam dumps are closed, UI-500 demand is zero, Dump Arming and Trip Signal lights are all out (VB3).
(continued on next page)		

** Critical Task

Op-Test No.: L181-NRC

Scenario No.: 5

Event No.: 3

Page 5 of 16

Event Description: Eagle 21 DFP-1 Halt in Rack 10 (continued)

Time	Position	Applicant's Actions or Behavior
	SRO	<ul style="list-style-type: none"> • Reads NOTE regarding consequences of a rack failure. • (5) Notifies I&C to investigate. • (6) Notes the need to ensure affected channels are removed from service prior to maintenance.
	BOP	<ul style="list-style-type: none"> • (7) Places Out-of-Service stickers on affected indicators.
	SRO	<ul style="list-style-type: none"> • (8) Shift Foreman review Tech Specs and enters the following: <ul style="list-style-type: none"> ○ TS 3.3.2.D, PC 456D Low Press SI (72 hrs) ○ TS 3.3.1.E, PC 456A High Press Trip (72 hrs) ○ TS 3.3.1.M, PC 456C Low Press Trip (72 hrs) ○ TS 3.3.1.M, LC 460A High Level Trip (72 hrs) ○ TS 3.3.1.M, FC-415(425,435,445) RCS Loop 1 (2,3,4) Flow (72 hrs) ○ TS 3.3.2.L, PC-456B, P-11 (1 hr) ○ TS 3.4.11.B1, B2, & B3 PC-456 E, to close & remove power from associated PORV block valve (1 hr) and restore to operable (72 hrs)
	SRO/BOP	<ul style="list-style-type: none"> • (8) Directs board operator to implement OP A-4A:III, "Pressurizer – Shutdown and Clearing" to place PCV-456 in close and close block valve 8000C, and dispatches Nuclear Operator to remove power.
<i>Proceed to the next event once Tech Specs addressed, per the lead examiner</i>		

**** Critical Task**

Op-Test No.: L181-NRCScenario No.: 5Event No.: 4Page 6 of 16Event Description: Loss of Main Transformer Cooling

Time	Position	Applicant's Actions or Behavior
	ATC	<ul style="list-style-type: none"> Observes PK14-21, "MAIN TRANSF", and informs the Shift Foreman.
(PK14-21, "MAIN TRANSF")		
	SRO/ATC	<ul style="list-style-type: none"> (1) Identifies input 829 – "Mn Bk Xfmr Annun and UV" for >90°C AND only 1 fan group running.
	SRO/ATC	<ul style="list-style-type: none"> (2.1.1, 2.1.2) Updates crew that AR PK contains the Rx Trip and Turbine Trip criteria. (2.1.3) Dispatches Nuclear Operator to investigate and report any local alarms: <ul style="list-style-type: none"> Checks blue breaker trip lights OFF in each TQMx-Cx panel (6 panels total). Nuclear Operator will report back there are local alarms in for High Oil Temp and Low Oil Flow; notes Main Bank 'C' has no fans running and winding temperature is currently 95°C.
	SRO/BOP	<ul style="list-style-type: none"> (2.1.4.a,b,c) When Nuclear Operator is directed to manually start the fans, reports fans did not start, and there are no oil pumps running. (2.1.4.d) Contacts Maintenance to investigate.
	SRO	<ul style="list-style-type: none"> (2.1.6) Directs Shift Manager to contact GCC to report alarm is in due to cooling problem on Main Bank 'C' (GCC receives local annunciator alarm when PK14-21 goes into alarm). (2.1.7) Determines alarm condition will not clear. <ul style="list-style-type: none"> (2.1.7.a) Notes alarm IS due to Main transformer bank high winding temperature and forced cooling cannot be restored. <ul style="list-style-type: none"> Notes Reactor must be tripped, and E-0 entered if winding temperature reaches 115°C and forced cooling has not been restored. Updates crew that Unit will be ramped at 50 MW/min per OP AP-25, "Rapid Load Reduction or Shutdown," until the Unit is off line or forced cooling is restored.

(continued on next page)

** Critical Task

Op-Test No.: L181-NRCScenario No.: 5Event No.: 5Page 9 of 16Event Description: Large seismic with no automatic or manual reactor trip (ATWS)

