Facility: Diablo Canyon Power Plant Printed: 02/04/2009

Date Of Exam: 02/06/2009

Tier	Group	RO K/A Category Points												SRO-Only Points		
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2	G*	Total
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			3	3	N/A		3	18	0	0	0
	2	1	2	2				1	1			2	9	0	0	0
	Tier Totals	4	5	5				4	4			5	27	0	0	0
2. Plant Systems	1	3	2	3	3	3	2	1	3	2	3	3	28	0	0	0
	2	1	1	1	1	1	1	1	0	1	1	1	10	0 / 0	0	0
	Tier Totals	4	3	4	4	4	3	2	3	3	4	4	38	0	0	0

3. Generic Knowledge And Abilities Categories	1	2	3	4	10	1	2	3	4	0
	2	3	3	2		0	0	0	0	

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.

3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.

4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.

5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.

6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.

9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

Facility: Diablo Canyon Power Plant

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

E/APE # / Name / Safety Function	KA	KA Topic	Comment
000008 Pressurizer Vapor Space Accident / 3	AK1.02	Change in leak rate with change in pressure	
000009 Small Break LOCA / 3	EA2.12	Charging pump ammeter	
000011 Large Break LOCA / 3	EA1.03	Securing of RCPs	
000022 Loss of Rx Coolant Makeup / 2	AK1.03	Relationship between charging flow and PZR level	
000025 Loss of RHR System / 4	AA2.07	Pump cavitation	
000027 Pressurizer Pressure Control System Malfunction / 3	AK2.03	Controllers and positioners	
000029 ATWS / 1	EK2.06	Breakers, relays, and disconnects	
000038 Steam Gen. Tube Rupture / 3	EK1.01	Use of steam tables	
000040 Steam Line Rupture - Excessive Heat Transfer / 4	AK2.02	Sensors and detectors	
000054 Loss of Main Feedwater / 4	AA1.01	AFW controls, including the use of alternate AFW sources	
000055 Station Blackout / 6	2.1.31	Ability to locate control room switches, controls, and indications, and to determine that they correctly reflect the desired plant lineup.	

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

E/APE # / Name / Safety Function	KA	KA Topic	Comment
000056 Loss of Off-site Power / 6	AA2.19	T-cold and T-hot indicators (wide range)	
000057 Loss of Vital AC Inst. Bus / 6	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.	
000058 Loss of DC Power / 6	AA1.02	Static inverter dc input breaker, frequency meter, ac output breaker, and ground fault detector	
000062 Loss of Nuclear Svc Water / 4	AK3.02	The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	
000065 Loss of Instrument Air / 8	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	
W/E04 LOCA Outside Containment / 3	EK3.4	RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated	
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4	EK3.2	Normal, abnormal and emergency operating procedures associated with Loss of Secondary Heat Sink	

E/APE # / Name / Safety Function	KA	KA Topic	Comment
000032 Loss of Source Range NI / 7	AK3.01	Startup termination on source-range loss	
000033 Loss of Intermediate Range NI / 7	AA2.01	Equivalency between source-range, intermediate-range, and power-range channel readings	
000036 Fuel Handling Accident / 8	AK1.02	SDM	
000059 Accidental Liquid RadWaste Rel. / 9	2.2.22	Knowledge of limiting conditions for operations and safety limits.	
000060 Accidental Gaseous Radwaste Rel. / 9	2.4.50	Ability to verify system alarm setpoints and operate controls identified in the alarm response manual.	
000074 Inad. Core Cooling / 4	EK3.04	Tripping RCPs	
W/E08 RCS Overcooling - PTS / 4	EK2.2	Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	
W/E13 Steam Generator Over-pressure / 4	EA1.1	Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	
W/E14 Loss of CTMT Integrity / 5	EK2.2	Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility	

