

Final Submittal

**SEQUOYAH NUCLEAR PLANT  
EXAM 2002-301  
50-327 & 50-328**

**DECEMBER 2 - 6, 2002**

**FINAL SAMPLE PLANS / OUTLINES**

Facility: Sequoyah Nuclear Plant

Form ES-401-4

Exam Date: 12/02/2002Exam Level: RO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	3	4	4				3	2			0	16
	2	3	5	3				3	0			2	16
	3	1	1	1				0	0			0	3
	Totals Tier	7	10	8				6	2			2	35
2. Plant Systems	1	3	2	1	3	2	2	3	1	2	2	2	23
	2	2	2	2	2	2	2	2	2	2	2	1	21
	3	0	0	1	2	0	0	2	1	2	0	0	8
	Tier Totals	5	4	4	7	4	4	7	4	6	4	3	52
3. Generic Knowledge And Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					4		3		3		3		13
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each teir (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. Actual point totals must match those specified in the table.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolitions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category /tier.</p> <p>6. The generic 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.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the</p>													

# PWR RO Examination Outline

Printed: 11/15/2002

Facility: Sequoyah Nuclear Plant

ES - 401

## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-4

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
005	Inoperable/Stuck Control Rod / 1					X		AA2.01 - Stuck or inoperable rod from in-core and ex-core NIS, in-core or loop temperature measurements	3.3	1
015	Reactor Coolant Pump (RCP) Malfunctions / 4		X					AK2.08 - CCWS	2.6	1
024	Emergency Boration / 1				X			AA1.17 - Emergency borate control valve and indicators	3.9	1
027	Pressurizer Pressure Control (PZR PCS) Malfunction / 3	X						AK1.02 - Expansion of liquids as temperature increases	2.8	1
040	Steam Line Rupture / 4	X						AK1.01 - Consequences of PTS	4.1	1
051	Loss of Condenser Vacuum / 4			X				AK3.01 - Loss of steam dump capability upon loss of condenser vacuum	2.8*	1
067	Plant Fire on Site / 9					X		AA2.17 - Systems that may be affected by the fire	3.5	1
068	Control Room Evacuation / 8		X					AK2.07 - ED/G	3.3	1
069	Loss of Containment Integrity / 5				X			AA1.03 - Fluid systems penetrating containment	2.8	1

Facility: Sequoyah Nuclear Plant

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## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-4

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
074	Inadequate Core Cooling / 4	X						EK1.01 - Methods of calculating subcooling margin	4.3	1
074	Inadequate Core Cooling / 4		X					EK2.06 - Turbine bypass and atmospheric dump valves	3.5*	1
076	High Reactor Coolant Activity / 9			X				AK3.05 - Corrective actions as a result of high fission-product radioactivity level in the RCS	2.9	1
E08	Pressurized Thermal Shock / 4			X				EK3.2 - Normal, abnormal and emergency operating procedures associated with Pressurized Thermal Shock	3.6	1
E09	Natural Circulation Operations / 4				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.5	1
E10	Natural Circulation with Steam Void in Vessel with/without RVLIS / 4			X				EK3.1 - Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	3.4	1
E14	High Containment Pressure / 5		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.4	1

K/A Category Totals: 3 4 4 3 2 0

Group Point Total: 16

# PWR RO Examination Outline

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Facility: Sequoyah Nuclear Plant

ES - 401

## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-4

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
001	Continuous Rod Withdrawal / 1	X						AK1.03 - Relationship of reactivity and reactor power to rod movement	3.9	1
009	Small Break LOCA / 3	X						EK1.01 - Natural circulation and cooling, including reflux boiling	4.2	1
025	Loss of Residual Heat Removal System (RHRS) / 4		X					AK2.05 - Reactor building sump	2.6	1
029	Anticipated Transient Without Scram (ATWS) / 1		X					EK2.06 - Breakers, relays, and disconnects	2.9*	1
037	Steam Generator (S/G) Tube Leak / 3				X			AA1.11 - PZR level indicator	3.4	1
037	Steam Generator (S/G) Tube Leak / 3						X	2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	3.7	1
038	Steam Generator Tube Rupture (SGTR) / 3			X				EK3.08 - Criteria for securing RCP	4.1	1
058	Loss of DC Power / 6			X				AK3.01 - Use of dc control power by ED/Gs	3.4*	1
060	Accidental Gaseous Radwaste Release / 9		X					AK2.02 - Auxiliary building ventilation system	2.7	1

Facility: Sequoyah Nuclear Plant

ES - 401

## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-4

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
061	Area Radiation Monitoring (ARM) System Alarms / 7		X					AK2.01 - Detectors at each ARM system location	2.5*	1
E01	Radiagnosis / 3				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.7	1
E01	Radiagnosis / 3						X	2.2.25 - Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	2.5	1
E03	LOCA Cooldown and Depressurization / 4	X						EK1.3 - Annunciators and conditions indicating signals, and remedial actions associated with the LOCA Cooldown and Depressurization	3.5	1
E03	LOCA Cooldown and Depressurization / 4			X				EK3.1 - Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	3.3	1
E04	LOCA Outside Containment / 3		X					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	3.8	1
E05	Loss of Secondary Heat Sink / 4				X			EA1.3 - Desired operating results during abnormal and emergency situations	3.8	1

K/A Category Totals: 3 5 3 3 0 2

Group Point Total: 16

# PWR RO Examination Outline

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Facility: Sequoyah Nuclear Plant

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## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3

Form ES-401-4

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
056	Loss of Offsite Power / 6			X				AK3.01 - Order and time to initiation of power for the load sequencer	3.5	1
E15	Containment Flooding / 5	X						EK1.1 - Components, capacity, and function of emergency systems	2.8	1
E15	Containment Flooding / 5		X					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	2.7	1

K/A Category Totals: 1 1 1 0 0 0

Group Point Total: 3

Facility: Sequoyah Nuclear Plant

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## Plant Systems - Tier 2 / Group 1

Form ES-401-4

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001	Control Rod Drive System / 1			X									K3.01 - CVCS	2.9*	1
001	Control Rod Drive System / 1					X							K5.30 - Effects of fuel burnout on reactivity in the core	2.9	1
003	Reactor Coolant Pump System (RCPS) / 4				X								K4.02 - Prevention of cold water accidents or transients	2.5	1
003	Reactor Coolant Pump System (RCPS) / 4							X					A1.03 - RCP motor stator winding temperatures	2.6	1
004	Chemical and Volume Control System (CVCS) / 1									X			A3.07 - S/G level and pressure	3.3	1
013	Engineered Safety Features Actuation System (ESFAS) / 2				X								K4.01 - SIS reset	3.9	1
015	Nuclear Instrumentation System / 7								X				A2.03 - Xenon oscillations	3.2	1
017	In-Core Temperature Monitor (ITM) System / 7						X						K6.01 - Sensors and detectors	2.7	1
022	Containment Cooling System (CCS) / 5		X										K2.01 - Containment cooling fans	3.0*	1
022	Containment Cooling System (CCS) / 5											X	2.4.27 - Knowledge of fire in the plant procedure.	3.0	1
025	Ice Condenser System / 5					X							K5.02 - Heat transfer	2.6*	1



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Plant Systems - Tier 2 / Group 1

Form ES-401-4

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
025	Ice Condenser System / 5											X	2.2.13 - Knowledge of tagging and clearance procedures.	3.6	1
056	Condensate System / 4	X											K1.03 - MFW	2.6*	1
056	Condensate System / 4	X											K1.03 - MFW	2.6*	1
059	Main Feedwater (MFW) System / 4	X											K1.04 - S/GS water level control system	3.4	1
059	Main Feedwater (MFW) System / 4											X	A4.01 - MFW turbine trip indication	3.1*	1
061	Auxiliary / Emergency Feedwater (AFW) System / 4		X										K2.01 - AFW system MOVs	3.2*	1
061	Auxiliary / Emergency Feedwater (AFW) System / 4						X						K6.01 - Controllers and positioners	2.5	1
068	Liquid Radwaste System (LRS) / 9									X			A3.02 - Automatic isolation	3.6	1
068	Liquid Radwaste System (LRS) / 9				X								K4.01 - Safety and environmental precautions for handling hot, acidic, and radioactive liquids	3.4	1
071	Waste Gas Disposal System (WGDS) / 9							X					A1.06 - Ventilation system	2.5	1
071	Waste Gas Disposal System (WGDS) / 9											X	A4.26 - Authorized waste gas release, conducted in compliance with radioactive gas discharge permit	3.1	1

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Printed: 11/15/2002

Facility: Sequoyah Nuclear Plant

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Plant Systems - Tier 2 / Group 1

Form ES-401-4

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
072	Area Radiation Monitoring (ARM) System / 7							X					A1.01 - Radiation levels	3.4	1

K/A Category Totals: 3 2 1 3 2 2 3 1 2 2 2

Group Point Total: 23

Facility: Sequoyah Nuclear Plant

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## Plant Systems - Tier 2 / Group 2

Form ES-401-4

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
006	Emergency Core Cooling System (ECCS) / 2							X					A1.07 - Pressure, high and low	3.3	1
006	Emergency Core Cooling System (ECCS) / 2						X						K6.19 - HPI/LPI systems (mode change)	3.7	1
010	Pressurizer Pressure Control System (PZR PCS) / 3								X				A2.02 - Spray valve failures	3.9	1
012	Reactor Protection System / 7						X						K6.07 - Core protection calculator	2.9*	1
012	Reactor Protection System / 7		X										K2.01 - RPS channels, components, and interconnections	3.3	1
016	Non-Nuclear Instrumentation System (NNIS) / 7	X											K1.01 - RCS	3.4*	1
016	Non-Nuclear Instrumentation System (NNIS) / 7									X			A3.02 - Relationship between meter readings and actual parameter value	2.9*	1
029	Containment Purge System (CPS) / 8							X					A1.02 - Radiation levels	3.4	1
035	Steam Generator System (S/GS) / 4					X							K5.01 - Effect of secondary parameters, pressure, and temperature on reactivity	3.4	1
039	Main and Reheat Steam System (MRSS) / 4			X									K3.04 - MFW pumps	2.5*	1
039	Main and Reheat Steam System (MRSS) / 4					X							K5.05 - Bases for RCS cooldown limits	2.7	1

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## Plant Systems - Tier 2 / Group 2

Form ES-401-4

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
062	A.C. Electrical Distribution System / 6										X		A4.03 - Synchroscope, including an understanding of running and incoming voltages	2.8	1
063	D.C. Electrical Distribution System / 6				X								K4.04 - Trips	2.6?	1
063	D.C. Electrical Distribution System / 6								X				A2.01 - Grounds	2.5	1
064	Emergency Diesel Generator (ED/G) System / 6		X										K2.02 - Fuel oil pumps	2.8*	1
064	Emergency Diesel Generator (ED/G) System / 6									X			A3.06 - Start and stop	3.3	1
073	Process Radiation Monitoring (PRM) System / 7										X		A4.01 - Effluent release	3.9	1
075	Circulating Water System / 8	X											K1.01 - SWS	2.5	1
079	Station Air System (SAS) / 8				X								K4.01 - Cross-connect with IAS	2.9	1
079	Station Air System (SAS) / 8											X	2.1.1 - Knowledge of conduct of operations requirements.	3.7	1
086	Fire Protection System (FPS) / 8			X									K3.01 - Shutdown capability with redundant equipment	2.7	1

K/A Category Totals: 2 2 2 2 2 2 2 2 2 2 2 1

Group Point Total: 21

Facility: Sequoyah Nuclear Plant

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Plant Systems - Tier 2 / Group 3

Form ES-401-4

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
005	Residual Heat Removal System (RHRS) / 4							X					A1.01 - Heatup/cooldown rates	3.5	1
008	Component Cooling Water System (CCWS) / 8				X								K4.02 - Operation of the surge tank, including the associated valves and controls	2.9	1
008	Component Cooling Water System (CCWS) / 8								X				A2.04 - PRMS alarm	3.3	1
034	Fuel Handling Equipment System (FHES) / 8				X								K4.02 - Fuel movement	2.5	1
034	Fuel Handling Equipment System (FHES) / 8							X					A1.02 - Water level in the refueling canal	2.9	1
078	Instrument Air System (IAS) / 8			X									K3.03 - Cross-tied units	3.0	1
078	Instrument Air System (IAS) / 8									X			A3.01 - Air pressure	3.1	1
103	Containment System / 5									X			A3.01 - Containment isolation	3.9	1

K/A Category Totals: 0 0 1 2 0 0 2 1 2 0 0

Group Point Total: 8

## PWR RO Examination Outline

Form ES-401-5

Facility: Sequoyah Nuclear Plant

Generic Category	KA	KA Topic	Imp.	Points
Conduct of Operations	2.1.16	Ability to operate plant phone, paging system, and two-way radio.	2.9	1
	2.1.24	Ability to obtain and interpret station electrical and mechanical drawings.	2.8	1
	2.1.31	Ability to locate control room switches, controls and indications and to determine that they are correctly reflecting the desired plant lineup.	4.2	1
	2.1.32	Ability to explain and apply all system limits and precautions.	3.4	1
Category Total:			4	
Equipment Control	2.2.4	(multi-unit) Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility.	2.8	1
	2.2.14	Knowledge of the process for making configuration changes.	2.1	1
	2.2.26	Knowledge of refueling administrative requirements.	2.5	1
Category Total:			3	
Radiation Control	2.3.9	Knowledge of the process for performing a containment purge.	2.5	1
	2.3.10	Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.9	1
	2.3.11	Ability to control radiation releases.	2.7	1
Category Total:			3	
Emergency Procedures/Plan	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0	1
	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.	3.3	1
	2.4.39	Knowledge of the RO's responsibilities in emergency plan implementation.	3.3	1
Category Total:			3	
Generic Total:			13	

**Facility:** Sequoyah Nuclear Plant

Form ES-401-3

**Exam Date:** 12/02/2002**Exam Level:** SRO

Tier	Group	K/A Category Points											Point Total
		K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	
1. Emergency & Abnormal Plant Evolutions	1	3	5	4				4	5			3	24
	2	3	3	3				2	3			2	16
	3	1	0	0				0	2			0	3
	Tier Totals	7	8	7				6	10			5	43
2. Plant Systems	1	1	2	1	2	2	2	3	1	2	1	2	19
	2	2	1	1	2	1	2	2	1	2	1	2	17
	3	0	0	0	1	0	0	1	0	1	0	1	4
	Tier Totals	3	3	2	5	3	4	6	2	5	2	5	40
3. Generic Knowledge And Abilities				Cat 1		Cat 2		Cat 3		Cat 4			
				4		4		5		4		17	
<p>Note: 1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).</p> <p>2. Actual point totals must match those specified in the table.</p> <p>3. Select topics from many systems; avoid selecting more than two or three K/A topics from a given system unless they relate to plant-specific priorities.</p> <p>4. Systems/evolutions within each group are identified on the associated outline.</p> <p>5. The shaded areas are not applicable to the category/tier.</p> <p>6. The generic 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.</p> <p>7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the RO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the</p>													

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Facility: Sequoyah Nuclear Plant

ES - 401

## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-3

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
001	Continuous Rod Withdrawal / 1	X						AK1.03 - Relationship of reactivity and reactor power to rod movement	4.0	1
003	Dropped Control Rod / 1						X	2.4.4 - Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1
015	Reactor Coolant Pump (RCP) Malfunctions / 4		X					AK2.08 - CCWS	2.6	1
015	Reactor Coolant Pump (RCP) Malfunctions / 4					X		AA2.07 - Calculation of expected values of flow in the loop with RCP secured	2.9	1
024	Emergency Boration / 1				X			AA1.17 - Emergency borate control valve and indicators	3.9	1
026	Loss of Component Cooling Water (CCW) / 8					X		AA2.01 - Location of a leak in the CCWS	3.5	1
029	Anticipated Transient Without Scram (ATWS) / 1		X					EK2.06 - Breakers, relays, and disconnects	3.1*	1
040	Steam Line Rupture / 4					X		AA2.01 - Occurrence and location of a steam line rupture from pressure and flow indications	4.7	1
040	Steam Line Rupture / 4	X						AK1.01 - Consequences of PTS	4.4	1



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## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-3

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
051	Loss of Condenser Vacuum / 4			X				AK3.01 - Loss of steam dump capability upon loss of condenser vacuum	3.1*	1
069	Loss of Containment Integrity / 5						X	2.1.14 - Knowledge of system status criteria which require the notification of plant personnel.	3.3	1
069	Loss of Containment Integrity / 5				X			AA1.03 - Fluid systems penetrating containment	3.0	1
074	Inadequate Core Cooling / 4	X						EK1.01 - Methods of calculating subcooling margin	4.7	1
074	Inadequate Core Cooling / 4		X					EK2.06 - Turbine bypass and atmospheric dump valves	3.6	1
076	High Reactor Coolant Activity / 9			X				AK3.05 - Corrective actions as a result of high fission-product radioactivity level in the RCS	3.6	1
E01	Rediagnosis / 3					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	4.0	1
E01	Rediagnosis / 3				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.7	1
E04	LOCA Outside Containment / 3		X					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	4.0	1

# PWR SRO Examination Outline

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## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 1

Form ES-401-3

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
E08	Pressurized Thermal Shock / 4			X				EK3.2 - Normal, abnormal and emergency operating procedures associated with Pressurized Thermal Shock	4.0	1
E09	Natural Circulation Operations / 4					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.8	1
E09	Natural Circulation Operations / 4				X			EA1.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.5	1
E10	Natural Circulation with Steam Void in Vessel with/without RVLIS / 4			X				EK3.1 - Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	3.7	1
E12	Uncontrolled Depressurization of all Steam Generators / 4						X	2.4.16 - Knowledge of EOP implementation hierarchy and coordination with other support procedures.	4.0	1
E14	High Containment Pressure / 5		X					EK2.1 - Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features	3.7	1

K/A Category Totals: 3 5 4 4 5 3

Group Point Total: 24

# PWR SRO Examination Outline

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## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-3

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
009	Small Break LOCA / 3	X						EK1.01 - Natural circulation and cooling, including reflux boiling	4.7	1
022	Loss of Reactor Coolant Makeup / 2					X		AA2.01 - Whether charging line leak exists	3.8	1
025	Loss of Residual Heat Removal System (RHRS) / 4		X					AK2.05 - Reactor building sump	2.6	1
025	Loss of Residual Heat Removal System (RHRS) / 4					X		AA2.07 - Pump cavitation	3.7	1
027	Pressurizer Pressure Control (PZR PCS) Malfunction / 3					X		AA2.04 - Tech-Spec limits for RCS pressure	4.3	1
027	Pressurizer Pressure Control (PZR PCS) Malfunction / 3	X						AK1.02 - Expansion of liquids as temperature increases	3.1	1
037	Steam Generator (S/G) Tube Leak / 3				X			AA1.11 - PZR level indicator	3.3	1
037	Steam Generator (S/G) Tube Leak / 3						X	2.1.7 - Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
038	Steam Generator Tube Rupture (SGTR) / 3			X				EK3.08 - Criteria for securing RCP	4.2	1
058	Loss of DC Power / 6			X				AK3.01 - Use of dc control power by ED/Gs	3.7	1

# PWR SRO Examination Outline

Printed: 11/19/2002

Facility: Sequoyah Nuclear Plant

ES - 401

## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 2

Form ES-401-3

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
060	Accidental Gaseous Radwaste Release / 9		X					AK2.02 - Auxiliary building ventilation system	3.1	1
061	Area Radiation Monitoring (ARM) System Alarms / 7		X					AK2.01 - Detectors at each ARM system location	2.6*	1
E03	LOCA Cooldown and Depressurization / 4	X						EK1.3 - Annunciators and conditions indicating signals, and remedial actions associated with the LOCA Cooldown and Depressurization	3.8	1
E03	LOCA Cooldown and Depressurization / 4			X				EK3.1 - Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics	3.7	1
E05	Loss of Secondary Heat Sink / 4				X			EA1.3 - Desired operating results during abnormal and emergency situations	4.2	1
E16	High Containment Radiation / 9						X	2.4.41 - Knowledge of the emergency action level thresholds and classifications.	4.1	1

K/A Category Totals: 3 3 3 2 3 2

Group Point Total: 16

# PWR SRO Examination Outline

Printed: 11/19/2002

Facility: Sequoyah Nuclear Plant

ES - 401

## Emergency and Abnormal Plant Evolutions - Tier 1 / Group 3

Form ES-401-3

E/APE #	E/APE Name / Safety Function	K1	K2	K3	A1	A2	G	KA Topic	Imp.	Points
056	Loss of Offsite Power / 6					X		AA2.18 - Reactor coolant temperature, pressure, and PZR level recorders	4.0	1
E15	Containment Flooding / 5					X		EA2.1 - Facility conditions and selection of appropriate procedures during abnormal and emergency operations	3.2	1
E15	Containment Flooding / 5	X						EK1.1 - Components, capacity, and function of emergency systems	3.0	1

K/A Category Totals: 1 0 0 0 2 0

Group Point Total: 3

# PWR SRO Examination Outline

Printed: 11/19/2002

Facility: Sequoyah Nuclear Plant

ES - 401		Plant Systems - Tier 2 / Group 1												Form ES-401-3	
Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
001	Control Rod Drive System / 1			X									K3.01 - CVCS	3.0*	1
001	Control Rod Drive System / 1					X							K5.30 - Effects of fuel burnout on reactivity in the core	3.1	1
003	Reactor Coolant Pump System (RCPS) / 4							X					A1.03 - RCP motor stator winding temperatures	2.6	1
004	Chemical and Volume Control System (CVCS) / 1											X	2.4.1 - Knowledge of EOP entry conditions and immediate action steps.	4.6	1
004	Chemical and Volume Control System (CVCS) / 1									X			A3.07 - S/G level and pressure	3.3	1
013	Engineered Safety Features Actuation System (ESFAS) / 2				X								K4.01 - SIS reset	4.3	1
013	Engineered Safety Features Actuation System (ESFAS) / 2											X	2.4.2 - Knowledge of system set points, interlocks and automatic actions associated with EOP entry conditions. Note: The issue of setpoints and automatic safety features is not specifically covered in the systems sections.	4.1	1
017	In-Core Temperature Monitor (ITM) System / 7						X						K6.01 - Sensors and detectors	3.0	1
022	Containment Cooling System (CCS) / 5		X										K2.01 - Containment cooling fans	3.1	1
025	Ice Condenser System / 5					X							K5.02 - Heat transfer	2.8*	1

# PWR SRO Examination Outline

Printed: 11/19/2002

Facility: Sequoyah Nuclear Plant

Plant Systems - Tier 2 / Group 1													Form ES-401-3		
ES - 401															
Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
059	Main Feedwater (MFW) System / 4	X											K1.04 - S/GS water level control system	3.4	1
059	Main Feedwater (MFW) System / 4										X		A4.01 - MFW turbine trip indication	3.1*	1
061	Auxiliary / Emergency Feedwater (AFW) System / 4		X										K2.01 - AFW system MOVs	3.3	1
061	Auxiliary / Emergency Feedwater (AFW) System / 4						X						K6.01 - Controllers and positioners	2.8*	1
063	D.C. Electrical Distribution System / 6				X								K4.04 - Trips	2.9?	1
063	D.C. Electrical Distribution System / 6								X				A2.01 - Grounds	3.2*	1
068	Liquid Radwaste System (LRS) / 9									X			A3.02 - Automatic isolation	3.6	1
071	Waste Gas Disposal System (WGDS) / 9							X					A1.06 - Ventilation system	2.8	1
072	Area Radiation Monitoring (ARM) System / 7							X					A1.01 - Radiation levels	3.6	1

K/A Category Totals: 1 2 1 2 2 2 3 1 2 1 2

Group Point Total: 19

**PWR SRO Examination Outline**

Printed: 11/19/2002

Facility: Sequoyah Nuclear Plant

ES - 401

**Plant Systems - Tier 2 / Group 2**

**Form ES-401-3**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
006	Emergency Core Cooling System (ECCS) / 2						X						K6.19 - HPI/LPI systems (mode change)	3.9	1
006	Emergency Core Cooling System (ECCS) / 2							X					A1.07 - Pressure, high and low	3.6	1
010	Pressurizer Pressure Control System (PZR PCS) / 3								X				A2.02 - Spray valve failures	3.9	1
010	Pressurizer Pressure Control System (PZR PCS) / 3											X	2.4.47 - Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.7	1
011	Pressurizer Level Control System (PZR LCS) / 2											X	2.1.6 - Ability to supervise and assume a management role during plant transients and upset conditions.	4.3	1
012	Reactor Protection System / 7						X						K6.07 - Core protection calculator	3.2*	1
016	Non-Nuclear Instrumentation System (NNIS) / 7	X											K1.01 - RCS	3.4*	1
016	Non-Nuclear Instrumentation System (NNIS) / 7									X			A3.02 - Relationship between meter readings and actual parameter value	2.9*	1
034	Fuel Handling Equipment System (FHES) / 8				X								K4.02 - Fuel movement	3.3	1
034	Fuel Handling Equipment System (FHES) / 8							X					A1.02 - Water level in the refueling canal	3.7	1



**PWR SRO Examination Outline**

Printed: 11/19/2002

Facility: Sequoyah Nuclear Plant

ES - 401

**Plant Systems - Tier 2 / Group 2**

**Form ES-401-3**

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
035	Steam Generator System (S/GS) / 4					X							K5.01 - Effect of secondary parameters, pressure, and temperature on reactivity	3.9	1
039	Main and Reheat Steam System (MRSS) / 4			X									K3.04 - MFW pumps	2.6*	1
062	A.C. Electrical Distribution System / 6										X		A4.03 - Synchroscope, including an understanding of running and incoming voltages	2.9	1
064	Emergency Diesel Generator (ED/G) System / 6		X										K2.02 - Fuel oil pumps	3.1	1
075	Circulating Water System / 8	X											K1.01 - SWS	2.5	1
079	Station Air System (SAS) / 8				X								K4.01 - Cross-connect with IAS	3.2	1
103	Containment System / 5									X			A3.01 - Containment isolation	4.2	1

**K/A Category Totals:**    2    1    1    2    1    2    2    1    2    1    2

**Group Point Total:**    17

# PWR SRO Examination Outline

Printed: 11/19/2002

Facility: Sequoyah Nuclear Plant

ES - 401

Plant Systems - Tier 2 / Group 3

Form ES-401-3

Sys/Ev #	System / Evolution Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	KA Topic	Imp.	Points
005	Residual Heat Removal System (RHRS) / 4							X					A1.01 - Heatup/cooldown rates	3.6	1
007	Pressurizer Relief Tank/Quench Tank System (PRTS) / 5											X	2.1.32 - Ability to explain and apply all system limits and precautions.	3.8	1
008	Component Cooling Water System (CCWS) / 8				X								K4.02 - Operation of the surge tank, including the associated valves and controls	2.7	1
078	Instrument Air System (IAS) / 8									X			A3.01 - Air pressure	3.2	1

K/A Category Totals: 0 0 0 1 0 0 1 0 1 0 1

Group Point Total: 4

# Generic Knowledge and Abilities Outline (Tier 3)

Printed: 11/19/2002

## PWR SRO Examination Outline

Form ES-401-5

Facility: Sequoyah Nuclear Plant

Generic Category	KA	KA Topic	Imp.	Points
<b>Conduct of Operations</b>	2.1.7	Ability to evaluate plant performance and make operational judgments based on operating characteristics, reactor behavior, and instrument interpretation.	4.4	1
	2.1.10	Knowledge of conditions and limitations in the facility license.	3.9	1
	2.1.22	Ability to determine Mode of Operation.	3.3	1
	2.1.24	Ability to obtain and interpret station electrical and mechanical drawings.	3.1	1
<b>Category Total:</b>			<b>4</b>	
<b>Equipment Control</b>	2.2.4	(multi-unit) Ability to explain the variations in control board layouts, systems, instrumentation and procedural actions between units at a facility.	3.0*	1
	2.2.9	Knowledge of the process for determining if the proposed change, test or experiment increases the probability of occurrence or consequences of an accident during the change, test or experiment.	3.3	1
	2.2.14	Knowledge of the process for making configuration changes.	3.0	1
	2.2.25	Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.	3.7	1
<b>Category Total:</b>			<b>4</b>	
<b>Radiation Control</b>	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	3.0	1
	2.3.2	Knowledge of facility ALARA program.	2.9	1
	2.3.3	Knowledge of SRO responsibilities for auxiliary systems that are outside the control room (e.g., waste disposal and handling systems).	2.9	1
	2.3.9	Knowledge of the process for performing a containment purge.	3.4	1
	2.3.11	Ability to control radiation releases.	3.2	1
<b>Category Total:</b>			<b>5</b>	

# Generic Knowledge and Abilities Outline (Tier 3)

Printed: 11/19/2002

## PWR SRO Examination Outline

Form ES-401-5

Facility: Sequoyah Nuclear Plant

Generic Category	KA	KA Topic	Imp.	Points
Emergency Procedures/Plan	2.4.4	Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1
	2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	3.6	1
	2.4.33	Knowledge of the process used track inoperable alarms.	2.8	1
	2.4.39	Knowledge of the RO's responsibilities in emergency plan implementation.	3.1	1
Category Total:			4	4

Generic Total: 17

# **Final Submittal**

(Blue Paper)

## **SEQUOYAH NUCLEAR PLANT EXAM 2002-301 50-327 & 50-328**

**DECEMBER 2 - 6, 2002**

1. Administrative Questions/JPMs
2. In-plant JPMs
3. Control Room JPMs (simulator JPMs)

Facility: SequoyahDate of Examination: 12-02-02Examination Level (circle one): **SRO**Operating Test Number: 1

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Plant Parameter Verification	JPM # 161, Calculate Subcooling Margin
	Refueling Operations	Maximum # of fuel assemblies in refueling canal. 2.2.30/3.5
		Unexpected increase in count rate during fuel load. 2.2.30/3.5
A.2	Equipment Control	Work Request Priority. 2.2.19/3.1
		Releasing equipment for maintenance. 2.2.17/3.5
A.3	Radiation Control	JPM (NEW) Calculate Stay Time
A.4	Emergency Plan	JPM #164, (NEW) Classify the REP

Facility: <u>Sequoyah</u>		Date of Examination: <u>12-02-02</u>
Examination Level (circle one): <b>RO</b>		Operating Test Number: <u>1</u>
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Plant Parameter Verification	JPM # 161, Calculate Subcooling Margin
	Refueling Operations	Maximum # of fuel assemblies in refueling canal. 2.2.30/3.5
		Unexpected increase in count rate during fuel load. 2.2.30/3.5
A.2	Equipment Control	Abnormal Seal leakoff. 2.2.2/4.0
		Rod Thermal Lockup. 2.2.1/3.7
A.3	Radiation Control	JPM (NEW) Calculate Stay Time
A.4	Emergency Plan	JPM #156, Monitor Status Trees

\* - Industry OE importance item

# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

**JPM # 161**

**Calculate Subcooling Margin**

**PREPARED/  
REVISED BY:** \_\_\_\_\_ Date/ \_\_\_\_\_

**VALIDATED BY:** \* \_\_\_\_\_ Date/ \_\_\_\_\_

**APPROVED BY:** \_\_\_\_\_ Date/ \_\_\_\_\_  
(Operations Training Manager)

**CONCURRED:** \*\* \_\_\_\_\_ Date/ \_\_\_\_\_  
(Operations Representative)

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.  
\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).