Time	Position	Applicant's Actions or Behavior
	ALL	ATWS is diagnosed from the following: <ul style="list-style-type: none"> • PK04-11 REACTOR TRIP INITIATE (Record Time for Critical Task: _____)
	SRO	Implements EOP E-0, "Reactor Trip or Safety Injection".
(EOP E-0, "Reactor Trip or Safety Injection")		
<u>Note:</u> Attempt to manually trip the reactor may be done prior to entry into EOP E-0 or as part of E-0, step 1 RNO.		
	ALL	Performs immediate actions: <ul style="list-style-type: none"> • (1) Ensure reactor trip: <ul style="list-style-type: none"> ◦ Identifies reactor is NOT tripped based on the following: <ul style="list-style-type: none"> ▪ Rx Trip breakers did NOT open (VB2) ▪ NIs are NOT lowering (CC1) ▪ Rod bottom lights are NOT lit(VB2); moves to step 1 RNO
	ATC/BOP	<ul style="list-style-type: none"> • (1 RNO) Attempts Manual Reactor Trip <ul style="list-style-type: none"> ◦ Tries manual reactor trip handles but is unsuccessful (CC1 or VB2). ◦ Opens 480V breakers 13D and 13E (VB5)(CT)** (Time Opened: _____) ◦ Recloses breakers 13D and 13E. <p>(Critical Task)(S5CT-1) Trip the Reactor by manually de-energizing 480V Buses 13D and 13E within 90 seconds of PK04-11, Reactor Trip Initiate coming into alarm.</p>
	SRO/ATC	<ul style="list-style-type: none"> • (1) Verifies reactor trip (trip bkrs open (VB2 upper left), rods on bottom (VB2 upper left DRPI panel), NIs decreasing (CC1 left)).
	SRO/ATC	<ul style="list-style-type: none"> • (2) Verifies turbine trip (stop valves closed) (CC3 HMI or VB2 RPS indicator lamps).
	SRO/BOP	<ul style="list-style-type: none"> • (3) Checks vital 4kv busses (VB4, vital busses G/H have white lights on mimic busses; bus F has no power).
<i>(continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 5Event No.: 6Page 10 of 16Event Description: Small Break LOCA (CT)

Time	Position	Applicant's Actions or Behavior
(EOP E-0, "Reactor Trip or Safety Injection") (continued)		
	SRO/ATC	<ul style="list-style-type: none"> (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). <ul style="list-style-type: none"> May note loss of pumps due to bus F failure.
	SRO	<ul style="list-style-type: none"> (5) Directs App E implemented (usually to BOP)(see page 14) <ul style="list-style-type: none"> Board manipulations are as follows: <ul style="list-style-type: none"> Manually closes Phase A Containment Isolation Valves: (CT S5CT-2)** <ul style="list-style-type: none"> 9356A/B (RCS Sample), 9355A/B (PZR Liquid Space Sample) (VB1, far left, lower skirt) 8045 (N2 Supply Isolation) (VB2, far right, upper) 8029 (PRT Primary Water) (VB2, far right, upper) 8100 and 8112 8152 FCV-253, 255, 258, 500 (Train A) FCV-254, 256, 260, 501 (Train B) FCV-584 FCV-633 8880 Starts CCP 1-2 and SIP 1-2 (S5CT-3)** Switches LCV-12 to CONT ONLY (VB3). Opens Main Feedwater Recirc Valves FCV-53 & 54 (VB3). Stops all but one CB Pp set. Throttles RCP seal injection flows to normal if needed (FCV-128, to 8-13 gpm each, CC2). <p>**(Critical Task)(S5CT-2) Manually close containment isolation valves such that at least one valve is closed on each Phase A containment penetration before transition out of EOP E-0.</p> <p>**(Critical Task)(S5CT-3) Start CCP 1-2 and SIP 1-2 pump so as to avoid a severe (Magenta) challenge to the Core Cooling critical status function.</p>
<i>(continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 5Event No.: 6,8Page 12 of 16Event Description: Small Break LOCA (continued)

Time	Position	Applicant's Actions or Behavior
(EOP E-0, "Reactor Trip or Safety Injection") (continued)		
	SRO/ALL	<ul style="list-style-type: none"> (11) Checks RCS intact (only one valid abnormal reading needed to transition from E-0): <ul style="list-style-type: none"> (11a) Determines containment pressure is NOT normal (VB1 meters, PPC). (11b) Determines containment sump levels NOT normal (VB1 meters, PAMS). (11c) Determines containment radiation is NOT normal (RM-11, 02, 07 in alarm). (11 RNO) Places 2nd ASW/CCW HX in service (opens FCV-603 and FCV-431, VB1)
	SRO	<ul style="list-style-type: none"> Checks Critical Safety Function Status Trees and transitions to EOP E-1, Loss of Reactor or Secondary Coolant
(EOP E-1, "Loss of Reactor or Secondary Coolant")		
	SRO/ATC	<ul style="list-style-type: none"> (1) Re-checks RCP trip criteria, noting again pumps not running due to bus loss (VB2).
	SRO/ALL	<ul style="list-style-type: none"> (2 & 3) Re-checks for faulted/ruptured S/Gs: <ul style="list-style-type: none"> Faulted – checks all S/G pressures on VB3 (not uncontrolled drop/depressurized). Ruptured – checks RE-71/72/73/74 and RE-15R/19 recorders on VB2 (and PPC; no upward trends or spikes), 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"> Verifies phase A containment isolation reset (VB1) Opens FCV-584 (air to containment) (VB4, lower left) Opens blowdown isolation valves inside containment (FCV-760, 761, 762, 763) Ensures Chemistry is sampling per CAP AP-1.
	SRO/ALL	<ul style="list-style-type: none"> (4) Checks S/G levels: <ul style="list-style-type: none"> Intact S/Gs NR Level – GREATER THAN 15% [25%] (VB3). Controls feedflow to maintain NR S/G Level between 20% and 65%. <ul style="list-style-type: none"> Notes only able to feed S/Gs 1-1 and 1-2 due to equipment failures.
<i>(continued on next page)</i>		

