Facility:	SONGS	Date of Examination:	06/04/07
Examination Level	RO	Operating Test Number:	NRC

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R, S	2.1.20 Ability to execute procedure steps (4.3). JPM: Perform RCS Flow Rate Determination. (J162A3)
Conduct of Operations	M, R	2.1.25 Ability to obtain and interpret station reference materials such as graphs, nomographs, and tables which contain performance data (2.8) JPM: Determine boric acid concentration required for cooldown to Mode 5 (J169A).
Equipment Control	D, R	2.2.11 Knowledge for the process of controlling temporary changes (2.5) JPM: Disable Nuisance Alarm (J167A)
Radiation Control	M, R	2.3.4 Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized (2.5). JPM: Determine radiation levels for work to be performed based on HP Surveys (J242A1).
Emergency Plan	-	

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

*Type Codes & Criteria:

(C)ontrol room

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

(N)ew or (M)odified from bank (> 1)

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

(S)imulator

Class(R)oom

A.1.a The candidate will be required to perform a manual RCS flow rate determination. This is a modified bank JPM.

A.1.b The candidate will determine the required boron concentration for RCS cooldown to Mode 5 with one stuck control rod. The critical tasks are to determine target boron concentration and gallons of boric acid required. This is a modified bank JPM.

A.2 The candidate will be a given nuisance alarm in the control room and be tasked with disabling the nuisance alarm. Candidate will determine compensatory actions, labeling and sliding of links to silence the alarm.

A.3 The candidate will determine radiation levels for work to be performed based on HP Surveys. This is a modified bank JPM.

A.4 N/A

Facility:	SONGS	Date of Examination:	06/04/07
Examination Level	SRO(I) & (U)	Operating Test Number:	NRC

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	M, R, S	2.1.20 Ability to execute procedure steps (4.2). JPM: Perform RCS Flow Rate Determination. (J162A3)
Conduct of Operations	M, R	2.1.25 Ability to obtain and interpret station reference materials such as graphs, nomographs, and tables which contain performance data (2.8) JPM: Determine boric acid concentration required for cooldown to Mode 5 (J169A).
Equipment Control	M, R	2.2.24 Ability to analyze the affect of maintenance activities on LCO status (3.8). JPM: Perform a LCOAR for Reactivity Control (J240A).
Radiation Control	M, R	2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure (3.3). JPM: Determine radiation levels for work to be performed based on HP Surveys, and reportability requirements (J242A1).
Emergency Plan	N, R	2.4.41 Knowledge of emergency plan protective action recommendations. (4.0). JPM: Determine PAR (New).

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

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

A.1.a The candidate will be required to perform a manual RCS flow rate determination. This is a modified bank JPM.

A.1.b The candidate will determine the required boron concentration for RCS cooldown to Mode 5 with one stuck control rod. The critical tasks are to determine target boron concentration and gallons of boric acid required. This is a modified bank JPM.

A.2 The candidate will complete a manual Limiting Condition for Operation ACTION Requirement (LCOAR) for Reactivity Control (Boration Systems - Operating). The critical task is to choose the correct Technical Specification ACTION(s) and properly complete the paperwork for a manual LCOAR. This is a modified bank JPM.

A.3 The candidate will determine radiation levels for work to be performed based on HP Surveys, and reportability requirements. This is a modified bank JPM.

A.4 The candidate will determine the Protective Action Recommendation (PAR) for a Steam Generator Tube Rupture and Main Steam Line Break on the same steam generator. Based on Projected dose rates at the Site Boundary, determine the appropriate event classification and PAR recommendation. This is a new JPM.

