

A3 and A4 are RO/SRO

ES-301

Administrative Topics Outline

Form ES-301-1

Facility: <u>Diablo Canyon</u>		Date of Examination: <u>1/11/2010</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>L081</u>
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Determine Boration/Dilution requirement for a power increase. G 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (3.9)
Conduct of Operations	D, R	Estimate Heat Up Rate (LJC-014) G 2.1.2 Knowledge of operator responsibilities during all modes of plant operation. (4.1)
Equipment Control	N, R	Review a tagout for a CCP G 2.2.13 Knowledge of tagging and clearance procedures (4.1)
Radiation Control	N, R	Calculate Maximum Stay Time G 2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions. (3.2)
Emergency Procedures/Plan		
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Facility: <u>Diablo Canyon</u>		Date of Examination: <u>1/11/2010</u>
Examination Level: RO <input type="checkbox"/>	SRO <input checked="" type="checkbox"/>	Operating Test Number: <u>L081</u>

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N, R	Determine the correct number of shift staffing during refueling operations. G 2.1.5 Ability to use procedures related to shift staffing, such as minimum crew complement, overtime limitations, etc. (3.9)
Conduct of Operations	N, R	Review Operator Logs G 2.1.3 Knowledge of shift or short-term relief turnover practices. (3.9)
Equipment Control	N, R	Review tagout of CCP G 2.2.13 Knowledge of tagging and clearance procedures (4.3)
Radiation Control	N, R	Calculate Maximum Stay Time G 2.3.4 Knowledge of radiation exposure limits under normal or emergency conditions. (3.7)
Emergency Procedures/Plan	N, R	Emergency event classification G 2.4.41 Knowledge of the emergency action level thresholds and classifications. (4.6)

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

* Type Codes & Criteria:

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

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

(N)ew or (M)odified from bank (≥ 1)

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

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT

JOB PERFORMANCE MEASURE

Number:	NRCL081LJA_ROA1		
Title:	DETERMINE DILUTION REQUIREMENTS FOR A POWER INCREASE		
Examinee:	_____		
Evaluator:	_____	_____	_____
	Print	Signature	Date
Results:	Sat _____	Unsat _____	Total Time: _____ minutes
Comments:			
References:	DCPP Unit 1 Cycle 16 Reactivity Briefing Sheet (9000 MWD/MTU)		
Alternate Path:	Yes _____	No	<u> X </u>
Time Critical:	Yes _____	No	<u> X </u>
Time Allotment:	15 Minutes		
Critical Steps:	2-6		
Job Designation:	RO		
Task Number:	G2.1.25		
Rating:	3.9		

JOHN P. LYLE ED HURST

AUTHOR:	_____ GARY HUTCHISON _____	DATE:	_____ 10/16/09 _____
			REV. 0

- Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the procedure and told the step with which to begin.
- Required Materials:** Calculator, Reactivity Briefing Sheet
- Initial Conditions:** Unit 1 was ramped down due to problems with Governor valve 4. Unit 1 has been at 90% power for 3 days with Control Bank D at 200 steps.
- Initiating Cue:** Shift Foreman directs you to determine the dilution or boration requirements to increase power to 95% assuming final rod position of 210 steps using the Reactivity Briefing Sheet.
- Task Standard:** Operator determines that 230 (+/- 2) gallons of primary water is required.

Start Time: _____

Step	Expected Operator Actions
1. Operator obtains correct procedure	1.1 Operator obtains Reactivity Briefing Sheet. Note: Provide exam copy of Reactivity Briefing Sheet Step was: Sat: _____ Unsat _____ *
2. ** Calculates reactivity from change in power	2.1 Operator determines that power coefficient is -12.57 pcm/% power. ** 2.2 Operator determines PCM for 5% increase in power. (-62.85 pcm) ** Step was: Sat: _____ Unsat _____ *
3. **Calculates reactivity from change in rod position	3.1 Operator determines PCM for Control Bank D at 210 steps. (28 pcm) ** 3.2 Operator determines PCM for Control Bank D at 200 steps. (59.8 pcm) ** 3.3 Operator determines PCM for change in rod position. (PCM at 200 – PCM at 220 steps = 31.8 pcm) ** Step was: Sat: _____ Unsat _____ *

*Denotes an entry required on the JPM cover sheet.

**Denotes a Critical Step.

Step	Expected Operator Actions
4. ** Calculates reactivity left after accounting change in rod position.	4.1 Accounts for reactivity from change in rods position on total reactivity from change in power. $(-62.8 + 31.8 = -31.05 \text{ pcm})^{**}$ Step was: Sat: _____ Unsat _____ *
5. **Determines % power change from reactivity associated with dilution.	5.1 Determines that 2.47 % power change is left to dilution water. $(-31.05 \text{ pcm} / -12.57 \text{ pcm}/\% \text{ power})^{**}$ Step was: Sat: _____ Unsat _____ *
6. **Determines amount of primay water to add.	6.1 Determines that 230 (+/- 2) gallons of primary water is required. $(2.47\% * 93 \text{ gal}/\% = 230 \text{ gallons})^{**}$ Step was: Sat: _____ Unsat _____ *

Stop Time: _____

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

*Denotes an entry required on the JPM cover sheet.

**Denotes a Critical Step.

ANSWER KEY

Initial Conditions: Unit 1 was ramped down due to problems with Governor valve 4. Unit 1 has been at 90% power for 3 days with Control Bank D at 200 steps

Initiating Cue: Shift Foreman directs you to determine the dilution or boration requirements to increase power to 95% assuming final rod position of 210 steps using the Reactivity Briefing Sheet.

Answer Key	Operator determines that 230 (+/- 2) gallons of primary water is required.
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Initial Conditions: Unit 1 was ramped down due to problems with Governor valve 4. Unit 1 has been at 90% power for 3 days with Control Bank D at 200 steps

Initiating Cue: Shift Foreman directs you to determine the dilution or boration requirements to increase power to 95% assuming final rod position of 210 steps using the Reactivity Briefing Sheet.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJA-ROA2

Title: ESTIMATE DECAY HEAT AND HEATUP RATE

Examinee: _____

Evaluator: _____

Print	Signature	Date
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Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: The Simulator is not required for the performance of this JPM.
Copy of Appendix B of OP AP SD-5 to be provided to the student for calculations.

References: OP AP SD-5, Loss of Residual Heat Removal, Rev. 9A

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 10 minutes

Critical Steps: 2, 3, 4

Job Designation: STA, SRO

Task Number: 43600.084

Rating: 3.8

AUTHOR: _____ GARY HUTCHISON _____ DATE: 10/22/09
REV.0

INSTRUCTOR WORKSHEET

- 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 student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the applicable procedure and step with which to begin.
- Required Materials:** Calculator, Copy of Appendix B of AP SD-5 to be provided to the student for calculations.
- Initial Conditions:** Unit 1 was shut down five days ago for a refueling outage.
- Core is still loaded (has not been off-loaded)
 - RCS has been drained to half loop for S/G nozzle dam installation
 - Reactor Vessel level is being maintained at 108' in accordance with OP A-2:III
 - RHR pump 1-1 just tripped on overcurrent
 - ◆ RHR pump 1-2 can NOT be started
 - ◆ RCS temperature is 110°F
 - ◆ NR RVRLIS level is 108'
- Initiating Cue:** The Shift Foreman has directed you to determine the time to reach 200°F.

INSTRUCTOR WORKSHEET

Start Time: _____

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 Refers to Appendix B of OP AP SD-5 <hr/> Note: May refer to SD-0 first. Appendix B may be used in other than SD-5. <hr/> 1.2 May refer to Foldout Page of OP AP SD-5. <hr/> Step was: Sat: _____ Unsat _____*
** 2. Calculate the predicted decay heat load. <hr/>	2.1 From the Predicted Heat Load curve, determines predicted heat load to be 13 MW (-0.5, +0.5). ** 2.2 Determines the fraction of previously used assemblies installed in core to be 1.0. ** <hr/> Note: A fraction of 1.0 is used since the core has not been off-loaded <hr/> 2.3 Calculates the estimated decay heat load to be 13 MW (-0.5, +0.5). ** <hr/> Step was: Sat: _____ Unsat _____*

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

INSTRUCTOR WORKSHEET

Step	Expected Operator Actions
** 3. Predict the heat up rate.	3.1 Uses 13 MW (-0.5, +0.5) from previous step. 3.2 Determines inventory factor to be 0.45 (based on 108' RCS level). ** 3.3 Calculates the predicted heat up rate to be 5.85 (5.63 to 6.08) degrees per minute. ** Step was: Sat: _____ Unsat _____ *
** 4. Calculate the estimated time to reach 200°F.	4.1 Calculates current temperature difference to be 90°F. ** 4.2 Calculates the time to reach 200°F to be 15.4 (14.8 to 16.0) minutes. ** Step was: Sat: _____ Unsat _____ *
5. Inform the Shift Foreman.	5.1 Informs the Shift Foreman. Step was: Sat: _____ Unsat _____ *

Stop Time: _____

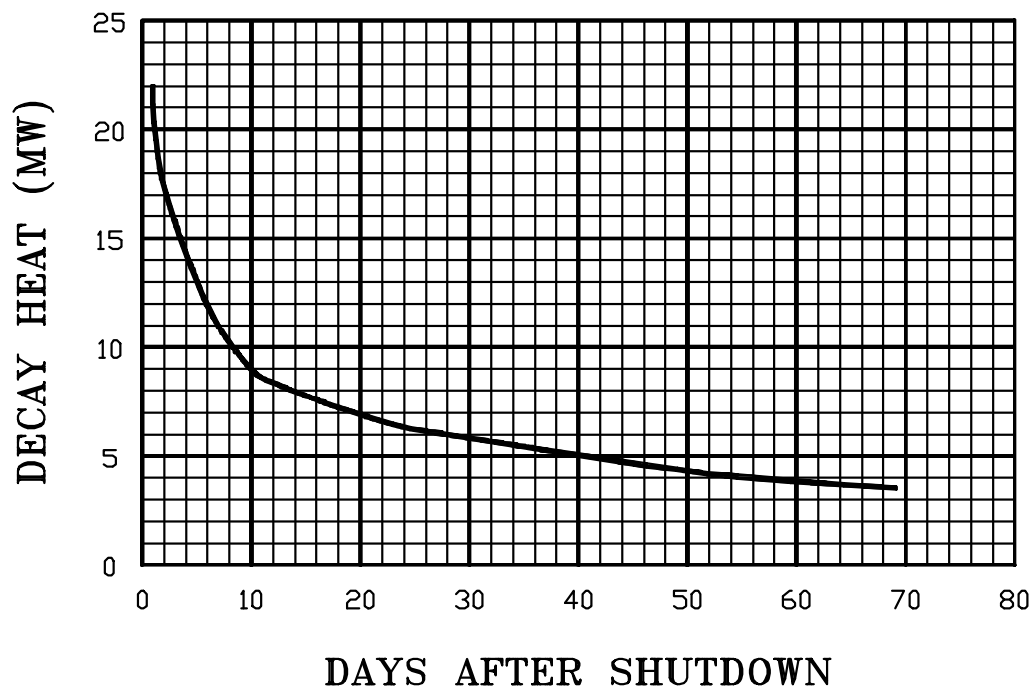
Total Time: _____ (Enter total time on the cover page)

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

EXAMINEE CUE SHEET

- Initial Conditions: Unit 1 was shut down five days ago for a refueling outage.
- Core is still loaded (has not been off-loaded)
 - RCS has been drained to half loop for S/G nozzle dam installation
 - Reactor Vessel level is being maintained at 108' in accordance with OP A-2:III
 - RHR pump 1-1 just tripped on overcurrent
 - ◆ RHR pump 1-2 can NOT be started
 - ◆ RCS temperature is 110°F
 - ◆ NR RVRLIS level is 108'
- Initiating Cue: The Shift Foreman has directed you to determine the time to reach 200°F.

APPENDIX BEstimation of Decay Heat and Heatup Rate^{T31417, T31098}1. PREDICTED HEAT LOAD**DECAY HEAT**1. 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)**2. 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

3. ESTIMATED TIME TO REACH 200 DEGREES

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

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJA-ROA3

Title: REVIEW A TAGOUT FOR A CCP

Examinee: _____

Evaluator: _____
Print Signature Date

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: Clearance 1C16 D-08-002 is required to complete this JPM.

References: Operator Valve Identification Diagram, 106708, Sheet 5 Rev. 131

Alternate Path: Yes X No _____

Time Critical: Yes _____ No X

Time Allotment: 15 minutes

Critical Steps: 2

Job Designation: RO/SRO

K/A Number: G 2.2.13 Knowledge of tagging and clearance procedures

K/A Rating 4.1 / 4.3

AUTHOR: _____ GARY HUTCHISON _____ DATE: 11/04/2009
REV.0

- Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The student will be given the initial conditions, initiating cue, and task standard. 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 with which to begin.
- Required Materials:** **Clearance 1C16 D-08-002 and OVID 106708 sheet 5**
- Initial Conditions:** Unit 1 is 100% power, steady state.
- Initiating Cue:** Perform a review of all clearance points on Clearance 1C16 D-08-002, Uncouple for rotation check, for technical errors.
- Task Standard:** Find and correct the two technical clearance errors within the clearance points.

Start Time: _____

Step

1. Obtain the correct reference material.**Expected Operator Actions**

Cue: Provide Operator with clearance sheet.

1.1 Operator selects Operator Valve Identification Diagram (OVID).

1.2 Selects Section 106708, Sheet 8.

Note: Operator may obtain valve and breaker number using optional reference material.**Note: Clearance Legend****TAGS:****MAN-ON-LINE (M)****CAUTION (C)****CONTROL BOARD CAUTION (CBC)****POSITIONS:****RACKED OUT (RO)****RACKED IN (RI)****CLOSED (CL)****OPEN (OP)**

Step was: Sat: _____ Unsat: _____*

*Denotes an entry required on the JPM cover sheet.

**Denotes a Critical Step.

Step	Expected Operator Actions
2. **Identify Auxiliary Feedwater Pump 1-2 clearance errors.	2.1 Operator determines point #3 tag should be a MAN-ON-LINE tag. 2.2 Determines point #4 FW-2-169 Position should be CLOSED (CL). 2.3 Determines point #6 valve FW-2-191 should be FW-2-173 for AFW Pp 2-2.

Step was: Sat: _____ Unsat _____*

Stop Time: _____

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

*Denotes an entry required on the JPM cover sheet.

**Denotes a Critical Step.

Initial Conditions: Unit 1 is 100% power, steady state.

Initiating Cue: Perform a review of all clearance points on Clearance 1C16 D-08-002, Uncouple for rotation check, for technical errors.

Task Standard: Find and correct the two technical clearance errors within the clearance points.

Technical Errors

0002	1C16-	Caution	RACKED OUT
1-08-E-CBL	52HF11		
4KV CHARGING PP 1-1			
UAE 1-A-119 Radmap 1533.00 G-7			

point 0002 should be a Danger Tag

0005	1C16-	Danger	CLOSED
1-08-P-V	CVCS-1-8477B		
CHARG. PP 1-2 RECIRC TO SEAL WTR HX...			
UAE 1-H-73 Radmap 0130.00 L-8 CHG PP 1-2 RM / 73' AUX BLDG / B-1A:IX			

point 0005 is for CCP 12 not pump 11

Answer Key

Initial Conditions: Unit 1 is 100% power, steady state.

Initiating Cue: Perform a review of all clearance points on Clearance 1C16 D-08-002,
Uncouple for rotation check, for technical errors.

Answer

Student Handout

Nuclear Power Generation
Diablo Canyon Power Plant
Job Performance Measure

Number: NRCL081LJA-ROA4

Title: Stay Time Determination

Examinee: _____

Evaluator: _____

Print

Signature

Date

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: Designed for RO Candidates in a classroom setting.

References: RP1.ID6, Personnel Dose Limits and Monitoring Requirements, Rev. 10

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 10 minutes

Critical Steps: 3.3

Job Designation: RO

K/A: G 2.3.4; Knowledge of radiation exposure limits under normal or emergency conditions.

Rating: 3.2

AUTHOR: _____ **SEAN CURRIE** _____ **DATE:** 05/24/2009

REV. 0

Instructor Worksheet

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 student will be given the initial conditions and initiating cue. 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 with which to begin.
Required Materials:	RP1.ID6, Personnel Dose Limits and Monitoring Requirements, Rev. 10
Initial Conditions:	<p>The Work Control Shift Foreman (WCSFM) has requested you to hang a clearance in an area where the known radiation dose rate is 300 mrem/hr. Your current year exposure history, according to your NRC Form 4 is as follows:</p> <ul style="list-style-type: none">• Committed Dose Equivalent (CDE) 15 mrem• Committed Effective Dose Equivalent (CEDE) 250 mrem• Deep Dose Equivalent (DDE) 450 mrem• Eye Dose Equivalent (LDE) 15 mrem• Shallow Dose Equivalent (SDE) 10 mrem
Initiating Cue:	The WCSFM has directed you to determine your maximum stay time in the High Radiation Area while hanging clearance before exceeding the DCPD Administrative Dose Guideline for Whole Body Total Effective Dose Equivalent (TEDE).
Task Standard:	DO NOT READ TO STUDENT: Maximum Stay time is calculated.

* Denotes an entry required on the JPM cover sheet

** Denotes a Critical Step

Instructor Worksheet

Start Time:

Step	Expected Operator Actions
1. Determine TEDE	<div>1.1 TEDE = DDE + CEDE</div> <div>1.2 TEDE = 450 mrem + 250 mrem</div> <div>1.3 TEDE = 700 mrem</div> <div>Step was: Sat: _____ Unsat _____*</div>
2. Determine DCPD Administrative Limits for TEDE	<div>2.1 Determines DCPD Administrative Limit for TEDE = 4500 mrem</div> <div>2.2 Determines DCPD Administrative Guideline for TEDE = 2000 mrem</div> <div>2.3 Determine MARGIN to Administrative Guideline is: 2000 – 700 = 1300 mrem</div> <div>Step was: Sat: _____ Unsat _____*</div>
3. Determine maximum stay time **	<div>3.1 Stay time = Margin / Dose Rate</div> <div>3.2 Stay time = 1300 mrem / 300 mrem/hr</div> <div>** 3.3 Stay time = 4.33 hours</div> <div>ACCEPTABLE TIME: 4.1 – 4.5 hours</div> <div>Step was: Sat: _____ Unsat _____*</div>

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

ANSWER KEY

Initial Conditions: The Work Control Shift Foreman (WCSFM) has requested you to hang a clearance in an area where the known radiation dose rate is 300 mrem/hr. Your current year exposure history, according to your NRC Form 4 is as follows:

- Committed Dose Equivalent (CDE) 15 mrem
- Committed Effective Dose Equivalent (CEDE) 250 mrem
- Deep Dose Equivalent (DDE) 450 mrem
- Eye Dose Equivalent (LDE) 15 mrem
- Shallow Dose Equivalent (SDE) 10 mrem

Initiating Cue: The WCSFM has directed you to determine your maximum stay time in the High Radiation Area while hanging clearance before exceeding the DCPD Administrative Dose Guideline for Whole Body Total Effective Dose Equivalent (TEDE).

Document Your Answer Here		
TEDE = DDE + CEDE	TEDE = 450 mrem + 250 mrem	TEDE = 700 mrem
Margin = 2000 – 700 = 1300 mrem		
Stay time = Margin / Dose Rate	1300 mrem / 300 mrem/hr	
Stay time = 4.33 hours		

- Committed Dose Equivalent (CDE) 15 mrem
- Committed Effective Dose Equivalent (CEDE) 250 mrem
- Deep Dose Equivalent (DDE) 450 mrem
- Eye Dose Equivalent (LDE) 15 mrem
- Shallow Dose Equivalent (SDE) 10 mrem

The WCSFM has directed you to determine your maximum stay time in the High Radiation Area while hanging clearance before exceeding the DCPD Administrative Dose Guideline for Whole Body Total Effective Dose Equivalent (TEDE).

Document Your Answer Here

STUDENT HANDOUT

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT

JOB PERFORMANCE MEASURE

Number: NRCL081LJA_SROA1

Title: DETERMINE SHIFT STAFFING DURING REFUELING
OPERATIONS

Examinee: _____

Evaluator: _____

Print	Signature	Date
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Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: OP1.DC37 "Plant Logs." Rev. 40

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 15 Minutes

Critical Steps: 2

Job Designation: SRO

Task Number: G2.1.3

Rating: 3.9

- 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 student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the procedure and told the step with which to begin.
- Required Materials:** Shift Watch List for this JPM
- Initial Conditions:** Unit 1 is operating at 100% power, Unit 2 is 10 days into a refueling outage in mode 6.
- Initiating Cue:** Review the Shift Watch List.
- Task Standard:** Operator determines U1 Work Control Lead can not be TS/Eplan and Ops Responder (OR).
- Operator determines that watch list doesn't have four management licenses designated.

Start Time: _____

Step	Expected Operator Actions
1. Operator reviews shift watch list	1.1 Operator reviews shift logs for completeness and accuracy. Step was: Sat: _____ Unsat _____*
2. ** Determines errors with staffing	2.1 Determines that U1 Work Control Lead can not be TS/Eplan and Ops Responder (OR).** 2.2 Determines that watch list doesn't have four management licenses designated. ** Step was: Sat: _____ Unsat _____*

Stop Time: _____

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

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

ANSWER KEY

Initial Conditions: Unit 1 is operating at 100% power, Unit 2 is 10 days into a refueling outage in mode 6.