** Critical Task

Op-Test No.: L181-NRCScenario No.: 5Event No.: 6Page 13 of 16Event Description: Small Break LOCA (continued)

Time	Position	Applicant's Actions or Behavior
(EOP E-1, "Loss of Reactor or Secondary Coolant") (continued)		
	SRO/ATC	<ul style="list-style-type: none"> (5) Checks PORVs closed; block valves 8000A and 8000B are open (VB2 – upper panel, far right). May restore power to 8000C (5.a RNO) <ul style="list-style-type: none"> 8000A is without power due to bus loss. 8000C is closed and without power.
	SRO/ATC	<ul style="list-style-type: none"> (6) Determines Containment Spray did not actuate and is not required. (7) Determines ECCS flow should NOT be reduced. <ul style="list-style-type: none"> (a) RCS subcooling is less than 20°F (SCMM YI-31, lower center VB2).
	SRO/ATC	<ul style="list-style-type: none"> Reads CAUTION regarding running RHR pump with cooling to associated heat exchanger. (8) Determines RHR pump may be stopped: <ul style="list-style-type: none"> (a) Pressure is greater than 300 psig and slowly lowering. Goes to step (9) per RNO. (9) Notes RCS Pressure is lowering and continues to step (10).
	SRO/ATC	<ul style="list-style-type: none"> (10) Checks if Diesel Generators should be stopped <ul style="list-style-type: none"> (a) Checks for vital 4kV buses energized by offsite power; notes D/G powering buses G/H. (b) Resets SI (VB1) (c) Leaves D/Gs running.
	SRO/ALL	<ul style="list-style-type: none"> (11) Evaluates Plant Status: <ul style="list-style-type: none"> (a) Verifies cold leg recirculation capability – notes power avail to both RHR pumps. (b) Checks Aux building radiation monitor – all are Normal. (c) RNO Opens CCW Outlet Valves from RHR Hxs, FCV-364 and 365, to establish cooling to RHR pumps running on recirc. (VB2) (d) Directs RO to Implement Appendix P, Monitor Light Box Verification (checks ECCS valve lineup). (e) Contacts Chemistry to sample the RCS and place H₂ analyzers in service. (f) Checks Turbine status (oil pumps, coast down, etc). (g) Checks for alarms on Spent Fuel Pool level and temperature.
Once CTs S5CT-2 and S5CT-3 are complete, scenario may be terminated at any point past E-1, step 7.		

Op-Test No.: L181-NRC

Scenario No.: 5

Event No.: 7,8

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Event Description: (EOP E-0, Appendix E)(continued) (CT)

[illegible]

(continued on next page)

**** Critical Task**

Op-Test No.: L181-NRCScenario No.: 5Event No.: 7,8Page 16 of 16Event Description: (EOP E-0, Appendix E) (continued)

Time	Position	Applicant's Actions or Behavior
(EOP E-0, "Appendix E", continued)		
	BOP	<ul style="list-style-type: none"> (10) Checks ECCS flows (charging injection (VB2 upper panel left), SI, RHR (both on VB1 upper panel); <ul style="list-style-type: none"> Identifies injection flow from both CCP 1-2 and SIP 1-2. Determines RHR pumps are running in recirc; RCS pressure currently above pump shutoff head. (VB1, middle center skirt) (11) Reports ESF and AFW status to the Shift Foreman (Shift Foreman may direct operator to continue with Appendix E, or redirect to higher priority tasks)
	BOP	<ul style="list-style-type: none"> (12) Checks excess letdown – not in service (8166/8167 closed); (13) Checks secondary systems (MFPs tripped (VB2, green lights ON) <ul style="list-style-type: none"> Selects FCV-53/54 to recirc. Stops all but one CB Pp set. Takes LCV-12 control switch to CONT ONLY.
	BOP	<ul style="list-style-type: none"> (14) Checks proper operation of Aux Bldg and Control Rm vent systems (vent status light panel white lights)(VB4). <ul style="list-style-type: none"> Places both Unit 1 VENT TRAIN 1 BUS F and H MODE SELECT Switches to Mode-3 (VB4). (15) Verifies available DGs running normally (freq (60), volts (120), speed (900))(VB4). (16) Verifies vital batteries supplied by chargers (charger and bus volts)(VB5). (17) Verifies MSRs reset (Triconex HMI)(CC3). (18) Throttles RCP seal injection flows to normal if needed (FCV-128, to 8-13 gpm each, CC2). (19) Checks PK11-04 NOT IN (SFP alarm). (20) Notifies Shift Foreman of completion.