Facility:	SONGS	Date of Examination:	06/04/07
Exam Level (circle one):	RO / SRO(I) / **SRO (U)**	Operating Test No.:	NRC

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U, including 1 ESF)			
	System / JPM Title	Type Code*	Safety Function
S-1	**APE 025 - Loss of RHR (J245FS)** **Perform Alternate Reactor Core Cooling**	**A, D, L, S**	**4-P**
S-2	064 - Emergency Diesel Generators (J188S) Reenergize Bus 2A06 from Unit 3 Diesel Generator	D, S	6
S-3	001 - Control Rod Drive System (J029FS) Perform CEA Exercises	A, D, S	1
S-4	**006 - Emergency Core Cooling System (J226FS)** **Perform Recirculation Actuation System operations**	**A, D, P, S**	**2**
S-5	**010 - Pressurizer Pressure Control System (New)** **Respond to an open Pressurizer Spray Valve**	**A, N, S**	**3**
S-6	061 - Main Feedwater System (J221FS) Feedwater System Operation During a Valid RTO	M, S	4-S
S-7	029 - Containment Purge System (J147FS) Place Containment Mini-Purge in Service	A, D, S	8
S-8	012 - Reactor Protection System (J047S) (RO only) Channel A Narrow Range Pressure Transmitter Failure	D, S	7
In-Plant Systems@ (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)			
P-1	**062 - AC Electrical Distribution (New)** **Security Actions for Loss of Control Room**	**E, N**	**6**
P-2	016 - Non-Nuclear Instrumentation (J003) Place the EPPM in Service	D, E, R	7
P-3	**103 - Containment System (J247)** **Perform Manual Containment Isolation Valve Alignment**	**D, E, R**	**5**

@	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
(L)ow-Power	≥ 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	≥ 1 / ≥ 1 / ≥ 1

NRC JPM Examination
Summary Description

S-1 The candidate will perform Alternate Reactor Core Cooling with RCS level lowering per SO23-13-15, Loss of Shutdown Cooling System. The candidate will isolate and secure Shutdown Cooling Pumps and RCPs. The alternate path includes isolating the SDC Valves inside and outside Containment. This is a low power; bank JPM under the Residual Heat Removal System – Primary System Heat Removal from Reactor Core safety function. This is a PRA significant action.

S-2 The candidate will reenergize Bus 2A06 from the Unit 3 Emergency Diesel Generator per SO23-12-11, EOI Supporting Attachments, Attachment 24, Supplying 1E 4 KV Bus from Opposite Unit Diesel. This is a bank JPM in the AC Electrical Distribution System – Electrical safety function.

S-3 The candidate will use the Control Rod Drive System to exercise the CEAs per SO23-3-3.5, CEA/Reactor Trip Breaker Operability Test. The alternate path requires a Reactor trip when two rods fall into the core during exercising. This is a bank JPM under the Control Rod Drive System – Reactivity Control safety function.

S-4 The candidate will align for sump recirculation per SO23-12-11, EOI Supporting Attachments, FS-21, Verify Recirculation Actuation Signal Conditions Established. The alternate path requires manual actions to contend with Containment Sump blockage. This is a bank JPM under the Emergency Core Cooling System – Reactor Coolant System Inventory Control safety function. This JPM was previously used on the October 2005 NRC Exam. This meets the ESF function for the SRO upgrade. This is a PRA significant action.

S-5 This is a Time Critical JPM. The candidate will respond to an open Pressurizer Spray Valve per SO23-13-27, Pressurizer Pressure and Level Malfunction. The alternate path includes tripping the Reactor and Reactor Coolant Pump when it is determined that the Pressurizer Spray Valve will not close. This is a new JPM under the Pressurizer Pressure Control System – Reactor Pressure Control safety function.

S-6 The candidate will perform Feedwater Control System operation during a valid Reactor Trip Override (RTO) signal. The alternate path requires that the candidate position the Bypass Feedwater Control Valves following an RTO per SO23-9-6, Feedwater Control System Operation. This is a modified bank JPM under the Main Feedwater System – Secondary System Heat Removal from Reactor Core safety function. This is a PRA significant action.

S-7 The candidate will place Containment Mini-Purge in service per SO23-1-4.2, Containment Purge and Recirculation Filtration System. The alternate path requires securing the mini-purge manually when a Containment high radiation signal fails to isolate the purge. This is a bank JPM under the Containment Purge System – Plant Service Systems safety function.

S-8 The candidate will take corrective actions for Channel "A" Narrow Range Pressurizer Pressure Transmitter failure per SO23-13-18, Reactor Protection System Failure. This is a bank JPM under the Reactor Protection System – Instrumentation safety function.