Initiating Cue: Review the Shift Watch List

Answer Key

- Operator determines U1 Work Control Lead can not be TS/Eplan and Ops Responder (OR).
- Operator determines that watch list doesn't have four management licenses designated.

Initial Conditions: Unit 1 is operating at 100% power, Unit 2 is 10 days into a refueling outage in mode 6.

Initiating Cue: Review the Shift Watch List

Hand the
following two
pages to
examinee

Shift Watch List

Position	Name	EPlan	R	OR	FBM	STA	Comm #2
Shift Manager	WERNER, ERIK	X	X			X	
Work Control Shift Foreman	KENNEDY, MICHAEL	X	X				
SFM Extra (Optional)	BEALS, DAVID		X				
SFM Extra (Optional)	MERTOGLU, REMZI		X				
Shift Engineer							
U1 Shift Foreman	MEHIGAN, CHRISTOPHE	X	X				
U1 SCO							
Control Room Assistant							
U1 Work Control Lead	KATZ, RAYMOND	X	X	X			
U1 Balance of Plant CO	HACKLEMAN, JOHN	X	X				
U2 SCO							
U1 CO	RACETTE, GARRY	X	X				
U1 Turbine Building	PERRY, DANIEL	X	X				
Additional CO							
U1 Aux Building	SPARKS, BRYAN	X	X				
U1 Polisher	LEE, MICHAEL	X	X				
Intake and Outside	KONDO, MARK		X				
U2 Shift Foreman	HURST, CLAYTON		X				
U2 Work Control Lead (Optional)	JANES JR, RICHARD	X	X				
Auxiliary Senior							
U2 Balance of Plant CO	TRYGG, JACK	X	X				X
U2 CO	MOYER, JAMES	X	X				
U2 Turbine Building	ANNONI, GRANT	X	X				
U2 Aux Building	ANTHONY, DAVID	X	X				
U2 Polisher	KNIGHT, JAMES						

Work Control Extra License	MARTIN, TIMOTHY						
Shift Control Tech 1 - Days	HART, DANIEL	X					
Shift Control Tech 2 Days	PELYPEC, MICHAEL	X					
Shift Control Tech 1 Swings	CIMBUR, NIKOLA	X					
Shift Control Tech 2 Swings	EVENSON, DONNA	X					
Shift Control Tech 1 Mids							
Shift Control Tech 2 Mids							
RP Tech Days	GOETTIG, JEFFRY	X					
RP Tech Swings	FIELDING, RICKY	X					
RP Tech Mids	FIELDING, RICKY	X					
Chem Tech Days	SHELDON, KEITH	X					
Chem Tech Swings	LIBBY, DENNIS	X					
Chem Tech Mids	LIBBY, DENNIS	X					
Additional Personnel	KISER, JACK		X				
Additional Personnel	SILVA, STEPHEN		X				
Additional Personnel	VOGEL, JAY		X				
Additional Personnel	SMITH, JARED		X				
Additional Personnel	HALL, TODD		X				
Additional Personnel	BEERFELDT, STEVEN		X				
Additional Personnel	STEFFENS, TYLER		X				
Additional Personnel	BARE, CHRISTINE		X				
Additional Personnel	HURLBURT JR, JOHN		X				

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJA_SROA2

Title: REVIEW OPERATOR LOGS

Examinee: _____

Evaluator: _____

Print	Signature	Date
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Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References:

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 15 Minutes

Critical Steps:

Job Designation: SRO

Task Number: G2.1.3

Rating: 3.9

- 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 student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the procedure and told the step with which to begin.
- Required Materials:** Operator Log Sheet for this JPM
- Initial Conditions:** Unit 1 is operating at 100% power, with a overcurrent trip on 52-1G-46 for 8000B.
- Initiating Cue:** Review the shift logs.
- Task Standard:** Operator determines that Pressurizer PORV PCV-456 was taken to close > 1 hour from loss of Bus.

Start Time: _____

Step	Expected Operator Actions
1. Operator reviews shift logs	1.1 Operator reviews shift logs for completeness and accuracy. Step was: Sat: _____ Unsat _____*
2. ** Determines time PORV taken to close greater than 1 hour	2.1 Determines that PCV-455C was not taken to close within one hour of block valve 8000B being inoperable as required in TS 3.4.11.C.1. ** Step was: Sat: _____ Unsat _____*

Stop Time: _____

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

*Denotes an entry required on the JPM cover sheet.

**Denotes a Critical Step.

Initial Conditions: Unit 1 is operating at 100% power, with a overcurrent trip on 52-1G-46 for 8000B.

Initiating Cue: Review the shift logs.

Hand the
following two
pages to
examinee



Diablo Canyon Power Plant

Operations Shift Log

Unit 1



Today - Dayshift

*NPG has gone 193 days without a plant event.
NPG has operated 18 days without a critical equipment event.*

Unit 1 Days at Power: 10 Days

Operating Mode: 1

Gross Generation: 1178 MWe

Power Level: 100%

Net Generation: 1128 MWe

Shift Manager Turnover

PRA NEXT SHIFT:	GREEN
GRID STATUS NEXT SHIFT:	NORMAL
AVERAGE RCS CALCULATED LEAKRATE:	0.01 GPM
CONDENSER INLEAKAGE:	0.0 GPD
MAIN GENERATOR H2 USAGE:	Daily = 369 SCF / 5 day average = 428 SCFD

NEW EMERGENT WORK

* 52-1G-46 (8000B) overcurrent trip

SHUTDOWN TECH SPECS / ECGS

* TS 3.4.11 for 8000B

TURNOVER ITEMS

* Generate clearance for 52-1G-46

Log Entries

Time	Entry	User	User Type
7:09	Power Range NIs 100.2 Calorimetric Power 99.6 Generator MW 1177.6 Bank D @ 231 Boron Conc. 1262 ppm. from sample taken on: Today at 0145 hrs. Ave. Delta I -2.9 Target Delta I -2.8 Gov.Vlv. 4 Pos. 24.5 N. Cond. Press. 1.96 S. Cond. Press. 2.08 Contmt. Press. +0.097 Boric Acid Integrator 116449 Primary Water Integrator 681744 DILUTING 10 gallons approx every 4 hours; RUNNING EQUIPMENT: ASW pp 1-1; CCW pps 1-1 & 1-2; CFCU's 1-1, 1-2, & 1-3 In HIGH; CCP 1-3 with 78 gpm letdown in service 8149B; BA transfer pp 1-1 aligned to blender; Primary water pp 1-2; Letdown filter 1-1; Seal injection filter 1-1 and Mixed bed demin 1-2 all in service; Makeup water transfer pp 02; Cond / Booster pp sets 1-1 & 1-3; Circ water pp 1-2 aligned for Auto Reclose and SCW h/x supply; Stator Top Delta T at 9.4 degrees, Bottom Delta T at 8.0 degrees, flow @ 825.8 gpm; Condenser Delta P's: NW @ 7.0 psid, NE @ 7.4 psid, SW @ 7.2 psid, SE @ 7.5 psid	GLH1	CO
7:59	Diluted RCS with 10 gallons of primary water. 10 gallons total this shift	GLH1	CO
8:24	Authorized Discharge of LDT 0-1 Per Discharge Permit 2009-0-109	RNF5	USFM
8:48	Reviewed STP I-1A (Shift Checklist), satisfactory. Gross sump leakage = .0184 gpm		
9:36	Commenced Discharge of LDT 0-1 @ 83%. Batch # 2009-0-109. SCARP Sheldon informed	BCS1	AUXSR
11:15	Chemistry Technician B. Leasburg reports U1 RCS Boron Conc. = 1260 ppm., Sample taken @ 0845 hours. A 30 minute Cation Bed run is not requested	bcl6	CHEM SCARP
11:36	Diluted RCS with 10 gallons of primary water. 20 gallons total this shift	GLH1	CO
12:16	Secured Discharge of LDT 0-1 @ 10%. Batch # 200-0-109	BCS1	AUXSR
15:53	Diluted RCS with 10 gallons of primary water. 30 gallons total this shift	GLH1	CO
17:00	Overcurrent trip on 52-1G-46 breaker for 8000B.	GLH1	CO
17:00	Entered TS 3.4.11 for inoperable PORV block valve.	RNF5	USFM
17:05	Turbine Building watch reports breaker 52-1G-46 in tripped position and has burnt insulation smell at breaker.	RNF5	USFM
17:07	52-1G-46 in tripped position and has burnt insulation smell.	JMB1	TURB
17:09	Contacted maintenance to investigate breaker 52-1G-46.	RNF5	USFM
18:05	PCV-455C switch placed to closed position	GLH1	CO
18:17	Electrical Maintenance reports that 52-1G-46 has indications of shorted wiring.	RNF5	USFM
18:53	Diluted RCS with 10 gallons of primary water. 40 gallons total this shift	GLH1	CO

Nuclear Power Generation
Diablo Canyon Power Plant
Job Performance Measure

Number: NRCL081LJA-SROA5

Title: Classify a Loss of Shutdown Cooling Event

Examinee: _____

Evaluator: _____

	Print	Signature	Date
Results:	Sat _____	Unsat _____	Total Time: _____ minutes
Comments:	Designed for SRO Candidates in a classroom setting.		

References: DCPD Emergency Action Level Matrix & Background Document
EVENT Number 43360 May 12, 2007

Alternate Path: Yes _____ No X

Time Critical: Yes X No _____

Time Allotment: 15 minutes

Critical Steps: 2.1

Job Designation: SRO

K/A: G 2.4.41; Knowledge of the emergency action level thresholds and classifications.

Rating: 4.6

AUTHOR: _____ SEAN CURRIE _____ DATE: _____ 05/24/2009 _____

REV. 0

Instructor Worksheet

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 student will be given the initial conditions and initiating cue. 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 with which to begin.
Required Materials:	DCPP Emergency Action Level Matrix & Background Document
Initial Conditions:	<p>Unit 1 is cooling down and just entered Mode 5 in preparation for a refueling outage with the following conditions:</p> <ul style="list-style-type: none">• Auxiliary Power is cleared for maintenance.• Emergency Diesel Generator EDG 1-1 cleared for maintenance.• Offsite power is being supplied by startup power. <p>At 1200 hrs, Morro-Bay-Diablo transmission line fails resulting in a loss of startup power.</p> <p>Emergency Diesel Generator EDG 1-3 generator output breaker trips on over-current.</p> <p>Emergency Diesel Generator EDG 1-2 starts but trips on over-speed, interrupting RCS heat removal.</p> <p>At 1220, EDG 1-2 over-speed is reset and plant cooldown is re-established.</p>
Initiating Cue:	Determine the proper event classification and report results to the Shift Manager.
Task Standard:	DO NOT READ TO STUDENT: The proper event classification is determined and the results are reported to the Shift Manager.

Instructor Worksheet

Start Time:

Step		Expected Operator Actions	
1.	Obtain correct procedure	1.1	References DCPD Emergency Action Level Matrix.
		Step was: Sat: _____ Unsat _____*	
2.	Determine DCPD emergency Action Level	** 2.1	Determines that the Cold SD/Refuel System Malfunction/Loss of Power C.1 is an ALERT (CA1.1)
		2.2	Determines that the Cold SD/Refuel System Malfunction/RCS Temperature C.3 is an UNUSUAL EVENT (CU3.1)
		Step was: Sat: _____ Unsat _____*	
3.	Report Event Classification.	3.1	Reports to Shift Manager an initial classification of ALERT.
		ACCEPTABLE TIME: 15 minutes	
		Step was: Sat: _____ Unsat _____*	

Stop Time:

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

* Denotes an entry required on the JPM cover sheet

** Denotes a Critical Step

Answer Key

Initial Conditions: Unit 1 is cooling down and just entered Mode 5 in preparation for a refueling outage with the following conditions:

- Auxiliary Power is cleared for maintenance.
- Emergency Diesel Generator EDG 1-1 cleared for maintenance.
- Offsite power is being supplied by startup power.

At 1200 hrs, Morro-Bay-Diablo transmission line fails resulting in a loss of startup power.

Emergency Diesel Generator EDG 1-3 generator output breaker trips on over-current.

Emergency Diesel Generator EDG 1-2 starts but trips on over-speed, interrupting RCS heat removal.

At 1220, EDG 1-2 over-speed is reset and plant cooldown is re-established.

Initiating Cue: Determine the proper event classification and report results to the Shift Manager.

Document Your Answer Here

Cold SD/Refuel System Malfunction/Loss of Power C.1 is an ALERT (CA1.1) due to Loss of ALL offsite and Onsite Power to Vital Buses F,G, and H for > 15 min.

The Cold SD/Refuel System Malfunction/RCS Temperature C.3 is an UNUSUAL EVENT (CU3.1) due to RCS temperature exceeding 200F

EVENT CLASSIFICATION IS: ALERT (CA1.1)

Examinee Cue Sheet

Initial Conditions:

Unit 1 is cooling down and just entered Mode 5 in preparation for a refueling outage with the following conditions:

- Auxiliary Power is cleared for maintenance.
- Emergency Diesel Generator EDG 1-1 cleared for maintenance.
- Offsite power is being supplied by startup power.

At 1200 hrs, Morro-Bay-Diablo transmission line fails resulting in a loss of startup power.

Emergency Diesel Generator EDG 1-3 generator output breaker trips on over-current.

Emergency Diesel Generator EDG 1-2 starts but trips on over-speed, interrupting RCS heat removal.

At 1220, EDG 1-2 over-speed is reset and plant cooldown is re-established.

Initiating Cue:

Determine the proper event classification and report results to the Shift Manager.

Document Your Answer Here

STUDENT HANDOUT

Facility: <u>Diablo Canyon</u>	Date of Examination: <u>1/11/2010</u>
Exam Level: <u>RO</u> <input type="checkbox"/> <u>SRO-I</u> <input type="checkbox"/> <u>SRO-U</u> <input type="checkbox"/>	Operating Test No.: <u>L081</u>

Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. C1 Initiate Containment Spray Manually (LJC-010)	D, C, E, L	5
b. C2 Remove Power Range Channel N42 from Service (LJC-051)	C, D, E	7
c. S1 Manually feed S/Gs using FR-H1	N, A, S	4-S
d. S2 Establish Emergency Boration (LJC-063)	D, A, E, S	1
e. S3 Align RHR pump 12 for Hot Leg Recirculation (modified LJC-028)	M, S, A, EN, L	2
f. S4 Start an RCP (LJC-120)(bank, alternate path)	M, A, E, S, L	4-P
g. S5 Respond to High Radiation Alarm on RE-44B	N, S	8
h. S6 Cross-tie Vital Bus G to H (LJC-032)	D, E, S	6
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. P1 Align 480V Buses for control from Hot Shutdown Panel (LJP-007)	D, E, L	6
j. P2 Close an MSIV locally (LJP-008)	D, L, E, R	4-S
k. P3 Locally verify Containment Isolation Phase 'B'	M, R, L, E, A	5
<p>@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol room		
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$	
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$	
(EN)gineered safety feature	- / - / ≥ 1 (control room system)	
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$	
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$	
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)	
(R)CA	$\geq 1 / \geq 1 / \geq 1$	
(S)imulator		

Facility: <u>Diablo Canyon</u>	Date of Examination: <u>1/11/2010</u>
Exam Level: <u>RO</u> <input type="checkbox"/> <u>SRO-I</u> <input checked="" type="checkbox"/> <u>SRO-U</u> <input type="checkbox"/>	Operating Test No.: <u>L081</u>

Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
a. C1 Initiate Containment Spray Manually (LJC-010)	D, C, E, L	5
b. C2 Remove Power Range Channel N42 from Service (LJC-051)	C, D, E	7
c. S1 Manually feed S/Gs using FR-H1	N, A, S	4-S
d. S2 Establish Emergency Boration (LJC-063)	D, A, E, S	1
e. S3 Align RHR pump 12 for Hot Leg Recirculation (modified LJC-028)	M, S, A, EN, L	2
f. S4 Start an RCP (LJC-120)(bank, alternate path)	M, A, E, S, L	4-P
g. S5 Respond to High Radiation Alarm on RE-44B	N, S	8
h.		

In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. P1 Align 480V Buses for control from Hot Shutdown Panel (LJP-007)	D, E, L	6
j. P2 Close an MSIV locally (LJP-008)	D, L, E, R	4-S
k. P3 Locally verify Containment Isolation Phase 'B'	M, R, L, E, A	5

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

Nuclear Power Generation
Diablo Canyon Power Plant
Job Performance Measure

Number: NRCL081LJC-S1

Title: MANUALLY FEED S/G USING FR-H1

Examinee: _____

Evaluator: _____

Print

Signature

Date

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: FR-H1, Response to Loss of Secondary Heat Sink

Alternate Path: Yes _____ X _____ No _____

Time Critical: Yes _____ No _____ X _____

Time Allotment: 10 minutes

Critical Steps: 1.1, 2, 3, 4.1-4.7

Job Designation: RO/SRO

K/A: 059 A4.08

Rating: 3.0/2.9

AUTHOR: _____ **CHRIS STEELY/GARY HUTCHISON** _____ **DATE:** _____ **12/2/2009** _____

REV. 1

Instructor Worksheet

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 student will be given the initial conditions and initiating cue. 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 with which to begin.
Required Materials:	FR-H1, Response to Loss of Secondary Heat Sink
Initial Conditions:	Unit 1 is tripped. RCS temperature is 570 F and RCS pressure is 2230 PSIG. Feed flow to all S/Gs has been lost.
Initiating Cue:	The Shift Foreman directs you to manually restore feed flow to S/Gs in order to restore a heat sink per FR-H1 step 7.
Task Standard:	DO NOT READ TO STUDENT: MFW pumps will be tripped at start of scenario, so a MFW pump must be started and discharge pressure increased enough to establish feedwater flow to at least one S/G (Alternate Path).

* Denotes an entry required on the JPM cover sheet

** Denotes a Critical Step

Instructor Worksheet

Start Time:

Step	Expected Operator Actions
1. Check Condensate System – IN SERVICE	1.1 Checks at least one Condensate/Booster Pump set running in recirc on VB3. Step was: Sat: _____ Unsat _____ *
2. Manually set Zero demand on ALL MFW Control Valves AND MFW Control Bypass Valve Controllers	2.1 Set ZERO demand on Mn Fdwtr Cont & Bypass Vlvs controllers on CC3 touch screens Step was: Sat: _____ Unsat _____ *
3. Check MFW Isolation Valves – OPEN	3.1 Sees that MFW Isolation Valves are open (VB3) Step was: Sat: _____ Unsat _____ *
4. Establish MFW flow capability	4.1 Verify Condenser - Available by checking PK 08-14 C-9 annunciator on 4.2 Verify MSIVs – OPEN (VB3) 4.3 Verify manual isolation for HP steam to MFW pumps – OPEN (MS-1-95, MFW Pp 1-1 AND MS-1-92, MFW Pp 1-2) ***** Cue: MS-1-95 and MS-1-92 are OPEN. *****

Instructor Worksheet

Step	Expected Operator Actions
5. Check ANY MFW Pump – LATCHED **	5.1 Determines that no MFW Pumps are latched 5.2 Determines FCV-53 <u>AND</u> FCV-54 switches in RECIRC on VB3 ** 5.3 Press ALARM/TRIP RESET on MFW Pp S/U station (VB3). ** 5.4 Take Trip/Latch switch to RESET to latch the MFW Pp Turbine (Hold until latched, ~ 2 min). ** 5.5 Press RAMP UP TO IDLE, verify ramp to ~ 600 RPM. ** 5.6 Press IDLE TO STANDBY, verify ramp to ~ 3000 RPM. Step was: Sat: _____ Unsat _____ *
6. Increase MFW Pump speed until discharge pressure is 100 PSIG GREATER THAN S/G pressure **	** 6.1 Presses Raise PB on MFW pp S/U station or uses CC3 touch screen (may have to toggle the DFW Control PB on S/U station) to increase MFW discharge pressure > S/G pressure **
7. Check PK09-11, FEEDWATER ISOLATION, finds alarm is active **	** 7.1 Resets FW Isolation on VB3**
8. Throttle open – MFW Control Bypass Valves or MFW Control Valves **	** 8.1 Uses CC2 touch screen to establish MFW flow with either MFW control or Bypass valves Step was: Sat: _____ Unsat _____ *

Stop Time:

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

Examinee Cue Sheet

Initial Conditions: Unit 1 is tripped. RCS temperature is 570 F and RCS pressure is 2230 PSIG. Feed flow to all S/Gs has been lost.

Initiating Cue: The Shift Foreman directs you to manually restore feed flow to S/Gs in order to restore a heat sink per FR-H1 step 7.