Attachment 1 – Scenario Set-up & Booth Actions

X = manual entry required

	TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
X	IC	RESTORE IC-10	100%; MOL, C _B – See Turnover Sheet
X	Setup	N/A	PT-403 OOS
	The Plant Abnormal Status Board for Surveillance Requirements		Ensure Abnormal Status board reflects initial setup prior to pump swap.
	Copies of Procedures, Attachments; Appendixes; Foldout Pages; Annunciator Response Procedures and commonly used forms are in binders and NOT Marked up		OP B-IA:V, AR PK01-11, PK14-21, OP AP-5, AP-11, AP-25, EOP E-0, E-1
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"> S5CT1: 13D & E position S5CT2: Phase A valve positions (see pg 13 for listing). S5CT3: ECCS pump discharge pressure and amps; Charging Injection Flow FI-917, and SI Flow FI-918 and FI-922
X	0 min	Lesson L181 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: Normal – Swap Charging Pumps</u> (approx. 3 min after taking watch per lead examiner)	Evt-1: Swap CCP 1-3 to CCP 1-1 Initial State: PENDING Delay Time: 00:00:00.000	Normal plant evolution to swap from CCP 1-3 to CCP 1-1.
X	<u>Evt-2: CCW 1-1 Shaft Shear</u> (once seal flow is adjusted after pump swap)	Evt-2: CCW Pp 1-1 Shaft Shear Initial State: PENDING Delay Time: 00:00:00.000 ● insert CC02CCW_CCP11_MTF SHEAR 1 delay=0 ramp=0	When dispatched to investigate, report back pump is running, but sounds unusual – high pitched squealing noise. Recirc valve FCV-606 is open, but there is no sound of water flowing in the adjacent pipe.
X	<u>Evt-3: Eagle 21 DFP Halt in Rack 10</u> (once Evt-2 TS addressed per lead examiner)	Evt-3: Eagle 21 DFP-1 Halt in Rack 10 (Mult TS) Initial State: PENDING Delay Time: 00:00:00.000 ● insert MAL_PPL7J 1 delay=0 ramp=0	When dispatched to rack, provide crew with copy of completed AP-5, Attachment 5.3 (using time compression)
X	<u>Evt-4: Loss of Main Transformer Cooling</u> (once Evt-3 TS addressed)	Evt-4: Loss of Main X-former Cooling Initial State: PENDING Delay Time: 00:00:00.000 ● insert PK1421_0829 1 delay=0 ramp=0	When dispatched to Main Transformer, report back "local alarms for high oil temp and low oil flow; also note that Bank 'C' has no fans running and winding temperature is currently 95°C. If asked about TQMx-Cx panels, report back "the blue breaker trip lights are OFF". When directed to manually start the fans, report "Fans did not start and there are no oil pumps running".
X	<u>Evt-5: (Major) Seismic event - ATWS</u> (triggers 45 seconds after FCV-110A opens)	Evt-5A: (Major) 0.31 G Seismic 45 sec after boration Initial State: TRIGGER Delay Time: 00:00:00.000 ● insert MAL_SEI 0.31 cd="h_v2_272r_1" delay=45 ramp=15 Evt-5B: ATWS (13D/E work) Initial State: TRIGGER Delay Time: 00:00:00.000 ● insert MAL_PPL5A BOTH delay=0 ramp=0 ● insert MAL_PPL5B BOTH delay=0 ramp=0	Seismic event is automatically triggered 45 seconds after boration flow control valve FCV-110A opens. ATWS: 13D/E will work.

(continued on next page)

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

X = manual entry required

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
<u>Evt-6: (Major) SB Loca</u> (10 seconds after seismic)	<p>Evt-6: SBLOCA 10 sec after seismic Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert MAL_RCS3C 10.0 cd='jmlsei1' delay=10 ramp=60 	SM Loca in loop 3 cold leg.
<u>Evt-7: (Phase A, Train A/B failure to init (post trip)</u>	<p>Evt-7: Phase A - Train A/B Failure Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert MAL_PPL1A FAILURE_TO_INIT delay=0 ramp=0 ● insert MAL_PPL1B FAILURE_TO_INIT delay=0 ramp=0 	Phase A, Train A/B actuation failure.
<u>Evt-8: Combination of mechanical/electrical failures resulting in potential ICC condition (post trip)</u>	<p>Evt-8A: Loss of S/U15 sec after SI Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert MAL_SYD2 0 cd='jpplsia' delay=15 ramp=0 <p>Evt-8B: SIP 1-2 OC Fail to Start (Man Avail) Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert PMP_SIS2_1 AS_IS delay=0 ramp=0 ● delIA PMP_SIS2_1 2 delay=0 cd='V1_241S_3' <p>Evt-8C: CCP 1-2 Fail to Start; Man Avail Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert PMP_CVC2_1 AS_IS delay=0 ramp=0 ● delIA PMP_CVC2_1 2 delay=0 cd='v2_265s_3' <p>Evt-8D: Bus F S/U Brkr OC; D/G 1-3 Breaker Fails As Is Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert BKR_EPS15 AS_IS delay=0 ramp=0 ● insert BKR_EPS9_1 OVERCURRENT cd='H_V4_225R_1' delay=0 ramp=0 <p>Evt-8E: TDAFW Overspeed Trip Initial State: TRIGGER Delay Time: 00:00:00.000</p> <ul style="list-style-type: none"> ● insert MAL_AFW1 TRIP cd='h_v3_109m_1 gt 3000' delay=0 ramp=0 	<p>Failures result in no high or intermediate head ECCS flow and only 1 MDAFW pump running.</p> <p>If contacted regarding D/G 1-3, report (after delay) breaker mechanically jammed.</p>