NUCLEAR TRAINING REVISION/USAGE LOG					
REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
0	Initial Issue	Y	07/18/00	All	L. Pauley/P. Gass
pen/ink	Minor changes to setup and recalculated subcooling margin	N	12/17/01	4, 5, 6	L. Pauley
1	Incorporated pen/ink change	N	8/22/02	4,5,6	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.



**SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Critical steps identified by an asterisk (\*)
2. Sequenced steps identified by an "s"
3. Any UNSAT requires comments
4. Initialize the simulator in IC-92. Trip the Reactor, and FREEZE the simulator when RCS pressure is ~2110 psig and RCS HL temperature is ~ 550°F (if necessary open PZR spray valve to lower pressure). Place covers over the Saturation Monitor Displays.
5. Supply Examinee with a Steam Table and hand held calculator.

**Validation Time: CR.** 15 mins      **Local**                     

**Tools/Equipment/Procedures Needed:**

**References:**

	Reference	Title	Rev No.
1.	Steam Tables	Combustion Engineering Steam Tables	15

=====

**READ TO OPERATOR**

**Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All steps shall be simulated for this JPM. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

**INITIAL CONDITIONS:**

The Unit has tripped from 100% power and all system have responded normally.  
The ICS computers and Saturation Monitor Displays were out of service just before the trip and have not been returned to service.

**INITIATING CUES:**

You are the Unit 1 RO and the US has directed you to determine the amount of Subcooling in the RCS if any. Report your findings to the US when your calculations are complete.

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<p><b>STEP 1.:</b> Operator obtains a copy of Steam Tables and a Hand held calculator.</p> <p><b>NOTE:</b> Calculator and Steam Tables are located on Simulator Desk.</p> <p><b>NOTE:</b> If JPM is performed in the Main Control Room, the examiner should provide a Calculator and Steam Tables.</p> <p><b>STANDARD:</b> Operator locates Steam Tables and a Hand held calculator.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time___</p>
<p><b>STEP 2.:</b> Obtain RCS Hot Leg Temperature.</p> <p><b>Cue:</b> If JPM is performed in the Main Control Room, Examiner will give the examinee a temperature of 550°F.</p> <p><b>STANDARD:</b> Operator observes RCS Hot Leg Temperature Indicators marked as PAM and determines HL Temperature is approximately 550 degrees F. (1-TI-68-1, 1-TI-68-24, 1-TI-68-43, 1-TI-68-65)</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 3.:</b> Obtain RCS Pressure.</p> <p><b>Cue:</b> If JPM is performed in the Main Control Room, Examiner will give the examinee a pressure of 2100 - 2150 psia.</p> <p><b>STANDARD:</b> Operator observes RCS Pressure Indicators marked as PAM and determines RCS Pressure is approximately 2100 - 2150 psia. (1-PI-68-66A, 1-PI-68-62, 1-PI-68-69)</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 4.:</b> Determine Saturation Temperature for RCS Pressure of 2110 psig.</p> <p><b>STANDARD:</b> MCR calculation: Operator refers to Steam Tables and determines Saturation temperature for 2100 - 2150 psia is approximately 642.8 - 649.5 degrees. Simulator Calculation: May be different based on simulator RCS pressure and temperature.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<u>STEP 5.:</u>	Determine subcooling margin for given parameters.	___ SAT
<b>NOTE:</b>	<b><i>Subcooling calculation results in~ 94.5 degrees F subcooled. (92.8 to 99.5 degrees will be acceptable if no cues for temperature or pressure are given by the examiner.)</i></b>	___ UNSAT
<u>STANDARD:</u>	Operator determines subcooling is approximately 94.5 degrees F. based on calculation from given information.	<b>Critical Step</b> Stop Time___

End of JPM

**Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All steps shall be simulated for this JPM. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

**INITIAL CONDITIONS:**

The Unit has tripped from 100% power and all system have responded normally. The ICS computers and Saturation Monitor Displays were out of service just before the trip and have not been returned to service.

**INITIATING CUES:**

You are the Unit 1 RO and the US has directed you to determine the amount of Subcooling in the RCS if any. Report your findings to the US when your calculations are complete.

A.2 Q.1      Equipment Control

On Unit 1, what is the concern with using Alternate Dilute additions to the VCT?

Reference Allowed      **Yes**

Answer:

The concern is thermal gradients across the RCP seals.

*Additional information to clarify answer:*

*Alternate dilution in small amounts is acceptable on a regular basis, provided no significant changes in seal water temperature or seal leakoff are indicated. Batches of 5 to 10 gallons may be added through FCV-62-144 on a frequency not to exceed once per 30 minutes. ICS points for No. 1 seal leakoffs and seal water temperatures on the RCPs should be monitored during and after dilution.*

*This allows mixing of incoming water and less temperature changes on the RCP seals.*

Reference:      0-SO-62-7, p.18

K/A:            2.2.2 (4.0/3.5)

A.2 Q.2      Equipment Control

- a. Describe the cause of rod thermal lockup.
- b. How is the possibility of rod thermal lockup minimized?

Reference Allowed      **Yes**

Answer:

- a. Rod thermal lockup can occur from a 50 degree RCS temperature decrease if the rods are fully inserted and the reactor trip breakers are closed.
- b. The possibility of rod thermal lockup is minimized by withdrawing shutdown and control rods at least 5 steps prior to the RCS temperature change.

Reference:      0-GO-1, p.9

K/A:              2.2.1 (3.7/3.6)



A.1 Q.1      Fuel Handling

A fuel assembly is stored in the upender

A fuel assembly is in the RCCA Change Fixture

A fuel assembly in the manipulator (over the core flange) is on its way to the upender

A containment high radiation alarm is actuated

Where can the Refueling SRO put the fuel assembly currently in the manipulator?

Reference Allowed      **Yes**

Answer:

Two fuel assemblies are permitted in the rod cluster control changing fixture.

The fuel assembly can either be placed in the RCCA Fixture or put back in the core.

Reference:      FHI-3, Movement of Fuel, P.15

K/A:            2.2.30 (2.6/3.5)

A.1 Q.2      Fuel Handling

Refueling operations are in progress on Unit 1. The core has been completely off-loaded and 10 new assemblies have been loaded. Count rate on all nuclear instrument channels are 60 cps. After loading the 11<sup>th</sup> fuel assembly, neutron count rate increases to between 180 and 320 cps on all nuclear instrument channels (with no movement of neutron detectors or source).

What, if any, restrictions are placed on fuel movement?

Reference Allowed      **Yes**

Answer:

Fuel loading may continue because there are no restrictions on nuclear instrumentation readings until after the first 12 fuel assemblies are loaded.

Reference:      FHI-3, Movement of Fuel, P.7

K/A:              2.2.30 (2.6/3.5)

A.2 Q.1      Equipment Repair

Unit 2 is operating at 100% power steady state when the following alarm actuates:

“COMPUTER ALARM ROD DEV & SEQ NIS PWR RANGE TILTS”

Upon investigation it is determined that control rod H4 is mis-aligned from its bank by 20 steps, immovable, and un-trippable. When the Work Request for control rod H4 is prepared, what priority is appropriate for these conditions?

Reference Allowed      **Yes**

Answer:

Priority P-2 (Note: if they choose P-1 they need to justify reasoning, Hot channel factors, cannot repair an un-trippable rod at power, etc), the SM may assign a P-1 if he deems it an emergency

Reference:      SPP-7.1, Appendix B

K/A:              2.2.19 (2.1/3.1)

May refer to: TS 3.1.3.1  
ARP 1-AR-M4-B, D4  
SPP-6.1

A.2 Q.2      Equipment Repair

Unit 2 is operating at 100% steady state. The TDAFW pump is scheduled to be removed from service for routine cleaning, inspection, and lubrication. It is expected to be returned to service within 24 hours. Prior to SM releasing the pump for maintenance, who else must review and approve the planned work?

Reference Allowed      **Yes**

Answer:

The WCC SRO performs the initial review of the WO, the Operations Designee (US, SM, or WCC SRO) approves the work to begin.

Reference:      ODM-1.0, Appendix M  
                     SPP-7.1  
                     TS 3.7.1.2

K/A:              2.2.17 (2.3/3.5)

A.1 Q.1      Fuel Handling

A fuel assembly is stored in the upender

A fuel assembly is in the RCCA Change Fixture

A fuel assembly in the manipulator (over the core flange) is on its way to the upender

A containment high radiation alarm is actuated

Where can the Refueling SRO put the fuel assembly currently in the manipulator?

Reference Allowed      **Yes**

A.1 Q.2      Fuel Handling

Refueling operations are in progress on Unit 1. The core has been completely off-loaded and 10 new assemblies have been loaded. Count rate on all nuclear instrument channels are 60 cps. After loading the 11<sup>th</sup> fuel assembly, neutron count rate increases to between 180 and 320 cps on all nuclear instrument channels (with no movement of neutron detectors or source).

What, if any, restrictions are placed on fuel movement?

Reference Allowed      **Yes**

A.2 Q.1      Equipment Control

On Unit 1, what is the concern with using Alternate Dilute additions to the VCT?

Reference Allowed      **Yes**

A.2 Q.2      Equipment Control

- a. Describe the cause of rod thermal lockup.
- b. How is the possibility of rod thermal lockup minimized?

Reference Allowed      **Yes**



A.2 Q.1      Equipment Repair

Unit 2 is operating at 100% power steady state when the following alarm actuates:

“COMPUTER ALARM ROD DEV & SEQ NIS PWR RANGE TILTS”

Upon investigation it is determined that control rod H4 is mis-aligned from its bank by 20 steps, immovable, and un-trippable. When the Work Request for control rod H4 is prepared, what priority is appropriate for these conditions?

Reference Allowed      **Yes**

A.2 Q.2      Equipment Repair

Unit 2 is operating at 100% steady state. The TDAFW pump is scheduled to be removed from service for routine cleaning, inspection, and lubrication. It is expected to be returned to service within 24 hours. Prior to SM releasing the pump for maintenance, who else must review and approve the planned work?

Reference Allowed      Yes

# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

**JPM # 166**

## Survey Map

<b>PREPARED/ REVISED BY:</b>	_____	Date/
<b>VALIDATED BY:</b>	* _____	Date/
<b>APPROVED BY:</b>	_____	Date/
	(Operations Training Manager)	
<b>CONCURRED:</b>	** _____	Date/
	(Operations Representative)	

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.

\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

NUCLEAR TRAINING REVISION/USAGE LOG					
REVISIO N NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTE D	PREPARED/ REVISED BY:
0	Initial Issue	N	9/25/02	All	JP Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.

**SEQUOYAH NUCLEAR PLANT  
RO/SRO  
JOB PERFORMANCE MEASURE**

**Task:**  
Using a Survey Map

**JA/TA task # :** 3430290302 (RO)

**K/A Ratings:** 2.3.2 (2.5/2.9) 2.3.10 (2.9/3.3)

**Task Standard:**

Using a radiation survey map and an RWP, the examinee will determine:

- required anti-contamination clothing requirements;
- available stay time for an operator to perform routine surveillance in lower containment; and
- contact reading, 30cm reading, and general area reading in the vicinity of the RCDT.

**Evaluation Method :** Simulator \_\_\_\_\_ In-Plant   X  

=====

**Performer:** \_\_\_\_\_  
NAME

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

**Performance Rating :** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ Performance Time \_\_\_\_\_

Finish Time \_\_\_\_\_

**Evaluator:** \_\_\_\_\_  
SIGNATURE DATE

=====

**COMMENTS**

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\_\_\_\_\_

\_\_\_\_\_

**SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s"
2. Any UNSAT requires comments
3. Initialize the simulator in IC-10 and leave in FREEZE. Simulator is NOT required to complete this JPM.
4. Provide Operator with a calculator and equation sheet if required.
5. The simulator is not needed to complete this JPM.

Validation Time: CR. \_\_\_\_\_ Local 7 min.

**Tools/Equipment/Procedures Needed:**

Survey #041602-4, RWP # 02027020

**References:**

	Reference	Title	Rev No.
	SPP-5.1	Radiological Controls	4

**READ TO OPERATOR**

**DIRECTIONS TO TRAINEE:**

I will explain the initial conditions and state the task to be performed. All steps of this JPM shall be simulated. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return, the handout sheet I provided you.

**INITIAL CONDITIONS:**

Unit 2 is in Mode 5.

You are an extra AUO assigned to perform routine surveillance inside the polar crane wall of U2.

You have received 50 mr this year no dose this quarter

**INITIATING CUES:**

You are to review the radiological conditions for the area. Using the radiation survey map and RWP provided, determine:

1. required anti-contamination clothing requirements;
2. maximum available stay time for you to perform routine surveillance in lower containment; and
3. contact reading, 30cm reading, and general area reading in the vicinity of the RCDT.

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 1.:</u> Determine the required anti-contamination clothing requirements</p> <p><u>STANDARD:</u> Operator determines that work step 2 (OPS INSPECTION) of the RWP applies and determines the following clothing is required:</p> <ul style="list-style-type: none"> <li>•modesty clothing</li> <li>•one pair of cloth booties</li> <li>•one pair of gloves with cloth inserts</li> <li>•one pair of coveralls</li> <li>•one pair shoe covers</li> <li>•hood</li> <li>•secure wraps for gloves and booties</li> </ul>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time___</p> <p><b>Critical Step</b></p>
<p><u>STEP 2.:</u> Determine the available stay time for an operator to perform routine surveillance in lower containment.</p> <p><u>STANDARD:</u> Operator determines that general area radiation inside the polar crane wall is 10 mrem/hr and the dose alarm is set at 100 mrem. Thus the available stay time is 10 hours.</p> <p>Stay time = [100 mrem]/[10 mrem/hr] = 10 hrs.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 3.:</u> Determine the contact reading, 30cm reading, and general area reading in the vicinity of the RCDT.</p> <p><u>STANDARD:</u> Operator determines:</p> <ul style="list-style-type: none"> <li>contact reading = 3.5 rem/hr</li> <li>30cm reading = 300 mrem/hr</li> <li>general area reading = 25 mrem/hr</li> </ul>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p> <p>Stop Time___</p>

END of JPM

### **DIRECTIONS TO TRAINEE:**

I will explain the initial conditions and state the task to be performed. All steps of this JPM shall be simulated. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return, the handout sheet I provided you.

### **INITIAL CONDITIONS:**

Unit 2 is in Mode 5.

You are an extra AUO assigned to perform routine surveillance inside the polar crane wall of U2.

You have received 50 mr this year no dose this quarter

### **INITIATING CUES:**

You are to review the radiological conditions for the area. Using the radiation survey map and RWP provided, determine:

1. required anti-contamination clothing requirements;
2. maximum available stay time for you to perform routine surveillance in lower containment; and
3. contact reading, 30cm reading, and general area reading in the vicinity of the RCDT.



# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

## JPM # 164

**Classify the Event per the REP  
(LOCA with Significant Fuel Failure and  
Potential Loss of Containment Integrity)**

**PREPARED/  
REVISED BY:** \_\_\_\_\_ **Date/** \_\_\_\_\_

**VALIDATED BY:** \* \_\_\_\_\_ **Date/** \_\_\_\_\_

**APPROVED BY:** \_\_\_\_\_ **Date/** \_\_\_\_\_  
(Operations Training Manager)

**CONCURRED:** \*\* \_\_\_\_\_ **Date/** \_\_\_\_\_  
(Operations Representative)

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.

\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

**NUCLEAR TRAINING**

**REVISION/USAGE LOG**

<b>REVISION NUMBER</b>	<b>DESCRIPTION OF REVISION</b>	<b>V</b>	<b>DATE</b>	<b>PAGES AFFECTED</b>	<b>PREPARED/ REVISED BY:</b>
0	New	Y	10/1/02	All	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.

Classify the Event per the REP (LOCA with Significant Fuel Failure and Potential Loss of Containment Integrity)

JA/TA task # : 3440030302 (SRO)  
3440190302 (SRO)

**K/A Ratings:**

2.4.29 (2.6/4.0)	2.4.38 (2.2/4.0)	2.4.44 (2.1/4.0)
2.4.30 (2.2/3.6)	2.4.40 (2.3/4.0)	
2.4.37 (2.0/3.5)	2.4.41 (2.3/4.1)	

**Task Standard:**

The event is classified as a GENERAL EMERGENCY based on Loss of Both Fuel Clad and RCS Barriers, and Potential Loss of Containment. The event's protective action recommendation is Recommendation 1 based on a projected dose at greater than 5 miles.

**Evaluation Method :** Simulator   X   In-Plant             
\* This JPM will be simulated

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

**Performance Rating :** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ Performance Time \_\_\_\_\_ Finish Time \_\_\_\_\_

**Evaluator:** \_\_\_\_\_ / \_\_\_\_\_  
SIGNATURE DATE

## COMMENTS

**SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s"
2. Any **UNSAT** requires comments
3. Initialize the simulator in IC-10 and leave in FREEZE.
4. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.
5. **Caution: DO NOT LET THE EXAMINEE FAX THE NOTIFICATION FORM**

Validation Time: CR. 17 mins Local                     

**Tools/Equipment/Procedures Needed:**

EPIP-1  
EPIP-5

**References:**

	Reference	Title	Rev No.
1.	EPIP-1	Emergency Plan Initiating Conditions Matrix	33
2.	EPIP-5	General Emergency	29

**PROVIDE THIS AS HANDOUT AND REVIEW WITH OPERATOR**

**Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All steps of this JPM shall be simulated. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you

**The simulator is NOT representative of the scenario you are about to address.**

**INITIAL CONDITIONS:**

1. Approximately 50 minutes ago, Unit 1 experienced an AUTO SI from a small RCS leak which quickly escalated to a LOCA and a high containment pressure.
2. RCS pressure has stabilized at 600 psig. The CLAs are injecting.
3. The **ONLY** ECCS pump available and in service is the 1B-B RHR pump. The last of the other ECCS pumps tripped off shortly after the RCPs were removed from service per procedure.
4. The break size is such that partial core uncover occurred during saturation blowdown at ~1100 psi, prior to CLAs starting injection.
5. Containment hydrogen concentration is 6% as indicated on the H<sub>2</sub> Analyzers (just completing 30 minute analyze mode).
6. Containment pressure is 1.8 psi and relatively stable.
7. Unit 2 is at 100% RTP and stable.
8. For purposes of this JPM the TSC has not been staffed.
9. CECC EPIP-9, "Emergency Environmental Radiological Monitoring Procedures" has been implemented.

**INITIATING CUES:**

1. You are the US and have assumed the SED position.
2. The STA reports a RED path condition exists on Core Cooling.
3. The operating crew is taking appropriate actions per the emergency procedures, they are currently in E-1 at Step 15 and are now transitioning to FR-C.1.
4. You are to classify and document this event per the appropriate EPIP **AND** perform all required actions.

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<p><u>STEP 1.:</u> Refers to EPIP-1 to determine level of event.</p> <p><u>STANDARD:</u> Operator refers to EPIP-1, Section 1, Fission Product Barrier Matrix. Operator determines that they have met the conditions of</p> <ul style="list-style-type: none"> <li>1.1.1 Loss, "Core Cooling Red"</li> <li>1.2.2 Loss "RCS leak results in subcooling &lt;40°F"</li> <li>1.3.2 Potential loss, "Cntmt H2 increases to greater &gt;4%"</li> </ul> <p>Utilizing "Emergency Class Criteria", operator determines the need to declare a <b>General Emergency</b> based on Loss of two barriers and Potential loss of third barrier.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p> <p><b>Task Start Time</b> _____</p>
<p><u>STEP 2.:</u> Implements EPIP-5 GENERAL EMERGENCY.</p> <p><b>Enter time Declaration made:</b> _____</p> <p><b>Time from Task Acceptance to Declaration:</b> _____</p> <p><u>STANDARD:</u> Operator Implements a GENERAL EMERGENCY per EPIP-5, Section 3.1. Operator should classify the event <b>within 15 minutes</b> of the time the task was accepted. Declaration Time should be consistent with the time the examinee transitions from EPIP-1 to EPIP-5.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 3.:</u> ANNOUNCE to the operating crew: "A GENERAL EMERGENCY has been declared based on <b>(Core Cooling Red Path) AND (RCS leak results in subcooling &lt;40°F) AND (Cntmt H2 increases to greater &gt;4%)</b>. I will be the Site Emergency Director".</p> <p><u>STANDARD:</u> Operator makes announcement to the crew.</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4.:</u> IF the Emergency Paging System (EPS) has not been previously initiated, THEN activate EPS.</p> <p><u>Cue:</u> <b><i>If requested, the clerk/MSS will activate/monitor the EPS.</i></b></p> <p><u>STANDARD:</u> Operator utilizes "Touch Screen" or directs the Clerk/MSS to activate the EPS.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 5.:</u> IF EPS fails, THEN.....</p> <p><u>STANDARD:</u> Operator N/As this step</p>		<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 6.:</u> ANNOUNCE to plant personnel</p> <p>"ATTENTION PLANT PERSONNEL. ATTENTION PLANT PERSONNEL. A GENERAL EMERGENCY HAS BEEN DECLARED BASED ON <b>LOSS OF 2 FISSION PRODUCT BARRIERS WITH A POTENTIAL LOSS OF 3RD BARRIER</b>, AFFECTING UNIT 1. ALL TSC AND OSC PERSONNEL REPORT TO THE EMERGENCY FACILITIES IMMEDIATELY." Repeat the announcement.</p> <p><u>STANDARD:</u> Operator makes the PA announcement.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 7.:</u> If personnel accountability has not been previously initiated, THEN [a] Notify Security Shift Supervisor to implement EPIP-8. [b] ACTIVATE emergency sirens for personnel assembly.</p> <p><u>Cue:</u> <i>Role play as Security Shift Supervisor and acknowledge.</i></p> <p><u>STANDARD:</u> 1. Operator calls Security Shift Supervisor to implement EPIP-8. 2. Operator activates the emergency sirens.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 8.:</u> EVALUATE the appropriate protective actions (page 17).</p> <p><u>Cue:</u> <i>When asked "Rx coolant activity prior to the event was 0.5 micro curies per gram Dose Equivalent Iodine 131".</i></p> <p><u>Cue:</u> <i>If Operator checks Cntmt HI Rad monitors, tell operator "There is no significant change in their readings".</i></p> <p><u>Cue:</u> <i>When asked, "The measured dose at 5 miles is 4.5E6 micro curies per cc Iodine-131".</i></p> <p><u>STANDARD:</u> Operator determines from page 17, logic chart in EPIP-5, that appropriate protective action recommendation is <b>RECOMMENDATION 1</b>. This should be done on the notification form in the next JPM step.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 9.</b> Complete the GE Notification Form (page 18) and notify the Operations Duty Specialist (ODS).</p> <p><b>NOTE:</b> Enter time call is made to the ODS: _____</p> <p>Time from Declaration (step 2) to ODS Notification: _____</p> <ol style="list-style-type: none"> <li>This is a Real Event</li> <li>Their name, Shift Manager at SQN Plant.</li> <li>General Emergency declared on UNIT 1</li> <li>EAL No. <b>LOSS 1.1.1, LOSS 1.2.2, and Potential LOSS 1.3.2.</b></li> <li>Brief description of incident: <b>[Core Cooling Red Path AND RCS leak results in subcooling &lt;40°F AND Cntmt H2 increases to greater &gt;4%].</b></li> <li>Radiological Conditions <b>[Airborne Release Offsite]</b></li> <li>Event Declared: <b>[Time and Date]</b></li> <li>Protective Action Recommendation: <b>[1 - Evacuate 2 mile radius and 10 miles downwind and shelter remainder of 10 mile EPZ].</b></li> <li>Wind speed at 46 meters <b>[5 mph]</b> AND wind direction at 46 meters <b>[Southwest at 235 degrees]</b></li> <li>Ask the ODS to repeat the information he has received to ensure accuracy.</li> </ol> <p><b>Cue:</b></p> <ol style="list-style-type: none"> <li>When examinee on proper ICS screen, "Wind speed at 46 meters is 5 mph".</li> <li>When examinee on proper ICS screen, "Wind direction at 46 meters is Southwest at 235 degrees".</li> <li>Role play as the ODS and acknowledge report.</li> </ol> <p><b>STANDARD:</b> Operator should notify the ODS within 5 minutes after declaration is made giving the above information from page 18.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 10.:</b> FAX Notification Form (page 18) to the ODS.</p> <p><b>Cue:</b> The support AUO will send the FAX for you.</p> <p><b>Caution:</b> DO NOT LET THE EXAMINEE FAX THE FORM</p> <p><b>STANDARD:</b> Operator addresses FAXing the Notification Form to the ODS.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 11.:</b> IF ODS CANNOT be contacted within 10 minutes of declaration....</p> <p><b>STANDARD:</b> Operator N/As this step and continues.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 12.:</b> NOTIFY RADCON Shift Supervisor that "A GENERAL EMERGENCY HAS BEEN DECLARED BASED ON [CORE COOLING RED PATH AND RCS LEAK RESULTS IN SUBCOOLING &lt;40°F AND CNTMT H2 INCREASES TO GREATER &gt;4%], AFFECTING UNIT 1".</p> <p><b>NOTE:</b> This notification may be delegated to an extra SRO/RO.</p> <p><b>Cue:</b> As the Radcon Shift Supervisor, acknowledge the report.</p> <p><b>Cue:</b> If delegated, report that the notification has been completed.</p> <p><b>STANDARD:</b> Operator makes the notification and directs the Radcon Shift Supervisor to implement EPIP-14 AND CECC EPIP-9.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 13.:</b> NOTIFY Chemistry Shift Supervisor that "A GENERAL EMERGENCY HAS BEEN DECLARED BASED ON [CORE COOLING RED PATH AND RCS LEAK RESULTS IN SUBCOOLING &lt;40°F AND CNTMT H2 INCREASES TO GREATER &gt;4%]. AFFECTING UNIT 1".</p> <p><b>NOTE:</b> This notification may be delegated to an extra SRO/RO.</p> <p><b>Cue:</b> As the Chemistry Shift Supervisor, acknowledge the report.</p> <p><b>Cue:</b> If delegated, report that the notification has been completed.</p> <p><b>STANDARD:</b> Operator makes the notification and directs the Chemistry Shift Supervisor to implement EPIP-14.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 14.:</b> MONITOR radiation monitors. When indication of an unplanned radiological release, Then perform Dose Assessment.</p> <p><b>Cue:</b> When examinee uses ICS or RM indication to determine radiation levels, cue the operator: "All RM reading ~ normal and Field surveys are in progress".</p> <p><b>STANDARD:</b></p> <ol style="list-style-type: none"> <li>1. Since a radiological release is indicated by the field surveys, the Operator directs the Chemistry Shift Supervisor to perform a dose assessment per EPIP-13.</li> <li>2. Operator should use either ICS or the RP-30 modules to determine effluent radiation conditions. No additional classifications determined.</li> <li>3. Operator should provide the Chemistry Shift Supervisor the following: Type of Event: LOCA Release Path: Unknown or Containment Leakage Expected Duration: 4 hours</li> </ol>	<p>___ SAT</p> <p>___ UNSAT</p>



Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 15.:</b> IF there are any personnel injuries THEN, IMPLEMENT EPIP-10.</p> <p><b>Cue:</b> <i>There have been no reports of personnel injury.</i></p> <p><b>STANDARD:</b> Operator should N/A this step.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 16.:</b> IF there has been a security threat THEN, NOTIFY Security Shift Supervisor to IMPLEMENT SSI-1.</p> <p><b>Cue:</b> <i>There have been no reports of a security threat.</i></p> <p><b>STANDARD:</b> Operator should N/A this step.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 17.:</b> Notify the Plant Management in accordance with SPP-3.5.</p> <p><b>NOTE:</b> Activation of the EPS will make the Plant Management aware of the REP actuation, however administrative procedures require notification.</p> <p><b>NOTE:</b> This notification may be delegated to an extra SRO/RO.</p> <p><b>Cue:</b> <i>As the NRC, acknowledge the report.</i></p> <p><b>Cue:</b> <i>If delegated, report that the notification has been completed.</i></p> <p><b>STANDARD:</b> Operator contacts Plant Management and informs him of the REP classification and provides GE information from page 18.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 18.:</b> Notify the NRC via ENS in accordance with SPP-3.5.</p> <p><b>Note:</b> This notification may be delegated to an extra SRO/RO.</p> <p><b>Cue:</b> <i>As the NRC, acknowledge the report.</i></p> <p><b>Cue:</b> <i>If delegated, report that the notification has been completed.</i></p> <p><b>STANDARD:</b> Operator should notify the NRC (headquarters) as soon as practicable, but within 1 Hr. of declaration of the event. Operator provides GE information from page 18.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p> <p><b>Time of Notification:</b> _____</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 19.:</u> MONITOR plant conditions AND EVALUATE using EPIP-1.....</p> <p><u>Cue:</u> <i>If operator begins Monitoring plant conditions, THEN tell him "The TSC is staffed and will COMPLETE GE follow-up Form".</i></p> <p><u>STANDARD:</u> Operator addresses completing GE follow-up Form (page 19).</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Stop Time:</p> <p>_____</p>

End of JPM

**Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All steps of this JPM shall be simulated. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you

**The simulator is NOT representative of the scenario you are about to address.**

**INITIAL CONDITIONS:**

1. Approximately 50 minutes ago, Unit 1 experienced an AUTO SI from a small RCS leak which quickly escalated to a LOCA and a high containment pressure.
2. RCS pressure has stabilized at 600 psig. The CLAs are injecting.
3. The ONLY ECCS pump available and in service is the 1B-B RHR pump. The last of the other ECCS pumps tripped off shortly after the RCPs were removed from service per procedure.
4. The break size is such that partial core uncover occurred during saturation blowdown at ~1100 psi, prior to CLAs starting injection.
5. Containment hydrogen concentration is 6% as indicated on the H<sub>2</sub> Analyzers (just completing 30 minute analyze mode).
6. Containment pressure is 1.8 psi and relatively stable.
7. Unit 2 is at 100% RTP and stable.
8. For purposes of this JPM the TSC has not been staffed.
9. CECC EPIP-9, "Emergency Environmental Radiological Monitoring Procedures" has been implemented.