STUDENT HANDOUT

Simulator Setup

- ☐ Initialize the simulator to the RELAP INIT 510 (100%, MOL).
- ☐ If possible, a second instructor should be available during this JPM to control PZR pressure when required.
- ☐ Enter drill file 6807 or manually insert the following:

Command	Description
1. mal afw1 act,0,0,d,0	Trips AFW pp 1-1
2. pmp afw1 4,0,0,0,d,0	Trips AFW pp 1-2 from starting
3. pmp afw2 4,0,0,0,d,0	Trips AFW pp 1-3 from starting
4. ovr xrei022h act,1,0,0,c,fnispr.1t.10,5	Reset MSRS
5. delm bsgnwrr1	Removes bsgnwrr1 from monitor
6. monv bsgnwrr1	Monitors steam generator wide range level
7. run 120	
8. mal pp14a act,0,0,0,d,2	Inadvertent Reactor Trip, Train A
9. mal pp14b act,0,0,0,d,2	Inadvertent Reactor Trip, Train B
10. ovr xv2i260o act,1,0,0,c,fnispr.1t.10,0	Trips RCP 11
11. ovr xv2i261o act,1,0,0,c,fnispr.1t.10,0	Trips RCP 12
12. ovr xv2i262o act,1,0,0,c,fnispr.1t.10,0	Trips RCP 13
13. ovr xv2i263o act,1,0,0,c,fnispr.1t.10,0	Trips RCP 14

- ☐ Perform the following:
 1. Place FCV-53/54 in RECIRC.
 2. Place Steam Dump Control in Steam Pressure Mode.
 3. Place LCV-12 in CONT ONLY.
 4. Stop all but one Condensate/Booster Pump sets.
 5. Trip both MFW pumps
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJC-S2

Title: ESTABLISH EMERGENCY BORATION

Examinee: _____

Evaluator: _____
Print Signature Date

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: OP AP-6, Emergency Boration, Rev. 19

Alternate Path: Yes X No

Time Critical: Yes No X

Time Allotment: 15 minutes

Critical Steps: 4

Job Designation: RO/SRO

Task Number: KA 004A2.14

Rating: 3.8 / 3.9

AUTHOR: GARY HUTCHISON DATE: 08/25/09
REV. 0

- Directions:** **No PLANT controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the applicable procedure and step with which to begin.
- Required Materials:** None
- Initial Conditions:** Unit 1 is shutdown in MODE 3 and an unexplained increase in reactivity is causing source range counts to increase.
- Initiating Cue:** The Shift Foreman directs you to emergency borate.
- Task Standard:** Emergency boration has been established.

INSTRUCTOR WORKSHEET

Start Time: _____

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 References OP AP-6. 1.2 Reads NOTES prior to Step 1. Note: This is an alternate path JPM. Emergency boration will be accomplished via the RWST due to FCV-110B and CVCS-8104 failing closed. Step was: Sat: _____ Unsat: _____*
2. Initiate emergency boration using make-up controls.	2.1 Verifies charging in service. 2.2 Places VCT makeup control in the BORATE mode. 2.3 Determines amount of boric acid required per Appendix A. 2.4 Sets TARGET BATCH. Note: Appendix A guidance is to borate until control is regained. ***** Cue: The SFM is referring to EOP FR-S.1, Appendix D, to isolate dilution flow paths and directs you to continue emergency boration. ***** 2.5 Resets the BATCHED GALLONS indicator to ZERO 2.6 Set BORIC ACID FLOW SP \geq 30 GPM.

Step continued on next page

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

INSTRUCTOR WORKSHEET

Step	Expected Operator Actions
2. Initiate emergency boration using make-up controls (continued).	<p>2.7 Presses START and verifies at least 30 GPM boric acid flow.</p> <p>Note: Operator may attempt to open FCV-110B manually.</p> <p>2.8 Diagnoses that FCV-110B is failed closed.</p> <p>2.9 Verifies boric acid transfer pump is selected to high speed.</p> <p>2.10 Closes HCV-104 (BATP 1-1) or HCV-105 (BATP 1-2), as applicable.</p> <p>2.11 Verifies that VCT pressure is less than 30 psig.</p> <p>2.12 Determines that emergency boration flow of at least 30 gpm is NOT attainable.</p> <p>Step was: Sat: _____ Unsat _____*</p>
3. Initiate alternate boration method using CVCS-8104.	<p>3.1 Reads NOTE prior to Step 2.</p> <p>3.2 Attempts to open 8104.</p> <p>3.3 Diagnoses that 8104 will NOT open.</p> <p>3.4 Determines that emergency boration flow of at least 30 gpm is NOT attainable.</p> <p>Step was: Sat: _____ Unsat _____*</p>

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

INSTRUCTOR WORKSHEET

Step	Expected Operator Actions
** 4. Initiate alternate boration method using the RWST.	4.1 Opens 8805A <u>and</u> 8805B. **
	4.2 Closes LCV-112B <u>and</u> LCV-112C. **
	4.3 Adjusts charging flow to greater than 90 gpm. **
	Step was: Sat: _____ Unsat: _____*

Stop Time: _____

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

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

EXAMINEE CUE SHEET

Initial Conditions: Unit 1 is shutdown in MODE 3 and an unexplained increase in reactivity is causing source range counts to increase.

Initiating Cue: The Shift Foreman directs you to emergency borate.

ATTACHMENT 1, SIMULATOR SETUP

- ☐ Initialize the simulator to IC-514 (HSB, 550°F, MOL).
- ☐ Trip the reactor.
- ☐ Reset all shutdown bank step counters to zero.
- ☐ Perform a rod bank update on the PPC.
- ☐ Verify NR-45 is displaying source ranges.
- ☐ Enter drill file 1063 or manually insert the following:

Command	Description
set acvcvctw=12000	Increase VCT level
ramp pcvcvct=40,5,0	Ensures VCT pressure < 30 psig
mal nislact,4,600,0,d,0 mal nislb act,4,600,0,d,0	Causes source range NIs to increase by four decades over 10 minutes.
vlv cvc13 2,0,0,0,d,0 #rcvf110b	FCV-110B fails closed.
vlv cvc28 2,0,0,0,d,0 #rcvh8104	8104 fails closed.
run 10	Runs for 10 sec.
anack	Acknowledges alarms

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

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJC-S3

Title: ALIGN RHR PUMP 12 FOR HOT LEG RECIRCULATION

Examinee: _____

Evaluator: _____

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

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: EOP E-1.4, Transfer to Hot Leg Recirculation, Rev. 19

Alternate Path: Yes X No _____

Time Critical: Yes _____ No X

Time Allotment: 10 minutes

Critical Steps: 4

Job Designation: RO/SRO

Task Number: KA 006A4.05

Rating: 3.9/3.8

AUTHOR: _____ GARY HUTCHISON _____ DATE: _____ 04/29/09 _____
REV. 0

- Directions:** No PLANT controls or equipment are to be operated during the performing of this Job Performance Measure. All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the applicable procedure and step with which to begin.
- Required Materials:** None
- Initial Conditions:** A Unit 1 reactor trip and safety injection has occurred. Cold leg recirculation was initiated just over 10.5 hours ago. Both RHR pumps are running and both SI pumps are aligned for hot leg recirculation.
- Initiating Cue:** The Shift Foreman directs you to align RHR pump 12 for hot leg recirculation, per EOP E-1.4, steps 6 - 7. |
- Task Standard:** RHR pump 12 aligned for hot leg recirculation in accordance with EOP E-1.4.

INSTRUCTOR WORKSHEET

Start Time: _____

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 References EOP E-1.4. Step was: Sat: _____ Unsat _____*
2. Check RHR pump 12 running.	2.1 Observes that RHR pump 12 is running. Step was: Sat: _____ Unsat _____*
3. Open 8716B, RHR pump 12 discharge crosstie valve.	3.1 Opens valve 8716B. 3.2 Verifies valve open. Step was: Sat: _____ Unsat _____*
** 4. Open 8703, RHR to hot legs 1 and 2.	4.1 Attempts to open valve 8703, goes to RNO after determining 8703 will not open. 4.2 Cuts in series contactors for 8809A AND B ** 4.3 Opens 8809A AND B ** 4.4 Close 8716B, RHR Pp 2 Disch Crosstie Vlv ** 4.5 Throttle RHR HX Outlet valve as needed to maintain motor current LESS THAN 57 amps if needed Step was: Sat: _____ Unsat _____*

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

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

EXAMINEE CUE SHEET

Initial Conditions: A Unit 1 reactor trip and safety injection has occurred. Cold leg recirculation was initiated just over 10.5 hours ago. Both RHR pumps are running and both SI pumps are aligned for hot leg recirculation.

Initiating Cue: The Shift Foreman directs you to align RHR pump 12 for hot leg recirculation, per EOP E-1.4, steps 6 - 7.

ATTACHMENT 1, SIMULATOR SETUP

- ☐ Select RELAP JPM IC 628. Click the BYPASS SWCK button on the expert screen to continue after control boards are aligned.
- ☐ Cutout series contactors for 8009A & B
- ☐ Manually insert the following:

Command	Description
vlv rhr7 1,0,0,0,d,0	Fails 8703 closed

- ☐ This SNAP allows entry into EOP E-1.4 at Step 6. Both SI and RHR pumps are running.
- ☐ Hang control board caution tags on 8105 and 8106.
- ☐ Inform the examiner that the simulator setup is complete.
- ☐ Go to RUN when the examinee is given the cue sheet.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJC-S4

Title: START A REACTOR COOLANT PUMP

Examinee: _____

Evaluator: _____
Print Signature Date

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: **Print out NRCL081LJC-S4 Attachment.pdf to hand to examinee at step 8.**

References: OP A-6:I, Reactor Coolant Pumps - Place in Service, Rev. 38
AR PK05-03, RCP NO. 13, Rev. 33

Alternate Path: Yes _____X_____ No _____

Time Critical: Yes _____ No _____X_____

Time Allotment: 25 minutes

Critical Steps: 6, 7, 8

Job Designation: RO/SRO

Task Number: KA 003A1.02

Rating: 2.9 / 2.9

AUTHOR: _____ GARY HUTCHISON _____ 10/22/09
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 student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the applicable procedure and step with which to begin.
- Required Materials:** None
- Initial Conditions:** Unit 1 is in HOT STANDBY with three reactor coolant pumps running.
- Initiating Cue:** The Shift Foreman directs you to start Reactor Coolant Pump 1-3 in accordance with OP A-6:I, step 6.3.6
- Task Standard:** Reactor Coolant Pump 1-3 has been started in accordance with OP A-6:I and following the start, RCP 13 secured due to multiple alarms .

Start Time: _____

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 References OP A-6:I. ***** Cue: Section 6.2 actions to make RCP 1-3 available have been verified and the prerequisites and precautions and limitations have been tailboarded. Start at Step 6.3.6 ***** Step was: Sat: _____ Unsat _____*
2. Check all related RCP alarms are cleared.	2.1 Reads NOTE 2.2 Observes that PK05-03 and PK05-05 are cleared. Note: Operator may display PICTURE “RCP” on the PPC to monitor RCP parameters. Step was: Sat: _____ Unsat _____*
** 3. Start the Oil Lift Pump and allow it to run at least two minutes.	3.1 Reads NOTE ** 3.2 Starts the RCP 1-2 oil lift pump. 3.3 Verifies that the RCP 1-2 oil lift pump has started. 3.4 Waits for two minutes prior to starting the RCP. Step was: Sat: _____ Unsat _____*

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

Step	Expected Operator Actions
** 4. Start the RCP.	***** Cue: The Shift Foreman is reviewing the Technical Specifications. The motor heaters have been deenergized. *****
	** 4.1 Starts RCP 1-3.
	4.2 Verifies RCP 1-3 has started.
	4.3 Verifies normal operation of RCP 1-3 by observing pump motor amps and loop 3 flow (FI-434, FI-435, FI-436).
	Step was: Sat: _____ Unsat _____ *

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

Step	Expected Operator Actions
** 5. Observes that PK05-03 and then PK05-05 have alarmed.	5.1 Refers to PK 05-03
	5.2 Reads Caution about multiple alarms.
	5.3 Observes that RCP 13 radial bearing temperature and RCP 13 seal leakoff flow lo are in alarm.
	5.4 May check RCP vibration computer for RCP 13.
	<p>*****</p> <p>Cue: Hand examinee printouts of RCP vibration computer screens for RCP 13</p> <p>*****</p>
	5.5 Trips RCP 13 on VB2.**
	5.6 Verifies RCP 13 is secured.
	5.7 Proceeds to implement OP AP-28 Reactor Coolant Pump Malfunction
	<p>*****</p> <p>Cue: Another Operator will address OP AP-28.</p> <p>*****</p>
	<p>Step was: Sat: _____ Unsat _____*</p>

Stop Time: _____

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

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

Initial Conditions: Unit 1 is in HOT STANDBY with three reactor coolant pumps running.

Initiating Cue: The Shift Foreman directs you to start Reactor Coolant Pump 1-3 in accordance with OP A-6:I, step 6.3.6

- ☐ Initialize the simulator to IC-514 (Hot standby MOL).
- ☐ Ensure RCP vibration computer program started on simulator floor PC.
- ☐ Go to RUN.
- ☐ Perform the following:
 1. Trip the reactor
 2. Stop RCP 1-3.
 3. Allow the plant to stabilize.
- ☐ Enter drill file 6806 or manually insert the following:

Command	Description
1. xmt rcp21 3,244,60,0, c,xv2o262r	Increases RCP 13 radial brg temperature when RCP 13 red lite is on
2. ser 1244 act,1,0,50, c,xv2o262r	Brings in PK05-05 RCP Vibration alarm when RCP 13 red lite is on

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

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJC-S5

Title: Respond to High Radiation Alarm on RE-44B

Examinee: _____

Evaluator: _____

Print

Signature

Date

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: AR PK02-06 CONTMT VENT ISOLATION Rev. 16

Alternate Path: Yes _____ No _____ X

Time Critical: Yes _____ No _____ X

Time Allotment: 15 Minutes

Critical Steps: 1, 2, 3

Job Designation: RO/SRO

Task Number: KA 029A3.01

Rating: 3.8/4.0

AUTHOR: _____ GARY HUTCHISON _____ DATE: 08/19/2009
REV. 0

- Directions:** **No plant controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The student will be given the initial conditions, initiating cue, and task standard. 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 with which to begin.
- Required Materials:** None
- Initial Conditions:** Unit 1 is at 100% power. A Containment Purge was in progress when RE-44B went into alarm and a Containment Vent Isolation occurred. Maintenance has determined that the alarm was spurious.
- Initiating Cue:** The Shift Foreman directs you to respond to the alarm per AR PK02-06 step 2.1.5
- Task Standard:** RE-44B high radiation alarm and CVI are reset and RM-11 and 12 sample pump flowpath aligned per step 2.1.5.

INSTRUCTOR WORKSHEET

Start Time: _____

Step	Expected Operator Actions
** 1. Reset spurious alarm on RE-44B.	1.1 Reads Caution prior to resetting alarm. ** 1.2 Reset alarm on RE-44B by pressing Fail/ACK pushbutton. 1.3 Verifies Alert, High, and CVI ALM lights go out. Step was: Sat: _____ Unsat: _____*
** 2. Reset containment ventilation isolation signal.	** 2.1 Reset containment ventilation isolation signal by depressing both trains Reset pushbuttons. 2.2 Verifies CVI red lights on VB1 go out. 2.3 Verifies PK02-06 goes out. Step was: Sat: _____ Unsat: _____*
** 3. Opens Valves to restore flow to RE-11 & 12 sample pump.	** 3.1 Opens FCV-678, Supply to Gas and Air Particulate Monitors RE-11 & RE-12 on VB4. ** 3.2 Opens FCV-679, Supply to RE-11 & RE-12 Outside Containment ** 3.3 Opens FCV-681, Return to Containment from RE-11 & RE-12 Step was: Sat: _____ Unsat: _____*

* Denotes an entry required on the JPM cover sheet.

** Denotes a Critical Step.

INSTRUCTOR WORKSHEET

4. Restart sample pump for RE-11 & 12 and contact Maintenance.

Cue: Another Operator will restart the sample pump for RE-11 & 12 and contact Maintenance.

Step was: Sat: _____ Unsat: _____*

Stop Time: _____

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

* Denotes an entry required on the JPM cover sheet.

** Denotes a Critical Step.

EXAMINEE CUE SHEET

Initial Conditions: Unit 1 is at 100% power. A Containment Purge was in progress when RE-44B went into alarm and a Containment Vent Isolation occurred. Maintenance has determined that the alarm was spurious.

Initiating Cue: The Shift Foreman directs you to respond to the alarm per AR PK02-06 step 2.1.5

- ☐ Initialize the simulator to IC-510 (100%, MOL).
- ☐ Manually insert the following:

Command	Description
Xmt rms35 3,0.0023,1,0,d,5	High rad on RE-44B, clears after 5 seconds
Run 65	Runs 65 seconds

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

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJC-S6

Title: CROSSTIE OF VITAL BUS G TO H

Examinee: _____

Evaluator: _____

Print	Signature	Date
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Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments:

References: EOP ECA-0.3, Restore 4kV Buses, Appendix X and Appendix Q, Rev. 14A

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 25 minutes

Critical Steps: 2, 4, 5, 6, 7, 9, 10, 12, 13, 16

Job Designation: RO/SRO

Task Number: KA 062A4.01

Rating: 3.3 / 3.1

AUTHOR: _____ GARY HUTCHISON _____ DATE: 10/22/09
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 student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the applicable procedure and step with which to begin.
- Required Materials:** None
- Initial Conditions:** 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.
- Initiating Cue:** The Shift Foreman directs you to crosstie 4kV bus G to 4kV bus H and energize 480V Bus H per EOP ECA-0.3, Appendix X, commencing at step 4.c. Steps 4.a and 4.b have been completed. The Site Emergency Coordinator has concurred with this implementation.
- Task Standard:** 4kV and 480V bus H are energized after being crosstied to 4kV bus G in accordance with ECA-0.3.

Start Time: _____

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 References ECA-0.3, Appendix X. Step was: Sat: _____ Unsat _____*
** 2. Verify OPEN the 4kV to 480 VAC bus feeder breaker for the deenergized bus to be reenergized.	2.1 Opens 52-HH-10. ** 2.2 Verifies that 52-HH-10 has opened. Step was: Sat: _____ Unsat _____*
3. On the deenergized 480V bus to be reenergized, open all 480V breakers.	3.1 Opens all 480V Bus H breakers opened. ***** Cue: An Operator has opened all the 480V breakers on bus H. ***** Step was: Sat: _____ Unsat _____*
** 4. 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. ** Step was: Sat: _____ Unsat _____*
** 5. Reset SI.	5.1 Checks PK08-21 "Safety Injection Actuation" status. 5.2 Manually depresses both pushbuttons, if required. ** 5.3 Checks at least one of the following: <ul style="list-style-type: none"> • Monitor Light Box B "Safety Injection" red light OFF, <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • PK08-21, "Safety Injection Actuation" not ON. Step was: Sat: _____ Unsat _____*

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

Step	Expected Operator Actions
** 6. 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. ** Step was: Sat: _____ Unsat _____ *
** 7. Depress all auto transfer reset pushbuttons.	7.1 Reads NOTE. 7.2 Depresses all AUTO XFER RESET pushbuttons, if required. ** 7.3 Verifies that all Auto Xfer indicating blue lights are off. Step was: Sat: _____ Unsat _____ *
8. Verify OPEN all vital 4kV bus auxiliary feeder breakers.	8.1 Observes that all vital 4kV bus aux feeder breakers are OPEN: <ul style="list-style-type: none">• 52-HH-13 OPEN• 52-HG-13 OPEN• 52-HF-13 OPEN Step was: Sat: _____ Unsat _____ *
** 9. Verify OPEN all vital 4kV bus startup feeder breakers.	9.1 Observes that vital 4kV bus startup feeder breakers: <ul style="list-style-type: none">• 52-HF-14 & 52-HH-14 are CLOSED and Opens Breakers**• 52-HG-14 is OPEN Step was: Sat: _____ Unsat _____ *
** 10. Verify OPEN the 4kV startup feeder breaker 52-HG-15.	10.1 Opens 52-HG-15. ** 10.2 Verifies that 52-HG-15 has opened. Step was: Sat: _____ Unsat _____ *

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

Step	Expected Operator Actions
11. Verify that Steps 4.b and 4.c of this appendix are complete.	11.1 Reads CAUTION and NOTE ***** Cue: Steps 4.b and 4.c of this appendix are complete. ***** Step was: Sat: _____ Unsat _____*
** 12. Close 4kV startup feeder breaker for the deenergized bus being reenergized.	12.1 Inserts sync key for 4kV bus H startup feeder breaker 52-HH-14. 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 _____*
** 13. Close the 4kV startup feeder breaker for the bus that will be supplying power to the deenergized bus.	13.1 Inserts sync key for 4kV bus G startup feeder breaker 52-HG-14. 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 _____*

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

Step	Expected Operator Actions
14. IMPLEMENT Appendix Q to start 4kV loads as needed on the reenergized bus.	<p>14.1 Reads cautions</p> <p>*****</p> <p>Cue: An operator has been stationed at VB4 and will implement Appendix Q and will monitor the diesel generator.</p> <p>*****</p> <p>Step was: Sat: _____ Unsat _____*</p>
15. Verify that Step 4.d of this Appendix is complete PRIOR to performing the next step.	<p>15.1 Verifies that Step 4.d of this Appendix is complete.</p> <p>*****</p> <p>Cue: Step 4 of this Appendix is complete.</p> <p>*****</p> <p>Step was: Sat: _____ Unsat _____*</p>
** 16. Close the 4kV to 480V bus feeder breaker for the reenergized bus.	<p>16.1 Closes 52-HH-10.**</p> <p>16.2 Verifies that 52-HH-10 has closed.</p> <p>Step was: Sat: _____ Unsat _____*</p>
17. Implement Appendix Q for starting 480V loads as needed.	<p>17.1 Implements Appendix Q for starting 480V bus loads as needed.</p> <p>*****</p> <p>Cue: An operator has been stationed at VB4 with Appendix Q to monitor the diesel generator.</p> <p>*****</p> <p>Step was: Sat: _____ Unsat _____*</p>

Stop Time: _____

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

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

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

EXAMINEE CUE SHEET

- Initial Conditions:** 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.
- Initiating Cue:** The Shift Foreman directs you to crosstie 4kV bus G to 4kV bus H and energize 480V Bus H per EOP ECA-0.3, Appendix X, commencing at step 4.c. Steps 4.a and 4.b have been completed. The Site Emergency Coordinator has concurred with this implementation.