P-1 The candidate will perform actions at the Remote Shutdown Panel for a security event. This is a new JPM under the AC Electrical Distribution – Electrical Systems safety function.
This JPM was removed from public view due to SUNSI screening.

P-2 The candidate will place the Essential Plant Parameters Monitoring Panel (EPPM) in service per SO23-13-2, Shutdown form Outside the Control Room. This is a bank JPM under the Non-Nuclear Instrumentation System – Instrumentation safety function.

P-3 The candidate will align manual Containment isolation valves per SO23-12-11, EOI Supporting Attachments, Attachment 26, Manual Containment Isolation Valve Alignment. This is a bank JPM under the Containment Integrity - Containment System safety function.

Facility:	San Onofre	Scenario No.: 1	Op Test No.: 2007 NRC
Examiners:		Operators:	

Initial Conditions:
- 99.2% power MOC - RCS Boron is 883 ppm (by sample)
- Train A Component Cooling Water Pump (P025) in service
- Train A Auxiliary Feedwater Pump (P141) OOS
- Train A Saltwater Cooling Pump (P307) OOS
- Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS
- Fire Computer OOS

Turnover: Maintain steady-state power conditions

Critical Tasks:
- Manually trip the Reactor due to Reactor Protection System failure
- Energize Vital AC Buses A04 and B04 with EDG 2G002

Event No.	Malf. No.	Event Type*	Event Description
1 +0 min	RC16B	I (RO, CRS) TS (CRS)	Pressurizer Level Control Channel (LT-0110-2) fails low
2 +10 min	SG05G	I (BOP, CRS) TS (CRS)	Steam Generator E089 NR Level Transmitter (LT-1113-3) fails low
3 +20 min	CV22B	C (RO, CRS)	Charging Pump (P191) trip
4 +25 min	CV02B CV03B RC07B	C (RO, CRS)	Reactor Coolant Pump (P002) lower and middle seal failures, followed by a seized shaft
5 +45 min	RP15	C (ALL)	Automatic Reactor trip failure, manual trip required
6 +50 min	PG24	M (ALL)	Loss of Offsite Power upon Reactor trip
7 +55 min	EG08B	C (BOP)	Diesel Generator (2G003) mechanical failure
8 +55 min	EG07A	C (BOP)	Diesel Generator (2G002) Automatic Voltage Regulator failure

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

SCENARIO SUMMARY #1

The crew will assume the watch and maintain steady-state conditions per SO23-5-1.7, Power Operations.

The first event is a Pressurizer Level instrument failure that requires crew actions per the Annunciator Response Procedures (ARPs) and AOI SO23-13-27, Pressurizer Pressure and Level Malfunction. The CRS will evaluate Technical Specifications.

When the CRS completes the evaluation of Technical Specifications, a narrow range level transmitter will fail low on Steam Generator E-089. The crew will diagnose a level transmitter failure per the ARPs and AOI SO23-13-18, Reactor Protection System Failure/Loss of Vital Bus, and are required to bypass the effected Functional Units using SO23-3-2.12, Reactor Protective System Operation. The CRS will evaluate Technical Specifications.

When appropriate Functional Units are bypassed, Charging Pump P191 will trip and the operator should start Charging Pump P192 before Letdown isolates. RO actions are addressed per the ARPs and SO23-3-2.1, Chemical and Volume Control System Operations.

When plant conditions are stable, Reactor Coolant Pump P002 will sustain a failure of the lower and middle seals, requiring entry into AOI SO23-13-6, Reactor Coolant Pump Seal Failure. Once the diagnosis is made the RCP shaft will seize. The RO will diagnose the seized shaft and determine that a Reactor trip is required. The automatic Reactor trip failure will require a manual trip by the crew.

A Loss of Offsite Power will occur following the manual trip. The crew will respond per EOI SO23-12-1, Standard Post Trip Actions. Following the trip a mechanical failure of Emergency Diesel Generator 2G003 will occur and a voltage regulator setpoint failure of Emergency Diesel Generator 2G002 will also occur. The ACO must adjust 2G002 voltage in order for the output breaker to close and reenergize Bus 2A04. When SPTAs are complete, the crew will transition to EOI SO23-12-7, Loss of Forced Circulation / Loss of Offsite Power.