Diablo Canyon Power Plant Operations Shift Log



Unit 1

Unit 1 Days at Power: 111 Days

Operating Mode: 1

Gross Generation: 1187 MWe

Power Level: 100%

Net Generation: 1137 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 5.7 SW 5.7 NE 5.7 SE 5.8 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 EMERGENT WORK:

- None

SHUTDOWN TECH SPECS / ECGS:

- None

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

- None

TURNOVER ITEMS:

- PT-403 OOS for Calibration (TS 3.3.3.A); RTS next shift

PRIORITY ITEMS FOR NEXT SHIFT:

- Perform swap from CCP 1-3 to CCP 1-1 per OP B-1A:V, Section 6.1. RP surveys and postings have been completed.

Shift Foreman Turnover

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 3 days.
- Boron concentration is 906 ppm from a sample taken 2 hours ago.
- Control Rod Height: 231 steps on CBD.
- Diluting the RCS approximately 25 gallons every 1.5 hrs.
- The last dilution was completed 30 minutes ago.

CONDITIONAL SURVEILLANCES & INCREASED MONITORING:

- None

OTHER ABNORMAL PLANT STATUS

- None

Group 1 (U1, I1, R1)

Facility: Diablo Canyon			Date of Exam: Feb 24, 2020			Operating Test Number: L181												
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(*)		
		S5			S1			S3			S4							
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N							
		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					
RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>	RX				1									1	1	1	0	
	NOR													0	1	1	1	
	I/C				2,3,4,6					1,2,3,5,6,7				10	4	4	2	
	MAJ				5					4				2	2	2	1	
	TS				3,4									2	0	2	2	
RO <input type="checkbox"/> SRO-I1 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX					1								1	1	1	0	
	NOR													0	1	1	1	
	I/C					2,4,6		1,2,3,5,7						8	4	4	2	
	MAJ					5		4						2	2	2	1	
	TS							1,2						2	0	2	2	
RO1 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX													0	1	1	0	
	NOR													0	1	1	1	
	I/C						2,3,4,6,7	1,3,5,7						9	4	4	2	
	MAJ						5	4						2	2	2	1	
	TS													0	0	2	2	
RO2 <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:

- Check the applicant level and enter the operating test number and Form ES D 1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at the controls (ATC) and balance of plant (BOP) positions. Instant SROs (SRO I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO I additionally serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- 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 2 (I2, I3, R2, R3)

Facility: <u>Diablo Canyon</u>			Date of Exam: <u>Feb 24, 2020</u>			Operating Test Number: <u>L181</u>												
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(*)		
		S5			S1			S3			S4							
		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-I2 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX				1										1	1	1	0
	NOR		1												1	1	1	1
	I/C		3,4,8		2,3,4,6						1,2,3,4,5,7				13	4	4	2
	MAJ		5,6		5						6				4	2	2	1
	TS				3,4						1,3				4	0	2	2
RO <input type="checkbox"/> SRO-I3 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	RX														0	1	1	0
	NOR														0	1	1	1
	I/C	2,3,4,8						1,2,3,5,7				2,3,5			12	4	4	2
	MAJ	5,6						4				6			4	2	2	1
	TS	2,3						1,2							4	0	2	2
RO2 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX				1										1	1	1	0
	NOR														0	1	1	1
	I/C				2,4,6					1,2,3,5,6,7			1,3,4,7		13	4	4	2
	MAJ				5					4			6		3	2	2	1
	TS														0	0	2	2
RO3 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>	RX														0	1	1	0
	NOR			1											1	1	1	1
	I/C			2,3,4,7,8			2,3,4,6,7		1,3,5,7						14	4	4	2
	MAJ			5,6			5		4						4	2	2	1
	TS														0	0	2	2

Instructions:

- Check the applicant level and enter the operating test number and Form ES D 1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at the controls (ATC) and balance of plant (BOP) positions. Instant SROs (SRO I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO I additionally serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- 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 3 (I6, I7, R6, R4)

Facility: <u>Diablo Canyon</u>			Date of Exam: <u>Feb 24, 2020</u>			Operating Test Number: <u>L181</u>												
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(*)		
		S5			S1			S3			S4							
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N							
		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					
RO <input type="checkbox"/>	RX				1									1	1	1	0	
<input type="checkbox"/>	NOR		1											1	1	1	1	
<input checked="" type="checkbox"/> SRO-I6	I/C		3,4,8		2,3,4,6						1,2,3,4,5,7			13	4	4	2	
<input checked="" type="checkbox"/> SRO-U	MAJ		5,6		5						6			4	2	2	1	
<input type="checkbox"/>	TS				3,4						1,3			4	0	2	2	
RO <input type="checkbox"/>	RX													0	1	1	0	
<input type="checkbox"/>	NOR													0	1	1	1	
<input checked="" type="checkbox"/> SRO-I7	I/C	2,3,4,8						1,2,3,5,7				2,3,5		12	4	4	2	
<input checked="" type="checkbox"/> SRO-U	MAJ	5,6						4				6		4	2	2	1	
<input type="checkbox"/>	TS	2,3						1,2						4	0	2	2	
RO6 <input checked="" type="checkbox"/>	RX				1									1	1	1	0	
<input checked="" type="checkbox"/>	NOR													0	1	1	1	
<input type="checkbox"/> SRO-I	I/C				2,4,6					1,2,3,5,6,7			1,3,4,7	13	4	4	2	
<input type="checkbox"/> SRO-U	MAJ				5					4			6	3	2	2	1	
<input type="checkbox"/>	TS													0	0	2	2	
RO4 <input checked="" type="checkbox"/>	RX													0	1	1	0	
<input checked="" type="checkbox"/>	NOR			1										1	1	1	1	
<input type="checkbox"/> SRO-I	I/C			2,3,4,7,8			2,3,4,6,7	1,3,5,7						14	4	4	2	
<input type="checkbox"/> SRO-U	MAJ			5,6			5	4						4	2	2	1	
<input type="checkbox"/>	TS													0	0	2	2	