Facility: Diablo Canyon Power Plant

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	KA	KA Topic	Comment
003 Reactor Coolant Pump	K1.08	Containment isolation	
004 Chemical and Volume Control	A3.03	Ion exchange bypass	
004 Chemical and Volume Control	K5.11	Thermal stress, brittle fracture, pressurized thermal shock	
005 Residual Heat Removal	K5.02	Need for adequate subcooling	
006 Emergency Core Cooling	2.1.30	Ability to locate and operate components, including local controls.	
006 Emergency Core Cooling	K6.13	Pumps	
007 Pressurizer Relief/Quench Tank	K4.01	Quench tank cooling	
008 Component Cooling Water	A2.02	High/low surge tank level	
008 Component Cooling Water	K2.02	CCW pump, including emergency backup	
010 Pressurizer Pressure Control	A4.01	PZR spray valve	
010 Pressurizer Pressure Control	K6.03	PZR sprays and heaters	
012 Reactor Protection	A2.03	Incorrect channel bypassing	
013 Engineered Safety Features Actuation	2.4.31	Knowledge of annunciator alarms, indications, or response procedures.	
013 Engineered Safety Features Actuation	K1.10	CPS	

Facility: Diablo Canyon Power Plant

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	KA	KA Topic	Comment
022 Containment Cooling	A4.01	CCS fans	
022 Containment Cooling	A2.01	Fan motor over-current	
026 Containment Spray	K2.01	Containment spray pumps	
039 Main and Reheat Steam	A3.02	Isolation of the MRSS	
059 Main Feedwater	A4.03	Feedwater control during power increase and decrease	
059 Main Feedwater	K3.04	RCS	
061 Auxiliary/Emergency Feedwater	K1.11	AFW turbine exhaust/drains	
062 AC Electrical Distribution	K3.03	DC system	
063 DC Electrical Distribution	A1.01	Battery capacity as it is affected by discharge rate	
064 Emergency Diesel Generator	K3.01	Systems controlled by automatic loader	
073 Process Radiation Monitoring	K5.01	Radiation theory, including sources, types, units, and effects	
076 Service Water	2.4.4	Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	
078 Instrument Air	K4.03	Securing of SAS upon loss of cooling water	

Facility: Diablo Canyon Power Plant

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	KA	KA Topic	Comment
103 Containment	K4.01	Vacuum breaker protection	

Facility: Diablo Canyon Power Plant

ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-2**

Sys/Evol # / Name	KA	KA Topic	Comment
001 Control Rod Drive	K2.01	One-line diagram of power supply to M/G sets	
011 Pressurizer Level Control	A4.02	Movement of the pressure control valve, using manual controller	
014 Rod Position Indication	2.1.32	Ability to explain and apply system limits and precautions.	
015 Nuclear Instrumentation	A1.01	NIS calibration by heat balance	
028 Hydrogen Recombiner and Purge Control	K5.03	Sources of hydrogen within containment	
033 Spent Fuel Pool Cooling	K3.02	Area and ventilation radiation monitoring systems	
034 Fuel Handling Equipment	K6.02	Radiation monitoring systems	
035 Steam Generator	A3.01	S/G water level control	
075 Circulating Water	K4.01	Heat sink	
079 Station Air	K1.01	IAS	

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 02/04/2009

PWR RO Examination Outline

Form ES-401-3

Facility: Diablo Canyon Power Plant

Generic Category	KA	KA Topic	Comment
Conduct of Operations	2.1.26	Knowledge of industrial safety procedures (such as rotating equipment, electrical, high temperature, high pressure, caustic, chlorine, oxygen and hydrogen).	
	2.1.39	Knowledge of conservative decision making practices.	
			Category Total: 2
Equipment Control	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	
	2.2.6	Knowledge of the process for making changes to procedures.	
	2.2.13	Knowledge of tagging and clearance procedures.	
			Category Total: 3
Radiation Control	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions.	
	2.3.13	Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	
	2.3.14	Knowledge of radiation or contamination hazards that may arise during normal, abnormal, or emergency conditions or activities.	
			Category Total: 3
Emergency Procedures/Plan	2.4.26	Knowledge of facility protection requirements, including fire brigade and portable fire fighting equipment usage.	
	2.4.32	Knowledge of operator response to loss of all annunciators.	
			Category Total: 2
			Generic Total: 10