**INITIATING CUES:**

1. You are the US and have assumed the SED position.
2. The STA reports a RED path condition exists on Core Cooling.
3. The operating crew is taking appropriate actions per the emergency procedures, they are currently in E-1 at Step 15 and are now transitioning to FR-C.1.
4. You are to classify and document this event per the appropriate EPIP **AND** perform all required actions.

# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

**JPM # 156**

## Monitor Status Trees - Degraded Core Cooling

<b>PREPARED/ REVISED BY:</b>	_____	Date/	_____	
<b>VALIDATED BY:</b>	*	_____	Date/	_____
<b>APPROVED BY:</b>	_____		Date/	_____
	(Operations Training Manager)			
<b>CONCURRED:</b>	**	_____	Date/	_____
	(Operations Representative)			

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.

\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

NUCLEAR TRAINING					
REVISION/USAGE LOG					
REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
0	New JPM	Y	2/15/01	All	SR Taylor
pen/ink	Added setup for IC-86 and minor changes to setup. Updated K/As.	N	12/17/01	4	L. Pauley
1	Incorporated pen/ink change	N	8/22/02	4	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.

**COMMENTS**

# SPECIAL INSTRUCTIONS TO EVALUATOR:

1. Critical steps identified by the Words "**Critical Step**" in the SAT/UNSAT Column.
2. Sequenced steps identified by an "s"
3. Any UNSAT requires comments
4. Initialize Simulator to IC #93 (100% If IC-86 is not available THEN Initialize to IC 12 EOL) and enter the actions below to set up the JPM
5. Activate malfunction **cs01a (Containment spray Pump 1A Trip). Pull to lock and Tag Containment Spray pump 1A-A.**
6. Activate Malfunction **tho1a @ 100% (LOCA Hot Leg break Loop 1)**
7. Ensure power on 1-FCV-63-1 with remote function **RHR14**
8. Control AFW as necessary by perform EA-3-8 and **CLOSE ALL** AFW flow to #4 SG when the #4 SG NR level is 5%. This will ensure one SG level is < 25% during performance of the Status Trees.
9. Place simulator in run until auto sump swapover is complete, then complete the manual ECCS swapover actions of ES-1.3 (Containment Spray alignment to sump is not required). **Trip RCPs when Phase B occurs.**
10. After Sump swapover is complete, activate Malfunctions **eg02b (D/G 1B-B Trip), ed01 (Loss of Offsite Power), RH01A (RHR pump 1A Trip). Lock out 1A CCP and 1A SI pump.** Acknowledge alarms and clear white lights.  
NOTE: The loss of power will cause the Saturation Margin Alarm to go DARK (XA-55-4B).
11. Run simulator until RVLIS Lower Range is less than 40%, and containment pressure >2.81 psid. Ensure SR is re-instated and at least 1 S/G NR Level is >25% and at least 1 S/G NR level is <25%. Also, verify that at least 1 Tcold is less than 250 and all Tcold channels are >191 °F.
12. Acknowledge alarms and place simulator in **Freeze when all SR and IR range Startup Rate indicators show zero or Negative SUR.** The simulator will **remain in freeze** during performance of the JPM.
13. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

Validation Time: CR 10 min. Local \_\_\_\_\_

Tools/Equipment/Procedures Needed: FR-0, Status Trees.

## REFERENCES:

	Reference	Title	Rev No.
A.	FR-0	Status Trees	11

Task Number	Task Title	Cont TRN
3110450601	Monitor Status Trees to ensure that the Critical Safety Functions are maintained	Y
3110460602	Monitor Status Trees to ensure that the Critical Safety Functions are maintained	Y
3520950305	Monitor status trees to ensure that the critical safety functions are maintained {LICENSE PROGRAM}	Y

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## READ TO OPERATOR

### Directions to Trainee:

I will explain the initial conditions, and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. All steps shall be simulated for this task, the **simulator will remain in freeze during performance of this JPM**. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### INITIAL CONDITIONS:

Approximately 30 minutes ago, Unit 1 was at 100% power EOL with the 1A Containment Spray Pump Tagged for maintenance when a Large Break LOCA occurred. Just after ECCS pump sump swapover was completed per ES-1.3, a total loss of offsite power occurred and Diesel Generator 1B-B failed. Subsequently RHR pump 1A tripped on overcurrent. Alarms have been acknowledged and pumps have been placed in pull-to-lock as appropriate. The Crew is currently in E-1. Typical crew actions to this point have been performed.

### INITIATING CUES:

You are an RO and have been assigned to monitor status trees. Monitor the Status trees for the current conditions and inform the Unit Supervisor of the results.



Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 1:</u> Perform the Subcriticality Status Tree (F-0.1)</p> <p><u>NOTE:</u> The following steps are from performance of the subcriticality Status Tree.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time___</p>
<p><u>STEP 2:</u> Power Range less than 5%.</p> <p><u>STANDARD:</u> Operator checks power range less than 5% on 1-M-13 Power Range Drawer Indicators (1-XI-92-5005B, 5006B, 5007B, &amp; 5008B) and determines Power Range is less than 5%.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> Intermediate Range SUR Zero or Negative.</p> <p><u>Cue:</u> <i>If simulator was not frozen with Zero or Negative SUR cue that it is when checked.</i></p> <p><u>STANDARD:</u> Operator checks Intermediate Range SUR Zero or Negative Using 1-M-13 Comparator and Rate Drawer (1-XX-92-5041) Indicator with the Startup Rate Selector Switch to in both the N35 and N36 positions and determines it is Zero or Negative.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> Source Range Reinstated.</p> <p><u>STANDARD:</u> Operator checks Source Range Reinstated by observing 1-M-13 Source Range indicators (1-XI-92-5001B &amp; 5002B) responses and determines it is Reinstated.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 5:</b> Source Range SUR Zero or Negative.</p> <p><b>Cue:</b> <i>If simulator was not frozen with Zero or Negative SUR cue that it is when checked.</i></p> <p><b>STANDARD:</b> Operator checks Source Range SUR Zero or Negative Using 1-M-13 Comparator and Rate Drawer (1-XX-92-5041) Indicator with the Startup Rate Selector Switch to in both the N31 and N32 positions and determines it is Zero or Negative.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 6:</b> Perform the Core Cooling Status Tree (F-0.2)</p> <p><b>NOTE:</b> The following steps are from performance of the Core Cooling Status Tree.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 7:</b> Core Exit thermocouples less than 1200°F.</p> <p><b>NOTE:</b> Operator must use the Exo Sensor "Next " button to see page 2 of some T/C quadrants. Quadrants 3 &amp; 4 on 1-XI-94-101 have 2 pages, Quadrants 1 &amp; 2 on 1-XI-94-102 have 2 pages</p> <p><b>STANDARD:</b> Operator Checks thermocouples in all quadrants Exo-sensors (1-XI-94-101 &amp; 102) on 1- M-4 using the Quad buttons to determine if 5 T/Cs have exceeded 1200°F as follows: One T/C near the core center and the hottest T/C in each quadrant (this can be verified by ensuring no T/Cs are above the limit without identifying a specific T/C near the core center). The Operator should determine that the limit has <b>not</b> been exceeded.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 8:</b> RCS Subcooling Based on Core Exit T/C greater than 40°F.</p> <p><b>STANDARD:</b> Operator Checks Subcooling on both Exo sensor "Margin" Displays (1-XI-94-101 &amp; 102) on 1-M-4 to determine if subcooling is greater than 40°F. The Operator should determine that subcooling is not greater than 40°F.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 9:</u> At least one RCP running.</p> <p><u>STANDARD:</u> Operator Checks RCPs Running and determines that No RCPs are running.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 10:</u> Core Exit T/Cs Less than 700°F</p> <p><u>NOTE:</u> Operator must use the Exo Sensor "Next " button to see page 2 of some T/C quadrants. Quadrants 3 &amp; 4 on 1-XI-94-101 have 2 pages, Quadrants 1 &amp; 2 on 1-XI-94-102 have 2 pages</p> <p><u>STANDARD:</u> Operator Checks thermocouples in <b>all</b> quadrants on Exo sensors (1-XI-94-101 &amp; 102) on 1-M-4 using the Quad buttons to determine if 5 T/Cs have exceeded 700°F as follows: One T/C near the core center and the hottest T/C in each quadrant (this can be verified by ensuring no T/Cs are above the limit without identifying a specific T/C near the core center). Operator should determine that core exit T/C are also less than 700°F.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 11:</u> RVLIS Lower Range Greater than 40%.</p> <p><u>STANDARD:</u> Operator Checks both PAM RVLIS Lower Range Channels (1-LI-68-368 &amp; 371) on 1-M-4. Operator should determine RVLIS is <b>not</b> greater than 40% and identify that an <u>Orange Path to FR-C.2</u> exists. However, operator should continue checking status trees to ensure Red path does not exist on another status tree.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 12:</u> Perform the Heat Sink Status Tree (F-0.3)</p> <p><u>NOTE:</u> The following steps are from performance of the Heat Sink Status Tree.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 13:</u>      Narrow range level in at least one S/G greater than 10% [25% ADV].</p> <p><u>NOTE:</u>      <b>Adverse Setpoint will be required.</b></p> <p><u>STANDARD:</u>    Operator Checks S/G Narrow Range level on all PAM S/G NR level instruments on 1-M-4 and determines at least one S/G NR Level is greater than 25%.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14:</u>      Pressure in All S/Gs less than 1117 psig.</p> <p><u>STANDARD:</u>    Operator Checks S/G Pressure on all PAM S/G Pressure instruments on 1-M-4 and determines all S/Gs are less than 1117 psig.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 15:</u>      Narrow Range level in all S/Gs less than 81%.</p> <p><u>STANDARD:</u>    Operator Checks S/G Narrow Range level on all PAM S/G NR Level instruments on 1-M-4 and determines that all S/G levels are less than 81%.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 16:</u>      Pressure in All S/Gs less than 1064 psig.</p> <p><u>STANDARD:</u>    Operator Checks S/G Pressure on all S/G PAM Pressure instruments on 1-M-4 and determines all S/Gs are less than 1064 psig.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 17:</u>      Narrow Range level in all S/Gs greater than 10% [25% ADV].</p> <p><u>NOTE:</u>      <b>Adverse Setpoint will be required.</b></p> <p><u>STANDARD:</u>    Operator Checks S/G Narrow Range level on all PAM S/G NR level instruments on 1-M-4 and determines that at least one S/G level is <b>not</b> greater than 25% and notes that a <u>yellow path to FR-H.5</u> exists.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 18:</u>      Perform the Pressurized Thermal Shock Status Tree (F-0.4)</p> <p><u>NOTE:</u>      <b>The following steps are from performance of the Pressurized Thermal Shock Status Tree.</b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 19:</u>      All T-Colds dropped less than 100°F in the last 60 minutes.</p> <p><u>STANDARD:</u>    Operator Checks all RCS PAM T-Cold instruments on 1-M-5 (1-TI-68-18, 41, 60, and 83) and determines that All T-Colds have <b>not</b> dropped less than 100°F in the last 60 minutes. (i.e. Any T-Cold has exceeded the Cooldown limit)</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 20:</u>      All RCS Pressure Vs T-Cold points to the right of limit A on Curve 3.</p> <p><u>STANDARD:</u>    Operator should use the <u>lowest</u> RCS PAM T-Cold on 1-M-5 (1-TI-68-18, 41, 60, and 83) and highest RCS pressure reading from Exo sensors or PAM pressure instruments on 1-M-6 (1-PI-68-66A, 62, &amp; 69) and determine that Limit A has <b>not</b> been exceeded on curve 3.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 21:</u> All T-Colds Greater than 250°F.</p> <p><u>STANDARD:</u> Operator Checks All RCS PAM T-Cold instruments on 1-M-5 (1-TI-68-18, 41, 60, and 83) and determines that All T-Colds are <b>not</b> Greater than 250°F and identifies that an <u>Orange path to FR-P.1</u> exists. However, operator should continue checking status trees to ensure Red path does not exist on another status tree.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 22:</u> Perform the Containment Status Tree (F-0.5)</p> <p><u>NOTE:</u> The following steps are from performance of the Containment Status Tree.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 23:</u> Containment Pressure Less than 12.0 PSID.</p> <p><u>STANDARD:</u> Operator Checks PAM Containment pressure instruments on 1-M-6 (1-PDI-30-45 &amp; 44) and determines that Containment Pressure is Less than 12.0 PSID.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 24:</u> Containment Pressure Less than 2.81 PSID.</p> <p><b>Examiner Note:</b> Operator may report highest Orange path to US before checking inventory since the highest path available in inventory is Yellow.</p> <p><u>STANDARD:</u> Operator Checks PAM Containment pressure instruments on 1-M-6 (1-PDI-30-45 &amp; 44) and determines that Containment Pressure is <b>not</b> Less than 2.81 PSID and identifies that an <u>Orange path to FR-Z.1</u> exists. However, operator should continue checking status trees.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 25:</b> Perform the Inventory Status Tree (F-0.6)</p> <p><b>NOTE:</b> The following steps are from performance of the Inventory Status Tree.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 26:</b> Pressurizer Level Less than 92%</p> <p><b>STANDARD:</b> Operator Checks PAM Pressurizer level instruments on 1-M-4 (1-PI-68-333A, 335A, &amp; 320) and determines that Pressurizer Level is Less than 92%.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 27:</b> Pressurizer Level Greater than 17%.</p> <p><b>STANDARD:</b> Operator Checks PAM Pressurizer level instruments on 1-M-4 (1-PI-68-333A, 335A, &amp; 320) and determines that Pressurizer Level is <b>not</b> Greater than 17% and notes that a <u>yellow path to FR-I.2</u> exists.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 28:</b> Inform the Unit 1 Unit Supervisor that status trees have been monitored and that Orange paths exist on the Core cooling (to FR-C.2), PTS (to FR-P.1) and Containment (to FR-Z.1) Status trees requiring transition to FR-C.2 the highest priority path.</p> <p><b>Cue:</b> <i>US/SRO acknowledges the report.</i></p> <p><b>NOTE:</b> Operator may also report Yellow paths on Heat Sink (FR-H.5) and Inventory (FR-I.2). Reporting the yellow paths to the US/SRO is optional.</p> <p><b>STANDARD:</b> Operator Informs the Unit 1 Unit Supervisor that status trees have been monitored and that Orange paths exist on the Core cooling (to FR-C.2), PTS (to FR-P.1), and Containment (to FR-Z.1) Status trees requiring transition to FR-C.2 the highest priority path.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Stop Time___</p> <p><b>Critical Step</b></p>

### **Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. I will provide initiating cues and reports on other actions when directed by you. All steps shall be simulated for this task, the **simulator will remain in freeze during performance of this JPM**. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS:**

Approximately 30 minutes ago, Unit 1 was at 100% power EOL with the 1A Containment Spray Pump Tagged for maintenance when a Large Break LOCA occurred. Just after ECCS pump sump swapover was completed per ES-1.3, a total loss of offsite power occurred and Diesel Generator 1B-B failed. Subsequently RHR pump 1A tripped on overcurrent. Alarms have been acknowledged and pumps have been placed in pull-to-lock as appropriate. The Crew is currently in E-1. Typical crew actions to this point have been performed.

### **INITIATING CUES:**

You are an RO and have been assigned to monitor status trees. Monitor the Status trees for the current conditions and inform the Unit Supervisor of the results.



Facility: Sequoyah  
 Exam Level (circle one): **RO**

Date of Examination: 12-02-02  
 Operating Test No.: 1

### B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
150, Flush Unit 1 Blender Piping	D, S	1
136, Recovery from SI and Solid Water Conditions	D, S, L	3
077-4 AP2, Perform D/G Load Test on 1A-A D/G	D, S, A	6
34AP, Loss of Secondary Heat Sink	D, S, L, A, PSA	4S
021, Respond to a Failure of PR N-41	D, S	7
065-1, Re-establishment of Containment Pressure Control	D, S, M	5
014, Control Room Inaccessibility	N, S, L	8
099 AP, Locally Align 1B-B CCS Pump to Supply B Train	D, P, R, A	8
42, Placing Vital Inverter 1-II Back in Service	D	6
201R AP1, Local Isolation of Charging with Local Control of Seal Injection Flow	N, P, R, L, A	2
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

Facility: <u>Sequoyah</u>		Date of Examination: <u>12-02-02</u>
Exam Level (circle one): <b>SRO (U)</b>		Operating Test No.: <u>1</u>
B.1 Control Room Systems		
System / JPM Title	Type Code*	Safety Function
150, Flush Unit 1 Blender Piping	D, S	1
34AP, Loss of Secondary Heat Sink	D, S, L, A, PSA	4S
014, Control Room Inaccessibility	N, S, L	8
42, Placing Vital Inverter 1-II Back in Service	D	6
201R AP1, Local Isolation of Charging with Local Control of Seal Injection Flow	N, P, R, L, A	2
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA		

**SEQUOYAH NUCLEAR PLANT**  
**JOB PERFORMANCE MEASURE**

**JPM 150**

**Flush Unit 1 Blender Piping**

Original Signatures on File

PREPARED/ REVISED BY:	_____	Date/	_____	
VALIDATED BY:	*	_____	Date/	_____
APPROVED BY:	_____		Date/	_____
	(Operations Training Manager)			
CONCURRED:	**	_____	Date/	_____
	(Operations Representative)			

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.  
\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

NUCLEAR TRAINING					
REVISION/USAGE LOG					
REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
0	New	Y	10/7/98	All	JP Kearney
pen/ink	0-SO-62-7 rev change only	N	9/21/99	4	SR Taylor
pen/ink	0-SO-62-7 rev change only	N	8/28/00	4	SR Taylor
1	Incorporated pen/ink changes; revised per recent revisions to 0-SO-62-7; no impact on JPM flow	N	8/21/02	All	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).

See cover sheet for criteria.

## COMMENTS

**SPECIAL INSTRUCTIONS TO EVALUATOR:**

- 1. Sequenced steps identified by an "s"
- 2. Any UNSAT requires comments
- 3. Simulator setup: IC-8
- 4. Place 1-HS-62-230A, A Boric Acid Pump, in PTL and tag with a hold order.
- 5. Place hold order ( or orange sticker) on 1-FQ-62-142, Primary Water Batch Counter.
- 6. Booth operator needed to simulate opening and closing 1-62-1051B at steps 17 and 19.
- 7. Freeze the simulator until the operator has been briefed and is ready to perform task.
- 8. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

**Validation Time: CR.** 15 mins

**Tools/Equipment/Procedures Needed:**

0-SO-62-7, Boron Concentration Control, Section 8.8

**References:**

	Reference	Title	Rev No.
A.	0-SO-62-7	Boron Concentration Control	19

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**READ TO OPERATOR**

**Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

**INITIAL CONDITIONS:**

- 1. Unit is in mode 1.
- 2. Maintenance has completed unplugging of the boric acid system and has returned the system to service.
- 3. The "A" Boric Acid Pump is tagged for breaker inspection.
- 4. The Primary Water Batch Counter (1-FQ-62-142) was damaged during the recent outage and currently out of service.
- 5. All prerequisites for 0-SO-62-7, Boron Concentration Control, have been met.

**INITIATING CUES:**

- 1. You are the CRO and are directed to perform the post-maintenance flush of the Unit 1 Blender piping with primary water per 0-SO-62-7, Boron Concentration Control.
- 2. Inform US when any required action(s) associated with the performance of this task has been completed.

JOB PERFORMANCE CHECKLIST

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 1.:</b> Obtain a copy of the appropriate procedure.</p> <p><b>Cue:</b> <i>Two AUOs are stationed at valves 62-936 and 62-948 and have established communications with the control room.</i></p> <p><b>STANDARD:</b> A copy of the 0-SO-62.7 has been obtained and goes to section 8.8.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time___</p>
<p><b>STEP 2.:</b> Check the available capacity of the HUT(s) to receive the blend.</p> <p><b>CUE:</b> <i>The HUT tank levels are: <u>A</u> 10%, <u>B</u> 20%.</i></p> <p><b>Cue:</b> <i>(If Asked) The Unit Supervisor will review Technical Requirements Manual.</i></p> <p><b>STANDARD:</b> Operator records the level of the A and B HUT.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 3.:</b> Ensure AUOs are stationed at valves 62-936 and 62-948 and check communications.</p> <p><b>Cue:</b> <i>AUOs report they are stationed at valves 62-936 and 62-948.</i></p> <p><b>STANDARD:</b> Operator establishes radio communications.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 4.:</b> STOP the operating Boric Acid Pump.</p> <p><b>STANDARD:</b> Positions 1-HS-62-232A, Boric Acid Pump 1B-B to stop.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 5.</b> Ensure the following handswitch in Pull-to-Lock.</p> <p><b>STANDARD:</b> Positions 1-HS-62-232A, Boric Acid Pump 1B-B in Pull-to-Lock</p>	<p>___ SAT</p> <p>___ UNSAT</p>

JOB PERFORMANCE CHECKLIST

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 6.:</u> CLOSE 1-62-1050B, Boric Acid Pump Suction Valve</p> <p><b><u>CUE:</u> AUO reports 1-62-1050B is CLOSED.</b></p> <p><b><u>STANDARD:</u> Directs AUO to Close valve 1-62-1050B. [PREVENTS FLOW DIVERSION]</b></p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 7.:</u> CLOSE 1-FCV-62-237, A Bat recirc valve.</p> <p><b><u>STANDARD:</u> Closes 1-FCV-62-237, A Bat Recirc. [PREVENTS FLOW DIVERSION]</b></p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 8.:</u> UNLOCK and CLOSE 1-62-1057, A Bat Recirc.</p> <p><b><u>CUE:</u> AUO reports 1-62-1057 is CLOSED.</b></p> <p><b><u>STANDARD:</u> Directs AUO to Unlock and Close 1-62-1057, A Bat Recirc valve. [PREVENTS FLOW DIVERSION]</b></p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 9.:</u> Place 1-HS-62-140A, Boric Acid to Blender Flow Control Switch to the STOP position.</p> <p><b><u>STANDARD:</u> Positions 1-HS-62-140A, Boric Acid to Blender Flow Control Switch to STOP.</b></p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 10.:</u> CLOSE 1-FCV-62-140D, Boric Acid to Blender.</p> <p><b><u>STANDARD:</u> Positions 1-FCV-62-140D to CLOSE</b></p>	<p>___ SAT</p> <p>___ UNSAT</p>



JOB PERFORMANCE CHECKLIST

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 11.:</u> CLOSE 1-FCV-62-143, Primary Water Valve to Blender.</p> <p><u>STANDARD:</u> Positions 1-FCV-62-143 to CLOSE</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 12.:</u> ENSURE valves 0-62-1077 and 1-62-938 are CLOSED.</p> <p><u>CUE:</u> <i>AUO reports 0-62-1077 and 1-62-938 are CLOSED.</i></p> <p><u>STANDARD:</u> Directs AUO to check that valves 0-62-1077 and 1-62-938 are closed.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13.:</u> ENSURE valves 1-FCV-62-144 and 1-FCV-62-128 are CLOSED.</p> <p><u>STANDARD:</u> Checks that valves 1-FCV-62-144 and 1-FCV-62-128 are positioned to CLOSED</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14.:</u> OPEN valves 1-62-936 and 1-62-948.</p> <p><u>Cue:</u> <i>AUO's report that 1-62-936 and 1-62-948 are OPEN.</i></p> <p><u>STANDARD:</u> Directs AUO's to OPEN 1-62-936 and 1-62-948. [ESTABLISHES FLOW PATH]</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 15.:</u> ENSURE that 1-62-951 is open.</p> <p><u>CUE:</u> <i>AUO reports 1-62-951 is OPEN</i></p> <p><u>STANDARD:</u> Operator directs AUO to check that 1-62-951 is OPEN.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

JOB PERFORMANCE CHECKLIST

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 16.:</u> OPEN 1-FCV-62-140D.</p> <p><u>STANDARD:</u> Positions 1-FCV-62-140D to OPEN. [ESTABLISHES FLOW PATH]</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 17.:</u> UNLOCK and OPEN one of the primary water suction valves.</p> <p><b><u>NOTE:</u> Booth operator inserts IOR zaofi62139 5. This will give a 25 gpm flow indication on FI-62-139.</b></p> <p><b><u>CUE:</u> AUO reports 1-62-1051B is OPEN</b></p> <p><u>STANDARD:</u> Directs AUO to unlock and open 1-62-1051B, 1B-B Boric Acid Pump Primary Water Suction valve. [ESTABLISHES FLOW PATH]</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 18.:</u> FLUSH piping with about 50 gallons of primary water into the HUT.</p> <p><u>STANDARD:</u> Operator monitors 1-F1-62-139, Boric Acid Flow Meter for flow indication.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 19.:</u> After flushing is complete (about 50 gals.) CLOSE 1-FCV-62-140D and 1-62-1051B, Boric Acid Pump 1B-B Primary Water Suction Valve.</p> <p><b><u>NOTE:</u> Booth operator deletes IOR zaofi62139 5. This will delete the 25 gpm flow indication on FI-62-139</b></p> <p><b><u>CUE:</u> AUO reports 1-62-1051B is CLOSED.</b></p> <p><u>STANDARD:</u> Operator closes 1-FCV-62-140D and directs AUO to close 1-62-1051B. [STOPS FLOW]</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

JOB PERFORMANCE CHECKLIST

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 20.:</u>      VERIFY valves 1-62-936 and 1-62-948 are closed.</p> <p><b><u>Cue:</u>      AUO's report that 1-62-936 and 1-62-948 are CLOSED.</b></p> <p><b><u>STANDARD:</u></b> Directs AUO's to close valves 1-62-936 and 1-62-948. [STOPS FLOW]</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 21.:</u>      THROTTLE OPEN 1-FCV-62-237, A BAT Recirc.</p> <p><b><u>STANDARD:</u></b> Operator throttles open 1-FCV-62-237.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 22.:</u>      OPEN 1-62-1057, A BAT Recirc</p> <p><b><u>CUE:</u>      AUO reports 1-62-1057 is open.</b></p> <p><b><u>STANDARD:</u></b> Operator directs AUO to open 1-62-1057.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 23.:</u>      ENSURE Boric Acid Pump Suction Valve OPEN.</p> <p><b><u>CUE:</u>      AUO reports 1-62-1050B is OPEN</b></p> <p><b><u>STANDARD:</u></b> Directs AUO to open 1-62-1050B, 1B-B Boric Acid Pump suction valve.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 24.:</u>      Inform US of completion of the performance of 0-SO-62-7, section 8.8</p> <p><b><u>Cue:</u>      The US is evaluating LCOs</b></p> <p><b><u>Cue:</u>      NOTE: When the next step is addressed inform candidate that the OATC will realign the blender controls for AUTO makeup and verify valve positions per steps 26 and 27 of section 8.8 of the procedure for Boric Concentration Control.</b></p> <p><b><u>STANDARD:</u></b> SM is informed that Flushing of Unit 1 Blender per 0-SO-62-7 has been performed.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Stop Time___</p>

**SEQUOYAH NUCLEAR PLANT  
JOB PERFORMANCE MEASURE**

**JPM # 136**

**Recovery From Safety Injection  
and Solid Water Conditions**

Original Signatures on File  
Original Signatures on File

<b>PREPARED/ REVISED BY:</b>	_____	Date/
<b>VALIDATED BY:</b>	* _____	Date/
<b>APPROVED BY:</b>	_____	Date/
	(Operations Training Manager)	
<b>CONCURRED:</b>	** _____	Date/
	(Operations Representative)	

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.  
\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

NUCLEAR TRAINING					
REVISION/USAGE LOG					
REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
0	Initial Write	Y	12/13/94	All	HJ Birch
1	Incorporate Rev B changes. Validate since original was not.	Y	9/18/95	All	HJ Birch
pen/ink	EA-62-5 Rev Change only	N	9/23/99	4	SR Taylor
pen/ink	ES-1.1 Rev Change only	N	9/27/99	4	SR Taylor
pen/ink	EA-62-5 Rev Change only	N	8/22/00	all	SR Taylor
2	Incorporated pen/ink changes; revised to latest revision to EA-62-5; no impact on JPM flow	N	8/20/02	All	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.