Instructions:

- Check the applicant level and enter the operating test number and Form ES D 1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at the controls (ATC) and balance of plant (BOP) positions. Instant SROs (SRO I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO I additionally serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- 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 4 (I4, I5, R5)

Facility: <u>Diablo Canyon</u>			Date of Exam: <u>Feb 24, 2020</u>			Operating Test Number: <u>L181</u>												
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(*)		
		S5			S1			S3			S4							
		C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N			C R E W P O S I T I O N							
		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"/>	RX				1										1	1	1	0
SRO-I4 <input checked="" type="checkbox"/>	NOR		1												1	1	1	1
SRO-U <input type="checkbox"/>	I/C		3,4,8		2,3,4,6						1,2,3,4,5,7				13	4	4	2
	MAJ		5,6		5						6				4	2	2	1
	TS				3,4						1,3				4	0	2	2
RO <input type="checkbox"/>	RX														0	1	1	0
SRO-I5 <input checked="" type="checkbox"/>	NOR														0	1	1	1
SRO-U <input type="checkbox"/>	I/C	2,3,4,8				2,3,4,6,7						2,3,5			12	4	4	2
	MAJ	5,6				5						6			4	2	2	1
	TS	2,3													2	0	2	2
RO5 <input checked="" type="checkbox"/>	RX				1										1	1	1	0
SRO-I <input type="checkbox"/>	NOR			1											1	1	1	1
SRO-U <input type="checkbox"/>	I/C			2,3,4,7,8		2,4,6							1,3,4,7		12	4	4	2
	MAJ			5,6		5							6		4	2	2	1
	TS														0	0	2	2
RO7 <input type="checkbox"/>	RX														0	1	1	0
SRO-I <input type="checkbox"/>	NOR														0	1	1	1
SRO-U <input type="checkbox"/>	I/C														0	4	4	2
	MAJ														0	2	2	1
	TS														0	0	2	2

Instructions:

- Check the applicant level and enter the operating test number and Form ES D 1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the at the controls (ATC) and balance of plant (BOP) positions. Instant SROs (SRO I) must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an SRO I additionally serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
- 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.

Facility: DCPP		Date of Examination: February 24, 2020								Operating Test No.: L181							
Competencies	GROUP I APPLICANTS																
	RO <input type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input checked="" type="checkbox"/>				RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				RO-1 <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				
	5	1	3	4	5	1	3	4	1	2	3	4	1	2	3	4	
Interpret/ Diagnose Events and Conditions		2,3,4,5,6,7	1,2,3,4,5,6,7			1,2,3,4,5,6	1,2,3,4,5,6,7			2,3,4,5,6,7		1,2,3,4,5,6,7					
Comply With and Use Procedures (1)		1,2,3,4,5,6,7	1,2,3,4,5,6,7			1,2,4,5,6	1,2,3,4,5,6,7			2,3,4,5,6,7		1,2,3,4,5,6,7					
Operate Control Boards (2)			1,2,3,4,5,6,7			1,2,5,6				2,3,4,5,6,7		1,3,4,5,7					
Communicate and Interact		1,2,3,4,5,6	1,2,3,4,5,6,7			1,2,3,4,5,6	1,2,3,4,5,6,7			2,3,4,5,6,7		1,2,3,4,5,6,7					
Demonstrate Supervisory Ability (3)		1,2,3,4,5,6					1,2,3,4,5,7										
Comply With and Use Tech Specs. (3)		3,4					1,2										
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																	

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Competency Rating factors as described on forms ES-303-1 and ES-303-3.)