ATTACHMENT 1, SIMULATOR SETUP

- ☐ Initialize the simulator to the IC-510 (100%, MOL).
- ☐ Enter drill file 1032 or manually insert the following:

Command	Description
1. mal deg1a act,2,0,0,d,0	Fails DG 11
2. mal deg1c act,2,0,0,d,0	Fails DG 13
3. mal syd1 act,1,1,0,d,0	Loss of offset power
4. mal ppl2a act,0,0,0,d,2	Inadvertent SI, Train A
5. mal ppl2b act,0,0,0,d,2	Inadvertent SI, Train B
6. pmp ccw2 4,0,0,4,d,0	CCW pp 1-2 OC trip
7. loa afw14 act,f,0, 60,d,0	Opens knife switch for AFW pp 1-2
8. loa css8 act,f,0,60,d,0	Opens knife switch for cont. spray pp 1-2
9. loa rhr10 act,f,0,60,d,0	Opens knife switch for RHR pp 1-2
10. loa ccw31 act,f,0,60,d,0	Opens knife switch for CCW pp 1-3
11. loa sis2 act,f,0,60,d,0	Opens knife switch for SI pp 1-2
12. dsc ven14 act,f,0,60,d,0	Opens breaker for CFCU 1-4
13. run	

- ☐ Drill 63 (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.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJC-C1

Title: INITIATE CONTAINMENT SPRAY MANUALLY

Examinee: _____

Evaluator: _____

Print	Signature	Date
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Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: This JPM is to be simulated in the Unit 2 Control Room.

References: U2 EOP FR-Z.1, Response to High Containment Pressure, Rev. 7

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 15 minutes

Critical Steps: 3, 4

Job Designation: RO/SRO

Task Number: KA 026A4.01

Rating: 4.5/4.3

AUTHOR: _____ GARY HUTCHISON _____ DATE: 10/22/2009
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 student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the applicable procedure and step with which to begin.
- Required Materials:** None
- Initial Conditions:** Unit 2 experienced a LOCA. EOP E-1 is in progress and Safety Injection is reset.
- Initiating Cue:** Containment pressure is 25 psig. The EEC confirms a MAGENTA path on the Containment Critical Safety Function Status Tree. All higher priority critical safety functions have been addressed. The Shift Foreman directs you to manually initiate containment spray in accordance with EOP FR-Z.1.
- Task Standard:** Containment spray is initiated and aligned for injection phase.

Start Time: _____

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 References EOP FR Z.1. ***** Cue: Start with Step 3. ***** Step was: Sat: _____ Unsat _____*
2. Check if containment spray is required.	2.1 Checks if EOP ECA-1.1 is the procedure in effect. ***** Cue: EOP ECA-1.1 is not in effect. ***** 2.2 Checks containment pressure greater than 22 psig. ***** Cue: Containment Pressure is 25 psig. ***** Step was: Sat: _____ Unsat _____*
** 3. Start the containment spray pumps.	3.1 Turns control switches to the START position for containment spray pumps 21 and 22. ** ***** Cue: Containment spray pumps are running with stable amps. ***** Step was: Sat: _____ Unsat _____*

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

INSTRUCTOR WORKSHEET

-
- **** 4. Checks containment spray system
for proper valve alignment.

4.1 Determines that ECCS is aligned for
injection flow.

4.2 Takes control switch for 9001A and
B to OPEN position. ******

Cue: 9001A & B indicate open.

4.3 Verifies 8992 open.

4.4 Takes control switch for 8994A&B
to the OPEN position******.

Cue: 8994A & B indicate open.

Step was: Sat: _____ Unsat _____*

-
5. Checks Containment Isolation
Phase B valves

5.1 Checks Phase B portion of monitor
light Box D Red Activated light ON

Cue: Phase B Red lights are ON

5.2 Checks Phase B portion of monitor
light Box D White status lights OFF

Cue: All Phase B white lights are OFF

**Cue: Another Operator will complete
FR Z.1**

Step was: Sat: _____ Unsat _____*

Stop Time: _____

* Denotes an entry required on the JPM cover sheet.

****** Denotes Critical Step and Sub Steps.

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

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

EXAMINEE CUE SHEET

Initial Conditions: Unit 2 experienced a LOCA. EOP E-1 is in progress and Safety Injection is reset.

Initiating Cue: Containment pressure is 25 psig. The EEC confirms a MAGENTA path on the Containment Critical Safety Function Status Tree. All higher priority critical safety functions have been addressed. The Shift Foreman directs you to manually initiate containment spray in accordance with EOP FR-Z.1.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJC-C2

Title: REMOVE POWER RANGE CHANNEL N42 FROM SERVICE

Examinee: _____

Evaluator: _____

Print	Signature	Date
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Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: This JPM is to be simulated in the Unit 2 Control Room.

References: OP AP-5, Malfunction of Protection or Control Channel, Rev. 30

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 10 minutes

Critical Steps: 2, 3, 4, 5, 6

Job Designation: RO/SRO

Task Number: 217400.015

Rating: 3.6

AUTHOR: _____ GARY HUTCHISON _____ DATE: 08/06/2009

REV. 0

- Directions:** **No PLANT controls or equipment are to be operated during the performance of this Job Performance Measure.** All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the applicable procedure and step with which to begin.
- Required Materials:** None
- Initial Conditions:** Unit 2 is at 100% power. A malfunction caused power range channel N42 to fail high. Rod control was placed in MANUAL after rods stepped in five (5) steps.
- The Shift Foreman has requested the Maintenance to:
- trip bistables BS421C and BS421D, and
 - remove the control power and instrument power fuses.
- Initiating Cue:** The Shift Foreman directs you to remove power range channel N42 from service, with the exception of pulling fuses, in accordance with OP AP-5, Attachment 4.1.
- Task Standard:** Power range channel N42 has been removed from service, with the exception of pulling fuses, in accordance with OP AP-5.

Start Time: _____

Step	Expected Operator Actions
1. Obtain the correct procedure.	1.1 References OP AP-5, Attachment 4.1, "Actions to be performed for NI failure."
	Note: Operator may review STP I-2C1.
	Step was: Sat: _____ Unsat: _____ *
** 2. Place rod stop bypass switch the failed channel position.	***** Cue: If the operator refers to the requirement to use concurrent verification, state that requirement is waived for this JPM. *****
	2.1 Places the ROD STOP BYPASS switch in the BYPASS PR N42 position. **
	Cue: If asked about alarm: PK07-07, PWR RNG 42 ROD STOP BYPASSED -- ON.
	Step was: Sat: _____ Unsat: _____ *
** 3. Place power mismatch bypass switch to the failed channel position.	3.1 Places the POWER MISMATCH BYPASS switch in the BYPASS PR N42 position. **
	Step was: Sat: _____ Unsat: _____ *
** 4. Place quadrant power tilt alarm upper section switch to the failed channel position.	4.1 Places the QUADRANT POWER TILT ALARM UPPER SECTION switch in the PRN42 position. **
	4.2 Verifies that the CHANNEL DEFEAT light has lit.
	Step was: Sat: _____ Unsat: _____ *

Step	Expected Operator Actions
** 5. Place quadrant power tilt alarm lower section switch to the failed channel position.	5.1 Places the QUADRANT POWER TILT ALARM LOWER SECTION switch in the PRN42 position. ** 5.2 Verifies that the CHANNEL DEFEAT light has lit. Step was: Sat: _____ Unsat _____*
** 6. Place the comparator defeat switch to the failed channel position.	6.1 Places the COMPARATOR CHANNEL DEFEAT switch in the N42 position. ** 6.2 Verifies that the COMPARATOR DEFEAT light has lit. ***** Cue: Maintenance Services will remove the control power and instrument power fuses. ***** Step was: Sat: _____ Unsat _____*

Stop Time: _____

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

EXAMINEE CUE SHEET

Initial Conditions: Unit 2 is at 100% power. A malfunction caused power range channel N42 to fail high. Rod control was placed in MANUAL after rods stepped in five (5) steps.

The Shift Foreman has requested the Maintenance to:

- trip bistables BS421C and BS421D, and
- remove the control power and instrument power fuses.

Initiating Cue: The Shift Foreman directs you to remove power range channel N42 from service, with the exception of pulling fuses, in accordance with OP AP-5, Attachment 4.1.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJP-P1

Title: ALIGN 480V BUSES FOR CONTROL FROM THE HOT SHUTDOWN
PANEL

Examinee: _____

Evaluator: _____
Print Signature Date

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: This is a Unit 2 JPM.

References: U2 OP AP-8A, Control Room Inaccessibility - Establishing Hot Standby,
Rev. 22

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 20 minutes

Critical Steps: 1, 2, 3, 4, 5, 6

Job Designation: RO/SRO

Task Number: KA 062A4.04

Rating: 2.6 / 2.7

AUTHOR: _____ GARY HUTCHISON

08/25/09
REV. 0

- Directions:** No PLANT controls or equipment are to be operated during the performance of this Job Performance Measure. All actions taken by the examinee should be clearly demonstrated and verbalized to the evaluator. The student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the applicable procedure and step with which to begin.
- Required Materials:** Procedure OP AP-8A, Appendix F.
- Initial Conditions:** A fire in the control boards has caused a Unit 2 Control Room evacuation. OP AP-8A is being performed and the operating crew is ready to align all 480 VAC loads for control from the Hot Shutdown Panel.
- Initiating Cue:** The Shift Foreman directs you to perform Appendix F of OP AP-8A.
- Task Standard:** Breakers and switches aligned per Appendix F of OP AP-8A

Start Time: _____

Step	Expected Operator Actions
** 1. Place the control transfer cutout switches for 480V vital bus F to the CUT-IN position.	1.1 Locates the 480V vital bus F aux relay panel in the vital switchgear room. Note: CUT IN / CUT OUTs switches are located inside the aux relay panel. The aux relay panel may be opened. 1.2 Places the following switches to the CUT-IN position: <ul style="list-style-type: none">• switch 43BX, letdown orifice valve 8149B. **• switch 43X-2F-1, containment fan cooler CFCU 22. ** Step was: Sat: _____ Unsat _____*
** 2. Open 480V vital bus F breakers to prevent spurious operation.	2.1 Opens the following breakers: <ul style="list-style-type: none">• FCV-430 bkr 52-2F-11. **• LCV-112B bkr 52-2F-12 **• 8805A bkr 52-2F-19. **• FCV-750 bkr 52-2F-23. ** Step was: Sat: _____ Unsat _____*

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

Step	Expected Operator Actions
** 3. Place the control transfer cutout switches for 480V vital bus G to the CUT-IN position.	3.1 Locates 480V vital bus G aux relay panel in the vital switchgear room.
	Note: CUT IN / CUT OUTs switches are located inside the aux relay panel. The aux relay panel may be opened.
	3.2 Places the following switches to the CUT-IN position: <ul style="list-style-type: none">• switch 43X-22-30, FCV-95.**• switch 43X-2G-2, CFCU 25.**• switch 43X-2G-57, emergency borate valve 8104.**• switch 43X-2G-4, BATP 2-2.**• switch 43X-2G-44, LCV-106.**• switch 43X-2G-68, LCV-107.**
	Step was: Sat: _____ Unsat _____*

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

Step	Expected Operator Actions
** 4. Open 480V vital bus G breakers to prevent spurious operation.	4.1 Opens the following breakers: <ul style="list-style-type: none">• FCV-356 bkr 52-2G-36. **• 9003A bkr 52-2G-48. **• 8982A bkr 52-2G-58. **• LCV-112C bkr 52-2G-11.**• 8805B bkr 52-2G-14. **• FCV-363 bkr 52-2G-23. **• 8100 bkr 52-2G-26. **• FCV-431 bkr 52-2G-28 ** Step was: Sat: _____ Unsat _____*
** 5. Open 480V vital bus H breakers to prevent spurious operation.	5.1 Opens the following breakers: <ul style="list-style-type: none">• 9003B bkr 52-2H-06. **• Opens 8982B bkr 52-2H-12. **• Opens FCV-355 bkr 52-2H-16. **• Opens FCV-357 bkr 52-2H-17. **• Opens FCV-749 bkr 52-2H-18. ** Step was: Sat: _____ Unsat _____*

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

Step	Expected Operator Actions
** 6. Place the control transfer cutout switches for 480V bus 23D to the CUT-IN position.	<p>6.1 Locates the 480V bus 23D control transfer cutout switch inside bus 23D panel behind control transfer relay 43X-3D-6.</p> <hr/> <p>Note: The examinee should simulate this step. The panel should NOT be opened.</p> <hr/> <p>6.2 Places PZR Htr Group 2 Control Transfer Cutout Switch in the CUT-IN position. **</p> <p>*****</p> <p>Cue: Cut-out switch has been CUT-IN.</p> <p>*****</p> <p>6.3 Open 72-2321 and 72-2224 to prevent spurious operation of the Reactor Head Vents. **</p> <p>6.4 Informs the HSDP Operator that the 480V Bus Alignment is complete.</p> <p>Step was: Sat: _____ Unsat _____*</p>

Stop Time: _____

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

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

EXAMINEE CUE SHEET

Initial Conditions: A fire in the control boards has caused a Unit 2 Control Room evacuation. OP AP-8A is being performed and the operating crew is ready to align all 480 VAC loads for control from the Hot Shutdown Panel.

Initiating Cue: The Shift Foreman directs you to perform Appendix F of OP AP-8A.

NUCLEAR POWER GENERATION
DIABLO CANYON POWER PLANT
JOB PERFORMANCE MEASURE

Number: NRCL081LJP-P2

Title: CLOSE AN MSIV FCV-43 (Lead 3) LOCALLY

Examinee: _____

Evaluator: _____
Print Signature Date

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: This is a Unit 2 JPM.

References: U2 EOP E-2, Faulted Steam Generator Isolation, Appendix L, Rev 13.

Alternate Path: Yes _____ No X

Time Critical: Yes _____ No X

Time Allotment: 20 minutes

Critical Steps: 1, 2, 3

Job Designation: RO/SRO

Task Number: KA APE040AA1.03

Rating: 4.3 / 4.3

JOHN BECERRA

AUTHOR: _____ **GARY HUTCHISON** **DATE:** 08/25/09
REV. 0

INSTRUCTOR WORKSHEET

- 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 student will be given the initial conditions, initiating cue, and task standard. The examiner will then ask if any clarifications are needed. The examinee may be given the applicable procedure and step with which to begin.
- Required Materials:** Procedure EOP E-2, Appendix L.
- Initial Conditions:** A main steam line rupture has occurred on Unit 2 downstream of the MSIVs. MSIV FCV-43 has failed to close automatically. Manual attempts to close it from VB-3 have also been unsuccessful. FCV-43 bypass valve, FCV-23, is closed.
- Initiating Cue:** After completion of your tailboard, the Shift Foreman provides you with an eight inch Crescent wrench, a diagonal cutter, and a flashlight, then directs you to locally CLOSE MSIV FCV-43 in accordance with Appendix L of EOP E-2.
- Task Standard:** Unit 2 MSIV FCV-43 has been CLOSED in accordance with Appendix L of EOP E-2.

INSTRUCTOR WORKSHEET

Start Time: _____

Step	Expected Operator Actions
** 1. Locally CLOSE MSIV air supply or common air supply valves.	1.1 CLOSES Common air supply valve AIR-I-2-1044 OR MSIV air supply valve AIR-I-2-4027.**
** 2. REMOVES BOTH accumulator drain caps.	Step was: Sat: _____ Unsat _____* 2.1 REMOVES BOTH accumulator drain caps.**
** 3. OPEN MSIV air accumulator drain valves.	Step was: Sat: _____ Unsat _____* 3.1 OPENS drain valves AIR-I-2-1547 AND AIR-I-2-1548.** ***** Cue: You hear the flow of steam stop. If asked the Control Room reports that FCV-43 has closed. *****
	3.2 Reports to the Control Room that you have closed FCV-43. Step was: Sat: _____ Unsat _____*

Stop Time: _____

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

* Denotes an entry required on the JPM cover sheet.

** Denotes Critical Step and Sub Steps.

EXAMINEE CUE SHEET

- Initial Conditions:** A main steam line rupture has occurred on Unit 2 downstream of the MSIVs. MSIV FCV-43 has failed to close automatically. Manual attempts to close it from VB-3 have also been unsuccessful. FCV-43 bypass valve, FCV-23, is closed.
- Initiating Cue:** After completion of your tailboard, the Shift Foreman provides you with an eight inch Crescent wrench, a diagonal cutter, and a flashlight, then directs you to locally CLOSE MSIV FCV-43 in accordance with Appendix L of EOP E-2.

Nuclear Power Generation
Diablo Canyon Power Plant
Job Performance Measure

Number: NRCL081LJC-P3

Title: Local Verification of Containment Isolation Phase 'B'

Examinee: _____

Evaluator: _____

Print

Signature

Date

Results: Sat _____ Unsat _____ Total Time: _____ minutes

Comments: This JPM can be performed on Unit 1 or Unit 2.

References: System Lesson Guide B6A, Reactor Protection System, page 2.2-45

Alternate Path: Yes _____ X _____ No _____

Time Critical: Yes _____ No _____ X _____

Time Allotment: 15 minutes

Critical Steps: 1,2,3

Job Designation: RO

K/A: 103 A2.03

Rating: 3.5/3.8

AUTHOR: _____ **CHRIS STEELY/GARY HUTCHISON** **DATE:** _____ **12/10/2009**

REV. 1

Instructor Worksheet

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 student will be given the initial conditions and initiating cue. 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 with which to begin.

Required Materials:

Initial Conditions: The reactor has tripped and Phase 'B' isolation has occurred. The following lights on Monitor Light Box D do not indicate the complete actuation of Phase 'B':

- Spray Pump 1 Discharge Valve – 9001A (Should be OPEN)
- Spray Additive Tank Out – 8994B (Should be OPEN)
- CCW HDR C ISO – FCV 355 (Should be CLOSED)

Initiating Cue: The Shift Foreman directs you to enter the plant and locally verify the correct position of the non-indicating Phase 'B' valves. The breakers for the associated valves have been opened.

Task Standard: **DO NOT READ TO STUDENT:** Spray Pump 1 Discharge Valve - 9001A, will be CLOSED and will need to be repositioned OPEN (Alternate Path). Spray Additive Tank outlet valve 8994B will be CLOSED and will need to be repositioned OPEN (Alternate Path). CCW HDR C ISO- FCV 355 will be OPEN and will need to be repositioned CLOSED (Alternate Path).

* Denotes an entry required on the JPM cover sheet

** Denotes a Critical Step

Instructor Worksheet

Start Time:

Step	Expected Operator Actions
1. Locally verify proper actuation of Phase 'B' Containment isolation Valves that are not properly indicating on Monitor Light Box D. **	Location: 115' Aux Bldg Cnm Pen area CUE: Valve position is as seen. 1.1 Opens Spray Pump 1 Discharge Valve – 9001A ** CUE: Valve position indicator is up. Step was: Sat: _____ Unsat _____ *
2. Locally verify proper actuation of Phase 'B' Containment isolation Valves that are not properly indicating on Monitor Light Box D. **	Location: 73' Aux Bldg near Spray Add Tank CUE: Valve Position is as seen. 2.1 Opens Spray Additive Tank Out – 8994B ** CUE: Valve position indicator is up. Step was: Sat: _____ Unsat _____ *
3. Locally verify proper actuation of Phase 'B' Containment isolation Valves that are not properly indicating on Monitor Light Box D. **	Location: 85' Turb. Bldg upper area of CCW HX room CUE: Valve Position is as seen. 3.1 Closes CCW HDR C ISO – FCV 355 ** CUE: Valve Position indicator shows "C". Step was: Sat: _____ Unsat _____ *

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

Examinee Cue Sheet

Initial Conditions:

The reactor has tripped and Phase 'B' isolation has occurred. The following lights on Monitor Light Box D do not indicate the complete actuation of Phase 'B':

- Spray Pump 1 Discharge Valve – 9001A (Should be OPEN)
- Spray Additive Tank Out – 8994B (Should be OPEN)
- CCW HDR C ISO – FCV 355 (Should be CLOSED)

Initiating Cue:

The Shift Foreman directs you to enter the plant and locally verify the correct position of the non-indicating Phase 'B' valves. The breakers for the associated valves have been opened.