Event termination will occur once the crew commences recovery of offsite power.

Risk Significance:

- Risk important components out of service: AFW Pump P141; SWC Pump P307
- Failure of risk important system prior to trip: Loss of two Charging Pumps
- Risk significant core damage sequence: Failure to recover from LOOP
- Risk significant operator actions: Station Blackout due to EDG voltage regulator failure

Facility:	San Onofre	Scenario No.: 2	Op Test No.: 2007 NRC
Examiners:		Operators:	

Initial Conditions:
- 69% power - RCS Boron is 956 ppm (by sample)
- Train A Component Cooling Water Pump (P025) in service
- Train A Auxiliary Feedwater Pump (P141) OOS
- Train A Saltwater Cooling Pump (P307) OOS
- Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS
- Fire Computer OOS

Turnover: Maintain steady-state power conditions

Critical Tasks:
- Trip any RCP not satisfying RCP operating limits
- Restore feedwater flow to at least one Steam Generator

Event No.	Malf. No.	Event Type*	Event Description
1 +0 min	CS05C	I (RO, CRS) TS (CRS)	RWST Level Indication (LI-0305-3) fails low
2 +10 min	RC10B	I (RO, CRS)	RCS Loop 1 Tcold (TT-0111AY) fails low
3 +15 min	ED03B	C (BOP, CRS) TS (CRS)	Bus 2A06 Overcurrent trip and lockout
4 +25 min		R (RO) N (BOP, CRS)	Perform a rapid power reduction per Operations Management directive
5 +30 min	Override	C (BOP, CRS)	Uncontrolled Turbine Load Decrease
6 +35 min	RC03	M (ALL)	Small break LOCA @1200 gpm
7 +35 min	FW23		Total loss of Condenser vacuum
8 +45 min	FW25	C (BOP)	Loss of Turbine Driven Auxiliary Feedwater Pump (P140) due to overspeed trip
9 +45 min		M (ALL)	Loss of all Feedwater
10 +45 min	RP01D	C (RO)	LPSI Pump (P015) fails to start

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

SCENARIO SUMMARY NRC #2

The crew will assume the watch and maintain steady-state conditions per SO23-5-1.7, Power Operations.

When turnover is complete an RWST level indicator will fail low. The CRS will evaluate Technical Specifications. There are no other required actions.

When Technical Specifications have been addressed, a Tcold instrument fails low and will require crew actions per the ARPs and AOI SO23-13-27, Pressurizer Pressure and Level Malfunction. The failed instrument provides input to the Pressurizer level program. The CRS will need to evaluate Technical Specifications if RCS pressure rises above 2275 PSIA.

When Pressurizer level control is restored to normal, a bus fault and lockout will occur on 1E 4kV Bus 2A06. The crew will refer to AOI SO23-13-26, Loss of Power to an AC Bus. The BOP will perform actions to preserve the Train B Emergency Diesel Generator. The CRS will evaluate Technical Specifications and determine that a plant shutdown is required. When the CRS has determined that a Technical Specification LCO 3.0.3 condition exists, Operations Management will direct the crew to commence a rapid downpower per SO23-5-1.7, Power Operations.

During the downpower the Turbine Load Lower pushbutton will stick "IN", causing an uncontrolled turbine load decrease. The crew should manually trip the plant. It is possible to minimize the effects of the stuck pushbutton by reducing the ramp rate to minimum (0.1 MW/min), but it is not an optimal operating condition.

Following the trip a 1200 gpm Loss of Coolant Accident and Loss of all Feedwater will occur. A total loss of Condenser vacuum will cause a loss of the Main Feedwater Pumps. An overspeed trip of the Steam Driven AFW Pump 30 seconds after start, combined with P141 being OOS and the loss of 2A06, will cause a total loss of AFW. The crew performs SO23-12-1, Standard Post Trip Actions, diagnoses a LOCA and a LOFW and transitions to SO23-12-9, Functional Recovery.

Following the trip, a LPSI Pump fails to start and the RO will be required to manually start the pump. This may not occur until the crew is in SO23-12-9. The scenario is terminated when the Steam Driven AFW Pump overspeed trip is reset and RCS temperature and pressure are stabilized while in the Functional Recovery procedure and associated Floating Steps.