**JA/TA task # :** 0001000501 (R0)

**K/A Ratings:**

006050A1.01 (4.0-4.3)	011000A1.02 (3.3-3.5)
006050A4.02 (4.1-4.2)	011000A4.01 (3.5-3.2)
011000A1.01 (3.5-3.6)	011000A4.05 (3.2-2.9)

**Task Standard:**

**Terminate Safety Injection and Stabilize the Plant.**

**Evaluation Method :** Simulator   X   In-Plant           

**Performer:** \_\_\_\_\_  
NAME

Start time \_\_\_\_\_

**Performance Rating :** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ Performance Time \_\_\_\_\_

Finish time \_\_\_\_\_

Evaluator: \_\_\_\_\_  
SIGNATURE / DATE

## COMMENTS

### **SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s"
2. Initialize simulator to IC 10. (Use IC 89 if available) Actuate Safety Injection Signal. Close TDAFW valves. Allow the Pzr to go solid and the PORV to start OPENING. Freeze the simulator.
3. **The Console operator will be required to acknowledge simulator alarms**
4. Any UNSAT requires comments
5. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

**Validation Time:** CR. 16 mins Local \_\_\_\_\_

### **Tools/Equipment/Procedures Needed:**

ES-1.1  
EA-62-5

### **REFERENCES:**

	Reference	Title	Rev No.
1.	ES-1.1	SI Termination	7
2	EA-62-5	Establishing Normal Charging and Letdown	6

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### **READ TO OPERATOR**

### **Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you and to indicate completion of your answer to a knowledge question return the written copy of the question to me.

### **INITIAL CONDITIONS:**

1. Unit 1 has experienced a Safety Injection from 100% power.
2. During the performance of E-0 the operators experienced multiple problems with AFW and were required to implement FR-H.1.
3. FR-H.1 has been completed and all problems corrected.
4. During the performance of FR-H.1 the pressurizer level went off scale and the PORVs have lifted several times.

### **INITIATING CUES:**

1. The operators have just determined that the SI was spurious and E-0 has directed them to ES-1.1 "SI Termination.
2. You are the OATC and the SRO has directed you to perform ES-1.1.  
He has cautioned you to minimize the Pzr level reduction rate to minimize the RCS pressure excursions during this recover.
3. Notify the SRO when CCP suction has been realigned to the VCT and letdown is greater than charging flow.

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 1.:</u> Obtain a copy of the procedure.</p> <p><u>STANDARD:</u> Operator obtains a copy of ES-1.1 SI Termination.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time___</p>
<p><u>STEP 2.:</u> Reset SI and Check the following SI ACTUATED permissive DARK. AUTO SI BLOCKED permissive LIT.</p> <p><u>STANDARD:</u> Checks that the "SI ACTUATED" permissive is DARK and that the "AUTO SI BLOCKED" permissive is lit (panel M-4 XA-55-4A)</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 3.:</u> MONITOR shutdown boards continuously energized.</p> <p><u>Cue:</u> <i>The CRO will monitor the shutdown boards energized.</i></p> <p><u>STANDARD:</u> Operator addresses monitoring the SD Bds continuously energized.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4.:</u> <b>Reset Phase A &amp; Phase B.</b></p> <p><u>NOTE:</u> <b>Phase B reset NOT required since Phase B has NOT actuated.</b></p> <p><u>STANDARD:</u> Operator depresses Train A &amp; Train B Phase A reset push-buttons. (HS-30-63E &amp; D). (May reset Phase B also)</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 5.:</u> ESTABLISH control air to containment USING EA-32-1.</p> <p><u>Cue:</u> <i>The CRO will perform this EA.</i></p> <p><u>STANDARD:</u> Operator initiates EA-32-1.</p>	<p>___ SAT</p> <p>___ UNSAT</p>



Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<u>STEP 6.:</u>	STOP all BUT one CCP and PLACE in A-AUTO.	___ SAT ___ UNSAT
<u>STANDARD:</u>	Checks both CCPs running. Places the control switch for one of the charging pumps in the STOP position, (HSS-63-108 or 104), verifies pump stops - green light comes "on", amps go to zero, and then RETURNS the handswitch to the A-AUTO position.	<b>Critical Step</b>
<u>STEP 7.:</u>	CHECK RCS pressure stable or rising.	___ SAT ___ UNSAT
<u>STANDARD:</u>	Operator checks RCS pressure to ensure it is STABLE OR RISING (PAM INSTRUMENTS)	
<u>STEP 8.:</u>	CLOSE inlet isolation valves FCV-63-39 and FCV-63-40.	___ SAT ___ UNSAT
<u>STANDARD:</u>	Operator closes FCV-63-39 and FCV-63-40 as indicated by green light only lit on HSS.	<b>Critical Step</b>
<u>STEP 9.:</u>	CLOSE outlet isolation valves FCV-63-25 and FCV-63-26	___ SAT ___ UNSAT
<u>STANDARD:</u>	Operator closes FCV-63-25 and FCV-63-26 as indicated by green light only lit on HSS.	<b>Critical Step</b>
<u>STEP 10.:</u>	CLOSE seal water flow control valve FCV-62-89.	___ SAT ___ UNSAT
<u>STANDARD:</u>	Operator closes FCV-62-89 by dialing controller to zero.	<b>Critical Step</b>
<u>STEP 11.:</u>	OPEN alternate or normal charging isolation valve FCV-62-85 or 86.	___ SAT ___ UNSAT
<u>STANDARD:</u>	Operator verifies FCV-62-85 or 86 is open.	

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 12.:</u> OPEN charging flow isolation valves FCV-62-90 and 91.</p> <p><u>STANDARD:</u> Operator opens both FCV-62-90 and 91.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 13.:</u> ESTABLISH desired charging flow USING FCV-62-89 and FCV-62-93.</p> <p><u>STANDARD:</u> Operator adjusts FCV-62-89 &amp; 93 to establish:</p> <ol style="list-style-type: none"> <li>1) Seal injection flow 6-10 gpm (FIs-62-1, 14, 27, 40)</li> <li>2) Charging flow <b>should</b> be approx. 60 gpm to prevent letdown flashing when it is placed in service. (It is permissible to set charging at minimum at this time)</li> </ol>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 14.:</u> CONTROL charging flow to maintain pressurizer level..</p> <p><u>STANDARD:</u> Operator ensures FCV-62-89 &amp; 93 to establish:</p> <ol style="list-style-type: none"> <li>1) Seal injection flow 6-10 gpm (FIs-62-1, 14, 27, 40)</li> <li>2) PZR level stable or increasing (LR-68-339)</li> <li>3) Charging flow <b>should</b> be approx. 60 gpm to prevent letdown flashing when it is placed in service. (It is permissible to set charging at minimum at this time)</li> </ol>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 15.:</u> Determine if SI pumps should be stopped.</p> <p><u>STANDARD:</u> Operator verifies:</p> <ul style="list-style-type: none"> <li>that RCS pressure <math>\geq</math> 1500 psig (PAM Instruments)</li> <li>RCS pressure stable or increasing</li> <li>SI pump flow on FI-63-151 ZERO</li> <li>SI pump flow on FI-63-20 ZERO</li> </ul>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 16.:</u> STOP SI pumps and PLACE in A-AUTO.</p> <p><u>STANDARD:</u> Operator places control switches to the STOP position, verifies green lights "ON" HSS-63-10 &amp; 15, then places both switches to the A-AUTO position.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 17.:</u> Determine if RHR pumps should be stopped.</p> <p><u>STANDARD:</u> Checks ECCS pumps aligned to RWST, FCV-74-3 &amp; 21 open. THEN places control switch in the STOP position for both pumps verify green lights "ON", and amps go to zero, then return switches to the A-AUTO position.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 18.:</u> Monitor ECCS flow NOT required.</p> <p><u>STANDARD:</u> Operator monitors the following: a) RCS subcooling based on core exit T/Cs&gt; 40°F (PAM Instruments) b) PZR level&gt; 10% (PAM Instruments)</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 19.:</u> MONITOR if containment spray should be stopped:</p> <p><u>STANDARD:</u> Operator determines not CS pumps running and goes to next step.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 20.:</u> MONITOR if letdown can be established:</p> <p><u>STANDARD:</u> Operator verifies pressurizer level greater than 20% and transitions to EA-62-5, Establishing Normal Charging and Letdown.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>NOTE:</b> The following steps will be performed in EA-62-5 section 4.3.</p> <p><u>STEP 21.:</u> VERIFY pressurizer level greater than 17%.</p> <p><u>STANDARD:</u> Operator verifies pzs level greater than 17%.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<u>STEP 22.:</u>	ENSURE letdown orifice isolation valves CLOSED:	___ SAT ___ UNSAT
<u>STANDARD:</u>	Operator verifies FCV-62-72, 73, 74 closed as indicated by green light ON HSs.	
<u>STEP 23.:</u>	OPEN letdown isolation valves:	___ SAT ___ UNSAT
<u>STANDARD:</u>	Operator verifies open FCV-62-69 and 70. Opens FCV-62-77 as indicated by Red light ON all HSs.	<b>Critical Step</b>
<u>STEP 24.:</u>	PLACE HIC-62-78 in MANUAL and open to ~50%.	___ SAT ___ UNSAT
<u>STANDARD:</u>	HIC-62-78 controller placed in MANUAL and opened to ~50%.	
<u>STEP 25.:</u>	PLACE letdown pressure controller PCV-62-81 in MANUAL and ADJUST output between 40% and 50% open (meter reading).	___ SAT ___ UNSAT
<u>STANDARD:</u>	PCV-62-81 controller placed in manual and its output adjusted between 40% and 50% open (meter reading).	<b>Critical Step</b>
<u>STEP 26.:</u>	ADJUST charging flow as necessary to prevent flashing in the letdown line.	___ SAT ___ UNSAT
<u>STANDARD:</u>	Operator adjusts charging flow to approximately 60 gpm. (this amount will prevent flashing)	
<u>STEP 27.:</u>	OPEN letdown orifice isolation valves as needed:	___ SAT ___ UNSAT
<u>STANDARD:</u>	Operator opens either FCV-62-72, 73, OR, 74 as indicated by Red light ON that HS.	<b>Critical Step</b>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 28.:</u> ADJUST letdown pressure controller, PCV-62-81, output to obtain desired pressure, Match setpoint to existing pressure and THEN place PCV-62-81 in AUTO.</p> <p><u>STANDARD:</u> PCV-62-81 adjusted to get letdown pressure to approximately 325 psig and the controller placed in AUTO.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>NOTE:</b> Normal letdown temperature is ~110°F.</p> <p><u>STEP 29.:</u> ADJUST HIC-62-78 to obtain desired letdown temperature, as indicated on TI-62-78, and place HIC-62-78 in AUTO.</p> <p><u>STANDARD:</u> Operator adjusts letdown temperature to ~110°F..</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 30.:</u> IF necessary to stabilize letdown temperature on Unit 1, place HIC-62-78A in Man and adjust in open direction. WHEN letdown HTX outlet temperature stabilized at approximately 110°F, PLACE in auto.</p> <p><u>STANDARD:</u> Operator ensures letdown temperature is stabilized.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 32.:</u> ENSURE high temperature divert valve, HS-62-79A, in DEMIN position.</p> <p><u>STANDARD:</u> Operator ensures or places HS-62-79A is in DEMIN position and the right RED light ON.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<p><u>STEP 33.:</u> ADJUST charging and letdown as necessary to maintain RCP seal injection flow and pressurizer level.</p> <p><b>NOTE:</b> Since pressurizer level is off scale, it will be necessary to control RCS pressure to determine if level is rising / stable / or increasing. Operator may use cold cal level indicator for trend.</p> <p><u>STANDARD:</u> FCV-62-89 and 93 adjusted to stabilize pzt pressure or slowly decrease pressure.</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>Note:</b> The following steps are in ES-1.1</p> <p><u>STEP 34.:</u> CHECK VCT makeup control system: Makeup set for &gt; RCS boron Conc. And set for automatic control.</p> <p><b>Cue:</b> The CRO will ensure check RCS boron and perform this step.</p> <p><u>STANDARD:</u> Operator addresses setting VCT makeup controls.</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 35.:</u> DETERMINE if CCP suction can be aligned to VCT: CHECK CCP suction aligned to RWST.</p> <p><u>STANDARD:</u> Operator determines that CCP is aligned to RWST (FCV-63-135 &amp; 136 open).</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 36.:</u> OPEN VCT outlet valves LCV-62-132 and 133 and PLACE in PULL A-P-AUTO</p> <p><u>STANDARD:</u> Operator opens LCV-62-132 and 133 verifies red lights ON, THEN places handswitches to PULL A-P-AUTO</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<u>STEP 37.:</u>	Close RWST valves LCV-62-135 and 136 and PLACE in PULL A-P-AUTO	___ SAT
	<u>STANDARD:</u> Operator closes LCV-62-135 and 136 verifies green lights ON, THEN places handswitches to PULL A-P-AUTO	___ UNSAT
		<b>Critical Step</b>
<u>STEP 38.:</u>	When Pzr pressure is stable (or slightly decreasing) with a slightly increasing VCT level, Inform SRO that SI is terminated, normal charging and letdown has been established, and Pzr conditions indicate that level is decreasing	___ SAT
	<u>Cue:</u> <i>When conditions indicate that pressure is decreasing slowly, cold cal decreasing, and/or VCT level is increasing slowly; inform operator that pzr level indicators are starting to show level below 100%.</i>	___ UNSAT
		Stop Time_____
<u>STANDARD:</u>	Operator informs SRO that SI is terminated, normal charging and letdown is established, and Pzr level in less than 100%.	

# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

## JPM # 77-4AP2

Perform D/G Load Test on 1A-A D/G  
(Erratic Voltage)

PREPARED/  
REVISED BY: \_\_\_\_\_ Date/ \_\_\_\_\_

VALIDATED BY: \* \_\_\_\_\_ Date/ \_\_\_\_\_

APPROVED BY: \_\_\_\_\_ Date/ \_\_\_\_\_  
(Operations Training Manager)

CONCURRED: \*\* \_\_\_\_\_ Date/ \_\_\_\_\_  
(Operations Representative)

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.

\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).



NUCLEAR TRAINING					
REVISION/USAGE LOG					
REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
0	New, written from #077-4AP, changed to 1A-A DG.	Y	7/6/00	All	JL Epperson
pen/ink	Updated for procedure rev., minor changes. Validation N/A based on JPM 77-4AP.	N	12/19/01	4, 6-9	L. Pauley
1	Incorporated pen/ink changes; no impact on JPM flow	N	8/21/02	4, 6-9	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.

**JA/TA task #:** 0640020101    0640040101    0640060101    **(RO)**

064A4.03 (3.2/3.3)

Perform D/G Operability Test per 1-SI-OPS-082-007.A, specifically manually start and load the D/G. Trip D/G due to erratic voltage control.

**Evaluation Method :** Simulator   X   In-Plant       

Performer: \_\_\_\_\_  
NAME

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

**Performance Rating :** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ Performance Time \_\_\_\_\_

Finish Time \_\_\_\_\_

**Evaluator:** \_\_\_\_\_ / \_\_\_\_\_  
SIGNATURE DATE

## COMMENTS

**SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s"
2. Any UNSAT requires comments
3. Acknowledge any associated alarms.
4. Initialize Simulator in IC: #8.
5. A Console operator will be required to play role of AUO on Radio.
6. **Insert malfunction IMF EG05A to cause voltage/vars to be erratic.**
7. Operator may request assistance during D/G start and loading at step 5 and 18. A simulator operator needs to be present to perform this timing.
8. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

**Validation Time:** CR. 14 minutes Local                     

**Tools/Equipment/Procedures Needed:**

1. 1-SI-OPS-082-007.A, Through Section 6.1 and Appendix "C".
2. "Signed off" copy of entire section 4.

**References:**

	Reference	Title	Rev No.
1.	1-SI-OPS-082-007.A	Electrical Power System Diesel Generator 1A-A	28

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**READ TO OPERATOR**

**Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

**INITIAL CONDITIONS:**

1. Unit 1 is ~57% and unit 2 is 100% RTP.
2. All systems are OPERABLE, except for the 1A-A D/G, 0-GO-16 has been completed on all the B Tr. equipment.
3. Maintenance has been completed on the 1A-A D/G and the clearance has been removed.
4. The D/G has been rolled and is in standby alignment using 0-SO-82-1.
5. The AUO at the D/G building has completed Appendix A of 1-SI-OPS-082-007.A and all parameters are within limits.
6. The U1 Control Room AUO has verified breaker 1932 is in the Disconnect position.
7. D/G-DAQ has been installed per Appendix J
8. Room fire protection is in service

**INITIATING CUES:**

1. The U1 US/SRO has reviewed the completed work package for the 1A-A D/G, all that remains is to perform 1-SI-OPS-082-007.A for the PMT.
2. You are an extra unit operator and have been assigned to perform the SI on 1A-A D/G.
3. The PMT requires the AMBIENT MANUAL START method for testing.
4. Notify the US when the test is complete.
5. Preliminary actions are complete, US has granted permission to perform the SI.
6. Start at Appendix "C"

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<p><u>STEP 1.:</u> Operator obtains a copy of the appropriate procedure.</p> <p><u>NOTE:</u> Initial conditions cover steps up to transition to App "C".</p> <p><u>STANDARD:</u> Operator obtains a copy of 1-SI-OPS-082-007.A. Performance of task will start with Appendix C.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time___</p>
<p><u>STEP 2.:</u> Ensure 0-HS-82-18 1A-A D/G mode selector switch in the UNIT position.</p> <p><u>STANDARD:</u> 0-HS-82-18 in UNIT position on O-M-26. Green light ON.</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3.:</u> Place 1-HS-57-47 D/G 1A-A Synchronize Switch in the SYN position.</p> <p><u>NOTE:</u> 0-EI-82-5 and 0-XI-82-3 will indicate running voltage &amp; frequency.</p> <p><u>STANDARD:</u> 1-HS-57-47 in "SYN" position on O-M-26</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 4.</u> NOTIFY D/G-DAQ Operator to <b>START</b> the D/G-DAQ</p> <p><u>NOTE:</u> Operator should coordinate the start of the D/G-DAQ just prior to D/G start actuation.</p> <p><u>Cue</u> Console operator Play role of D/G-DAQ operator: D/G-DAQ computer is running.</p> <p><u>STANDARD:</u> Operator notifies the <b>D/G-DAQ</b> operator to start the <b>D/G-DAQ</b>.</p>		<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 5.:</b> Proceed with the countdown: 3,2,1, start and <b>DEPRESS</b> 0-HS-82-16A DG 1A-A Emergency Start Switch.</p> <p><b>NOTE:</b> <b>Role play as extra operator with stop watch and start watch when 0-HS-82-16A is depressed.</b></p> <p><b>STANDARD:</b> 0-HS-82-16A momentarily depressed. Green light will go "out" and red light will come "on" above D/G mimic. [Not critical: D/G running alarm will ANN to indicate D/G &gt; 40 rpm. Incoming voltage and frequency are verified on 0-EI-82-4 and 0-XI-82-2.]</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 6.:</b> ENSURE 1-FCV-67-66, ERCW cooling water supply valve is OPEN.</p> <p><b>STANDARD:</b> ERCW valve 1-FCV-67-66 red light comes "on" and green light goes "out" on 0-M-27A panel.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 7.:</b> <b>RECORD</b> the steady state values for the following: 0-EI-82-4, DG 1A-A incoming Voltage. 0-XI-82-2, DG 1A-A incoming Frequency. Time from stop watch.</p> <p><b>NOTE:</b> <b>Volt meter will be erratic and not steady.</b></p> <p><b>Cue:</b> <b><i>If operator asks for SRO direction: Act as SRO and ask for their recommendation and concur with it.</i></b></p> <p><b>STANDARD:</b> Operator observes D/G voltage (0-EI-82-4) is erratic and not steady. Frequency (0-XI-82-2) is <math>\geq 58.8</math> Hz and <math>\leq 61.2</math> Hz</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 8.:</b> RECORD Voltage Regulator Control Current.</p> <p><b>Cue:</b> <b><i>Voltage Regulator Control Current is 1.8 dc amps.</i></b></p> <p><b>STANDARD:</b> Operator records Voltage Regulator Control Current.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<p><b>STEP 9.:</b> Emergency stop Diesel Generator 1A-A using 0-HS-82-17A.</p> <p><b>NOTE:</b> Operator may elect to do a normal stop. This will require the performance of steps 10 thru 13 to gain manual control. If Emergency stop is used N/A JPM steps 10 thru 13.</p> <p><b>STANDARD:</b> Operator depresses emergency stop button for Diesel Generator 1A-A, or initiates a normal stop.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 10.:</b> <b>ENSURE</b> D/G 1A-A 86 LOR red light DARK, at D/G local relay panel.</p> <p><b>Cue:</b> <i>Role Play as D/G operator - 86 LOR local red light is not LIT.</i></p> <p><b>STANDARD:</b> Operator verifies red light on 86 LOR at D/G is not illuminated.</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 11.:</b> <b>RESET 86 LOR</b> lockout relay, on D/G local relay panel and verify reset by amber light 0-XI-82-19 illuminated on 0-M-26.</p> <p><b>NOTE:</b> When the D/G AUO is requested to reset 86LOR, the Console operator should insert MRF EGR07 RESET to reset 86LOR and notify operator - 86 LOR is reset.</p> <p><b>STANDARD:</b> 86 LOR is reset and amber light on 0-M-26 is verified LIT.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 12.:</b> <b>RECORD</b> from the <i>D/G-DAQ</i> computer the time required to achieve <math>\geq</math> 58.8 HZ and <math>\geq</math> 6800 Volts.</p> <p><b>Cue:</b> <i>Time was 9.5 seconds for D/G-DAQ.</i></p> <p><b>STANDARD:</b> Operator ensures the DG accelerates to at least 900 rpm (58.8 - 61.2 Hz) and Voltage and frequency are within limit within the required 10 seconds. (Evaluator can sign for Tech Support). Operator may N/A this step due to erratic voltage reading.</p>		<p>___ SAT</p> <p>___ UNSAT</p>

## Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<u>STEP 13:</u>	Place 0-HS-82-14, DG 1A-A Control Start-Stop Switch in the STOP position momentarily.	___ SAT ___ UNSAT
<u>Cue:</u>	<b>To expedite the JPM, Inform operator that the D/G &gt;40 rpm "running light" has cleared</b>	<b>Critical Step</b>
<u>STANDARD:</u>	Operator momentarily places 0-HS-82-14 in the STOP position, verifies red light OFF and green light ON above HS.	
<u>STEP 14:</u>	Inform US/SRO of Emergency OR Normal stop of Diesel Generator 1A-A.	___ SAT ___ UNSAT
<u>Cue:</u>	<b>US/SRO instructs operator to return to his/hers normal duties until maintenance requests assistance.</b>	Stop Time___
<u>STANDARD:</u>	Operator informs US/SRO of Emergency stop of Diesel Generator 1A-A.	



# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

## JPM # 34AP

### LOSS OF SECONDARY HEAT SINK

Original Signatures on File

PREPARED/  
REVISED BY: \_\_\_\_\_ Date/ \_\_\_\_\_

VALIDATED BY: \* \_\_\_\_\_ Date/ \_\_\_\_\_

APPROVED BY: \_\_\_\_\_ Date/ \_\_\_\_\_  
(Operations Training Manager)

CONCURRED: \*\* \_\_\_\_\_ Date/ \_\_\_\_\_  
(Operations Representative)

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.

\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

NUCLEAR TRAINING					
REVISION/USAGE LOG					
REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
5	Transfer from WP. Minor enhancements.	N	8/19/94	All	HJ Birch
6	Incorporate Rev B changes. Chgd performance time to 6 min based on validation time.	Y	9/15/95	All	HJ Birch
pen/ink	FR-H.1 Rev chg only	N	1/16/96	4	HJ Birch
pen/ink	FR-H.1 Rev chg which chgd criteria loss of heat sink.	N	5/13/98	4	HJ Birch
pen/ink	FR-H.1 Rev chg only	N	8/22/00	4	SR Taylor
pen/ink	FR-H.1 Rev change only, correct typo	N	11/28/01	4, 6	L. Pauley
7	Incorporated pen/ink changes	N	8/22/02	4,6	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.

JA/TA task #: 3110060601 (RO)  
0100040101 (RO)

E05EK1.2	(3.9/3.5)	E05EK1.3	(3.9/4.1)	E05EK2.1	(2.7/3.9)
E05EK2.2	(3.9/4.2)	E05EK3.1	(3.4/3.8)	E05EK3.2	(3.7/4.1)
E05EK3.3	(4.0/4.1)	E05EA1.1	(4.2/4.0)	E05EA1.2	(3.7/4.0)
E05EA1.3	(3.8/4.2)	E05EA2.1	(3.4/4.4)	E05EA2.2	(3.0/3.3)
194K1.02	(3.0/3.3)				

**Evaluation Method :** Simulator   X   In-Plant       

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## COMMENTS

[illegible]

### **SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Critical steps are identified within the step
2. Sequenced steps identified by an "s"
3. Any UNSAT requires comments
4. Acknowledge any associated alarms.
5. Initialize Simulator in IC: #9. (Use IC 90 if available) Activate **MFs FW07A, B, & C** to inop all AFW pumps
6. Activate **MF ED01**, to initiate a total loss of offsite power.
7. Activate **OVERRIDES ZAOL1343A 20 (and 56, 98, 111)** to hold wide range S/G level indicators at ~20%. **ZAOLR343[1] 20 (and [2], [3], [4])** to hold recorder at 20%.
8. Acknowledge alarms and FREEZE simulator until the operator has been briefed
9. Console operator will role play as CRO and acknowledge/clear alarms as needed.
10. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

**Validation Time:** CR. 6 mins      **Local** \_\_\_\_\_

### **Tools/Equipment/Procedures Needed:**

FR-H.1, steps 5-23.

### **References:**

	Reference	Title	Rev No.
1.	FR-H.1	Response to Loss of Secondary Heat Sink	14

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### **READ TO OPERATOR**

### **Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS:**

1. Unit 1 has experienced a Reactor Trip due to a total loss of offsite power.
2. A "red path" on "Heat Sink Critical Safety Function" has directed the crew to FR-H.1, "Response to Loss of Secondary Heat Sink".
3. All four S/G levels have been decreasing.
4. Flow to the S/Gs can NOT be established.

### **INITIATING CUES:**

1. You are the OATC and the US directs you to reestablish RCS cooling.
2. You are to perform FR-H.1 beginning at step 5 .
3. Inform the US when an RCS cooling method has been established.