Rev 1

Facility: Diablo Canyon Power Plant Printed: 02/04/2009

Date Of Exam: 02/06/2009

Tier	Group	RO K/A Category Points												SRO-Only Points				
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Total	A2			G*	Total
1. Emergency & Abnormal Plant Evolutions	1	0	0	0	N/A			0	0	N/A		0	0	3			3	6
	2	0	0	0				0	0			0	0	2			2	4
	Tier Totals	0	0	0				0	0			0	0	5			5	10
2. Plant Systems	1	0	0	0	0	0	0	0	0	0	0	0	0	3			2	5
	2	0	0	0	0	0	0	0	0	0	0	0	0	1	1		1	3
	Tier Totals	0	0	0	0	0	0	0	0	0	0	0	0	5			3	8
3. Generic Knowledge And Abilities Categories		1		2		3		4		0		1	2	3	4			7
		0		0		0		0				2	1	2	2			

Note:

1. Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).

2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final RO exam must total 75 points and the SRO-only exam must total 25 points.

3. Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.

4. Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.

5. Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.

6. Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.

7.* The generic (G) K/As in Tiers 1 and 2 shall be selected from Section 2 of the K/A Catalog, but the topics must be relevant to the applicable evolution or system. Refer to Section D.1.b of ES-401 for the applicable K/As.

8. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.

9. For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1** **Form ES-401-2**

E/APE # / Name / Safety Function	KA	KA Topic	Comment
000007 Reactor Trip - Stabilization - Recovery / 1	EA2.06	Occurrence of a reactor trip	
000026 Loss of Component Cooling Water / 8	2.2.36	Ability to analyze the effect of maintenance activities, such as degraded power sources, on the status of limiting conditions for operations.	
000055 Station Blackout / 6	2.4.4	Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures.	
000056 Loss of Off-site Power / 6	2.4.6	Knowledge of EOP mitigation strategies.	
000077 Generator Voltage and Electric Grid Disturbances / 6	AA2.10	Generator overheating and the required actions	
W/E11 Loss of Emergency Coolant Recirc. / 4	EA2.2	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	

ES - 401 **Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2** **Form ES-401-2**

E/APE # / Name / Safety Function	KA	KA Topic	Comment
000024 Emergency Boration / 1	2.4.11	Knowledge of abnormal condition procedures.	
000076 High Reactor Coolant Activity / 9	2.2.38	Knowledge of conditions and limitations in the facility license.	
W/E01 Rediagnosis / 3	EA2.2	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	
W/E07 Inad. Core Cooling / 4	EA2.2	Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments	

Facility: Diablo Canyon Power Plant

ES - 401 **Plant Systems - Tier 2 / Group 1** **Form ES-401-2**

Sys/Evol # / Name	KA	KA Topic	Comment
003 Reactor Coolant Pump	A2.01	Problems with RCP seals, especially rates of seal leak-off	
007 Pressurizer Relief/Quench Tank	A2.02	Abnormal pressure in the PRT	
012 Reactor Protection	2.2.38	Knowledge of conditions and limitations in the facility license.	
059 Main Feedwater	2.2.38	Knowledge of conditions and limitations in the facility license.	
061 Auxiliary/Emergency Feedwater	A2.03	Loss of dc power	

Facility: Diablo Canyon Power Plant

ES - 401 **Plant Systems - Tier 2 / Group 2** **Form ES-401-2**

Sys/Evol # / Name	KA	KA Topic	Comment
034 Fuel Handling Equipment	A1.01	Load limits	
041 Steam Dump/Turbine Bypass Control	A2.02	Steam valve stuck open	
055 Condenser Air Removal	2.4.11	Knowledge of abnormal condition procedures.	