Facility: DCPP		Date of Examination: February 24, 2020								Operating Test No.: L181							
Competencies	GROUP II APPLICANTS																
	RO <input type="checkbox"/> SRO-I2 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				RO <input type="checkbox"/> SRO-I3 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				RO-2 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				RO-3 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				
	SCENARIO				SCENARIO				SCENARIO				SCENARIO				
	5	1	3	4	5	1	3	4	5	1	3	4	5	1	3	4	
Interpret/ Diagnose Events and Conditions	3,4,5,6, 8	2,3,4,5, 6,7		1,2,3,4, 5,6,7	2,3,4,5, 6,7,8		1,2,3,4, 5,6,7	2,3,5,6		1,2,3,4, 5,6	1,2,3,4, 5,6,7	1,2,3,4, 6,7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,2,3,4, 5,6,7		
Comply With and Use Procedures (1)	1,3,4,5, 6,8	1,2,3,4, 5,6,7		1,2,3,4, 5,6,7	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6,7	2,3,5,6		1,2,4,5, 6	1,2,3,4, 5,6,7	1,3,4,6, 7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,2,3,4, 5,6,7		
Operate Control Boards (2)	1,3,4,5, 6,8							2,3,5,6		1,2,5,6	1,2,3,4, 5,6,7	1,3,4,6, 7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,3,4,5, 7		
Communicate and Interact	1,3,4,5, 6,8	1,2,3,4, 5,6		1,2,3,4, 5,6,7	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6,7	2,3,5,6		1,2,3,4, 5,6	1,2,3,4, 5,6,7	1,2,3,4, 6,7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,2,3,4, 5,6,7		
Demonstrate Supervisory Ability (3)		1,2,3,4, 5,6		1,2,3,4, 5,6,7	2,3,4,5, 6,7,8		1,2,3,4, 5,7										
Comply With and Use Tech Specs. (3)		3,4		1,3	2,3		1,2										
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																	

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Competency Rating factors as described on forms ES-303-1 and ES-303-3.)

Facility: DCPP		Date of Examination: February 24, 2020								Operating Test No.: L181																																																																																																											
Competencies	GROUP III APPLICANTS																																																																																																																				
	RO <input type="checkbox"/> SRO-I6 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				RO <input type="checkbox"/> SRO-I7 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				RO-6 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>				RO-4 <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>																																																																																																								
	SCENARIO				SCENARIO				SCENARIO				SCENARIO																																																																																																								
	5	1	3	4	5	1	3	4	5	1	3	4	5	1	3	4																																																																																																					
	<table border="1"> <tr> <td>Interpret/ Diagnose Events and Conditions</td> <td>3,4,5,6, 8</td> <td>2,3,4,5, 6,7</td> <td></td> <td>1,2,3,4, 5,6,7</td> <td>2,3,4,5, 6,7,8</td> <td></td> <td>1,2,3,4, 5,6,7</td> <td>2,3,5,6</td> <td></td> <td>1,2,3,4, 5,6</td> <td>1,2,3,4, 5,6,7</td> <td>1,2,3,4, 6,7</td> <td>1,2,3,4, 5,6,7,8</td> <td>2,3,4,5, 6,7</td> <td>1,2,3,4, 5,6,7</td> <td></td> </tr> <tr> <td>Comply With and Use Procedures (1)</td> <td>1,3,4,5, 6,8</td> <td>1,2,3,4, 5,6,7</td> <td></td> <td>1,2,3,4, 5,6,7</td> <td>1,2,3,4, 5,6,7,8</td> <td></td> <td>1,2,3,4, 5,6,7</td> <td>2,3,5,6</td> <td></td> <td>1,2,4,5, 6</td> <td>1,2,3,4, 5,6,7</td> <td>1,3,4,6, 7</td> <td>1,2,3,4, 5,6,7,8</td> <td>2,3,4,5, 6,7</td> <td>1,2,3,4, 5,6,7</td> <td></td> </tr> <tr> <td>Operate Control Boards (2)</td> <td>1,3,4,5, 6,8</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>2,3,5,6</td> <td></td> <td>1,2,5,6</td> <td>1,2,3,4, 5,6,7</td> <td>1,3,4,6, 7</td> <td>1,2,3,4, 5,6,7,8</td> <td>2,3,4,5, 6,7</td> <td>1,3,4,5, 7</td> <td></td> </tr> <tr> <td>Communicate and Interact</td> <td>1,3,4,5, 6,8</td> <td>1,2,3,4, 5,6</td> <td></td> <td>1,2,3,4, 5,6,7</td> <td>1,2,3,4, 5,6,7,8</td> <td></td> <td>1,2,3,4, 5,6,7</td> <td>2,3,5,6</td> <td></td> <td>1,2,3,4, 5,6</td> <td>1,2,3,4, 5,6,7</td> <td>1,2,3,4, 6,7</td> <td>1,2,3,4, 5,6,7,8</td> <td>2,3,4,5, 6,7</td> <td>1,2,3,4, 5,6,7</td> <td></td> </tr> <tr> <td>Demonstrate Supervisory Ability (3)</td> <td></td> <td>1,2,3,4, 5,6</td> <td></td> <td>1,2,3,4, 5,6,7</td> <td>2,3,4,5, 6,7,8</td> <td></td> <td>1,2,3,4, 5,7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Comply With and Use Tech Specs. (3)</td> <td></td> <td>3,4</td> <td></td> <td>1,3</td> <td>2,3</td> <td></td> <td>1,2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>																Interpret/ Diagnose Events and Conditions	3,4,5,6, 8	2,3,4,5, 6,7		1,2,3,4, 5,6,7	2,3,4,5, 6,7,8		1,2,3,4, 5,6,7	2,3,5,6		1,2,3,4, 5,6	1,2,3,4, 5,6,7	1,2,3,4, 6,7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,2,3,4, 5,6,7		Comply With and Use Procedures (1)	1,3,4,5, 6,8	1,2,3,4, 5,6,7		1,2,3,4, 5,6,7	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6,7	2,3,5,6		1,2,4,5, 6	1,2,3,4, 5,6,7	1,3,4,6, 7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,2,3,4, 5,6,7		Operate Control Boards (2)	1,3,4,5, 6,8							2,3,5,6		1,2,5,6	1,2,3,4, 5,6,7	1,3,4,6, 7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,3,4,5, 7		Communicate and Interact	1,3,4,5, 6,8	1,2,3,4, 5,6		1,2,3,4, 5,6,7	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6,7	2,3,5,6		1,2,3,4, 5,6	1,2,3,4, 5,6,7	1,2,3,4, 6,7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,2,3,4, 5,6,7		Demonstrate Supervisory Ability (3)		1,2,3,4, 5,6		1,2,3,4, 5,6,7	2,3,4,5, 6,7,8		1,2,3,4, 5,7										Comply With and Use Tech Specs. (3)		3,4		1,3	2,3		1,2								
Interpret/ Diagnose Events and Conditions	3,4,5,6, 8	2,3,4,5, 6,7		1,2,3,4, 5,6,7	2,3,4,5, 6,7,8		1,2,3,4, 5,6,7	2,3,5,6		1,2,3,4, 5,6	1,2,3,4, 5,6,7	1,2,3,4, 6,7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,2,3,4, 5,6,7																																																																																																						
Comply With and Use Procedures (1)	1,3,4,5, 6,8	1,2,3,4, 5,6,7		1,2,3,4, 5,6,7	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6,7	2,3,5,6		1,2,4,5, 6	1,2,3,4, 5,6,7	1,3,4,6, 7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,2,3,4, 5,6,7																																																																																																						
Operate Control Boards (2)	1,3,4,5, 6,8							2,3,5,6		1,2,5,6	1,2,3,4, 5,6,7	1,3,4,6, 7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,3,4,5, 7																																																																																																						
Communicate and Interact	1,3,4,5, 6,8	1,2,3,4, 5,6		1,2,3,4, 5,6,7	1,2,3,4, 5,6,7,8		1,2,3,4, 5,6,7	2,3,5,6		1,2,3,4, 5,6	1,2,3,4, 5,6,7	1,2,3,4, 6,7	1,2,3,4, 5,6,7,8	2,3,4,5, 6,7	1,2,3,4, 5,6,7																																																																																																						
Demonstrate Supervisory Ability (3)		1,2,3,4, 5,6		1,2,3,4, 5,6,7	2,3,4,5, 6,7,8		1,2,3,4, 5,7																																																																																																														
Comply With and Use Tech Specs. (3)		3,4		1,3	2,3		1,2																																																																																																														
Notes: (1) Includes Technical Specification compliance for an RO. (2) Optional for an SRO-U. (3) Only applicable to SROs.																																																																																																																					