STUDENT HANDOUT

Facility: **Diablo Canyon**Scenario No.: **1**Op-Test No.: **Jan 2010**

Examiners: _____ Operators: _____

Initial Conditions: Operating per OP-L-4. Reactor Power is 100 percent. Diesel Generator 1-1 is paralleled with Bus H for EDG Monthly Surveillance Testing.

Turnover: Secure EDG 1-1. Maintain power at 100 percent.

Event No.	Malf. No.	Event Type*	Event Description
1		N(BOP) TS	Unload and Secure EDG 1-1. After output breaker is opened, EDG trips on low lube oil pressure. (Will not get back)
2		I(ATC/SRO) TS	Tc channel fails high.
3		C(ALL) TS	Steam Generator Tube Leak (SG1-2) (Action Level 3b) (Requires downpower per OP AP-25)
4		C(ALL)	Loss of all (230kV and 500kV) Offsite Power, results in reactor trip. (We will have to insert reactor trip due to DCPD main generator supplying in house loads and would survive the load rejection.)
5		C(BOP)	EDG 1-3 output breaker fails to auto close. Manual action to close the breaker.
6		C(BOP)	(TDAFWP Steam Supply) FCV-95 fails to Auto Open. (Manual Action Required)
			MD AFW pump 1-3 fails to auto start. (Manual Action Required)
7		M(ALL)	SGTR on SG 1-2
			Isolate Ruptured Steam Generator – CRITICAL TASK
			Close FCV-37 (Powered from Bus H) (TDAFWP steam supply from SG 1-2) – CRITICAL TASK
			Restore AFW – CRITICAL TASK
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Op-Test No.: 1 Scenario No.: 1 Event No.: 1

Page 1 of 7

Event Description: Unload and Secure EDG 1-1 (OP J-6B:IV)

Time	Position	Applicant's Actions or Behavior
	SRO	Directs BOP to unload and secure EDG 1.1
	BOP	6.5.1 While limiting load changes to less than 0.5 MW every two minutes, slowly adjust the governor speed control in the LOWER direction to lower DG 1-1 load to approximately 0.5 MW.
	BOP	6.5.2 WHEN DG 1-1 load has been reduced to about 0.5 MW, THEN before continuing, maintain load at 0.5 MW for at least five minutes for cooldown.
	BOP	6.5.3 Place the DG 1-1 Feeder Sync switch in "ON".
	BOP	6.5.4 Reduce DG 1-1 load to about 0.1 MW, and promptly OPEN 52-HH-7, DG 1-1 Output Breaker, to separate DG 1-1 from the bus.
	BOP	Determines DG 1-1 has tripped.
	SRO	Refers to PK 16-15 "DSL GEN 11 SHUTDOWN RELAY TRIP" and PK 16-06 "DIESEL 11 LUBE OIL SYSTEM".
	SRO	Dispatches operator to DG 11 to determine alarms at local annunciator panel.
	SRO	Directs Maintenance to investigate trip
	SRO	Refers to TS 3.8.1.B

Appendix D Required Operator Actions [Form ES-D-2](#)

Op-Test No.: 1		Scenario No.: 1	Event No.: 2	Page 2 of 7
Event Description: Tc Fails High (OP AP-5)				
Time	Position	Applicant's Actions or Behavior		
	ATC	Acknowledges and reports the following Annunciators: <ul style="list-style-type: none"> • PK04-10 (AUCTIONED TAVG HIGH) • PK04-03 (TAVG DEVIATION FROM REF) • PK04-01 (RCL DELTA-T DEVIATION) • PK06-03 (PPS RTD FAILURE) 		
	SRO	Directs ATC/BOP to carry out actions of OP AP-5 (Malfunction of Eagle 21 Protection or Control Channel)		
	BOP	<u>IF</u> PK06-01 <u>OR</u> PK06-03 is <u>ON</u> , <ol style="list-style-type: none"> 1) Determine which Protection Set is affected from the Main Annunciator Typewriter or CRT. 2) Open ALL the doors for the racks in the affected protection set and inspect PER Attachment 4.2, "Eagle 21 Rack Inspection/Compensatory Measure Tracking Sheet." <ul style="list-style-type: none"> • Protection Set 1 - Racks 1, 2, 3, 4 • Protection Set 2 - Racks 6, 7, 8, 10 • Protection Set 3 - Racks 11, 13 • Protection Set 4 - Racks 15, 16 		
	BOP	<u>IF</u> PK06-03 is ON, <u>THEN</u> perform the following: <ol style="list-style-type: none"> 1) Identify which "RTD FAILURE" red LEDs are LIT 2) Determine which Instrument Channels are in the affected rack using Attachment 4.1. 		
	BOP	IMPLEMENT Attachment 4.2 to monitor the status of the unaffected racks in the		
	BOP	IDENTIFY affected Protection Set and Rack number		
	BOP	REFER to Attachment 4.1 pages 3-17 to determine failed channel bistable		
	BOP	COMPLETE Attachment 4.3, "Bistable Trip Authorization."		
	BOP/ATC	Defeats Loop 4 DT and TAVG		
	ATC	Select redundant recorder, if available.		

Op-Test No.: 1

Scenario No.: 1

Event No.: 2

Page 3 of 7

Event Description: Tc Fails High (OP AP-5) continued

Time	Position	Applicant's Actions or Behavior
	ATC	<u>CHECK Steam Dumps NOT Actuated</u> <ul style="list-style-type: none"> • Steam Dump Valves - CLOSED • UI-500 Demand - ZERO • Dumps Arming Signal light - OFF Dumps Trip Signal light - OFF
	SRO	<u>NOTIFY I&C to Investigate</u>
	SRO/ATC	<u>VERIFY Affected Channels are Removed From Service Prior to Performing Maintenance</u>
	SRO/ATC/BOP	<u>PLACE Out-of-Service Stickers On the Affected Indicators:</u>
	SRO/ATC	<u>PERFORM Required TS/ECG Actions for INOPERABLE Channels</u>
	ATC	<u>WHEN Failure has been Corrected, Return CHANNEL to NORMAL Status</u>
	ATC	<u>Return CONTROL SYSTEM to AUTO</u>
	SRO	Refers to TS 3.3.1.X, 3.3.1.E, 3.3.2.M

Op-Test No.: 1 Scenario No.: 1 Event No.: 3

Page 4 of 7

Event Description: Steam Generator Tube Leak on SG 1-2 (OP AP-3)

[illegible]

Op-Test No.: 1 Scenario No.: 1 Event No.: 4-6

Page 5 of 7

Event Description: Loss of all Offsite Power (230kV and 500kV), EDG 1-3 output breaker fails to Auto Close, FCV-95 (TDAFWP Steam Supply) fails to Auto Open, and MD AFW pump 1-3 fails to Auto Start. (OP AP-26)

Time	Position	Applicant's Actions or Behavior
	ALL	Perform remaining immediate actions of E-0 "Reactor Trip or Safety Injection"
		<ul style="list-style-type: none"> • VERIFY reactor tripped • VERIFY turbine tripped • VERIFY vital 4kV buses energized • CHECK SI – Actuated
	BOP	<u>ENERGIZE a Non-Vital Bus From a D/G (EDG 1-3 output breaker will fail to Auto Close thus necessitating manual action to close this breaker).</u>
	SRO	Transitions to EOP E-0.1 Reactor Trip Response
	ALL	Recognition of loss of power to non-vital 4kV and 12kV buses – Loss of Offsite Power.
	SRO	Recognizing Loss of Offsite Power – Enter OP AP-26 (Loss of Offsite Power) and direct the following actions.
	SRO to Aux Op.	FCV -95 will fail to Auto Open – Will have to be opened manually
	BOP	MD AFW pump 1-3 will fail to Auto Start – (Manual Action Required) Critical Task

Op-Test No.: 1 Scenario No.: 1 Event No.: 7

Page 6 of 7

Event Description: SGTR on SG 1-2 (EOP E-3)

Time	Position	Applicant's Actions or Behavior
	ATC	Determines that PZR level is decreasing and a Safety Injection is required
	SRO	Directs manual Safety Injection and transitions back to EOP E-0
	BOP	Performs Appendix E of EOP E-0
	SRO/ATC	Recognition of transition from tube failure to tube rupture on SG 1-2
	SRO	Direct ATC/BOP through actions of EOP E-3(SGTR) – transition from EOP E-0
	SRO/ATC	1. Check if RCPs should be stopped
	ATC	23. Identify ruptured SG (Will have occurred from earlier tube leak)
	ATC	23. Isolate flow from ruptured SG (SG 1-2) CRITICAL TASK Note: Closing FCV-37 (TDAFWP steam supply from SG 1-2) will be part of this critical task.
	ATC	4. Check ruptured SG levels
	SRO/ATC	5. Verify ruptured SG isolation from step three completed CRITICAL TASK
	ATC	6. Check ruptured SG pressure greater than 225#
	SRO	7. Prepare for RCS cooldown
	BOP	8. Block Low Steam Line Pressure SI
	BOP	9. Initiate RCS cooldown using 40% Steam Dumps
	BOP	10. Initiate RCS cooldown using 10% Steam Dumps
	SRO	11. Initiate Evaluation of Plant Status
	ATC	12. Check PZR PORVs and Block Valves
	BOP	23. Reset SI
	BOP	14. Reset both trains of Containment Isolation Phase A and B
	BOP	15. Establish Instrument Air to Containment
	BOP	16. Check status of RHR pumps
	SRO	17. Check if RCS cooldown should be stopped
	ATC	18. Check Ruptured SG Pressure (Stable or Increasing)
	BOP	19. Check RCS Sub-Cooling based on Core Exit T/Cs
	ATC	20. Depressurize RCS to minimize break flow and refill PZR

Op-Test No.: 1 Scenario No.: 1 Event No.: 7

Page 7 of 7

Event Description: SGTR on SG 1-2 (EOP E-3) continued

[illegible]

MAJOR EVENT SUMMARY AND SCENARIO OBJECTIVES

- A. Unload and Secure EDG 1-1. After output breaker is opened, EDG trips on low lube oil pressure. (Will not get EDG 1-1 back)
- B. Loop 4 Tcold channel fails high. ATC takes manual control of rods and crew enters AP-5 "Malfunction of Eagle 21 Protection or Control Channel"
- C. S/G 12 tube leak at 200 gpd. Crew enters AP-3 "SG Tube Failure". Crew commences ramp per OP AP-25 "Rapid Load Reduction or Shutdown" at 10 MW/min.
- D. During the ramp a loss of offsite power and a reactor trip occurs. The crew will go to EOP E-0 and then to EOP E-0.1. The crew must start AFW pp 13 or open FCV-95 to establish AFW flow (CT).
- E. Crew should re-energize 4kv Bus F by manually closing D/G 13 output breaker 52-HF-7.
- F. A S/G 12 tube rupture at 400 gpm will occur 6 minutes after the reactor trip. The crew should determine that Pressurizer level can't be maintained and performs a manual Safety Injection and goes back to E-0 "Reactor Trip or Safety Injection".
- G. Crew transitions from E-0 to E-3 "Steam Generator Tube Rupture" and performs ruptured S/G isolation (CT). The crew must close FCV-37 from S/G 12 (CT).

ATTACHMENT 1 - SIMULATOR SET-UP

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
Setup Simulator per Checklist	Init 510	100% power, Mol, $C_B = 772$ Integrators: BA - 0 and PW -40
Setup	Drill 81	Reset normal engineering values
Setup		<ul style="list-style-type: none"> Start D/G 11 and parallel to Bus F Cutin Protection relays for D/G 11 Load D/G 11 to 0.5 MW

CONTROL BOARD SETUP

- ☐ Copies of commonly used forms and procedures are available.
- ☐ Any tags are placed/removed as necessary.
- ☐ Primary integrator = 40 gal, Boron = 0 gal.
- ☐ Record PPC MAX (BOL = 99.8, MOL = 100.0, EOL = 100.2) on CC2 lamicoid
- ☐ The plant Abnormal Status Board is updated with last CCP C_B near 772 and current date, and STP I-1C Attachment 12.4 due in 6 hours.
- ☐ Circuit breaker flags are correct.
- ☐ Equipment status lamicoids are correct:

B.A. XFER PP SUPPLYING BLENDER	- BA Pp 1-2
SUPPLYING IN-SERVICE SCW HX	- CWP 1-1
AUTO RECLOSE FEATURE CUTIN ON THIS CWP	- CWP 1-1
SELECTED TO BUS 2F	- Cont. Rm. Vent Train 1 Bus F
SELECTED TO BUS 1H	- Cont. Rm. Vent Train 1 Bus H

- ☐ The proper Delta-I curve and Reactivity Handbook for the simulator **INIT** are in place
- ☐ The Rod Step Counters indicate correctly.
- ☐ PPC Setup:
 - o RBU is updated.
 - o R2B blowdown flows at 90 gpm.
 - o Operational mode correct for current conditions.¹
 - o Delta-I target slope matches Delta-I curve
- ☐ SPDS (screens and time updating), A screen "RM", B screen "SPDS".
- ☐ The chart recorders are operating properly, and advanced.
- ☐ Run Chart Recorder program and select all digital chart recorders
- ☐ All typewriters are on, with adequate paper/ribbon/etc., and are in the "**ON LINE**" status.
- ☐ The Annunciator Horn is on (**BELL ON**).
- ☐ Sound Effects are on (**SOUND ON**).
- ☐ **The video and audio systems are SECURED.**

¹ Allow about ten minutes for the PPC to automatically update the plant mode. If still not correct, place PPC display in ovrd mode, and type APMC. Follow menu to manually override to correct mode.

TIMELINE AND INSTRUCTOR ACTIONS FOR SIMULATION

X = manual entry required

X	0 min	DRILL 6801	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by DRILL FILE or MANUALLY (below)
	0 min	vlv afw7 1,0,0,0,d,xv3i219o	FCV-95 fails to open automatically
	0 min	pmp afw2 1,0,0,0,d,0	AFW pp 13 fails to automatically start
	0 min	bkr eps15 1,0,0,0,d,0	block auto closure of d/g 13 output bkr 52-hf-7
	When D/G 11 output bkr 52-HH-7 is opened.	mal deg1a act 2,0,5,c,.not.jbkhh7,0 ser 0254 act,1,0,5,c,.not.jbkhh7,	D/G 11 trips on low lube oil press after 52-hh-7 is opened
X	When requested	Report D/G 11 local annunciator indicates a Low Lube oil pressure trip.	
	10 min after D/G 11 trip	xmt rcs132 3,679,0,605, c,.not.jbkhh7,	Loop 4 tcold fails high
X	When requested	Report that Racks 15 & 16 trouble LED's are lit.	
	15 min after Loop 4 Tcold fails high	plp aux25 act,200,0,900, c,txmt410b(4).gt.675,	S/G 12 tube leak at 200 gpd
	At 80% power	mal syd1 act 1,1,0,c,fnispr.lt.80.0,0 mal ppl4b act 0,0,5,c,fnispr.lt.80.0,0	Loss of offsite power and reactor trip
	On Safety Injection	Mal syd1 act,2,60,30,c,jpplsi	Loss of Startup (230 KV) power
	6 minutes after reactor trip	mal rcs4b act 400,60,360,c,jpplp4,0	400 gpm SGTR on SG 12
	After RX trip	Drill 32	N.O. Action on reactor trip
X	When requested	Vlv mss1 2,0,90,200,d,0	Closes FCV-37 locally
X	When requested	Vlv Mfw3 2,0,600,120,d,0	Closes FCV-440 locally

Drl_6801.txt

* NRC L081 sim 01
* glh1, 8/18/09
*
* init 510
* start d/g 11 and parrallel to bus F, load to 2.5 MW
*
* d/g 11 trips on low lube oil press after 52-hh-7 is opened
mal deg1a act 2,0,5,c,.not.jbkhh7,0
ser 0254 act,1,0,5,c,.not.jbkhh7, #alm300b
*
* pt-505 fails at 100% power value
* xmt tur2 1,0,0,0,d,0 #pxmtst1(1) per RNF5
*
* loop 4 tcold fails high 10 min after d/g trip
xmt rcs132 3,679,0,605,c,.not.jbkhh7, #txmt410b(4)
*
* s/g 12 tube leak at 200 gpd 15 min after tcold fails high
plp aux25 act,200,0,900,c,txmt410b(4).gt.675, #wrmssglk(2)
*
* loss of offsite power and reactor trip at 80% power
mal syd1 act 1,1,0,c,fnispr.lt.80.0,0
mal ppl4b act 0,0,5,c,fnispr.lt.80.0,0
*
* block auto closure of d/g 13 output bkr 52-hf-7
bkr eps15 1,0,0,0,d,0 #jbkhf7
*
* fcv-95 fails to open automatically
vlv afw7 1,0,0,0,d,xv3i219o #rmsf095
*
* afw pp 13 fails to automatically start
pmp afw2 1,0,0,0,d,0 #oafp13
*
* 400 gpm sgtr on s/g 12 6 min after reactor trip
mal rcs4b act 400,60,360,c,jpplp4,0

DIABLO CANYON POWER PLANT OPERATIONS SHIFT LOG UNIT 1

OPERATING MODE:	1	
POWER LEVEL:	100	%
GROSS GENERATION:	1198	MWe
NET GENERATION	1155	MWe
DAYS AT POWER:	120	

Shift Manager Turnover

<u>PRA RISK STATUS NEXT SHIFT:</u>	Green
<u>PROTECTED EQUIPMENT:</u>	Train A/B, Bus F,G,&H, Prot. Sets I, II,III,IV
<u>HOMELAND SECURITY THREAT LEVEL:</u>	YELLOW
<u>GRID STATUS NEXT SHIFT:</u>	Normal
<u>AVERAGE RCS CALCULATED LEAKRATE:</u>	0.05 gpm

URGENT WORK:

ACTIVE SHUTDOWN TECH SPECS / ECGS:

TS 3.8.1.b STP I-1C Att. 12.4 completed 2 hour ago

TURNOVER ITEMS:

* Secure EDG 1-1 per STP M-9A.

OPERABILITY ITEMS:

* None

PRIORITY ITEMS FOR NEXT SHIFT:

* None.

ANNUNCIATORS IN ALARM

* PK16-03, 16-09, 16-20, 13-10, 13-15

SHIFT FOREMAN TURNOVER

COMMENTS:

1. Reactivity management:
 - a. Time in core life: MOL
 - b. Power History: At 100%.
 - c. Boron concentration is 772 ppm from a sample taken 2 hours ago.
 - d. Diluting 40 gallon batches every 2-4 hours. Last dilution was 30 minutes ago.
 - e. ΔI is stable.
2. No one is in Containment, no entries are expected
3. U-2 is operating at 100% power

COMPENSATORY MEASURES:

None

CONTROL ROOM ABNORMAL STATUS

See Abnormal Status Board.

Facility: Diablo Canyon Scenario No.: 2 Op-Test No.: L081-2

Examiners: _____ Operators: _____

Initial Conditions: 15% Power, MOL, 1185 ppm CB

Turnover: PRA Status: Green. Protected Equipment – Train B, Buses H& G, Prot. Sets II, III, IV. CCP 13 cleared due to excessive bearing vibration. U-2 at 100% power. Crew parallels generator and ramps at 3 MW/min to 28% power.