<p><u>STEP 1:</u> Obtain copy of the appropriate procedure.</p> <p><u>STANDARD:</u> Operator obtains a copy of FR-H.1</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time___</p>
<p><u>STEP 2:</u> MONITOR heat removal capability: At least two S/G wide range levels greater than 25%. (or Pzr press less than 2335)</p> <p><u>STANDARD:</u> Operator checks LI-3-43, 56, 98 and/or LR-3-43 and determines that 1, 2, and 3 S/Gs are less than 25%.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> STOP RCPs.</p> <p><u>STANDARD:</u> Operator determines RCPs previously stopped.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> GO TO Caution prior to Step 16.</p> <p><u>STANDARD:</u> Operator goes to Caution prior to Step 16.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> ACTUATE SI.</p> <p><u>STANDARD:</u> Operator actuates the SI from HS-63-133B on M-4 OR HS-63-133A on M-6</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 6:</u> VERIFY RCS feed path: CHECK at least one CCP <b>OR</b> SI pump running.</p> <p><u>STANDARD:</u> Operator ensures at least one CCP as indicated by red light LIT on HS-62 108A or 104A (and amps indicated on EI-62-108A or 104A) <b>OR</b> at least one SI pump is running as indicated by red light LIT HS-63-10 or 15 (and amps indicated on EI-63-12 &amp; 16). (not critical items)</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><b>STEP 7:</b> CHECK ECCS valves ALIGNED as appropriate: REFER TO EA-63-5, ECCS Injection Mode Alignment. REFER TO ES-1.3, Transfer to RHR Cntmt Sump. REFER TO ES-1.4, Transfer to Hot Leg Recirc.</p> <p><b>Cue:</b> <i>The CRO has verified ECCS valve alignment.</i></p> <p><b>STANDARD:</b> Operator identifies alignment should be verified via EA-63-5.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>NOTE:</b> The next steps ESTABLISH RCS Bleed path</p> <p><b>STEP 8:</b> CHECK power to pressurizer PORV block valves AVAILABLE and block valves OPEN.</p> <p><b>STANDARD:</b> Operator verifies power is on Block Valves FCV-68-332 and FCV-68-333 and that both Block Valves OPEN as indicated by red lights ON</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 9:</b> OPEN pressurizer PORVs.</p> <p><b>STANDARD:</b> Operator ensures BOTH PZR PORVs FCV-68-340 &amp; 334 OPEN by placing HS-68-340A &amp; 334A in the open position and verifies red lights ON.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 10:</b> CHECK RCS bleed path ADEQUATE: Pzr PORVs OPEN Pzr PORV block valves OPEN</p> <p><b>STANDARD:</b> Operator verifies the actions of the previous steps were completed.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>NOTE:</b> The following 2 steps may not be performed. The task has been met at this point.</p> <p><b>STEP 11:</b> Perform Steps 1 through 12 of E-0, WHILE continuing with this procedure.</p> <p><b>Cue:</b> <i>The CRO will perform E-0 1st 12 steps.</i></p> <p><b>STANDARD:</b> Operator notifies the US/SRO of the need to perform steps 1 thru 12 of E-0 while he/she continues with FR-H.1.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

<p><u>STEP 12:</u>      MAINTAIN RCS heat removal:</p> <p><u>STANDARD:</u>    Operator verifies flow thru the CCPIT on FI-63-170 and Pressurizer PORVs OPEN.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13:</u>      Inform the US/SRO when feed and bleed of the RCS has been established.</p> <p><u>STANDARD:</u>    Operator informs the US/SRO when feed and bleed of the RCS has been established.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Stop Time___</p>

**End of JPM**

**SEQUOYAH NUCLEAR PLANT  
JOB PERFORMANCE MEASURE**

**JPM # 21**

**Respond to a Failure of PRM N-41**

Original Signatures on File

PREPARED/ REVISED BY:	_____	Date/	_____
VALIDATED BY:	* _____	Date/	_____
APPROVED BY:	_____	Date/	_____
	(Operations Training Manager)		
CONCURRED:	** _____	Date/	_____
	(Operations Representative)		

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.  
\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).



NUCLEAR TRAINING					
REVISION/USAGE LOG					
REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
7	Transfer from WP. Minor enhancements.	N	8/94	All	HJ Birch
8	Incorporate pen/ink chg which made cue to "cmplt AOI". Also chgd JPM due to AOP upgrade. Changed initiating cues to monitor board. Malf not already in. Chgd performance time based on validation.	Y	11/3/95	All	HJ Birch
pen/ink	AOP Rev chg	N	7/16/97	4	HJ Birch
pen/ink	AOP Rev chg	N	2/2/98	4	HJ Birch
pen/ink	AOP revision change had no impact. Revised K/A ratings. Reformatted critical steps.	N	10/16/98	All	JP Kearney
pen/ink	AOP Rev chg only	N	8/29/00	4	SR Taylor
pen/ink	pen/ink	N	2/5/01	2, 4	GS Poteet
pen/ink	Step 5 chgd defeat light from off to on and added step to notify Rx Eng, added use of ARP	N	11/27/01	5, 7	L. Pauley
9	Incorporated pen/ink changes	N	8/22/02	All	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.

JA/TA task #: 3210140401 (RO) 0150050101 (RO) 0150040101 (RO)

015A4.03 (3.8/3.9)	015A4.02 (3.9/3.6)
015A2.01 (3.5/3.9)	015A3.03 (3.9/3.9)
015A4.01 (3.6/3.6)	

**Standard:** Recognize failure of Power Range Monitor, N-41, defeat its control functions, and prepare for its removal from service.

**Evaluation Method :** Simulator   X   In-Plant       

Performer: \_\_\_\_\_  
NAME

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

**Performance Rating :** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ Performance Time \_\_\_\_\_

Finish Time \_\_\_\_\_

Evaluator: \_\_\_\_\_ / \_\_\_\_\_  
SIGNATURE DATE

## COMMENTS

**SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s".
2. Any UNSAT requires comments.
3. Acknowledge any associated alarms.
4. Initialize simulator in IC #8.
5. Place one NR45 selector switch to the N-41 (P-1) position.
6. Approximately 1 minute after operator assumes shift, Activate **MF # NI07A @ 0%**.
7. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

**Validation Time:** CR. 8 mins Local \_\_\_\_\_

**Tools/Equipment/Procedures Needed:**

AOP-I.01, Section 2.0 & 2.3, AR-M6-A

**References:**

	Reference	Title	Rev No.
1.	AOP-I.01	Nuclear Instrument Malfunction	4
2.	1-AR-M6-A	Reactor Protection and Safeguards	12

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**READ TO OPERATOR**

**Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

**INITIAL CONDITIONS:**

Unit 1 is operating at 57% reactor power, all controls are in AUTOMATIC.

**INITIATING CUES:**

1. You are the OATC and are to monitor the control board and respond per licensed duties to operating conditions.
2. Your US is currently assisting in tagging unit 1 125V spare charger .
3. You will be required to respond, as a reader/doer, to any abnormality that occurs.
4. When any required actions/procedures have been completed notify the SM.

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 1:</u> Respond to alarm on XA-M6-A window B-1 AND: IF no reactor trip, PLACE rod control in Man. Checks for dropped rod (rod bottom lights LIT or RPIs on bottom. Checks 1-XX-55-5 trip status panel for tripped bistables.</p> <p><b>Examiner Note: Operator may use M4-B3 or E3 in lieu of M6-B1</b></p> <p><u>STANDARD:</u> Operator responds to alarm, places rod control in Man, checks for dropped rods, checks bistable trip status and GOTO AOP-I.01.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time___</p>
<p><u>STEP 2:</u> Obtains a copy of AOP-I.01 and determines the appropriate section.</p> <p><b>Cue:</b> <i>SM will evaluate Tech Specs.</i></p> <p><u>STANDARD:</u> Operator obtains a copy of AOP-I.01 and determines appropriate section to be 2.3</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> Place rod control in Man.</p> <p><b>NOTE:</b> The rods may have been placed in manual in Step 1.</p> <p><u>STANDARD:</u> Operator place HS-85-5110 to manual.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> STABILIZE reactor power at current level.</p> <p><u>STANDARD:</u> Operator checks other power range instruments and determines that reactor is stable.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 5:</u> PLACE "UPPER SECTION" switch to failed detector, panel M-13 (Upper Detector current comparator defeat switch).(XX-92-5037)</p> <p><u>STANDARD:</u> Detector Current comparator "Upper Section" switch in the PRN-41 position. Channel defeat light on.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<u>STEP 6:</u>	PLACE "LOWER SECTION" switch to failed detector, panel M-13 (Lower detector current comparator defeat switch). (XX-92-5037)	___ SAT ___ UNSAT
	<u>STANDARD:</u> Detector Current comparator "Lower Section" switch in the PRN-41 position. Channel defeat light on.	<b>Critical Step</b>
<u>STEP 7:</u>	PLACE ROD STOP BYPASS switch to failed detector, panel M-13 (C-2 interlock defeat switch) (XX-92-5037)	___ SAT ___ UNSAT
	<u>STANDARD:</u> Rod Stop Bypass switch in "BYPASS PRN-41" position.	<b>Critical Step</b>
<u>STEP 8:</u>	PLACE Power Mismatch Bypass switch to failed detector, Panel M-13 (automatic rod control input defeat switch) (XX-92-5037)	___ SAT ___ UNSAT
	<u>STANDARD:</u> Power Mismatch Bypass switch in the "Bypass PRN-41" position.	<b>Critical Step</b>
<u>STEP 9:</u>	DEFEAT failed Power Range channel Using Comparator Channel defeat switch, Panel M-13 (Comparator and Rate Drawer) (XX-92-5041)	___ SAT ___ UNSAT
	<u>STANDARD:</u> Comparator Channel Defeat switch in the N-41 position. Comparator defeat light on.	<b>Critical Step</b>
<u>STEP 10:</u>	RESTORE T-avg to T-ref.	___ SAT ___ UNSAT
	<u>STANDARD:</u> Operator compares T-avg to T-ref at TR-68-2B verifies <u>NO</u> difference (< 1.5°F).	
<u>STEP 11:</u>	ENSURE Nuclear Power Recorder, NR-45, to operable channel.	___ SAT ___ UNSAT
	<u>STANDARD:</u> Operator checks position of Hand Switches, 1-HS-92-5009 and 1-HS-5010. Ensures neither of these is selected for N-41 (P-1).	

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 12:</u> ENSURE RCS Temp <math>\Delta T</math> recorder, XS-68-2B, to operable channel.</p> <p><u>STANDARD:</u> Operator checks position of XS-68-2B. Ensures it is <u>NOT</u> selected for LOOP ONE.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13:</u> RETURN rod control to AUTO if desired.</p> <p><u>Cue:</u> <b><i>SM would like the rods placed back in AUTO.</i></b></p> <p><u>STANDARD:</u> Operator places HS-85-5110 to AUTO.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14:</u> CHECK reactor power greater than 75%.</p> <p><u>STANDARD:</u> Operator verifies power less than 75% (current power is ~ 57%), goes to RNO and to appropriate step.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 15:</u> NOTIFY Reactor Engineering to perform 0-SI-NUC-000-011.0, Moveable Detector Determination of Quadrant Power Tilt Ratio.</p> <p><u>Cue:</u> <b><i>The SM will notify Reactor Engineering.</i></b></p> <p><u>STANDARD:</u> The step is N/A due to plant power level.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 16:</u> NOTIFY IM to remove failed power range channel from service using Appendix "A" of AOP-I.01.</p> <p><u>Cue:</u> <b><i>Role play as MSS or IM, inform operator that a crew will be to the MCR within the hour to perform Appendix "A" of AOP-I.01.</i></b></p> <p><u>STANDARD:</u> Operator communicates with IMs or MSS to request performance of Appendix "A" of AOP-I.01 for removal of N-41 from service.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 17:</u>      Notify SM that N-41 failed, its control functions have been defeated, Rx Eng and IMs have been notified to remove it from service.</p> <p><u>STANDARD:</u>   SAME.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Stop Time ___</p>

End of JPM

# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

## JPM # 65-1

### Re-establishment of CNTMT Pressure Control Following High Pressure Conditions

Original Signatures on File

PREPARED/  
REVISED BY:

Date/

VALIDATED BY:

\*

Date/

APPROVED BY:

Date/

(Operations Training Manager)

CONCURRED:

\*\*

Date/

(Operations Representative)

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.

\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).



NUCLEAR TRAINING REVISION/USAGE LOG					
REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
0					

V - Specify if the JPM change will require another Validation (Y or N).

See cover sheet for criteria.

## SEQUOYAH NUCLEAR PLANT

**RO/SRO  
JOB PERFORMANCE MEASURE**

### Task:

### Re-establishment of CNTMT Pressure Control Following High Pressure Condition

**JATA task #: 00601801 (RO)**

**K/A Ratings:**

103A1.01 (3.7/4.1)	103A4.01 (3.2/3.3)	2.1.31 (4.2/3.9)
103A4.09 (3.1/3.7)	2.1.20 (4.3/4.2)	

**Task Standard:**

**Standard:**  
Vent the containment pressure down to normal range (within -0.1 to +0.3 psig) and then place the containment automatic Pressure Control System in service.

**Evaluation Method :** Simulator   X   In-Plant       

\_\_\_\_\_

**Performer:** \_\_\_\_\_  
NAME

Start time \_\_\_\_\_

**Performance Rating :** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ Performance Time \_\_\_\_\_

Finish time \_\_\_\_\_

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

SIGNATURE

DATE

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## COMMENTS

*[The page contains faint horizontal lines, suggesting it was part of a lined notebook or document.]*

**SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s"
2. Any **UNSAT** requires comments
3. Acknowledge any associated alarms.
4. Initialize Simulator in IC #91 or IC: #10 with steps 5,6 below.
5. **IMF CH01A, CH01B, CH01C, CH01D** at 15, to fail the containment pressure indicators at ~ 1.4 psid. **IOR ZAOPDIR30133 .5** to put PDIR-30-133 upscale. **IOR ZAOPDI30133 4.5** to put PDI-30-133 near top scale.
6. **CLOSE FCV-30-46, 47, 48** and **FREEZE** simulator until turnover completed.
7. **Note: A console operator will be needed for JPM step 21.**
8. View Cntmt Ventilation diagram to see when FCV-30-54 is open. When the operator begins venting containment **delete malfunctions CH01A, B, C, & D** to return cntmt press to normal. **AND Delete overrides** on PDIR-30-133 & PDI-30-133.
9. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

Validation Time: CR 25 min Local                     

**Tools/Equipment/Procedures Needed:**

0-SO-30-8 Sections 3.0, 4.0, 5.1, and 7.2

**References:**

	Reference	Title	Rev No.
A.	0-SO-30-8	Containment Pressure Control	13

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**READ TO OPERATOR****Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

**INITIAL CONDITIONS:**

Unit 1 is in Mode 1 recovering from an Air Line break in containment. The air leak was discovered on a section of the header that allowed isolation without affecting any equipment. During isolation efforts, cntmt pressure increased to approx. 1.5 psid.

**INITIATING CUES:**

1. The US directs you, the Unit 1 CRO, to vent containment per Section 5.2 of 0-SO-30-8 using the normal flow path to within normal operating limits.
2. Inform the US when Containment has been vented.

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<b>STEP 1:</b>	<p>OBTAIN the appropriate procedure</p> <p><b>STANDARD:</b> Operator obtains a copy of 0-SO-30-8, starting with Section 5.2.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time ___</p>
<b>STEP 2:</b>	<p>ENSURE power checklist complete for the appropriate unit.</p> <p><b>Cue:</b> <i>Power checklist 1-30-8.02 is complete with NO deviations.</i></p> <p><b>STANDARD:</b> Operator checks configuration log to ensure power checklist 1-30-8.02 is complete.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<b>STEP 3:</b>	<p>ENSURE that the check valve portion of the containment vacuum relief assembly is capable of closing by observing monitor lights on panel XX-55-9C (panel M-9).</p> <p><b>STANDARD:</b> Operator checks XX-55-9C to ensure valves are closed, green lights ON.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<b>STEP 4:</b>	<p>NOTIFY the US/SRO that the EAM will be placed in the Adverse Cntmt condition for venting containment and EVALUATE LCO 3.6.6.</p> <p><b>Cue:</b> <i>Play role of SRO, State you will evaluate the LCO.</i></p> <p><b>STANDARD:</b> Operator informs the US/SRO that the EAM will be placed in the Adverse Cntmt condition for venting containment and addresses LCO 3.6.6.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<b>STEP 5:</b>	<p>IF the EAM is not in the Adverse Cntmt condition, THEN: PLACE the EAM in the Adverse Cntmt condition by depressing the ACTUATE button in each rack as follows.</p> <p><b>STANDARD:</b> Operator recognizes that the EAMs are in the Adverse Cntmt condition (verifies the blue lights are ON above the NR S/G level indicators, and verifies XA-55-3C window 30 illuminated) and N/As this step.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

## Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 6.:</b>      VERIFY Radiochemical Laboratory has a current weekly performance of 0-SI-CEM-030-410.1.</p> <p><b>Cu1:</b>      <i>SI-410.1 has been completed and signed by the SRO and Rad Chem Supervisor.</i></p> <p><b>STANDARD:</b> Operator verifies SI-410.1 and approved by SRO and Radiochemical Laboratory Supervisor approval.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 7.:</b>      IF the noble gas count rate for the lower containment radiation monitor has increased by more than 50% since the last sample time, THEN TRANSMIT the release permit to the Chem Lab to obtain another (noble gas and tritium) set of samples.</p> <p><b>Cu3:</b>      <i>SI-410.1 sample data shows RM-90-106 indicates Gas = 4.0 E3</i></p> <p><b>STANDARD:</b> Operator looks at RM-90-106 and determines that conditions have not changed by 50% and N/As this step.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 8.:</b>      ENSURE that the Shield Building Annulus Vacuum Control System is in service and maintaining a negative 5.0 inches of H<sub>2</sub>O as indicated on M-9 PDI-30-126 or PDI-30-127 OR EGTS in service OR EGTS testing in progress.</p> <p><b>STANDARD:</b> Operator obtains reading from PDI-30-126 or 127 on panel M-9, OR if EGTS is in service verifies filter bank ΔP is between 1 and 7 inches water.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 9.:</b>      VERIFY no abnormal or unexplainable radiation levels exist inside containment.</p> <p><b>STANDARD:</b> Operator checks RM-90-106 and 112 for abnormal radiation levels in containment.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 10.:</b>      VERIFY that no containment vent isolation signal exists.</p> <p><b>STANDARD:</b> Operator checks XA-55-6C windows C5 &amp; C6 to verify that a cntmt vent isolation signal is not present.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

## Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 11.:</b>      <b>ENSURE</b> at least ONE of the following radiation monitors in service for the appropriate unit:</p> <ul style="list-style-type: none"> <li>• U-1 Containment                      1-RM-90-130</li> <li>• Purge Exhaust Monitors            1-RM-90-131</li> <li>• U-2 Containment                      2-RM-90-130</li> <li>• Purge Exhaust Monitors            2-RM-90-131</li> </ul> <p><b>STANDARD:</b> Operator verifies the RM-90-130 or 131 is in service.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 12.:</b>      <b>VERIFY</b> that all personnel have been evacuated from the annulus and that all doors are closed.</p> <p><b>Cue:</b>            <i>Role play as NSS or Rad Con and verify all personnel are out of the annulus and the doors are closed.</i></p> <p><b>STANDARD:</b> Operator calls Nuclear Security or Rad Con and verifies that all personnel have been evacuated from the annulus and that all doors are closed.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 13.:</b>      <b>ENSURE</b> at least one of the following radiation monitors in service for the appropriate unit:</p> <p><i>AB Vent:</i>                                <i>0-RM-90-101B</i></p> <p><i>Upper Compartment:</i>                <i>1-RM-90-112 A, B</i>        <i>2-RM-90-112 A, B</i></p> <p><i>Lower compartment:</i>                 <i>1-RM-90-106 A, B</i>        <i>2-RM-90-106 A, B</i></p> <p><b>STANDARD:</b> Operator verifies the absence of applicable instrument malfunction alarms on 0-M-12 and block switch for RM-90-101 is in the off position.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 14.:</b>      <b>LOG</b> time in 1-SI-OPS-030-286.0</p> <p><b>Cue:</b>            <i>The CRO will log appropriate data</i></p> <p><b>NOTE:</b>          <b>SI-286 is NOT available on the simulator, it will be sufficient for the operator to address logging of the time in the SI.</b></p> <p><b>STANDARD:</b> Operator logs time in SI-286.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 15.:</b> IF aligning the lower compartment purge isolation valves using the <u>NORMAL</u> flow path THEN PERFORM steps [a] thru [f].</p> <p><b>NOTE:</b> This step will be satisfied in steps 16 thru 19.</p> <p><b>STANDARD:</b> None</p>	
<p><b>STEP 16.:</b> ENSURE FCV-30-37 is CLOSED.</p> <p><b>STANDARD:</b> Operator verifies green light ON for FCV-30-37</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 17.:</b> ENSURE FCV-30-40 is CLOSED.</p> <p><b>STANDARD:</b> Operator verifies green light ON for FCV-30-40</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 18.:</b> OPEN FCV-30-14 &amp; 56 with HS-30-14 and VERIFY FCV-30-14 &amp; 56 OPEN</p> <p><b>STANDARD:</b> Operator places HS-30-14 in the OPEN position and verifies red lights ON FCV-30-14 &amp; 56 indicator lights and places HS-30-14 in the A-AUTO position.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 19.:</b> OPEN FCV-30-15 &amp; 57 with HS-30-15 and VERIFY FCV-30-15 &amp; 57 OPEN.</p> <p><b>STANDARD:</b> Operator places HS-30-15 in the OPEN position and verifies red lights ON indicating lights for FCV-30-15 &amp; 57 and places HS-30-15 in the A-AUTO position.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 20.:</b> IF aligning the lower compartment purge isolation valves using the <u>Alternate</u> flow path THEN PERFORM steps [a] thru [h].</p> <p><b>STANDARD:</b> Operator should NA this step since the NORMAL flow path is being used.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

## Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 21:</b> OPEN Annulus exhaust isolation valve FCV-30-54 with HS-30-54.</p> <p><b>NOTE:</b> View Contmt Ventilation diagram to see when FCV-30-54 is open. When operator opens FCV-30-54 delete malfunctions CH01A, B, C, &amp; D AND delete override ZAOPDIR30133. and ZAOPDI30133 (These can be deleted by clearing MALF &amp; OVRD tables)</p> <p><b>STANDARD:</b> Operator opens FCV-30-54 with HS-30-54. Verifies valve open by observing red light ON.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 22:</b> IF the Annulus Vacuum Control System is in service and the standby Annulus Vacuum Control Fan is available, THEN START the standby Annulus Vacuum Control Fan.</p> <p><b>STANDARD:</b> Operator starts the standby Annulus Vacuum Control Fan</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 23:</b> IF a high radiation alarm occurs on any of the following Radiation monitors, THEN</p> <p><b>CUE:</b> <i>Radiation levels remain normal during venting operation</i></p> <p><b>STANDARD:</b> Operator addresses step and potential for action required if radiation levels increase.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 24:</b> WHEN containment vent is completed, THEN perform [Section 7.2].</p> <p><b>Cue:</b> <i>After Booth operator deletes failures above, Inform operator that containment venting is complete</i></p> <p><b>NOTE:</b> JPM steps 25 through 31 will satisfy section 7.2 of procedure.</p> <p><b>STANDARD:</b> Operator monitors containment pressure by observing Pdl-30-133. When pressure differential within -0.1 and +0.3 psig, then go to Section 7.2.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>



# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

## JPM # 14

### Control Room Inaccessibility (Fire in the Spreader Room)

Original Signatures on File

PREPARED/ REVISED BY:	_____	Date/	_____
VALIDATED BY:	*	Date/	_____
APPROVED BY:	_____		Date/
	(Operations Training Manager)		
CONCURRED:	**	Date/	_____
	(Operations Representative)		

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.

\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

**NUCLEAR TRAINING**  
**REVISION/USAGE LOG**

REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
0	New	Y	8/19/02	All	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.



### **SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s"
2. Any **UNSAT** requires comments
3. Initialize in IC # 10 with all controls aligned normally.
4. **FREEZE** the simulator until the operator has been briefed.
5. **Provide an additional board operator as CRO to handle the actions of ES-0.1 while the OATC addresses the actions of AOP-C.04.**
6. Ensure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

**Validation Time: CR.**    18 mins    **Local** \_\_\_\_\_

**Tools/Equipment/Procedures Needed:**  
AOP-C.04, Section 2.0 & 2.1.

### **References:**

	Reference	Title	Rev No.
A.	AOP-C.04	Control Room Inaccessibility	5

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### **READ TO OPERATOR**

### **Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

### **INITIAL CONDITIONS:**

Unit 1 is at 100% power.  
A fire is in progress in the Control Building spreading room. The SM has declared an Appendix R fire and has decided to abandon the control room.

### **INITIATING CUES:**

You are the Unit 1 OATC and are to perform the required actions of AOP-C.04 to abandon the main control room.  
Inform the US when you are prepared to leave the main control room.

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 1.:</u> Obtains a copy of the appropriate procedure.</p> <p><u>STANDARD:</u> Operator obtains AOP-C.04, Section 2.0 and determines that section 2.1 will be required to address abandoning the control room.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time___</p>
<p><u>STEP 2.:</u> ENSURE reactor tripped.</p> <p><u>STANDARD:</u> Operator TRIPS the Reactor and VERIFIES reactor tripped.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 3.:</u> ENSURE MSIV and MSIV bypass valve handswitches in CLOSE.</p> <p><u>STANDARD:</u> After the reactor is tripped, the operator places (4) HSs for MSIV in the closed position and verifies Red light OFF and Green and Blue light ON.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 4.:</u> IF abandoning MCR due to Appendix R fire, THEN ALIGN the following switches: •PLACE one CCP in STOP/PULL TO LOCK.</p> <p><u>Cue:</u> <b><i>SM has declared an Appendix R fire in the spreading room.</i></b></p> <p><u>STANDARD:</u> The operator places HS for the 1A CCP in Stop/PTL.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 5.:</u> IF abandoning MCR due to Appendix R fire, THEN ALIGN the following switches: •PLACE pressurizer PORV handswitches in CLOSE position.</p> <p><u>STANDARD:</u> The operator places pressurizer PORV handswitches in CLOSE position.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><u>STEP 6.:</u> IF abandoning MCR due to Appendix R fire, THEN ALIGN the following switches: •PLACE pzs spray controllers in MANUAL and ADJUST output to zero.</p> <p><u>STANDARD:</u> The operator places pzs spray controllers in MANUAL and adjusts output to zero.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 7.:</b> IF abandoning MCR due to Appendix R fire, THEN ALIGN the following switches:            •PLACE S/G atmospheric relief valve handswitches in CLOSE position..</p> <p><b>STANDARD:</b> The operator places S/G atmospheric relief valve handswitches in CLOSE position.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 8.:</b> IF abandoning MCR due to Appendix R fire, THEN ALIGN the following switches:            •PLACE S/G atmospheric relief valve controllers in MANUAL and ADJUST output to zero.</p> <p><b>STANDARD:</b> The operator places S/G atmospheric relief valve controllers in MANUAL and adjusts output to zero.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 9.:</b> PLACE RCP handswitches in STOP/PULL TO LOCK</p> <p><b>STANDARD:</b> The operator places RCP handswitches in STOP/PULL TO LOCK.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 10.:</b> PLACE TD AFW LCV handswitches in CLOSE/PULL-TO-LOCK.</p> <p><b>STANDARD:</b> The operator places TD AFW LCV handswitches in STOP/PULL TO LOCK.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 11.:</b> <b>ENSURE</b> the following handswitches placed in TRIP: [1-M-15]</p> <ul style="list-style-type: none"> <li>• 0-HS-13-204</li> <li>• 0-HS-13-205</li> </ul> <p><b>STANDARD:</b> The operator places handswitches in TRIP.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 12.:</u>      ANNOUNCE "Unit 1 Reactor trip, abandoning the Main Control Room" USING PA System.</p> <p><u>STANDARD:</u>    Operator announces over the P.A. that the unit has been tripped and that the Main Control Room is being abandoned. He should repeat the message a second time.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 13.:</u>      <b>ENSURE</b> the following items are taken to the Auxiliary Control Room when Main Control Room is evacuated:</p> <p>                 flow prints                  radios</p> <p><u>CUE:</u>            <i>Unit 2 operator reported they will take these prints and the radios with them.</i></p> <p><u>STANDARD:</u>    Operator ensures the flow prints and radios are taken to the ACR.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 14.:</u>      EVACUATE Main Control Room.</p> <p><u>CUE:</u>            <i>When Operator reports or starts to leave tell him JPM is complete.</i></p> <p><u>STANDARD:</u>    Operator reports to the US he is ready to abandon the MCR or starts to leave MCR.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Stop Time___</p>

# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

## JPM # 99AP

### Locally Align 1B-B CCS Pump to Supply the B Train Header

Original Signatures on File

PREPARED/ REVISED BY:	_____	Date/	_____
VALIDATED BY:	* _____	Date/	_____
APPROVED BY:	_____	Date/	_____
	(Operations Training Manager)		
CONCURRED:	** _____	Date/	_____
	(Operations Representative)		

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.

\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).