Instructions:

Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Competency Rating factors as described on forms ES-303-1 and ES-303-3.)

Facility: DCPP		Date of Examination: February 24, 2020								Operating Test No.: L181							
Competencies	GROUP IV APPLICANTS																
	RO <input type="checkbox"/> SRO-I4 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				RO <input type="checkbox"/> SRO-I5 <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>				RO-5 <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				
	5	1	3	4	5	1	3	4	5	1	3	4	5	1	3	4	
Interpret/ Diagnose Events and Conditions	3,4,5,6,8	2,3,4,5,6,7		1,2,3,4,5,6,7	2,3,4,5,6,7,8	2,3,4,5,6,7		2,3,5,6	1,2,3,4,5,6,7,8	1,2,3,4,5,6		1,2,3,4,6,7					
Comply With and Use Procedures (1)	1,3,4,5,6,8	1,2,3,4,5,6,7		1,2,3,4,5,6,7	1,2,3,4,5,6,7,8	2,3,4,5,6,7		2,3,5,6	1,2,3,4,5,6,7,8	1,2,4,5,6		1,3,4,6,7					
Operate Control Boards (2)	1,3,4,5,6,8					2,3,4,5,6,7		2,3,5,6	1,2,3,4,5,6,7,8	1,2,5,6		1,3,4,6,7					
Communicate and Interact	1,3,4,5,6,8	1,2,3,4,5,6		1,2,3,4,5,6,7	1,2,3,4,5,6,7,8	2,3,4,5,6,7		2,3,5,6	1,2,3,4,5,6,7,8	1,2,3,4,5,6		1,2,3,4,6,7					
Demonstrate Supervisory Ability (3)		1,2,3,4,5,6		1,2,3,4,5,6,7	2,3,4,5,6,7,8												
Comply With and Use Tech Specs. (3)		3,4		1,3	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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Check the applicants' license type and enter one or more event numbers that will allow the examiners to evaluate every applicable competency for every applicant. (This includes all rating factors for each competency.) (Competency Rating factors as described on forms ES-303-1 and ES-303-3.)