Event No.	Malf. No.	Event Type*	Event Description and Time Line
1		R (ATC) N(ALL)	Parallels generator and ramps to 28% at 3 MW/min.
2	Xmt p2r40	I (ATC)	Controlling P2r level channel (LT-459) fails high. (TS 3.3.1)
3	Pmp cvc1	C (ALL)	CCP 11 trips on overcurrent. (TS 3.5.2)
4		N (ATC, BOP)	Restore letdown.
5	mal sei1	M	0.28g earthquake 10 minutes after LT-459 failure.
6	mal rcs3b	M (ALL)	Small break (3.5") LOCA after earthquake. (Requires RCP trip Criteria – CT)
7	mal ppl1b pmp sis1	C (ATC, BOP)	Phase A train B fails to actuate on SI. SI pp 11 trips on overcurrent on SI.
8	Vlv cvc6	C (BOP)	Seal Return valve Inside Containment 8112 fails to close (requires Operator action - CT)

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	5
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	2
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)	2

Op-Test No.: L081-2 Scenario No.: 2 Event No.: 1

Page 1 of 6

Event Description: Parallels generator and ramps to 28%

Time	Position	Applicant's Actions or Behavior
	SRO	Directs Parallel the Main Unit Generator to the 500KV system PER OP C-3:II, "Main Unit Startup," starting at Step 6.3.5
	SRO	<ul style="list-style-type: none"> Station operators and review actions to be taken at each station immediately after paralleling the main generator to the system:
	BOP	<ul style="list-style-type: none"> Adjust generator frequency to slightly greater than grid frequency.
	BOP	<ul style="list-style-type: none"> Close PCB-532 when the synchroscope pointer is slightly before the 12 o'clock position.
	ATC	<ul style="list-style-type: none"> Control steam generator pressure (in auto or manual) such that the 10% steam dump valves and the main steam safety valves are prevented from lifting
	BOP	<ul style="list-style-type: none"> Manually check synchronism for PCB-632 and then close the breaker
	BOP	Increase turbine load to 28% power at 3 MW/min
	ATC	Adjusts rods to maintain Tavg matched to Tref

Op-Test No.: L081-2 Scenario No.: 2 Event No.: 2

Page 2 of 6

Event Description: Pzr level channel (LT-459) fails high

Time	Position	Applicant's Actions or Behavior
	SRO	Responds to PK 05-22 PZR LEVEL HI/LO CONTROL
	SRO/BOP	Diagnoses LT-459 failing high
	ATC	Takes manual control of PZR level control, increases charging flow
	SRO	Enters AP-5
	ATC	Selects B/U channel for control and Level recorder
	SRO	Refers to Tech Specs 3.3.1 (Condition M - 72 hours)
	SRO	Determines bistables to be tripped as time permits (AP-5, attachment 4.1, rack 1) <ul style="list-style-type: none"> LC 459A High Lvl Trip
	SRO	Directs Maintenance to investigate

Op-Test No.: L081-2 Scenario No.: 2 Event No.: 3

Page 3 of 6

Event Description: CCP 11 trips on overcurrent

Time	Position	Applicant's Actions or Behavior
	ATC	Recognizes trip of CCP 1-1
	SRO	Refers to AR PK04-17
	SRO	Enters AP-17, Section A
	BOP	Verifies suction flow path & starts CCP 1-2
	SRO	Directs letdown restoration per OP B-1A:XII
	ATC	Stabilizes PZR level controls; returns to auto
	SRO	Refers to Tech Spec 3.5.2 (Condition A - 14 days)
	SRO	Directs Maintenance to investigate

Op-Test No.: L081-2 Scenario No.: 2 Event No.: 4

Page 4 of 6

Event Description: Restores Letdown

Time	Position	Applicant's Actions or Behavior
	ALL	Restores letdown per OP B-1A:XII
	BOP	<ul style="list-style-type: none"> Reviews Precautions and Limitations of OP B-1A:XII
	SRO	<ul style="list-style-type: none"> Performs Reactivity Brief for returning Letdown.
	BOP	<ul style="list-style-type: none"> Manually adjust Letdown temperature control, TCV-130, to 35-40% demand.
	BOP	<ul style="list-style-type: none"> Check open letdown isolation valve 8152.
	BOP	<ul style="list-style-type: none"> Place letdown back pressure control valve, PCV-135 in manual and open 60%.
	BOP	<ul style="list-style-type: none"> Open letdown isolation valves LCV-459 and LCV-460.
	ATC	<ul style="list-style-type: none"> Increase normal charging to ≈ 87 gpm and adjust RCP seal injection flow to \approx between 8 GPM and 13 GPM per RCP using HCV-142.
	BOP	<ul style="list-style-type: none"> Manually adjust Letdown temperature control, TCV-130, to 35-40% demand.
	BOP	<ul style="list-style-type: none"> Open office isolation valve 8149C.
	BOP	<ul style="list-style-type: none"> Adjust PCV-135 to control at 350 psig, ≈ 5.8 turns, and place in Auto.
	ATC	<ul style="list-style-type: none"> Adjust charging flow and when pressurizer level is on reference, return to auto.
	BOP	<ul style="list-style-type: none"> Adjust TCV-130 to maintain normal letdown temperature and return to Auto

Op-Test No.: L081-2 **Scenario No.:** 2 **Event No.:** 5 & 6

Page 5 of 6

Event Description: Earthquake and Small break LOCA

[illegible]

** Critical Task

Op-Test No.: L081-2 Scenario No.: 2 Event No.: 7 & 8

Page 6 of 6

Event Description: Phase A train B failure and 8112 seal return fails to close

Time	Position	Applicant's Actions or Behavior
	BOP	Implement Appendix E, ESF Auto Actions, Secondary And Auxiliaries Status
	BOP	<p>Determines Train B of Phase A Containment Isolation is not met. Takes action to place the following valves to the closed position:</p> <ul style="list-style-type: none"> • 9355B – PZR Liquid Sample OC • 9356B – RCS Sample OC • 8880 – N₂ supply to Accumulators • 8152 – Letdown Isolation • 8100 – RCP Seal Return ** • 8029 – Containment Primary Water • 8045 – PRT N₂ supply • 633 – Containment Fire Water Supply • 584 – Instrument Air Supply • Rad Waste Isolation Train
	BOP	Determines 8112 did not close, and closes 8112 RCP seal return **
		Note: either 8100 OR 8112 must be closed to satisfy the critical task
	BOP	Verify Containment Spray & MSL isolation not required
	BOP	CHECK ECCS flow and VERIFY pump operation
	ATC	Throttles AFW flow as directed by SRO.
	ATC	Places 2 nd CCW Heat Exchanger in-service
	SRO	Conducts Procedure Transition Brief for E-1, "Loss of Reactor of Secondary Coolant".
	SRO	Enter E-1, "Loss of Reactor of Secondary Coolant".
	BOP	Shuts down D/Gs; returns them to Auto
	ATC	Aligns CCW cooling to RHR HXs
	SRO	Conducts Procedure Transition Brief for E-1.2 "Post LOCA Cooldown and Depressurization"
		Terminate Scenario after E-1.2 tailboard is complete.

** Critical Task

MAJOR EVENT SUMMARY AND SCENARIO OBJECTIVES

- A. Commences ramp to 28% power at 3 MW/min.
- B. Centrifugal Charging Pump 11 trips on over current. Crew goes to AP-17 “Loss of Charging” section A to restore charging flow.
- C. Crew restores letdown after charging is restored in AP-17 per OP B-1A:XII “CVCS-letdown system establish normal letdown following isolation”.
- D. LT-459 Pressurizer controlling level channel fails high. Crew enters AP-5 “Malfunction of Eagle 21 Protection or Control Channel” to address instrument failure.
- E. Earthquake at 0.28g causes Small break LOCA. Crew is unable to maintain Pressurizer level and performs a manual Safety Injection and enters E-0 “Reactor Trip or Safety Injection”.
- F. On the Safety Injection, Train B of Phase A Containment Isolation does not actuate, and isolation must be done via manual operator actions.
- G. On the Safety Injection, 8112 RCP seal return valve inside containment does not close and must be manually isolated. (CT)
- H. The RCP’s must be tripped within 5 minutes of RCS pressure going below 1300 psig. (CT)
- I. Crew transitions from E-0 to E-1 “Loss of Reactor or Secondary Coolant” and performs verification steps.
- J. Crew transitions to E-1.2 “Post LOCA cooldown and depressurization”, Scenario is terminated after transition tailboard.

ATTACHMENT 1 - SIMULATOR SET-UP

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
Setup Simulator per Checklist	Load snap31 and IC_31 from exam flashdrive Init 31	15% power, Mol, $C_B = 1185$ <ul style="list-style-type: none"> Integrators: BA - 0 and PW -40 Tags: CCP 13
Setup	Drill 81	Reset normal engineering values
Setup	Loa cvc67 act,0,0,0,d,0	Swap to CCP 11 in service and shutdown CCP 13, then activate Loa cvc67 if not done in snap 31

CONTROL BOARD SETUP

- ☐ Copies of commonly used forms and procedures are available.
- ☐ Any tags are placed/removed as necessary.
- ☐ Primary integrator = 40 gal, Boron = 0 gal.
- ☐ Record PPC MAX (BOL = 99.8, MOL = 100.0, EOL = 100.2) on CC2 lamicoid
- ☐ The plant Abnormal Status Board is updated with last CCP C_B near 1185 and current date.
- ☐ Circuit breaker flags are correct.
- ☐ Equipment status lamicoids are correct:

B.A. XFER PP SUPPLYING BLENDER	- BA Pp 1-2
SUPPLYING IN-SERVICE SCW HX	- CWP 1-1
AUTO RECLOSE FEATURE CUTIN ON THIS CWP	- CWP 1-1
SELECTED TO BUS 2F	- Cont. Rm. Vent Train 1 Bus F
SELECTED TO BUS 1H	- Cont. Rm. Vent Train 1 Bus H

- ☐ The proper Delta-I curve and Reactivity Handbook for the simulator **INIT** are in place
- ☐ The Rod Step Counters indicate correctly.
- ☐ PPC Setup:
 - o QP TAVG, ALM/MODE-1, QP CHARGING, BIG U1169
 - o RBU is updated.
 - o PEN running.
 - o R2B blowdown flows at 90 gpm.
 - o Operational mode correct for current conditions.¹
 - o Delta-I target slope matches Delta-I curve
- ☐ SPDS (screens and time updating), A screen "RM", B screen "SPDS".
- ☐ The chart recorders are operating properly, and advanced.
- ☐ All typewriters are on, with adequate paper/ribbon/etc., and are in the "**ON LINE**" status.
- ☐ The Annunciator Horn is on (**BELL ON**).
- ☐ Sound Effects are on (**SOUND ON**).
- ☐ **The video and audio systems are SECURED.**

¹ Allow about ten minutes for the PPC to automatically update the plant mode. If still not correct, place PPC display in ovrd mode, and type APMC. Follow menu to manually override to correct mode.

TIMELINE AND INSTRUCTOR ACTIONS FOR SIMULATION

X = manual entry required

X	0 min	DRILL 6802	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by DRILL FILE or MANUALLY (below)
	0 min	mal ppl1b act,2,0,0,d,0	Phase A train B fails to actuate.
	0 min	Vlv cvc6 1,0,0,0,d,xv2i221c	8112 fails as is until C/S taken to close
	10 minutes after PCB 632 closed	Xmt pzt40 3,100,30,600,c,xc3i033c	Pzt level channel (LT-459) fails high
	10 min from LT-459 failure	Pmp cvc1 4,0,0,600,c, llc459a	CCP 11 trips on overcurrent
X	When requested	Report CCP 11 motor hot to touch, B phase OC flags dropped at breaker	
	10 min after PCV-135 in Manual	Mal sei1 act,0.28,10,600,c,xv2i159m	0.28g earthquake
	On Seismic	mal rcs3b act,3.5,300,30,c,jmlsei1,0	Small break LOCA (3.5") on loop 2 cold leg
X	After RX trip	Drill 32	N.O. Action on reactor trip
	On Safety Injection	Pmp sis1 4,0,0,20,c,jpplsi	SI pp 11 trips on S.I.

Drl_6802.txt

```
* NRC L081 scenario #2
* glhl, 9/29/9
*
* init 510
*
* Phase A train B fails to actuate
mal ppl1b act,2,0,0,d,0
*
* SI pp 12 trips on OC on SI
pmp sis1 4,0,0,20,c,jpplsi
*
* 8112 fails as is until C/S taken to close
Vlv cvc6 1,0,0,0,d,xv2i221c
*
* Pzr level channel (LT-459) fails high
Xmt pzs40 3,100,30,600,c,xc3i033c
*
* CCP 11 trips on overcurrent
Pmp cvc1 4,0,0,600,c,1lc459a
*
* 0.28g earthquake
Mal sei1 act,0.28,10,600,c,xv2i159m
*
* Small break LOCA (3.5") on loop 2 cold leg
mal rcs3b act,3.5,300,30,c,jmlsei1,0
```

DIABLO CANYON POWER PLANT OPERATIONS SHIFT LOG UNIT 1

OPERATING MODE: 1
POWER LEVEL: 15 %
GROSS GENERATION: 0 MWe
NET GENERATION: 0 MWe
DAYS AT POWER: 120

Shift Manager Turnover

PRA RISK STATUS NEXT SHIFT: Green
PROTECTED EQUIPMENT: Train A/B, Bus F,G,&H, Prot. Sets I, II,III,IV
HOMELAND SECURITY THREAT LEVEL: YELLOW
GRID STATUS NEXT SHIFT: Normal
AVERAGE RCS CALCULATED LEAKRATE: 0.05 gpm

URGENT WORK:

ACTIVE SHUTDOWN TECH SPECS / ECGS:

CCP 13 cleared due to excessive bearing vibration.

TURNOVER ITEMS:

- Parallel the unit starting at OP C-3:II step 6.3.5
- Ramp to 28% power at 3 MW/min per OP L-3 (at step 6.44 to parallel)

OPERABILITY ITEMS:

* None

PRIORITY ITEMS FOR NEXT SHIFT:

* Perform STP R-2B and continue power ascension.

ANNUNCIATORS IN ALARM

* None

SHIFT FOREMAN TURNOVER

COMMENTS:

1. Reactivity management:
 - a. Time in core life: MOL
 - b. Power History: Tripped from 100% 3 days ago.
 - c. Boron concentration is 1185 ppm from a sample taken 2 hours ago.
 - d. Dilute in 100 gallon batches as needed after parallel.
 - e. After paralleling unit, ramp at 3 MW/min to 280 MW, don't exceed 28% power.
2. No one is in Containment, no entries are expected
3. U-2 is operating at 100% power

COMPENSATORY MEASURES:

None

CONTROL ROOM ABNORMAL STATUS

See Abnormal Status Board.

Facility: Diablo Canyon Scenario No.: 3 Op-Test No.: L081-3

Examiners: _____ Operators: _____

Initial Conditions: 100% Power, MOL, 772 ppm CB

Turnover: PRA Status: Green. Protected Equipment – Train A/B, Buses F,G& H, Prot. Sets I,II, III, IV. AFW pp 11 cleared due to bearing replacement. U-2 at 100% power. Swap ASW trains after watch is taken.

Event No.	Malf. No.	Event Type*	Event Description and Time Line
1		N (BOP)	Swaps ASW pp trains.
2	Pmp asw2 Pmp asw1	C (SRO, BOP)	ASW pp 12 trip 5 minutes after train swap (TS 3.7.8.A), ASW pp 11 doesn't auto start.
3	Dsc rod1	I (ATC) I (SRO)	Loss of power to DRPI
4	Ser 0829	C (All) R (ATC)	Loss of Main Transformer cooling.
5	mal rcs4d mal ppl3a mal ppl3b	M (All)	S/G 14 tube rupture during ramp. Requires manual Safety Injection (CT)
6	Mal syd1	M (All)	Loss of Startup power on unit trip.
7	Pmp cvc1 Pmp cvc2	C (BOP)	Both Charging pumps fail to start after transfer to D/G. (CT)
8	Vlv pzz	C (All)	Pzz PORV and block valve stick open after S/G isolation (CT) in EOP E-3.

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	7
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	3
4. Major transients (1–2)	2
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	3

Op-Test No.: L081-3 Scenario No.: 3 Event No.: 1

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Event Description: Swaps ASW pp trains

Time	Position	Applicant's Actions or Behavior
	SRO	Directs Swap of ASW train from HX 11 to HX 12 per OP E-5:IV
	BOP	<ul style="list-style-type: none"> Has intake watch secure continuous chlorination to the in-service ASW suction bay
	BOP	<ul style="list-style-type: none"> Advise U2 Control Room to place the U2 standby ASW pump in "MANUAL", to prevent a possible auto-start.
	BOP	<ul style="list-style-type: none"> Place the Mode Selector Switch for the standby ASW pump 12 in "MANUAL"
	BOP	<ul style="list-style-type: none"> Place the Control Switch for the standby ASW pump 12 in "START", to start the pump
	BOP	<ul style="list-style-type: none"> OPEN the CCW HX 12 saltwater inlet valve FCV-603 on the HX being placed in service.
	BOP	<ul style="list-style-type: none"> OPEN the CCW HX 12 shell-side outlet valve FCV-431 on the HX being placed in service.
	BOP	<ul style="list-style-type: none"> CLOSE the CCW HX 11 shell-side outlet valve FCV-430 on the HX being placed in standby
	BOP	<ul style="list-style-type: none"> CLOSE the CCW HX 11 saltwater inlet valve FCV-602 on the HX being placed in standby.
	BOP	<ul style="list-style-type: none"> SHUT DOWN ASW pump 11.
	BOP	<ul style="list-style-type: none"> place the Mode Selector Switch for ASW pump 11 in "AUTO".
	BOP	<ul style="list-style-type: none"> Advise U2 Control Room that the U2 standby ASW pump can be placed in "AUTO".
	BOP	<ul style="list-style-type: none"> Place in service continuous chlorination to the in-service ASW suction bay

Op-Test No.: L081-3 Scenario No.: 3 Event No.: 2

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Event Description: ASW pp 12 trips on overcurrent

Time	Position	Applicant's Actions or Behavior
	CO	Acknowledge alarm PK 01-03, Input 427, Aux Salt Water Pump OC Trip.
	CO/BOP	Diagnose Aux Salt Water Pump 1-2 tripped on Over Current.
	SRO	Responds per Annunciator Response Procedure PK 01-03 (May refer to OP AP-10).
	SRO	<ul style="list-style-type: none"> Directs Starting of Standby ASW Pump 1-1.
	BOP	<ul style="list-style-type: none"> Starts ASW Pump 1-1
	BOP	<ul style="list-style-type: none"> Verifies CCW-ASW HX DP is within limits.
	BOP	<ul style="list-style-type: none"> Direct continuous chlorination to be secured.
	BOP	<ul style="list-style-type: none"> Dispatch operator to investigate failure.
	SRO	<ul style="list-style-type: none"> Directs Maintenance to investigate failure of ASW pump 1-2
	SRO	<ul style="list-style-type: none"> Refers to Tech Spec 3.7.8 "ASW System" Condition A (72 Hour completion time with 1 train inoperable)

Op-Test No.: L081-3 Scenario No.: 3 Event No.: 3

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Event Description: Loss of Power to DRPI

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	Diagnose loss of power to DRPI
		Note: PK03-21 may be referred to first
	ATC	Refers to PK03-25 - PPC Rx Alarm Axial Flux/Rod Position
	SRO	Step 2.2.2.d - Directs N.O. to place DRPI on B/U power per OP A-3:I
	ATC	Refers to PK03-21 – DRPI Failure/Rod Bottom
	ATC	Places control rods in manual
	SRO	Refer to Tech Specs 3.1.7.B
	SRO	If not done as part of PK03-25, step 2.1.3 - Directs N.O. to place DRPI on B/U power per OP A-3:I
	ATC	Returns control rods to Auto after restoration of DRPI

Op-Test No.: L081-3 Scenario No.: 3 Event No.: 4

Page 4 of 6

Event Description: Loss of Main Transformer Bank Cooling

Time	Position	Applicant's Actions or Behavior
	CO	Acknowledge alarm PK 14-21, Input 829, Mn Bk Xfmr Annun and UV.
	SRO	Dispatches operator to investigate local alarms
		Operator reports that NO cooling fans or oil pumps are running on Main Bank C Transformer.
	SRO	Directs power reduction at 50 MW per minute per direction in AR PK14-21 using OP AP-25, "Rapid Load Reduction or Shutdown,"
	ATC	Commences ramp to take unit offline at 50 MW/min
	ATC	Verifies Control Rods Inserting in AUTO
	ATC	Turns PZR Backup Heaters - ON
	ATC	Borates the RCS using the Reactivity Handbook to determine the quantity of boric acid to add.
		As time permits:
	BOP	When $\leq 35\%$ Rx power, shutdown MFW Pp 12
	BOP	When $\leq 35\%$ Rx power, shutdown the No. 2 Heater Drip Pump
	BOP	When $\leq 35\%$ Rx power, shutdown down all but one Cnd/Bstr pump set
	BOP	Reset the MSRs per OP C-5:III

Op-Test No.: L081-3 **Scenario No.:** 3 **Event No.:** 5 & 6

Page 5 of 6

Event Description: SGTR and Loss of Startup power

[illegible]

** Critical Task

Op-Test No.: L081-3 Scenario No.: 3 Event No.: 7 & 8

Page 6 of 6

Event Description: Charging pumps fail to start & Pzr PORV and Block Valve sticks open

Time	Position	Applicant's Actions or Behavior
	BOP	Implement Appendix E, ESF Auto Actions, Secondary And Auxiliaries Status
	BOP	Determines Charging pumps 11 & 12 did start after transfer to Diesel , and starts both Charging pumps. ** (CT)
	ATC	Throttles AFW flow as directed by SRO.
	SRO	May direct early isolation of S/G 1-4
	SRO	Determines S/G 1-4 is ruptured and recognizes procedure transition criteria met
	ALL	Implements F-0; monitors CSFST's
	SRO	Directs transition to E-3
	ATC/BOP	Isolates S/G 14 ** (CT)
	ATC/BOP	<ul style="list-style-type: none"> • Sets 10% steam dump to 8.67 turns
	ATC/BOP	<ul style="list-style-type: none"> • Isolates S/G 1-4 MSIV
	ATC/BOP	<ul style="list-style-type: none"> • Isolates AFW flow when S/G level > 15%
	SRO	Determines cooldown target temperature
	BOP	Determines that PORV used to depressurize has stuck open and tries to close PORV and block valve.
	SRO	Determines that since PORV <u>AND</u> Associated Block Valve <u>CANNOT</u> be Closed, that a transition to EOP ECA-3.1 is required.
	SRO	Transitions to ECA 3.1
	ATC	Resets SI
	ATC	Resets Both Trains of Containment Isolation Phase A
	BOP	Opens FCV-584 to establish Instrument Air to Containment
	SRO	Directs cooldown to cold shutdown using 10% steam dumps, maintaining cooldown rate in RCS Cold Legs - LESS THAN 100°F in any ONE HOUR period
		Terminate Scenario after Cooldown is commenced.