NUCLEAR TRAINING					
REVISION/USAGE LOG					
REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
3	Chgd to AP since one MOV will not operate electrically, must open manually. Incorp previous pen/inks which added cues to step 2,4,5 and chgd performance time based on requal performance	N	8/14/96	All	HJ Birch
pen/ink	0-SO-70-1 Rev chg only	N	8/11/97	4	HJ Birch
	step 2 chg light from green to red in cue per requal feedback.	N	9/22/97	5	HJ Birch
	0-SO-70-1 Rev chg only	N	2/2/98	4	HJ Birch
	Requal comment - No HS in MCR. Chg cue to MOV bd	N	5/13/98	4	HJ Birch
pen/ink	SO-70-1 revision had no impact. Revised K/A ratings. Reformatted critical steps.	N	9/25/98	All	JP Kearney
pen/ink	SO-70-1 revision update only	N	10/16/98	4	JP Kearney
pen/ink	SO-70-1 revision update only	N	9/21/99	4	SR Taylor
pen/ink	SO-70-1 revision update only	N	8/29/00	4	SR Taylor
pen/ink	SO-70-1 rev. Update	N	12/4/01	4	L. Pauley
4	Incorporated pen/ink changes; revised to recent revision of 0-SO-70-1; no impact on JPM flow	N	8/21/02	ALL	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.

**SEQUOYAH NUCLEAR PLANT  
AUO/RO/SRO  
JOB PERFORMANCE MEASURE**

### Task:

### Locally Align 1B-B CCS Pump to Supply the B Train Header

JA/TA TASK #:0080060101 (RO)  
0080010104 (AUO)

**K/A Ratings:**

008A2.01 (3.3/3.6)  
008A4.01 (3.3/3.1)  
008A4.06 (2.5/2.5)

**Task Standard:**

**Perform local (manual) alignment of the 1B-B pump to supply the B train CCS header.**

**Evaluation Method :** Simulator \_\_\_\_\_ In-Plant  X

**Performer:** \_\_\_\_\_  
NAME

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

**Performance Rating :** SAT \_\_\_\_\_ UNSAT \_\_\_\_\_ Performance Time \_\_\_\_\_

Finish Time \_\_\_\_\_

**Evaluator:** \_\_\_\_\_ / \_\_\_\_\_  
SIGNATURE DATE

### COMMENTS

**SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s"
2. Any **UNSAT** requires comments
3. Insure operator performs the following required actions for **SELF-CHECKING**:
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

Validation Time: CR. \_\_\_\_\_

Local 13 mins**Tools/Equipment/Procedures Needed:**

0-SO-70-1 Section 8.3, step 5c ("Initial" steps that had been completed)

**References:**

	Reference	Title	Rev No.
1.	0-SO-70-1	Component Cooling Water System B Train	23

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**READ TO OPERATOR****Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All steps shall be simulated for this JPM. I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

**INITIAL CONDITIONS:**

1. Both units are operating at full power.
2. The C-S CCS pump tripped on over current, WCG has been notified to initiate maintenance. LCO 3.7.3 was entered, parts are being delivered, 3 hours remain in the LCO.
3. The 1A-A CCS pump is in service through the A train CCS HXs.
4. The 1 B-B CCS pump is aligned for standby but the control switches have been placed in the PULL TO LOCK position.
5. The U2 CRO has verified that U2 is supplying the SFP HXs.
6. Section 8.3 steps 5a and 5b of 0-SO-70-1 have been completed.
7. Power has been aligned to the Appendix R valves.

**INITIATING CUES:**

1. You are the U1 Aux. Bldg. AUO, the U2 CRO has directed you to complete alignment of the 1 B-B CCS pump to supply the B train header per 0-SO-70-1, Section 8.3 step 5c.
2. Complete all valve alignments at the local control stations.
3. When you have completed the alignment of the 1B-B CCS pump, inform the U2 CRO.

## Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<b>STEP 1:</b>	Operator obtains a copy of the procedure.	___ SAT
<b>STANDARD:</b>	Operator obtains a copy of O-SO-70-1, to perform Sections 8.3, step 5c	___ UNSAT Start Time _____
<b>STEP 2:</b>	CLOSE O-FCV-70-34 1A-A and 1 B-B suction crosstie.	___ SAT
<b>NOTE:</b>	Valve is located on the mezzanine above the CCS pumps directly in front and to left of the access ladder.	___ UNSAT
<b>Cue:</b>	<i>If operator goes to the MOV Bd OR the local control switch to operate the valve, state: RED light only (local: No movement in valve)</i>	Critical Step
<b>Cue:</b>	<i>HW turned several times in the CW direction and is now snug, position indicator is pointing at CLOSED.</i>	
<b>STANDARD:</b>	Operator locates O-FCV-70-34, engages manual operation lever, turns HW in CW direction until snug and verifies position indicator pointing at CLOSED.	
<b>STEP 3:</b>	CLOSE 1-70-507 1A-A and 1 B-B discharge crosstie.	___ SAT
<b>NOTE:</b>	Valve is located on the 2nd level of the mezzanine above the CCS pumps approx. 10 ft to the right of the ladder.	___ UNSAT
<b>Cue:</b>	<i>HW turned several times in the CW direction and is now snug. Pointer is pointing to CLOSED position.</i>	Critical Step
<b>STANDARD:</b>	Operator locates 1-70-507 turns HW in CW direction until snug.	
<b>STEP 4:</b>	Open 1-FCV-70-64, Suction Header Isol Between CCS Pumps 1B-B and C-S.	___ SAT
<b>Cue:</b>	<i>Green light goes out, Red light comes on.</i>	___ UNSAT
<b>STANDARD:</b>	Operator locates 1-FCV-70-64 switch on local control station and goes to the open position. Closed (green light) goes out and Open (red light) comes on.	Critical Step

## Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<b>STEP 5:</b> Open 1-FCV-70-74, Suction Header Isol Between CCS Pumps 1B-B and C-S.  <b>Cue:</b> <i>Green light goes out, Red light comes on.</i>  <b>STANDARD:</b> Operator locates 1-FCV-70-74 switch on local control station and goes to the open position. Closed (green light) goes out and Open (red light) comes on.		___ SAT
		___ UNSAT
		<b>Critical Step</b>
<b>STEP 6:</b> Open 1-FCV-70-26, CCS Pumps 1A-A and 1B-B Discharge Crosstie to C-S Outlet Isol.  <b>Cue:</b> <i>Green light goes out, Red light comes on.</i>  <b>STANDARD:</b> Operator locates 1-FCV-70-26 switch on local control station and goes to the open position. Closed (green light) goes out and Open (red light) comes on.		___ SAT
		___ UNSAT
		<b>Critical Step</b>
<b>STEP 7:</b> Open 1-FCV-70-27, CCS Pumps 1A-A and 1B-B Discharge Crosstie to C-S Outlet Isol.  <b>Cue:</b> <i>Green light goes out, Red light comes on.</i>  <b>STANDARD:</b> Operator locates 1-FCV-70-27 switch on local control station and goes to the open position. Closed (green light) goes out and Open (red light) comes on.		___ SAT
		___ UNSAT
		<b>Critical Step</b>
<b>STEP 8</b> VERIFY open 1-70-503B, CCS Pump 1B-B suction.  <b>Cue:</b> <i>Handwheel moves CW, but will not move CCW, Indicator points to open.</i>  <b>STANDARD:</b> Operator locates 1-70-503B and verifies valve open by no movement of handwheel in CCW direction.		___ SAT
		___ UNSAT

## Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<b>STEP 9:</b>	VERIFY open 1-70-505B, CCS Pump 1B-B discharge.	___ SAT
<b>Cue:</b>	<i>Handwheel moves CW, but will not move CCW, Indicator points to open.</i>	___ UNSAT
<b>STANDARD:</b>	Operator locates 1-70-505B and verifies valve open by no movement of chain operated handwheel in CCW direction and pointer indication open.	
<b>STEP 10:</b>	Inform the U2 CRO that the 1B-B CCS pump is aligned to supply the B train CCS header.	___ SAT
<b>STANDARD:</b>	Operator informs the U2 CRO that the 1B-B CCS pump is aligned to supply the B train CCS header.	___ UNSAT
		Stop Time___

**SEQUOYAH NUCLEAR PLANT  
JOB PERFORMANCE MEASURE**

**JPM # 42**

**Placing Vital Inverter 1-II  
Back in Service Following Maintenance**

Original Signatures on File

<b>PREPARED/ REVISED BY:</b>	_____	Date/
<b>VALIDATED BY:</b>	* _____	Date/
<b>APPROVED BY:</b>	_____	Date/
	(Operations Training Manager)	
<b>CONCURRED:</b>	** _____	Date/
	(Operations Representative)	

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.  
\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

**NUCLEAR TRAINING**  
**REVISION/USAGE LOG**

REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
11	Revised to rev 23 of 0-SO-250-2 which utilizes the Spare inverter 0-II as operable replacement for 1-II or 2-II Inverters	Y	08/07/01	ALL	WR Ramsey
pen/ink	0-SO-250-2 Rev 24 update only	N	8/21/01	4	WR Ramsey
12	Revised based on changes to 0-SO-250-2	Y	9/4/02	All	J P Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.





**SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s"
2. Any **UNSAT** requires comments
3. **SM approval will be required to enter the "Trip Hazard Zone" in the Vital Battery Rm and Vital Inverter area.**
4. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

**Validation Time: CR.** \_\_\_\_\_

**Local** 55 minutes

**Tools/Equipment/Procedures Needed:**

0-SO-250-2, Section 8.10

**References:**

	Reference	Title	Rev No.
1.	0-SO-250-2	120V AC Vital Instrument Power System	35

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**READ TO OPERATOR**

**Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All steps **shall be simulated** for this JPM. **WHEN ENTERING A UNIT TRIP HAZARD ZONE ENSURE YOU DO NOT TOUCH ANY SWITCHES WITHIN THAT ZONE.** I will provide initiating cues and indicate any steps to be discussed. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

**INITIAL CONDITIONS:**

Both units are operating at power (MODE 1) and maintenance on 120V ac Vital Inverter 1-II has been completed.

Inverter "1-II" is currently shutdown and out of service with its respective 120V AC Vital Instrument Power Board "1-II" supplied from its alternate supply, Inverter 0-II, in accordance with 0-SO-250-2.

**INITIATING CUES:**

1. Maintenance has cleaned and inspected the 120V AC Vital Inverter "1-II"
2. The Unit 1 SRO has directed you, the Control Room AUO to return the 120V AC Vital Inverter "1-II" to service and align it to 120V AC Vital Instrument Board 1-II per 0-SO-250-2 section 8.10.
3. Inform the Unit 1 SRO when 120V AC Vital Instrument Board 1-II has been realigned to its normal supply.

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><u>STEP 1:</u> Obtain copy of the appropriate procedure.</p> <p><u>STANDARD:</u> Operator obtains a copy of SO-250-2 Section 8.10</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Start Time ___</p>
<p><u>NOTE:</u> If operator asks, acknowledge that a Concurrent Verifier would be present during performance of this S.O. (For JPM purposes have him continue as if a CV was present)</p> <p><u>STEP 2:</u> VERIFY 120V AC Vital Instrument Board 1-II is ENERGIZED by observing transfer switch 1-SW-250-NE-E in ALTERNATE position and normal board voltage on 1-EI-250-NE-E.</p> <p><u>Cue:</u> <b>Board voltage is NORMAL and the transfer switch is in the ALTERNATE position. Voltage is 123V AC.</b></p> <p><u>STANDARD:</u> Operator identifies Vital Instrument Board 1-II and verifies board voltage normal and the transfer switch in the ALTERNATE position.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 3:</u> ENSURE 120V AC Vital Inverter 1-II DC supply breaker 1-BKRC-250-KF /326-E on 125V DC Vital Battery Board II is in ON position.</p> <p><u>Cue:</u> <b>Breaker 326 is in the ON ,UP, position.</b></p> <p><u>STANDARD:</u> Operator identifies breaker 326 on 125V Vital Batt Bd II and ensures it is in the ON, UP, position.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><u>STEP 4:</u> ENSURE [0-BCTB-250-DM/9A-B], 120V AC Vital Inverters 1-II &amp; 2-II CLOSED at 480 V SDBD 1B2-B compt. 9A.</p> <p><u>Cue:</u> <b>Breaker is in the closed position.</b></p> <p><u>STANDARD:</u> Operator verifies breaker is closed.</p>	<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<p><b>STEP 5.:</b> IF 1-II Inverter is NOT already in service, THEN ENSURE all breakers on 120V AC Vital Inverter 1-II are OFF</p> <p><b>NOTE</b> Per initiating cues, the inverter is not in service.</p> <p><b>Cue:</b> <i>As each breaker is addressed state "The breaker switch is in the OFF, down position."</i></p> <p><b>STANDARD:</b> Operator identifies each breaker on Vital Inverter 1-II and ensures it is in the OFF, down, position.</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 6.:</b> ENSURE [1-BKRA-250-KS/11-E], 120V AC Vital Inverter 1-II Disconnect Bkr ON at 480V AC Vital Disconnect Panel II, el. 749 Aux Bldg.</p> <p><b>Cue:</b> <i>After operator simulates placing the disconnect breaker in the ON, cue him the breaker is in the ON position</i></p> <p><b>STANDARD:</b> Operator places [1-BKRA-250-KS/11-E] in the ON position.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 7. S:</b> PRESS AND HOLD precharge pushbutton [1-HS-250-QN/S4-E]. Verify PRE-CHARGE light is lit.</p> <p><b>Cue:</b> <i>The pre-charge light is lit.</i></p> <p><b>STANDARD:</b> Operator identifies 1-II Vital Inverter and presses the PRECHARGE pushbutton and verifies pre-charge light is LIT.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 8. S:</b> PLACE BATTERY INPUT breaker [1-BKR-250-QN/B1-E] In ON position.</p> <p><b>NOTE:</b> <b>After the PB is released the capacitors begin to discharge. Waiting more than 5 seconds after the PB is released could cause high charging currents that could blow the Inverter fuses making the Inverter Inop.</b></p> <p><b>Cue:</b> <i>Breaker handle is in the ON, up, position.</i></p> <p><b>STANDARD:</b> Operator places the Battery input circuit breaker on Vital Inverter cabinet 1-II in the ON, up, position.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<p><b>STEP 9. S:</b> RELEASE precharge pushbutton [1-HS-250-QN/S4-E].</p> <p><b>Cue:</b> <i>The pre-charge light is lit.</i></p> <p><b>STANDARD:</b> Operator releases pre-charge button.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 10.:</b> PLACE [1-BKRA-250-QN/B301-E], AC Input To Rectifier Bkr in ON position.</p> <p><b>Cue:</b> <i>Breaker handle is in the ON position.</i></p> <p><b>STANDARD:</b> Operator places the breaker in the ON position.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 11.:</b> ENSURE [1-HS-250-QN/S5-E] Remote sync switch on 1-II Inverter in OFF position.</p> <p><b>Cue:</b> <i>Remote sync switch on 1-II Inverter is in OFF position.</i></p> <p><b>STANDARD:</b> Operator verifies the Remote sync switch on 1-II Inverter in OFF position..</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 12.:</b> ENSURE [1-BKRA-250-QN/B701-E], AC Input To Isolimiter Bkr in ON position.</p> <p><b>Cue:</b> <i>After operator simulates placing [1-BKRA-250-QN/B701-E], AC Input To Isolimiter Bkr in the ON position, cue him/her that it is ON.</i></p> <p><b>STANDARD:</b> Operator places the [1-BKRA-250-QN/B701-E], AC Input To Isolimiter Bkr in ON position</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 13.:</b> ENSURE [1-BKRA-250-QN/B4-E], Bypass Source AC Input Bkr in ON position.</p> <p><b>Cue:</b> <i>After operator simulates [1-BKRA-250-QN/B4-E], Bypass Source AC Input Bkr in the ON position, cue him/her that it is ON.</i></p> <p><b>STANDARD:</b> Operator [1-BKRA-250-QN/B4-E], Bypass Source AC Input Bkr in the ON position.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<p><b>STEP 14.:</b> PLACE [1-BKRA-250-QN/B2-E], Inverter Output Bkr in ON position.</p> <p><b>Cue:</b> <i>After operator simulates [1-BKRA-250-QN/B2-E], Inverter Output Bkr in ON position.the ON position, cue him/her that it is ON.</i></p> <p><b>STANDARD:</b> Operator places [1-BKRA-250-QN/B2-E], Inverter Output Bkr in the ON position.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 15.:</b> ENSURE [1-HS-250-QN/S1-E] Manual Bypass Sw is in the INVERTER TO LOAD position.</p> <p><b>Cue:</b> <i>After operator simulates [1-HS-250-QN/S1-E] Manual Bypass Sw in the INVERTER TO LOAD position, cue him/her that it is in the LOAD position.</i></p> <p><b>STANDARD:</b> Operator places [1-HS-250-QN/S1-E] Manual Bypass Sw in the INVERTER TO LOAD position.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 16.:</b> PRESS [1-HS-250-QN/S201-E], Inverter To Load Pushbutton AND VERIFY "Inverter Supplying Load" light ON and "Bypass Source Supplying Load" light OFF.</p> <p><b>Cue:</b> <i>"Inverter Supplying Load" light ON and "Bypass Source Supplying Load" light OFF</i></p> <p><b>STANDARD:</b> Operator presses [1-HS-250-QN/S201-E], Inverter To Load Pushbutton and verifies "Inverter Supplying Load" light ON and "Bypass Source Supplying Load" light OFF</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 17.:</b> PERFORM the following on Annunciator Pnl 1:</p> <ol style="list-style-type: none"> <li>1. PLACE [1-HS-250-QN/S2-E], AN1 Annunciator Disable Sw in ON.</li> <li>2. PRESS button A (Acknowledge)</li> <li>3. PRESS button R (Reset).</li> </ol> <p><b>Cue:</b> <i>After operator simulates places [1-HS-250-QN/S2-E], AN1 Annunciator Disable Sw in ON, cue him/her that it is in the ON position.</i></p> <p><b>STANDARD:</b> Operator places [1-HS-250-QN/S2-E], AN1 Annunciator Disable Sw ON; presses button A (Acknowledge); and presses button R (Reset).</p>		<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 18.:</b>      PERFORM the following on Annunciator Pnl 2:</p> <ol style="list-style-type: none"> <li>1. PLACE [1-HS-250-QN/S3-E], AN2 Annunciator Disable Sw in ON.</li> <li>2. PRESS button A (Acknowledge).</li> <li>3. PRESS button R (Reset).</li> </ol> <p><b>Cue:</b>            <i>After operator simulates places [1-HS-250-QN/S3-E], AN2 Annunciator Disable Sw in ON, cue him/her that it is in the ON position.</i></p> <p><b>STANDARD:</b>    Operator places [1-HS-250-QN/S3-E], AN2 Annunciator Disable Sw ON; presses button A (Acknowledge); and presses button R (Reset).</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 19.:</b>      ENSURE alarms clear in the MCR (1-XA-55-1C, windows B-6 and B-7)</p> <p><b>Cue:</b>            <i>As the CRO, acknowledge that the alarms are clear.</i></p> <p><b>STANDARD:</b>    Operator calls the MCR to determine the alarms are clear.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 20.:</b>      IF [INVERTER OUTPUT] voltage is &lt; 120.6 volts or &gt; 126.5 volts OR frequency is &lt; 59.4 Hz or &gt; 60.6 Hz, THEN NOTIFY Electrical Maintenance for support.</p> <p><b>Cue:</b>            <i>AC OUTPUT voltage is 121 volts and frequency is 60 Hz.</i></p> <p><b>STANDARD:</b>    Operator checks AC OUTPUT voltage and frequency to ensure within required limits.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 21.:</b>      <b>PLACE [1-HS-250-QN/S5-E],</b> Remote Sync switch on 1-II Vital Inverter to <b>SYNC OUT</b> position.</p> <p><b>Cue:</b>            <i>After operator simulates placing [1-HS-250-QN/S5-E], Remote Sync switch on 1-II Vital Inverter to SYNC OUT position, cue him/her that it is in the SYNC OUT position.</i></p> <p><b>STANDARD:</b>    Operator places [1-HS-250-QN/S5-E], Remote Sync switch on 1-II Vital Inverter to the SYNC OUT position.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 22.:</b> ENSURE [0-HS-250-QW/SW4-E] Remote Sync Input Switch, in UNIT 1 Position.</p> <p><b>Cue:</b> <i>After operator simulates placing [0-HS-250-QW/SW4-E] Remote Sync Input Switch, in the UNIT 1 Position, cue him/her that it is in the Unit 1 position.</i></p> <p><b>STANDARD:</b> Operator places [0-HS-250-QW/SW4-E] Remote Sync Input Switch, in the UNIT 1 Position</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 23.:</b> ENSURE [0-HS-250-QW/SW5-E], Remote Sync Light Switch, in UNIT 1 position.</p> <p><b>Cue:</b> <i>After operator simulates placing [0-HS-250-QW/SW5-E] Remote Sync Input Switch, in the UNIT 1 Position, cue him/her that it is in the Unit 1 position.</i></p> <p><b>STANDARD:</b> Operator places [0-HS-250-QW/SW5-E] Remote Sync Input Switch, in the UNIT 1 Position</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 24.:</b> VERIFY In Sync light LIT on 1-II Inverter..</p> <p><b>Cue:</b> <i>In Sync light LIT</i></p> <p><b>STANDARD:</b> Operator verifies In Sync light LIT.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 25.:</b> VERIFY 120V AC Vital Instrument Power Board 1-II amber [NOR SUPPLY AVAIL] light LIT.</p> <p><b>Cue:</b> <i>120V AC Vital Instrument Power Board 1-II amber [NOR SUPPLY AVAIL] light LIT.</i></p> <p><b>STANDARD:</b> Operator verifies 120V AC Vital Instrument Power Board 1-II amber [NOR SUPPLY AVAIL] light LIT.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 26.:</b> VERIFY 120V AC Vital Instrument Power Board 1-II blue sync light LIT to show Inverter 0-II is in synchronism.</p> <p><b>Cue:</b> <i>120V AC Vital Instrument Power Board 1-II blue sync light LIT.</i></p> <p><b>STANDARD:</b> Operator verifies 120V AC Vital Instrument Power Board 1-II blue sync light LIT.</p>	<p>___ SAT</p> <p>___ UNSAT</p>



Job Performance Checklist:

STEP/STANDARD		SAT/UNSAT
<p><b>STEP 27.:</b> OPERATE 120V AC Vital Instrument Board 1-II Transfer switch 1-SW-250-NE-E to NORMAL position.</p> <p><b>NOTE:</b> Switch must travel 150-180° for breaker to close (This is past the NORMAL position indication).</p> <p><b>Cue:</b> Transfer switch is aligned to the NORMAL (Vertical) position.</p> <p><b>STANDARD:</b> Operator identifies the transfer switch on the 1-II Vital Instrument Power Distribution Board and rotates the switch swiftly to the normal position.</p>		<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 28.:</b> VERIFY 120V AC Vital Instrument Board 1-II voltage remains stable on the voltmeter 1-EI-250-NE-E.</p> <p><b>Cue:</b> Board voltage is stable.</p> <p><b>STANDARD:</b> Operator checks board voltmeter to verify voltage is stable.</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 29.:</b> PLACE [1-HS-250-QN/S5-E], Remote Sync Switch on 1-II Inverter to OFF position</p> <p><b>Cue:</b> After operator simulates placing [1-HS-250-QN/S5-E], Remote Sync Switch on 1-II Inverter to the OFF position, cue him/her that it is in the OFF position.</p> <p><b>STANDARD:</b> Operator places [1-HS-250-QN/S5-E], Remote Sync Switch on 1-II Inverter to OFF position.</p>		<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 30.:</b> ENSURE [0-HS-250-QW/SW4-E] Remote Sync Input Switch, in OFF Position.</p> <p><b>Cue:</b> After operator simulates placing [0-HS-250-QW/SW4-E] Remote Sync Input Switch to the OFF position, cue him/her that it is in the OFF position.</p> <p><b>STANDARD:</b> Operator places [[0-HS-250-QW/SW4-E] Remote Sync Input Switch to OFF position.</p>		<p>___ SAT</p> <p>___ UNSAT</p>

Job Performance Checklist:

STEP/STANDARD	SAT/UNSAT
<p><b>STEP 31.:</b>     <b>ENSURE [0-HS-250-QW/SW5-E]</b>, Remote Sync Light Switch, in <b>OFF</b> position.</p> <p><b>Cue:</b>     <i>After operator simulates placing [0-HS-250-QW/SW5-E] Remote Sync Light Switch to the OFF position, cue him/her that it is in the OFF position.</i></p> <p><b>STANDARD:</b> Operator places <b>[0-HS-250-QW/SW5-E]</b> Remote Sync Light Switch to OFF position.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 32.:</b>     <b>ENSURE [0-HS-250-QW/SW3-E]</b> Remote Alarm Switch in <b>OFF</b>.</p> <p><b>Cue:</b>     <i>After operator simulates placing [0-HS-250-QW/SW3-E] Remote Alarm Switch to the OFF position, cue him/her that it is in the OFF position.</i></p> <p><b>STANDARD:</b> Operator places <b>[0-HS-250-QW/SW4-E]</b> Remote Alarm Switch to OFF position.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 33.:</b>     <b>ENSURE</b> alarms clear in the MCR (1-XA-55-1C, window B-6 and B-7).</p> <p><b>Cue:</b>     <i>As the CRO, acknowledge the alarms are clear.</i></p> <p><b>STANDARD:</b> Operator contacts the main control room to determine alarm light status.</p>	<p>___ SAT</p> <p>___ UNSAT</p>
<p><b>STEP 34.:</b>     Inform the Unit 1 SRO that the 1-II Vital Inverter is back in service and that the 1-II Vital Power Board is back on the NORMAL supply from the 1-II Inverter.</p> <p><b>Cue:</b>     <i>If asked, Vital Inverter 0-II will be removed from service by the on-coming shift.</i></p> <p><b>STANDARD:</b> Operator informs the Unit 1 SRO that the 1-II Vital Inverter is back in service and that the 1-II Vital Power Board is back on the NORMAL supply from the 1-II Inverter. (Only lacks IV)</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Stop Time___</p>

# SEQUOYAH NUCLEAR PLANT JOB PERFORMANCE MEASURE

## JPM 201RAP1

### LOCAL ISOLATION OF CHARGING with LOCAL CONTROL OF SEAL INJECTION FLOW

Original Signatures on File

PREPARED/ REVISED BY:	_____	Date/	_____
VALIDATED BY:	*	Date/	_____
APPROVED BY:	_____		Date/
	(Operations Training Manager)		
CONCURRED:	**	Date/	_____
	(Operations Representative)		

\* Validation not required for minor enhancements, procedure Rev changes that do not affect the JPM, or individual step changes that do not affect the flow of the JPM.

\*\* Operations Concurrence required for new JPMs and changes that affect the flow of the JPM (if not driven by a procedure revision).

**NUCLEAR TRAINING**  
**REVISION/USAGE LOG**

REVISION NUMBER	DESCRIPTION OF REVISION	V	DATE	PAGES AFFECTED	PREPARED/ REVISED BY:
0	New	Y	8/1/2002	All	JP Kearney

V - Specify if the JPM change will require another Validation (Y or N).  
See cover sheet for criteria.

SEQUOYAH NUCLEAR PLANT  
RO/SRO  
JOB PERFORMANCE MEASURE

**Task:** Local Isolation Of Charging With Local Control Of Seal Injection Flow

**JA/TA task #:** 3010070401(RO)      3010070402(SRO)

**K/A Ratings:**    2.4.27 (3.0/3.5)      2.1.30 (3.9/3.4)      067AA2.16 (3.3/4.0)  
                         067AK3.04 (3.3/4.1)    004A4.08 (3.8/3.4)    004A4.11 (3.4/3.3)

**Task Standard:**      Locally isolate Charging With Local Control Of Seal Injection Flow

**Evaluation Method:**    Simulator \_\_\_\_\_      In-Plant \_\_\_\_ X \_\_\_\_

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**Performer:**    \_\_\_\_\_      NAME      Start Time \_\_\_\_\_

**Performance Rating:**    SAT \_\_\_\_      UNSAT \_\_\_\_      Performance Time \_\_\_\_\_      Finish Time \_\_\_\_\_

**Evaluator:**    \_\_\_\_\_ / \_\_\_\_\_  
                         SIGNATURE      DATE

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COMMENTS

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**SPECIAL INSTRUCTIONS TO EVALUATOR:**

1. Sequenced steps identified by an "s"
2. Any UNSAT requires comments
3. Task should begin in the SM office.
4. Supply the operator with a copy of AOP-N.08 (appropriate section), when he is given initial conditions and cues.
5. Insure operator performs the following required actions for **SELF-CHECKING**;
  - a. Identifies the correct unit, train, component, etc.
  - b. Reviews the intended action and expected response.
  - c. Compares the actual response to the expected response.

**Validation Time: CR. 12 mins**

**Tools/Equipment/Procedures Needed:**

AOP-N.01, Appendix R Fire Safe Shutdown, Appendix B (**Do not** give operator until discussion of equipment in JPM step 1 is complete.