Generic Knowledge and Abilities Outline (Tier 3)

Printed: 02/04/2009

PWR SRO Examination Outline

Form ES-401-3

Facility: Diablo Canyon Power Plant

Generic Category	KA	KA Topic	Comment
Conduct of Operations	2.1.4	Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc.	
	2.1.14	Knowledge of criteria or conditions that require plant-wide announcements, such as pump starts, reactor trips, mode changes, etc.	
			Category Total: 2
Equipment Control	2.2.15	Ability to determine the expected plant configuration using design and configuration control documentation, such as drawings, line-ups, tagouts, etc.	
			Category Total: 1
Radiation Control	2.3.11	Ability to control radiation releases.	
	2.3.15	Knowledge of radiation monitoring systems, such as fixed radiation monitors and alarms, portable survey instruments, personnel monitoring equipment, etc.	
			Category Total: 2
Emergency Procedures/Plan	2.4.21	Knowledge of the parameters and logic used to assess the status of safety functions, such as reactivity control, core cooling and heat removal, reactor coolant system integrity, containment conditions, radioactivity release control, etc.	
	2.4.38	Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required.	
			Category Total: 2
			Generic Total: 7

Rev 1

Tier / Group	Randomly Selected K/A	Reason for Rejection
RO-T2/G1	061 K2.03	KA is knowledge of the power supply to AFW diesel driven pump.
		This is not applicable at DCPP
		Replaced with 061 K1.11 interrelationship between AFW/Turbine exh/drains, IR 2.7
RO-T2/G1	076 A1.02	KA is to predict and monitor changes in reactor and turbine building closed
		cooling water temperatures.
		At DCPP, Service Water is ASW which is not supplied to either building. It only
		supplies cooling to CCW pumps.
		Replaced with 008 K2.02- Power to pumps, including emergency B/U IR 3.0*
SRO -	W/E12 G2.4.1	KA tests knowledge of EOP entry conditions and immediate actions. There are no
T1/G1		immediate actions in the Steam Line Rupture (E-2) EOP.
		Replaced with APE 056 2.4.6 - EOP mitigation strategies IR 4.7
SRO	APE 005 G2.4.26	knowledge of eop warning, notes, cautions, for stuck rod,
T1/G2		not testable at SRO level. replaced with APE 076 G2.2.38
RO T1G1	APE 017G2.2.38	This is a Tech Spec KA, for RCPs there are no Tech Specs (ie <1hr) that are RO
		knowledge . Replaced with EPE055.G2.1.31
RO T1G2	APE 003AK1.17	theory KA that is not site specific and category 1. Replaced with E14.EK2.2
rev 1	modifications	23 January, 2009 - rev1
RO T2G2	033 K3.02	no testable tie for DCPP. randomly selected from the remaining K3's.
		New KA 033 K3.03 - effect of loss of SFP cooling on SFP temperature
RO T2G2	071A1.06	Randomly, using the KA program, resampled for a new KA.
		Original did not apply to DCPP. Using the program to randomly sample
		assured the balance of the sample plan would be maintained. (015A1.01)
		Continued on next page

Rev 1

Tier / Group	Randomly Selected K/A	Reason for Rejection
		23 January, 2009 rejected KA's continued - rev1
SRO T3/4	G2.4.47	Not at SRO level. used the KA program to randomly sample for new KA to
		ensure balance to sample plan maintained. NEW KA 2.4.38
SRO T3/1	G2.1.13	original KA only required basic RO knowledge of radiation levels.
		Resampled using the KA program to maintain sample plan balance.
		NEW KA G2.1.4

Rev 1

Facility: Diablo Canyon
Date of Examination: 02/09/09
Examination Level: RO ☐ SRO ☑
Operating Test Number: L061C