** Critical Task

MAJOR EVENT SUMMARY AND SCENARIO OBJECTIVES

- A. Swaps ASW trains per OP E-5:IV "Swapping pumps for HX's during single CCW HX operation".
- B. ASW Pump 12 trips on over current. Crew restarts ASW pp 11 per AR PK01-03.
- C. Loss of power to DRPI. ATC takes manual control of rods and crew enters either PK03-21 or PK03-25 to address the power failure and restore power to DRPI.
- D. PK 14-21 MAIN TRANSF alarms. Report from plant operator indicates that all forced cooling has been lost to MTB C. Crew commences ramp at 50 MW/min to take unit offline using AP-25 "Rapid Load Reduction or Shutdown".
- E. During the ramp a S/G tube rupture occurs on S/G 14. Crew enters AP-3 "Steam Generator Tube Failure" and determines Pressurizer level can't be maintained and performs an manual Safety Injection (CT) and goes to E-0 "Reactor Trip or Safety Injection".
- F. After the Unit trip, Startup power is lost and vital 4KV buses transfer to Diesel Generators.
- G. Both CCP's fail to restart on the transfer and must be manually restarted (CT).
- H. Crew transitions from E-0 to E-3 "Steam Generator Tube Rupture" and performs ruptured S/G isolation (CT). When crew tries to depressurize RCS, the PORV and associated Block valve stick open.
- I. Crew transitions to ECA 3.1 "SGTR With Loss of Reactor Coolant -Subcooled Recovery Desired", Scenario is terminated after commencing RCS cooldown.

ATTACHMENT 1 - SIMULATOR SET-UP

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
Setup Simulator per Checklist	Init 510	100% power, Mol, $C_B = 772$ <ul style="list-style-type: none"> Integrators: BA - 0 and PW -40 Tags: FCV-95
Setup	Drill 81	Reset normal engineering values
Setup	Drill 40	Clears TDAFW pp

CONTROL BOARD SETUP

- ☐ Copies of commonly used forms and procedures are available.
- ☐ Any tags are placed/removed as necessary.
- ☐ Primary integrator = 40 gal, Boron = 0 gal.
- ☐ Record PPC MAX (BOL = 99.8, MOL = 100.0, EOL = 100.2) on CC2 lamicoid
- ☐ The plant Abnormal Status Board is updated with last CCP C_B near 1185 and current date.
- ☐ Circuit breaker flags are correct.
- ☐ Equipment status lamicoids are correct:

B.A. XFER PP SUPPLYING BLENDER	- BA Pp 1-2
SUPPLYING IN-SERVICE SCW HX	- CWP 1-1
AUTO RECLOSE FEATURE CUTIN ON THIS CWP	- CWP 1-1
SELECTED TO BUS 2F	- Cont. Rm. Vent Train 1 Bus F
SELECTED TO BUS 1H	- Cont. Rm. Vent Train 1 Bus H

- ☐ The proper Delta-I curve and Reactivity Handbook for the simulator **INIT** are in place
- ☐ The Rod Step Counters indicate correctly.
- ☐ PPC Setup:
 - o QP TAVG, ALM/MODE-1, QP CHARGING, BIG U1169
 - o RBU is updated.
 - o PEN running.
 - o R2B blowdown flows at 90 gpm.
 - o Operational mode correct for current conditions.¹
 - o Delta-I target slope matches Delta-I curve
- ☐ SPDS (screens and time updating), A screen "RM", B screen "SPDS".
- ☐ The chart recorders are operating properly, and advanced.
- ☐ All typewriters are on, with adequate paper/ribbon/etc., and are in the "**ON LINE**" status.
- ☐ The Annunciator Horn is on (**BELL ON**).
- ☐ Sound Effects are on (**SOUND ON**).
- ☐ **The video and audio systems are SECURED.**

¹ Allow about ten minutes for the PPC to automatically update the plant mode. If still not correct, place PPC display in ovrd mode, and type APMC. Follow menu to manually override to correct mode.

TIMELINE AND INSTRUCTOR ACTIONS FOR SIMULATION

X = manual entry required

X	0 min	DRILL 6803	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by DRILL FILE or MANUALLY (below)
	0 min	Mal ppl3a act,1,0,0,d,0 Mal ppl3b act,1,0,0,d,0	Fails Auto SI
	0 min	Pmp asw1 1,0,0,0,d,0	ASW pp 11 doesn't auto start
	5 minutes after ASW pp 11 s/d	Pmp asw2 6,10,1,300,c,xv1o242g	ASW pp 12 trips on overcurrent
X	When requested	Report ASW pp 12 motor terminal box has blown off, B and C phase OC flags dropped at breaker	
	10 min after ASW pp 12 trip	Dsc rod1 act,0,0,600,c,xv1o243b	Loss of normal power to DRPI
X	When requested	Report that DRPI transformer looks fine, but 52-1F-45 is tripped.	
X	When requested to transfer DRPPI to B/U	Dsc eps17 act,1,0,0,d,0 Loa eps1 act,1,0,0,d,0	Closes DRPI b/u breaker and transfers DRPI pwr supply to b/u
	10 min from rods in manual	Ser 0829 act,1,0,600,c,xc1i085f	PK14-21 #0829 for MTB local annunciator
X	When requested	Report that NO cooling fans or oil pumps are running on Main Bank C Transformer. If asked Oil and Winding Temperatures 95 C and slowing rising.	
	12 minutes after ramp started	Mal rcs4d act,400,150,720,c,ggo	400 gpm SGTR on SG 14
	On Safety Injection	Mal syd1 act,2,60,30,c,jpplsi	Loss of Startup (230 KV) power
X		Pmp cvc1 1,0,0,0,c,jpplsi Pmp cvc2 1,0,0,0,c,jpplsi	CCP 11 and 12 fail to auto start after bus transfer to diesel.
	After RX trip	Drill 32	N.O. Action on reactor trip
	If manually opened	Vlv pzs4 2,1,0,3,c,xv2i205o	Fails PCV-455C open
		Vlv pzs5 2,1,0,3,c,xv2i206o	Fails PCV-456 open
		Vlv pzs6 2,1,0,3,c,xv2i204o	Fails PCV-474 open
	When associated PORV is manually opened	Vlv pzs1 2,1,0,0,c, xv2i204o	Fails 8000A open when PCV-474 opened
		Vlv pzs2 2,1,0,0,c, xv2i205o	Fails 8000B open when PCV-455C opened
		Vlv pzs3 2,1,0,0,c, xv2i206o	Fails 8000C open when PCV-456 opened

Drl_6803.txt

```
* NRC L081 scenario #3
* glhl, 10/21/2009
*
* init 510
*
* fail auto si
Mal ppl3a act,1,0,0,d,0
Mal ppl3b act,1,0,0,d,0
*
* ASW pp 11 doesn't auto start
Pmp asw1 1,0,0,0,d,0
*
* ASW pp 12 trips on overcurrent
Pmp asw2 6,10,1,300,c,xvlo242g
*
* Loss of power to DRPI
Dsc rod1 act,0,0,600,c,xvlo243b
*
* PK14-21 #0829 for MTB local annunciator
Ser 0829 act,1,0,600,c,xcli085f
*
* 400 gpm SGTR on SG 14
Mal rcs4d act,400,150,720,c,ggo
*
* Loss of Startup (230 KV) power
Mal syd1 act,2,60,30,c,jpplsi
*
* CCP 11 and 12 fail to auto start after bus transfer to diesel.
Pmp cvc1 1,0,0,0,c,jpplsi
Pmp cvc2 1,0,0,0,c,jpplsi
*
* Fails PCV-455C open
Vlv pzs4 2,1,0,3,c,xv2i205o
*
* Fails PCV-456 open
Vlv pzs5 2,1,0,3,c,xv2i206o
* Fails PCV-474 open
Vlv pzs6 2,1,0,3,c,xv2i204o
* Fails 8000A open when PCV-474 opened
Vlv pzs1 2,1,0,0,c, xv2i204o
* Fails 8000B open when PCV-455C opened
Vlv pzs2 2,1,0,0,c, xv2i205o
* Fails 8000C open when PCV-456 opened
Vlv pzs3 2,1,0,0,c, xv2i206o
```

DIABLO CANYON POWER PLANT

OPERATIONS SHIFT LOG

UNIT 1

OPERATING MODE: 1
POWER LEVEL: 100 %
GROSS GENERATION: 1198 MWe
NET GENERATION 1155 MWe
DAYS AT POWER: 120

Shift Manager Turnover

PRA RISK STATUS NEXT SHIFT: Green
PROTECTED EQUIPMENT: Train A/B, Bus F,G,&H, Prot. Sets I, II,III,IV
HOMELAND SECURITY THREAT LEVEL: YELLOW
GRID STATUS NEXT SHIFT: Normal
AVERAGE RCS CALCULATED LEAKRATE: 0.05 gpm

URGENT WORK:

ACTIVE SHUTDOWN TECH SPECS / ECGS:

AFW pp 11 cleared due to bearing replacement – LCO 3.7.5 Condition B.

TURNOVER ITEMS:

* Swap ASW pump 11 to pump 12 and HX 11 to HX 12 per OP E-5:IV

OPERABILITY ITEMS:

* None

PRIORITY ITEMS FOR NEXT SHIFT:

* None.

ANNUNCIATORS IN ALARM

* None

SHIFT FOREMAN TURNOVER

COMMENTS:

1. Reactivity management:
 - a. Time in core life: MOL
 - b. Power History: At 100%.
 - c. Boron concentration is 772 ppm from a sample taken 2 hours ago.
 - d. Diluting 40 gallon batches every 2-4 hours. Last dilution was 30 minutes ago.
 - e. ΔI is stable.
2. No one is in Containment, no entries are expected
3. U-2 is operating at 100% power

COMPENSATORY MEASURES:

None

CONTROL ROOM ABNORMAL STATUS

See Abnormal Status Board.

Facility: Diablo CanyonScenario No.: 4Op-Test No.: L081-4

Examiners: _____

Operators: _____

Initial Conditions: 100% Power, MOL, 772 ppm CB

Turnover: PRA Status: Green. Protected Equipment – Train B, Buses H& G, Prot. Sets II, III, IV. AFW pp 11 cleared due to bearing replacement. U-2 at 100% power. Crew ramps unit at 3 MW/min to 50% power in preparation of CWP tunnel cleaning.

Event No.	Malf. No.	Event Type*	Event Description and Time Line
1		R (ATC) N (SRO)	Ramps to 50% at 3 MW/min.
2	Xmt cvc	I (All)	VCT level channel LT-114 fails high.
3	Pmp cvc1	C (SRO)	Loss of UC fuse to MDAFW pp 13. (TS 3.7.5)
4	Xmt pzt41	I (ATC, SRO)	Backup Pzt level channel (LT-461) fails low. (TS 3.3.1)
5	mal gen1	M (All)	Main Transformer Bank Sudden Pressure Trip causes Reactor trip.
6	mal eps4		Differential trip on 4KV bus G (lose 2 CCP's)
	Mal syd1		Loss of offsite power
7	Pmp cvc1	C (All)	CCP 11 trips on OC – lose all Charging pumps.
8	Pmp afw1	C (All)	MDAFW pp 12 trip on OC – Loss of Heat Sink with no High Head Injection.

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

Target Quantitative Attributes (Per Scenario; See Section D.5.d)	Actual Attributes
1. Total malfunctions (5–8)	5
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	2
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	1
6. EOP contingencies requiring substantive actions (0–2)	1
7. Critical tasks (2–3)	2

Op-Test No.: L081-4 Scenario No.: 4 Event No.: 1

Page 1 of 6

Event Description: Starts ramp to 50% power

Time	Position	Applicant's Actions or Behavior
	SRO	Directs RO to perform RCS boration for ramp.
	ATC	Performs Boration of RCS in accordance with OP B-1A:VII, "Makeup Control System Operation," may use Attachment 1 for guidance.
		<ul style="list-style-type: none"> Set target Batch on flow controller (40 gallons)
		<ul style="list-style-type: none"> Verify Boric Acid Flow Rate set to desired flow.
		<ul style="list-style-type: none"> Start Boration and verify response.
		<ul style="list-style-type: none"> Return controller to auto at conclusion of Batch
	SRO	Directs RO to perform ramp to 50%.
	ATC	Sets up ramp on DEHC Console per SRO direction using OP C-3:III, "Main Unit Turbine – At Power Operations. (May use Committed Posting for Direction)
		<ul style="list-style-type: none"> Places MW feedback in service.
		<ul style="list-style-type: none"> Set desired Ramp Rate. (3 MW/Min)
		<ul style="list-style-type: none"> Set Target to desired load. (<200 MW)
		<ul style="list-style-type: none"> Commence ramp by Pressing GO

Op-Test No.: L081-4 Scenario No.: 4 Event No.: 2Page 2 of 6Event Description: VCT level channel LT-114 fails high.

Time	Position	Applicant's Actions or Behavior
	ATC	Determines VCT level on PPC L0112A is increasing.
	BOP	Determines VCT level on VB-2 is decreasing.
	SRO	Determines that VCT level channel LT-114 has failed high
	SRO	Enters OP AP-19 "Malfunction of Reactor Makeup Control System".
	ATC	Ensure Reactor Makeup Control System selector switch is set to mode desired (usually AUTO)
	ATC	Ensure Reactor Makeup Control System auto makeup is selected to START
	ATC	Verifies Reactor Makeup System Pumps and Valves in AUTO on VB2.
	SRO	Refers to Appendix A for LT-114
	BOP	Aligns LCV-112A to VCT
	BOP	Verifies Suction to CCP 13
	SRO	Notifies Maintenance to troubleshoot and repair LT-114

Op-Test No.: L081-4 Scenario No.: 4 Event No.: 3Page 3 of 6Event Description: Loss of UC fuse to MDAFW pp 13

Time	Position	Applicant's Actions or Behavior
	SRO	Refers to PK 18-18 "4KV Bus F DC Cont UV or Trouble" input 146
	BOP	Notes that AFW pp 13 white light is out
	SRO	Declares AFW pp 13 inoperable and enters TS 3.7.5, Condition C (mode 3 in 6 hours)
	SRO	Directs an Operator to the 4kV Vital Bus F Room to report the status of the 4kV Bus F DC potential (white) lights on each breaker door
		Local Operator reports that 52-HF-9 breaker DC potential white light is not lit.
	SRO	Directs Operator to open breaker door and report status of <ul style="list-style-type: none"> • Closing spring charged flag • UC fuse holder • DC knife switch
		Local Operator reports that breaker closing spring is charged, UC fuses installed in the ON position, and DC knife switch is closed.

Op-Test No.: L081-4 Scenario No.: 4 Event No.: 4

Page 4 of 6

Event Description: Backup Pzr level channel (LT-461) fails low

Time	Position	Applicant's Actions or Behavior
	BOP/ATC	Diagnoses LT-461 failing low
	BOP	Determines letdown is isolated.
	ATC	Takes manual control of PZR level control and reduces charging to seals only
	SRO	Enters AP-5
	ATC	Selects alternate channel for backup control
	SRO	Refers to Tech Specs 3.3.1.M (72 hours), 3.3.3.A (30 days)
	SRO	Determines bistables to be tripped (Rack 13) <ul style="list-style-type: none"> LC 461A High Lvl Trip
	SRO	Directs Maintenance to investigate failure of LT-461
	SRO	Reactivity Tailboard for restoring letdown.

Op-Test No.: L081-4 Scenario No.: 4 Event No.: 5 & 6

Page 5 of 6

Event Description: Main Transformer Bank Sudden Pressure Trip & Loss of 4KV bus G and Offsite power

[illegible]

** Critical Task

Op-Test No.: L081-4 Scenario No.: 4 Event No.: 7 & 8Page 6 of 6Event Description: Loss of Heat Sink with no High Head Injection

Time	Position	Applicant's Actions or Behavior
	SRO/BOP	Determines that low AFW flow is not due to operator action and that a secondary heat sink is required.
	SRO/ATC	Determines no CCPs are available
	ATC	Stops all RCPs
	ALL	Initiates Bleed & Feed **
	ATC	<ul style="list-style-type: none"> • Actuates SI**
	ATC	<ul style="list-style-type: none"> • Reset SI
	ATC	<ul style="list-style-type: none"> • Reset Phase A
	BOP	<ul style="list-style-type: none"> • Open FCV-584 Instrument air to Containment
	ATC	<ul style="list-style-type: none"> • Opens available PORV's**
	ATC	Implements Steps 1-7 of E-0
	SRO	Continues attempts to establish secondary heat sink
		Maintenance reports off of clearance on AFW pp 11
	BOP	Opens FCV-37 and FCV-38 to align Steam supply to AFW pp 11
	SRO	Directs Aux Watch to start AFW pp 11
	BOP	Verifies >435 gpm AFW flow
	ALL	Establishes NR level in at least one S/G > 15%
	ATC	Checks RCS temperatures decreasing
	ATC	Closes PORV's ** until Subcooling > 20 F and RVLIS full range > 60% **
		Terminate Scenario after last PORV is closed.

**** Critical Task**

MAJOR EVENT SUMMARY AND SCENARIO OBJECTIVES

- A. Commences ramp to 50% power at 3 MW/min.
- B. VCT level channel LT-112 fails high causing letdown to divert to the LHUTs. Crew goes to AP-19 "Malfunction of Reactor Makeup Control System" and aligns letdown back to the VCT.
- C. Crew responds to PK 18-18 4KV BUS F DC CONTROL UV and determines that the cause is a problem with MDAFW pp 13. SRO refers to TS 3.7.5.C
- D. LT-461 Pressurizer backup level channel fails low. Crew enters AP-5 "Malfunction of Eagle 21 Protection or Control Channel" to address instrument failure
- E. Main Transformer Bank Sudden Pressure Trip causes Reactor trip. Crew enters E-0 "Reactor Trip or Safety Injection". Lose offsite power and 4KV bus G shortly after reactor trip.
- F. Crew transitions from E-0 to FR H-1 "Response to Loss of Secondary Heat Sink" and performs bleed and feed steps since no high head injection is available (CT).
- G. Maintenance reports off clearance on AFW pp 11. Crew establishes AFW flow to the S/G's, Scenario is terminated after Pressurizer PORV's are closed (CT).

ATTACHMENT 1 - SIMULATOR SET-UP

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
Setup Simulator per Checklist	Init 510	100% power, Mol, $C_B = 772$ <ul style="list-style-type: none"> Integrators: BA - 0 and PW -40 Tags: FCV-95
Setup	Drill 81	Reset normal engineering values
Setup	Drill 40	Clears TDAFW pp
Setup		Turn Pzr Backup Heater ON Close FCV-37 & 38 and open breakers <ul style="list-style-type: none"> dsc mss1 act,0 dsc mss2 act,0

CONTROL BOARD SETUP

- ☐ Copies of commonly used forms and procedures are available.
- ☐ Any tags are placed/removed as necessary.
- ☐ Primary integrator = 40 gal, Boron = 0 gal.
- ☐ Record PPC MAX (BOL = 99.8, MOL = 100.0, EOL = 100.2) on CC2 lamicoid
- ☐ The plant Abnormal Status Board is updated with last CCP C_B near 1185 and current date.
- ☐ Circuit breaker flags are correct.
- ☐ Equipment status lamicoids are correct:

B.A. XFER PP SUPPLYING BLENDER	- BA Pp 1-2
SUPPLYING IN-SERVICE SCW HX	- CWP 1-1
AUTO RECLOSE FEATURE CUTIN ON THIS CWP	- CWP 1-1
SELECTED TO BUS 2F	- Cont. Rm. Vent Train 1 Bus F
SELECTED TO BUS 1H	- Cont. Rm. Vent Train 1 Bus H

- ☐ The proper Delta-I curve and Reactivity Handbook for the simulator **INIT** are in place
- ☐ The Rod Step Counters indicate correctly.
- ☐ PPC Setup:
 - o QP TAVG, ALM/MODE-1, QP CHARGING, BIG U1169
 - o RBU is updated.
 - o PEN running.
 - o R2B blowdown flows at 90 gpm.
 - o Operational mode correct for current conditions.¹
 - o Delta-I target slope matches Delta-I curve
- ☐ SPDS (screens and time updating), A screen "RM", B screen "SPDS".
- ☐ The chart recorders are operating properly, and advanced.
- ☐ All typewriters are on, with adequate paper/ribbon/etc., and are in the "**ON LINE**" status.
- ☐ The Annunciator Horn is on (**BELL ON**).
- ☐ Sound Effects are on (**SOUND ON**).
- ☐ **The video and audio systems are SECURED.**

¹ Allow about ten minutes for the PPC to automatically update the plant mode. If still not correct, place PPC display in ovrd mode, and type APMC. Follow menu to manually override to correct mode.