SCBAs, portable lanterns, radio (These items are simulated. The operator should be able to explain where they are located)

**References:**

	Reference	Title	Rev No.
A.	AOP-N.08	Appendix R Fire Safe Shutdown	1

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**READ TO OPERATOR**

**Directions to Trainee:**

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM. I will provide initiating cues and reports on other actions when directed by you. When you complete the task successfully, the objective for this job performance measure will be satisfied. Ensure you indicate to me when you understand your assigned task. To indicate that you have completed your assigned task return the handout sheet I provided you.

**INITIAL CONDITIONS:**

1. Unit 2 has experienced an Appendix R Fire located in area 734-A24, 6.9 KV Shutdown Board Rm B.
2. The operating crew has entered AOP-N.08, section 2.44.
3. The AUOs are in the SM's office with SCBAs, portable lanterns, and radios prepared to be dispatched as directed by the MCR.

**INITIATING CUES:**

1. You are an AUO located in the SM office and been directed to locally isolate Unit 2 charging and throttle seal injection flow using Appendix B of AOP-N.08.
2. Inform the US/CRO when charging has been isolated.
3. **This is a time critical JPM. Timing will start when the evaluator provides you with AOP-N.08, Appendix B.**

<p><b>STEP 1.:</b>      <b>OBTAIN</b> radio, SCBA, and portable lantern.</p> <p><b>NOTE</b>            Evaluator should complete the discussion of where the operator may obtain a radio, SCBA, and portable lantern before providing the operator AOP-N.08, Appendix B. The time critical step begins in the SM's office when the operator is given Appendix B.</p> <p><b>Cue</b>              <i>Ask operator where these items may be obtained.</i></p> <p><b>STANDARD:</b>    Operator should be able to explain where he can obtain these items. SCBAs available for operator use are located in the MCR Chart cabinets.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical step</b></p> <p>Start Time___</p> <p>Time operator given App B</p> <p>_____</p>
<p><b>STEP 2.:</b>      Proceed to AB el. 669 Pen Rm</p> <p><b>Cue:</b>            <i>If operator attempts to open fire door to the 6.9KV Shutdown Board Room B, inform the operator the door is hot to the touch.</i></p> <p><b>STANDARD:</b>    Operator proceeds to AB el. 669 Pen Rm. via a route other than through the 6.9KV Shutdown Board Room B.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 3.:</b>      <b>ISOLATE</b> charging header by closing one of the following:</p> <ul style="list-style-type: none"> <li>• VLV-62-537, Reach rod in AB el. 669 Pen Rm, <b>OR</b></li> <li>• VLV-62-539, Reach rod in AB el. 669 Pen Rm</li> </ul> <p><b>Cue:</b>            <i>When the operator attempts to close the first valve, inform him/her that it does not move. After operator simulates closing the second valve, inform him that the valve on its closed seat..</i></p> <p><b>STANDARD:</b>    Close either 2-VLV-62-537, Reach rod in AB el. 669 Pen Rm, <b>OR</b> 2-VLV-62-539, Reach rod in AB el. 669 Pen Rm. Critical step timing starts after discussion of where radio, SCBA, and portable lantern may be located. This step must be completed within 10 minutes of being given Appendix B. Operator notifies US/CRO that charging is isolated.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Time to isolate charging</p> <p>_____ min.</p> <p><b>Time Critical Step and AP Critical Step</b></p>

<p><b>STEP 4.:</b></p> <p><b>NOTE</b></p> <p><i>Cue:</i></p> <p><b>STANDARD:</b></p>	<p><b>IF MCR directs throttling seal injection flow THEN THROTTLE</b> one of the following valves to control pressurizer level and seal injection flow:</p> <ul style="list-style-type: none"> <li>• VLV-62-535, CCP B-B Room, or</li> <li>• VLV-62-536, CCP B-B Room</li> </ul> <p>A step ladder and valve cheater will be required for this step. An EOI ladder is outside 1B-B or 2B-B CCP Room.</p> <p><b>As the CRO, direct the operator to throttle 2-VLV-62-535-or 2-VLV-62-536 until the valve is approximately half closed.</b></p> <p>Throttle 2-VLV-62-535-or 2-VLV-62-until the valve is approximately half closed.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p><b>Critical Step</b></p>
<p><b>STEP 5.:</b></p> <p><b>STANDARD:</b></p>	<p>NOTIFY US/CRO that Appendix B of AOP-N.08 is complete.</p> <p>CRO notified.</p>	<p>___ SAT</p> <p>___ UNSAT</p> <p>Stop Time ____</p>

**End of JPM**



# Final Submittal

(Blue Paper)

1. As Given Simulator Scenario Operator Actions ES-D-2

**SEQUOYAH NUCLEAR PLANT  
EXAM 2002-301  
50-327 & 50-328**

**DECEMBER 2 - 6, 2002**

Facility: Sequoyah Scenario No.: 1 Op-Test No.: 1

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

Initial Conditions: Plant is at 58% power following a trip after a refueling outage. 40 gpd leakage in #3 S/G

Turnover: Increase power to 85%. A Severe Thunderstorm Warning is in effect for Hamilton and Rhea counties for the next 2 hours. There is general increased security due to validated threats in the US

Event No.	Malf. No.	Event Type*	Event Description
			Set up simulator to IC- 8.
Preinsert			"A" Containment Spray Pump OOS
Preinsert			"A" MDAFW Pump OOS
Preinsert	FW07B	C	"B" MDAFW fails to auto start
Preinsert	RP16K 612A	C	Phase "A" fails to actuate
1	-	N (BOP)	Start 2 <sup>nd</sup> MFP
2 2a	-	R (RO) I	Increase power to 85% NI Channel Deviation
3	RX05A	I (RO)	PZR Level Channel 339 fails High
4	RX12B	I (BOP)	PT-1-73, Impulse Pressure Transmitter, Fails low
5	IA02	C (BOP)	Air system rupture, can be isolated
6	TH05C	M (All)	#3 S/G Tube Rupture
7	MS12C	C (RO)	#3 Atmospheric Relief valve fails open after SGTL
			Terminate at transition to ECA

\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (P)RA, (L)ow Power

Op-Test No.: _____ Scenario No.: <u>1</u> Event No.: <u>1</u> Page <u>1</u> of <u>1</u>		
Event Description: <u>Start a 2<sup>nd</sup> Main Feed Pump</u>		
Time	Position	Applicant's Actions or Behavior
	CRO	RECORD MFPT selected to be started second. _____ MFPT
	CRO	ENSURE applicable Trip Test Prior to Startup has been COMPLETED
	CRO	ENSURE MFPT Speed Control Bias dial at 50%.
	CRO	ENSURE MFPTs H-P and L-P steam isolation valves for the MFP being started are OPEN
	CRO	IF MFPT is rolling greater than 200 rpm once HP ISOL is OPEN, THEN CONTACT Maintenance to check and adjust dashpot settings as necessary
	CRO	THROTTLE [1-FCV-3-70] OR [1-FCV-3-84] MFP Recirc valve between 30%-50% OPEN (for pump to be started) with [1-FIC-3-70] or [1-FIC-3-84].
	CRO	RESET the Standby MFPT
	CRO	ENSURE the Condenser inlet and outlet valves OPEN
	CRO	OPEN the Stop Valves for the MFPT to be started by placing either the H/P or L/P handswitch to the RAISE position
	CRO	VERIFY the MFP turning gear motor has STOPPED
	CRO/OATC	NOTIFY MIG to adjust the MFPT hand changer for the proper rpm as the second MFPT is accelerated
	CRO	MONITOR the following parameters during MFWP startup: Vibration and thrust bearing wear, MFWP Condenser vacuum/drain temperature, Oil system and bearing temperatures
	CRO	PLACE the governor valve positioner to the RAISE position to open the steam chest valves and accelerate the MFPT
	CRO	SLOWLY LOAD the second MFPT to raise MFPT speed until demand on MFPT speed controller matches the demand output of the first MFPT
	CRO	ENSURE MFP Injection Water Intermediate Leakoff Pressure for pump started is 200-250 psig
	CRO	ENSURE MFP Injection Water Differential Pressure for pump started is equal to or greater than 25 psid
	CRO	WHEN the master controller has zero deviation, PLACE the second MFPT in AUTO
	CRO	CLOSE the second MFPT drain valves
	CRO	ENSURE [1-FCV-3-70] or [1-FCV-3-84] MFP Recirc valve is CLOSED and in MANUAL
	CRO	WHEN MFWP speed controllers [SIC-46-20A] and [SIC-46-20B] are in AUTO, THEN, PERFORM the following to adjust the minimum speed on the second MFWP; VERIFY both MFWP speed controller bias settings at 50%, NOTIFY MIG to slowly adjust the hand speed changer on the second MFWP so that the MFWP speeds are equal
	CRO	IF an adjustment of the flow balance between the MFPTs is desired, THEN, SLOWLY ADJUST one MFPT speed control bias in downward direction (0% to 50%) until desired flow balance is achieved

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 2 Page 1 of 1Event Description : Increase Power to 85%

Time	Position	Applicant's Actions or Behavior
		GO-5 Steps
	CRO	PRIOR to increasing load above 729 MWe ENSURE at least one bus duct cooler is in service USING 0-SO-58-1
	CRO	PRIOR to increasing turbine load above 60%, ENSURE all #3 and #7 heater drain tank systems are pumping forward
	CRO	PRIOR to increasing turbine load above 65%, ENSURE second MFPT is in service
	CRO	WHEN approximately 70% turbine load, THEN, PLACE the third #3 heater drain pump in service in accordance with 1,2-SO-5-2, ENSURE valves LCV-6-106A and LCV-6-106B are controlling #3 heater drain tank level properly
		SO-62-7 Steps * steps may be repeated to add additional water
	OATC	ENSURE unit is <u>NOT</u> in a Tech Spec action that prohibits positive reactivity additions
	OATC	ENSURE sufficient capacity available in the HUT selected to receive large amounts of CVCS letdown
	OATC	ENSURE makeup system is aligned for AUTO operation in accordance with Section 5.1
	OATC*	RECORD the quantity of dilution water required to achieve desired boron concentration
	OATC*	PLACE [HS-62-140A], Boric Acid Supply to Blender Flow Control Switch to the STOP position
	OATC*	PLACE [HS-62-140B], CVCS Makeup Selector Switch to the DILUTE position
	OATC*	ENSURE [HS-62-140D], Boric Acid Valve to the Blender is CLOSED (Green light is LIT)
	OATC*	SET [FQ-62-142], Batch Integrator for the desired quantity
	OATC*	ADJUST [FC-62-142], Primary Makeup Water Flow Controller for the desired flow rate
	OATC*	PLACE [HS-62-140A], Boric Acid Supply to Blender Flow Control Switch to the START position
	OATC*	VERIFY the following; Inlet to top of VCT [FCV-62-128] is OPEN, Primary Water flow by [FI-62-142A] or [FQ-62-142]
	OATC*	IF primary water addition to the bottom of the VCT [FCV-62-144] is desired, THEN, CLOSE [FCV-62-128] with [HS-62-128], OPEN [FCV-62-144] with [HS-62-144], VERIFY Primary Water flow by [FI-62-142A] or [FQ-62-142].
	OATC*	MONITOR nuclear instrumentation and reactor coolant temperature to ensure the proper response from dilution is achieved
	OATC*	IF [LI-62-129], Volume Control Tank Level, increases to 63 percent, THEN; ENSURE [LCV-62-118], Volume Control Tank Divert Valve OPENS to divert excess water to the Holdup Tanks
	OATC*	WHEN dilution is complete, THEN, PLACE [HS-62-140A], Boric Acid to Blender Flow Control Switch to the STOP position, IF [FCV-62-144] was previously OPENED, THEN CLOSE [FCV-62-144] with [HS-62-144], VERIFY no primary water flow on either [FI-62-142A] or [FQ-62-142], ENSURE [FCV-62-128] is CLOSED
	OATC	REALIGN the blender controls for AUTO makeup to the CVCS in accordance with Section 5.1

Op-Test No.: _____ Scenario No.: <u>  1  </u> Event No.: <u>  3  </u> Page <u>  1  </u> of <u>  1  </u>		
Event Description: <u>  PZR Level Channel Fails High  </u>		
Time	Position	Applicant's Actions or Behavior
	US	Crew enters AOP-I.04
	US	Evaluate TS (STA)
	US	Evaluate EPIP-1 Emergency Plan (Shift Manager)
	Crew	DIAGNOSE the failure, IF... Pressurizer Level Instrument Malfunction, Go To Section 2.2
	OATC	CHECK LI-68-339 indicates NORMAL (NO)
	OATC	ENSURE LEVEL CONTROL CHANNEL SELECTOR switch XS-68-339E in LT-68-335 & 320
	OATC	ENSURE LEVEL REC CHANNEL SELECTOR switch XS-68-339B in LT-68-320 or LT-68-335
	OATC	CHECK letdown IN SERVICE (YES)
	OATC	ENSURE pressurizer heaters restored to service
	US	NOTIFY IM to remove failed pressurizer level channel from service USING appropriate Appendix (E)
	US	GO TO appropriate plant procedure

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 4 Page 1 of 1Event Description: PT-1-73 Fails Low

Time	Position	Applicant's Actions or Behavior
	US/OATC	ARP-M5-C-6 actions, IF controls are in AUTO when alarm occurs, THEN PLACE rod control system in manual and match Tavg with Tref.
		AOP-I.08 Steps
	CRO	CHECK PI-1-73 indicates normal (NO)
	OATC	PLACE rods in MAN <i>Critical Task</i>
	CREW	STABILIZE reactor power
	CRO	EVALUATE placing Main Reg Valves in MAN to maintain SG level on program (S/G levels will go to 33%)
	CRO	PLACE steam dumps in STEAM PRESSURE mode
	OATC	DETERMINE Program T-avg for current reactor power USING TI-28 Figure A.9
	CREW	RESTORE T-avg to program; POSITION control rods, ADJUST turbine load, ADJUST RCS boron concentration
	US	NOTIFY IM to remove P-1-73 from service USING Appendix B, Removing Turbine Impulse Pressure Instrument Loop P-1-73 (P-505) from Service
	OATC/CRO	CHECK PI-1-72 indicates normal
	US/STA	EVALUATE Tech Specs for applicability
	US	GO TO appropriate plant procedure
		CREW may go to AOP-C.01 will be directed to AOP-I.08 after rods in manual

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 5 Page 1 of 1Event Description: Air System Rupture

Time	Position	Applicant's Actions or Behavior
		ARP M15, D-7, E-7
	CRO	Dispatch and operator to verify PCV-33-4 closed
	CRO	Investigate the cause, dispatch operators to search for the leak
	CRO	Locate and isolate the leak
	CRO	Monitor air pressures
	US	Refer to AOP-M.02 Only applicable steps from the AOP will be performed
	US/CRO	DISPATCH personnel
	US/CRO	VERIFY 6900V and 480V Shutdown Boards ENERGIZED
	CRO	MONITOR PI-33-199, service air header pressure greater than 88 psig (NO), ENSURE 0-PCV-33-4, Service Air Isol Valve, CLOSED
	CRO/AUO	START Control Air Compressors as required to maintain system pressure
	CRO/AUO	VERIFY A and B Control Air Compressors LOADED as required
	CRO/AUO	VERIFY Control Air Dryers and Filters operating properly
	US	NOTIFY Maintenance to initiate repairs to source of air leakage
	CRO	MONITOR PI-32-200, control air header pressure, greater than 77 psig (Pressure should recover when 33-4 closes)

[illegible]



Op-Test No.: \_\_\_\_\_ Scenario No.: \_\_\_\_\_ Event No.: 6 Page 2 of 3Event Description: S/G Tube Rupture

Time	Position	Applicant's Actions or Behavior
		E-0 Actions
	OATC	VERIFY reactor TRIPPED
	CRO	VERIFY turbine TRIPPED
	CRO	VERIFY shutdown boards ENERGIZED
	CRO/OATC	DETERMINE if SI actuated (Yes)
	CRO	VERIFY CCS pumps RUNNING
	CRO	CHECK ERCW system operation, VERIFY at least four ERCW pumps RUNNING, VERIFY D/G ERCW supply valves OPEN
	CRO/OATC	VERIFY ECCS pumps RUNNING
	OATC	VERIFY CCP flow through CCPIT
	OATC	* CHECK RCS pressure less than 1500 psig (NO)
	OATC	VERIFY ESF systems ALIGNED, Phase A ACTUATED, Containment Ventilation Isolation ACTUATED, Status monitor panels, Train A status panel 6K, Train B status panel 6L. <i>Critical Task - Complete CTMT /sol.</i>
	OATC	MONITOR containment spray NOT required (Yes)
	OATC	CHECK if main steam lines should be isolated (NO)
	CRO	VERIFY MFW Isolation
	CRO	VERIFY AFW pumps RUNNING, MDAFW (NO)
	CRO	CHECK AFW valve alignment
	CRO	DETERMINE if secondary heat sink available (Yes)
	OATC	MONITOR RCS temperatures
	OATC	IF any RCP running, THEN CHECK T-avg stable at or trending to between 547°F and 552°F (NO)
	OATC/CRO	IF temperature less than 547°F and dropping, THEN PERFORM the following; ENSURE steam dumps and atmospheric reliefs CLOSED (NO)
	CRO	IF cooldown continues, THEN, PERFORM the following; CONTROL total feed flow USING EA-3-8, Manual Control of AFW Flow, MAINTAIN total feed flow greater than 440 gpm UNTIL narrow range level greater than 10% [25% ADV] in at least one S/G
	US/CRO	IF cooldown continues, THEN, CLOSE MSIVs and MSIV bypass valves
	CRO	DISPATCH personnel to perform EA-0-1, Equipment Checks Following ESF Actuation

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Op-Test No.: _____ Scenario No.: <u>1</u> Event No.: <u>7</u> Page <u>1</u> of <u>3</u>		
Event Description: <u>S/G Tube Rupture</u>		
Time	Position	Applicant's Actions or Behavior
		E-2 Steps (Starts Event 7)
	CRO	CHECK MSIVs and MSIV bypass valves CLOSED
	CRO	CHECK S/G secondary pressure boundary integrity
	CRO	IDENTIFY Faulted S/G(s): CHECK S/G pressures, Any S/G pressure DROPPING in an uncontrolled manner
	CRO	ISOLATE Faulted S/G(s): <i>Critical Task: Isolate #3 S/G</i>
	CRO	• ISOLATE MFW
	CRO	• ISOLATE AFW 3-148 and 3-172A are closed
	CRO	• VERIFY S/G blowdown valves CLOSED
	CRO	• VERIFY atmospheric relief CLOSED (NO), CLOSE atmospheric relief, IF Faulted S/G(s) atmospheric relief can NOT be closed, THEN DISPATCH personnel to close atmospheric relief USING EA-1-2, Local Control of S/G PORVs
	CRO	MONITOR CST level greater than 10%.
	CRO	VERIFY secondary radiation NORMAL (NO), GO TO E-3, Steam Generator Tube Rupture

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 7 Page 2 of 3Event Description: S/G Tube Rupture

Time	Position	Applicant's Actions or Behavior
		E-3 Steps
	OATC	MONITOR RCP trip criteria (NO)
	CRO	BYPASS condensate DI
	CRO	MONITOR indications of Ruptured S/G(s): IDENTIFY Ruptured S/G(s) as indicated by any of the following, Unexpected rise in any S/G narrow range level (Loop 3)
	CRO	ISOLATE flow from Ruptured S/G(s):
	CRO	• ADJUST Ruptured S/G(s) atmospheric relief controller setpoint to 87% in AUTO. (1040 psig)
	CRO	• CHECK Ruptured S/G(s) atmospheric relief hand switch in P-AUTO and valve(s) CLOSED (NO)
	CRO	WHEN Ruptured S/G(s) pressure less than 1040 psig, THEN PERFORM the following: VERIFY atmospheric relief CLOSED, IF atmospheric relief NOT closed, THEN CLOSE atmospheric relief.
	CRO	IF Ruptured S/G(s) atmospheric relief CANNOT be closed, THEN DISPATCH personnel to close atmospheric relief USING EA-1-2, Local Control of S/G PORVs.
	CRO	VERIFY Ruptured S/G(s) blowdown isolation valves CLOSED
	CRO	CLOSE Ruptured S/G(s) MSIV and MSIV bypass valve
	CRO	MAINTAIN Ruptured S/G(s) level in narrow range: CHECK narrow range level greater than 10%, WHEN ruptured S/G level is greater than 10% [25% ADV], THEN STOP feed flow to ruptured S/G
	CRO	VERIFY Ruptured S/G ISOLATED from Intact S/G(s)
	CRO	CHECK either of the following conditions SATISFIED: Ruptured S/G MSIVs and MSIV bypass valves CLOSED OR MSIV(s) and MSIV bypass valve(s) CLOSED on Intact S/G(s) to be used for RCS cooldown.
	CRO	CHECK Ruptured S/G pressure greater than 380 psig (YES)
	OATC	CHECK at least one RCP RUNNING
	CRO	INITIATE RCS cooldown
	OATC	DETERMINE target core exit T/C temperature based on Ruptured S/G pressure
	CRO	DUMP steam at maximum achievable rate USING Intact S/G(s) atmospheric relief(s).
	CRO	WHEN RCS pressure less than 1920 psig, THEN PERFORM the following: BLOCK low steamline pressure SI, CHECK STEAMLINE PRESS ISOL/SI BLOCK RATE ISOL ENABLE permissive LIT. [M-4A, A4]
	CRO	WHEN core exit T/Cs less than target temperature determined in Substep 9.a, THEN PERFORM the following: STOP RCS cooldown, MAINTAIN core exit T/Cs less than target temperature

Op-Test No.: \_\_\_\_\_ Scenario No.: 1 Event No.: 7 Page 3 of 3Event Description: S/G Tube Rupture

Time	Position	Applicant's Actions or Behavior
		E-3 Steps Continued
	CRO	MAINTAIN Intact S/G narrow range levels, Greater than 10%, Between 10% [25% ADV] and 50%.
	OATC	MONITOR pressurizer PORVs and block valves, Power to block valves AVAILABLE, Pressurizer PORVs CLOSED, At least one block valve OPEN
	OATC	RESET SI and CHECK the following: AUTO S.I. BLOCKED permissive LIT [M-4A, C4], S.I. ACTUATED permissive DARK [M-4A, D4].
	CRO	MONITOR AC busses energized from start busses
	OATC	RESET Phase A and Phase B
	CRO	ESTABLISH control air to containment USING EA-32-1, Establishing Control Air to Containment
	OATC	DETERMINE if RHR pumps should be stopped: CHECK RHR pump suction aligned from RWST, CHECK RCS pressure greater than 180 psig, STOP RHR pumps and PLACE in A-AUTO, MONITOR RCS pressure greater than 180 psig
	OATC	CHECK if RCS cooldown should be stopped
	OATC	CHECK core exit T/Cs less than target temperature
	CRO	STOP RCS cooldown <i>Critical Task: Cooldown RCS to target temp.</i>
	CRO	MAINTAIN core exit T/Cs less than target temperature
	CRO	CHECK Ruptured S/G(s) pressure STABLE or RISING (NO)
	US/CRO	IF Ruptured S/G(s) pressure drops to less than 250 psig above pressure of Intact S/G(s) being used for cooldown, THEN GO TO ECA-3.1, SGTR and LOCA - Subcooled Recovery
		TERMINATE THE EXERCISE AT ECA TRANSITION

Facility: Sequoyah Scenario No.: 2 Op-Test No.: 1

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

Initial Conditions: Plant is at 100% power EOL proceeding to a refueling outage. 10 gpd leakage in #3 S/G

Turnover: A Severe Thunderstorm Warning is in effect for Hamilton and Rhea counties for the next 2 hours. There is general increased security due to validated threats in the US.

Event No.	Malf. No.	Event Type*	Event Description
			Set up simulator to IC- 12.
Preinsert			"B" Containment Spray Pump OOS
Preinsert			"B" MDAFW Pump OOS
Preinsert	FW07C	C	TDAFW pump fails
Preinsert	RP16K 643A	C	Containment Spray Pump "A" Fails to Auto Start
1	-	N (RO)	Swap CCP's for maintenance preps
2	RX10B	I (BOP)	Loop #2 Steam Flow Channel Fails Low
3	RX02	I (RO)	T Cold Fails High
4	CV17B	C (RO)	#2 RCP - #1 Seal Failure (Below Trip Criteria)
5		R (RO)	Shutdown the plant IAW AOP-C.03. Let power decrease for 10-15% (Normal for CRO)
6	CN09	C (BOP)	Loss of Condenser Vacuum (Slow Ramp to Trip)
7	MS01B	M (All)	#2 S/G Break I/S Containment

\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (P)RA, (L)ow Power

[illegible]

Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 2 Page 1 of 1Event Description : Loop #2 Steam Flow Channel Fails Low

Time	Position	Applicant's Actions or Behavior
		AR-M5-A A-7 Steps
	CRO	IF S/G level is low, THEN ENSURE MFP and reg. valves are responding to return level to program
	CRO/US	IF MFP and reg. valves cannot return level to program, THEN EVALUATE turbine runback criteria and/or load reduction with SRO
	CRO/US	IF steam generator feedwater flow is high and level is normal or increasing to hi level, THEN PERFORM the following: PLACE affected steam generator Reg Valve in MANUAL, RESTORE level to program, GO TO AOP-S.01, <i>Loss of Normal Feedwater</i> .
		AOP-S.01 Steps
	US	DIAGNOSE the failure, IF Loss of Normal Feedwater Control, GO TO Section 2.1
	CRO	MAINTAIN steam generator level(s) on program
	CRO	PLACE affected level controller(s) in MANUAL, FIC-3-48A, S/G-2
	CRO	CONTROL feedwater flow on affected S/G(s) USING main feedwater regulating valve controller(s) to restore level to program
	CRO	CHECK Steam Flow and Feed Flow Channels NORMAL [M-4]: (NO)
	CRO	TRANSFER associated Steam Flow or Feed Flow selector switch to alternate channel (FI-1-10B)
	CRO	MAINTAIN steam generator level(s) on program
	CRO	VERIFY failure due to steam flow/feed flow instrument malfunction
	CRO	PLACE main feedwater regulating valve(s) in AUTO
	CRO	CHECK S/G pressure instruments NORMAL
	US	INITIATE repairs on failed equipment



Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 3 Page 1 of 1Event Description: T Cold Fails high

Time	Position	Applicant's Actions or Behavior
		AR-M5A D-7 Steps Crew may refer to A6, B6, or C6
	OATC	CHECK 1-XX-55-5, Trip status, AND EVALUATE Rx trip criteria
	US	IF reactor trips, THEN GO TO E-0, <i>Reactor Trip or Safety Injection</i>
	US	GO TO AOP-I.02, RCS Loop RTD Instrument Malfunction
		AOP-I.02 Steps
	US	EVALUATE Tech Specs for applicability
	OATC	STABILIZE reactor power USING manual rod control <i>Critical Task</i>
	OATC	CHECK loop 1 temperature channel OPERABLE (YES)
	OATC	CHECK loop 2 temperature channel OPERABLE (NO)
	OATC	PULL-TO-DEFEAT TAVG CHANNEL DEFEAT switch to LOOP 2
	OATC	PULL-TO-DEFEAT ΔT CHANNEL DEFEAT switch to LOOP 2
	OATC	PLACE LOOP TAVG ΔT REC/SEL switch in LOOP 1, 3, or 4
	US	NOTIFY IM to remove failed TAVG ΔT instrument loop from service USING appropriate Appendix B
	OATC	RESTORE rod control to AUTO

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Op-Test No.: \_\_\_\_\_ Scenario No.: 2 Event No.: 5 Page 1 of 2  
 Event Description: Shutdown the Plant IAW AOP-C.03

Time	Position	Applicant's Actions or Behavior
		AOP-C.03 Steps
	US	EVALUATE Tech Specs for applicability
	US	EVALUATE EPIP-1, Emergency Plan Initiating Conditions Matrix
	US	NOTIFY following personnel of emergency shutdown: Load Coordinator, Chemistry, RADCON, Plant Management
	CRO	MONITOR reactor/turbine trip NOT required USING Appendix A, Reactor and Turbine Trip Criteria
	CREW	INITIATE load reduction at rate between 2% and 5% per minute
	OATC	IF boration from the BAT, THEN PERFORM the following
	OATC	DETERMINE recommended boration flowrate and volume
	OATC	INITIATE emergency boration to maintain control rods above low-low insertion limit
		SO-62-7 Steps
	OATC	ENSURE Boric Acid Storage Tank level is within requirements of Technical Requirements Manual LCO's 3.1.2.5 or 3.1.2.6, as applicable
	OATC	RECORD the quantity of boric acid required to achieve desired boron concentration using Appendix D
	OATC	MONITOR nuclear instrumentation and reactor coolant temperature to ensure the proper response from the boration is achieved
	OATC	ENSURE Boric Acid Pump aligned to the blender is in FAST speed by right red light LIT on [HS-62-230A] or [HS-62-232A].
	OATC	ADJUST [FCV-62-138], Emergency Borate Valve, to maintain boric acid flow between 35 and 150 gpm, OR flow rate as directed by AOP-C.03 or 1,2-AR-M4-B
	OATC	RECORD the time started
	OATC	CALCULATE time for boration
	OATC	IF Volume Control Tank level increases to 63 percent, THEN, ENSURE [LCV-62-118], Volume Control Tank Divert Valve OPENS to divert excess water to the Holdup Tank
	OATC	WHEN it is time to terminate boration, THEN, COMPLETE the following substeps: ENSURE the boric acid transfer pumps in slow speed, THROTTLE recirculation valve for applicable BAT as needed for pump protection, ENSURE [FCV-62-138], Emergency Borate valve is CLOSED, NOTIFY Chem Lab to obtain RCS boron sample
	OATC	WHEN evolution is complete, THEN, ENSURE requirements of Technical Requirements Manual LCO's 3.1.2.5 and 3.1.2.6 are met