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	D, R	Determination of SFP Heat Load Removal Parameters (LJACO-01R) G2.1.23 - Ability to perform specific system and integrated plant procedures during all modes of plant operation. (4.4)
Conduct of Operations	D, R	Review Outage Safety Checklist (NRC ADM02SRO - L031) G2.1.40 - Knowledge of refueling administrative requirements. (3.9)
Equipment Control	D, R	Verify AFD is within Tech Spec Limits (LJAEC - 11S) G2.2.42 - Ability to recognize system parameters that are entry-level conditions for Technical Specifications. (4.6)
Radiation Control	N, R	Review Liquid Radwaste Discharge checklist G2.3.6 - Ability to approve release permits. (3.8)
Emergency Procedures/Plan	D, R	Offsite Dose Assessment and classification - FHB Accident (LJC-166) G2.4.41 - 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)

Facility: Diablo Canyon
Exam Level: RO ☐ SRO-I ☑ SRO-U ☐

Date of Examination: 02/09/09
Operating Test No.: L061C

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. S1 - 004/Isolate VCT Rupture (LJC-005)	M,A,E,S	02
b. S2 - 010/Respond to PT-456 failed high (LJC-143)	D,S	03
c. S3 - 005/Isolate LOCA outside containment (LJC-118)	D,A,E,S	04p
d. S4 - 103/Manually isolate CVI components	N,A,E,S	05
e. S5 - 008/Loss of CCW to one RCP (L031 NRC test)	D,A,E,S	08
f. S6 - 041/RCS cooldown for SGTR (LJC-090)	D,A,E,S	04s
g. S7 - 073/Verify RM-44A OPERABLE	N,S	07
h.		

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

i. P1 - 062/Transfer pressurizer heater group 12 to backup (LJP-029, modified for Unit 2) ✚	D,L,E	06
j. P2 - 061/Align Alternate AFW from the FWST (LJP-104, modified for Unit 2)	D,L,R	04s
k. P3 - EPE011 Establish CCW Train Separation (LJP-158, modified for Unit 2)	D,A,L,R	03

@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(EN)gineered safety feature	- / - / ≥1 (control room system)
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

Facility: Diablo Canyon **Scenario No.:** 1 **Op-Test No.:** L061C-1

Examiners: _____ **Operators:** _____

Initial Conditions: 100% Reactor power, BOL, Boron at 1182 ppm CFCU 1-2 cleared.

Turnover: High Swell warning is expected in 6 hours. ODM has decided to ramp both units to 25% power at 3 MW/min. OP O-28 actions are complete. OP L-4 preparations are done, at step 6.3.3.m. Turn Pzr Backup heaters on and commence ramp.

Event No.	Malf. No.	Event Type*	Event Description and Time Line
1		N - ATC	Turn Pzr Backup Heaters ON.
2		R – ATC N - SRO	Ramp unit to 25% power.
3	Xmt rcs15	I – ATC I - SRO	Loop 1 narrow range Tcold fails high and causes rods to step in. (TS 3.3.1.E & X and 3.3.2.M)
4	Pmp ven	C – BOP C - SRO	CFCU 11 overcurrent trip. (TS 3.6.6.C)
5	Cnv mfw6	C – SRO C - ATC	FCV-540 FW reg valve to S/G 14 fails open, requires Reactor Trip
6	mal tur1	C - ATC	No Automatic turbine trip, must trip manually. (CT)
7	mal rcs3a	M - ALL	Small break LOCA (4") 3 minutes after turbine trip. Will require RCP Trip criteria.(CT)
8	Mal eps		4KV Bus G differential trip on Safety Injection.
9	pmp cvc1	C - ATC	Charging pump 11 doesn't auto start. (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)	6
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	3
4. Major transients (1–2)	1
5. EOPs entered/requiring substantive actions (1–2)	2
6. EOP contingencies requiring substantive actions (0–2)	0
7. Critical tasks (2–3)	3

MAJOR EVENT SUMMARY AND SCENARIO OBJECTIVES

1. Crew places Pzr Backup Heaters in service.

2. Commences ramps 25% power at 3 MW/min.

3. Loop 1 Tcold fails high, causing rods to step in rapidly. Reactor operator should place rods in manual and crew will respond per OP AP-5.