TIMELINE AND INSTRUCTOR ACTIONS FOR SIMULATION

X = manual entry required

X	0 min	DRILL 6804	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by DRILL FILE or MANUALLY (below)
	10 minutes after ramp started	Xmt cvc20 3,100,30,600,c,ggo	VCT level channel LT-114 fails high
	10 min after VCT level channel fails	Dsc afw11 act,0,0,600, c,bxmtl114.gt.90	Loss of UC fuse to AFW pp 13
X	When requested	Report that 52-HF-9 breaker DC potential white light is not lit.	
X	When requested	Report that breaker closing spring is charged, UC fuses installed in the ON position, and DC knife switch is closed.	
X	10 minutes after blown UC fuse	Xmt pzc42 2,0,0,600, c,.not.xv3o222w	Backup Pzc level channel (LT-461) fails low
	10 minutes after LCV-460 closed	Mal gen1 act,3,0,600,c,xv2o210g	MTB sudden pressure trip
	After RX trip	Drill 32	N.O. Action on reactor trip
	On reactor trip	Mal eps4d act,2,0,10,c,jpplp4	Loss of 4KV bus G on reactor trip
	On reactor trip	Mal syd1 act,2,60,10,c,jpplp4	Loss of offsite power
X	On reactor trip	Pmp cvc1 4,0,0,12,c,jpplp4	OC trip on CCP 11
	On reactor trip	Pmp afw1 4,0,0,12,c,jpplp4	OC trip on AFW pp 12
	When requested	Vlv mfw2 2,0,600,60,d,0	Locally closes FCV-439
	When requested	Vlv ccw5 2,1,150,60,d,0	Locally open FCV-431
	After FR H-1 feed and bleed is done. (Step 22)	Dsc mss1 act,1,0,0,d,0 Dsc mss2 act,1,0,0,d,0 Dsc afw7 act,1,0,0,d,0 Vlv afw7 clr Mal afw1 clr	Closes breakers for FCV-37 & 38, and FCV-95. Clears FCV-95 failed in closed position and AFW pp trip malfunction
X	After FR H-1 feed and bleed is done. (Step 22)	Report that Maintenance has reported off clearance on AFW pp 11, and control room can pull tags and restart AFW pp 11.	
X	When requested to locally start TDAFWP	Loa afw1 act,0,0,0,d,0 Loa afw2 act,1,60,0,d,0	Reset FCV-152 trip handle and slow opens FCV-152.

Drl_6804.txt

```
* NRC L081 scenario #4
* glhl, 9/29/9
*
* init 510
*
* VCT level channel LT-114 fails high
xmt cvc20 3,100,30,600,c,ggo
*
* Loss of UC fuse to AFW pp 13
dsc afw11 act,0,0,600,c,bxmtl114.gt.90
*
* Backup Pzr level channel (LT-461) fails low
Xmt pzr42 2,0,0,600,c,.not.xv3o222w
*
* MTB sudden pressure trip
Mal gen1 act,3,0,600,c,xv2o210g
*
* Loss of 4KV bus G on reactor trip
Mal eps4d act,2,0,10,c,jpplp4
*
* Loss of offsite power
Mal sydl act,2,60,10,c,jpplp4
*
* OC trip on CCP 11
Pmp cvcl 4,0,0,10,c,jpplp4
*
* OC trip on AFW pp 12
Pmp afw1 4,0,0,10,c,jpplp4
```

DIABLO CANYON POWER PLANT

OPERATIONS SHIFT LOG

UNIT 1

OPERATING MODE: 1
POWER LEVEL: 100 %
GROSS GENERATION: 1198 MWe
NET GENERATION 1155 MWe
DAYS AT POWER: 120

Shift Manager Turnover

PRA RISK STATUS NEXT SHIFT: Green
PROTECTED EQUIPMENT: Train A/B, Bus F,G,&H, Prot. Sets I, II,III,IV
HOMELAND SECURITY THREAT LEVEL: YELLOW
GRID STATUS NEXT SHIFT: Normal
AVERAGE RCS CALCULATED LEAKRATE: 0.05 gpm

URGENT WORK:

ACTIVE SHUTDOWN TECH SPECS / ECGS:

AFW pp 11 cleared due to bearing replacement.

TURNOVER ITEMS:

* None

OPERABILITY ITEMS:

* None

PRIORITY ITEMS FOR NEXT SHIFT:

* Ramp unit at 3 MW/min to 50% power in preparation of tunnel cleaning. Maintenance will start tunnel cleaning on CWP 12 after unit is at 50% power. Tunnel cleaning is scheduled for 20 hours.

ANNUNCIATORS IN ALARM

* PK09-18

SHIFT FOREMAN TURNOVER

COMMENTS:

1. Reactivity management:
 - a. Time in core life: MOL
 - b. Power History: At 100%.
 - c. Boron concentration is 772 ppm from a sample taken 2 hours ago. Latest BAST ppm sample was 7500 ppm.
 - d. Start with a 40 gallon boration prior to ramp and continue 40 gallon borations every 15 minutes for the first 2 hours of the ramp.
 - e. Place rods in manual as needed for ΔI control.
2. No one is in Containment, no entries are expected
3. U-2 is operating at 100% power

COMPENSATORY MEASURES:

None

CONTROL ROOM ABNORMAL STATUS

See Abnormal Status Board.

Facility: **Diablo Canyon**Scenario No.: **5**Op-Test No.: **Jan2010**

Examiners: _____

Operators: _____

Initial Conditions: Operating per OP-L-4. Reactor Power is at 100 percent. EOL 100 ppm CB. High electrical grid demand

Turnover: Maintain Power at 100 Percent.

Event No.	Malf. No.	Event Type*	Event Description
1		I(ATC) TS (SRO)	PT-456 fails high.
2	Mal sei1		Siesmic event < 0.30g's
	Turb3	C(ALL)	High Turbine Vibration (due to seismic event)
3		N(BOP) R(ATC)	Initiate Ramp to take unit offline.
4		I(ATC)	VCT Level transmitter 112 fails high (ramp over minute).
5		C(ALL)	PK09-13 High bearing temp/vibration > 5 mils on Main Feed pump 11.
6		C(BOP) T/S (SRO)	Steam Generator C MFRV (FCV-530) fails closed. (During power reduction) Crew can control in manual.
7			Auto Reactor Trip SIGNAL on Low-Low S/G level.
		M(ALL)	Auto trip signal fails & MAN reactor trip from control board unsuccessful. Enter E-0 then FR-S.1
			Crew inserts negative Reactivity per Step 4 of FR-S1 critical task
8	MSS-4	M(ALL)	Steam Break on MFP turbine steam supply w/MSLI signal failure after emergency boration.
			Manually Isolated all S/G's .prior to transitioning to E-2. critical task
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Op-Test No.: LO81 Scenario No.: 5 Event No.: 1Page 1 of 1

Event Description: PT-456 backup pressurizer channel fails high

[illegible]

Op-Test No.: LO81 Scenario No.: 5 Event No.: 2 Page 2 of 1

Event Description: Seismic event/High Turbine vibration

[illegible]

Op-Test No.: L081 Scenario No.: 5 Event No.: 3Page 3 of 1

Event Description: Ramp offline per AOP-25

[illegible]

Page 4 of 1

Event Description: VCT Level Transmitter 112 Fails High

[illegible]

Op-Test No.: L081 Scenario No.: 5 Event No.: 5Page 5 of 1

Event Description: High Vibration on Main Feed Puump 11
PK 09-13 Input 573

[illegible]

[illegible]

Op-Test No.: LO81 Scenario No.: 5 Event No.: 7 Page 7 of 1Event Description: Auto Trip on Low S/G level fails

Time	Position	Applicant's Actions or Behavior
	ATC	Notes that FCV-530 has went closed. tries to open in manual
	ATC	Tries to open FCV-1530
	SRO	Directs manual reactor trip
	ATC	Attempts Man Reactor Trip but is unsuccessful
	BOP	De-energizes 480v Bus 13D & 13E per E-0 Step 1 RNO
	BOP	Reports that Bus 13E fdr breaker will not open
	SRO	Directs entry into FR-S.1
	ATC	Manually inserts control rods
	BOP	Trips Turbine
	BOP	Starts AFW pumps
	ATC/BOP	Starts emergency boration by opening 8805A or B (critical task)
	ATC/BOP	Closes LCV-112B or C
	ATC	Verifies at least 90 gpm charging flow
	BOP	Performs Manual Cnm Vent Isolation by closing valves on VB4 to clear CVI white lights

Op-Test No.: LO81 Scenario No.: 5 Event No.: 8Page 8 of 1Event Description: Main Steam Break on Main Feed Pump 11 supply
with MSIL signal failure

Time	Position	Applicant's Actions or Behavior
	ALL	Recognize excessive steam flow noise
	ATC	Verifies S/I
	BOP	Recognizes Main Steam line isolation failure & manually closes MSIV's per FR-S1 step 13 (critical task)
	SRO	Verify Reactor remains subcritical Directs transition to E-0.
	BOP	Performs Appendix E
	SRO	Determines ECCS flow should be reduced
	ATC	Resets SI
	ATC	Resets Cnm Isolation Phase A
	BOP	Resets Vital 4KV auto transfer relays
	ATC	Stops all but one ECCS CCP
		Terminate Scenario after going to 1 ECCS CCP

MAJOR EVENT SUMMARY AND SCENARIO OBJECTIVES

- A. PT-456 fails high. Crew closes PCV-456 and refers to AP-5.
- B. Seismic event and Main Turbine High Vibration. Crew refers to AP-29 and will ramp offline per Shift Managers direction at 10 MW/min.
- C. Crew ramps unit at 10 MW/min per AP-25.
- D. VCT level channel LT-112 fails high causing letdown to divert to the LHUTs. Crew goes to AP-19 "Malfunction of Reactor Makeup Control System" and aligns letdown back to the VCT.
- E. MFW pp 11 has high vibration causing Crew to increase ramp to 50 MW/min to 50% power. At 50% power Crew secures MFW pp 11.
- F. After MFW pp trip FCV-530 fails closed in auto, and manual control must be taken on FCV-530 to restore S/G level.
- G. FCV-530 and FCV-1530 go closed and can not be re-opened. Crew should initiate a Manual Reactor trip. The Reactor trip breakers and the Feeder breaker for Bus 13E will not open, so the Crew transitions from E-0 to FR S-1 "Response to Nuclear Power Generation / ATWS" and must insert negative reactivity per step 4 (CT).
- H. A steam line break downstream of the MSIV's occurs and the MSL isolation signal will not close the MSIV's. The Crew must manually close the MSIV's (CT). The Crew transitions back to E-O and reduces ECCS flow.
- I. The scenario is terminated after going to 1 ECCS charging pump.

ATTACHMENT 1 - SIMULATOR SET-UP

TIME LINE	CONSOLE ENTRY	SYMPTOMS/CUES/DESCRIPTION
Setup Simulator per Checklist	Init 515	100% power, Mol, $C_B = 47$ • Integrators: BA - 0 and PW – 500
Setup	Drill 81	Reset normal engineering values

CONTROL BOARD SETUP

- ☐ Copies of commonly used forms and procedures are available.
- ☐ Any tags are placed/removed as necessary.
- ☐ Primary integrator = 500 gal, Boron = 0 gal.
- ☐ Record PPC MAX (BOL = 99.8, MOL = 100.0, EOL = 100.2) on CC2 lamicoid
- ☐ The plant Abnormal Status Board is updated with last CCP C_B near 47 and current date.
- ☐ Circuit breaker flags are correct.
- ☐ Equipment status lamicoids are correct:

B.A. XFER PP SUPPLYING BLENDER	- BA Pp 1-2
SUPPLYING IN-SERVICE SCW HX	- CWP 1-1
AUTO RECLOSE FEATURE CUTIN ON THIS CWP	- CWP 1-1
SELECTED TO BUS 2F	- Cont. Rm. Vent Train 1 Bus F
SELECTED TO BUS 1H	- Cont. Rm. Vent Train 1 Bus H

- ☐ The proper Delta-I curve and Reactivity Handbook for the simulator **INIT** are in place
- ☐ The Rod Step Counters indicate correctly.
- ☐ PPC Setup:
 - o QP TAVG, ALM/MODE-1, QP CHARGING, BIG U1169
 - o RBU is updated.
 - o PEN running.
 - o R2B blowdown flows at 90 gpm.
 - o Operational mode correct for current conditions.¹
 - o Delta-I target slope matches Delta-I curve
- ☐ SPDS (screens and time updating), A screen "RM", B screen "SPDS".
- ☐ The chart recorders are operating properly, and advanced.
- ☐ All typewriters are on, with adequate paper/ribbon/etc., and are in the "**ON LINE**" status.
- ☐ The Annunciator Horn is on (**BELL ON**).
- ☐ Sound Effects are on (**SOUND ON**).
- ☐ **The video and audio systems are SECURED.**

¹ Allow about ten minutes for the PPC to automatically update the plant mode. If still not correct, place PPC display in ovrd mode, and type APMC. Follow menu to manually override to correct mode.

TIMELINE AND INSTRUCTOR ACTIONS FOR SIMULATION

X = manual entry required

X	0 min	DRILL 6805	After SFM reports the crew has taken the watch, load session MALS, OVRs, etc. by DRILL FILE or MANUALLY (below)
	0 min	mal ppl5a act 3,0,0,d,0 mal ppl5b act 3,0,0,d,0	ATWS
	0 min	vlv mss7 1,0,0,0,d,xv3i183c vlv mss8 1,0,0,0,d,xv3i184c vlv mss9 1,0,0,0,d,xv4i185c vlv mss10 1,0,0,0,d,xv4i186c	MSIV's won't close in auto
	0 min	ovr xv5i239o act,0,0,0,d,0	52-HE-4 for 13E breaker won't trip
	0 min	cnv mfw11 1,0,0,0,d,0	FCV-1530 won't open
	3 min	xmt pzt18 3,2642,0,180,d,0	PT-456 fails high
	When requested	Dsc pzt3 act, 0,0,0,d,0	Opens breaker for 8000C
X	10 minutes PT-456 failure	mal sei1 act 0.15,10,600, c,pxmtpzt(2).gt.2400,	Seismic at 0.15g
	On Seismic	mal tur3c act 7.5,60,0,c,jmlsei1,	Turbine bearing 3 high vibration
	5 min after ramp starts	xmt cvc19 3,100,60,300,c,ggo,	LT-112 fails high
	10 minutes after LT-112 failure	mal mfw2a act 7,60,600, c, bxmtl112.gt.90,	MFW pp 11 high vibration
	After MFW pp 11 trip	cnv mfw5 2,0,60,30, c,xv3o195g,ftd530_man	FCV-530 fails closed in auto, failure clears when FCV-530 taken to manual
	When FCV-530 in manual	bst aux1 1,0,0,600, c,ftd530_man,0	Starts 10 minute instructor timer to activate second failure of FCV-530
	10 min after FCV-530 taken to man.	c jstbst1, cnv mfw5 2,0,60,0,d,0	FCV-530 fails closed again, and won't re-open
	3 min after LCV-112B or C is closed	mal mss4 act 1e+07,120,180,c,xv2o232g.or.xv2o231g,	Main steam line break outside containment
	DO NOT OPEN REACTOR TRIP BREAKERS UNTIL BORATION STARTED IN FR S-1 STEP 4.		
	When requested	Mal ppl5a clr Mal ppl5b clr	Opens reactor trip breakers

Drl_6805.txt

* NRC L081 SCENARIO 05
* GLH1, 10/20/9
*
* mal PPL5A REACTOR TRIP BREAKER RTA FAILURE TO OPEN (TRAIN A)
mal ppl5a act 3,0,0,d,0
* mal PPL5B REACTOR TRIP BREAKER RTB FAILURE TO OPEN (TRAIN B)
mal ppl5b act 3,0,0,d,0
*
* VLV MSS7 MAIN STEAM ISO VLV 1 #rmsf041
vlv mss7 1,0,0,0,d,xv3i183c #rmsf041
* VLV MSS8 MAIN STEAM ISO VLV 2 #rmsf042
vlv mss8 1,0,0,0,d,xv3i184c #rmsf042
* VLV MSS9 MAIN STEAM ISO VLV 3 #rmsf043
vlv mss9 1,0,0,0,d,xv4i185c #rmsf043
* VLV MSS10 MAIN STEMA ISO VLV 4 #rmsf044
vlv mss10 1,0,0,0,d,xv4i186c #rmsf044
*
* ovr VB5121E 52 HE 4 TRIP & RESET XV51239O #xv5i239
ovr xv5i239o act,0,0,0,d,0 #vb5121e
*
* XMT PZR18 PZR PRESS #pxmtpzr(2)
xmt pzm18 3,2642,0,180,d,0 #pxmtpzr(2)
*
* mal SEI1 SEISMIC ACTIVITY
mal sei1 act 0.15,10,600,c,pxmtpzr(2).gt.2400,
*
* mal TUR3C TURBINE VIBRATION (BEARING # 3)
mal tur3c act 7.5,60,0,c,jmlsei1,
*
* XMT CVC19 VCT 1-1 LEVEL, ALM0341, SPDS, LI-112 #bxmtl112
xmt cvc19 3,100,60,300,c,ggo, #bxmtl112
*
* mal MFW2A MAIN FEEDWATER PUMP 1-1 VIBR ALARM AND TRIP
mal mfw2a act 7,60,600,c,bxmtl112.gt.90,0
*
* CNV MFW5 MAIN FEEDWATER REG. VALVE #rfwf530
cnv mfw5 2,0,60,30,c,xv3o195g,ftd530_man #rfwf530
*
* CNV MFW11 FEEDWATER REG. BYPASS VALV #rfwfrbv(3)
cnv mfw11 1,0,0,0,d,0 #rfwfrbv(3)
*
* instructor bistable for timing of 2nd FCV-530 failure
bst aux1 1,0,0,600, c,ftd530_man,0 #jstbst1
*
* fails fcv-530 closed 10 min after taking to manual
tc jstbst1, cnv mfw5 2,0,60,0,d,0
*
* mal MSS4 STEAMLINE BREAK OUTSIDE CONTAINMENT (DOWNSTEAM OF MSIV)
mal mss4 act 1e+07,120,180,c,xv2o232g.or.xv2o231g,

DIABLO CANYON POWER PLANT

OPERATIONS SHIFT LOG

UNIT 1

OPERATING MODE:	1	
POWER LEVEL:	100	%
GROSS GENERATION:	1198	MWe
NET GENERATION	1155	MWe
DAYS AT POWER:	523	

Shift Manager Turnover

<u>PRA RISK STATUS NEXT SHIFT:</u>	Green
<u>PROTECTED EQUIPMENT:</u>	Train A/B, Bus F,G,&H, Prot. Sets I, II,III,IV
<u>HOMELAND SECURITY THREAT LEVEL:</u>	YELLOW
<u>GRID STATUS NEXT SHIFT:</u>	Normal
<u>AVERAGE RCS CALCULATED LEAKRATE:</u>	0.05 gpm

URGENT WORK:

ACTIVE SHUTDOWN TECH SPECS / ECGS:

* None.

TURNOVER ITEMS:

* None

OPERABILITY ITEMS:

* None

PRIORITY ITEMS FOR NEXT SHIFT:

* Hold at 100% power, high electrical demand on system

ANNUNCIATORS IN ALARM

* None

SHIFT FOREMAN TURNOVER

COMMENTS:

1. Reactivity management:
 - a. Time in core life: EOL
 - b. Power History: At 100%.
 - c. Boron concentration is 47 ppm from a sample taken 2 hours ago. BAST at 7500 ppm.
 - d. Use Deborating demin for 2 hours every shift. Last time in service was 1 hour ago.
 - e. Delta I is stable.
2. No one is in Containment, no entries are expected
3. U-2 is operating at 100% power

COMPENSATORY MEASURES:

None

CONTROL ROOM ABNORMAL STATUS

See Abnormal Status Board.

Facility:		Diablo Canyon		Date of Exam:		1/11/10		Operating Test No.:		L081							
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 (*)		
		1			3			5									
		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-1,3,5	RX		3										1	1	1	0	
	NOR						3			1			2	1	1	1	
	I/C		2,3,4				1,2,4, 5			2,4,7 ,8			11	4	4	2	
	MAJ		7				6,7			5			4	2	2	1	
	TS												0	0	2	2	
RO-2,4,6	RX					3							1	1	1	0	
	NOR			1									1	1	1	1	
	I/C			3,4, 5,6		2,4							6	4	4	2	
	MAJ			7		6,7							3	2	2	1	
	TS												0	0	2	2	
RO-7,8	RX							4					1	1	1	0	
	NOR			1			3						2	1	1	1	
	I/C			3,4, 5,6			1,2,4, 5		3,4,8				11	4	4	2	
	MAJ			7			6,7		5				4	2	2	1	
	TS												0	0	2	2	
SRO-I 1,2,3	RX							4					1	1	1	0	
	NOR												0	1	1	1	
	I/C	2,3,4			1,2,4 ,5			3,4,8					10	4	4	2	
	MAJ	7			6,7			5					4	2	2	1	
	TS	2,3			1,5								4	0	2	2	

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must 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 Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.

Facility: Diablo Canyon				Date of Exam: 1/11/10				Operating Test No.: L081									
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(*)		
		1			3			5									
		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
SRO-I 4,5	RX					3							1	1	1	0	
	NOR								1				1	1	1	1	
	I/C	2,3,4				2,4			2,4,7 ,8				9	4	4	2	
	MAJ	7				6,7			5				4	2	2	1	
	TS	2,3											2	0	2	2	
SRO-I 6,7	RX		3										1	1	1	0	
	NOR												0	1	1	1	
	I/C		2,3,4		1,2,4 ,5			2,3,8 ,4					11	4	4	2	
	MAJ		7		6,7			5					4	2	2	1	
	TS				1,5			2,3					4	0	2	2	
	RX													1	1	0	
	NOR													1	1	1	
	I/C													4	4	2	
	MAJ													2	2	1	
	TS													0	2	2	
	RX													1	1	0	
	NOR													1	1	1	
	I/C													4	4	2	
	MAJ													2	2	1	
	TS													0	2	2	

Instructions:

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