Risk Significance:

- Risk important components out of service: AFW Pump P141
SWC Pump P307
- Failure of risk important system prior to trip: Loss of Bus 2A06
- Risk significant core damage sequence: LOCA and LOFW
- Risk significant operator actions: Failure to manually start LPSI
Failure to supply feedwater

Facility:	San Onofre	Scenario No.:	4 (pri spare)	Op Test No.:	2007 NRC
Examiners:	_____	Operators:	_____		
	_____		_____		
	_____		_____		

Initial Conditions:
- Reactor Critical at 2.5x10E-4% power BOC - RCS Boron is 2038 ppm (by sample)
- Train A Component Cooling Water Pump (P-025) in service
- Condenser Air Ejector Low Range Radiation Monitor (RM-7818) OOS
- Fire Computer OOS

Turnover: Power increase in progress to about 2% power

Critical Tasks:
- Trip any RCP not satisfying RCP operating limits
- Manually initiate MSIS (Auto actuation failure)
- Stabilize RCS temperature / pressure following loss of heat removal from the faulted SG
- Isolate the most affected Steam Generator (ESDE)

Event No.	Malf. No.	Event Type*	Event Description
1 +0 min		R (RO) N (ACO, CRS)	Rod withdrawal and power increase in progress
2 +30 min	FWCS LP	C (BOP, CRS)	Auxiliary Feedwater Valve (HV-4762) fails closed
3 +40 min	CV19	I (RO, CRS)	Letdown Temperature Transmitter (TT-0223) fails low
4 +50 min	RC15B	I (RO, CRS) TS (CRS)	Pressurizer Pressure Control Channel (PT-0100Y) fails low
5 +55 min		TS (CRS)	T120, Condensate Storage Tank, low level alarm
6 +60 min	RC03	C (RO, CRS) TS (CRS)	RCS leak less than Charging Pump capacity (~15 GPM)
7 +65 min	RC03	M (ALL)	Small break LOCA (~500 GPM)
8 +70 min	MS03B	M (ALL)	Excess Steam Demand Event on E-089 inside Containment
9 +70 min	RPS LP	I (BOP)	MSIS fails to actuate, manual actuation required

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

SCENARIO SUMMARY NRC #4

The crew will assume the watch with the Reactor critical at 2.5x10E-4% power. The crew will raise power using rod withdrawal per SO23-5-1.3.1, Plant Startup from Hot Standby to Minimum Load.

With the plant stable at 1 to 2% power, the crew will respond to the Letdown Temperature Control Valve failing closed due to a temperature transmitter failure. This will require action per the Annunciator Response Procedures (ARPs).

Once Letdown is restored, the Auxiliary Feedwater Control Valve to Steam Generator E-088 will fail closed. The BOP will align an alternate valve per the ARPs.

After the crew has restored Steam Generator level, a Pressurizer Pressure instrument fails low and will require crew actions per the ARPs and AOI SO23-13-27, Pressurizer Pressure and Level Malfunction. The CRS will evaluate Technical Specifications. During this event the CRS

The next event is an RCS leak inside Containment due to a sensing line failure. The crew will respond per the ARPs and AOI SO23-13-14, Reactor Coolant System Leak. The CRS will evaluate Technical Specifications and determine that a plant shutdown per the AOI is required. Once the requirement to shutdown is determined, the leak will increase to greater than Charging Pump capacity. The crew will initiate a plant trip and perform EOI SO23-12-1, Standard Post Trip Actions.

When the plant is tripped and the crew is performing actions of EOI SO23-12-1, an ESDE inside Containment will occur. The CRS will diagnose a LOCA and an ESDE and transition to EOI SO23-12-9, Functional Recovery.

Following the trip, the Main Steam Isolation Signal (MSIS) fails to actuate and the crew will be required to manually actuate MSIS. The scenario is terminated when RCS temperature and pressure are stabilized and E089 is isolated.

Risk Significance:

- Failure of risk important system prior to trip: Loss of AFW flow
- Risk significant core damage sequence: LOCA and ESDE
- Risk significant operator actions: Manually actuate MSIS

  Isolate affected Steam Generator