4. CFCU 11 will trip on overcurrent. Another CFCU will be placed in service per AR PK01-21.

5. FCV-540 Main Feedwater Regulation valve will fail open. The crew should perform a manual Reactor trip after attempting manual control of the valve.

6. The crew enters E-0 and will transition to E-0.1. The Main Unit Turbine must be manually tripped as part of E-0 immediate actions.

7. A small break LOCA on loop 1 cold leg comes in over 5 minutes requiring the crew to perform a Safety Injection if not automatically initiated and return to EOP E-0. The RCP's should be tripped after RCS pressure goes below 1300 psig.

8. On the Safety Injection, 4KV Bus G will get a differential trip, which will remove power to Charging pumps 12 & 13.

9. The crew must manually start Charging pump 11, which will fail to auto start on the Safety Injection Signal.

The crew will transition from E-0 to E-1, and then to E-1.2.

The scenario is terminated after the crew has transitioned to E-1.2 and the decision whether the cooldown can be started has been made.

Facility: Diablo Canyon **Scenario No.:** 3 **Op-Test No.:** L061C-3

Examiners: _____ **Operators:** _____

Initial Conditions: 100% Power, MOL, 782 ppm CB

Turnover: PRA Status: Yellow. Protected Equipment – Train B, Buses H& G, Prot. Sets II, III, IV. RHR pp 11 is cleared for seal repair. U-2 at 100% power.

Event No.	Malf. No.	Event Type*	Event Description and Time Line
1	mal cvc8	C – ATC C - SRO	RCP seal injection filter plugs up, reducing charging flow to seals.
2		R - ATC	Shift Manager requests ramp to 900 MW at 25 MW/min
3	xmt rcs93	I – ALL	NI-44 fails high, requires rods to manual. (TS 3.3.1.D, E, S, T)
4	mal eps4c	C- SRO C - BOP	4KV bus F diff trip (TS 3.0.3 due to loss of both RHR pumps)
5	mal mfw2a mal mfw2b	C – SRO C- ATC	Both MFW pumps trip spuriously.
6	mal ppl5a mal ppl5b	M - ALL	Reactor trip breakers won't open from the control room. ATWS. (CT)
7	ovr xv5i245o	C - ALL	52-hd-13 fdr for bus 13d fails to open, so 1 MG set stays in service. Crew must insert rods and go to FR S.1. (CT)
8	vlv afw7	C - BOP	TDAFW pp 11 FCV-95 won't open automatically, crew must open at VB3. (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)	6
2. Malfunctions after EOP entry (1–2)	2
3. Abnormal events (2–4)	4
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)	3

MAJOR EVENT SUMMARY AND SCENARIO OBJECTIVES

1. RCP seal injection filter plugs up, reducing charging flow to seals. Crew refers to PK 04-22 and swaps to other filter.
2. Shift Manager requests ramp down to 900 MW at 25 MW/min per TOC direction
3. At 1000 MW, NI-44 fails high, which causes rods to drive in. Rod control is taken to manual and crew refers to AP-5 for actions.
4. 4KV Bus F de-energizes due to a differential trip. Crew refers to AP-27 for actions.
5. Both MFW pumps trip spuriously. Crew should try to manually trip the reactor, but trip breakers will not open.
6. Crew goes from E-0 to FR S.1 since 52-HD-13 breaker will not open from the control room.
7. Turbine driven AFW pp 11 must be manually started from VB3.

Crew transitions back to E-0 from FR S.1 and then to E-0.1 for Reactor trip recovery.

Terminate scenario at step 8 of E-0.1.