Event Description: Shutdown the Plant IAW AOP-C.03

[illegible]

Op-Test No.: \_\_\_\_ Scenario No.: 2 Event No.: 6 Page 1 of 1Event Description: Loss of Condenser Vacuum (Slow Ramp Time to Trip)

Time	Position	Applicant's Actions or Behavior
		AR M2C C-6 Actions
		Verify alarm on recorder
		Verify required CCW pumps running
		Check condenser in-leakage on ICS
		If alarm valid, Go to AOP-S.02, Loss of Condenser Vacuum
		AOP-S.02 Steps
	CRO	MONITOR condenser pressure for turbine trip criteria
	CRO	CHECK generator load greater than or equal to 350 MWe
	CRO	CHECK condenser pressure less than or equal to 2.7 psia
	CRO	ENSURE condenser vacuum pumps RUNNING
	CRO	ENSURE condenser vacuum breaker CLOSED
	CRO	CHECK required CCW Pumps RUNNING [M-15].
	CREW	Crew should trip the unit per the RNO in step 1a. IF condenser pressure can NOT be restored within 5 minutes, THEN TRIP the reactor and GO TO E 0, Reactor Trip or Safety Injection

Op-Test No.: _____ Scenario No.: <u>2</u> Event No.: <u>7</u> Page <u>1</u> of <u>3</u>		
Event Description: <u>Faulted S/G I/S</u>		
Containment _____		
Time	Position	Applicant's Actions or Behavior
		E-0 Actions
	OATC	VERIFY reactor TRIPPED
	CRO	VERIFY turbine TRIPPED
	CRO	VERIFY shutdown boards ENERGIZED
	CRO/OATC	DETERMINE if SI actuated (Yes)
		Operator stops Loop 2 RCP and closes 62-22 within 30 seconds
	CRO	VERIFY CCS pumps RUNNING
	CRO	CHECK ERCW system operation, VERIFY at least four ERCW pumps RUNNING, VERIFY D/G ERCW supply valves OPEN
	CRO/OATC	VERIFY ECCS pumps RUNNING
	OATC	VERIFY CCP flow through CCPIT
	OATC	* CHECK RCS pressure less than 1500 psig (NO)
	OATC	VERIFY ESF systems ALIGNED, Phase A ACTUATED, Containment Ventilation Isolation ACTUATED, Status monitor panels, Train A status panel 6K, Train B status panel 6L
	OATC	MONITOR containment spray NOT required (NO)
	OATC	ENSURE containment spray INITIATED <i>Critical Task</i>
	OATC	Containment spray pumps RUNNING (NO), Operator starts Containment Spray Pump
	OATC	Containment spray header isolation valves FCV-72-39 and FCV-72-2 OPEN
	OATC	Containment spray recirculation valves to RWST FCV-72-34 and FCV-72-13 CLOSED
	OATC	Containment spray header flow greater than 4750 gpm per train
	OATC	Panel 6E LIT
	OATC	ENSURE Phase B valves CLOSED, Panel 6K PHASE B GREEN, Panel 6L PHASE B GREEN
	OATC	STOP RCPs <i>Critical Task: Stop RCP's within 2 minutes</i>
	OATC	MONITOR containment air return fans, RECORD present time, WHEN 10 minutes have elapsed, THEN ENSURE containment air return fans are running
	OATC	CHECK if main steam lines should be isolated (NO)
	CRO	VERIFY MFW Isolation

Op-Test No.: \_\_\_\_\_ Scenario No.:   2   Event No.:   7   Page   2   of   3  Event Description:   Faulted S/G I/S Containment  

Time	Position	Applicant's Actions or Behavior
		E-0 Steps Continued
	CRO	VERIFY AFW pumps RUNNING, MDAFW (NO)
	CRO	CHECK AFW valve alignment
	CRO	DETERMINE if secondary heat sink available (Yes) <i>Should Use adverse numbers</i>
	OATC	MONITOR RCS temperatures
	OATC	IF any RCP running, THEN CHECK T-avg stable at or trending to between 547°F and 552°F (NO)
	OATC	IF RCPs stopped, THEN CHECK T-cold stable at or trending to between 547°F and 552°F
	OATC	IF temperature less than 547°F and dropping, THEN PERFORM the following
	CRO	ENSURE steam dumps and atmospheric reliefs CLOSED
	CRO	IF cooldown continues, THEN PERFORM the following
	CRO	CONTROL total feed flow USING EA-3-8, Manual Control of AFW Flow
	CRO	MAINTAIN total feed flow greater than 440 gpm UNTIL narrow range level greater than 10% [25% ADV] in at least one S/G
	CRO	IF cooldown continues, THEN CLOSE MSIVs and MSIV bypass valves
	CRO	DISPATCH personnel to perform EA-0-1, Equipment Checks Following ESF Actuation
	OATC	CHECK pressurizer PORVs, safeties, and spray valves
	EXAMINER NOTE	* Depending on crew speed, the crew may go back to step 7c when RCS pressure goes below 1500 psig
	OATC	MONITOR RCP trip criteria; At least one CCP OR SI pump RUNNING AND RCS pressure less than 1250 psig <i>Critical Task</i>
	CRO	CHECK if S/G secondary pressure boundaries are INTACT (NO)
	US	MONITOR status trees, GO TO E-2, Faulted Steam Generator Isolation.

Op-Test No.: _____		Scenario No.: <u>2</u>	Event No.: <u>7</u>	Page <u>3</u> of <u>3</u>
Event Description: <u>Faulted S/G I/S Containment</u>				
Time	Position	Applicant's Actions or Behavior		
		FR-Z.1 Steps		
		Monitor RWST > 27%		
		Verify Containment Ventilation dampers closed		
		Verify Phase A valves closed		
		Verify Phase B valves closed		
		Verify Containment Spray Actuation		
		Verify EGTS Operation		
		Monitor Containment Air Return fans		
		Verify MSIV's and bypasses closed		
		Determine any intact S/G		
		E-2 Steps		
	CRO	CHECK MSIVs and MSIV bypass valves CLOSED		
	CRO	CHECK S/G secondary pressure boundary integrity		
	CRO	IDENTIFY Faulted S/G(s): CHECK S/G pressures, Any S/G pressure DROPPING in an uncontrolled manner		
	CRO	ISOLATE Faulted S/G(s): <i>Critical Task: Isolate #2 S/G</i>		
	CRO	<ul style="list-style-type: none"> <li>ISOLATE MFW</li> </ul>		
	CRO	<ul style="list-style-type: none"> <li>ISOLATE AFW</li> </ul>		
	CRO	<ul style="list-style-type: none"> <li>VERIFY S/G blowdown valves CLOSED</li> </ul>		
	CRO	<ul style="list-style-type: none"> <li>VERIFY atmospheric relief CLOSED (NO), CLOSE atmospheric relief, IF Faulted S/G(s) atmospheric relief can NOT be closed, THEN DISPATCH personnel to close atmospheric relief USING EA-1-2, Local Control of S/G PORVs</li> </ul>		
	CRO	MONITOR CST level greater than 10%.		
	CRO	VERIFY secondary radiation NORMAL (YES), GO TO E-1, Loss of Reactor or Secondary Coolant		
		TERMINATE THE EXERCISE AFTER SI TERMINATION IS CHECKED IN E-1		



Facility: Sequoyah Scenario No.: 3 Op-Test No.: 1

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

Initial Conditions: Plant is at 94% power following a trip after a refueling outage. 10 gpd leakage in #3 S/G.

Turnover: Increase power to 100%. A Severe Thunderstorm Warning is in effect for Hamilton and Rhea counties for the next 2 hours. There is general increased security due to validated threats in the US.

Event No.	Malf. No.	Event Type*	Event Description
			Set up simulator to IC- 9. Place "A" CCP in-service
Preinsert			"B" Containment Spray Pump OOS
Preinsert			"B" RHR Pump OOS
Preinsert	CV01B	C	"B" CCP fails on start
Preinsert	EG03A	C	"A" EDG fails to auto start
Preinsert	RP16k6 08A	C	"A" Train SI Fails
1	-	N (BOP)	Transfer "B" Shutdown Board to Alternate Supply
2	-	R (RO)	Increase Power to 100%
3	RX06A	I (RO)	PZR Level channel fails Low
4	RW01H	C (BOP)	ERCW Pump Trips
5	RX20	I (BOP)	PT-1-33, Steam Pressure Channel, fails High
6	CV03	C (RO)	25 GPM leak in Containment
7	TH03A	M (All)	Small Break LOCA 20-80%
			When RHR pumps are stopped in ES-1.1

\* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor, (P)RA, (L)ow Power

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 1 Page 1 of 1Event Description: Transfer "B" Shutdown Board to Alternate

Time	Position	Applicant's Actions or Behavior
		SO-202-4 Section 8.2.1 Steps
	US	SM APPROVAL to perform this section
	US	ENSURE Section 8.2 of this Instruction has been PERFORMED (SM cue section 8.2 has been completed)
	CRO/OATC	ENSURE normal 3 phase voltage AVAILABLE on alternate feeder breaker [1728], compartment 16, via local voltmeter and selector switch on door
	CRO	ENSURE [1-XS-57-66], 6.9kV Shutdown Board 1B-B voltmeter selector switch is on BUS VOLTAGE position
	CRO	PLACE [1-HS-57-71A], control switch for [1728], in CLOSE position and HOLD
	CRO	PLACE [1-HS-57-68A], control switch for [1726], in TRIP position momentarily
	CRO	VERIFY breaker [1726] OPEN and breaker [1728] CLOSED
	CRO	VERIFY [1-EI-57-66], 1B-B 6.9kV Shutdown Board Bus Voltmeter INDICATES normal voltage (6560-7260)
	CRO	RELEASE [1-HS-57-71A] to MID position
	CRO	VERIFY all loads previously in service remain in service
	CRO	ENSURE any annunciators illuminated due to transfer are DARK (located panel 1-XA-55-1B or 0-XA-55-26B)

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Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 2 Page 2 of \_\_\_\_\_Event Description: Increase Power to 100%

Time	Position	Applicant's Actions or Behavior
		SO-62-7 Steps * steps may be repeated to add additional water
	OATC	ENSURE unit is <u>NOT</u> in a Tech Spec action that prohibits positive reactivity additions
	OATC	ENSURE sufficient capacity available in the HUT selected to receive large amounts of CVCS letdown
	OATC	ENSURE makeup system is aligned for AUTO operation in accordance with Section 5.1
	OATC*	RECORD the quantity of dilution water required to achieve desired boron concentration
	OATC*	PLACE [HS-62-140A], Boric Acid Supply to Blender Flow Control Switch to the STOP position
	OATC*	PLACE [HS-62-140B], CVCS Makeup Selector Switch to the DILUTE position
	OATC*	ENSURE [HS-62-140D], Boric Acid Valve to the Blender is CLOSED (Green light is LIT)
	OATC*	SET [FQ-62-142], Batch Integrator for the desired quantity
	OATC*	ADJUST [FC-62-142], Primary Makeup Water Flow Controller for the desired flow rate
	OATC*	PLACE [HS-62-140A], Boric Acid Supply to Blender Flow Control Switch to the START position
	OATC*	VERIFY the following; Inlet to top of VCT [FCV-62-128] is OPEN, Primary Water flow by [FI-62-142A] or [FQ-62-142]
	OATC*	IF primary water addition to the bottom of the VCT [FCV-62-144] is desired, THEN, CLOSE [FCV-62-128] with [HS-62-128], OPEN [FCV-62-144] with [HS-62-144], VERIFY Primary Water flow by [FI-62-142A] or [FQ-62-142].
	OATC*	MONITOR nuclear instrumentation and reactor coolant temperature to ensure the proper response from dilution is achieved
	OATC*	IF [LI-62-129], Volume Control Tank Level, increases to 63 percent, THEN; ENSURE [LCV-62-118], Volume Control Tank Divert Valve OPENS to divert excess water to the Holdup Tanks
	OATC*	WHEN dilution is complete, THEN, PLACE [HS-62-140A], Boric Acid to Blender Flow Control Switch to the STOP position, IF [FCV-62-144] was previously OPENED, THEN CLOSE [FCV-62-144] with [HS-62-144], VERIFY no primary water flow on either [FI-62-142A] or [FQ-62-142], ENSURE [FCV-62-128] is CLOSED
	OATC	REALIGN the blender controls for AUTO makeup to the CVCS in accordance with Section 5.1

Op-Test No.: _____ Scenario No.: <u>3</u> Event No.: <u>3</u> Page <u>1</u> of <u>2</u>		
Event Description: <u>Pressurizer Level Channel Fails Low</u>		
Time	Position	Applicant's Actions or Behavior
		AR-M5-A (E-3) Steps
	OATC	VERIFY the following automatic operations: Pressurizer heaters OFF, Letdown orifice valves FCV-62-72, 73 and 74 CLOSED, Letdown isolation valves FCV-62-69 and 70 CLOSED
	US	IF level channel failed, THEN, GO TO AOP-I.04, Pressurizer Instrument Malfunction
		AOP-I.04 Steps
	US	EVALUATE Tech Specs for applicability
	US	EVALUATE EPIP-1, Emergency Plan Classification Matrix
	OATC	DIAGNOSE the failure
	OATC	CHECK LI-68-339 indicates NORMAL (NO)
		PERFORM the following:
	OATC	ENSURE LEVEL CONTROL CHANNEL SELECTOR switch XS-68-339E in LT-68-335 & 320
	OATC	ENSURE LEVEL REC CHANNEL SELECTOR switch XS-68-339B in LT-68-320 or LT-68-335
	OATC	CHECK letdown IN SERVICE (NO)
	OATC	RESTORE letdown USING EA-62-5, Establishing Normal Charging and Letdown <i>Critical Task</i>
	OATC	ENSURE pressurizer heaters restored to service
	US	NOTIFY IM to remove failed pressurizer level channel from service USING Appendix E

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 3 Page 2 of 2Event Description: Pressurizer Level Channel Fails Low

Time	Position	Applicant's Actions or Behavior
		EA-62-5 Steps
	OATC	IF charging flow NOT established, THEN PERFORM Section 4.2
	OATC	VERIFY pressurizer level greater than 17%.
	OATC	ENSURE letdown orifice isolation valves CLOSED
	OATC	OPEN letdown isolation valves, opens 62-70
	OATC	PLACE [HIC-62-78] in MANUAL, AND OPEN [TCV-70-192] to ~ 50%.
	OATC	PLACE letdown pressure controller [PCV-62-81] in MANUAL and ADJUST output between 40% and 50%, (50%-60% open).
	OATC	ADJUST charging flow as necessary to prevent flashing in the letdown line
	OATC	OPEN letdown orifice isolation valves as needed
	OATC	ADJUST letdown pressure controller [PCV-62-81] output to obtain desired pressure
	OATC	ADJUST letdown pressure controller [PCV-62-81] setpoint to match existing pressure
	OATC	PLACE letdown pressure controller [PCV-62-81] in AUTO
	OATC	ADJUST [HIC-62-78A] to obtain desired letdown temperature, as indicated on [TI-62-78].
	OATC	PLACE [HIC-62-78A] in AUTO
	OATC	ENSURE high temperature divert valve [HS-62-79A] in DEMIN position
	OATC	ADJUST charging and letdown as necessary to maintain RCP seal injection flow and pressurizer level

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 4 Page 1 of \_\_\_\_\_Event Description: ERCW Pump R-A Trip

Time	Position	Applicant's Actions or Behavior
		AR-M27-A (B2) Steps
	CRO	ENSURE sufficient pumps running for system configuration
	CRO	VERIFY ERCW pump R-A running
	US/CRO	IF R-A ERCW pump is failed, THEN GO TO AOP-M.01, Loss of Essential Raw Cooling Water
		AOP-M.01 Steps
	US	EVALUATE Tech Specs and TRM for applicability
	US	EVALUATE EPIP-1, Emergency Plan Classification Matrix
	CRO	DIAGNOSE the failure
	CRO	IDENTIFY and LOCK OUT failed ERCW pump
	CRO	START additional ERCW pumps as required to maintain supply header pressure between 78 psig and 124 psig
	CRO	CHECK two A Train ERCW Pumps AVAILABLE
	CRO/ OATC	DISPATCH personnel to INSPECT failed pump(s) and determine cause for failure
	CRO	CHECK 1A and 2A ERCW supply header pressures and flows NORMAL
	CRO	CHECK 1B and 2B ERCW supply header pressures and flows NORMAL
	CRO	CHECK ERCW pump loading amps NORMAL
	CRO	TRANSFER emergency power selector switch away from failed pump
	CRO/ OATC	CLOSE manual discharge valve for failed pump(s) [ERCW Pumping Station]. 2-67-746A

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 5 Page 1 of \_\_\_\_\_Event Description: PT-1-33 Fails High

Time	Position	Applicant's Actions or Behavior
		AR-M3C (C1) Steps
	CRO	DISPATCH operator to #1 feedwater heaters to verify the valves open
	CRO	REDUCE feedwater pressure to $\leq 1100$ psig
	CRO	WHEN pressure reduces to $\sim 1100$ psig, THEN VERIFY the above PSV's closed
	US	IF alarm still illuminated or by SRO decision, THEN GO TO AOP-S.01, Loss of Normal Feedwater
		AOP-S.01 Steps
	CRO	DIAGNOSE the failure - Loss of Main Feedwater Pump Control
	CRO	MAINTAIN feedwater pressure on program
	CRO	PLACE affected MFP speed controller(s) in MANUAL - PC-46-20, MFPT 1A(2A) & 1B(2B) Speed Control
	CRO	CONTROL speed on affected MFP(s) to restore feedwater pressure to program <i>Critical Task</i>
	CRO	MAINTAIN steam generator level(s) on program
	US	INITIATE repairs on failed equipment



Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 6 Page 1 of \_\_\_\_\_Event Description: Leak in Containment

Time	Position	Applicant's Actions or Behavior
		AR-M5C (B3) Steps
	OATC	CHECK dew point temperature by observing 1-MR-30-240 on 1-M-10
	OATC	MONITOR containment pressure via 1-PDI-30-45, 44, 43, 42 on 1-M-6 for increase
	US	IF a small RCS leak is indicated, THEN GO TO AOP-R.05, <i>RCS Leak and leak Source Identification</i>
		AOP-R.05 Steps
	US	EVALUATE Tech Specs for applicability
	US	EVALUATE EPIP-1, Emergency Plan Classification Matrix
	US	EVACUATE all personnel from containment
		DIAGNOSE the failure, go to section 2.1
	OATC	CONTROL charging flow as necessary to maintain pressurizer level greater than 10%. 1B CCP trips when attempted to start
	OATC	MAINTAIN VCT level greater than 13% using automatic or manual makeup
	OATC	MONITOR containment pressure STABLE or DROPPING (NO)
	OATC	IF containment pressure is approaching 1.54 psig, THEN PERFORM the following: IF in MODE 1, 2 or 3, THEN TRIP the reactor, INITIATE Safety Injection, and GO TO E-0, Reactor Trip or Safety Injection
	CRO	MONITOR condenser vacuum and S/G radiation monitors NORMAL
	OATC	MONITOR containment conditions STABLE (NO)
	OATC	PLACE spare upper and lower compartment coolers IN SERVICE as required
	CRO	CHECK containment radiation RISING
	CREW	DETERMINE leakage source
	OATC	ISOLATE letdown: CLOSE letdown orifice valves FCV-62-72, FCV-62-73, FCV-62-74
	OATC	CLOSE letdown isolation valves: FCV-62-69, FCV-62-70, FCV-62-77
	OATC	EVALUATE need to CLOSE FCV-62-83, RHR Letdown Isolation
	US	NOTIFY Chemistry Shift Supervisor to ENSURE all primary side sample points in Hot Sample Room CLOSED

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 6 Page 2 of \_\_\_\_\_Event Description: Leak in Containment

Time	Position	Applicant's Actions or Behavior
		AOP-R.05 Continued
	US	CHECK leak IDENTIFIED and ISOLATED
	US	EVALUATE placing excess letdown in service using EA-62-3, Establishing Excess Letdown
	US	INITIATE leak repairs
		EA-62-3 Steps
	OATC	IF excess letdown is only letdown flowpath, THEN CONTROL charging flow as necessary to prevent high pressurizer level
	US	IF high activity levels in RCS are suspected, THEN NOTIFY Radiological Control (Radcon) section to monitor plant radiological conditions as required
	CRO	ENSURE CCS inlet to excess letdown heat exchanger [FCV-70-143] OPEN
	CRO	ENSURE CCS outlet to excess letdown heat exchanger [FCV-70-85] OPEN
	CRO	VERIFY CCS flow to excess letdown heat exchanger greater than 230 gpm, as indicated on [FI-70-84].
	OATC	ENSURE excess letdown divert valve [FCV-62-59] in NORMAL
	OATC	OPEN excess letdown isolation valve [FCV-62-54].
	OATC	OPEN excess letdown isolation valve [FCV-62-55].
	OATC	ADJUST excess letdown flow control valve [FCV-62-56] as necessary to control flow WHILE maintaining heat exchanger outlet temperature less than 200°F (240°F on Unit 1), as indicated on [TI-62-58].
	US	NOTIFY RADCON excess letdown has been placed in service

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 7 Page 1 of \_\_\_\_\_Event Description: Small Break LOCA

Time	Position	Applicant's Actions or Behavior
		<i>Crew should use Monitor Step 3 in AOP-R.05 to trip the reactor when containment pressure approaches 1.54 psig</i>
		E-0 Steps
	OATC	VERIFY reactor TRIPPED
	CRO	VERIFY turbine TRIPPED
	CRO	VERIFY shutdown boards ENERGIZED
	CRO/OATC	DETERMINE if SI actuated (Yes)
	CRO	VERIFY CCS pumps RUNNING ( <i>Manual Start 1B-B</i> )
	CRO	CHECK ERCW system operation, VERIFY at least four ERCW pumps RUNNING, VERIFY D/G ERCW supply valves OPEN ( <i>1A EDG did not start</i> )
	CRO/OATC	VERIFY ECCS pumps RUNNING, "A" train CCP, SIP, and RHR Pumps will fail to start. "A" Train control room isolation also fails
	OATC	VERIFY CCP flow through CCPIT
	OATC	* CHECK RCS pressure less than 1500 psig (NO)
	OATC	VERIFY ESF systems ALIGNED, Phase A ACTUATED, Containment Ventilation Isolation ACTUATED, Status monitor panels, Train A status panel 6K, Train B status panel 6L
	OATC	MONITOR containment spray NOT required (Yes)
	OATC	CHECK if main steam lines should be isolated (NO)
	CRO	VERIFY MFW Isolation
	CRO	VERIFY AFW pumps RUNNING
	CRO	CHECK AFW valve alignment
	CRO	DETERMINE if secondary heat sink available (Yes)
	OATC	MONITOR RCS temperatures
	OATC	IF any RCP running, THEN CHECK T-avg stable at or trending to between 547°F and 552°F (NO)
	OATC/CRO	IF temperature less than 547°F and dropping, THEN PERFORM the following; ENSURE steam dumps and atmospheric reliefs CLOSED (NO)
	CRO	IF cooldown continues, THEN, PERFORM the following; CONTROL total feed flow USING EA-3-8, Manual Control of AFW Flow, MAINTAIN total feed flow greater than 440 gpm UNTIL narrow range level greater than 10% [25% ADV] in at least one S/G

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 7 Page 2 of \_\_\_\_\_Event Description: Small Break LOCA

Time	Position	Applicant's Actions or Behavior
		E-0 Steps Continued
	US/CRO	IF cooldown continues, THEN, CLOSE MSIVs and MSIV bypass valves
	CRO	DISPATCH personnel to perform EA-0-1, Equipment Checks Following ESF Actuation
	OATC	CHECK pressurizer PORVs, safeties, and spray valves
	EXAMINER NOTE	* Depending on crew speed, the crew may go back to step 7c when RCS pressure goes below 1500 psig
	OATC	MONITOR RCP trip criteria; At least one CCP OR SI pump RUNNING AND RCS pressure less than 1250 psig (NO*)
		A phase B signal should be generated during this portion of the procedure
	OATC	STOP RCPs <i>Critical Task: Stop RCP's within 2 minutes</i>
	CRO	CHECK if S/G secondary pressure boundaries are INTACT: All S/G pressures controlled or rising, All S/G pressures greater than 140 psig (YES)
	CRO	CHECK if S/G tubes are INTACT (YES)
	OATC	CHECK if RCS is INTACT: Containment pressure NORMAL (NO)
	US	PERFORM the following: MONITOR status trees, GO TO E-1, Loss of Reactor or Secondary Coolant

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 7 Page 3 of \_\_\_\_\_Event Description: Small Break LOCA

Time	Position	Applicant's Actions or Behavior
		E-1 Steps
	OATC	MONITOR RCP trip criteria; At least one CCP OR SI pump RUNNING AND RCS pressure less than 1250 psig (NO*)
	CRO	CHECK if S/G secondary pressure boundaries are INTACT: All S/G pressures controlled or rising, All S/G pressures greater than 140 psig (YES)
	CRO	MAINTAIN Intact S/G narrow range levels: > 25%, Between 25 - 50%
	CRO	VERIFY secondary radiation NORMAL: CHECK the following radiation monitors, including available trends prior to isolation: Main steamline NORMAL, Condenser exhaust NORMAL, S/G blowdown recorder RR-90-120, pen #1 and pen #2 NORMAL, Post-Accident Area Radiation Monitor recorder RR-90-268B, points 3 (blue), 4 (violet), 5 (black), and 6 (brown) NORMAL. [M-31 (back of M-30)]
	US	NOTIFY chem lab to take S/G activity samples every 60 minutes
	US	NOTIFY RADCON to survey main steamlines and S/G blowdown
	OATC	MONITOR pressurizer PORVs and block valves: Power to block valves AVAILABLE, Pressurizer PORVs CLOSED, At least one block valve OPEN
	CRO	ENSURE Reactor Building auxiliary floor and equipment drain sump pumps (pocket sump pumps) STOPPED
	OATC	MONITOR SI termination criteria
	OATC	RCS subcooling based on core exit T/Cs greater than 40°F
	CRO	Secondary heat sink: Narrow range level in at least one Intact S/G greater than 10% [25% ADV]. Or Total feed flow to Intact S/Gs greater than 440 gpm
	OATC	RCS pressure stable or rising
	OATC	Pressurizer level greater than 10% [20% ADV].
	US	GO TO ES-1.1, SI Termination

Op-Test No.: \_\_\_\_\_ Scenario No.: 3 Event No.: 7 Page 4 of \_\_\_\_\_

Event Description: \_\_\_\_\_

Time	Position	Applicant's Actions or Behavior
		ES-1.1 Steps
	OATC	RESET SI and CHECK the following: AUTO S.I. BLOCKED permissive LIT. [M-4A, C4], S.I. ACTUATED permissive DARK. [M-4A, D4]
	CRO	MONITOR shutdown boards continuously energized
	OATC	RESET Phase A and Phase B
	CRO	ESTABLISH control air to containment USING EA-32-1, Establishing Control Air to Containment
	OATC	STOP all BUT one CCP and PLACE in A-AUTO
	OATC	CHECK RCS pressure stable or rising
	OATC	ISOLATE CCPIT: CLOSE inlet isolation valves FCV-63-39 and FCV-63-40, CLOSE outlet isolation valves FCV-63-26 and FCV-63-25
	OATC	ESTABLISH normal charging flow
	OATC	CLOSE seal water flow control valve FCV-62-89
	OATC	OPEN alternate or normal charging isolation valve FCV-62-85 or FCV-62-86
	OATC	OPEN charging flow isolation valves FCV-62-90 and FCV-62-91
	OATC	ESTABLISH desired charging flow USING seal water and charging flow control valves FCV-62-89 and FCV-62-93
	OATC	CONTROL charging flow to maintain pressurizer level
	OATC	DETERMINE if SI pumps should be stopped
	OATC	CHECK RCS pressure and SI flow: Pressure stable or rising, Pressure greater than 1500 psig, SI pump flow on FI-63-151 ZERO, SI pump flow on FI-63-20 ZERO
	OATC	STOP SI pumps and PLACE in A-AUTO
	OATC	DETERMINE if RHR pumps should be stopped: CHECK RHR pumps ALIGNED to RWST, STOP RHR pumps and PLACE in A-AUTO
		TERMINATE THE EXERCISE AFTER THE RHR PUMPS ARE STOPPED